The Impact of User Charges on Patient Choice of Healthcare Services in Ireland

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ABBREVIATIONS

A&E	Accident and Emergency
AIC	Akaike information criteria
ANOVA	Analysis of variance
ARIMA	Autoregessive integrated moving average
BIC	Bayesian information criteria
CSO	Central Statistics Office
CUA	Cost-utility assessment
CV	Contingent valuation
CVM	Contingent valuation method
DCE	Discrete choice experiment
DOH	Department of Health
DPS	Drugs payment scheme
EU	European Union
EXPH	Expert Panel On Effective Ways of Investing in Health
FAQ(s)	Frequently asked question(s)
GDP	Gross domestic product
GMS	General medical services
GNP	Gross national product
GP	General practitioner
GPVC	General Practitioner Visit Card
HRS	Health Retirement Study
HSE	Health Service Executive
IDS	Integrated delivery system
IIA	Independence of irrelevant alternatives
IMB	Irish medicines board
IMO	Irish Medical Organisation
INMO	Irish Nurses and Midwives Organisation
LHO	Local health office
LTI	Long-term illness
MAU	Medical assessment unit
MEM	Marginal effects at mean
MNLM	Multinomial logit model
MRI	Magnetic resonance imaging
MSE	Mean squared error
NAGP	National Association of General Practitioners
NBRM	Negative binomial regression model
NCA	National Consumer Agency
NHS	National Health Service
OECD	Organisation for Economic Co-operation and Development
OHP	Oregon Health Plan
OLS	Ordinary least squares
OOP	Out-of-pocket
OTC	Over-the-counter
PCRS	Primary Care Reimbursement Scheme
PHI	Private health insurance
PPC	Pre-payment certificate
PRM	Poisson regression model
QALY	Quality-adjusted life year

QNHS	Quarterly National Health Survey
RC	Retail clinic
RRR	Relative Risk Ratio
SAQ	Seattle Angina Questionnaire
SREC	Social Research Ethical Committee
UCAOA	Urgent Care Association of America
UCC	Urgent care clinic
UCLA	University of California, Los Angeles
UK	United Kingdom
US	United States
VA	Veterans Affairs
VIF	Variance inflation factor
WIC	Walk-in clinic
WTA	Willingness-to-accept
WTP	Willingness to pay
ZINB	Zero-inflated negative binomial
ZIP	Zero-inflated poisson
ZTNB	Zero-truncated negative binomial
ZTP	Zero-truncated poisson

DECLARATION

This is to certify that the work I am submitting is my own and has not been submitted for another degree, either at University College Cork or elsewhere. All external references and sources are clearly acknowledged and identified within the contents. I have read and understood the regulations of University College Cork concerning plagiarism.

Signed: ______________________ Date: _________________

Aimée Fox

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ABSTRACT

This research assesses the impact of user charges in the context of consumer choice to ascertain how user charges in healthcare impact on patient behaviour in Ireland. Quantitative data is collected from a subset of the population in walk-in Urgent Care Clinics and General Practitioner surgeries to assess their responses to user charges and whether user charges are a viable source of part-funding healthcare in Ireland.

Examining the economic theories of Becker (1965) and Grossman (1972), the research has assessed the impact of user charges on patient choice in terms of affordability and accessibility in healthcare. The research examined a number of private, public and part-publicly funded healthcare services in Ireland for which varying levels of user charges exist depending on patients' healthcare cover.

Firstly, the study identifies the factors affecting patient choice of privately funded walk-in Urgent Care Clinics in Ireland given user charges. Secondly, the study assesses patient response to user charges for a mainly public or part-publicly provided service; prescription drugs. Finally, the study examines patients' attitudes towards the potential application of user charges for both public and private healthcare services when patient choice is part of a time-money trade-off, convenience choice or preference choice. These services are valued in the context of user charges becoming more prevalent in healthcare systems over time.

The results indicate that the impact of user charges on healthcare services vary according to socio-economic status. The study shows that user charges can disproportionately affect lower income groups and consequently lead to affordability and accessibility issues. However, when valuing the potential application of user charges for three healthcare services (MRI scans, blood tests and a branded over a generic prescription drug), this research indicates that lower income individuals are willing to pay for healthcare services, albeit at a lower user charge than higher income earners.

Consequently, this study suggests that user charges may be a feasible source of part-financing Irish healthcare, once the user charge is determined from the patients' perspective, taking into account their ability to pay.

To my parents for their love and support and putting me through the best education possible. I appreciate their sacrifices and I would not have been able to get through this without them.

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1 INTRODUCTION

1.1 User Charges in Health Care

User charges are a common policy adopted in most EU healthcare systems such as Ireland, Portugal, Denmark, Spain, Belgium, Poland, Austria and France that result in the sharing of healthcare costs between the patient and provider. User charges are defined as payments made in an out-of-pocket (OOP) manner by users of healthcare services as a contribution towards their costs (Morris et al., 2007).

These patient-targeted user charge policies are grounded in the economic theory of consumer choice and how price can be used as a tool to change consumer behaviour. Transferring a proportion of the cost to the patient, it is theorised that user charges encourage consumers to become more cost-conscious (Hurley and Johnson, 1991). This is based on the assumption that consumers reduce unnecessary demand (Hurley and Johnson, 1991). This unnecessary demand is referred to as 'moral hazard'; defined as "the intangible loss-producing propensities of the individual assured" (Dickerson, 1959, p. 67) (Dickerson, 1959) (Dickerson, 1959) (Dickerson, 1959) (Dickerson, 1959) (Dickerson, 1959) (Dickerson, 1959) (Dickerson, 1959). In other words, moral hazard is the excess use of services when the patient is insured against all of the cost or a proportion of the cost (Morris et al., 2007). This reduction in moral hazard, reduces unnecessary spending in healthcare (Hurley and Johnson, 1991, Skinner, 2002). This research acknowledges that user charges may not always raise revenue and whether they do or not depends on the revenue they are replacing. If the money generated from the user charge is used to reduce overall healthcare spending, then the user charge does not raise revenue. However, if the money it replaces continues to be spent in health then the user charge does raise revenue for the healthcare system.

There is the counter-argument that the absence of user charges in healthcare systems can continue to increase healthcare expenditure as there is the risk of patients excessively using some healthcare services due to lower healthcare costs (Xu et al., 2006). Lack of healthcare funding, such as user charges, may negatively impact the provision of healthcare thereby impacting on availability of healthcare for patients. Economic theory states that when a patient must pay the full cost of healthcare, he/she will consume healthcare based on preferences and budgetary constraints (Becker, 1965, Grossman, 1972). If a third party pays all the cost, it is expected that patients will have a higher utilization rate.

In healthcare, some patients have full financial protection (full third party payment) against user charges while other patients must pay the full user charge for a healthcare service (full cost borne OOP by the patient). When the user charge lies between full third-party payment and the full user charge, the patient is subject to some form of payment for the healthcare service.

Throughout this research, unless otherwise stated, the term "user charge" is generally applied when referring to any OOP payment made by patients for healthcare services. More specifically, the term "cost-sharing" is used to indicate that only a proportion of the total cost of the healthcare service is paid OOP by the patient. Consequently, this research defines cost-sharing as a subset of user charges.

Cost-sharing can involve either direct or indirect payment for a healthcare service by the patient (Tamblyn et al., 2001). Direct cost-sharing includes co-payments (flat fee for service), deductibles (payment which covers a specific proportion of the healthcare cost before insurer/government begins to pay), co-insurance (percentage of total cost) and balance billing (difference between the doctor’s fee and health insurance reimbursement). Indirect cost-sharing is still paid OOP by the patient but is not directly imposed (Robinson, 2002). Indirect cost-sharing includes coverage exclusions (services not covered by insurance) and pharmaceutical mechanisms such as generic substitution (switching a branded drug for a generic drug), reference pricing (patient pays difference between reference price and actual cost of the drug) and formularies (positive, negative and selected lists) (Robinson, 2002). The current study addresses the impact of full OOP user charges, direct cost-sharing (co-payments and deductibles) and indirect cost-sharing (generic substitution and reference pricing) on patient choice of healthcare services in Ireland.

The different types of user charges have varying impacts on patient behaviour (Hurley and Johnson, 1991). For example, a co-insurance rate for which the patient pays a percentage of the total cost encourages the patient to become cost-conscious and incentivises them to use the service sparingly as their OOP payment will depend on the amount or level of the service they use. Unless the co-payment is applied per service/item, a patient who pays a flat rate co-payment (e.g. per prescription) has no incentive to be cost-conscious as the OOP payment will be the same regardless of whether the patient uses the service sparingly or not.

User charges commonly exist in EU healthcare systems for most healthcare services such as; prescription drugs, GP (General Practitioner) services, out-patient services, in-patient care and dental care (Robinson, 2002, Tambor et al., 2011, Barros and Siciliani, 2012). A mixture of direct and indirect cost-sharing is applied in terms of co-payments, co-insurance, deductibles, reference pricing and balance billing throughout EU member states for prescription drugs (Thomson et al., 2009, Barros and Siciliani, 2012). With regard to GP and out-patient care, in 2011, Tambor *et al* (2011) conducted a review of cost-sharing in the 27 European Union (EU) countries at the time. They found that more than half of these EU countries had some form of cost-sharing for GP services and out-patient care with co-payments and co-insurance being the most commonly applied forms of cost-sharing for these services. Tambor *et al* (2011) also report that EU countries apply user charges for in-patient care with daily co-payments forming the most common type of cost-sharing for this service.

1.2 Research Objective

This research assesses the impact of user charges in the context of consumer choice to ascertain how user charges in healthcare impact on patient behaviour in Ireland. Using two specifically designed questionnaires, primary data is collected from patients in the Irish healthcare system. The research examines three different topics in Irish healthcare; the first topic examines the factors that affect patient choice for a private health service for which a user charge is already in place. It assesses the impact of a full user charge that is paid OOP by the patient.[1] Primary data is collected from

[1] Patients with private health insurance (PHI) may be subject to ex-post reimbursement for part of this user charge depending on the health insurance plan they have.

patients attending three walk-in urgent care clinics (UCCs) in Ireland.[2] These UCCs offer an alternative choice of care to patients for the treatment of a minor injury or illness. Comparable to walk-in UCCs in the UK, US and Canada (Weinick et al., 2009), UCCs in Ireland fill the gap between the traditional GP services and Accident and Emergency (A&E) departments.

The second topic examines how consumer choice changes as a result of a recently introduced or increased user charge for a mainly public or part-publicly provided service. Collecting primary data from patients in selected GP surgeries in Cork, the research investigates if prescription drug user charges cause patients to change their behaviour in order to afford and access prescription medication. This topic investigates the impact of co-payments, deductibles and full user charges on patient behaviour for prescription drugs.

The third and final topic presents patients with three different healthcare services and determines how much they are willing to pay OOP for each service. This topic also collects primary data from patients as they wait in selected GP surgeries in Cork. The topic examines patients' attitudes towards the potential of user charges for both public and private healthcare services when it is part of a time-money choice (MRI scan), a convenience choice (blood tests) or a preference choice (branded drug). These services are valued in the context of user charges becoming more prevalent in healthcare systems over time.

[2] It is important to note in this research that the walk-in UCCs where this data is collected are privately funded clinics. There are also publicly funded walk-in UCCs in Ireland and in other countries such as the US, UK and Canada but this research only collects data from three privately funded clinics in Ireland. When referring to the data collected for this research, it is in the context of a privately funded walk-in clinic unless otherwise stated. The literature review in Section 3.2 deals with public as well as private UCCs.

The results of the research will reveal patients' responses to user charges in the different situations and how these responses vary by socio-economic status. Assessing patients' response to price is essential in the healthcare system and is particularly important in a system where user charges are gaining popularity as a method of healthcare financing. Understanding patients' response to user charges is important, as this response will indicate whether user charges are a viable source for part-funding healthcare in Ireland.

1.3 Research Questions

The three research questions addressed are:

1. What factors influence patient choice of Walk-in Urgent Care Clinics in Ireland in the face of user charges?
2. What impact have prescription drug user charges had on patient behaviour in Ireland?
3. What are Irish healthcare consumers willing to pay for three selected healthcare services (Blood tests, MRI scans and branded versus a generic prescription drug)?

From these questions stem more specific objectives that include:

- Characterize the type of patient who chooses a walk-in UCC in Ireland.
- Identify using a zero-truncated negative binomial model the factors that determine why a patient pays a higher user charge to receive urgent care at an UCC.

- Identify using a probit regression what factors affect the likelihood of a patient being a first-time user of an UCC in Ireland.
- Identify the impact that different types of user charges have on patient behaviour for prescription drugs.
- Using a multinomial logit model, measure the association between patient behaviour regarding prescription drugs and individual characteristics.
- Reveal patients' willingness-to-pay (WTP) values for three healthcare services.
- Identify discrepancies between patients' reported WTP and the current market price.
- Using a two-part model, identify the factors that are associated with patients' WTP values for the three selected healthcare services.

1.4 Motivation

User charges increase patient OOP expenditure, which contributes towards the healthcare system but can lead to a welfare loss for patients who cannot afford the necessary healthcare services (Srivastava and McGuire, 2015). Consequently, user charges can restrict patient access and may make some services unaffordable for patients (Robinson, 2002). User charges may be "regressive" with larger effects on patients who spend a larger proportion of their income on a particular healthcare service (Adams et al., 2001, Contoyannis et al., 2005, Gibson et al., 2005a, Lexchin and Grootendorst, 2004, Smith and Kirking, 1992). Conversely, lack of healthcare funding, such as user charges, may negatively impact the provision of healthcare thereby impacting on availability of healthcare for patients. While user charges can contribute towards healthcare financing, accessible and affordable healthcare for all patients must be at the centre of healthcare delivery. This research assesses the impact of user charges in the context of consumer choice to establish how they affect patient behaviour in Ireland.

In Ireland, OOP payments as a percentage of total healthcare financing has increased from 15% to 18.1% between 2007 and 2011 (OECD, 2013). It is suggested this increase in OOP is due to corresponding increases in the hospital and out-patient costs and fees for healthcare professionals (OECD, 2013) in addition to increases in user charges for prescription drugs (Mladovsky et al., 2012). Government spending also fell during this period, which would have contributed to the increased share of health expenditure accounted for by OOP payments. With an extra €510 million in additional healthcare funding required by the end of 2014 and €600 million supplementary funding required for public services at the end of 2015, it is evident that the Irish health sector is under increasing pecuniary pressure and user charges will need to remain to help contribute towards healthcare financing (Hurley and Johnson, 1991, Robinson, 2002, Usher et al., 2012, Xu et al., 2006). This research examines the impact of user charges on patient choice of healthcare services in Ireland in the context of whether user charges are a viable method of part-funding healthcare.

Similar to other countries in the EU, user charges exist in the Irish healthcare system for most healthcare services; GP services, ambulatory care, specialist care and prescription drugs. User charges are imposed on these services for patients with or without private health insurance (PHI). For most healthcare services in Ireland, the user charge depends on the level of healthcare cover the patient has. Consequently, the first topic in this research assesses patients who have already made a choice to pay a full user charge for a private health service in order to identify what drives patient choice. The second topic assesses the impact of co-payments, deductible and full user charges for a mainly public or part-publicly provided service to reveal patient response. The third and final topic examines patients' attitudes towards the potential application of user charges in the form of OOP payments for both public and private healthcare services when it is part of a time-money (MRI scans) choice, a convenience choice (blood tests) or a preference (branded drug) choice.

1.5 Methodology

The research methodology is of a quantitative nature, revolving around three research questions as identified above. Two specifically constructed questionnaires are used to collect primary data from Irish healthcare consumers.

Using a self-completion questionnaire, the first topic (see Chapter 3) collects primary data from patients attending three walk-in UCCs in Ireland. This methodology is consistent with international empirical research studies conducted in walk-in UCCs across the US, UK and Canada (Bell and Szafran, 1992, Hunter et al., 2009, Rizos et al., 1990, Salisbury et al., 2002, Scott et al., 2009). A zero-truncated negative binomial model is used to estimate the factors that influence patient choice of walk-in UCCs in Ireland. A probit regression is also applied to identify the factors that affect the likelihood of the patient being a first-time user of the service.

The second study, (see Chapter 4) develops a questionnaire based on a previous study conducted by Reed *et al* (2008) to examine the impact that prescription drug user charges have on patient behaviour in Ireland. The questionnaire measures three types of patient behaviour that can result from an increase or introduction in user charges for prescription drugs; decreased adherence, financial constraints and cost-coping strategies (Reed et al., 2008). Behavioural responses are assessed by measuring the percentage of patients who report any behaviour change (decreased adherence, financial burden or cost-coping behaviours). A multinomial logit model measures the association between behaviour and individual characteristics.

The final topic, (see Chapter 5) is a contingent valuation method (CVM) using a questionnaire designed stated preference approach to identify what Irish healthcare consumers are willing to pay for healthcare (blood tests, MRI scans and prescription drugs). This study examines the potential application of user charges when it is part of a time-money choice (MRI scan), a convenience choice (blood tests) or a preference choice (branded drug). The econometric analysis of the WTP studies is shaped on how the WTP question is asked and any underlying theoretical implications (Donaldson et al., 1998). Percentages and frequencies are examined to generate a response profile for WTP for the three identified healthcare services (Liu et al., 2013, Marvasti, 2006). A two-part model (probit and OLS regression) is used to identify the factors associated with patients' WTP for the three services.

1.6 Contributions

User charges are gaining popularity as a commonly used financing method in healthcare. User charges transfer a proportion of the cost to the patient, which consequently contributes towards their healthcare costs. In Ireland, very little research has examined the impact of user charges on consumer choice from the patient perspective, predominantly due to a lack of data. This needs to be done before one can determine if user charges can be used to part-fund healthcare. If user charges do not exist and patients excessively utilize healthcare services, this may negatively impact on the provision of healthcare, thereby impacting on availability of healthcare for patients.

Collecting primary data from a subset of the population in walk-in UCCs and GP surgeries, the research contributes to the literature by examining user charges in the context of consumer choice to determine how they impact on patient behaviour in Ireland. This research will provide a direct insight into patients' responses to user charges in Ireland. This contribution is important at a time of increasing financial pressure in the Irish healthcare system in which user charges are becoming a more common method of healthcare financing. The results will indicate whether user charges may be a viable source of part-funding Irish healthcare and the results will serve as an evidence base for development of user charge policies and pricing decisions for healthcare services in Ireland. The results also have potential for international applicability for other healthcare systems which may be considering an introduction/increase in user charges.

1.7 Thesis Structure

Chapter 2 of this research provides a background to the current Irish healthcare system, a description of healthcare financing in Ireland and identifies the health economic theories that support this study. Section 2.2 describes the current Irish healthcare system while Sections 2.2.1 to 2.2.3 in particular describe patient eligibility for healthcare services in Ireland with a primary focus on full eligibility, limited eligibility and Long-Term Illness (LTI). Section 2.2.4 describes PHI in Ireland. Section 2.3 describes healthcare funding in Ireland and Section 2.4 presents the health economic theories that support this research. Consumer choice is presented in Section 2.4.1 and the impact of user charges on affordability and accessibility is described in Section 2.4.2. Section 2.5 concludes Chapter 2.

Chapter 3 addresses the first research topic, *What factors influence patient choice of Walk-in Urgent Care Clinics in Ireland in the face of user charges?* Section 3.1 provides the introduction to this topic while Section 3.1.1 to 3.1.3 describe the research objective, research motivation and chapter structure for Chapter 3. Section 3.2 provides the literature review for this topic while Section 3.3 provides the methodology used in this chapter. Section 3.4 presents the econometric model, results and a discussion of the findings in this chapter while Section 3.5 concludes this topic.

Chapter 4 examines the second research question, *What impact have prescription drug user charges had on patient behaviour in Ireland?* Section 4.1 provides the introduction to this topic while Sections 4.1.1 and 4.1.2 describe prescription drug user charges in Ireland and the impact of prescription drug user charges on affordability and accessibility in healthcare. Sections 4.1.3 to 4.1.5 discuss the research question and aim, research motivation and chapter structure. Section 4.2 presents the literature review on this topic and Section 4.3 describes the methodology used to answer the research question in Chapter 4. Section 4.4 presents the econometric model, results and a discussion of the results in this chapter. Finally, Section 4.5 concludes Chapter 4.

Chapter 5 addresses the final topic in this thesis, *What are Irish healthcare consumers willing to pay for three selected healthcare services? (Blood tests, MRI scans and prescription drugs)?* Section 5.1 introduces this topic, Section 5.1.1 discusses the impact of accessibility and affordability in the context of this topic and Sections 5.1.2 to 5.1.3 present the research question, objective and research motivation. Section 5.1.4 describes the structure of Chapter 5. Section 5.2 presents the literature review on this topic and Section 5.3 describes the methodology used in Chapter 5. Section 5.4 presents the results of Chapter 5 which focuses on the econometric model, research findings and a discussion on the findings. Section 5.5 concludes Chapter 5.

Finally, Chapter 6 provides an overall conclusion to this thesis. Section 6.1 provides an overview of the research. Section 6.2 discusses the research findings, Section 6.3 presents the research contributions, Section 6.4 describes recommendations for future studies and Section 6.5 concludes this thesis.

2 IRISH HEALTHCARE SYSTEM AND HEALTH ECONOMIC THEORIES.

2.1 Introduction

The initial focus of this chapter is to provide a description of the Irish healthcare system in terms of healthcare financing and patient eligibility to healthcare services. The second function of the chapter is to identify the health economic theories that support this research. Sections 2.2.1 to 2.2.3 describe patient eligibility to healthcare services with a particular emphasis on full eligibility, limited eligibility and LTI while Section 2.2.4 describes PHI in Ireland. Section 2.3 examines the current situation of healthcare financing in Ireland. Finally, Section 2.4 identifies the health economic theories that support the research; consumer choice (Section 2.4.1) and affordability and accessibility in healthcare (Section 2.4.2).

2.2 Irish Healthcare System

The Irish healthcare system is a primarily government financed public healthcare system with general taxation forming 67% of the funding. OOP payments (17%) and PHI (13%) also contribute towards healthcare funding (OECD, 2015).[3,4]. Public healthcare is available to every resident yet some people choose to purchase PHI. Patients purchase PHI in order to receive faster access to hospital services or as a result of preference for care in a private hospital rather than a public hospital (HIA, 2014c).

[3] The remainder of healthcare funding comes from private corporations.
[4] The research acknowledges that Wren *et al* (2015) also report statistics on healthcare funding in Ireland (Wren et al., 2015) However, for consistency purposes, this research will include the most up-to-date OECD figures when possible.

Entitlement to public health services in Ireland is based on residency rather than individuals' contribution of tax or pay-related social insurance (PRSI). There are two forms of eligibility for healthcare in Ireland. The first is full eligibility and the second is limited eligibility.

The following sections; 2.2.1 to 2.2.4 describe the different types of healthcare cover which exist in Ireland.

2.2.1 Full Eligibility

Full eligibility is granted to patients primarily on an income basis under the General Medical Services (GMS) Scheme.[5] There is separate eligibility criteria for the GMS scheme depending on the patients age (under 65 years, between 66 and 70 years and patients over 70 years) and living situation (single living alone, living with a family, married couple or a single parent with dependent children) (HSE, 2015b). For example, to be eligible for the GMS scheme, the gross weekly rate income threshold for a person under 65 years living alone is €184, the threshold for a person between 66 and 70 years is €201.50 while the gross weekly rate income threshold for a patient over 70 years of age is <€500 (HSE, 2015b). Patients who are granted full eligibility are given a GMS card which entitles them to free GP services, prescription drugs (subject to a recently introduced user charge on each item), public hospital services, dental, optical and aural services, maternity and infant care services and community care and social services (HSE, 2013f).

[5] Some medical cards are issued on a discretionary basis if the individual cannot access healthcare service without undue hardship (HSE, 2014)

Previous to 2010, all of these services were provided free of charge to all GMS patients. However, in 2010 a 50c fixed fee per prescription item was introduced on all prescription drugs dispensed by pharmacies to GMS patients. This user charge was subject to a maximum ceiling of €10 per family per calendar month. In October 2013, this co-payment was further increased to €1.50 per item with a monthly limit of €19.50. Currently, since October 2014, this co-payment is set at €2.50 per item with a monthly maximum of €25 per family per calendar month (DOH, 2013). The GMS co-payment saved €43 million in 2015 (IMO, 2016).

The latest available figures show that in 2013, 40.31% of the population (1,849,340) were eligible for GMS status (PCRS, 2013)[6]. This costs the HSE an average payment to pharmacies of €973.26 per person for prescription drugs (PCRS, 2013). The number of individuals under the GMS scheme increased by approximately 34% between 2009 and 2013 (PCRS, 2013). One reason for this increase in eligibility is due to the onset of the recession in Ireland in 2008. Increasing levels of unemployment led to lower incomes which resulted in a higher number of patients becoming eligible for GMS status. While GMS numbers have increased, the HSE cost per GMS patient decreased from €1,245.79 in 2009 to €973.26 per patient in 2013. One of the possible reasons for this reduction in cost per person is due to the increase that occurred in the prescription charge between 2010 and 2013. Patients were contributing towards a higher share of their prescription medication, therefore, reducing the HSE cost per claimant.

[6] The HSE Annual Report (2014), reports that 39% (1.77m) of the population were eligible for the GMS scheme in 2014. However, the HSE does not provide detailed statistics for the other publicly funded categories addressed in this thesis (Drugs Payment Scheme (DPS) and LTI). The PCRS provides the most up-to-date statistics for all community drug schemes in Ireland so for consistency purposes, the PCRS statistics are used when possible.

2.2.2 Limited Eligibility

Patients with limited eligibility (non-GMS) are entitled to public hospital services but may be subject to in-patient and out-patient hospital charges in Ireland.[7] Non-GMS holders are entitled to subsidised maternity and infant care services. Patients who do not qualify for the GMS scheme can apply for a General Practitioner Visit Card (GPVC). This is a primarily means-tested card which entitles the patient to attend a participating GP for free. The same eligibility criteria exist for GPVC as GMS cards except the income thresholds for a GPVC are higher than the income thresholds for a GMS card. For example, the gross weekly rate income threshold for a person under 65 years living alone is €276, the threshold for a person between 66 and 70 years is €302 while the gross weekly rate income threshold for a patient over 70 years of age is over €500 but less than €700 (HSE, 2015b). In 2013, 3% of the population (125,426) had a GPVC (PCRS, 2013).[8] Unless you have a GMS card or a GPVC in Ireland, the cost of the visit to the GP must be paid for OOP. The national average GP visit cost in Ireland is €51 (Nolan et al., 2014). Approximately 60% of the population must pay this charge (Nolan et al., 2014).

Patients without a GMS card may apply for a Drugs Payment Scheme (DPS) card to receive financial protection for prescription drugs. With a DPS card, a patient pays a monthly deductible for their prescription drugs after which the cost is covered by the HSE. In comparison to the recent introduction of the GMS user charge, the DPS user

[7] A non-GMS in-patient must pay €75 per night in hospital subject to a maximum of €750 per year. A non-GMS out-patient who does not have a referral from their GP must pay €100 for their out-patient or A&E treatment (HSE, 2013d).

[8] Since 2015, automatic entitlement to a GPVC is granted to children under 6 years and adults over 70 years irrespective of patient income (HSE, 2015a; HSE 2015d).

charge has been in existence in Ireland since 1999 (DOH, 1999). In 1999, the DPS set a monthly deductible of £42 (€56) per family per month (DOH, 1999). This meant that once a patients' drug cost exceeded £42 (€56) per month, the remainder of their drug costs were covered by the State. This deductible has increased considerably; in 2008 it increased to €90 (DOH, 2008) and in 2010 it rose to €120 (DOH, 2010). In 2012 it was further increased to €132 (DOH, 2011) and since the 1st of January 2013 an individual with a DPS card can pay up to €144 for prescription drugs per calendar month (DOH, 2012b). Any prescription drug costs in excess of this are covered by the State.

The latest available figures show that in 2013, 30.5% (1,399,208) of the population were registered under the DPS scheme. This costs the HSE an average payment of €272.56 per claim[9] (PCRS, 2013). The number of individuals under the DPS scheme decreased by approximately 12% between 2009 and 2013 (PCRS, 2013). One reason for this reduction is due to the onset of the recession in Ireland in 2008. Increasing levels of unemployment led to lower incomes which resulted in a higher number of patients becoming eligible for GMS status. This reasoning is supported as the number of GMS patients increased by almost 34% during the same time-frame (2009 to 2013) (PCRS, 2013).

[9] Figures are based on number of eligible persons who availed of services under the scheme. The PCRS only has data on the DPS patients who exceed the monthly deductible as it is only after a patient reaches €144 per calendar month that the HSE covers the cost of the patient's prescription drugs. Until this point, the patient pays OOP. Consequently, the €272.56 per claim refers only to patients who exceed the €144 per month.

2.2.3 Long-Term Illness (LTI)

The LTI scheme is also available which provides drugs and treatment for a long-term illness free of charge. There is a list of 16 long-term illnesses for which this scheme is available. In 2012, 1.57% of the population were covered by the LTI scheme with an average net cost of €1,480,83 to the HSE (PCRS, 2013).[10] Unlike the GMS and DPS, the LTI scheme is granted irrespective of patient income.

2.2.4 Private Health Insurance (PHI) in Ireland

Despite public healthcare being available to all of the population, just under half the population, 44%[11] (2.03m) purchase PHI[12] (HIA, 2014a). The number of individuals taking out PHI policies decreased by approximately 11.8% between 2008 and 2014. This decrease in coverage has occurred across all age groups up to 60 years with the sharpest decrease among lower age groups (HIA, 2014b). While entitlement under PHI plans vary, quicker access to hospital care is seen as the main benefit as well as preference for care in a private hospital rather than a public hospital (HIA, 2014a). Therefore, privately insured patients often access hospital services faster based on their ability to purchase PHI.

[10] These figures are based on the number of eligible persons who availed of services under the LTI scheme.
[11] This figure corresponds to the end of 2014.
[12] Some people who have a medical card will also have PHI. According to the latest available figures, 6% of the population have both types of cover QNHS 2010. Health Status and Health Service Utilisation. Dublin.

Sections 2.2.1 to 2.2.3 described the GMS, DPS and LTI schemes in Ireland. These are three of the largest publicly funded health schemes in Ireland.[13] Section 2.2.4 described the PHI market in Ireland. As mentioned in Section 1 .4, user charges for healthcare services in Ireland vary depending on the level of cover a patient has. This research distinguishes between the public and private schemes in order to understand the impact of the different user charges on patient choice.

2.3 Healthcare Funding in Ireland

Ireland entered a recession in 2008 and subsequently entered an international bailout in 2010 worth €85 billion (Burke, 2008). The bailout resulted in a number of severe austerity budgets leading to a 27% cut in the health budget between 2008 and 2014 (IMO, 2015). Since 2008, approximately €4 billion has been cut from the Irish health system (IMO, 2015). The HSE budget is consistently overrun requiring €510 million in supplementary healthcare funding by the end of 2014 and €600 million additional funding required at the end of 2015 (IMO, 2015). In Ireland, total health expenditure is 8.9% of GDP which is similar to the OECD average of 9% (OECD, 2015). Due to the imbalance between profits repatriated by foreign multinationals and overseas profits of Irish companies, it is also appropriate to acknowledge that total health expenditure in Ireland is 12.4% of GNI where GNI excludes the profits of foreign-owned companies in the country (Publicpolicy, 2016).

[13] There are 15 community schemes in Ireland; the GMS, DPS and LTI scheme, Dental Treatment Services Scheme (DTSS), European Economic Area (EEA), High Tech Drugs (HTD), Primary Childhood Immunisation, Health(Amendment) Act 1996, the methadone treatment and the HSE Community Ophthalmic Services Scheme, Immunisations for GMS eligible persons, GPVC, Discretionary Hardship Arrangements, Centralised reimbursement of selected high cost drugs administered or dispensed to patients in hospitals, Centralised reimbursement of Outpatient Parenteral Antimicrobial Therapy (OPTAT) (PCRS, 2013).

While healthcare spending in Ireland has decreased, demand on the public health system has increased. As mentioned, the number of individuals with PHI decreased by 11.8% between 2008 and 2014. In December 2008, almost 2.3 million individuals had PHI. This fell by 272,000 to just over 2 million in December 2014. Furthermore, the number of individuals eligible for GMS status increased by nearly half a million between 2009 and 2013 (HSE, 2015a, PCRS, 2013). This is due predominantly to an increase in the unemployment rate which increased by approximately almost 7 percentage points from 5.1% in 2008 to 12.2% in 2014 (QNHS, 2014b, QNHS, 2014a). This resulted in lower incomes and subsequently a greater number of individuals eligible for GMS status.

In addition to the decrease in PHI coverage and the increase in GMS numbers, demand on the public health system is stretched even further due to the ageing population in Ireland. The number of people over 70 years has increased by 20% since 2006 (IMO, 2016). The increasing demand on the healthcare system coupled with the need to keep within the healthcare budget has led to theatre closures and cancellation of elective procedures (IMO, 2015). This has a negative impact on the country's A&E departments, hospital wards, outpatient appointments and elective procedure waiting lists. A&E departments in Ireland are facing a daily struggle. Overcrowding in A&E departments reached an all-time high on the 6th January 2015 when there were 601 patients waiting on trollies in A&E departments and hospital wards across the country (Doran, 2015). In 2015, the HSE set a target of treating all A&E attendances within 6 hours of registration (HSE, 2015a). Extensive waiting periods are also experienced in the out-patient departments around the country. In May 2015, 85,130 patients had been waiting over 1 year for an out-patient appointment while 11,609 patients were waiting for over 2 years (IMO, 2016). This is despite the HSE setting a target of treating all outpatients within 52 weeks of first access to the outpatient department (HSE, 2015a). In addition, over 9,180 adults and children were waiting over 12 months for an elective procedure.

It is apparent that changes need to be introduced in the Irish healthcare system in order to cope with the restricted budget and the increasing demand. Not only do user charges contribute towards patients' healthcare costs, they also impact on patient choice by making consumers more aware of the costs of healthcare and deter patients from using unnecessary healthcare services. A combination of these objectives could be one of many methods of alleviating the financial strain on the Irish healthcare system. This thesis aims to examine the impact of user charges in the context of consumer choice to ascertain whether user charges are a viable source of part-funding healthcare in Ireland.

2.4 Health Economic Theories

Healthcare is an economic service for which patients must choose, in the onset of an illness, how much healthcare to consume. User charges in healthcare alter the price of healthcare services which has a knock-on effect on patient choice in terms of affordability and accessibility (Adams et al., 2001, Contoyannis et al., 2005, Gibson et al., 2005a, Lexchin and Grootendorst, 2004, Smith and Kirking, 1992). Affordability and accessibility are two fundamental considerations in equity in healthcare. Equity is one of many key objectives in healthcare policies and is a complex process for which there is no universal definition (Morris et al., 2007).

Generally, equity refers to equal access to healthcare for all patients regardless of their ability to pay (Andersen, 1975, Bergmo and Wangberg, 2007, LeGrand, 1978, Rosenzweig and Schultz, 1991). While this research focuses primarily on affordability and accessibility, the research recognizes that they are two dominant considerations in the complex process of equity in healthcare.

This research acknowledges that user charges may also impact on allocative efficiency in healthcare. Allocative efficiency is achieved when resources are allocated based on the preferences of the individual (Arrow, 1963, Morris et al., 2007). This type of efficiency ensures that the health service is provided to patients who need it most (Dupas, 2012). However, as this research focuses on the impact of user charges from the patients' perspective, the research measures the impact of user charges on patient choice in terms of affordability and accessibility in healthcare. The impact of user charges is examined using the theoretical foundations of Becker's household production function (1965) and Grossman's household production function (1972).

2.4.1 Consumer Choice

When consumers demand healthcare, they do not demand the service itself, but they demand good health. Therefore, the demand for healthcare is a derived demand. (Grossman, 1972, Lancaster, 1966). Healthcare demand is based on consumer preference; that is, what consumers want along with their ability to pay for the service (Morris et al., 2007).

Consumers' choice is driven by the objective of utility maximisation (Lancaster, 1966). Lancaster's approach to economic theory presents the idea that consumers demand a good or service for the characteristics it possesses. It is these characteristics that are the object of a consumer's utility (Lancaster, 1966). The characteristics of each good or service are objective, but the utility derived from the characteristics are subjective and based on the consumer's preferences. This theory was progressed by Grossman (1972) as he applied this concept to the demand for healthcare. It is the characteristics of the healthcare services which result in good health that are the source of utility maximisation for healthcare consumers. Utility maximisation for healthcare consumers is limited due to their income and the price the consumer must pay to use the service. Consequently, the price of healthcare goods and patient's income influence patient choice.

Consumer choice theory states that as price increases, the demand will decrease (Lancaster, 1966). This law of demand is relevant for most goods and services but for healthcare services, this theory needs to be applied with caution. In healthcare, user charges do not have a discriminating effect between necessary and unnecessary health services (EXPH, 2014). In other words, user charges not only discourage unnecessary consumption for discretionary health services (services that do not affect morbidity) but also reduce consumption of essential health services (services that do affect morbidity) (Robinson, 2002). Reducing the consumption of essential health services can have a long-term financial impact on the healthcare system as patients may become sicker without sufficient access to essential healthcare and consequently require more care in the long-run.

Good health requires patients to invest in healthcare now and reap the benefits in the future. This is known as an investment in health capital. The concept originally stemmed from the concept of human capital theory which was contributed to by Gary Becker (1965). Human capital theory promotes the idea that present costs, which enhance future productivity, are seen as an investment in capital. The implications of such a theory have implications for the economic analysis of health expenditure.

This theory was developed further by Grossman (1972) and is a foundation block in health economics. Grossman developed a household production model where individuals were producers and consumers of health. He proposed that a consumer spent time and resources on investments in their health to improve overall health, particularly future health (Grossman, 1972). The model views health as both a consumption good, as it allows people to feel well, and an investment good, as it promotes productivity, fewer sick days and higher wages (Grossman, 1972). In the model, health is treated as a stock which depreciates over time if there are no "investments" in health. Consequently, health is viewed as a form of capital. Investing in health increases the stock of health which provides benefits in the future (consumption of health) in terms of increased time available for other activities such as work and leisure (Grossman, 1972). Investing in health now reduces the risk of future illness or disease which consequently reduces healthcare costs in the long-term.

As identified by Becker (1954) and Grossman (1972), individuals consume healthcare subject to a budget constraint. As user charges increase the proportion of the cost borne directly by the patient, the amount of healthcare the patient can afford will be reduced, therefore reducing the patient's access to healthcare. Research has shown that an increase in the cost of healthcare has a regressive impact; patients with lower incomes are affected more so than patients with higher incomes (Wagstaff et al., 1999). If the user charge is set below the average cost but continues to reduce healthcare utilization more for the poor than the rich, this user charge is regressive as it disproportionately affects the poor.

The user charge for a healthcare service signals the cost to the patient of using the service (Mwabu, 1997). User charges provide information to the patient on what they must pay to utilize the service efficiently (Mwabu, 1997). Patients who pay a higher OOP cost for a healthcare service are more likely to be more cost-conscious and therefore, use the service sparingly. As highlighted by Grossman (1972), individuals are subject to a budget constraint when investing in their health. If the expected benefit from consuming a particular healthcare service is lower than the cost of the service, the patient is unlikely to invest. It is this budget constraint that allows patients to realise that spending a proportion of their budget on unnecessary healthcare reduces their ability to consume other goods or services (Mwabu, 1997). This response to user charges can reduce unnecessary demand of healthcare.

This unnecessary demand is referred to as 'moral hazard'. As in Section 1.1, moral hazard is defined as "the intangible loss-producing propensities of the individual assured" (Dickerson, 1959, p. 67). Economic theory states that when a patient must pay the full cost of healthcare, he/she will consume healthcare based on preferences and budgetary constraints (Becker, 1965, Grossman, 1972). If a third party pays all the cost, it is expected that patients will have a higher utilization rate. Lower user charges cause the patient to consume more healthcare because the price to the patient is less than the full price. Reducing unnecessary demand for a particular healthcare service reduces healthcare expenditure on this service and allows for efficient allocation of the service to patients who require it most.

2.4.2 Impact of User Charges on Accessibility and Affordability

High healthcare costs may influence a patient's decision to seek healthcare and particularly impact on patients who cannot afford healthcare. As previously mentioned, this research examines affordability and accessibility as two key considerations in equity. A useful method to examine equity is to distinguish between horizontal and vertical equity. Both forms of equity can be assessed in terms of affording and accessing healthcare (Black and Gruen, 2005).

Horizontal equity in relation to affordability in healthcare refers to the equal payment by those who have equal ability to pay. For example, setting the same user charge for a prescription drug for individuals within the same income group or the same insurance premium for individuals in the same income category. Horizontal equity in terms of accessibility refers to equal access for patients with equal need. For example, equal waiting time for patients with similar health conditions.

Vertical equity regarding affordability implies payment for care is related to patients' ability to pay, for example; progressive income tax rates. If the proportion of income used to pay for healthcare rises as income rises, then a healthcare system is identified as progressive. Vertical equity relating to accessibility in healthcare refers to the unequal treatment of unequal needs. For example, unequal treatment for patients with minor versus serious illnesses or injuries (Black and Gruen, 2005).

Inequity in healthcare can also arise in both forms of equity as discussed above. Horizontal inequity in affordability arises when patients with the same income pay different amounts towards healthcare (Morris et al., 2007). With regard to user charge payments, horizontal inequity arises due to the uncertain nature of the onset of illness and preferences for use of the healthcare service among individuals with the same income. Direct OOP payments have higher levels of horizontal inequity than social health insurance and tax-based systems. Horizontal inequity in terms of accessibility results when patients with similar needs do not have the same access to healthcare (Starfield, 2006).

Vertical inequity relating to affordability arises if the proportion of income used to pay for healthcare increases as income decreases. If this is the case then the healthcare financing system is identified as regressive (Wagstaff et al., 1999). Empirical work has found that user charges disproportionately affect the vulnerable in society such as the elderly and patients with low incomes (Bishop et al., 2009, Lexchin and Grootendorst, 2004, Thomson et al., 2009, Xu et al., 2006). Transferring a proportion of the cost to the patient, user charges contribute towards patients' healthcare costs which may help alleviate financial strain on healthcare systems. Vertical inequity in terms of accessibility exists when patients with higher healthcare needs do not have as much access to these services as patients who have the ability to pay for the service. Once inequity is identified, governments can intervene to create a more affordable and accessible healthcare system by providing financial protection to low-income patients and/or high risk patients (Tambor et al., 2011).

2.5 Conclusion

Examining the health economic theories of consumer choice and equity in terms of affordability and accessibility, this research assesses the impact of user charges on patient choice in Ireland. As proposed by Grossman (1972), price and income influence patient choice in healthcare. This research aims to reveal patients' responses to user charges in the different situations and how these responses vary with socio-economic status. For most healthcare services in Ireland, the user charge varies depending on the level of healthcare cover the patient has. To assess the impact of user charges on accessibility and affordability, this research deals with three different topics in the Irish healthcare system. The first topic assesses patients who have already made a choice to pay a user charge for a private healthcare service in order to identify what drives patient choice. The second topic looks at patients for whom a user charge has been recently introduced or increased, for a mainly public or part-publicly provided service, to reveal patient response. The third and final topic examines patients' attitudes towards the potential application of user charges for both public and private healthcare services when it is part of a time-money (MRI) choice, a convenience choice (blood test) or a preference (branded drug) choice.

The following chapter, Chapter 3, presents the first topic, What factors influence patient choice of urgent care clinics in the face of user charges in Ireland?

3 WHAT FACTORS INFLUENCE PATIENT CHOICE OF URGENT CARE CLINICS IN THE FACE OF USER CHARGES IN IRELAND?

3.1 Introduction

Patient choice of urgent care services in Ireland has expanded due to the development of public and private walk-in urgent care clinics. These UCCs offer an alternative choice of care to patients for the treatment of a minor injury or illness. Prior to the establishment of walk-in UCCs in Ireland, a patient had the choice of two traditional providers of urgent care; a GP or an A&E department.[14] The establishment of alternative providers of urgent care has increased accessibility for patients when seeking treatment for a minor injury or illness.

Comparable to walk-in UCCs in the UK, US and Canada (Weinick et al., 2009), UCCs in Ireland fill the gap between the traditional GP services and A&E departments. Walk-in UCCs do not replace the services of a GP but act as a provider for specific needs such as x-rays or a service that is unavailable in a GP surgery. Patients also attend UCCs when they perceive their injury to require urgent care rather than the full facilities of an A&E department (Dolan and Dale, 1997, Weinick et al., 2009). While the treatment list in UCCs may not be as extensive as A&E Departments[15], a re-direction of injuries/illnesses by A&E departments to UCCs within the community can

[14] Throughout this thesis, the term" traditional provider of urgent care" is used when referring to GP and A&E departments while "alternative providers of urgent care" is used when referring to walk-in UCCs.

[15] Urgent care clinics do not treat cardiac/chest pain, loss of consciousness, severe head/neck injuries, severe stomach pain, severe burns, infants under 12 months, pregnancy related conditions (VHI. n.d. *VHI SwiftCare Clinics* [Online]. Available: https://www.vhi.ie/swiftcare [Accessed 28 December 2015]..

be a possibility in Ireland. This structural change is possible as the injuries treated in UCCs could previously only be treated in an A&E department (CentricHealth, n.d.). The emergence of UCCs could therefore be one solution to relieving pressure on traditional providers of urgent care in Ireland. Understanding the factors that affect patient choice when attending an UCC is important while delivering affordable and accessible urgent care within an appropriate time-frame (Shearer et al., 2015).

Differences in the user charge and waiting times are the two main comparisons between the traditional and alternative providers of urgent care in Ireland. With regards to the user charge for traditional providers; the national average user charge for a GP consultation is €51 (Nolan et al., 2014) while a patient seeking care at a traditional public A&E department in Ireland pays €100 if they do not possess a medical card or a GP referral letter (HSE, 2013d). If they have either of these, treatment is provided to the patient free of charge. Similarly, the user charge to attend a public walk-in UCC in Ireland is €100 if the patient does not possess a medical card or a GP referral letter and if they have either of these, care is provided free of charge. In contrast, a patient attending a private walk-in UCC in Ireland may face an initial user charge between a range of €125 and €150[16] plus additional charges depending on the services required.[17]

In addition to disparities in the user charge, treatment waiting times also vary between the traditional and alternative providers of urgent care in Ireland. Traditional models of urgent care are associated with considerable waiting times; for example, a patient

[16] This range of user charges is based on the cost of receiving urgent care at a number of private walk-in UCCs that exist in Ireland; the Vhi SwiftCare Clinics (€125), the Blackrock Clinic (€140), the Mater Private (€150) and the Beacon Clinic (€150) (BLACKROCKCLINIC. 2016. MATERCLINIC.2016, BEACONHOSPITAL. 2016)...

[17] For example, X-rays and stitches, casts, splints and crutches (VHI. n.d.]..

may wait on average 6 hours or more for treatment of a minor injury/illness in an A&E department (HSE, 2013a). Similarly, GP surgeries in Ireland are experiencing excess utilisation which also leads to potentially lengthy waiting times for patients (NAGP, 2015). Parallel to UCCs in the UK, US and Canada, UCCs in Ireland are based on a model of care which promote shorter waiting times (Dolan and Dale, 1997). For example, most private UCC groups in Ireland promote a waiting time of 60 minutes or less (VHI, n.d., Blackrockclinic, 2016).

While private walk-in UCCs in Ireland improve patient access to urgent care, patients attending these clinics must pay the full user charge OOP at the point of use.[18] As discussed in Section 2.4.1, subject to a budget constraint, healthcare is demanded based on consumer preferences; what a patient wants and what they are willing to pay for it (Grossman, 1972, Lancaster, 1966). Attending an alternative UCC in Ireland requires a higher user charge and consequently, a larger proportion of the patient's budget is used. This research examines the impact of this full user charge on patient choice and what factors influence patient choice of this privately funded service given the potentially higher user charge.

This research notes that while there are differences in the services provided by traditional and alternative urgent care providers in terms of the waiting time and user charge, there is no empirical evidence to date to suggest that the quality of care differs in each location (Hutchison et al., 2003). There is growing evidence to suggest that the quality of care in alternative locations is equal to that of traditional urgent care

[18] Patients with PHI may be subject to reimbursement for part of this user charge depending on the health insurance plan they have.

providers, for a number of acute minor conditions (Chang et al., 2015, Jacoby et al., 2011, Mehrotra et al., 2008, Shrank et al., 2014).

3.1.1 Research Question and Aim

This chapter aims to answer the following research question:

What Factors Influence Patient Choice of Urgent Care Clinics in Ireland in the face of User Charges?

This question led to two more specific objectives that include:

- Characterize the type of patient who chooses a walk-in UCC in Ireland.
- Identify using a zero-truncated negative binomial model the factors that determine why a patient pays a higher user charge to receive urgent care at an UCC.
- Identify using a probit regression what factors affect the likelihood of a patient being a first-time user of an UCC in Ireland.

Through the construction of a unique questionnaire, this research collects primary data from patients attending three walk-in UCCs in Ireland in order to answer the objectives listed above.[19] Collecting primary data, the research investigates the impact of user

[19] As described in Section 1.2, the primary data collected in this chapter is collected from patients attending a privately funded walk-in UCC in Ireland. Therefore, from this point on, any acknowledgement to walk-in UCC in an Irish context are referring to privately funded walk-in UCCs.

charges on patient for this service and also identifies the other factors that affect patient choice of this service given the potentially higher user charges such as; patient demographics (age, gender), socio-economic characteristics (income, healthcare cover) and clinic characteristics (waiting time, non- appointment service, GP referral, extended opening times, travel, clinic location, injury type and parking) affect patient choice when deciding to use UCCs.

3.1.2 Motivation

As previously stated, walk-in UCCs have increased accessibility for some patients when seeking treatment for a minor injury or illness. If walk-in UCCs were not established in Ireland, it is assumed the patients attending the alternative providers would continue to present at the traditional providers of urgent care as found by Rizos *et al* (1990) in Canada. Therefore, understanding why patients choose to use this alternative healthcare provider is important. Understanding these factors may enable a re-direction of patients with minor injuries and illnesses away from A&E departments and towards an alternative urgent care provider. This would encourage a healthcare system which promotes affordable and accessible urgent care within an appropriate time-frame (Shearer et al., 2015).

In an attempt to improve Irish healthcare, the "Strategic Framework for Reform of the Health Service" proposes the delivery of a major reshaping of the Irish healthcare system in an attempt to improve the governance, accountability and organization systems in the primary, community and hospital sectors in Ireland (DOH, 2012a). The results from this study may indicate the possible reshaping of care between GP and

A&E departments with walk-in UCCs by successfully treating patients at the walk-in UCCs. This would promote a more efficient use of urgent care services in Ireland.

3.1.3 Chapter Structure

Section 3.2 presents the empirical literature that has been conducted on alternative providers of urgent care. Section 3.3 presents the methodology that was employed to identify the factors which influence patient choice of UCCs in the face of user charges; Section 3.4 describes the econometric methods and subsequent results while Section 3.5 concludes this chapter.

3.2 Literature Review

3.2.1 Introduction

Section 3.2 provides a critical review of existing literature on various aspects of alternative urgent care providers. Section 3.2.2 provides a description of traditional urgent care providers. Section 3.2.3 identifies three types of alternative urgent care providers and identifies similarities and differences between each provider. Section 3.2.4 compares alternative urgent care providers with traditional urgent care providers. Sections 3.2.5 to 3.2.10 focus on the various attributes of the alternative healthcare providers such as; patient demographics of the users of these clinics, factors influencing patient choice, patient satisfaction and the impact of UCCs on traditional healthcare providers. Section 3.2.11 describes the previous methodology used throughout previous literature and Section 3.2.12 concludes this section.

While this research collects data from three private walk-in UCCs, this chapter acknowledges that the alternative urgent care providers that are addressed in this review can be publicly or privately financed.

3.2.2 Overview of Traditional Urgent Care Providers

Emergency health services in Ireland are traditionally delivered by GPs and A&E departments. A GP can be the first point of contact within the healthcare system. A GP will deal with all health problems regardless of patient age, gender or any characteristics of the patient. As stated in Section 2.2.2, the national average adult consultation to attend a GP is €51 if the patient does not have a GMS or GPVC (Nolan et al., 2014). Should the patient require further treatment and/or care, the GP will refer the patient to the necessary provider. Previous to the establishment of UCCs in Ireland, should a patient require further urgent care, a GP would commonly refer the patient to an A&E department. Most A&E departments are open 24 hours and 7 days a week in Ireland. Non-GMS patients without a letter of referral from their GP must pay €100 to attend an A&E department. Patients can also self-refer to an A&E when they perceive an injury/illness as urgent or due to an inability to access other medical care (Schneider et al., 1998). Based on triage categories, patients with life-threatening injuries and illnesses are given priority treatment.[20] Consequently, patients with non-life-threatening injuries and illnesses can face an extensive waiting time for treatment.

Overcrowding and increasing costs in A&E departments are a worldwide problem (Khangura et al., 2012). Consequently, patients do not receive urgent care in a timely manner. The use of A&E departments for non-urgent cases is the primary cause of this overcrowding (Lee et al., 2000). This type of A&E use is often referred to as "inappropriate use" (Liggins, 1993). Inappropriate A&E use leads to increasing costs, overcrowding and compromised care for true urgent cases (Derlet and Richards, 2000, Jepson, 2001, Siddiqui and Ogbeide, 2002). Over 50% of A&E cases are considered non-urgent giving rise to the "inappropriate use" of an A&E department (IAEM, 2007). These patients are categorized as being ambulant ill or injured i.e. patients with a recent condition that results in their discharge instead of hospital admission (IAEM,

[20] Triage Categories: Category 1 – Patient needs immediate treatment; Category 2 – Patient needs treatment within 15 minutes; Category 3 – Patient needs treatment within 1 hour; Category 4 – Patient needs treatment within 2 hours; Category 5 – more appropriate to send patient to GP (HSE, 2013a)

2007), and their injuries/illness are more appropriate for treatment at an alternative urgent care provider such as an UCC.

In comparison to traditional providers, the alternative providers are not a substitute for A&E departments. They improve accessibility for patients with conditions requiring urgent care but without the requirement for the full services offered in A&E departments.

3.2.3 Overview of Alternative Urgent Care Providers

A review of international literature has revealed various alternative providers of urgent care such as: Walk-in Clinics (WICs) (Hutchison et al., 2003, Salisbury and Munro, 2003, Weinkauf and Kralj, 1998), UCCs (Merritt et al., 2000, Sibbald, 2000, Weinick et al., 2009) and Retail Clinics (RCs) (Mehrotra et al., 2008, Wang et al., 2010). Similar to UCCs in Ireland, each location provides urgent care for non-life threatening minor injuries and illnesses. The extent of services offered and the provider of care differ in each location yet all three locations provide increased accessibility for patients in terms of extended opening hours and shorter waiting times. With regard to cost, the user charge between each location varies yet all three alternative locations aim to provide affordable care. The user charge between each location fluctuates due to the different payment protection policies that are in place in different health systems. UCCs in Ireland possess similar characteristics to WICs, UCCs and RCs. Consequently, it is relevant that all three healthcare settings are examined in this review.

WICs emerged in the United States (US) in the early 1970s (Jones, 2007) followed by Canada in the late 1970s (Hutchison et al., 2003) and more recently in the United Kingdom (UK) in 2000 (Salisbury and Munro, 2003). In addition to improving access to healthcare, WICs aim to reduce pressure on traditional healthcare providers such as GPs and Emergency Departments (EDs)[21] (Jackson et al., 2005, Salisbury and Munro, 2003). WICs provide treatment for minor injuries and illnesses[22] (Desborough et al., 2012). In the US and Canada the clinics are doctor-led (Jones, 2007, Salisbury and Munro, 2003) while in the UK the clinics are nurse-led (Salisbury and Munro, 2003). The provider of care is acknowledged as it has been proven that patients place different preferences on healthcare providers (Ahmed and Fincham, 2010). This may be an influential factor for service utilization. Despite variations in healthcare providers, WICs aim to provide rapid and convenient access to primary healthcare on a non-appointment basis.

UCCs emerged in the US in the early 1980s (Weinick et al., 2009) and are also established in Canada and Australia and more recently in Ireland. The care in UCCs is delivered by physicians, physician assistants and nurse practitioners (Weinick et al., 2009). UCCs deliver acute episodic care for minor injuries such as fever, earaches, eye injuries, cuts, sprains and broken bones. UCCs fill the gap between hospital A&E departments and a primary physician’s office (Weinick et al., 2009). Patients use UCCs for services that are unavailable in a physician’s surgery such as; x-rays. Patients

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[21] In this thesis, the terms A&E departments and EDs both represent the same provider of urgent care. These terms are used interchangeably throughout this research and previous literature when referring to a department which provides urgent care for patients who present with or without a prior appointment.

[22] Infections and rashes, blood pressure checks, fractures and lacerations, emergency contraception and advice, stomach aches, vomiting and diarrhoea, hay fever, insect and animal bites, stitches (sutures), dressing care, minor cuts and bruises, minor burns and strains, stop smoking support

also attend UCCs when they perceive their injury to require urgent care rather than the full facilities of an A&E department (Dolan and Dale, 1997, Weinick et al., 2009). UCCs in the US encompass the distinguishing characteristics of walk-in urgent care clinics in Ireland such as; non-appointment service, short waiting times (Yee et al., 2013) and patients do not need to be registered with UCCs (Qin and Prybutok, 2013). The average user charge in UCCs in the US is $155. This is less than a primary care visit cost at $165 and an ED visit which can reach $583. This comparison is reversed in the Irish Healthcare system where attending an UCC can result in a higher user charge than a traditional urgent care provider (see Section 3.2.2). The higher user charge may act as a deterrent for patients choosing UCCs in Ireland. This is similar in Australia where the user charge for attending an UCC can be more expensive than a GP yet less expensive than an A&E department (UrgentCareAustralia.ie). This research examines the effect of the potentially higher user charge on patient choice of UCCs.

RCs appeared in the US in 2000 (Mehrotra et al., 2008) and more recently in Canada. In contrast to WICs and UCCs, RCs are based in stores such as Target, CVS, Walgreen and Walmart. Throughout the literature, RCs are also called "convenient care clinics" and "in-store medical clinics." The scope of treatment offered by RCs differs considerably in comparison to WICs and UCCs. Rather than treating urgent conditions, RCs provide treatment for common medical conditions such as respiratory infections, allergic reactions, sinusitis, bronchitis, strep throat, influenza, insect bites, urinary tract infections and conjunctivitis (Hunter et al., 2009). Routine immunizations, physical examinations and routine preventative health screening are also available for diabetes, tuberculosis and hypertension (Hunter et al., 2009).

Healthcare is provided by nurse practitioners or physician assistants (Mehrotra et al., 2008) and there is an average user charge of $50. The lower user charge in RCs compared to UCC could be due to the differences in staffing. Also, the cheaper user charge in RCs compared to the traditional providers and other alternative care providers could be due to the variation in injuries/illnesses that are treated. Despite the difference in services, the models of care on which RCs are established are similar to that of Irish UCCs. The accessible and affordable healthcare provided by RCs responds to consumer-driven healthcare which the American health industry has failed to recognise due to political, social and economic pressures (Hunter et al., 2009). Privatized market-driven companies are the driving force behind RCs. This is also the case for a number of walk-in UCCs in Ireland which are privately funded such as; Vhi SwiftCare Clinics, Blackrock Clinic, Mater Private and the Beacon.

In addition to varying attributes amongst the alternative providers themselves, notable differences exist between the alternative providers and the traditional providers of urgent care.

3.2.4 Differences between Traditional and Alternative Urgent Care Providers

The central difference between alternative and traditional providers of urgent care is the time-money trade-off faced by users of the services. With regards to time and accessibility, alternative urgent care providers offer a non-appointment service and promote shorter waiting times than traditional providers. One must acknowledge that EDs do provide unscheduled care but at the risk of longer waiting times for patients. For example, in the US in 2009, ED waiting times were in excess of 4 hours (Horwitz et al., 2010) while 80% of UCC visits in alternative providers were 60 minutes or less (Yee et al., 2013). Similarly, in Ireland, HSE targets for 2015 aimed to have 95% of patients admitted or discharged within 6 hours of arrival at the A&E department (HSE, 2015a). However, in the HSE Performance Report (2015) only 68.6% of patients were discharged or admitted within 6 hours in 2015 (HSE, 2015a). Comparable to the US, UCCs in Ireland work on a similar time-frame offering treatment for minor injuries and illnesses in less than 60 minutes. The spectrum of treatment available at alternative providers of urgent care may contribute to the shorter waiting times for patients. For example, alternative providers of urgent care do not provide treatment for all services offered in a traditional physician's office or in particular a hospital A&E department. The nature of injuries and illnesses they treat may be generally less severe (particularly in comparison to emergency departments) and as a result can be treated efficiently in a shorter time frame.

While access to urgent care is improved due to alternative urgent care providers the increase in accessibility may result in a higher user charge for patients in comparison to the traditional urgent care providers. In Ireland, patients who attend a walk-in UCC pay the full user charge OOP between €125 to €150 at the point of use[23] plus additional fees for additional services.[24] This is a higher user charge than the traditional A&E department user charge which is €100[25], irrespective of the intensity of the treatment, and considerably more expensive than a GP for which the national average user charge is €51.

[23] See footnote 1.
[24] See footnote 17.
[25] As previously mentioned, a patient without a medical card or a letter of referral from a GP must pay the relevant user charge of €100 for treatment received in the A&E irrespective of the amount or intensity of treatment received, while those with a medical card or a GP referral do not have to pay anything.

The differences in accessibility and cost between the traditional and alternative urgent care providers presents the patient with a time-money trade-off.

3.2.5 Literature Review of Alternative Urgent Care Providers

In an effort to identify the factors affecting patient choice of UCCs in Ireland, international literature on alternative urgent care providers is assessed with the intention of guiding the construction of the empirical model used in the methodology section for this research topic. An extensive literature review of alternative urgent care providers has identified patient demographics, socio-economic characteristics of the clinic users, factors influencing patient choice of the service, patient satisfaction and their impact on traditional urgent care providers (Ahmed and Fincham, 2010, Desborough et al., 2012, Hunter et al., 2009, Jackson et al., 2005, Mehrotra et al., 2008, Salisbury et al., 2002, Weinick et al., 2009). These studies identify patient characteristics which help understand the drivers of choice for these alternative urgent care providers. With this information, alternative providers can generate an understanding of their customers' needs and alter their services to better suit the needs of the patient as consumer choice in healthcare is based on the patients' preferences (Grossman, 1972, Lancaster, 1966). Understanding why patients choose to use an alternative urgent care provider in Ireland informs policy makers about what consumers want from urgent care providers. This will help to shape the delivery of an accessible and affordable urgent care system (Shearer et al., 2015).

The literature review was guided using a combination of the following search words in Academic Search Complete (urgent care, convenient care, alternative care, emergency care, primary care, factors, cost and user charge). A citation approach was adopted where citations were recorded and from there reference lists were scanned until such a time it was thought that all key paper/authors were retrieved. The criteria extracted from each study was as follows; data source, study design, outcome measurement and study results.

Table 3.1 shows a breakdown of the literature conducted in this area of research throughout the UK, US and Canada on alternative urgent care providers.

Table 3.1 Synopsis of Literature Examining Alternative Providers of Urgent Care

Authors	Date	Study Population (Date Source)	Design	Outcomes	Results
Ahmed and Fincham	2010	Adult residents in Georgia (N=493)	Patients interviewed using a DCE.	4 attributes with 2 levels each: cost ($59; $75) (€44.61; €56.71)[26], appointment wait time (same day;1 day longer), care setting (nurse in RC and physician in private office), acute illness (UTI; flu).	Reduced waiting time and reduced cost in RC is attractive to patients. Appointment wait time is most important factor when seeking healthcare.
Bell and Szafran	1992	Patients attending a WIC over a 6-month period (N=531)	Cross-sectional questionnaire	Patients use of WICs (visited a WIC in past 6 months), reasons for choosing this location, attempted to make an appointment with traditional provider, attended traditional provider after attending the WIC and patient demographics.	Convenient location of WIC, minor medical problem and increased accessibility were top three influential factors.
Hsu *et al*	2003	12 GPs. 6 in Loughborough with a WIC (N=69 and N=70) and 3 in Market Harborough; control town (N=39 and N=40)	Observational study	Mean daily rate of emergency GP consultations, mean number of half days to sixth bookable appointment, attendance at out of hours' services, minor injury units and A&E departments.	WIC did not greatly impact on the workload of the GP. Attendance at minor injury unit increased. Authors suggest this is because the unit was in the same building as the WIC.

[26] The prices included in this table have been converted into the Euro equivalent value corresponding to the year each study was conducted.

Hunter, Weber and Wall	2009	Patients in two RCs in Arizona between May 2006 and July 2007 (N=684)	Descriptive design using an anonymous voluntary self-report questionnaire.	Patient characteristic and factors influencing patient choice.	Patients with various income and different ethnicities value the same attributes of RC.
Jackson *et al*	2005	Patients using a WIC (N = 23)	Semi-structured interviews	Seeking care (execution and professional advice), resources and access	Patients experience of WICs suggest the clinics improve access to healthcare and serve as an alternative method of seeking healthcare.
Maheswaren *et al*	2007	2,509 GPs in 56 primary care trusts in England and 32 walk-in centres within 3km of each GP practice	Ecological Study	Impact of WICs in primary care access times: ecological study	WICs do not impact on waiting times to access primary care facilities. Results do not support this purpose.
Plauth and Pearson	1998	Patients 18+ years in an urgent care department in US (N=551).	Cross-sectional questionnaire	Patient demographics, health status, why patient chose the location, barriers in accessing care in traditional healthcare provider.	Barriers reported when accessing traditional provider of care. Factors influencing patient choice; quick access to care, traditional provider closed, unable to get appointment with physician and constrained by work or childcare.
Rizos *et al*	1990	Patients attending a WIC in Toronto over a 16-day period (N=321).	Cross-sectional questionnaire	Reason for attending, perception of urgency, satisfaction with care received and concerns regarding care received.	Three most influential factors were location, inability to get appointment with traditional provider and the non-appointment service of the WIC.

Salisbury *et al*	2006	8 hospitals with co-located EDs and WICs compared with EDs without WICs	Routine data on attendances and resources used. Random sample of patients attending before and after the opening of the WIC. Postal questionnaire sent to patients who had not been admitted.	Impact of co-located WICs on EDs: Effect on patient throughput, visit duration, process of care, resource use and costs, patient outcome and re-consultation	No evidence of an effect on the outcome measures.
Salisbury *et al*	2002	38 WICs and 34 neighbouring GPs (N=6229)	Observational study using questionnaires	Socio-demographic characteristics, reasons for consulting, attitudes to continuity, satisfaction, enablement, further referrals and intentions.	Main influential factors: speedier access and convenient care, less importance on continuity of care. WIC improve access to health but not necessarily for patients with the greatest needs.
Scott *et al*	2009	Patients attending an UCC (N=1,006)	Cross-sectional questionnaire	Demographic characteristics, socio-economic characteristics, reasons for choosing UCC, previous primary care use, reasons for delaying care and preventative care needs.	Patients use UCC largely because of the convenient and timely care. Not for economic reasons.

Source: Authors Own

From this table, the following sections discuss patient demographics, socio-economic characteristics, factors influencing patient choice of alternative urgent care providers, patient satisfaction, and the impact of alternative providers on traditional providers.

3.2.6 Patient Demographics

In Canada, using a prospective questionnaire, Bell and Szafran (1992) assessed family practice patients' use of WICs. Females and young adults (aged 20-29) are predominant users of WICs while patients over 40 prefer to use a regular family physician. In the UK, using a self-administered questionnaire, Salisbury *et al* (2002) support existing findings that younger adults constitute a high proportion of NHS WIC visits. In Boston, Plauth and Pearson (1998) implemented a cross-sectional study using a primary care comparison group to identify patient demographics in an UCC. Patients attending UCCs were younger than those attending primary care centres. In addition to comparing alternative providers of urgent care to primary care services, Mehrotra *et al* (2008) used a cross-sectional comparison of RCs with physician offices and EDs. Once more, age was deemed as a significant variable with a younger age cohort attending RCs compared to physician office and EDs.

The nature of the injuries and illnesses treated at alternative urgent care providers could be an influential factor for the younger age groups that choose these healthcare locations. For example; bone fractures, sprains and sports injuries are more likely to occur among young adults due to active lifestyles. Older age groups are more susceptible to serious illness/injuries consequently requiring longer healthcare visits and long-term care rather than the episodic care offered by the alternative providers of urgent care (WHO, 2016). This influences patient behaviour in older adults as they prefer traditional providers of care for the treatment of minor injuries and illnesses. Older patients prefer to go to their "regular" doctor as they always have done before UCCs were established. Older patients will be less likely to change their (Beache and Guell, 2015). Mehrotra *et al* (2008) strengthens this rationalization as a low percentage of users at an alternative urgent care provider in the US reported registration with a regular family physician. In conclusion, patients who choose to use an alternative urgent care provider tend to be a younger age group and are less likely to be registered with a regular doctor.

The results of these studies generate concerns that alternative providers of urgent care only meet the needs of a younger healthier age group and as a result do not provide a healthcare service which satisfies the needs of the older and possibly unhealthier section of the population (Salisbury et al., 2002).

3.2.7 Socio-Economic Characteristics

With regard to socio-economic characteristics, the literature reveals diverse findings amongst patients using alternative urgent care providers. Jackson *et al* (2005) found patients attending a WIC in the US are of a high socio-economic status reporting high levels of education and a high social demographic.[27] (Jackson et al., 2005). Similarly, Rylko-Bauer (1988) found an insignificant presence of medical aid beneficiaries using WICs in the US. This is a logical finding as the majority of medical aid is granted on

[27] Social demographic in this case is based on employment type: Professional, Blue-collar worker, civil servant, business owners or unemployed.

an income basis. If the individuals using these healthcare providers are of a high socio-economic background, they are not likely to receive government aid for access to healthcare services.

Conversely, Scott *et al* (2009) found patients in an UCC in Denver to be of a low socio-economic background; 24.8% reported low levels of education, 17.9% reported literacy issues and 12% were homeless.

Diverse payment methods between the traditional and alternative urgent care providers offer justification for these conflicting findings. For example, in the US, traditional and alternative urgent care providers provide care to all income groups. They provide treatment to patients with PHI and also to those who receive government medical aid.[28] Consequently, different income groups have no reason to place a higher preference on one urgent care provider over another compared to Ireland where patients face varying user charges at traditional and alternative providers of urgent care depending on their healthcare cover. Using a Primary Care Comparison group, Plauth and Pearson (1998) support this justification as they found no difference in socio-economic status between traditional and alternative providers of urgent care. Their study could be strengthened by identifying and comparing the number of patients who pay OOP for treatment, those who are covered by medical aid and patients who are covered by PHI for treatment received in physician offices and UCCs. This would determine if patients of various socio-economic backgrounds reveal similar utilization patterns for physicians and UCC services. Consequently, this research measures patient healthcare cover to test if

[28] A survey conducted by the Urgent Care Association of America (UCAOA), found 51% of respondents had their treatment paid for through PHI, 17% paid OOP while 32% of respondents reported that payment to the clinic was made by Medicare, Medicaid or workers' compensation on their behalf.

the full OOP user charge required to attend an alternative provider of urgent care is significant in an Irish context[29].

3.2.8 Factors Influencing Patient Choice of Alternative Urgent Care Providers

A number of studies have addressed the issue as to why patients choose alternative urgent care providers over the traditional services. Findings are consistent among the studies. Increased accessibility in terms of the non-appointment service, extended opening hours, clinic location, difficulty in accessing traditional providers of urgent care and patients' perception of need are the main characteristics influencing patient choice of alternative urgent care providers (Bell and Szafran, 1992, Dolan and Dale, 1997, Hunter et al., 2009, Plauth and Pearson, 1998, Salisbury et al., 2002). The user charge associated with the alternative providers is revealed to be less significant in comparison to the factors measuring accessibility.

The non-appointment service and extended opening hours are the most common influential factors for patients deciding to use an alternative provider of urgent care (Bell and Szafran, 1992, Dolan and Dale, 1997, Plauth and Pearson, 1998, Rizos et al., 1990). These attributes allow patients to seek healthcare at a time which is most suitable to them. Due to the uncertain onset of an urgent injury/illness, the non-appointment service offered by alternative urgent care providers offers peace of mind

[29] It is important to note that depending on the nature of the urgent care provider in Ireland (public or private), the level of cover varies. Private UCCs in Ireland such as Vhi SwiftCare Clinics and the Medical Assessment Unit in the Bon Secours hospitals do not accept government aid as payment for their services. The clinics will only treat patients who are willing to pay for the service. Some PHI plans reimburse a proportion of the cost.. Public healthcare providers in Ireland such as the Mercy Urgent Care Clinic in Cork do accept government aid as a method of payment for their services.

that urgent care is accessible outside the traditional scheduled service offered by traditional healthcare providers.[30]

Location of the alternative clinics is another factor which influences patient choice of alternative providers of urgent care. Previous literature has found these services to be locally used services (Dolan and Dale, 1997, Grafstein et al., 2013, Rizos et al., 1990, Shearer et al., 2015). Distributing a pre-consultation questionnaire to self-referred patients in a minor injury unit in South Kent, Dolan and Dale (1997) reveal that patients in their sample travelled 10 minutes or less to attend the minor injury unit. Distributing a cross-sectional questionnaire to patients at 6 Canadian EDs[31], Grafstein *et al* (2013) investigated the factors that influence patient choice in attending an ED for urgent care. Assessing the importance of distance to the ED on a five-point Likert scale, they found 44%[32] of their sample reported distance to the ED as one of the primary reasons for choosing to visit that particular location. Similarly, Shearer *et al* (2015) found that patients chose a private Australian ED[33] due to close proximity to their home.

Several studies also found that patients chose an alternative provider of urgent care due to difficulty in accessing traditional providers of urgent care (Dolan and Dale, 1997, Paxton and Heaney, 1997, Jackson et al., 2005). As noted, traditional providers generally work on a scheduled basis and can involve longer waiting times than the

[30] While GPs in Ireland do operate on a scheduled basis, this research acknowledges that A&E departments in Ireland are open 24/7 and do operate on a non-appointment basis but with the risk of extensive waiting times for treatment.
[31] It is acknowledged that an ED is a traditional provider of urgent care and not an alternative provider of urgent care. Yet this study is included in this review as the study investigated factors affecting patient choice of urgent care.
[32] Total sample size was 634 (83.8% response rate).
[33] See footnote 21.

alternative providers. For example, in 2009 there was an average wait time of 4 hours in EDs in the US. In comparison, some alternative providers of urgent care treat patients within 60 minutes (Qin and Prybutok, 2013, Yee et al., 2013). It appears people choose an alternative urgent care provider due to increased accessibility and not as a result of dissatisfaction with the care provided by the traditional providers of urgent care (Rizos et al., 1990).

Jackson *et al* (2005) found patients in the NHS were concerned the nature of their injury/illness would not be deemed appropriate for treatment in a GP surgery. Some patients viewed GPs as a "precious service" with limited appointment times and were concerned with the increasing demand on the NHS. Despite the limitation of a small sample size, this study emphasises that alternative urgent care providers can function as a medium between the traditional primary care offices and hospital A&E departments. Some alternative urgent care providers erve as a complement to traditional services for convenience purposes while others use this alternative provider as a substitute to their preferred provider may not be accessible at that time (Jackson et al., 2005). Salisbury *et al* (2002) show similar findings to Jackson *et al* (2005). Patients in their study chose to use the alternative service as they did not want to needlessly bother their "regular" doctor. These results indicate that patients are aware of the overcrowding issues in the traditional urgent care providers. Patient awareness of the correct treatment location is crucial in the organization of an efficient healthcare system. Currently, patients present at hospital EDs with illnesses/injuries that are not deemed serious enough but do require immediate care outside that of the family physician. The objective of alternative urgent care providers is to meet the demand for patients whose needs lie between that of the traditional family doctor and hospital ED.

Three studies directly acknowledge the importance of the user charges on patient behaviour (Ahmed and Fincham, 2010, Hunter et al., 2009, Qin and Prybutok, 2013). Two reasons may explain this scarcity in literature; the patient payment mechanisms in different healthcare systems and the consequent pricing strategies that exist amongst alternative urgent care providers.

Disparity in payment mechanisms are as a direct result of healthcare financing across international healthcare systems. For example, the NHS in the UK is a publicly provided and financed system where user charges mainly exist in dental and optical care (Black and Gruen, 2005). Similar to the UK, healthcare in Canada is also publicly financed with most funding generated through taxation (Chua, 2005) and for the most part healthcare is free at the point of use. With healthcare free at the point of use in alternative urgent care providers, it can be assumed that the cost of the visit would not be an influential factor for choice and consequently does not feature heavily in the UK or Canadian literature. In the US, healthcare is largely financed through PHI (Black and Gruen, 2005) and payment is expected at the point of use for treatment received by alternative urgent care providers. Patients with PHI cover can apply for reimbursement for the treatment received in WICs (Wieczner, 1998). Collecting financial data from UCCs, Weinick, Bristol and DesRoches (2009) found 50% of UCC visits were paid for by a private health insurer in the US between September and November 2007.

As mentioned, Hunter *et al* (2009), Ahmed and Fincham (2010) and Qin and Prybutok (2013) did directly acknowledge the importance of cost on patient behaviour for alternative urgent care providers. Hunter *et al* (2009) examined the impact of user charges in RCs in two survey sites. An examination of the demographic data revealed distinct socio-economic variation between the two locations. Income per capita in region one was $59,355 and $18,068 in region two. Examining the influence of the user charge on patient choice between the two socio-economic groups revealed very little variation (27% Vs 38% respectively). Only 34% of this sample reported cost as an influential factor when deciding to use a RC. As previously stated, patients attending a RC in the US can pay for treatment OOP[34] and/or obtain reimbursement for a portion of the cost from their health insurance provider (Mehrotra et al., 2008). More recently, Medicare and Medicaid are paying for RC visits (Bohmer, 2007). Consequently, the user charge is not reported as being influential amongst a host of accessibility factors.

This indicates that patients who do not pay the full price for attending an alternative provider of urgent care, such as RCs, place less importance on cost. These findings are supported by economic theory. If a third party pays a proportion of the cost, it is assumed utilization of a service will be higher as patients are not paying the full cost of healthcare; the user charge does not influence utilization. Economic theory states that a when a patient must pay the full cost of healthcare, he/she will consume an amount of healthcare based on preferences and budgetary constraints (Becker, 1965, Grossman, 1972).

Ahmed and Fincham (2010) examined the impact of cost on treatment-seeking behaviour in RCs and physicians' offices. Using a Discrete Choice Experiment (DCE), they created 16 choice scenarios from which the respondents could choose. The

[34] A patient without health insurance would face a cost of $50 per visit

scenarios involved two types of care setting and clinician combination (nurse in a RC and physician at a private office), two symptoms (urinary tract infection or influenza), two price levels[35] ($59 or $75)[36] and two levels of appointment wait time (same day, 1 day or more). To calculate the preferences for care at RCs or a physician's office, a random-effects logistic regression was used. Ahmed and Fincham (2010) found that cost was important to patients, with cost-saving in RCs more likely to encourage treatment in this location rather than a physicians' office. It is not explicit in their study if the patients had PHI cover yet total annual household income levels are reported with 13.7% of the sample earning less than $25,000 and 40% earning $75,000 or more. If PHI status was recorded, exclusive results could be obtained determining the magnitude of the impact of user charges on RC utilization. Do patients who pay OOP place a higher preference on cheaper care and are patients who are covered by PHI less cost-conscious? This research will control for PHI status and income level when identifying the impact of user charges on patient behaviour when choosing UCCs in Ireland. While PHI does not cover the cost of attending a walk-in UCC, some PHI plans offer a reimbursement for part of the initial consultation fee.

To date, previous literature reveals patients place a higher preference on the increased accessibility offered by the clinics. This finding is supported by Shearer *et al* (2015) who assessed why patients chose to use a private ED[37] in Australia. In this study, cost was not deemed an influential factor in patient decision making amongst a host of

[35] Captured respondents' WTP.
[36] $59 represents the cost of treatment in RC based on the prevailing fee at a large RC in Georgia. $75 represents physician fees and the figure is taken from the 2004 Medical Expenditure Panel Survey.
[37] It is acknowledged that an ED is a traditional provider of urgent care and not an alternative provider of urgent care. Yet this study is included in this review as the study investigated factors affecting patient choice of urgent care.

convenience characteristics. The study assessed patients attending the ED, therefore the patient has already made the decision to utilize this service. Shearer *et al* (2015) suggest that as the patients decided to use the private ED they are not truly deterred by the OOP cost. This finding is relevant to UCCs in Ireland as this study also focuses on users of the service. Similar to Shearer *et al* (2015), the patients have already made the decision to pay the full user charge for attending this alternative provider of urgent care. Despite already being users of the clinics, price of the visit is still controlled for by asking patients to indicate how influential the cost of the service was in their decision to seek care at this location.

In a time where the urgent care industry is expanding, Qin and Prybutok (2013) wanted to understand how urgent care providers are perceived by patients and what influences patient satisfaction and patient behaviour. To develop and validate an urgent care service quality instrument, Qin and Prybutok (2013) considered the concept of perceived value. In terms of healthcare, perceived value is the trade-off between the service cost and the received value (Eggert and Ulaga, 2002). The inclusion of this concept is based on the impact patient perceptions have on service providers' long-term success. Patient perceptions influence behavioural decisions (Qin and Prybutok, 2013). This is important in particular in the urgent care industry where a number of options exists; hospital EDs, WICs, UCCs, RCs and family doctors etc. Urgent care is provided in terms of working hours, convenience and service scope. Differences in waiting time and costs vary among providers. Qin and Prybutok (2013) use the following example to highlight this disparity "...prices in hospital emergency departments are generally higher. The waiting times in primary care physicians' offices are longer. Therefore, we view perceived value as an important factor when influencing the patient's provider selection for urgent care services". Patient perception can have positive effects on behaviour (Sirohi et al., 1998, Sweeney et al., 1999) but the relationship can be mediated by patient satisfaction (Bolton and Drew, 1991, Cronin et al., 2000, Patrick and Park, 2004). This theory is supported by Qin and Prybutok (2013). Despite not assessing the importance of treatment cost in alternative urgent care providers, the study highlights the importance that perceived value can play in behavioural decisions guided by patient satisfaction. While cost is not explicitly identified in the studies included in this paragraph, the studies highlight how the perceived value of healthcare is important to patients.

Less significant factors influencing patient choice of alternative urgent care providers are also revealed; absence of regular physician, free parking (Bell and Szafran, 1992); preference for nurse rather than doctor, more confidence in advice, not registered with GP, better range of services offered, didn't think about going anywhere else (Salisbury et al., 2002); previous experience and word of mouth (Jackson et al., 2005). Even though these factors were reported as less significant than the convenient and timely care offered by the clinic, they will be included amongst the variables for this research to test their significance in an Irish context.

3.2.9 Patient Satisfaction

Patient satisfaction in alternative urgent care providers has also been examined throughout the literature (Chesteen et al., 1986, Feldman and Cullum, 1984, Garnett and Elton, 1991, Hunter et al., 2009, Jackson et al., 2005, Paxton and Heaney, 1997). In Canada using structured questionnaires at a hospital-based WIC, Feldman and

Cullum (1984) found high levels of patient satisfaction during patients' experience at the clinic. In the US, Chesteen, Warren & Woolley (1986) used a cross-sectional study and found that patients attending a free-standing emergency care clinic reported higher levels of satisfaction than patients attending a family physician. Similarly, in the UK, analysing the first six months within opening of a nurse-led minor injury clinic, Garnett and Elton (1991) also determined high levels of patient satisfaction. Heaney and Paxton (1997) performed an evaluation[38] of a minor injury unit in the UK, where 98%[39] of cases reported satisfactory treatment. More recently in the UK, Jackson *et al* (2005) conducted semi-structured interviews to study patients' experiences in an NHS WIC. This study also reported higher levels of patient satisfaction in WICs than traditional providers such as family physician offices.

As suggested by Jackson *et al* (2005), high levels of patient satisfaction in WICs may be due to the fact that patients do not have to discuss access with a receptionist or justify reasons for seeking care at a WIC (Jackson et al., 2005). Patients attending this WIC reported feeling a burden when attending a family practitioner as they are not sure whether their illness requires a visit to the GP. Despite GP healthcare being free at the point of use in the UK, patients remain conscious of unnecessarily utilizing a GP's valuable time. In a WIC, patients do not face the prospect that they are utilizing scarce appointment resources from someone more "deserving" (Jackson et al., 2005). While the sample size in Jackon *et al*'s (2005) study is quite small (23 patients) the study offers another perspective as to why patients may choose to visit a WIC.

[38] Distributed a self-completed questionnaire to patients in the clinics with a follow-up questionnaire posted to the patient, 10 to 14 days after their clinic visit (Paxton and Heaney, 1997).

[39] Questionnaire 1 yielded 749 respondents while the follow-up questionnaire retrieved 456 respondents.

The importance of assessing patient satisfaction for a healthcare service is highlighted in previous studies. Considering patients using a private ED in Australia, Shearer *et al* (2015) identified patient satisfaction of a service as an influencing factor in patient behaviour. A patient who reports high satisfaction with a service is more likely to return to the service again while low levels of satisfaction reduce this likelihood. It is argued that patient satisfaction mediates patients' perceived value and patient behaviour (Qin and Prybutok, 2013). Therefore, patient satisfaction with a particular service can influence their behaviour towards this service should they demand the service in the future. Consequently, this research will measure patient satisfaction in Irish urgent care clinics to test its significance in an Irish context.

3.2.10 Impact of Alternative Urgent Care Providers on Traditional Urgent Care Providers

As a consequence of their establishment, alternative urgent care providers may relieve demand on traditional healthcare providers and subsequently improve access to urgent care for patients. A number of studies have investigated this effect (Hsu et al., 2003, Maheswaran et al., 2007, Rizos et al., 1990, Salisbury and Munro, 2003).

Conducting an observational study, Hsu *et al* (2003) assessed the impact on demand of an NHS WIC on a traditional primary healthcare provider. They compared primary and emergency services in two different locations, one with a WIC and one without a WIC. Hsu *et al* (2003) retrieved data on daily phone calls, data collection forms, emergency GP consultations[40], number of out-of-hours attendances/visits, routine

[40] Defined as an appointment requested on the same day of consultation.

computerised data, number of A&E visits and number of calls to NHS Direct[41]. In the intervention town, Hsu *et al* (2003) conclude that primary and emergency service utilization did not experience a significant decrease in demand due to the existence of the WIC. This study did however, observe an increase in the use of a minor injuries unit that was co-located with the WIC. The authors propose that the publicity the minor injury unit received from the co-located WIC increased the attendance at the minor injury unit.

With similar results, Salisbury *et al* (2006) assessed the impact of NHS WICs on ED statistics. They examined the attendance rates, treatment duration, costs and outcomes of care in co-located emergency departments. Comparing 8 hospitals with co-located EDs and WICs, with 8 matched EDs without WICs, the researchers conclude that NHS WICs have little effect on the attendance rates, treatment duration, costs and outcomes of care in co-located emergency departments. Likewise, in the NHS, Maheswaren *et al* (2007) used data from a national primary care service to investigate the impact of WICs on waiting times for a doctors' appointment. They also found NHS WICs to have little impact on traditional healthcare providers.

While the findings of these studies are similar, the results are conflicting with the objectives of alternative urgent care providers. There are two possible reasons for this; patient demographics within the different healthcare systems and/or poor study design. The countries in which these studies are conducted may have an ageing population who continue to use traditional providers. As previously mentioned, the elderly

[41] Digital health and advice service for health matters which are not urgent enough for dialling traditional emergency services such as 999.

population are more likely to visit their regular doctor for treatment of an urgent injury or illness. These older patients are less likely to change their behaviour to attend an alternative provider (Beache and Guell, 2015). If so, the studies fail to pick up on the magnitude of the impact of alternative urgent care providers. With regard to the study design, studies which aim to identify the impact of alternative urgent care providers are of limited value as they generally only include users of the services (Hunter et al., 2009, Jackson et al., 2005, Salisbury et al., 2002, Salisbury and Munro, 2003, Scott et al., 2009). A number of these studies fail to assess why patients do not decide to use these alternative services. Understanding why patients chose to avoid alternative urgent care providers would provide further insight into patient behaviour regarding alternative urgent care providers. This is discussed in the context of this research in Section 6.4.

In addition to incorporating non-users, to successfully identify the impact of alternative urgent care providers, studies need to address 3 key considerations (Salisbury and Munro, 2003). Firstly, the correct function of the alternative urgent care provider(s) needs to be identified; does the alternative provider successfully treat and discharge patients rather than encourage duplicate care? Secondly, the user charge to attend the alternative provider needs to be recognised; is the user charge less than that of the traditional provider? Finally, it needs to be established if the alternative provider of urgent care was unavailable, whether the patient would attend a traditional provider of urgent care rather than self-manage the injury or illness (Salisbury and Munro, 2003). Rizos *et al* (1990) investigated the 3rd consideration listed here and of the 416 respondents in their study, 89 patients reported a regular physician as their alternative choice while 77 respondents stated they would have attended an emergency department had the WIC been closed. This finding proves that the existence of alternative urgent care providers could prevent GP waiting rooms and A&E departments from becoming overcrowded with non-urgent cases. These three considerations are acknowledged in the Irish research, either in the data collection tool itself or in the discussion of the results.

3.2.11 Previous Methodology

Studies assessing factors which influence patient choice of alternative urgent care providers used self-completion questionnaires to collect primary data from users of the service (Bell and Szafran, 1992, Hunter et al., 2009, Rizos et al., 1990, Salisbury et al., 2002, Scott et al., 2009) . Using self-completion questionnaires, recurring variables are measured such as; patient demographics (age, gender, nationality), socio-economic factors (education and healthcare cover), clinic characteristics (waiting time, non-appointment service, GP referral, extended opening times, travel, clinic location, injury type and parking), patient satisfaction and in some cases the questionnaires assessed the importance of the user charge for alternative urgent care providers. Subsequently, similar target samples, data location and collection methods are implemented in this research to identify the factors affecting patient choice of walk-in UCCs in Ireland.

Table 3.2 Previous Methodology

Author	Methods	Sample Size	Data Analysis
Rizos et al (1990)	**Two-part questionnaire** provided to all patients in a WIC in Toronto during a 16-day period in February 1988	N= 321 patients	Descriptive statistics
Bell and Szafran (1992) Canada	**Prospective questionnaire** completed in physician waiting room over a 1-week period	N=531	Z test Chi Squared
Salisbury et al (2002) UK	**Self-administered questionnaire** divided in 2 sections "before" and "after" treatment b/w Oct 2000 and April (2001)	N= 6,229	Descriptive stats Linear Models
Hunter, Weber and Wall (2009)	**Anonymous, voluntary, self-report questionnaire** completed during RC visit b/w May 2006 – June 2007	N= 684	Descriptive Statistics
Scott et al (2009)	**Cross-sectional questionnaire** of patients in UCCs over a six-week period	N= 1,006	Multiple logistic regressions

Source: Authors Own

3.2.12 Conclusion

A review of international literature has revealed various alternative providers of urgent healthcare such as; WICs (Hutchison et al., 2003, Salisbury and Munro, 2003, Weinkauf and Kralj, 1998), UCCs (Merritt et al., 2000, Sibbald, 2000, Weinick et al., 2009) and RCs (Mehrotra et al., 2008, Wang et al., 2010). Studies conducted in these various locations have identified patient demographics, socio-economic characteristics, factors influencing patient choice, patient satisfaction and the impact of alternative urgent care providers on the traditional urgent care providers. Literature conducted in the area of alternative providers of urgent care does not find the user charge to influence patient choice of this service.

Using the theoretical foundations in Section 2.4, (Becker, 1965, Grossman, 1972, Lancaster, 1966) and including the characteristics identified throughout the literature, this research investigates the impact of the user charge on patient choice of UCCs in Ireland and identifies the factors which influence patient choice of this service. This literature review guides the methodology utilised in the following section of this chapter.

Section 3.3 presents the methodology employed to identify the factors which influence patient choice of walk-in UCCs in Ireland given user charges.

3.3 Methodology

3.3.1 Introduction

Section 3.3 presents the methodology used to answer the research question in this chapter;

What Factors Influence Patient Choice of Urgent Care Clinics in Ireland in the Face of User Charges?

A cross-sectional questionnaire was specifically designed to collect primary data from patients in three UCCs in Ireland to investigate the factors influencing patient choice of these clinics given user charges. Section 3.3.2 describes the location of the data collection. Section 3.3.3 describes the data source. Section 3.3.4 explains the questionnaire construction. Section 3.3.5 describes the data collection procedure. Finally, Section 3.3.6 will present some descriptive statistics on the population sample.

3.3.2 Location of Data Collection

As the principal aim of this research is to assess the impact of the user charge and to identify the factors influencing patient choice when deciding to use walk-in UCCs in Ireland, patients using these clinics form the sample. Patient choice of urgent care services in Ireland has expanded due to the development of walk-in UCCs. This type of walk-in UCC was first established in Ireland in 2005 by Vhi Healthcare in conjunction with Centric Health (CentricHealth, n.d.). These privately financed clinics are called Vhi SwiftCare Clinics. Vhi SwiftCare Clinics operate as walk-in urgent clinics and as outlined in this paper, provide a non-appointment service, extended opening hours and decreased waiting times. To attend a Vhi SwiftCare Clinic a patient faces a user charge of €125 for the initial consultation[42] plus additional charges depending on the services required.[43] All patients in Ireland are eligible to attend Vhi SwiftCare Clinics once they are willing to pay the relevant user charges.[44] Vhi SwiftCare Clinics do not acknowledge medical cards or GP visit cards. There are currently three Vhi SwiftCare Clinics in Ireland; one in Mahon in Cork, one in Swords, Dublin and one in Dundrum, also in Dublin.

This research acknowledges that since 2005, a number of public walk-in UCCs have been opened in Ireland. Unlike Vhi SwiftCare Clinics, these walk-in UCCs are publicly financed and are generally co-located with public hospitals and under the governance of that hospital.[45] Patient access routes to both the Vhi SwiftCare Clinics and the publicly financed urgent care clinics are similar[46], however, there is variation in the waiting times and the user charge in each location. Publicly funded walk-in UCCs are not included in this research. As shown in Table 3.3, 2 out of the 3 categories of patients do not have to pay for attending a public walk-in UCC. Therefore, if publicly funded walk-in UCCs were included, the overall research question would not be addressed as a large proportion of the sample may not have to pay to use the service. This would not capture the effect of the user charge on patient choice.

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[42] See footnote 1.
[43] See footnote 17.
[44] The clinics are not solely for patients who have PHI.
[45] Examples of such clinics are the Mercy Urgent Care Clinic in Cork and the Mater Rapid Injury Unit in Dublin.
[46] Self-refer or GP referral.

In addition to publicly financed walk-in UCCs, private medical assessment units (MAUs) are also emerging in Ireland. These MAUs are established as part of the Bon Secours private hospital group. While these MAUs improve accessibility to urgent care, these units do not operate on a walk-in basis and were therefore not considered as a possible data source for this research. As Vhi SwiftCare Clinics were the first walk-in UCCs to be established in Ireland, this research focuses solely on patients attending the three Vhi SwiftCare Clinics in Ireland.

Table 3.3 User Charge Comparison between Walk-in Urgent Care Clinics in Ireland

Patient type	**Vhi SwiftCare Clinics**	**Public Walk-in Urgent Care Clinics**
GMS patients	Initial consultation charge €125 plus additional charges	Free
Non-GMS patients with a GP referral letter	Initial consultation charge €125 plus additional charges	Free
Non-GMS patients without a GP referral letter	Initial consultation charge €125 plus additional charges	€100

Source: Authors Own

Collecting primary data, the research investigates if user charges, amongst other factors such as patient demographics, socio-economic characteristics and clinic characteristics affect patient behaviour when deciding to use Vhi SwiftCare Clinics. As identified in Section 3.1.2, understanding why patients decide to use an alternative urgent care provider informs policy makers on the delivery of an efficient urgent care system (Shearer et al., 2015).

3.3.3 Data Source

There are only three Vhi SwiftCare Clinics in Ireland and all three were surveyed. The need to survey all three was due to location considerations which were identified in the literature and also as it would provide a more representative sample. Patients presenting at the three Vhi SwiftCare Clinics in Ireland on a non-appointment basis, between the 12th to the 26th February 2014, were eligible for inclusion in the sample. This data collection time-frame was recommended by the clinic managers in the clinics as this is a busy period in the clinic. This would contribute to a representative sample size. Vhi SwiftCare Clinics accept patients between 8am until 10pm, seven days a week. Patients are treated in the SwiftCare Clinic when they present directly for care or are referred by their GP.

Access to the Vhi SwiftCare Clinics was an on-going process (Gummesson, 1991, Marshall and Rossman, 2010, Robson, 2011). Allowing sufficient time, direct contact was made with the Medical Director of the Vhi SwiftCare Clinics and also the clinic managers in each of the three clinics in Ireland to present the research and the overall requirements needed to answer the research question. Following best practice, this access approach was adopted as recommended by Saunder, Lewis and Thornhill, 2009.

A non-probability convenience sampling technique is used. All three Vhi SwiftCare Clinics were surveyed but only patients in attendance at the clinic were included. This was due to a lack of time, cost and lack of access to non-users of UCCs. It is acknowledged this technique may lead to sampling bias as members of the general population that do not use the Vhi SwiftCare Clinics are not represented. An ideal sample would include both users and non-users of the walk-in UCC. However, as the main research objective is to identify the factors influencing patient choice of clinic, the research solely focussed on users of all three Vhi SwiftCare Clinic in Ireland.

The Social Research Ethical Committee (SREC) in University College Cork approved the research protocol and questionnaire (see Appendix A.1).

3.3.4 Questionnaire Construction

This section describes the construction of the questionnaire that was specifically designed to collect the primary data for this research.

Comparable to previous literature, a self-completion questionnaire was purposely designed and utilized to collect primary data from Vhi SwiftCare Clinic patients (see Appendix A.2) (Hunter et al., 2009, Rizos et al., 1990, Scott et al., 2009). A self-completion questionnaire was chosen as the most appropriate measure due to the high response rate found in previous studies conducted in similar healthcare locations across the US, UK and Canada (Bell and Szafran, 1992, Salisbury et al., 2002). When deciding on the data collection instrument, it was also important to identify the sample source in order to ensure a reliable sample and ensure minimum disruption to the services in the SwiftCare clinics. Due to the nature of this research, the main focus was on the patients' current visit to the clinic and the factors that played a role in choosing the clinic for the treatment of this particular injury/illness. Therefore, a self-completion questionnaire at the time of clinic use was most appropriate in order to answer the research question accurately. This methodology allowed for efficient data collection from a large number of respondents. As the same information was required from all patients in the three clinics, a standardized self-completion questionnaire was suitable. The self-completion questionnaire also ensured anonymity for the patient as possible reactive effects of direct contact between the researcher and respondent were eliminated (Sim and Wright, 2000). However, this eliminated the possibility to explore questions in depth or seek clarification from the respondent (Sim and Wright, 2000). Due to the factual nature of the answers required this concern was overcome due to a well-constructed standardized questionnaire including pre-determined responses generated from the literature review and discussions with the clinic managers and Vhi SwiftCare Clinic Medical Director (Sim and Wright, 2000). Further clarification from the respondent was not necessary. Another disadvantage associated with this methodology is that there is no guarantee the respondent will answer the questionnaire as anticipated by the researcher i.e. at the correct time or in the correct order (Sim and Wright, 2000). This was controlled using clearly labelled instructions and questions throughout the questionnaire.

To achieve reliable and valid results, the questionnaire was easy-to-follow and used clear direction and instructions. This was accomplished using factual questions for the majority of the questionnaire. The reliability of the questionnaire was tested by conducting a pilot study (January 2014). Assessing validity of the questionnaire proved to be more difficult as validity is usually established after the event (Oppenheim, 1992). Cross-checking may have been a possibility using information collected from the Vhi SwiftCare Clinics email survey[47] but this data was not made

[47] The Vhi SwiftCare Clinics collect the email addresses of their patients and send an annual survey to measure patient characteristics and satisfaction associated with the clinics. Vhi SwiftCare Clinic surveys collect similar information to this research but do so from a marketing perspective in order to improve their service.

available. Therefore, the pilot study tested the reliability and validity of the questionnaire instrument.

Each questionnaire was printed in black and white and printed back-to-back. This resulted in two pages in total. It was acknowledged that shorter questionnaires with concise completion time encourage a higher response and this was taken into consideration in the questionnaire design process (Dillman, 2000). This was important, as respondents would be eager to leave the clinic once treatment was received and it was necessary that the completion of the questionnaire would not excessively delay the respondent.

Each questionnaire included an introduction to inform potential respondents of the study's aims and why this area of research was chosen. In addition, they were informed why they were chosen as suitable candidates. Once they agreed to take part, they were asked to indicate this on the attached consent form.

The questionnaire required information regarding medical card status, PHI cover and income level. Due to the sensitive nature of this information it was assured that this information, i.e. information on individuals, would not be disclosed to anyone. To ensure anonymity, the respondents name was not required on the questionnaire. Respondents are more willing to provide information if they know the questionnaire is anonymous (Babbie, 2009). The potential respondent was advised that participation was voluntary and they could leave the questionnaire at any stage.

Due to the nature of the data collection instrument, a debriefing process was not necessary. However, if the respondent had questions regarding the questionnaire (before/after completion) they could consult a list of FAQs, which were available at the reception of the clinics (see Appendix A.3).

In the questionnaire itself, there were five sections in total. The questionnaire adopted a funnel approach i.e. it began with broad demographic questions such as the respondent's age and gender, socioeconomic variables such as education, nationality and health care cover were measured. The questions then narrowed down to measure the more specific variable categories such as Vhi SwiftCare Clinic characteristics, Vhi SwiftCare Clinic satisfaction and the dependent variables; patients' use of Vhi SwiftCare Clinics. The first dependent variable measures if the patient is a first-user or a second/multiple user of the Vhi SwiftCare Clinics. The second and final dependent variable measures the number of times a patient has used a Vhi SwiftCare Clinic.

The next paragraph will discuss each of the sections included in the questionnaire to identify and justify the nature of the variables included in each section.

Section 1 of the questionnaire explored patient demographics and type of healthcare cover. This section included nominal, continuous and categorical variables in order to generate an understanding of Vhi SwiftCare Clinic users. Section 2 measured the dependent variable in the research. This was a count variable measuring patient's previous use of Vhi SwiftCare Clinics. There were six levels in this variable ranging from; first-time user, second time user, third time user, fourth time user, fifth time user and more than five times. The dependent variable is explained further in Section

3.3.6.6. Section 3 assessed the current Vhi SwiftCare Clinic visit. This section included matrices presenting the characteristics of walk-in urgent care clinics. Using a Likert Scale, respondents indicated how important each characteristic was when deciding to visit the SwiftCare Clinic. Section 4 measured the gross annual income level of the person responsible for payment to the SwiftCare Clinic. To minimise non-response for this variable, respondents were presented with an interval scale including 6 ranges. Finally, Section 5 gathered information regarding further possible referrals as a result of this visit, total treatment cost and patient satisfaction with their visit at the SwiftCare Clinics.

The majority of the questions that appeared in the questionnaire are closed-ended. This research is of a quantitative nature, therefore, valid and reliable results were required. Close-ended questions were chosen as they are less time consuming and concise given the time restraints placed on the respondents (Oppenheim, 1992) and consequently are associated with a high response rate (Dillman, 2000). This permitted easier interpretation and coding of the data. The codebook can be found in Appendix A.4.

3.3.5 Data Collection Procedure

To ensure reliability of the questionnaire and the data collection procedure, a pilot study was conducted in the Vhi SwiftCare Clinic in Cork for 5 days in January 2014. A total of 30 surveys were collected during the pilot study. The administration process of the questionnaire was modified subsequent to the pilot study to ensure a high response and minimum disruption to the daily services in the clinics. The initial protocol required the receptionist to distribute the questionnaires to patients as they registered upon arrival at the clinic. Patients were then to complete the questionnaire throughout the visit (before and after treatment) and return the questionnaire to an allocated area within the reception area upon leaving the clinics[48] (see Appendix A.5). Following the pilot study and subsequent communication with the administrators in the clinics, this protocol was deemed unsatisfactory due to the risk of patients mislaying the questionnaire during their visit and consequently reducing the response rate. To overcome this, the survey process was adjusted. The new and final protocol required the receptionists to administer the questionnaires to the patients as they were signing out of the clinic after treatment was received. The patient was then invited to return the completed questionnaire to a clearly labelled box provided at reception. Due to the injuries/illnesses treated at Vhi SwiftCare clinics, it was recognised that the patient themselves may be unable to complete the questionnaire. To overcome this issue, the patient's parent, guardian, relative or friend, could fill in the patients' information on behalf of the patient. It is acknowledged this may increase the risk of recall bias if an individual other than the patient was completing the questionnaire. Instructions were provided on the questionnaire to ensure accuracy. It was important to include patients in the research with all levels of injuries.

In all three clinics during the given timeframe, all patients were asked to complete the questionnaire as they signed out of the clinic. Receptionists were given a brief to deliver to the potential participants. In this brief, potential respondents were informed that this questionnaire was part of a research project in University College Cork, they were assured of anonymity, patients were then invited to complete the questionnaire

[48] This questionnaire had sections that were to be completed before treatment was received and after treatment was received. These directions were clearly labelled. (See Appendix A.5)

and if they agreed to take part they were provided with a questionnaire attached to a clip board for ease of completion (see Appendix A.6).

It is important to note that face-to-face interviews were another consideration but this method was not conducive to generating a large sample size and proved to be more time-consuming in the pilot study. With the nature of injuries/illnesses presenting at these clinics and the one-hour treatment policy, it was important not to keep patients in the clinic longer than necessary.

Due to the nature of the data collection method, the study acknowledges the risk of sample selection bias and recall bias. However, due to the research question, it was necessary to use the specially constructed questionnaire to collect the data directly from patients who are using these clinics. While all attempts have been made during the construction of the questionnaire and its distribution to reduce sample selection and recall bias, the research acknowledges this risk in the interpretation of the research results.

3.3.6 Descriptive Statistics

Initially, 321 questionnaires were collected. Twenty-six questionnaires were excluded from analysis; twenty-two participants returned incomplete questionnaire[49] and four participants were not eligible for inclusion as they were not using the clinic on a non-

[49] Left pages blank.

appointment basis.[50] In addition to the non-appointment services offered by the SwiftCare Clinics, services such as physiotherapy, minor surgeries, and orthopaedic services are also offered. As this research focuses on the non-appointment service provided by the Vhi SwiftCare Clinics, patients with pre-booked appointments were excluded from the study. This resulted in a total of 295 participants eligible for this research. The collected data was analysed using STATA 11.0.

The following sections present the descriptive statistics. Patient demographics are presented with the purpose of providing an overview of the patients that use Vhi SwiftCare Clinics in Ireland. Socio-economic characteristics are presented to understand the type of patients who use Vhi SwiftCare Clinics. Descriptive statistics on the patients' current visit to the Vhi SwifCare Clinic are also provided. Patients' satisfaction with the current visit is presented. Factors influencing the patients' decision to use the clinics are described. Finally, descriptive statistics on the dependent variable are presented.

3.3.6.1 Patient Demographics

In Table 3.4, the most common age categories presenting at the clinics are 25-44 year olds (38%) and 45-64 year olds (24%). Similar to previous literature in the UK, US and Canada it appears that age groups below the age of 65 years constitute a higher proportion of Vhi SwiftCare Clinic visits than older age groups (65+) (Bell and Szafran, 1992, Mehrotra et al., 2008, Plauth and Pearson, 1998). The nature of the

[50] These four questionnaires were excluded as participants indicated on their questionnaire that they were attending the clinic to receive a service which required a pre-booked appointment such as; stitch removal, verruca treatment or to receive an injection.

injuries/illnesses treated at Vhi SwiftCare Clinics could be an influential factor for the age groups that use the clinics.[51] Bone fractures and sprains are more likely to occur among young adults and children due to perhaps more active lifestyles. While this also happens in an older age group, older patients are more susceptible to serious illnesses requiring longer visits and long-term care rather than the episodic care offered by Vhi SwiftCare Clinics (WHO, 2016). This influences patient behaviour in older adults as they prefer traditional providers of care for the treatment of minor injuries and illnesses. A qualitative study conducted in the Caribbean found patient use of traditional urgent care to be habitual (Beache and Guell, 2015). Older patients prefer to go to their "regular" doctor as they always have done before UCCs were established. Literature has also shown that older people are more likely to be registered with a family doctor and therefore, are more likely to use this traditional urgent care provider (Mehrotra et al., 2008). This may be the case particularly in an Irish context where the older age groups are more likely to have a medical card and consequently attend a traditional provider of urgent care where they will receive urgent care for free. Should a GMS patient attend an alternative provider, they must pay the relevant user charge.

In Table 3.4, there is a broadly equal prevalence of males and females in the sample, 52% and 48% respectively. The average patient travel time to the clinics is 21 minutes. Proximity to alternative urgent care providers is deemed important in previous research (Dolan and Dale, 1997, Grafstein et al., 2013, Shearer et al., 2015). This statistic indicates that similar to alternative urgent providers described earlier in the literature review, Vhi SwiftCare Clinics are also locally used services.

[51] Fractures, sprains or possible breaks, lacerations or cuts requiring stitches, sports injuries, burns and scalds, fever, infections rashes, eye and ear injuries, insect and animal bites and joint, muscular back pain (VHI. n.d)..

Table 3.4 Patient Demographics

			Surveyed patients N=295	%
Age (Years)	1-14		66	(22.37)
	15-24		35	(11.86)
	25-44		111	(37.63)
	45-64		70	(23.73)
	65+		8	(2.72)
	Missing		5	(1.69)
	Total		**295**	**(100)**
Nationality	Irish		270	(91.53)
	Other Eu		15	(5.08)
	UK		7	(2.37)
	Non-EU		3	(1.02)
	Total		**295**	**(100)**
Gender	Male		153	(51.86)
	Female		142	(48.14)
	Total		**295**	**(100)**
Travel time	Mean	21.2 Minutes		
	Range	(0 – 90)		

Note: Age categories begin with 1 year olds. Vhi SwiftCare Clinics do not cater for infants less than 12 months.

3.3.6.2 Socio-Economic Characteristics

The patients surveyed reflect a high socio-economic status with 52% of the sample reporting a third level qualification and at least 57% reporting a gross income level above the national average.[52] In Table 3.5, there is a high presence of PHI coverage within the sample (85%) and of those, 63% are Vhi members. Similar to the literature in the US (Rylko-Bauer, 1988), there is a low presence of medical aid in this sample with only 7% reporting the possession of a GMS card. These are justifiable findings as GMS status in Ireland is granted primarily on an income basis. With such high levels of income reported by this sample, it is logical that there would be a low level of GMS patients within the sample. Also, GMS patients may be less likely to choose a Vhi SwiftCare Clinic as these clinics do not accept medical cards as a form of payment. It is necessary to reiterate that everyone is entitled to attend Vhi SwiftCare Clinics once

[52] National annual earnings in Ireland in Q2 2015: €36,271 (CSO. 2015.).

they are willing to pay the relevant user charges. These clinics are not solely directed towards patients with PHI and in particular, not just Vhi members.

Table 3.5 Socio-Economic Characteristics

		Surveyed patients N=295	%
Education	No Education	17	(5.76)
	Primary Education	43	(14.58)
	Secondary Education	77	(26.10)
	Third Level	152	(51.53)
	Other	5	(1.69)
	Missing	1	(0.34)
	Total	**295**	**(100)**
Income	<€25,000	34	(11.53)
	€25,000 - €39,000	64	(21.69)
	€40,000 - €54,000	56	(18.98)
	€55,000 - €69,000	39	(13.22)
	€70,000 - € 84,000	28	(9.49)
	€85,000+	46	(15.59)
	Missing	28	(9.49)
	Total	**295**	**(100)**
PHI	Yes	250	(84.75)
	No	45	(15.25)
	Total	**295**	**(100)**
PHI Company	Allianz	1	(0.34)[53]
	Aviva	22	(7.46)
	ESB	1	(0.34)[54]
	GloHealth	2	(0.68)
	Laya	31	(10.51)
	Vhi	187	(63.39)
	No PHI	45	(15.25)
	Missing	6	(2.03)
	Total	**295**	**(100)**
Medical Card	Yes	22	(7.46)
	No	273	(92.54)
	Total	**295**	**(100)**

[53] Vhi offer Pupil Accident Insurance cover with Allianz (ALLIANZ. n.d)..
[54] There is restricted membership undertaking of this form of medical insurance in Ireland.

3.3.6.3 Current Vhi SwiftCare Clinic Visit

In addition to measuring demographics and socio-economic characteristics, the study investigates different features of the patients' current visit to the SwiftCare Clinic; current injury/illness, possible further referral and treatment cost. In Table 3.6 the most commonly presented minor injuries/illnesses to the Vhi SwiftCare Clinics throughout the data collection period were sprains/strains (23%) and fractures/breaks (19%).
The second attribute measures the possibility of the patient being referred further into the healthcare system.[55] Previous literature (Rizos et al., 1990) indicated the importance of this variable as a proxy to measure the success of the Vhi SwiftCare Clinics. In Table 3.6, 66% of the sample were successfully treated at the Vhi SwiftCare Clinic and did not require further treatment elsewhere in the healthcare system. Only 16% of the sample received further referral advice for the treatment of the minor injury/illness. This may occur if the injury/illness is beyond the scope of the Vhi SwiftCare Clinic requiring more intensive treatment. Alternatively, these patients may have presented with an injury/illness that Vhi SwiftCare Clinics do not treat; chest pain, pregnancy related illness etc.[56]

The high treatment rate indicates that Vhi SwiftCare Clinics are successfully treating patients who would otherwise present at a GP practice or A&E department. This assumption is supported by Rizos *et* al 1990, who investigated patients preferred choice of healthcare location in Canada should the alternative provider be unavailable.

[55] Referral to GP, A&E department, Consultant etc.

[56] 18.6% of the sample did not answer this question (55 respondents). It is assumed these patients were successfully treated at the Vhi SwiftCare Clinic. The question on the questionnaire included the word "referred" and perhaps these respondents presumed this question was not applicable to them as they received no further referral. This is acknowledged as a possible leading question if the patient was successfully treated and subsequently deemed this question as inapplicable to them (Edwards et al., 1997).

Patients indicated they would attend a family doctor or emergency department if the WIC was closed. The successful treatment rate in this study indicates the success of Vhi SwiftCare Clinics which may potentially reduce the pressure on traditional healthcare providers in Ireland.

The final variable estimates the patients' user charge for the current visit to the Vhi SwiftCare Clinic. In Table 3.6, the reported median user charge is €125.[57] This figure is representative of the actual user charge for initial consultation in Vhi SwiftCare Clinics which is also €125 (VHI, n.d.). The range of the user charge in this sample is €0-€400.[58] While the median user charge is similar to an A&E department[59] and nearly twice that of a GP[60], the range in Table 3.6 is considerable. This range captures the potential expense for patients of Vhi SwiftCare Clinics.

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[57] The median is presented rather than the mean user charge as the mean response is subject to bias due to outliers (Buckland et al., 1999).

[58] €0 if patient was not treated in Vhi SwiftCare Clinic and referred elsewhere. As mentioned, in Vhi SwiftCare Clinics, there are additional charges for additional services such as x-rays, stitches, crutches etc.

[59] €100 for a patient without a medical card of GP referral.

[60] The National Average Cost for a GP visit in Ireland for a non-GMS patient is €51.

Table 3.6 Vhi SwiftCare Clinic Characteristics

	Surveyed patients (N=295)	%
Injury/Illness treated		
Sprain/Strain	67	(22.71)
Minor ear/eye condition	22	(7.46)
Fracture/Break	57	(19.32)
Sport	35	(11.86)
Minor Burn	2	(0.68)
Cut requiring stitches	5	(1.69)
Minor Illness	48	(16.27)
Other	51	(17.29)
Missing	8	(2.71)
Total	**295**	**(100)**
Patient Referral		
GP	12	(4.07)
A&E department	9	(3.05)
Non-referral	194	(65.76)
Other	25	(8.47)
Missing	55	(18.64)
Total	**295**	**(100)**
User Charge (In Euro)		
Median (range)	€125 (€0-€400)	

3.3.6.4 Patient Satisfaction

This research estimates patients' satisfaction with the current visit at the Vhi SwiftCare Clinic. In this research, using a 5 point Likert Ranking scale, patients indicated how satisfied they were with a number of Vhi SwiftCare Clinic characteristics.[61,62] The attributes included in the matrix are based on clinic characteristics and characteristics emphasised in previous literature. Table 3.7 depicts how satisfied the patients were with Vhi SwiftCare Clinics characteristics such as, staff approach, quality of treatment received, waiting time, privacy from others, parking and cleanliness in the clinic. High levels of satisfaction are reported for each of the clinic characteristics. Within the sample, 98% were satisfied or very satisfied with the staff in the clinic, 97% were satisfied or very satisfied with the cleanliness of the clinic, 97% were satisfied or very satisfied with the length of waiting time before treatment, 94% were satisfied or very satisfied with the privacy they had from other patients/individuals, 81% were satisfied or very satisfied with the parking and 78% were satisfied or very satisfied with the quality of the treatment received in the clinic.

[61] A 5 point Likert scale was incorporated into the matrix ranging from "Very Satisfied" to "Very Dissatisfied". A 3 point or 7-point scale could also have been used. However, when examining the difference between 5 point and 7 point scales, research shows that adding the 2 extra rankings to form a 7-point scale has no clear advantage (Goodwin, 2010). A 5-point scale usually provides a sufficient discrimination among the levels of satisfaction (Nunnally, 1978). Yet, it may become a de facto 3-point scale as some people have a tendency to avoid making choice at the end of the scale. On the other hand, a 7 pointer may prove to be a 5 pointer if this is the case but this makes the scale too long to read and will only increase questionnaire completion time (Goodwin, 2010). So as a result, a 5-point scale was chosen for this Likert ranking scale.

[62] For ease of interpretation when analysing the questionnaire responses, the matrix was re-coded into 3 categories. The first two categories (Very Satisfied and Satisfied) were combined into "Satisfied". The final two categories in this scale (Dissatisfied and Very Dissatisfied) were combined into one category, "Dissatisfied". The third category in this scale (Neither satisfied nor dissatisfied) was re-coded to "No Opinion". Therefore, the analysis of this matrix was based on three categories "Satisfied", "Dissatisfied" and "No Opinion"

Table 3.7 Patient Satisfaction

Ranking	Staff satisfaction N (%)	Treatment satisfaction N (%)	Waiting time satisfaction N (%)	Privacy satisfaction N (%)	Parking satisfaction N (%)	Cleanliness satisfaction N (%)
Very Satisfied	248 (84.07)	0 (0)	234 (79.32)	212 (71.86)	174 (58.98)	248 (84.07)
Satisfied	42 (14.24)	229 (77.63)	51 (17.29)	65 (22.03)	66 (22.37)	38 (12.88)
Neither	1 (0.34)	48 (16.27)	3 (1.02)	10 (3.39)	27 (9.15)	4 (1.36)
Dissatisfied	0 (0)	4 (1.36)	1 (0.34)	2 (0.68)	15 (5.08)	0 (0)
Very dissatisfied	0 (0)	0 (0)	0 (0)	0 (0)	7 (2.37)	0 (0)
Missing	4 (1.36)	14 (4.75)	6 (2.03)	6 (2.03)	6 (2.03)	5 (1.69)
Total	**295 (100)**	**295 (100)**	**295 (100)**	**295 (100)**	**295 (100)**	**295 (100)**

As suggested by previous literature, patients' satisfaction with a healthcare service can be an indication of their perceived value of that service (Qin and Prybutok, 2013). Satisfaction levels can influence patient behaviour towards a service should they demand the service in the future (Shearer et al., 2015). Consequently, the high levels of satisfaction reported by users of the Vhi SwiftCare Clinic indicate that these patients have a high probability of using a Vhi SwiftCare Clinic in the future should they be faced with another minor injury or illness.

3.3.6.5 Factors Influencing Patient Choice of Vhi SwiftCare Clinics

Factors which influence patient choice of Vhi SwiftCare Clinics are examined. Also, using a matrix with a 5 point Likert Ranking Scale, patients indicated how important a number of Vhi SwiftCare Clinic characteristics were in their decision making process.[63] The attributes included in the matrix are based on the characteristics of the clinics themselves and from characteristics highlighted in previous literature (Hunter et al., 2009, Plauth and Pearson, 1998, Salisbury et al., 2002).

In Figure 3.2, the top 5 most important factors influencing patient choice of Vhi SwiftCare Clinic are reported; The 1-hour treatment policy (98%), accessibility (96%), nature of injury (95%), cleanliness (94%) and the non-appointment service (93%) were ranked the highest. These findings are supported by previous literature which revealed similar influential factors for patients deciding to use alternative healthcare providers

[63] For ease of interpretation, the matrix was re-coded into 3 categories. The first two categories (Very Important and Important) were combined into "Important". The final two categories in this scale (Unimportant and Very Unimportant) were combined into one category, "Unimportant". The third category in this scale (Neither important nor unimportant) was re-coded to "No Opinion". Therefore, the analysis of this matrix was based on three categories "Important", "Unimportant" and "No Opinion".

in the UK, US and Canada (Bell and Szafran, 1992, Hunter et al., 2009, Scott et al., 2009).

The effect of a user charge on patient choice is proxied by measuring the patient's knowledge of the cost and whether the cost is reimbursed. Patients were asked to rank the importance of cost[64] and cost reimbursement[65]. It can be seen in Figure 3.2 that patients do not rank cost and cost reimbursement as important amongst a plethora of factors measuring accessibility to the clinics. At this point in the research, the user charge associated with Vhi SwiftCare Clinics does not appear to influence patient choice as much as other factors. Factors related to improved accessibility are those valued by patients using the clinics. The significance of the user charge is examined in more detail in Section 3.4.4.

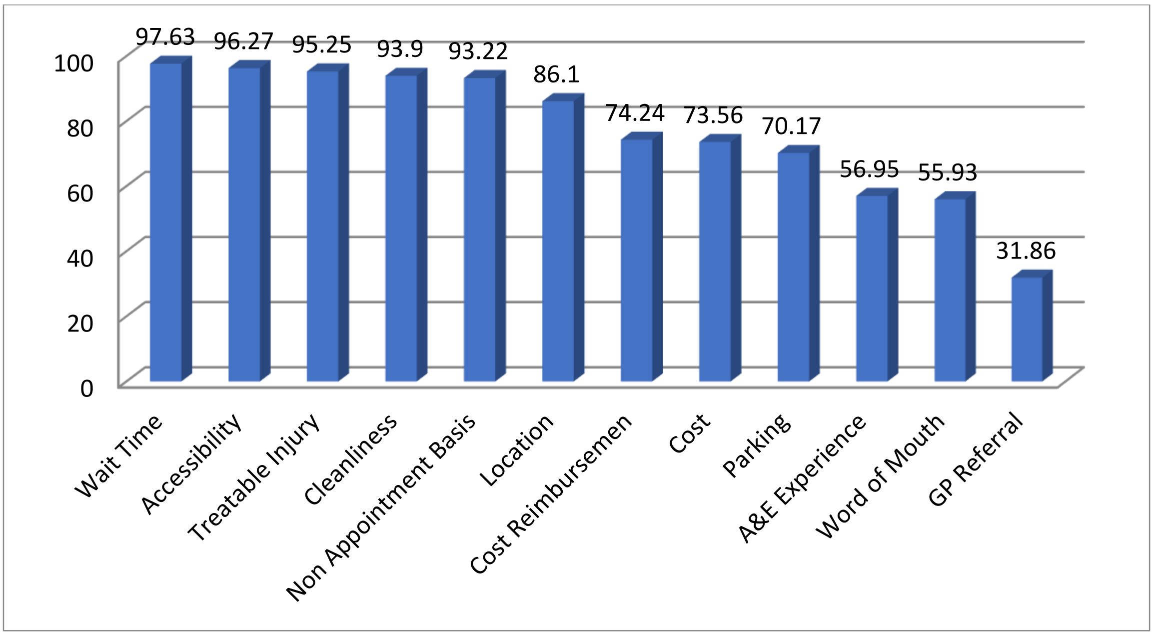
In addition to the walk-in service of Vhi SwiftCare Clinics, patients may also be referred to the clinics by their regular GP. Consequently, the matrix measured whether GP referral was an influential factor for patients using the clinics. Only 32% of the sample reported GP referral as an important factor when deciding to use the Vhi SwiftCare Clinic. This indicates that the patients in this sample chose to use this urgent care provider as a direct result of their decision-making and not as a result of a referral from a GP. Therefore, the majority of patients in this sample (68%) were self-referred and patient behaviour was not influenced by other healthcare providers.

[64] Knowledge of possible cost for treatment.
[65] Reimbursement of part of the Vhi SwiftCare Clinic cost.

Finally, in Figure 3.1, 57% of the sample report a previous experience in an A&E department as an influential factor when choosing to visit a Vhi SwiftCare Clinic. As mentioned, waiting times in A&E departments in Ireland can be quite extensive depending on the nature of the injury or illness. Therefore, these patients may have had a negative previous experience in an A&E department and consequently chose a Vhi SwiftCare Clinic due to the reduced waiting times. Further research should investigate why a patient may not choose to seek urgent care at an A&E department and consequently prefer to seek treatment at a SwiftCare Clinic.

At this point in the research it seems that despite potentially higher user charges in comparison to traditional healthcare providers, the main factors affecting patient choice when deciding to use Vhi SwiftCare Clinics are mainly factors associated with increased accessibility; one-hour treatment policy, extensive opening hours, injury type, non-appointment service. These findings will be examined further in Section 3.4.4.

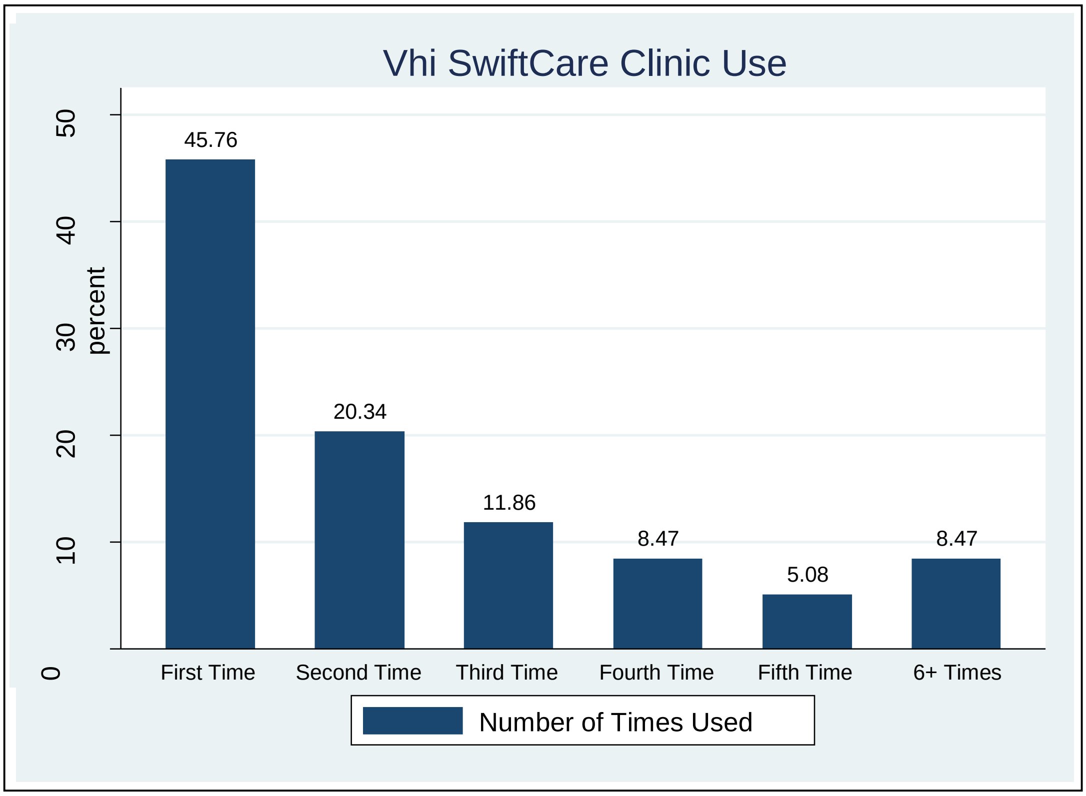
Figure 3.1 Factors Influencing Patient Choice of Vhi SwiftCare Clinics



3.3.6.6 Patients' Use of Vhi SwiftCare Clinics

Patients' use of Vhi SwiftCare Clinics formed the dependent variable for this research. The dependent variable is a count variable with 6 levels and measures the number of times the patient has used a Vhi SwiftCare Clinic. The descriptive statistics for the dependent variable are presented in Figure 3.3. Just over half of the sample, 54%, have used a Vhi SwiftCare Clinic at least once while 46% are first-time users. In the sample, 20% are second time users, 12% were third time users, 8% were fourth time users, 5% were fifth time users and 8% had used the Vhi SwiftCare Clinics more than 5 times.

Figure 3.2 Patients' VHI SwiftCare Clinic Use



Source: Authors Own

The dependent variable is a retrospective question;

Has the patient ever attended a Vhi SwiftCare Clinics before?

Yes ☐ *No* ☐

If yes, how many times previously? (Please State)

____

As the dependent variable is retrospective, this study acknowledges the risk of recall bias. However, this risk is reduced as the patient is already in the clinic, therefore this should encourage them to correctly recall any previous occasion on which they may have used the clinic.

The importance of measuring patients' use of a service was highlighted by Shearer et al (2015) who revealed patients' experience of an alternative urgent care provider as an influential factor in the decision making process. Figure 3.3 indicates that 54% of this sample are repeat users of this service. It has been found that patients are loyal to services they have used previously (Philips et al., 2010). Therefore, patient choice of Vhi SwiftCare Clinics may be influenced by a previous positive experience at the clinics. Multiple use of a service can be associated with positive previous experience. If this is the case, high levels of patient satisfaction can be expected from patients in Vhi SwiftCare Clinics. Section 3.4.4 will examine if the same factors influence choice for first time users versus second or repeat users of the clinics.

3.3.7 Conclusion

Using a specifically designed self-completion questionnaire, the descriptive statistics in Chapter 3 reveals the demographics of the patients using walk-in UCCs in Ireland and it identifies the impact of the user charge and other characteristics on patient choice when choosing walk-in UCCs. The descriptive statistics also identify patients' use of the Vhi SwiftCare Clinics.

The descriptive statistics reveal that patients who use these clinics are between 25 to 64 years of age with a high socio-economic status as indicated by a high prevalence of third level education and over half of the sample reporting an income level above the national average.[66] It is mainly privately insured individuals who use the clinics and as expected, there are very few GMS patients who use these clinics.

[66] See footnote 52.

Within this sample, 54% are repeat users of Vhi SwiftCare Clinics. This is consistent with research which shows patients' experience of the alternative provider is an influential factor in the decision making process (Shearer et al., 2015).

The descriptive statistics report it is mainly factors which measure accessibility are the most influential in patient choice when deciding to seek care at these clinics; reduced waiting time, increased accessibility, treatable injury, and the non-appointment service. These findings are consistent with previous research which also found the convenient care offered by alternative urgent care providers to influence patient choice (Bell and Szafran, 1992, Dolan and Dale, 1997, Hunter et al., 2009, Plauth and Pearson, 1998, Salisbury et al., 2002). Due to the uncertain onset of an urgent injury/illness, the convenient care provided in terms of the non-appointment service, reduced waiting time and increased accessibility provided by alternative urgent care providers offers peace of mind that urgent care is accessible outside the traditional scheduled service offered by traditional healthcare providers.

The factors measuring the impact of the user charge; knowledge of possible cost and possible cost reimbursement were not reported as influential amongst the factors measuring accessibility. As the patients in this sample are users of the clinic, they have already decided to use the alternative provider of urgent care. Previous literature suggests these patients are not truly deterred by the OOP cost (Shearer et al., 2015).

Despite patients in the sample reporting the influence of accessibility factors, the high socio-economic status reported by the descriptive statistics indicate that affordability does influence patient choice when choosing a walk-in UCC for the treatment of a minor injury or illnesses. The influence of affordability on patient choice is also highlighted by the low presence of GMS patients in the sample. These walk-in UCCs do not acknowledge GMS cards. Therefore, the potentially higher user charge may act as a deterrent for GMS patients who have a lower income. These findings are examined further in Section 3.4.4.

Section 3.4 presents the econometric methods for Chapter 3.

3.4 Results

3.4.1 Introduction

This section presents the econometric methodologies that were employed to investigate the factors influencing consumer choice of walk-in UCCs in Ireland. Section 3.4.2 discusses the rationale as to why the particular method was chosen. Section 3.4.3 presents the econometric model and focuses on model specification and model tests. The results are presented in Section 3.4.4 and Section 3.4.5 discusses these results. Chapter 3.5 concludes this research.

3.4.2 Econometric Rationale

The factors affecting patient choice of walk-in UCCs are tested using data collected from patients attending Vhi SwiftCare Clinics in Ireland. In modelling the factors affecting patient choice of walk-in UCCs, the nature of the data for the dependent variable determined the econometric methodology to be used. As identified in Section 3.3.6.6, the dependent variable is a count variable which measures patients' use of Vhi SwiftCare Clinics. There are six levels in this count variable; first time users, second time users, third time users, fourth time users, fifth time users and patients who have used the clinics more than five times. The count nature of the variable and the fact that the number of clinic visits is a variable that can only take on non-negative integer values, means that a count modelling data technique is appropriate (Mihaylova et al., 2011).

Linear regressions may also be used for count variables but the results from these regressions can be inconsistent, inefficient and biased estimators (Long and Freese, 2001). For example, an OLS regression would assume normal distribution of the error term and predict negative values for the dependent variable (Cameron and Trivedi, 2005). As an alternative to the classical linear regression models, a count model is implemented in this research. A count model assumes a skewed, discrete distribution and restricts values to non-negative integers (Nolan et al., 2014). There are a number of count models that could be used; Poisson Regression Model (PRM), Negative Binomial Regression Model (NBRM), Zero-Inflated Poisson (ZIP) regression, Zero-Inflated Negative Binomial (ZINB) regression, Zero-Truncated Poisson Regression (ZTP) and Zero-Truncated Negative Binomial (ZTNB) (Long and Freese, 2001).

3.4.3 Econometric Model

In general, empirical research using count data would begin with the PRM (Hilbe, 2011). This model lies on the assumption that the expected number of counts (mean) is equal to the variance. This is known as equi-dispersion, an assumption which is rarely satisfied in datasets (Long and Freese, 2001). In general, the conditional variance will exceed the conditional mean and the PRM does not account for this. When this is the case, the NBRM is used to model the over-dispersed data. The NBRM has the same mean structure as the PRM but it has an extra parameter for over-dispersion and corrects for the under-representation of zeros in the PRM. This is done in the NBRM by increasing the conditional variance without altering the conditional mean. The zero-inflated poisson and negative binomial models go one step further by changing the conditional mean to account for dispersion and excess zeros. The zero-inflated model uses two distinct processes to fit two models simultaneously. In general, one is a probit or logit which estimates the probability of having a count greater than zero or not. The second model estimates the parameters that affect the count. While the zero-inflated models and the NBRM correct for over-dispersion, the NBRM is a better fit based on Bayesian Information Criteria (BIC) and Akaike Information Criteria (AIC) statistics[67]. However, PRM, NBRM, ZIP and ZINB require a zero-count value for the dependent variable. Should a count variable begin at a count of 1, then the PRM, NBRM, ZIP and ZINB will not be appropriate count models. Zero-truncated models; zero-truncated poisson (ZTP) and zero-truncated negative binomial regression (ZTNB) are used when the dependent count variable cannot have a value of 0 (Zuur 2009).

As the patients included in this research are all users of the Vhi SwiftCare Clinics, every patient has at least one clinic visit. Therefore, the dependent count variable begins at a count of 1.

The following section compares the ZTP regression and the ZTNB regression implemented in this research and identifies why the ZTNB is the most appropriate count model for this data.

[67] AIC and BIC are two model selection criteria. The two criteria are formed on different model selection methods. AIC focuses on finding the best approximating model and BIC finds the true model. AIC does not depend on sample size and consequently lacks properties of asymptotic consistency (Bozdogan, 1987). Conversely, BIC does reflect sample size and therefore, BIC does have properties of asymptotic consistency. Studies have identified BIC is consistent while in contrast AIC is not (Bickel and Zhang, 1992; Zhang, 1993).

3.4.3.1 Model Selection

As mentioned, the PRM enables the probability of a count, such as the number of visits to a walk-in UCC, and is determined by the following Poisson distribution (Nolan and Nolan, 2003):

$$\Pr(Y=y_i) = \frac{\exp(-\lambda_1)\lambda_1^{yi}}{y_i!}, \quad (y_i = 0,1,2,\ldots..) \qquad (3.1)$$

Where y_i are the observed frequencies of the dependent variable and λ_1 is a function of the set of independent variables. As stated, the PRM assumes equality of the conditional mean and variance (equi-dispersion). This assumption is not satisfied by the dependent variable in this research where the variance (2.63) is larger than the mean (2.32). This is known as over-dispersion which may be caused by unobserved heterogeneity. Even though the values are almost identical, the possible presence of over-dispersion in the data needs to be controlled for as using the classical Poisson model may lead to biased results. The negative binomial model is used to deal with over-dispersion (Long and Freese, 2001). The NBRM has an extra variable which allows the variance of y to exceed the conditional mean. The NBRM has the same mean structure as the PRM but it has an extra parameter for over-dispersion; the gamma-distributed error term. Therefore, the probability distribution of the NBRM is:

$$\mathrm{Prob}(Y=y_j \,/\, u) = \frac{e^{-\lambda j e(uj)}\lambda_j{}^{uj}}{y_j!} \qquad (3.2)$$

where y is the probability of choosing a Vhi SwiftCare Clinic and j equals first time user, second time user, third time user, fourth time user, fifth time user and more than five visits. e^{uj} has a gamma distribution with the mean and variance equal to 1 and α, respectively. The NBRM increases the conditional variance without altering the conditional mean (Long and Freese, 2001).

The following paragraphs explain how the ZTP is not an appropriate fit for this data due to over-dispersion and how the ZTNB appears appropriate according to the goodness-of-fit and over-dispersion tests. The likelihood ratio (LR) test and the Bayesian Information Criteria (BIC) are used to examine the goodness-of-fit of both models and to identify that the ZTNB is a more appropriate fit than the ZTP.

As mentioned, over-dispersion is evident in the dependent variable in this research. The ZTNB controls for over-dispersion as this count model is defined in terms of the over-dispersion parameter, α. The model estimates the $\ln(\alpha)$ with the estimate given in the Stata results table by */lnalpha*. Estimating $\ln(\alpha)$ forces α to be positive (Long and Freese, 2001). In this case, the $\ln(\alpha)$ is -0.69 and the value for α is 0.50 (see Table 3.9). As the ZTNB reduces to the ZTP when $\alpha = 0$, overdispersion can be tested with the hypothesis: Ho: $\alpha= 0$. Stata provides a likelihood ration (LR) test at the end of the ZTNB output table to test if Ho: $\alpha= 0$ (Long and Freese, 2001). When the over-dispersion parameter $\alpha = 0$ the ZTNB is equal to the Poisson distribution. In this model, α is significantly different from zero ($p<0.05$) indicating that the Poisson distribution is not sufficient to explain the data. To further investigate the model fit, both the ZTP and ZTNB were compared using the BIC model selection criteria (see Appendix A.7). The BIC value for the ZTP model was 944.05 while the BIC value for the ZTNB is lower at 926.44. According to Rafferty (1996), if the difference in the BIC between the first (ZTP) and second model (ZTNB) is greater than 0, then the second model is preferred. Therefore, the ZTNB is identified as the most appropriate model for this research.

3.4.3.2 Model Specification

The explanatory variables included in the model are based on economic theory and previous literature. If economic theory could not defend the inclusion of an explanatory variable it was not included in the model (Kennedy, 2003). Patients' age, healthcare cover, gross monthly income level and factors affecting patient choice of choosing a Vhi SwiftCare Clinic are included. The explanatory variables included a combination of binary variables (male GMS, PHI, waiting time, no appointment necessary, GP referral, extended opening housr, location, injury type , parking and costs), categorical variables (age and income) and continuous variables (travel time to the clinic).[68] The model investigates the impact of patient demographics (age and gender), socio-economic characteristics (health care cover and income), clinic characteristics which may influence patient choice (reduced waiting time, non-appointment service, GP referral, extended opening hours, travel time, location, injury type and parking access), and cost (importance of cost[69]) on the number of times the clinic has been used. Table 3.8 provides more information on the variables included in the model.

[68] Travel time to the clinics is measured in minutes.
[69] In the questionnaire, patients were asked to indicate the importance of knowing the possible treatment cost of choosing this urgent care provider.

Table 3.8 Variable Description

Variable	Coding Description
Age (in years)	1 = 1-14 2 = 15-24 3 = 25-44 4 = 45-64 5 = 65+
Gender	0 = female 1 = male
GMS	0 = no 1 = yes
PHI	0 = no 1 = yes
Income	1 = <€25,000 2 = €25,000 - €39,000 3 = €40,000 - €54,000 4 = €55,000 - €69,000 5 = €70,000 - €84,000 6 = €85,000+
1 hour waiting time	0 = 1-hour treatment was not important in patient decision 1 = 1-hour treatment was important in patient decision
No appointment necessary	0 = Non-appointment service was not important in patient decision 1 = Non-appointment service was important in patient decision
GP referral	0 = Referral by GP was not influential in decision 1 = Referral by GP was influential in decision
Extended opening hours	0 = Longer opening hours were not influential in patient decision 1 =Longer opening hours were influential in patient decision
Travel time	Continuous variable – measured in minutes
Location	0 = Location of clinic was not influential in patient decision 1 = Location of clinic was influential in patient decision
Knowledge of treatable injury	0 = Knowing injury was treatable at clinic was not influential 1 = Knowing injury was treatable at clinic was influential
Parking	0 = Parking access at the clinic was not influential in patient decision 1 = Parking access at the clinic was influential in patient decision
User charge	0 = Knowledge of possible treatment cost was not influential 1 = Knowledge of possible treatment cost was influential

Patient satisfaction is not included in the econometric model. In this research, satisfaction is measured based on the current visit so therefore could not be included as an influential factor for choosing the SwiftCare Clinic on this particular occasion. However, as discussed in Section 3.3.6.4, measuring patient satisfaction is important in gauging possible future use as patients who report high levels of patient satisfaction are more likely to use the clinic again in the event of a minor injury or illness. Yet, due to the nature of the research question, patient satisfaction is not included in the econometric model.

As the objective of the research is to investigate the impact of the independent variables on the dependent variable, multi-collinearity can be a problem (Paul, 2006). Detection of multi-collinearity was carried out using a correlation matrix (Kennedy, 2003). Due to the nature of the independent variables, it was expected the relationships between some variables may be correlated as they measured similar aspects of the clinic. As expected, high correlations were found amongst variables measuring similar clinic characteristics (parking and cleanliness of the clinic). (see Appendix A.8). According to Kennedy, there are a number of methods of dealing with multi-collinearity; obtain additional information on the data, drop the highly correlated variable or do nothing and acknowledge the possibility of multi-collinearity (Kennedy, 2003). In this case, obtaining additional information was not possible. The "*do nothing"* approach was an option yet due to the small sample size it was important not to include variables that were not adding to the regression as these variables would affect the degrees of freedom. As these two variables both measure clinic characteristics and are highly correlated, including both in the regression was not adding to the regression so the variable measuring clinic cleanliness was not included in the regression.

In Ireland, access to urgent care is constrained by healthcare cover and income. Furthermore, income can affect access to healthcare cover (Nolan and Nolan, 2004). Consequently, it was suspected there may be an interaction effect between patient income and healthcare cover (GMS and PHI). Generally, patients with an income level below a certain income threshold in Ireland are entitled to a medical card. Patients who can afford to, purchase PHI to access healthcare. In this study, a chi square test of independence was used to test the relationships between income level, PHI and medical card possession. A significant positive relationship was found between PHI and an annual income level in excess of €85,000 (see Appendix A.9) and a significant positive relationship was found between medical card possession and an income level less than €25,000 (see Appendix A.9). While a significant relationship is found between medical eligbility and an annual income level less than €25,000, the income category (€25,000) forms the base category for the income variable in the model. Consequently, no interaction variable is created for GMS and this income level as the main effect variable (€25,000) is not included in the regression.

An interaction variable was created for PHI and income over €85,000 (*phiy17*) and the variable was included in the model to assess its significance. No significance was found for this interaction variable (see Appendix A.10). As the interaction variable was only included to check its significance and no hypotheses was made about the variable, the insignificant finding meant the variable was excluded from the final model as it did not add anything to the model (Kleinbaum and Klein, 2002).

For ease of interpretation of the results, the marginal effects for the significant variables are discussed. The third column in Table 3.9 shows the marginal effects at the mean (MEM) for both the categorical and continuous variable.[70] The marginal effects are computed differently for categorical and continuous variables. For binary explanatory variables, the marginal effects measure the discrete change; how the predicted probabilities change as the explanatory variables change from 0 to 1 (Cameron and Trivedi, 2005):

[70] Only one continuous variable; time travelled to the clinic which is measured in minutes.

$$\text{Marginal Effect Xk} = \Pr(Y = 1|X, Xk = 1) - \Pr(y=1|X, Xk = 0) \qquad (3.3)$$

For continuous independent variables, the marginal effects measure the instantaneous rate of change; estimate the change in the dependent variable produced by a 1-unit change in an independent variable (Cameron and Trivedi, 2005):

$$\text{Marginal Effect of Xk} = \text{limit}[\Pr(Y = 1|X, Xk+\Delta) - \Pr(y=1|X, Xk)] / \Delta]$$

as Δ gets closer and closer to 0. *(3.4)*

The marginal effects at the mean for continuous variables indicate that if X_k increases by a very small amount (e.g. 0.001), then P(Y=1) would increase by that amount.

3.4.4 Results

To examine the factors influencing patient choice of walk-in UCCs given user charges, a ZTNB was estimated (see Appendix A.11). The ZTNB coefficients and the MEM are presented in Table 3.9.

In Table 3.9, holding all other variables at their mean, GMS patients visit the clinics 1.56 times less than a non-GMS patient. In other words, GMS patients visit the clinics less frequently than non-GMS patients. Patients with PHI cover visit the clinics 0.92 times more than patients without PHI cover and patients who have an annual income level of €70,000-€84,000 visit the clinics 0.68 times more than a patient with an annual income less than €25,000. Therefore, patients with PHI and an annual income level in excess of €70,000-€84,000 visit the clinics more frequently than patients without PHI and patients on an annual income level less than €25,000. Table 3.9 shows that patient who have a longer travel time to the clinic visit the clinics 0.02 times less than patients with a shorter travel time to the clinic. This indicates that patients who have further to travel to attend the clinic visit the clinics less frequently. Finally, holding all other parameters at their means, patients who report parking as an influential factor for choosing the clinics, visit the clinics 0.61 times more than patient who do not report this characteristic as important. Therefore, patients who value the parking access at these clinics are higher users of the clinics.

Table 3.9 Zero-Truncated Negative Binomial Estimates

Independent Variable	Coefficient	dy/dx
Patient Demographics		
1-14 Years	0.36 (0.71)	0.51 (1.02)
15-24 Years	0.53 (0.73)	0.75 (1.04)
25-44 Years	0.57 (0.70)	0.81 (0.10)
45-64 Years	0.34 (0.71)	0.48 (1.01)
65+ Years	*base category*	
Male	-0.11 (0.15)	-0.16 (0.22)
Socio-Economic Characteristics		
GMS	-1.10** (0.48)	-1.56** (0.67)
Private health insurance	0.65*** (0.25)	0.92*** (0.35)
<€25,000	*base category*	
€25,000-€39,000	0.01 (0.25)	0.01 (0.36)
€40,000-€54,000	-0.04 (0.26)	-0.06 (0.37)
€55,000-€69,000	-0.29 (0.30)	-0.42 (0.43)
€70,000-€84,000	0.48* (0.29)	0.68* (0.42)
€85,000+	0.20 (0.27)	0.29 (0.39)
Clinic Characteristics		
Waiting time	-0.06 (0.59)	-0.08 (0.94)
No appointment necessary	0.16 (0.32)	0.23 (0.45)
GP referral	0.11 (0.17)	0.16 (0.24)
Extended opening hours	0.14 (0.45)	0.19 (0.65)
Travel time	-0.01* (0.01)	-0.02* (0.01)
Location	-0.18 (0.22)	-0.26 (0.32)
Injury type	0.03 (0.55)	0.05 (0.78)
Parking	0.43** (0.18)	0.61** (0.27)
Affordability		
User charge	-0.30 (0.18)	-0.43 (0.26)
Zero Truncated Negative Binomial		
No. of obs. = 263 LR chi2 (21) = 36.88 α = 0.500 chibar2(01) = 23.17	Pseudo R2 = 0.0442 ln(α) = -0.69 Prob > chi2 = 0.0174	

Note: * = significance at 1% level, **=significance at 5% level, *=significance at 10% level.**

The results in Table 3.9 show GMS cover, PHI cover, income level, travel time to the clinic and parking access are the factors which influence patient choice of Vhi SwiftCare Clinics. While the user charge associated with the clinic is not directly identified as a significant factor, most of the significant variables (GMS, PHI and income (€70,000-€84,000)) act as a proxy for affordability. These results indicate that affordability is significant for patients who choose to attend a private walk-in UCC. Patients with higher incomes and higher healthcare cover may find the full OOP user charge more affordable than a patient on a lower income with lower healthcare cover.

This insignificant finding associated with the user charge is supported by Shearer et al (2015). Since the patients in the sample are users of the clinic, they have already made the choice to utilize the service. Therefore, the potentially higher user charge in comparison to traditional providers of urgent care does not act as a deterrent. At this point, it seems the user charge does not significantly influence patient behaviour for alternative urgent care clinics in Ireland. However, while knowledge of the user charge is not significant for patients, significant socio-economic variables measuring healthcare cover and patient income can be related to affordability and are perhaps indirectly measuring the impact of the user charge associated with these clinics. As patients have already decided to use this service, they must be willing and able to pay the relevant user charge.

The research proceeds to investigate the factors which affect the likelihood of the patient being a first-time user of the walk-in UCC. This is conducted using the application of a standard probit regression. The results of the probit model will indicate the type of patient who is more likely to be a first-time user and less likely to be a repeat or multiple user of the clinic.

The dependent variable is modified and transformed into a binary dependent variable coded 1 for first time users (n= 135) and 0 for repeat or multiple users (n = 160). The explanatory variables included in the probit regression are identical to those included in the ZTNB (See Table 3.8 for description). As the probit model is nonlinear, it is difficult to describe the relationship between a variable and its outcome probability. For ease of interpretation of the results from the probit, the MEM are also presented for this regression.

Table 3.10 shows that, holding all parameters at their mean, GMS cover increases the probability of the patient being a first-time user by 0.43. In other words, GMS patients are more likely to be a first-time user and consequently, this research assumes GMS patients are less likely to be repeat or multiple users of these walk-in UCCs. Holding all parameters at their mean, PHI and an annual income level of €70,000-€84,000 decrease the probability of the patient being a first-time user by 0.26 and 0.34, respectively. Subsequent to this finding, it is assumed that patients with PHI and a high income level (€70,000-€84,000) are more likely to be repeat or multiple users of these clinics in comparison to patients without PHI and an annual income level less than €25,000. Reporting the importance of extended opening hours decreases the probability of a patient being a first-time user by 0.40. This highlights that patients who do value the extended opening hours of walk-in UCCs are more likely to be repeat or multiple users of the clinics. Longer travel time the clinic increases the probability of the patient being a first-time user by 0.01. This indicates that patients who have a longer travel time to the clinic are less likely to be repeat or multiple users of these clinics. Finally, reporting the importance of parking access decreases the probability of the patient being a first-time user by 0.20. Similar to extended opening hours, patients who value the parking access at these clinics are more likely to be repeat or multiple users of the clinics.

Table 3.10 Probit Regression: First-time Users Vs Multiple Users

Independent Variable	Coefficient	dy/dx
Patient Demographics		
1-14 Years	0.32 (0.58)	0.13 (0.23)
15-24 Years	0.37 (0.61)	0.15 (0.24)
25-44 Years	0.33 (0.56)	0.13 (0.22)
45-64 Years	0.43 (0.56)	0.17 (0.22)
65+ Years	*base category*	
Male	0.00 (0.17)	0.00 (0.69)
Socio-Economic Characteristics		
GMS	1.07** (0.44)	0.43** (0.17)
Private health insurance	-0.66*** (0.25)	-0.26*** (0.10)
<€25,000	*base category*	
€25,000-€39,000	-0.09 (0.27)	-0.04 (0.11)
€40,000-€54,000	-0.00 (0.29)	-0.00 (0.11)
€55,000-€69,000	0.14 (0.32)	0.05 (0.12)
€70,000-€84,000	-0.85** (0.37)	-0.34** (0.15)
€85,000+	-0.02 (0.31)	-0.01 (0.12)
Clinic Characteristics		
Waiting time	0.28 (0.70)	-0.11 (0.28)
No appointment necessary	-0.23 (0.37)	-0.09 (0.15)
GP referral	0.10 (0.19)	0.04 (0.07)
Extended opening hours	-0.10* (0.58)	-0.40* (0.23)
Travel time	0.02*** (0.01)	0.01*** (0.00)
Location	0.19 (0.27)	0.07 (0.11)
Injury type	0.20 (0.69)	0.08 (0.11)
Parking	-0.51** (0.21)	-0.20** (0.08)
Affordability		
User charge	0.13 (0.21)	0.05 (0.08)
Probit Regression		
No. of obs. = 263 LR chi2 (21) = 46.06 Prob > chi2 = 0.0019 Pseudo R2 = 0.1270		

Note: * = significance at 1% level, **=significance at 5% level, *=significance at 10% level.**

Similar to the findings of the ZTNB, the socio-economic characteristics (PHI and income €70,000-€84,000) reported by the probit which significantly decrease the likelihood of the patient being a first-time user can be related to a patients' ability to pay the potentially higher user charge for these clinics. The results of the probit indicate that first-time users are more likely to be without PHI and from a lower income background. Therefore, patients with PHI and a high income level (€70,000-€84,000) are more likely to be repeat or multiple users of the walk-in UCCs. Similarly, GMS cover increases the probability of a patient being a first-time user. This finding in conjunction with the descriptive statistics, presented in this chapter, which report 7% of the patients in this sample are GMS patients, highlights that GMS patients do attend these clinics but they are more likely to be first-time users and consequently, less likely to be repeat or multiple users.

The clinic characteristics reported by the probit (extended opening hours and parking) which decrease the likelihood of the patient being a first-time user are variables that could only be influential if the patient had previously used the clinics. If the patient is a first-time user, then they may be not aware of the extended opening hours or the access to parking that is provided. This supports the assumption that patients who value the extended opening hours and the parking access at these clinics are more likely to be repeat or multiple users of the clinics.

3.4.5 Discussion

Table 3.9 presented the results of the ZTNB which assessed the factors influencing patient choice of walk-in UCCS in the face of user charges. Table 3.10 presented the results of the probit regression which investigated the factors that affect the likelihood of the patient being a first-time user of the walk-in UCC.

The ZTNB found patient socio-economic characteristics (GMS, PHI and income (€70,000-€84,000)) and clinic characteristics (travel time to the clinic and parking access) significantly influence the number of times the walk-in UCCs are used.

PHI, income level and parking access are positively related to the number of times the clinic is used. Patients who purchase PHI generally have the income to do so and consequently, affordability to attend these clinics is less of an issue for high income earners in comparison to lower-income patients. In addition to a greater ability to pay, PHI patients may be subject to cost-reimbursement for the initial consultation charge at these clinics. For example, depending on their PHI plan, patients who are covered by Vhi, are entitled to a reimbursement of €75 off the initial consultation fee (€125). Reimbursement is also available with other Irish PHI providers, depending on the level of their health insurance plan. In addition to higher income levels, knowledge of this possible cost-reimbursement may further increase the affordability gap between PHI and lower income earners.

In addition to healthcare cover and income, parking also increases the number of times the clinics are used. This finding is supported by literature which also found parking to influence patient choice of an alternative provider of urgent care (Bell and Szafran, 1992, Jackson et al., 2005, Salisbury and Munro, 2003). Supply of parking and in particular, the supply of free parking provided by these Irish walk-in UCCs, enhances the convenient nature of these clinics. This is in contrast to A&E departments in

Ireland which can be co-located with hospitals and therefore result in a limited number of parking spaces for patients of the A&E. In addition to a limited number of parking spaces, patients parking in A&E departments may also incur parking charges.

The ZTNB found GMS cover and travel time to be negatively associated with the number of times the clinic is used. As mentioned, all patients attending the Vhi SwiftCare Clinics must pay the relevant user charge. The clinics do not accept medical cards as a method of payment. As GMS patients can receive free urgent care from traditional urgent care providers, this significant finding indicates that the user charge may be a deterrent for GMS patients. This is supported by previous literature which found lower income groups place higher value on cost-saving associated with urgent care providers (Ahmed and Fincham, 2010). Also, the impact of diverse payment methods has been found to influence the type of patients using alternative providers of urgent care (Jackson et al., 2005, Plauth and Pearson, 1998, Rylko-Bauer, 1988, Scott et al., 2009). It appears that patients with medical aid in Ireland are less likely to choose alternative urgent care providers as these providers do not accept medical aid as a method of payment.

The negative relationship between clinic use and travel time to the clinic is also supported by previous literature which found proximity to the home as an influential factor affecting patients' decisions for alternative providers of urgent care (Grafstein et al., 2013, Shearer et al., 2015). Similarly, as found in this study, alternative providers of urgent care in Ireland are locally used services.

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The probit regression found similar socio-economic characteristics (GMS, PHI and income (€70,000-€84,000)) and clinic characteristics (extended opening hours, travel time to the clinic and parking access) to significantly affect the probability of a patient being a first-time user at these clinics. The results of the probit regression suggest that GMS patients and patients with longer travel time to the clinic are more likely to be first-time users and consequently, less likely to be repeat or multiple users of the clinics. This is in comparison to patients who have PHI, a higher income level and a preference for the extended opening hours and parking access offered by these clinics. These patients are less likely to be first-time users of the clinics and are subsequently assumed to be repeat or multiple users of the clinics. Similar to the results of the ZTNB, the significant variables found in the probit model also highlight the affordability and accessibility issues that exist for lower incomes patients attending these clinics. The results further emphasise, that higher income earners and patients with PHI have increased accessibility to convenient urgent care due to their ability to pay.

The following section, Section 3.5, concludes this chapter.

3.5 Conclusion

This chapter identified the factors which influence patient choice of UCCs in Ireland in the face of user charges. Due to the nature of the question, the research collected primary data from patients attending three private UCCs in Ireland where all patients are subject to an OOP user charge to use the service. Vhi SwiftCare Clinics were the first type of walk-in UCCs to be established in Ireland. The clinics were founded by Vhi Healthcare in conjunction with Centric Health (CentricHealth, n.d.). These are privately financed clinics. Vhi SwiftCare Clinics operate as walk-in urgent clinics and provide a non-appointment service, extended opening hours and decreased waiting times. To attend a Vhi SwiftCare Clinic a patient faces a user charge of €125 for the initial consultation[71] plus additional charges depending on the services required.[72] All patients in Ireland are eligible to attend Vhi SwiftCare Clinics once they are willing to pay the relevant user charges.[73] Vhi SwiftCare Clinics do not accept medical cards or GPVCs as a method of payment. There are currently three Vhi SwiftCare Clinics in Ireland; one in Mahon in Cork, one in Swords, Dublin and one in Dundrum, also in Dublin.

Using a cross sectional study, this research collected primary data from patients attending all three Vhi SwiftCare Clinics in Ireland. A ZTNB is used to estimate the factors which influence patient choice of walk-in Vhi SwiftCare Clinics in Ireland. A probit regression was then used to identify the factors which increase the likelihood of the patient being a first-time user.

[71] See footnote 1.
[72] See footnote 17.
[73] The clinics are not solely for patients who have PHI.

Chapter 3 has acknowledged the objectives as set out in Section 3.1.1. This Chapter has revealed the type of patient that uses Vhi SwiftCare Clinics as mainly young patients with a high income level and PHI cover. Overall the findings show that PHI, GMS cover, income (€70,000-€84,000), parking and travel time to the clinic influence patient choice when deciding to use a Vhi SwiftCare Clinic. Despite an unexpected insignificant relationship found between the user charge and Vhi SwiftCare Clinics use, the significant variables measuring patient socio-economic characteristics (PHI, GMS and income) are related to patients' ability to pay and act as a proxy for affordability. Therefore, this section concludes that patient affordability is important when choosing a Vhi SwiftCare Clinic.

An insignificant relationship was found between the user charge and Vhi SwiftCare clinic use. In an Irish healthcare context, this can be identified as an unexpected finding as the cost of this urgent care provider is potentially more expensive than traditional providers. However, the significant variables measuring patient socio-economic characteristics (PHI, GMS and income) are related to patients' ability to pay and act as a proxy for affordability. The influence of affordability for this service raises accessibility concerns for lower income patients. Patients with lower incomes may not be able to afford this service and consequently, may not have the same access to this healthcare service as a patient with a higher income level. Therefore, this chapter concludes that patient affordability is important when choosing these clinics.

Another reason for the insignificant relationship between the user charge and use of these clinics may be due to the exclusion of non-users of the clinics in this study. As the patients included in this study have already made the decision to use the clinic, the potentially higher user charge may not act as a deterrent for these patients. The exclusion of non-users has been identified as an implication in this study in terms of sample bias. However, as the main research objective is to identify the factors influencing patient choice of the clinic, it was appropriate to include only users of the clinics to successfully answer the research objective. See Section 6.4 for further discussion. This research acknowledges the potential sample bias and interprets the results in terms of users of the clinic.

This section finds that 66% of the sample were successfully treated in the clinics and were not referred for further treatment. This indicates that without services such as the Vhi SwiftCare Clinics in Ireland, these patients would have had no choice but to attend a GP or A&E department with their injury or illness. The research concludes that patients of Vhi SwiftCare Clinics are influenced by clinic characteristics such as extended opening hours, parking and travel time to the clinics rather than be deterred by the potentially higher user charge in comparison to the traditional urgent care providers. While alternative urgent care providers have extended opening hours in comparison to GP services in Ireland, these clinics are not open 24 hours like an A&E department in Ireland. Further research should be conducted to confirm whether; if UCCs in Ireland were open 24 hours a day, patients would utilize the service despite the potentially higher user charge. If so, this would in turn reduce the increasing pressure occurring in A&E departments in Ireland.

Chapter 3 has shown that while patients in this sample have already made the choice to pay the higher user charge for this private service, the significant factors which are driving choice for alternative urgent care providers are also associated with affordability; GMS, PHI and income. These results indicate that when patients must pay the full user charge OOP for a healthcare service, it is predominantly patients with higher income and PHI that do so. The following chapter, Chapter 4, examines the impact of three different types of user charges on patient behaviour for a mainly public or part-publicly provided service in Ireland. The three different types of user charges result in varying OOP payments for the patients and varying OOP costs relative to the overall cost of the service. Rather than focussing on just one type of user charge as done in Chapter 3, Chapter 4 examines the impact of a co-payment, a deductible and also a full user charge for a mainly public or part-publicly provided service; prescription drugs.

4 WHAT IMPACT HAVE PRESCRIPTION DRUG USER CHARGES HAD ON PATIENT BEHAVIOUR IN IRELAND?

4.1 Introduction

In 2012, the total pharmaceutical bill across the EU was €200 billion (OECD, 2014). Pharmaceutical expenditure accounted for nearly one fifth of health expenditure in the EU in 2012 and accounted on average for 1.2% of GDP in the EU with two thirds of expenditure publicly financed and the remainder privately financed. There are wide variations in the pharmaceutical expenditure per capita amongst EU countries. For example, Belgium had the highest pharmaceutical expenditure per capita in 2012 at €550, followed by Germany at €501 per capita and Ireland at €500 per capita. Ireland spent 40% more on pharmaceutical expenditure per capita than the OECD average (€350) (OECD 2014). High pharmaceutical expenditure urges governments and policy makers to introduce policies such as user charges. User charges result in the sharing of healthcare costs between the patient and provider and result in the patient contributing towards the cost of their prescription drugs. User charges are an example of one of the strategies that are introduced by governments in the EU in an attempt to alleviate the financial strain on pharmaceutical expenditure (Gemmill et al., 2008).

User charges for prescription drugs are defined as payments made by the patient when a prescription is dispensed (Gibson et al., 2005b). This payment is a contribution towards their prescription costs (Morris et al., 2007). These user charge policies are grounded in economic theory of consumer choice and how price can be used as a tool to change consumer behaviour. Transferring a proportion of the prescription cost to the patient, it is theorised that user charges encourage consumers to become more cost-conscious (Hurley and Johnson, 1991). This is based on the assumption that consumers reduce unnecessary demand which is referred to as “moral hazard”. As defined in Chapter 1 of this thesis, moral hazard is the excess use of a healthcare service and in the context of this chapter, moral hazard refers to the excess use of prescription drugs.

In healthcare, some patients have full financial protection (full third party payment) against user charges for prescription drugs while other patients must pay the full user charge (full cost borne OOP by the patient). When the user charge is set between full third-party payment and the full user charge, the patient is subject to some form of cost-sharing for prescription drugs. Throughout this chapter, unless otherwise stated, the term “user charge” is generally applied when referring to any OOP payment made by patients towards the cost of their prescription drugs. More specifically, the term “cost-sharing” is used to indicate that only a proportion of the total cost of the prescription drug is paid OOP by the patient. Consequently, this chapter defines cost-sharing as a subset of user charges. Cost-sharing for prescription drugs can include direct or indirect payments (Tamblyn et al., 2001). Direct cost-sharing includes co-payments, deductibles and co-insurance. Indirect cost-sharing includes coverage exclusions, generic substitutions and reference pricing (Grootendorst et al., 2001, Motheral and Fairman, 2001). In Ireland, the main types of user charges that exist for prescription drugs are co-payments, monthly deductible, zero-cost-sharing and the full user charge. The type of user charge imposed on patients for prescription drugs is dependent on the type of prescription drug cover they have.

4.1.1 Prescription Drug User Charges in Ireland

Under the GMS Scheme, the user charge for prescription drugs was first introduced in 2010 and has increased substantially over the last 5 years. In 2010, a 50c fixed fee per prescription item was introduced on all prescription drugs dispensed by pharmacies to GMS patients. This user charge was subject to a maximum ceiling of €10 per family per calendar month. In October 2013, this co-payment was further increased to €1.50 per item with a monthly limit of €19.50. Currently, since October 2014, this co-payment is set at €2.50 per item with a monthly maximum of €25 per family per calendar month (DOH, 2013). The GMS co-payment saved €43 million in 2015 (IMO, 2016).

The latest available figures show that in 2013, 40.31% of the population (1,849,340) were eligible for GMS status (PCRS, 2013)[74]. This costs the HSE an average payment to pharmacies of €973.26 per person for prescription drugs (PCRS, 2013). The number of individuals under the GMS scheme increased by approximately 34% between 2009 and 2013 (PCRS, 2013). One reason for this increase in eligibility is due to the onset of the recession in Ireland in 2008. Increasing levels of unemployment led to lower incomes which resulted in a higher number of patients becoming eligible for GMS status. While GMS numbers have increased, the HSE cost per GMS patient decreased from €1,245.79 in 2009 to €973.26 per patient in 2013 (PCRS, 2013). One of the possible reasons for this reduction in cost per person is due to the increase that occurred

[74] The HSE Annual Report (2014), reports that 39% (1.77m) of the population were eligible for the GMS scheme in 2014. However, the HSE does not provide detailed statistics for the othe publicly funded categories addressed in this thesis (Drugs Payment Scheme (DPS) and LTI). The PCRS provides the most up-to-date statistics for all community drug schemes in Ireland so for consistency purposes, the PCRS statistics are used when possible.

in the prescription charge between 2010 and 2013. Patients were contributing towards a higher share of their prescription medication, therefore, reducing the HSE cost per claimant.

Patients without a GMS card may apply for a DPS card to receive financial protection for prescription drugs. With a DPS card, a patient pays a monthly deductible for their prescription drugs after which the cost is covered by the HSE. In comparison to the recent introduction of the GMS user charge, the DPS user charge has been in existence in Ireland since 1999 (DOH, 1999). In 1999, the DPS set a monthly deductible of £42 (€56) per family per month (DOH, 1999). This meant that once a patients' drug cost exceeded £42 (€56) per month, the remainder of their drug costs were covered by the State. This deductible has increased considerably; in 2008 it increased to €90 (DOH, 2008) and in 2010 it rose to €120 (DOH, 2010). In 2012 it was further increased to €132 (DOH, 2011) and since 1st January 2013 an individual with a DPS card can pay up to €144 for prescription drugs per calendar month (DOH, 2012b). Any prescription drug costs in excess of this are covered by the state.

The latest available figures show that in 2013, 30.50% (1,399,208) of the population were registered under the DPS scheme. This costs the HSE an average payment of €272.56 per claim[75] (PCRS, 2013). The number of individuals under the DPS scheme decreased by approximately 12% between 2009 and 2013 (PCRS, 2013). One reason for this reduction is due to the onset of the recession in Ireland in 2008. Increasing

[75] Figures are based on number of eligible persons who availed of services under the scheme. The PCRS only has data on the DPS patients who exceed the monthly deductible as it is only after a patient reaches €144 per calendar month that the HSE covers the cost of the patient's prescription drugs. Until this point, the patient pays OOP. Consequently, the €272.56 per claim refers only to patients who exceed the €144 per month.

levels of unemployment led to lower incomes which resulted in a higher number of patients becoming eligible for GMS status. This reasoning is supported as the number of GMS patients increased by almost 34% during the same time-frame (2009 to 2013) (PCRS, 2013).

Patients in Ireland who are entitled to the LTI scheme do not pay any cost towards prescription drugs that are dispensed to them under the LTI scheme for the treatment of their LTI. In some cases, LTI patients may be prescribed prescription drugs that are unrelated to their long-term condition and consequently, be subject to some form of user charges. A patient with LTI entitlement can also apply to the GMS or DPS scheme depending on their eligibility.

Patients who are not eligible for the GMS scheme or LTI scheme, and patients who have not applied to the DPS scheme are subject to the full cost of their prescription drugs which must be paid OOP at the point of use.

As a result of the three community drug schemes (GMS, DPS and LTI) and patients without any form of prescription drug cover, a number of user charge policies exist in Ireland for prescription drugs; a fixed co-payment per prescription item (GMS Scheme) and a deductible (DPS), zero cost-sharing (LTI) and the full user charge. Patients face different types of user charges depending on their eligibility for prescription drug cover. This research aims to assess the impact of the various types of user charges which exist for prescription drugs in Ireland. This is done in the context of consumer choice to ascertain how the user charges impact on patient behaviour in Ireland

4.1.2 Impact of Prescription Drug User Charges on Affordability and Accessibility

One of the major concerns associated with user charges on prescription drugs is the impact on patient affordability and accessibility.

Affordability suggests that patients with a higher income level pay a higher cost as a proportion of their income (Gemmill et al., 2008). As user charges transfer a proportion of the cost to the patient, there are concerns that user charges may cause patients to reduce their medication adherence, may create a financial burden for patients or may encourage individuals to engage in cost-coping strategies in order to afford and access prescription medication (Reed et al., 2008). User charges can be “regressive” with larger effects on patients who spend a larger proportion of their budget on prescription drugs, namely, the sick and the poor (Wagstaff et al., 1999). As patient user charges contribute towards pharmaceutical financing in EU countries, the impact of user charges needs to focus on all individuals and not just homogenous groups such as vulnerable patients[76] (Tele and Groot, 2009).

There are also concerns regarding user charges and their impact on accessibility to prescription drugs. As stated, one of the objectives of user charge policies is to reduce moral hazard. While research may find user charges encourage patients to reduce their consumption of prescription drugs, user charges do not have a discriminating effect between necessary and unnecessary prescription drugs (EXPH, 2014). User charges

[76] This thesis defines vulnerable populations as those covered by GMS, low-income individuals who have an income level below the national average’, patients with 3 or more chronic illnesses and those who report a self-reported health status as poor or very poor. This definition is similar to that used in a previous study by Lexchin and Grootendorst (2004).

not only discourage unnecessary consumption of discretionary prescription drugs[77] but user charges can also reduce consumption of essential prescription medication[78] (Robinson, 2002). If user charges are set at a price which does reduce the utilization of essential prescription drugs, then the user charge can lead to long-term financial impact on the healthcare system. Reducing the consumption of essential prescription drugs can have a long-term financial impact on the healthcare system as patients may become sicker without sufficient access to these drugs and consequently require more healthcare in the long-run (Kephart et al., 2007).

4.1.3 Research Question and Aim

This chapter aims to answer the following research question:

What Impact have Prescription Drug User Charges had on Patient Behaviour in Ireland?

This question led to two more specific objectives that include:

- Identify the effect that different forms of prescription drug user charges have on patient behaviour in Ireland.
- Using a multinomial logit model, measure the association between patient behaviour and individual characteristics.

[77] Prescription drugs that do not affect morbidity.
[78] Prescription drugs that do affect morbidity.

Through the construction of a novel questionnaire, this research collects primary data from patients in selected GP surgeries in Cork to investigate patient response to user charges for prescription drugs. Collecting primary data, the research investigates if prescription drug user charges cause patients to change their behaviour in order to afford and access prescription medication. The research assesses three types of behaviour in response to prescription drug user charges in Ireland; decreased adherence, financial burden and/or if the patient engaged in cost-coping strategies in order to afford and access prescription medication (without reducing adherence or creating a serious financial burden). The research will also control for patient characteristics such as age, GMS cover, DPS cover, patients without any prescription drug cover, prescription cost, gross monthly income level and the number of self-reported chronic illnesses.

4.1.4 Motivation

As Ireland spends 40% more than the OECD average on pharmaceuticals per capita, understanding patient response is crucial in order to identify whether or not user charge policies can be an effective method of contributing towards pharmaceutical costs in Ireland. If user charges for prescription drugs do not exist, patients have no incentive to be cost-conscious regarding this healthcare service and it is inevitable that pharmaceutical expenditure will continue to increase. This will negatively impact on the public provision of prescription drugs, thereby impacting on availability of prescription drugs for patients.

In Ireland very little research has examined the direct impact of prescription drug user charges on consumer choice from the patient perspective predominantly due to a lack of data. Some Irish studies have analysed prescription claims data to examine prescription drug utilization as a result of introduced/increased co-payments and deductibles (Sinnott et al., 2013, Usher et al., 2012, Walshe and Kenneally, 2013). However, these studies do not capture the direct impact user charges have on patient behaviour from the patients' perspective. This needs to be done before one can determine if user charges can be used to part-fund healthcare services such as prescription drugs. With this in mind, it is important to conduct this research in an Irish context from the patients' perspective to assess if user charge policies influence patient behaviour while providing affordable and accessible care to prescription drugs.

4.1.5 Chapter Structure

4.2 presents the previous literature that has been reviewed on the impact of prescription drug user charges. Section 4.3 presents the methodology that was employed to investigate patient response to prescription drug user charges in Ireland. Section 4.4 describes the econometric method that was utilized and Section 4.5 concludes this chapter.

4.2 Literature Review

4.2.1 Introduction

This chapter provides a critical review of existing literature on user charges for prescription drugs and their impact on patient behaviour. Similar to a literature review conducted by Lexchin and Grootendorst (2004), the following search words in EconLit guided this review: (drug OR pharma) AND (cost-sharing OR co-payment OR fee OR deductible OR coinsurance OR elasticity). A citation approach was adopted where citations were recorded and from there reference lists were scanned until such a time it was thought that all key paper/authors were retrieved. The criteria extracted from each study was as follows; data source, outcome measurement, price variation, study design and study results. Table 4.1 summarises the studies on which this review is based.

The studies included in this review come from the US, UK, Canada, Ireland, France, Spain and Italy (see Table 4.1). Due to diverse healthcare systems in these countries in terms of funding mechanisms and healthcare entitlements, user charge policies in these healthcare systems are also varied, resulting in different forms of cost-sharing such as co-payments, deductibles, co-insurance and benefit caps existing among the studies. Despite price variation, all studies aim to assess the impact of prescription drug user charges on patient behaviour such as medication adherence, financial burden or cost-coping strategies. Some studies also assess the impact of cost-sharing on health outcomes (Mojtabai and Olfson, 2003, Piette et al., 2004a, Rahimi et al., 2007). However, as the objective of this research focuses solely on patient behaviour in response to cost-sharing, health outcomes are beyond the scope of this research (see Section 6.4). The review will focus on three types of patient behaviour in response to user charges; medication adherence, financial burden and cost-coping strategies (Dor and Encinosa, 2010, Gilman and Kautter, 2008, Mojtabai and Olfson, 2003, Piette et al., 2004a, Piette et al., 2004b, Reed et al., 2008, Schafheutle et al., 2002).

Section 4.2.2 presents the impact of prescription drug user charges on medication adherence. Section 4.2.3 focuses on the financial burden of prescription drug user charges while Section 4.2.4 discusses cost-coping strategies adopted by patients in order to access and afford prescription drugs (without reducing adherence or creating a serious financial burden).

Table 4.1 Synopsis of Literature Examining User Charges and Prescription Drugs

Authors	Date	Study Population (Date Source)	Outcomes	Price Variation[79]	Design	Results
Atella *et al*	2005	Patients with dyspepsia or mild hypertension presenting at 51 physician offices in Italy and at 21 pharmacies in the UK during a set time period in 2000 (N = 519)	Self-reporting of cost-reducing strategies such as those initiated by the patient, those involving self-medication. Self-rated affordability measure.	UK – Fixed flat rate co-payment £6(€8.93) Italy – 3 reimbursement groups; Class A – Drugs for severe and chronic illness (fixed charge £5.90 (€8.68) Class B – Non-essential but useful (50% of the retail price) Class C – Other drugs (Fully paid for by patient)	Cross-sectional study; probit regression, ordered probit regression and poisson regression	Prevalence of cost-reducing strategies are higher in the UK where the co-payment is higher than Italy.
Carlson, DeVoe and Wright	2006	Adults (<19 Years) enrolled in the Oregon Health Plan (OHP) (N=2,783)	Coverage pattern, access to care, healthcare utilization, financial impact.	OHP premiums doubled for couples; Certain benefits eliminated and 6-month lockout for enrolees who miss a payment.	Prospective cohort study, bivariate and multivariate analyses to examine the effect of disrupted and lost insurance coverage on unmet needs, utilization and medical debt.	Lost or disrupted coverage resulted in unmet medication needs when compared to those continuously insured.
Kambia-Chopin and Perronnin	2013	Participants from the French Health, Health Care and Insurance Survey of 2013 (N=4985)	Drug consumption prior to 2008 and drug consumption after 2008.	Introduction of a €0.50 deductible levied on every prescription drug packet.	Cross-sectional study, logistic regression.	Deductibles on prescription drugs create a financial burden and accessibility concerns for low-income

[79] The prices included in this table have been converted into the Euro equivalent value corresponding to the year each study was conducted.

						individuals in poor health.
Dor and Encinosa	2010	Claims data from eight large firms. Largest database of insured individuals in the US, Market Scan. Adults <18 with type II diabetes (N=28,031)	"Non-compliers", "Partially Compliant", "Fully Complaint" individuals. Adherence - to refilling of prescriptions of preventive care drugs without interruption	Fixed co-payments or coinsurance	Cross-sectional, ordered logit regression	When coinsurance and co-payments have the same OOP payment ($9) (€6.86) , at least 34%of patients under co-payment refill meds compared to only 24% under co-insurance.
Gilman and Kautter	2008	Largest database of insured individuals in the US, Marketscan 2002 (N=352,760)	Number of co-payment tiers on total and enrollee drug payments, number of prescriptions filled and generic substitution.	Multi-tiered formularies applying fixed enrolee co-payment amounts to different types of prescription medications depending on payer preferences.	Cross-sectional variation in co-payment structures among firms, Multivariate regression	Medicare beneficiaries on three-tiered plans had 14.3% lower drug expenditure, 14.6% fewer prescriptions filled, 57.6% higher OOP costs than those on lower-tier plans.
Kephart *et al*	2007	Prescription drugs claims for beneficiaries <65 years in Canada between 1989 and 1992 (N = 2,407,758)	Monthly drug use (Vs non-use) and the mean quantity of medication used per month by medication users.	Prior to 1990 – Prescription drugs free of charge; 1990 - $3 (€2.03) co-pay per prescription (max. annual co-pay $150 (€101.62); 1991 – 20% coinsurance of the total cost (max. annual co-pay $150).	Logistic regression models	Co-payments $3 (€2.03) and 20% co-payments) decreased quantity of meds. used ranging from 5% to 15%. Only when the maximum was unlikely to be reached. 20% coinsurance rate increased the % who reached the maximum,

						decreasing proportion of patients who reduced drug use.
Mojtabi and Olfson	2003	Medicare Beneficiaries from the Health and Retirement Study (HRS), 2000 wave (N=10,413)	Office visits, preventative services, Drug cover and cost related poor medication adherence, health ratings, OOP spending and income	Decline in Medicare supplemental coverage. More than two million Medicare beneficiaries have no prescription drug cover.	Self-reported, cross-sectional study. Binary and ordinal logistic regression, Descriptive Statistics, Frequency weights, strata and primary sampling to adjust parameter estimates and their variances.	No or partial medication coverage results in poor medication adherence, poor health and higher rates of hospitalization.
Piette et al	2004	Detailed telephone interviews with patients and linkage to insurance information and haemoglobin test results (N=766).	Self-reported medication underuse as a result of cost, haemoglobin levels, symptom burden, Medical Outcomes Study 12-Item scores	No insurance – full cost (avg. $100 (€75.22)/month); Medicare – FFS; Medicaid - $1-$3 (0.75c-€2.26) per refill (max. 6 drugs/month); VA-100% covered, $7 (€5.27) co-pay for non-service illness/injury (<$840 (€631.86), costs waived); Privately insured $10-$30 (€7.52-€22.57) co-pay per script subject to annual cap.	Cross-sectional, bivariate correlations, follow-up pairwise tests, multivariate logistic regression, OLS regression	Fewer VA patients (9%) reported reduced medication use than those privately insured (18%), Medicare patients (25%), Medicaid (31%) and those with no insurance (40%).
Piette, Heisler and Wagner	2004	Survey of nationwide panel of adults in the US, (N=875)	Decreased medication adherence among older adults with diabetes, financial burden of medication costs, extents of discussion between patients and clinicians.	Insured Vs no form of insurance (See above price variation for Piette et al 2004)	Cross-sectional, Bivariate analysis, Pearsons chi square, multivariate logistic regression, post-stratification to adjust for distribution of respondents to match US population	19% decreased adherence due to cost, 28% gave up food and other essentials, 14% increased credit card debt, 10% borrowed from family/friend to pay for meds.

Puig-Junoy, Rodriguez-Feijoo, Lopes-Valcarel	2014	NHS data on dispensed prescription from Jan. 2003 – July 2013.	Number of prescriptions dispensed.	2012 - "Three-payment reform". National co-insurance rate of 10% with monthly, income-related ceiling, Cataluña/Madrid - €1 co-pay per prescription, delisting of some meds. for minor symptoms (100% coinsurance)	Time-series, Univariate ARIMA model,	First 14 months after the co-pay reform, total number of prescriptions decreased dramatically.
Rahimi et al	2007	Patients enrolled in US study, Prospective Registry Evaluating Myocardial Infarction: Event and Recovery (PREMIER) between January 2003 and June 2004 (N= 2498)	Health status symptoms (Seattle Angina Questionnaire – SAQ), overall health status (Short-Form 12), rehospitalisation.	Privately-insured, Medicare, Medicaid, Uninsured (Various co-pays)	Observational, self-reported financial burden.	12.9% reported financial burden, of these, 68.5% were insured. 1-year follow-up, more likely to have angina, lower SAQ score and increased hospitalization.
Reed et al	2008	Adults in a large prepaid, integrated delivery system (IDS) (N= 932).	Knowledge of cost sharing structures, knowledge of cost-sharing amounts, decreased adherence, financial burden and other cost-coping behaviours.	Members have either one co-pay for all covered drugs (one-tier), different co-pays for brand and generic drugs (two-tier), some had a pharmacy benefit cap; patients had to pay the cost of any drugs over this threshold.	Cross-sectional study using telephone interviews, descriptive statistics and frequencies, multivariate logistic regression.	27% knew their cost-sharing amount, additional tiers and caps and higher co-pays were associated with decreased adherence, financial burden and cost-coping methods.
Schafeulte et al	2002	Sufferers of dyspepsia, hay fever, hypertension or people taking hormone replacement treatment, recruited from 3 community pharmacies in North-West England. (N=31)	Medication costs and strategies to reduce medication costs.	£5.90 (€9.23) per prescription item (April 2001) Prepayment certificates (PPC) also available as a protection mechanism.	6 focus groups	Patient behaviour is influenced by medication cost, encouraged cost-reduction strategies,

Schafeulte	2008	Patients approached in 6 GP surgeries in Northwest England (N=61)	Views on prescription charge, principle of paying for medication, current level of the charge, level of exemption, ideas on potential changes.	£6.85 (€9.59) (April 2007)	Qualitative, semi-structured interviews	Cost creates a financial burden for paying for prescription drugs.
Sinnott et al	2013	All GMS patients attending a community pharmacy in Munster in Ireland, (N=23)	Knowledge on purpose of the levy, opinion on the levy, levy as a financial barrier, suggestions for policy	50c per prescription item subject to a monthly ceiling of €10 per family.	Qualitative, semi-structured interviews	Patients mostly accepting of the levy, concern about how the money would be used by the government, acknowledged moral hazard but questioned efficiency of the 50c levy. Felt it was affordable but may cause a financial impact for others.
Steinman et al	2001	Patients <70 years, Survey of Asset and Health Dynamics Among the Oldest Old (1995-1996) (N=4,935)	Medication restriction due to cost.	No prescription coverage, partial prescription coverage or full prescription coverage.	Cross-sectional, Bivariate and Multivariate analysis.	Medication restriction reported by 8% of those with no prescription coverage, 3% with partial coverage, 2% with full coverage.
Tseng et al	2004	Medicare+Choice beneficiaries <65 years with high medication costs (N= 665) (control N=643)	Proportion of beneficiaries reporting strategies to decrease medication costs, meds. affected, difficulty paying for prescription meds.	Annual beneficiary caps of $750 (€564.14) to $1504 (€1830.40). Co-pays ranging from $7-$30 (€5.27-€22.57) per prescription.	Multivariate analysis adjusting for demographic and health characteristics	Patients who exceed the cap reported using less prescription meds (18%), stopping prescription drug use (8%), not

						starting medications (6%), switched medications (15%), used samples (34%), difficulty affording prescriptions (62%).

Source: Authors Own

4.2.2 Medication Adherence

A number of studies have demonstrated a negative relationship between prescription drug user charges and medication adherence (Dor and Encinosa, 2010, Doran et al., 2005, Gilman and Kautter, 2008, Kephart et al., 2007, Mojtabai and Olfson, 2003, Piette et al., 2004a, Piette et al., 2004b, Puig-Junoy et al., 2014, Reed et al., 2008, Schafheutle et al., 2002, Steinman et al., 2001, Tseng et al., 2004). The following paragraphs review the literature which assesses decreased adherence as a result of prescription drug cost-sharing. Patients are said to engage in this type of behaviour, as a result of the cost, if they reduce their medication without the advice of their doctor, do not refill an existing prescription or if the patient does not fill a new prescription. This section initially presents studies which assess the impact of various levels of prescription drug coverage on patient behaviour in terms of decreased adherence (Gilman and Kautter, 2008, Mojtabai and Olfson, 2003, Piette et al., 2004a, Steinman et al., 2001) and then compares the impact of different forms of cost-sharing such as; co-payments, co-insurance and/or benefit caps and their impact on patient behaviour (Kephart et al., 2007, Reed et al., 2008, Dor and Encinosa, 2010, Puig-Junoy et al., 2014).

In the US, Steinman *et al* (2001) assessed medical adherence for patients over 70 years of age with different levels of insurance. The study included uninsured patients, patients with partial drug coverage and patients who had full prescription drug coverage. Consequently, the level of the user charge would be different for each group; uninsured patients had an average monthly OOP drug expenditure of $60 in comparison to partially insured patient who paid a monthly average of $25. In this cross-sectional study, 8% of uninsured patients reported taking less medication to avoid the cost in comparison to 3% of patients with partial drug coverage and 2% of patients with full prescription coverage. Using multivariate analysis, Steinman *et al* (2001) found medication restriction is common among vulnerable populations[80], while in contrast, seniors with partial or full prescription drug coverage were less likely to reduce medication adherence due to the cost.

Steinman *et al* (2001) acknowledge concerns regarding validity and bias issues that may be present in their study due to the self-reported nature of the data. To reduce these risks, the researchers ensured they developed a questionnaire that was a reliable measure of patients' response to cost-sharing. As the current research also collects self-reported data, all efforts are made to develop a well-constructed questionnaire in order to ensure reliable results.

The previous findings are also supported by Mojtabi and Olfson (2003) who assessed decreased adherence among 10,413 Medicare Beneficiaries with full, partial or no prescription coverage. Using a binary logistic regression, Mojtabi and Olfson (2003) found that 7% of 8,704 Medicare beneficiaries reported decreased adherence due to cost. Similar to Steinman (2001), the study also revealed higher OOP expenditure is associated with cost-related decreased adherence; over 20% of low-income beneficiaries in the study who spent over $1000 per month reported decreased adherence due to cost.

[80] Classified as ethnic minorities, poor, sick, frail and high OOP costs (Steinman et al., 2001).

Mojtabi and Olfson (2003) focus solely on the impact of cost-sharing on patient behaviour. The researchers do not assess the impact of cost-sharing on healthcare outcomes as adverse selection would cause problems in the results (Federman et al., 2001). As mentioned in Section 4.2.1, this research also only focuses on the impact of prescription drug user charges on patient behaviour and does not assess the impact of user charges on health outcomes as this is beyond the scope of this study. The objective of this study is to assess patient response to prescription drug user charges to determine whether user charges are a viable source of part-funding prescription drugs in Ireland.

Examining the effect of 5 different levels of co-payments, Piette *et al* (2004) also found patients with lower prescription drug cover were more likely to reduce medication adherence due to cost. Using self-reported data from telephone interviews, Piette *et al* (2004) included uninsured patients, privately insured patients, Medicare and Medicaid beneficiaries and patients under the Veterans Health Administration (VA). At the time, privately insured patients paid $10-30 per prescription, Medicare patients paid a fee-for-service, Medicaid patients paid $1-3 per refill subject to a maximum of 6 drugs per month while VA patients were 100% covered for prescription drugs.[81] Patients with the lowest level of cover for prescription drugs, uninsured patients, were most likely to report decreased adherence (40%), 31% of Medicaid beneficiaries reported reduced medication use, 25% of Medicare patients reported underuse, 18% of privately insured patients reported a reduction while only 9% of VA patients reported reduced medication use as a result of the cost. Similar to the previous studies, this study also

[81] A $7 co-payment for a 30 day supply was paid by VA patients for prescription medication treating a non-service injury/illness (Piette et al., 2004b).

states that patients with lower prescription drug coverage are more likely to engage in cost-related medication adherence.

Piette *et al* (2004) recommend the retrieval of further information on patients' medication regimen. This would allow the authors to assess if the patients' decreased adherence was only for high-cost drugs or whether patients equally reduced all of their medication. The current research does not identify the type of drug that the patient reduces as a result of cost. The research instead focuses on patients' overall response to prescription drugs user charges. This research does however collect data on the patients' medication regime by asking patients to report if they waited to fill an existing prescription, if they reduced their medication dose without the advice of the doctor or if they failed to fill a prescription for a new medication.

Finally, Gilman and Kauter (2008) also examined the impact of various co-payment levels on medication adherence. Extracting data from the largest database of insured individuals in the US, this study focused on multi-tiered formularies that were implemented to encourage the use of generic or preferred brand name medications, to control the use of non-essential drugs and limit financial exposure (Gilman and Kautter, 2008). Using a multivariate regression, the study found Medicare beneficiaries on three-tiered plans had 14.3% lower drug expenditure, 14.6% less prescriptions filled and 57.6% higher OOP payments than patients on one-tier plans. The study indicates that higher-tier drug plans are associated with a reduction on prescription drug expenditure and use by Medicare beneficiaries. The study found Medicare beneficiaries are less responsive to user charges for drugs treating chronic conditions implying that multi-tiered plans encourage efficient use of prescription drugs without creating an access barrier to essential medication (Gilman and Kautter, 2008). While this study makes these claims, the study does not identify whether the reduction in drug use under the three-tier plan is as a result of access barriers or efficiency improvements. If the reported decreased adherence is associated with less essential drugs that have no beneficial value, this signifies an improvement in efficiency. A reduction in all medications, including essential drugs indicates that the cost of prescription drugs decrease accessibility for patients.

These four studies conclude that lower prescription drug coverage amongst patients results in higher OOP expenditure and consequently leads to cost-related decreased adherence. In studies of this kind, decreased adherence needs to be correctly defined by assessing whether the patient reduced medication doses or failed to refill prescriptions. This definition is used in the current Irish study to correctly assess the impact of prescription drug user charges on patients' behaviour. When assessing the impact of user charges on patient behaviour, Gilman and Kauter (2008) highlight the importance of acknowledging all drug plans within a healthcare system. As pointed out in the previous paragraphs, different drug plans and benefits influence patient behaviour in different ways. In Ireland, depending on eligibility for community drug schemes, a patient pays a co-payment of €2.50 per item subject to a monthly maximum of €25 or a €144 monthly deductible. Some patients have no drug cover and must pay the total cost of the prescription drugs. Consequently, this Irish research includes patients covered by both community drug schemes and patients without this cover who must pay the total cost OOP.

The following four studies assess how different types of cost-sharing such as co-payments, deductibles, co-insurance and benefit caps impact on patient behaviour.

Kephart *et al* (2007) examined the impact of the introduction and subsequent increase in co-payments on the use (and non-use) of prescription drugs in Nova Scotia, Canada. Prior to 1990, prescription drugs in Nova Scotia were provided free of charge. In 1990 a $3 co-payment per prescription was introduced subject to an annual maximum amount of $150. This was subsequently changed to a 20% co-insurance rate in 1992. The maximum amount remained unchanged ($150). The study found both forms of cost-sharing reduced medication consumption between 5% and 15%. However, the reduction only occurred when the annual maximum amount was unlikely to be reached. The introduction of the co-insurance rate increased the number of patients who would reach the maximum amount. Therefore, this reduced the proportion of patients who decreased their medication use. This finding highlights the different impacts that co-payments cause. Ellis (1986) and Moffitt (1990) indicate that patients who expect to exceed their maximum amount, perceive the marginal OOP cost to be $0. Patients who do not expect to exceed their maximum amount view their marginal OOP cost as greater than $0. This indicates that patients respond differently to different forms of cost-sharing which influence their OOP expenditure. The study conducted by Kephart *et al* (2007) raises the questions regarding maximum amounts. If the maximum amount was also increased under the co-insurance regimen introduced in 1992, would the user charge have encouraged the desired effect of reducing overall expenditures while maintaining equitable access to prescription drugs?

Inconsistent with other studies, Kephart *et al* (2007) did not find user charges to have a stronger effect on decreased adherence for low-income patients. Kephart *et al* (2007) suggest the proxy variable they used for income may be a cause for this inconsistency (Finkelstein, 2004, Geronimus and Bound, 1998).

Using self-reported data from patients in a large prepaid integrated delivery system (IDS), Reed *et al* (2008) examined the effect of co-payments and a benefit cap on patient adherence to medication. Of the 932 participants, 9.2% of the sample reported not filling a new prescription, 8% stopped refilling an existing prescription while 5.6% reported reducing their medication dosage without the advice of their doctor. Patients over 65 years and patients who took fewer drugs were less likely to report decreased adherence. Using adjusted multivariate analysis, a strong association was found between the benefit cap and decreased adherence. Patients will not want to exceed the benefit cap as they will want to avoid OOP payments for the medication (Reed et al., 2008). At this point in the review, it would appear that benefit caps are associated with decreased adherence while co-payments such as deductibles or maximum amounts only decrease adherence when the maximum amount is unlikely to be reached.

This theory is further supported by Dor and Encinosa (2010). Using data from the largest database of insured individuals in the US, Dor and Encinosa (2010) assessed patient adherence to prescription drugs by examining prescription refills during a 19-month period (June 1st 1999 to December 31st 2000). Depending on their insurance regimen, some patients paid co-payments while others paid co-insurance for prescription drugs. The study found that when the OOP payment for both coinsurance and co-payment patients remained at a constant level ($9), decreased adherence was higher under coinsurance than under co-payment. Thirty-four per cent of those under co-payment refilled their prescription medication while only 24% under coinsurance refilled their medication. The higher rate of non-compliance under the coinsurance regimen than under the co-payment policy may be due to the uncertainty in OOP costs under coinsurance. Under a co-payment scheme, the OOP payment remains relatively constant for the patient while under the co-insurance scheme, the amount fluctuates due to changes in retail drug prices (Dor and Encinosa, 2010).

In the current Irish study, the co-payment theory as suggested by Dor and Encinosa (2010) is applicable under the GMS Scheme. GMS patients can be confident that they will only pay €2.50 per prescription item subject to a monthly maximum of €25. Under the DPS, patients face an element of uncertainty regarding their OOP payments unless they have reached the €144 deductible. Including patients covered by both community drug schemes and patients without community drug cover, the current Irish study assesses if patients' response to prescription drug user charges vary as a result of different types of user charges.

Following a "Three Payment Reform" in 2012, Puig-Junoy *et al* (2014) analysed prescription claims from NHS data between January and July 2013 to estimate the impact of the co-payment change on the number of prescriptions dispensed in the 17 regions in Spain. The first co-payment reform involved a national co-insurance rate of 10% with a monthly income-related maximum (€8, €18 or €60 maximum). Secondly, two regions; Cataluña and Madrid introduced a €1 co-payment per prescription (€61 annual maximum) and finally, the third national reform involved delisting of some prescriptions which treat minor symptoms (100% coinsurance) (Puig-Junoy et al., 2014). One region (Pais Vasco) did not introduce the national co-insurance reform until 1 year later. According to descriptive statistics, there was an anticipation effect (stockpiling) in all three regions prior to the reform. Following time-series analysis[82], there was a dramatic change in the number of prescriptions dispensed in July 2012 immediately following the introduction of the reforms. The highest impact was found in Cataluña where the co-payment and co-insurance rate were applied simultaneously. There was a 23.7% reduction in the number of prescriptions dispensed after 14 months. By contrast, Pais-Vasco did not apply the co-payment until July 2013 and only saw a 3.8% reduction in prescriptions dispensed in 2013. Examining the regional differences on co-payment policies it appears the first euro of cost-sharing largely impacts on medication use (Ellis, 2012, Puig-Junoy et al., 2014). The relatively low co-payment removes over-consumption associated with the free status. This co-payment was universal with an annual limit and was easy to manage (Puig-Junoy et al., 2014).

The decreased adherence reported by Puig-Junoy *et al* (2014) may be as a result of reduced overprescribing on the supply side or a result of stockpiling. If so, it signifies improvement in efficiencies in the health system. Conversely, the decreased adherence could also be a negative result as it may be due to some patients not being able to access prescription medications because of the cost.

Despite this limitation, similar to Kephart *et* al 2007, Reed *et al* 2008 and Dor and Encinosa 2010, Puig-Junoy *et al* (2014) also report that different forms of cost-sharing and their subsequent OOP costs cause different effects on patient behaviour.

The results of the studies included in the previous paragraphs highlight the different impacts that different forms of cost-sharing such as co-payments, co-insurance and

[82] The authors focus on three areas that represent three “models” of cost-sharing; Cataluña (Regional fee of €1 per prescription and national co-insurance rate); Castilla-Leon (national co-insurance only) and Pais Vasco (no cost-sharing reform until 1 year later) (Puig-Junoy, 2010).

benefit caps have on patient behaviour. All of these regimens reduce prescription drug utilization at varying levels with some having a larger impact than others. These effects are driven further in conjunction with benefit caps and monthly and/or annual maximums. With regard to maximum amounts, a patient who is unlikely to reach this amount decreases prescription drug use while a patient who is likely to reach the ceiling demands more prescription drugs. As mentioned, patients' perception of their marginal cost influences this behaviour. The result of Kephart *et al*'s study (2007), suggest that in conjunction with national co-payments, higher monthly/annual ceilings should be introduced under co-insurance regimens. While co-insurance regimens are associated with uncertainty and fluctuating prices, setting a monthly ceiling would put an upper limit on this uncertain cost. This cost-sharing combination would reduce inequity in user charge policies. It would reduce the inadvertent effects on the vulnerable population and patients requiring higher-cost medication. However, the "moral hazard" concern associated with annual maximum co-payments may reduce or even increase use of non-essential prescription drugs (Pauly, 2004) so this would need to be monitored. Following a recommendation from Kephart *et al* (2007), this current Irish study examines how co-payments with monthly ceilings and monthly deductibles impact on patient behaviour for prescription drugs in Ireland.

4.2.3 Financial Burden

A number of studies assess the financial impact that prescription drug user charges may have on patient behaviour (Carlson et al., 2006, Kambia-Chopin and Perronnin, 2013, Piette et al., 2004a, Rahimi et al., 2007, Reed et al., 2008, Schafheutle, 2008, Tseng et al., 2004). These studies conclude, that certain patients do find prescription drug user chargers to be a financial burden. This is in particular for patients with lower income levels. In this research, user charges are identified as a financial burden if patients report any of the following behaviours; borrowing money to pay for medication, going without a necessity to pay for medication and/or increasing credit card debt to afford medication (Reed et al., 2008, Tseng et al., 2004).

In the US in 2004, Medicare beneficiaries faced gaps in their prescription drug coverage if their total drug costs exceeded $2250. The benefit paid 75% of the drug costs and if the beneficiary's total drug costs exceeded $2250, the patient was left with no prescription drug coverage for the rest of the year (Tseng et al., 2004). Using a study[83] and control group[84], Tseng *et al* (2004) examined strategies adopted by beneficiaries due to prescription costs and the subsequent financial burden. The study group participants had an average OOP payment of $91 while the control group had an average of $72 in the month prior to exceeding the cap. Using a multivariate analysis adjusted for demographic and health characteristics, the study found that 62% of the Medicare+Choice beneficiaries who exceeded the maximum annual cap, report difficulty in affording their prescription medications. The cost of prescriptions impacted on both the study and control participants' ability to undertake regular leisure activities (46% vs 34%) or borrowing money to pay for prescription drugs (12% vs 10%), or both (Tseng et al., 2004). This study found prescription drug costs to act as a financial barrier for younger Medicare beneficiaries with lower incomes and poorer health.

[83] Patients who did exceed the maximum amount ($750 or $1200 per year) (see Table 4.1).
[84] Patients who did not exceed the maximum amount ($2000 cap) (see Table 4.1).

The difficulty in designing the most efficient user charge policy while protecting vulnerable populations from the financial burden of prescription drug costs is highlighted by Tseng *et al* (2004). If benefit caps are lowered, more individuals are protected, yet exceeding the cap would then increase the OOP payments which results in decreased adherence and increasing the financial burden. Even if generous caps are introduced, patients with chronic illnesses who are high users of prescription drugs will still have high OOP as they are at a higher risk of exceeding the benefit cap (Tseng et al., 2004).

As Medicare+Choice beneficiaries who exceeded their benefit cap were chosen as the population by Tseng *et al* (2004), sample selection may be an issue. It is also reasonable to assume that patients who do not exceed the cap may also find medication cost to be a financial strain. However, the sample is justified as Tseng *et al* (2004) note that patients with shorter gaps in drug cover will be less likely to reduce medication use as a result of cost while the effect on patients with longer gaps in coverage will be larger. To avoid this type of sample bias, the Irish study includes all patients subject to all types of prescription drug user charges in Ireland regardless of whether they exceed monthly ceilings or not. In order to assess their behaviour, the only eligibility criteria for the current Irish study is that patients must be over 18 years and must have purchased prescription drugs in the past 12 months.

Carlson *et al* (2006) also investigated the effect of lost prescription drug coverage due to the doubling of insurance premiums for patients enrolled in the Oregon Health Plan (OHP). Using a uniquely constructed survey, Carlson *et al* (2006) assessed the impact of increased premium on coverage patterns, access to healthcare, utilization and the financial impact. Of the patients who lost coverage, 67% reported that they experienced unmet medical need. The principal reason for unmet medical needs was cost; 74% of patients with lost or disrupted coverage reported cost as the reason in comparison to 52% of patients with stable coverage.

As with previous studies, the self-reported nature of this data is subject to recall bias. Carlson *et al* (2006) acknowledge this and have reduced the risk of recall bias by including a 6-month recall period rather than a 12-month period. Despite this, this Irish study has a 12-month recall period but will acknowledge the risk of recall bias in the interpretation of the results.

Non-response bias is also an issue for this study as the study excluded patients with no current address. Consequently, there is an under-reporting of patient behaviour for homeless or people in temporary housing (Carlson et al., 2006). In this current research, all patients attending the selected GP surgeries are eligible for inclusion. The GP surgeries are situated in various locations throughout Cork ensuring a representative sample that will capture patient demographic and socio-economic variation.

Also using self-reported data, Reed *et al* (2008) conclude that cost-sharing can create a financial barrier for patients accessing prescription medication. Reed *et al* (2008) assessed the concept of a financial burden by asking patients if the cost of prescription drugs caused them to change their behaviour in the any of the following ways; borrow money to pay for prescription drugs or forego a necessity in order to pay for medication

(Reed et al., 2008). Using a multivariate analysis, it was found that 9.4%[85] of patients who paid for prescription medication in the past 12 months reported borrowing money or going without a necessity in order to pay for their prescription drugs. Patients younger than 65 years and with a lower income level were more likely to report a financial barrier behaviour.

The study design of this research is unique in that the researchers compared patients' self-reported behaviour and actual drug cost-sharing. The importance of conducting this comparison is emphasised by the results. Patients have limited knowledge of their actual cost-sharing arrangement which indicates patients need to be made more aware and given possible alternative choices. This could be facilitated from the supply-side with healthcare providers advising their patients about making the correct choices should they financially struggle with the cost of their medications.

Adapting a qualitative approach in the UK, Schafeulte (2008) reports similar findings regarding financial burdens. In the UK at the time, patients paid £6.85 (€9.28) per prescription item (April 2007).[86] Patients with chronic conditions that required regular medication who currently pay for prescription medication were chosen as the data source for this study. Patients attending 6 GP surgeries in Northwest England were approached for inclusion in the study.[87] Using semi-structured interviews, patients provided their views on the prescription charge in the UK. In general, patients

[85] Overall sample size in the study wass 932 of which 848 patients paid for prescription drugs in last 12 months. .

[86] Patients under 16 years and over 65 years are exempt from these charges, patients on the income support and low income scheme and patients with specified chronic conditions such as diabetes are also exempt from this charge (Schafheutle, 2008).

[87] Final sample size was 61 patients with chronic conditions; asthma, coronary heart disease and hypertension.

recognised the necessity for the NHS to charge per prescription medication. They acknowledged the concept of moral hazard and how patients place different values on their drugs depending on whether they paid for them or not (Schafheutle, 2008). However, the patients in the study thought the cost was too high and would act as a disincentive for vulnerable patients. They suggested a much lower charge of £1-£2 would not have the same adverse effect. To reduce the potential financial burden to patients in the NHS, the study group suggested the construction of a "formulary" on which certain medicines would be exempt from the charge. They were of the opinion this would address the inequity that can exist as a result of the prescription charge.

While providing useful insight into patients' views on the prescription charge in the UK, the study is limited as it only includes patients with 1 of 3 chronic conditions and patients who had paid for prescription drugs. Patients with other illnesses and non-users of prescriptions drugs were not included to assess if their views differ from the patients included in this study. As the current research aims to assess the impact of user charges on patient behaviour, to answer the question effectively it is necessary that only patients who actually pay for prescription drugs are the patients included in the analysis.

The findings from the previous studies highlight that uninsured and low-income patients are more likely to report medication costs as a financial burden. Patients who exceed benefit caps or experience increases in cost sharing structures also report medication cost as a financial strain. While the user charges discussed in the previous paragraphs in the UK and in the US are relatively high, lower user charges do not seem to cause financial pressure as found by Chopin and Perronnin (2013) in France.

In France, following the introduction of a €0.50 deductible in 2008, Chopin and Perronnin (2013) assessed the financial impact of this user charge on patient behaviour. Only 12% of the sample[88] reported changing their behaviour as a result of the user charge. The study found that the higher the income level, the lower the impact of the deductible; 14% of patients with an income level below €1,167 per month reported a change in consumption behaviour while only 8% of patients with an income level equal to or over €1997 per month reported a change in consumption behaviour. Using a logistic regression, the significant income effect indicates the introduction of the €0.50 deductible does have a negative effect on access to prescription medication. While there is a significant relationship, the number of patients who self-reported the cost as a financial burden was low, the impact may not be as detrimental as in the UK or US where the OOP user charges are higher.

Similar to Carlson *et* al (2006) and Reed *et al* (2008), the dependent variable in this study is also self-reported providing a summary of the patients' behaviour. Chopin and Perronnin (2013) recommend that the type of drug which is reduced needs to be identified. In addition to patients' self-reporting data, a complementary study using prescription claims data should be conducted (Kambia-Chopin and Perronnin, 2013). This would capture the direct impact prescription drug user charges have on patient behaviour while controlling for actual prescription use. Reed *et al* (2008) conducted a study of this nature where patient behaviour and actual cost-sharing were compared. Despite this recommendation, Chopin and Perronnin (2013) recognise it may be difficult to find a sufficient control group as non-users of prescription drugs differ

[88] Total sample size is 4985.

significantly in terms of age, health and prescription drug cover (Kambia-Chopin and Perronnin, 2013).

The above studies are a combination of qualitative and quantitative studies revealing the financial burden that prescription drug user charges may cause for prescription drug users. While patients in the UK support the concept of user charges, they indicate that the OOP cost may be too high. These views are supported by patient behaviour in the US due to changes in cost-sharing structures which consequently increase the OOP cost for patients (Carlson et al., 2006, Reed et al., 2008, Tseng et al., 2004). These findings are further supported in France by Chopin and Perronnin (2013) who reveal lower OOP costs have a lesser financial impact than the relatively higher OOP payments in the UK and US.

All of the above studies report a strong association between income level and the financial burden of prescription drug user charges. As expected, patients with higher levels of cost-sharing (generic co-payments) or more complex cost-sharing structures such as benefit caps or multi-tiered co-payments, are more likely to report this type of behaviour (Reed et al., 2008). This signifies the importance of adopting user charge policies which protect vulnerable populations from the financial burden of prescription charges while simultaneously controlling pharmaceutical expenditure.

4.2.4 Cost-Coping Strategies

Previous research has identified cost-coping strategies that patients may adopt in order to afford and access prescription medication (without reducing adherence or creating a serious financial burden) (Atella et al., 2005, Reed et al., 2008, Schafheutle et al., 2002, Tseng et al., 2004). If a patient reports changing their behaviour in one or more of the following ways, they are said to adopt cost-coping strategies; substituting prescription medication for over-the-counter (OTC) remedies, substituting brand name to generic drugs, borrowing medication from others, requesting free samples from a doctor, purchasing prescription drugs from an on-line pharmacy and/or splitting tablets on the advice of the doctor (Reed et al., 2008).

Tseng *et al* (2004) examined cost-coping strategies adopted by Medicare+Choice beneficiaries when they exceeded their annual benefit cap. Study participants were more likely than control participants to adopt at least one strategy that reduced medication use and consequently medication cost (24% vs 16% respectively). Study participants were more likely to switch medications (15% vs 9%), “shop around” in pharmacies for lower prices (46% vs 29%) and/or obtain free drug samples (34% vs 27%) in order to decrease their medication costs. Cost-coping strategies were associated with independent risk factors such as younger age, low income and a higher number of health problems (Tseng et al., 2004). This research controls for cost-coping behaviours such as switching to cheaper generic drugs and requesting free drug samples as a result of the various types of prescription drug user charges that exits in Ireland.

Tseng *et al* (2004), emphasise the importance of including a control group when assessing patient behaviour. While their study group participants report adopting at least one cost-coping strategy, control group participants also report adopting at least one cost-coping strategy, albeit at a lower rate (16%). This shows that patients with lower prescription drug costs who consequently do not exceed their benefit caps are also likely to adopt cost-coping measures. In Section 4.2.3, Chopin and Perronnin (2013) acknowledge the difficulty in sourcing a control group with similar demographic and socio-economic characteristics to the study group. Despite this difficulty, Tseng *et* al (2004) succeeded in sourcing a comparable control group. However, it appears the importance of a control group depends on the objective of the study. For example, the study and control group used by Tseng *et* al (2004) included patients who exceeded their benefit cap and those who did not exceed the cap. Chopin and Perronnin (2013) were focused solely on users of prescription drugs and the impact of a €0.50 deductible had on patient behaviour. Therefore, including only patients who were subject to the deductible would correctly answer the question. Including a control group of non-users of prescription drugs would not contribute to the study as non-users will have zero drug costs and subsequently will not express a behavioural change as a result of cost-sharing. As the objective of this research is to identify the impact that prescription drug user charges have on patient behaviour, the research does not include non-users of prescription drugs and only focuses on patients who have paid for prescription drugs in the last 12 months.

Using a specifically constructed questionnaire, Atella *et al* (2005) assessed the impact of medication costs on patient behaviour in Italy and the UK. At the time of the study, the price variation for prescription drugs in the two countries were as follows; in the UK there was a fixed flat rate co-payment of £6 (€9.80) per prescription item while in Italy there were 3 reimbursement groups. Class A provided drugs for severe and chronic illnesses at a fixed co-payment charge of €1.70, Class B provided non-essential but useful drugs for 50% of the retail price while Class C provided all other drugs which were fully paid for by the patient. In this study, cost-reducing strategies were grouped into (i) patient-initiated and (ii) self-medication along with OTC products (Atella et al., 2005).

Following econometric analysis, the study found strong tendencies in both countries for patients to adopt cost-coping strategies. With regard to patient-initiated strategies, the influence of patient affordability is much stronger in the UK than in Italy. As suggested by Atella *et al* (2005), the reason for this discrepancy may be due to the difference in the level of prescription charges in the UK and Italy. As mentioned, the user charge for prescription drugs in the UK is much higher at £6 per prescription item than it is in Italy (€1.70[89]). Similar deductions can be made for the self-medication strategies. In Italy, because prescription drugs have a relatively low charge, €1.70, the most common patient strategy is to purchase prescription drugs because OTC drugs are more expensive. On the contrary, in the UK, patients consider OTC drugs first as they are cheaper than the relatively higher prescription charge (£6 per prescription item).

The results of this study indicate the various cost-reducing measures adopted by patients and reveal patients to be cost-conscious regarding the employment of different strategies. Atella *et al* (2005) acknowledge the different strategies adopted by patients depend on the options available with the healthcare systems and their reimbursement methods. The study concludes that self-medication strategies involving the switch to OTC medications may be an affordable option in countries like the UK where the prescription charge is relatively high (Atella et al., 2005).

[89] Class A drugs are the most commonly prescribed drugs and patients pay a €1.70 fixed co-payment.

In Ireland, self-medication strategies may differ between GMS and DPS patients due to the co-payment and deductible user charge policies they respectively face. As stated in Section 4.1.1, GMS patients pay €2.50 per prescription item while DPS patients must pay up to €144 in each calendar month before the State will cover any of their drug cost in that calendar month. In the case of self-medication, OTC substitution for GMS patients is likely be more expensive than the €2.50 co-payment they pay per prescription item. Conversely, OTC substitution for DPS patients may be a cheaper option depending on the patient's drug consumption that month. As stated by Kephart *et al* (2007) the closer the patient is to reaching the maximum amount, the less likely they are to reduce medication use. If the patient is likely to reach the €144 in a calendar month, the patient is likely to purchase a prescription drug instead of an OTC medication in order to reach the maximum, after which, drugs are covered by the HSE.

The final study assessing cost-reducing strategies was conducted by Reed *et al* (2008) in the US. They asked patients to report if they had engaged in at least one of eight different types of cost-reducing behaviours (listed in the introductory paragraph to this section). Using multivariate logistic analysis, 19.1% of patients[90] who paid for prescription drugs in the last two months reported that the cost of their medication caused them to do at least one of the eight cost-coping behaviours. The generic co-payment and the brand/generic co-payment difference were found to be significantly associated with the cost-coping behaviours.

[90] Overall sample size in the study wass 932 of which 848 patients paid for prescription drugs in last 12 months. .

Again, this finding highlights that different OOP payments resulting from user charge policies influence patient behaviour in different ways. The results of this study may be underestimated due to the data source of the participants. Adults in a large prepaid integrated delivery system (IDS) form the sample for this research. In this system, there are high levels of care coordination and low levels of brand-name drug use (Reed et al., 2008). Consequently, the cost-sharing in this system may be less complex than other available plans such as benefit caps, deductibles and multi-tiered plans. If the level of cost-sharing was higher, patients may engage in other cost-coping behaviours than observed in this study.

The data source for the current Irish study will not be restricted to a particular group as done by Reed *et al* (2008). Patients with different cost-sharing structures in Ireland are included in the study. This will allow for the assessment of cost-coping strategies for all user charge policies in Ireland.

The studies included in this section imply that patients adopt cost-coping strategies in an attempt to access and afford prescription drugs. Patients undertake these strategies without reducing adherence or creating a serious financial burden (Atella et al., 2005, Reed et al., 2008, Schafheutle et al., 2002, Tseng et al., 2004). It is apparent that the various cost-coping behaviours adopted by prescription drug users are influenced by the alternatives that are available in healthcare systems (Atella et al., 2005).

4.2.5 Conclusion

The articles reviewed in Sections 4.2.2 to 4.2.4 reveal different user charge policies through the use of co-payments, coinsurance, deductibles and/or benefit caps result in patients engaging in decreased adherence to medication, financial burden or cost-coping strategies. The findings of these studies were relatively consistent with respect to the study design used; cross-sectional with regression-based analysis, qualitative studies using semi-structured interviews or time-series analysis (Atella et al., 2005, Dor and Encinosa, 2010, Gilman and Kautter, 2008, Kambia-Chopin and Perronnin, 2013, Puig-Junoy et al., 2014, Schafheutle et al., 2002). While the types of cost-sharing and the data sources varied, the review reveals a strong relationship between user charges and patient behaviour. Overall, the study findings are consistent with the prediction of economic theory that the larger the proportion of income spent of prescription medication, the higher the degree of patient response.

As noted from the sections in this review, the data sources for these studies are either secondary sources from claims databases (Dor and Encinosa, 2010, Gilman and Kautter, 2008, Kephart et al., 2007, Mojtabai and Olfson, 2003, Puig-Junoy et al., 2014) or self-reported primary data which come directly from the patient (Piette et al., 2004a, Piette et al., 2004b, Reed et al., 2008, Schafheutle et al., 2002, Steinman et al., 2001, Tseng et al., 2004). The reliability of secondary data to examine the impact of prescription drug user charges on patient behaviour is questionable. While claims databases provide reliable statistics on the number of prescriptions dispensed, this source does not effectively measure patients' response to the user charge. To measure decreased adherence as a result of cost-sharing, patients subject to the user charge need to be asked if they have reduced medication as a result of the cost. It is acknowledged that this methodology may not be followed in studies utilizing claims data as the studies may be focused solely on the number of prescription items used. While a reduction in the number of prescription items that are dispensed might indicate patient response, it is less clear than with self-reported information which can assess if the reduction is as a result of the cost. As this paper focuses on the impact of prescription drug user charges on patient behaviour, self-reported primary data will be collected directly from patients' subject to some form of cost-sharing in the previous 12 months. The existence of user charge policies is dependent on the over consumption or under consumption of prescription drugs. If over consumption is the cause for intervention, cost-sharing could be used as a strategy to curb this over consumption. This will only be successful if healthcare professionals provide patients with sufficient information regarding the risks and benefits of medication. It is important to note that patient behaviour does not signify whether patients can successfully differentiate between over consumption, under consumption or appropriate consumption (Gibson et al., 2005). This behaviour needs to be monitored to maintain patient accessibility to prescription drugs.

The most obvious finding from this review is that user charges shift a proportion of the cost to the patient. As cost-sharing structures become more complex, concerns regarding affordability and accessibility emerge. Empirical research indicates that patients' response to cost-sharing is not identical depending on the nature of the user charge. Patients respond differently to the various forms of user charges such as; fixed co-payments, co-insurance, deductibles and/or benefit caps (Dor and Encinosa, 2010, Hurley and Johnson, 1991). Therefore, this research assesses the impact of prescription drug user charges on patient behaviour by including patients subject to all types of user charge strategies in Ireland; GMS patients subject to a fixed co-payment per item, DPS patients subject to a monthly deductible and patients who have no form of community drug cover and must pay the full cost for prescription drugs.

Section 4.3 presents the methodology that was employed to investigate patient response to prescription drug user charges in Ireland.

4.3 Methodology

4.3.1 Introduction

This section presents the methodology used to answer the research question;

What impact have prescription drug user charges had on patient behaviour in Ireland?

A cross-sectional questionnaire was designed to collect primary data from patients attending selected GP surgeries in Cork to assess the impact that prescription drug user charges have on patient behaviour in Ireland. Section 4.3.2 describes the location of the data collection. Section 4.3.3 describes the data source. Section 4.3.4 explains data collection procedure. Section 4.3.5 describes the questionnaire construction.[91]. Finally, Section 4.3.6 will present the descriptive statistics on the population sample.

4.3.2 Location of Data Collection

As the principle aim of this chapter is to identify the impact of prescription drug user charges on patient behaviour in Ireland, patients subject to these user charges are the main focus of this sample. Patients attending six selected GP surgeries in Cork formed the data source (see Table 4.2).

[91] The questionnaire instrument constructed for this chapter is modelled on a questionnaire used by Reed *et al* (2008) in the US to assess patients' response to prescription drug cost-sharing.

Initially the questionnaires were to be distributed in pharmacies throughout Cork as patients waited for their prescriptions to be dispensed. However, the length of the questionnaire would be an issue as the patient may decide to leave the pharmacy while their prescription is prepared. GP waiting rooms were identified as an appropriate location as patients have no choice but to wait for their consultation, therefore, having more time to complete the questionnaire.[92] GPs in Ireland treat all patients regardless of health cover therefore patient subject to all forms of prescription drug user charges; GMS patients, DPS patients, LTI patients and patients without any form of community drug cover would be included in the sample. As the research aims to identify the impact of prescription drug user charges on patients with all types of cover and consequently various types of user charges, the suitability of GP surgeries is further emphasised as the data collection location. In addition, previous research has found this healthcare location to be conducive to the generation of a high response rate using self-completion questionnaires (Bell and Szafran, 1992).

4.3.3 Data Source

Access to the GP clinics was an on-going process (Marshall and Rossman, 2010, Robson, 2011). Initial contact was made with a practising doctor in Ballincollig, Co. Cork, Dr. Eamonn O'Grady.[93] Liaising with Dr. O'Grady, a list of ten GP surgeries in Cork was generated as possible locations for data collection. The ten surgeries are located in the HSE regions. There are currently 2,500 GPs in Ireland (HSE, 2013c)

[92] The questionnaire also collected data for the next chapter in this thesis, "What are Irish patients willing to pay for health services in Ireland?" This added to the length of the questionnaire and it was important respondents would have sufficient time to complete the entire questionnaire.
[93] Dr. Eamonn O'Grady became the supporting GP for the data collection process.

and 394 practising in Cork (PCRS, 2013).[94] Ten GP surgeries were chosen due to time and financial constraints. Consequently, a convenient, non-probability sample forms the sample for this research. While the fast and inexpensive nature of this method of sampling is an advantage there is the inherent bias that a convenience sample may not be representative of the study population (Gravetter and Forzano, 2012). This research attempts to reduce this bias by including at least one GP surgery from each of the four Local Health Offices (LHO) in the Cork HSE region; North Cork, West Cork, Cork South Lee and Cork North Lee (see Table 4.2). Table 4.2 shows three surgeries included in the sample are found in the Cork South Lee region while there is only one GP representation of Cork South Lee. However, Cork South Lee is the largest LHO in Cork with 156 GPs (PCRS, 2013), therefore, it was important for the sample to sufficiently represent this area. Representation bias was further reduced as GPs in Ireland treat all patients. Consequently, including patient from all four LHO regions in Cork controls for varying patient demographics and socio-economic characteristics.

The contact process involved a phone call to each surgery to introduce the researcher and the research and request the questionnaire to be distributed in that surgery. Following a request for the surgery's email address and with permission from the administration staff, a follow-up email was sent to each surgery with a cover letter from the supporting GP (see Appendix B.1) and a copy of the questionnaire (see Appendix B.2). Of the ten surgeries contacted, six of the surgeries agreed to the distribution of the questionnaire to patients in their waiting rooms (see Table 4.2).[95]

[94] This figure is a combination of the number of GPs in Cork South Lee (156 GPs), Cork North-Lee (130), North Cork (62) and West Cork (46) (PCRS, 2013).
[95] The overall excuse for refusal was concerns regarding patient confidentiality and fears that patients may feel uncomfortable disclosing information required in the questionnaire such as; income level.

Following best practice, this approach was adopted as recommended by Saunder, Lewis and Thornhill (2009).

The Social Research Ethical Committee (SREC) in University College Cork approved the research protocol and questionnaire (see Appendix B.3).

Table 4.2 General Practitioner List

Surgery Number	Contact Doctor	Surgery Name	Address	Local Health Office
1	Dr. Gerard O'Shaughnessy	Skibbereen Medical Centre	Market Street, Skibbereen, Cork.	West Cork
2	Dr. Denis Twomey	Classes Lake Medical Centre	Classes Lake, Ballincollig, Cork.	Cork South Lee
3	Dr. Tom English	Broad lane Family Practice	72 Great William O'Brien Street	Cork North Lee
4	Dr. Eamonn O'Grady	The Clinic*	Old Quarter Ballincollig, Cork	Cork South Lee
5	Dr Eamonn O'Grady	Barnagore*	Ovens, Co. Cork	Cork South Lee
6	Dr. Brendan Payne	High Street Medical Centre	High Street, Newmarket, Co. Cork	North Cork

***The data collected from The Clinic and Barnagore practices were merged together by the administration staff as the same contact doctor was located in both.**
Source: Authors Own

4.3.4 Data Collection Procedure

Questionnaire distribution began in December 2014 and finished at the end of January 2015. Due to the convenient nature of the sample and based on previous literature, 300 patients were sampled. Questionnaires were randomly distributed by the administration staff to patients over 18 years of age as they entered each of the six surgeries. Administration staff were given a brief to deliver to the potential respondents (see Appendix B.4). In this brief, potential respondents were informed that this questionnaire was part of a research project in University College Cork and they were assured anonymity. The respondents were advised to complete the questionnaire as they waited for their consultation with the doctor. The patient was then invited to return the completed questionnaire to a clearly labelled box provided at reception. On average, questionnaires were distributed by the administration staff in each surgery for four weeks during this two-month period. These two months were chosen for data collection as December and January are two of the busiest months in a GP practice (according to expert opinion). These busy periods would allow for a larger sample size within this short timeframe.

It is important to note that face-to-face interviews were another consideration for data collection but this method was not conducive to generating a large sample size and proved to be more time-consuming in the pilot study.

Due to the nature of the data collection method, the study acknowledges the risk of sample selection bias and recall bias. However, due to the research question, it was necessary to use the specially constructed questionnaire to collect the data directly from patients who may be subject to prescription drug user charges. While all attempts have been made during the construction of the questionnaire and its distribution to reduce sample selection and recall bias, the research acknowledges this risk in the interpretation of the research results.

4.3.5 Questionnaire Construction

This section describes the construction of the questionnaire that was designed to collect the primary data for this research.

Comparable to previous research, self-reported data is collected from patients subject to prescription drug user charges (Atella et al., 2005, Costa-Font et al., 2007, Doran et al., 2005, Kambia-Chopin and Perronnin, 2013, Mojtabai and Olfson, 2003, Piette et al., 2004a, Piette et al., 2004b, Rahimi et al., 2007, Schafheutle, 2008, Schafheutle et al., 2002, Sinnott et al., 2013, Steinman et al., 2001, Tseng et al., 2004). While all of these studies collect self-reported data, the data collection method varies between self-completion questionnaires, interviews and focus groups. As this research follows the methodology outlined by Reed *et al* (2008), a self-completion questionnaire is implemented to collect the primary data for the current Irish research (see Appendix B.2). [96]

When deciding on the data collection instrument, it was important to acknowledge the sample source in order to ensure a reliable sample and ensure minimum disruption to the services in the GP waiting room. Interviews with patients were not deemed appropriate due to the enclosed nature of GP waiting rooms. Patient confidentiality would be at risk in this situation. Therefore, a self-completion questionnaire was most appropriate to answer the research question accurately. This methodology allowed for efficient data collection from a large group of respondents.

[96] As mentioned in section 4.3.1, this questionnaire was also used to collect the dataset for the next chapter in this thesis. Pages 1-3 in Appendix B.2 are the relevant pages for the questionnaire used to collect the dataset for this chapter.

As the same information was required from all patients in the six surgeries, a standardized self-completion questionnaire was suitable. The self-completion questionnaire also ensured anonymity for the patient as possible reactive effects of direct contact between the researcher and respondent were eliminated (Sim and Wright, 2000). However, this eliminated the possibility to explore questions in depth or seek clarification from the respondent (Sim and Wright, 2000). Due to the factual nature of the answers required this concern was overcome due to a well-constructed standardized questionnaire including pre-determined responses generated from the literature review, with a particular focus on Reed *et al* (2008), and discussions with the supporting GP. Further clarification from the respondent was not necessary. Another disadvantage associated with this methodology is that there is no guarantee the respondent will answer the questionnaire as anticipated by the researcher i.e. at the correct time or in the correct order (Sim and Wright, 2000). This was controlled using clearly labelled instructions and questions throughout the questionnaire.

To achieve reliable results, the questionnaire was easy-to-follow and used clear direction and instructions. This was accomplished using factual questions for the majority of the questionnaire. The reliability of the questionnaire was tested by conducting a pilot study (1st and 2nd July 2014). The pilot study was conducted in two surgeries; The Clinic and Classes Lake Medical Centre where 10 surveys were distributed and collected in each surgery.

Assessing the validity of the questionnaire proved to be more difficult as validity is usually established after the event (Oppenheim, 1992). Cross-checking may have been a possibility using patients' corresponding prescription drug claims or pharmacy dispensing data. The Primary Care Reimbursement Scheme (PCRS) collects prescription drug claims for the community drug schemes in Ireland. However, the aim of the current Irish study is to collect primary data from the patients' perspective and utilising a secondary source such as the PCRS would not capture this objective. Therefore, the pilot study tested the reliability and validity of the survey instrument.

To maintain costs, each questionnaire was printed in black and white and printed back-to-back. This resulted in three pages in total. It was acknowledged that shorter questionnaires with concise completion time encourage a higher response and this was taken into consideration in the questionnaire design process (Dillman, 2000). This was important as the patient was completing the questionnaire in the GP waiting room and it was the researcher's aim that patients would complete and submit the questionnaire before their consultation. This reduced the risk of incomplete and/or mislaid questionnaires.

Each questionnaire included an introduction to inform potential respondents of the questionnaire's aims and why this area of research was chosen. In addition, they were informed why they were chosen as a suitable candidate. Once they agreed to take part, they were asked to indicate this on the attached consent form.

The questionnaire required information regarding community drug cover, PHI cover and patients' income level. Due to the confidential nature of this information, it was assured that this information would not be disclosed to anyone. To ensure anonymity, the respondents' name was not required on the questionnaire. Respondents are more willing to provide information if they know the questionnaire is anonymous (Babbie, 2009). The potential respondent was advised that participation was voluntary and they could leave the questionnaire at any stage.

Due to the nature of the data collection instrument, a debriefing process was not necessary. However, if the respondent had questions regarding the questionnaire (before/after completion) they could consult a list of FAQs, which were available at the reception of the surgery (see Appendix B.5).

In the questionnaire itself, there are three sections in total. The questionnaire adopted a funnel approach i.e. it began with broad demographic questions such as the respondent's age and gender, socio-economic variables such as education, nationality and healthcare cover. The questions then narrowed down to measure the variable categories assessing patient behaviour in response to prescription drug user charges.

The next paragraphs discuss the three sections included in the questionnaire to identify and justify the nature of the variables included in each section.

Section 1 of the questionnaire explored patient demographics, community drug cover, PHI cover, health status and number of chronic illnesses. This section included nominal, continuous and categorical variables.

Section 2 of the questionnaire measures the dependent variable which assesses patients' behavioural response to prescription drug user charges. Following Reed *et al* (2008), the research categorises the different types of behavioural response. The dependent variable measures decreased adherence by asking patients to indicate if they have engaged in any of the following behaviours;

- Taking less of a prescription drug (skipping or decreasing dose) to make it last longer without the advice of their doctor.
- Not filling a prescription for a new medication.
- Not filling a prescription for existing medication.

The dependent variable also measures three types of financial burden behaviours by asking patients if the cost of their prescription drugs caused them to engage in any of the following behaviours;

- Borrowing money from friends or family to pay for medication.
- Spending less on food/heat or other basic needs to pay for medication.
- Increasing credit card debt to pay for medication.

Finally, the dependent variables assessed strategies patients may use to obtain their prescriptions in response to the user charge (without necessarily reducing adherence or creating a serious financial burden). Participants were asked to report any of the following other cost-coping behaviours;

- Using cheaper OTC drugs before purchasing prescription drugs.
- Switching to cheaper drugs such as generic drugs.
- Requesting free medication samples from the GP.

- Purchasing drugs from an on-line pharmacy.[97]

Section 3 measured the gross monthly income level of the respondent. To minimise non-response for this variable, respondents were presented with an interval scale including six ranges.

The majority of the questions that appeared in the questionnaire are closed-ended. This research is of a quantitative nature, therefore, valid and reliable results were required. Closed-ended questions were chosen as they are less time-consuming and concise given the time constraints placed on the patients (Oppenheim, 1992). Consequently, closed-ended questions are associated with a high response rate (Dillman, 2000). This permitted easier interpretation and coding of the data. The codebook can be found in Appendix B.6.

4.3.6 Descriptive Statistics

Initially, 220 questionnaires were collected out of 300 questionnaires Seven questionnaires were excluded from the analysis as they were incomplete questionnaires. This resulted in a total of 213 respondents with a response rate of 71%. The collected data was analysed using STATA 14. The following sections present patient demographics, socio-economic characteristics and prescription drug cost sharing and patient response to prescription drug user charges.

[97] The following section provides descriptive statistics for all of the behavioural responses listed above and provides a breakdown of the patient behaviour by community drug cover. However, it is important to note the dependent variable is recoded for econometric analysis to create a categorical variable with 4 mutually exclusive categories. This is discussed further in Section 4.4.2.

4.3.6.1 Patient Demographics

Table 4.3 shows the sample is predominantly female (68%) and Irish (95%).[98] The average age of respondents is 46 years.[99] Half of this sample (50%) report a health status between good, fair and poor health. As the patients in the sample are waiting to see their GP, it is presumed they are sick. This will influence their self-reported health status. Corresponding to the self-reported health status statistics, just over half of the sample report having at least one chronic illness (52%). This is an important measure of demographics as it will test whether the findings of the current Irish research support that of previous research which suggest vulnerable patients are adversely affected by prescription drug user charges.

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[98] The gender composition of this sample is slightly different from the national statistic where there is a broadly equal prevalence of males and females (CSO. 2014b).. The location of the data collection for this research may be the cause for the over-representation of females in this sample as females are higher users of GP services (Nolan and Smith, 2012). The nationality of this sample is representative of the national average where the majority of the population is Irish (87%) (CSO. 2014c).

[99] This is slightly higher than the national median age in Ireland (36.1 years) (CSO. 2014a)..

Table 4.3 Patient Demographics

	Surveyed Patients N = 213	%
Gender		
Male	66	(30.99)
Female	145	(68.08)
Missing	2	(0.94)
Total	**213**	**(100)**
Age		
Mean	45.77	
Range	19-84	
Nationality		
Irish	203	(95.31)
UK	6	(2.82)
Other	3	(1.41)
Missing	1	(0.47)
Total	**213**	**(100)**
Marital Status		
Single	54	(25.35)
Married	138	(64.79)
Separated	3	(1.41)
Divorced	8	(3.76)
Widowed	10	(4.69)
Total	**213**	**(100)**
Health Status		
Excellent	27	(12.68)
Very good	79	(37.09)
Good	76	(35.68)
Fair	24	(11.27)
Poor	7	(3.29)
Total	**213**	**(100)**
Number of Chronic Illnesses		
No chronic illness	102	(47.89)
1 chronic illness	62	(29.11)
2 chronic illnesses	31	(14.55)
3 or more chronic illnesses	18	(8.45)
Total	**213**	**(100)**
Reason for Visit		
Minor illness	83	(38.97)
Repeat prescription	22	(10.33)
Routine check-up	27	(12.68)
Chronic illness follow-up	10	(4.69)
Doctors certificate	3	(1.41)
Accompanying child	27	(12.68)
Maternity check-up	8	(3.76)
Other	13	(6.10)
More than 1 reason	18	(8.45)
Missing	2	(0.94)
Total	**213**	**(100)**

4.3.6.2 Socio-Economic Characteristics

In Table 4.4, at least 51% of the sample have an individual gross monthly income level below the national average[100] while 59% of sample report a third level education and nearly two-thirds of the sample have PHI (64%).

The following descriptive statistics will describe the prescription drug cover that exists within this sample. It is important to distinguish between the various drug schemes in the sample as each scheme imposes a different type of user charge for patients. Under the GMS scheme, as described in Section 4.1.1, the patient must pay a flat co-payment of €2.50 on each prescription item subject to a monthly ceiling of €25 per family per calendar month. Under the DPS, a family or individual pays a monthly deductible of €144 per calendar month. After they reach this ceiling, the cost of prescription drugs is covered by the HSE. Under the LTI, there is no form of cost-sharing for the patient for prescription drugs that treat the long-term illness. However, the patient may face an OOP cost should they be prescribed a prescription drug that is not related to their LTI. Finally, patients may have no form of community cover and must pay the full cost of their medication. To examine the impact of user charges, it is important to acknowledge the type of user charge the patient must pay (Hurley and Johnson, 1991).

In Table 4.4, 35% of the sample possess a medical card. An identical proportion hold a DPS card (35%) while 14% of the sample have an LTI book. [101] In the sample, 33%

[100] Average gross monthly income level in Ireland is €3,023 (CSO. 2015).
[101] With regard to GMS and DPS, these figures are representative of the national average where 40% of the population have a GMS card and 31% have a DPS card. The LTI coverage in the sample population is much higher than the national average where almost 2% of the population have an LTI card.

have no form of community drug cover. The mixture of prescription drug cover in this sample will accurately identify patient response to the different types of prescription drug user charges that exist in Ireland; fixed co-payments, deductibles and full OOP costs.

Table 4.4 Socio-Economic Characteristics

	Surveyed Patients N = 213	%
Education		
Primary	13	(6.10)
Secondary	71	(33.33)
Third level	125	(58.69)
Other	3	(1.41)
Missing	1	(0.47)
Total	**213**	**(100)**
Income (monthly)		
<€1,000	46	(21.60)
€1,000 - €2,249	62	(29.11)
€2,250 - € 3,499	34	(15.96)
€3,500 - €4,749	22	(10.33)
€4,750 - €5,999	11	(5.16)
€6,000+	15	(7.04)
Other[102]	9	(4.23)
Missing	14	(6.57)
Total	**213**	**(100)**
Private health insurance		
Yes	137	(64.32)
No	76	(35.68)
Total	**213**	**(100)**
Community Drug Cover		
GMS	74	(34.74)
DPS	74	(34.74)
LTI	30	(14.08)
No community cover	71	(33.33)
Total	**249**[103]	

[102] When reporting gross monthly income (Question 19), patients were given the opportunity to tick an “other” category if their monthly income level was not listed. Patients who chose this category were asked to state what their monthly income was. The responses from the 9 respondents included; student income, semi-retired, old age pension and unemployed.

[103] As seen in Table 4.4, the total figures (249) under community drug cover are higher than the sample size (213). This is due to patients in the sample having more than one form of community drug cover. A patient with an LTI book may apply for a DPS and/or a medical card should they be eligible. In this case, it most commonly occurs when a prescription drug unrelated to the long-term illness is prescribed to the patient. This drug will not be covered under the LTI scheme therefore the patient will need to pay the full cost of the medication. People should not have both GMS and DPS cover in Ireland but there are some exceptions. Due to the rare circumstances where patients have more than one form of cover, this is not accounted for in the analysis in this section but it is noted.

4.3.6.3 Prescription Drug Cost Sharing and Patient Response

Of the 213 patients included in this sample, 160 patients (75%) paid for prescription drugs in the past 12 months. As the aim of the research question is to assess the impact prescription drug user charges have on patient behaviour in Ireland, the descriptive statistics for the following sections will only include patients who have paid for prescription drugs in the past 12 months.[104] Consequently, the sample size is now 160 (as shown in Table 4.5). Within the sample, 36 medical card patients, 66 DPS patients and 24 LTI patients paid for prescription drugs in the past 12 months while 58 patients without community drug cover paid for prescription drugs in the last 12 months. The following statistics provide a general overview of patient response to prescription drug user charges which include patient response to co-payments, deductibles and full OOP user charges.

As described in Section 4.3.4 and shown in Table 4.5, patients were asked about three decreased adherence behaviours which assess if the patient did not take all of their medication as a result of the cost. Of the patients who reported paying for prescription drugs in the past 12 months, 12% reported taking less of a prescription drug (skipping or decreasing dose) to make it last longer without advice from the doctor, 6% reported not filling a prescription for new medication while 8% reported not filling a prescription for an existing medication.

[104] This is except for Table 4.6 which presents patients' prescription drug user charges. It was necessary to include the entire dataset in this table in order to present the particular descriptive statistics accurately.

Patients were also asked if the amount they paid for prescription drugs caused a financial burden. Of the 160 patients who paid for prescription drugs in the last 12 months, 13% reported borrowing money from friends or family to pay for medication. 14% spent less on food/heat or other basic needs to pay for their prescription while 7% increased credit card debt to pay for their prescription drugs.

Patients were also asked to report if they engaged in any cost-coping behaviours (behaviours that didn't necessarily involve reducing their adherence or creating a serious financial burden). Of the 160 patients who paid for prescription drugs in the last 12 months, 18% reported using cheaper OTC drugs before purchasing prescription drugs while 31% reported switching to cheaper generic drugs. Only 1% reported requesting free medication samples from their GP and only 1 patient reported purchasing drugs from an online pharmacy.

Table 4.5 Self-Reported Behavioural Responses to Cost-Sharing

	Surveyed Patients n = 160	%
DECREASED ADHERENCE:		
Took less than prescribed		
Yes	20	(12.50)
No	135	(84.38)
Missing	5	(3.13)
Total	**160**	**(100)**
Stopped refilling a prescription		
Yes	12	(7.50)
No	140	(87.50)
Missing	8	(5.00)
Total	**160**	**(100)**
Did not fill a new prescription		
Yes	10	(6.25)
No	142	(88.75)
Missing	8	(5.00)
Total	**160**	**(100)**
FINANCIAL BURDEN:		
Spend less on other necessities		
Yes	22	(13.75)
No	131	(81.88)
Missing	7	(4.38)
Total	**160**	**(100)**
Borrow € to pay for meds		
Yes	21	(13.13)
No	134	(83.75)
Missing	5	(3.13)
Total	**160**	**(100)**
Increase credit card debt to pay for meds		
Yes	11	(6.88)
No	143	(89.38)
Missing	6	(3.75)
Total	**160**	**(100)**
COST-COPING BEHAVIOURS		
Switched to generic brand		
Yes	50	(31.25)
No	106	(66.25)
Missing	4	(2.50)
Total	**160**	**(100)**
Used OTC medication first		
Yes	28	(17.50)
No	126	(78.75)
Missing	6	(3.75)
Total	**160**	**(100)**
Requested free GP samples		
Yes	2	(1.25)
No	151	(94.38)
Missing	7	(4.38)
Total	**160**	**(100)**
Purchase meds from online pharmacy		
Yes	1	(0.63)
No	152	(95.00)
Missing	7	(4.38)

Total	**160**	**(100)**

The next section will initially present patient user charges and patient response to prescription drug user charges by community drug cover (GMS, DPS and LTI) and without community drug cover. This structure is followed as it allows for a precise assessment of patients' response to the various levels of prescription drug user charges that exist in Ireland; co-payments, deductibles, and full OOP costs on patients' behaviour for prescription drugs. Previous literature also highlights the importance of acknowledging the type of cost-share when examining its impact (Hurley and Johnson, 1991).

4.3.6.3.1 General Medical Services (GMS) Scheme

As mentioned, GMS patients pay a flat co-payment of €2.50 per prescription item subject to a monthly ceiling of €25 per family. Before reaching the monthly maximum, a GMS patient can be certain that every prescription item they purchase will cost them €2.50. In this sample, the average monthly cost paid for prescription drugs under the GMS scheme was €3.76 (see Table 4.6). This indicates that GMS patients in this sample pay for between one to two prescription items per month on average.[105] As GMS cards are granted primarily on an income basis and previous research has shown prescription drug user charges to be regressive (Adams et al., 2001, Contoyannis et al., 2005, Gibson et al., 2005b, Lexchin and Grootendorst, 2004, Smith and Kirking, 1992)

[105] The latest figures (2013) from the PCRS report 3.09 items as the average number of items per GMS form. While this research reports a lower number of items, the increase in the co-payment from €1.50 in 2012 to €2.50 in 2015 may be reason for the reduction in the number of GMS items (PCRS 2013).

it was important to analyse GMS patients' response to prescription drug co-payments in Ireland.

With regard to decreased adherence, as shown in Table 4.7, 28% of medical card patients who paid for prescription drugs in the past 12 months reported decreasing their prescription dose without the advice of their GP, 8% reported not filling a new prescription while 11% reported not filling an old prescription. GMS patients also reported prescription costs causing a financial burden. Of the sample, 22% reported borrowing money to pay for prescription medications, 28% reported spending less on other basic necessities while 11% reported increasing credit card debt to pay for their prescription drugs. GMS patients also reported engaging in two cost coping behaviours as a result of their prescription drug costs; 19% reported substituting their prescription drugs with cheaper OTC drugs while 28% reported switching to cheaper generic versions.

Table 4.6 Prescription Drug User Charges

	Surveyed Patients N = 213	%
Prescription payment in last 12 months		
Yes	160	(75.12)
No	51	(23.94)
Missing	2	(0.94)
Total	**213**	**(100)**
GMS Payment		
Mean	€3.76	
Range	€2.50 - €70[106]	
DPS Payment		
Mean	€52.45	
Range	€0 - €244[107]	
LTI Payment		
Mean	€49.97	
Range	€2.50 - €244	
No community drug cover		
Mean	€24.45	
Range	0-€250	

4.3.6.3.2 Drugs Payment Scheme (DPS)

As mentioned in Section 4.1.1, DPS patients pay for their prescription drugs until they reach the €144 monthly maximum. Any excess drug costs after this are covered by the State for the remainder of that calendar month. Unlike GMS patients, DPS patients are uncertain about their OOP payment for their prescription drugs until they reach the €144 monthly maximum. In this research, the average monthly cost paid under the DPS scheme was €52.45 (see Table 4.6). This cost is notably less than the €144 deductible. According to research, when patients are unlikely to reach their maximum ceiling they reduce their use of prescription drugs (Kephart et al., 2007). This €144 deductible under the DPS may be incentivising DPS patients to reduce their

[106] There were six patients who had a medical card and paid more than the €25 threshold. Perhaps these patients only received the medical card in the last 12 months and had to pay OOP costs for prescription drugs before this. Also, these patients may have DPS and/or LTI cover in addition to GMS cover.

[107] There was one patient who reported prescription drug costs in excess of the €144 deductible under the DPS. These patients may have only applied for their DPS card within the last 12 months and faced OOP costs before this.

prescription use as patients will pay the cost of their prescription drugs until they reach €144 per month.

With regard to decreased adherence, of the DPS patients who paid for prescription drugs in the last 12 months, 5% reported taking less of a prescription drug to avoid cost, 5% reported not filling a new prescription while 6% reported not filling an old prescription due to the cost. Regarding financial burden behaviour, Table 4.7 also shows that 8% of DPS patients reported borrowing money to pay for prescription drugs, 8% reported spending less on other necessities to pay for prescription drugs while 3% reported increasing their credit card debt to pay for their prescription medication. DPS patients also report cost-coping behaviours; 12% report purchasing cheaper OTC medication before purchasing prescription drugs, 35% reported switching to the cheaper generic version while 3% reported requesting free medication.

4.3.6.3.3 Long-term Illness (LTI)

While LTI patients receive illness related prescriptions free of charge, they may also be prescribed medications that are not associated with their long-term illness and therefore must pay OOP for these medications.[108] The average monthly OOP cost under the LTI scheme was €49.97 (see Table 4.6). It is assumed that these OOP costs are for medication unrelated to the patient's long-term illness given that these are the medication they have to pay for.

[108] As stated in footnote 103, an LTI patient can also apply for a DPS or GMS card should they be eligible.

As shown in Table 4.7, of the LTI patients in the sample, 21% report decreasing their prescription dose without the advice of their doctor, 8% report not filling a new prescription with the same percentage reporting avoiding the refill of an old prescription due to cost. LTI patients also find prescription drug user charges to cause a financial burden with 13% reporting borrowing money to pay for prescription medication, 17% of LTI patients spend less on other necessities while 13% report increasing their credit card debt to pay for prescription drugs. Finally, LTI patients also engage in cost-coping behaviours; 13% report purchasing cheaper OTC drugs before they purchase prescription drugs, while 25% report switching to a cheaper generic version.

4.3.6.3.4 No community cover

In Ireland there are patients who do not qualify for a medical card, an LTI book and by choice or perhaps lack of knowledge, may not apply for a DPS card. Consequently, they are left without any form of community drug cover. In this sample, patients without any form of community drug cover paid a monthly cost of €24.45. In comparison to DPS and LTI patients (who have to pay for unrelated prescription drugs), the average cost paid by patients with no community cover is markedly lower. This indicates that patients in this sample with no community drug cover use less prescription drugs than DPS and LTI patients. This indicates that these patients may be in better health than the other categories. As they use less drugs, it is reasonable to assume these patients may not consider or may not be aware of the benefit of having some form of community drug cover.

With regard to decreased adherence (see Table 4.7), 12% of patients with no form of community drug cover who paid for prescription drugs in the past 12 months reported taking less of their prescribed medication to reduce their prescription costs. 8% reported not filling a new or old prescription. Patients with no community drug cover reported that OOP costs created a financial burden for them as 15% reported spending less on other necessities while 17% reported increasing their credit card debt to pay for prescription drugs. . These patients also reported increasing their credit card debt to pay for prescription drugs (8%). Patients with no community drug cover reported substituting their prescription medications for OTC medication while similar to DPS patients, 32% reported switching to generic versions of their prescription medication. Only one patient with no community cover reported purchasing drugs from an online pharmacy.

Table 4.7 Patients Response to User Charges by Community Drug Scheme Breakdown

	GMS n = 36	DPS n = 66	LTI n = 24	No community cover n = 60
DECREASED ADHERENCE:				
Took less than prescribed				
Yes	10 (27.78%)	3 (4.55%)	5 (20.83%)	7 (11.67%)
No	26 (72.22%)	59 (89.39%)	17 (70.83%)	52 (86.67%)
Missing	0	4 (6.06%)	2 (8.33%)	1 (1.67%)
Total	**36 (100)**	**66 (100)**	**24 (100)**	**60 (100)**
Stopped refilling a prescription				
Yes	4 (11.11%)	4 (6.06%)	2 (8.33%)	5 (8.33%)
No	30 (83.33%)	58 (87.88%)	17 (70.83%)	54 (90.00%)
Missing	2 (5.56%)	4 (6.06%)	5 (20.83%)	1 (1.67%)
Total	**36 (100)**	**66 (100)**	**24 (100)**	**60 (100)**
Did not fill a new prescription				
Yes	3 (8.33%)	3 (4.55%)	2 (8.33%)	5 (8.33%)
No	31 (86.11%)	58 (87.88%)	17 (70.83%)	55 (91.67%)
Missing	2 (5.56%)	5 (7.58%)	5 (20.83%)	0
Total	**36 (100)**	**66 (100)**	**24 (100)**	**60 (100)**
FINANCIAL BURDEN:				
Spend less on other necessities				
Yes	10 (27.78%)	5 (7.58%)	4 (16.67%)	9 (15.00%)
No	25 (69.44%)	58 (87.88%)	16 (66.67%)	49 (81.67%)
Missing	1 (2.78%)	3 (4.55%)	4 (16.67%)	2 (3.33%)
Total	**36 (100)**	**66 (100)**	**24 (100)**	**60 (100)**
Borrow € to pay for meds				
Yes	8 (22.22%)	5 (7.58%)	3 (12.50%)	10 (16.67%)
No	28 (77.78%)	58 (87.88%)	18 (75.00%)	49 (81.67%)
Missing	0	3 (4.55%)	3 (12.50%)	1 (1.67%)
Total	**36 (100)**	**66 (100)**	**24 (100)**	**60 (100)**
Increase credit card debt to pay for meds				
Yes	4 (11.11%)	2 (3.03%)	3 (12.50%)	5 (8.33%)
No	31 (86.11%)	61 (92.42%)	18 (75.00%)	53 (88.33%)
Missing	1 (2.78%)	3 (4.55%)	3 (12.50%)	2 (3.33%)
Total	**36 (100)**	**66 (100)**	**24 (100)**	**60 (100)**
COST-COPING BEHAVIOURS				
Switched to generic brand				
Yes	10 (27.78%)	23 (34.85%)	6 (25.00%)	19 (31.67%)
No	25 (69.44%)	40 (60.61%)	15 (62.50%)	41 (68.33%)
Missing	1 (2.78%)	3 (4.55%)	3 (12.50%)	0
Total	**36 (100)**	**66 (100)**	**24 (100)**	**60 (100)**
Used OTC medication first				
Yes	7 (19.44%)	8 (12.12%)	3 (12.50%)	14 (23.33%)
No	28 (77.78%)	54 (81.82%)	19 (79.17%)	45 (75.00%)
Missing	1 (2.78%)	4 (6.06%)	2 (8.33%)	1 (1.67)
Total	**36 (100)**	**66 (100)**	**24 (100)**	**60 (100)**
Requested free GP samples				
Yes	0	2 (3.03%)	0	0
No	35 (97.22%)	59 (89.39%)	22 (91.67%)	59 (98.33%)
Missing	1 (2.78%)	5 (7.58%)	2 (8.33%)	1 (1.67%)
Total	**36 (100)**	**66 (100)**	**24 (100)**	**60 (100)**
Purchase meds from online pharmacy				
Yes	0	0	0	1 (1.67%)
No	35 (97.22%)	61 (92.42%)	22 (91.67%)	58 (96.67%)

Missing	1 (2.78%)	5 (7.58%)	2 (8.33%)	1 (1.67%)
Total	**36 (100)**	**66 (100)**	**24 (100)**	**60 (100)**

4.3.7 Conclusion

The descriptive statistics presented in Table 4.7 reveal patient behaviours in an Irish context given prescription drug user charge policies. With regard to decreased adherence, Table 4.7 shows that GMS patients are the highest reporters of decreased adherence to prescription drugs due to cost. This finding is supported by previous literature that user charges have a higher impact on patients with lower incomes[109] who spend a larger proportion of their income on prescription drugs (Carlson et al., 2006, Reed et al., 2008, Tseng et al., 2004). It is also noted that in comparison to DPS and LTI patients, GMS patients and patients without any form of community drug cover are more likely to report user charges as a financial burden. For GMS patients, this can be related to income while patients with no community drug cover face potentially high OOP costs as they are not protected by a monthly maximum ceiling.

As expected, due to uncertainty regarding OOP costs, DPS patients are the highest reporters of cost-coping behaviours, with 35% of DPS patients, in comparison to 28% of GMS patients, reporting switching to generic versions of their prescription drugs in order to cope with the cost. This is important given the recent introduction of generic substitution in Ireland. It is now mandatory for pharmacists to dispense the generic version of a prescribed drug to all GMS patients. It is not surprising that a higher percentage of DPS patients compared to GMS patients report this type of behaviour. Switching to a cheaper generic version reduces the OOP payment for DPS patients.

[109] As mentioned in Section 4.1.1, a GMS card is granted primarily on an income basis.

This type of cost-coping behaviour as reported by DPS patients' needs to be examined further. When examining user charges, previous literature finds the closer a patient is to reaching the maximum amount they are required to pay, the less likely they are to engage in cost-coping strategies (Kephart et al., 2007). If a DPS patient is likely to reach the €144 deductible in a calendar month, the patient is less likely to switch to a generic or cheaper OTC version of the prescription drug. In this situation, the DPS patient has more of an incentive to reach the deductible after which, drugs are covered by the HSE.

Unexpectedly, GMS patients report higher levels of switching to OTC versions of their prescription drugs than DPS patients (19% Vs. 12%). This is unexpected as OTC medications are more likely to be more expensive than the €2.50 co-payment paid by GMS patients for prescription drugs. Atella et al (2005) acknowledge the different strategies adopted by patients depend on the options available with the healthcare systems and their reimbursement methods. Switching to OTC medications may be an affordable option in countries where the prescription charge is relatively high in comparison to the OTC medications (Atella et al., 2005). However, this is not the case for GMS patients in Ireland where OTC drugs are generally more expensive than €2.50.

In conclusion, the descriptive statistics in this section indicate that GMS patients, LTI patients and patients with no community drug cover are the highest reporters of decreased adherence as a results of the cost of their prescription drugs. These patient also report prescription drug costs as a financial burden. With regard to cost-coping strategies, GMS patient are more likely to report switching to OTC medications while

DPS patients are the highest reporters of switching to cheaper generic versions of prescription drugs. These descriptive statistics reveal that GMS patients and patients with lower income levels report a higher level of response to prescription drug user charges. Consequently, the statistics indicate that patients' response to prescription drug user charges in Ireland vary with socio-economic status. Section 4 in this chapter tests the significance of these findings

4.4 Results

4.4.1 Introduction

This section presents the econometric methodologies that were employed to assess the impact of prescription drug user charges on patient behaviour in Ireland. Section 4.4.2 discusses the rationale as to why this econometric model was chosen. Section 4.4.3 presents the econometric model and focuses on model specification and model tests. The results are presented in Section 4.4.4 and Section 4.4.5 discusses the research findings.

4.4.2 Econometric Rationale

The impact of prescription drug user charges on patient behaviour is tested using data collected from patients as they waited in GP waiting rooms in selected surgeries in Cork. The nature of the data for the dependent variable determined the econometric methodologies. As identified in Section 4.3.5, the dependent variable assesses patient response to prescription drug user charges in terms of decreased adherence, financial burden and cost-coping behaviours. The dependent variable was recoded into 4 categories measuring the number of responses that were reported by patients. This re-grouping was necessary due to a small number of observations in certain community drug schemes under the behavioural response categories (see Table 4.7). Due to the small sample size in a number of the behavioural response categories, it would not be appropriate to conduct econometric analysis focussing on a count of all nine responses.

Therefore, the 4 categories in the recoded dependent variable measure; no behavioural response to cost-sharing, one behavioural response to cost-sharing, two types of behavioural response and all three types of behavioural response (see Table 4.8). In other words, a patient who did not report any of the three types of behavioural responses; decreased adherence, financial burden or cost-coping strategies, was put into the first category “no behavioural response”. A patient who reported at least one of the three types of responses was put into the second category “one behavioural response”. A patient who reported at least two of the three types of responses was put into the third category “two types of behavioural responses”. Finally, a patient who reported all three types of behavioural response was put into the fourth and final category “all three types of behavioural response”. The categories of this dependent variable are now mutually exclusive.

This type of dependent variable was chosen in order to estimate the actual level of patient response to prescription drug cost-sharing. In Section 4.3.6.3, the study presents descriptive statistics on patient response to prescription drug user charges by community care cover to identify what type of patients engage in behavioural change as a result of their prescription drug costs. The dependent variable was recoded into the four categories in order to identify what factors significantly affect the level of patient response. Due to the categorical nature of the dependent variable and its mutually exclusive categories, a multinomial logit model (MNLM) is appropriate (Jones, 2007).

As the dependent variable measures the number of behavioural responses it may be argued that this is an ordinal variable and an ordered logit model may be the best approach. However, this paragraph justifies why an ordered logit model is not appropriate for this study. The original coding of this variable does not enable it to be identified as an ordinal one. For example, a patient who reports only one type of decreased adherence behaviour[110] and no other type of behavioural response (financial burden or cost-coping) will be coded as 1; one behavioural response, while a patient who reports all three types of decreased adherence behaviours[111] (and no other type of response) will also be coded as having only one type of behavioural response. The new dependent variable does not capture the difference in the number of patient responses within each category. Therefore, the dependent variable is nominal, coded as 0 or 1 for the presence or absence of any type of behaviour in each category (decreased adherence, financial burden and cost-coping strategies). As the variable does not account for the number of patient responses within each category, to identify the dependent variable as ordinal would be inaccurate.

Table 4.8 Dependent Variable

Number of behavioural responses	**n = 158[112]**	**Percent**
No behavioural response	85	53.80
One type of behavioural response	41	25.95
Two types of behavioural response	19	12.03
All three types of behavioural response	13	8.23
Total	**158**	**(100)**

[110] Stopped refilling an old prescription, did not fill a new prescription, or took less than prescribed.
[111] Stopped refilling an old prescription, did not fill a new prescription AND took less then prescribed.
[112] Sample size for the dependent variable is 158 as two missing observations for the dependent variable were dropped from the sample.

4.4.3 Econometric Model and Specification

Under a number of assumptions, the MNLM is shown as follows (Greene, 2002):

$$\Pr(y_j = j) = \frac{\exp(X_i\beta_j)}{1 + \sum_{j=1}^{J} exp(X_i\beta_j)} \qquad (4.1)$$

Where y_i is the observed outcome for the i_{th} individual and X_i is a vector of the independent variables. The unknown parameters β_j are estimated by using an extension of the maximum likelihood; maximum a posteriori (MAP) estimation.

To identify the coefficients of the MNLM, one of the outcome categories of the dependent variable is nominated as a base category and set to zero (Greene, 2002):

$$\Pr(y_i = 0) = \frac{1}{1 + \sum_{j=1}^{J} exp(X_i\beta_j)} \qquad (4.2)$$

The log-odds for the other categories is then calculated relative to the base category (Jones, 2007). By default, Stata drops the category with the most observations (Jones, 2007). In the current research the first category (*y=0 no behavioural response*) forms the base category as this category has the most observations (n=85). The log-odds for the last three categories is calculated relative to this base category. The qualitative interpretation of the coefficients depends on the sign of the coefficient (Jones, 2007).

The MNLM does not assume normality, linearity or homoscedasticity (Long and Freese, 2001). However, the model does have some assumptions such as non-perfect separation, independence of irrelevant alternatives (IIA) and an appropriate sample size; a minimum of 10 observations per independent variable is necessary (Schwab, 2002).

If the non-perfect separation assumption is not satisfied, the groups of the outcome variable are perfectly separated by the independent variables. This results in unrealistic coefficients (Starkweather and Kay, 2011). The assumption needs to be treated carefully in the MNLM as the model gives no warning that this assumption is violated (Long and Freese, 2001). An assessment of the variable coefficients reveals the violation of this assumption. Coefficients that have $z=0$ (and $p > z = 1$) should be excluded as these variables imply perfect prediction (Long and Freese, 2001). In this research, assessing the coefficients in earlier versions of the model reveal a number of coefficients do have $z=0$ (and $p > z = 1$) (see Appendix B.7). This implies perfect prediction which results in inaccurate coefficients. As recommended by Long and Freese (2001), the problem variables in this research were excluded from the model and the model was re-estimated in order to satisfy the assumption of non-perfect separation.

The second assumption associated with the MNLM is the independence of irrelevant alternatives (IIA). This assumption states choice or membership in one category is not related to the choice or membership in another category (i.e. the dependent variable) (Starkweather and Kay, 2011).

This assumption is described in terms of (Long and Freese, 2001):

$$\frac{\Pr(y=m\ |x)}{\Pr(y=n\ |x)} = exp\ (x\ [\beta_{m|b} - \beta_{n|b}]) \qquad (4.3)$$

where the odds are not dependent on other outcomes that are available. Thus, the alternative outcomes are "irrelevant" (Long and Freese, 2001). This means that increasing or decreasing the outcomes does not affect the odds among the remaining outcomes (Long and Freese, 2001). The nature of the dependent variable in this research cannot violate the assumption of IIA. A patient who reports engaging in one type of behaviour for example are classified in one category and each category is mutually exclusive. There are four categories; no behavioural response, one type of behavioural response, two types of behavioural response and all three types of behavioural response. Each individual is assigned into one behavioural category. Therefore, the odds of membership in one category are not dependent on the other outcome categories. The relative probabilities of the categories will not change if the number of categories are increased or reduced. The patient does not have the opportunity to select an alternative category as the categories in the dependent variable are not alternative choices (Kennedy 2003). An observation is assigned to an outcome category based on the number of responses to prescription drug user charges.

After controlling for perfect prediction by removing the variables with z=0 (and p > z = 1) and acknowledging the IIA, the independent variables included in the model are a combination of binary variables (GMS, DPS, no community cover and 3+ chronic illnesses), categorical variables (age and income) and a continuous variable (monthly drug cost). The data contains 158 cases and 10 independent variables which satisfies the cases to variables assumption.

The nature of the independent variables generated concern that there may be an interaction effect between some of the independent variables. For example, in Ireland, medical card eligibility is primarily determined by income level. Consequently, it was suspected there may be an interaction effect between patient income and GMS status. In this study, a chi square test of independence was used to test the relationships between a gross monthly income level of <€1,000, €1,000-€2,249 and €2,250-€3,499 and GMS status. A significant relationship was found between a gross monthly income level <€1,000 and €2,250-€3,449 and GMS cover (see Appendix B.9). Two interaction variables were created (*inc1medc* and *inc3medc)* and included in the model to test for significance. Due to the small sample size, the interaction variables were assessed separately. The model would not converge when the two variables were included in the MNLM simultaneously. The interaction variable measuring GMS and an income level <€1,000 was not found to be significant (see Appendix B.10). As the interaction variable was only included to check its significance and no hypotheses was made about the variable, the insignificant finding meant the variable was excluded from the final model as it did not add anything to the model overall (Kleinbaum and Klein, 2002). When the second interaction variable was assessed, the model would not converge and consequently, this interaction variable was not included in the MNLM either.

4.4.4 Results

Table 4.9 presents the results of the MNLM. The first category which measures no behavioural response is the base category. The other three categories; one type of behavioural response (decreased adherence, financial burden or cost-coping strategy), two types of behavioural response (decreased adherence, financial burden or cost-coping strategy), and all three types of behavioural responses (decreased adherence, financial burden and cost-coping strategy), are assessed relative to the base category. As the estimates are relative to the base group, the interpretation of the MNLM is that for a one-unit change in the independent variable, the logit of an outcome relative to the base group is expected to change by its parameter estimate (which is log-odds units) given the other variables in the model are held constant. The interpretation of the MNLM examines the significance and sign of the parameters under each type of behavioural response.

Table 4.9 presents the MNLM coefficients for the last three categories of the dependent variable (one behavioural response, two behavioural responses and all three behavioural responses) relative to the base category (no behavioural response). Table 4.9 shows significant variables occur when examining the last category (all three types of behavioural responses) relative to the base category (no behavioural response). No significant variables are found when assessing one type of behavioural response and two types of behavioural response relative to the base category.

Table 4.9 shows GMS patients are more likely to engage in all three types of behavioural response compared to non-GMS patients. Patients without any form of community drug cover are more likely to engage in all three types of behavioural response when compared to the base category. As expected, patients with higher prescription drug costs are more likely to engage in all three types of behavioural response to prescription drugs compared to patient with lower prescription drug costs. Finally, patients with a gross monthly income level below the national average

(€1,000-€2,249) are more likely to engage in all three types of patient behaviour relative to patients with a higher income level (€4,750-€5,999).

The results of the MNLM suggest that GMS patients, patient without community drug cover, higher prescription drug costs and an income level below the national average are more likely to decrease their adherence to prescription drugs without the advice of their GP. Furthermore, these patients are more likely to report their prescription drug costs as a financial burden and consequently borrow money or reduce spending on other necessities in order to afford their prescription drug costs. Finally, these patients are more likely to engage in cost-coping strategies to reduce the cost of their medication by switching to OTC or generic drugs, request free medication samples from their GP or purchase prescription drugs on-line.

Table 4.9 Multinomial Logit Results

Base Category: No behavioural response **Comparison groups:** One behavioural response, two types of behavioural response and all three types of behavioural responses			
Variable	**One behavioural response**	**Two types of behavioural response**	**Three types of behavioural response**
19-29 years	*base category (age)*		
30-44 years	-0.13 (0.51)	1.07 (0.77)	0.96 (0.93)
45-59 years	0.18 (0.54)	0.15 (0.98)	0.41 (1.23)
GMS	0.30 (1.34)	0.38 (1.93)	5.44*** (1.97)
DPS	0.59 (1.27)	-0.71 (1.83)	3.01 (1.85)
No prescription drug cover	0.77 (1.31)	-0.20 (1.88)	4.95** (2.06)
Monthly prescription drug costs	0.01 (0.01)	0.00 (0.01)	0.03*** (0.01)
<€1,000	0.20 (0.68)	1.25 (0.97)	2.03 (2.26)
€1,000-€2,249	-0.64 (0.53)	-0.13 (0.90)	4.11** (2.06)
€2,250-€3,499	-0.51 (0.57)	1.03 (0.82)	1.13 (2.25)
€4,750 - €5,999	*Base category (income)*		
3 or more chronic illnesses	-0.64 (0.85)	-0.11 (1.27)	0.43 (1.09)
_Cons	-1.33 (1.42)	-2.47 (2.15)	-11.63*** (3.49)
Multinomial Logit Model			
Multinomial Logit Model No. of obs. = 143[113] LR chi2 (30) = 43.58 Prob > chi2 = 0.0520 Pseudo R2 = 0.1343			

Note: * = significance at 1% level, **=significance at 5% level, *=significance at 10% level.**

4.4.5 Discussion

Table 4.9 presented the results of the MNLM which assessed the impact of prescription drug user charges on patient behaviour in Ireland.

[113] Number of observations dropped due to missing values in the data.

The MNLM found that patients with GMS cover, patients without any form of community drug cover, patients who report higher prescription drug costs and patients who have a low income (€1,000-€2,249) are more likely to engage in all three types of behavioural response. This indicates that the most vulnerable patients; the sick and the poor, report the highest response to prescription drug user charges in terms of decreased adherence, financial burden and cost-coping strategies as a result of prescription drug user charges in Ireland. The results are supported by previous literature which also suggests that the most vulnerable patients in the population are most likely to engage in behavioural changes as a result of prescription drug costs (Atella et al., 2005, Carlson et al., 2006, Dor and Encinosa, 2010, Kephart et al., 2007, Piette et al., 2004a, Rahimi et al., 2007, Reed et al., 2008, Schafheutle et al., 2002, Tseng et al., 2004)

With regard to decreased adherence, the results of this study are supported by previous research which has shown that increased prescription drug user charges increase the likelihood of vulnerable patients reducing their adherence to prescription drugs (Sinnott et al., 2013). Studies have also shown that prescription drug users charges are associated with an increase in hospitalization and deteriorating health outcomes (Goldman et al., 2007). As this research proves that user charges cause patients to reduce their adherence to prescription drugs, user charge policies in Irish healthcare need to be re-assessed to prevent the associated adverse outcomes. If patients in Ireland cannot afford essential prescription drugs due to their cost, these patients are at risk of hospitalization and deteriorating health. This results in these patients requiring the need of more expensive secondary care services. Prescription drug user charges in Ireland need to be based on patients' ability and willingness-to-pay to avoid the adverse impact of user charges in Ireland. In this manner, patients would be able to access prescription drugs at a user charge that is affordable to them while still contributing to prescription drug financing.

The MNLM shows that GMS patients, patients with no community drug cover, higher prescription drug costs and a lower income level are most likely to report prescription drug costs as a financial burden. This vulnerable population report the borrowing of money from others, reducing their spending on other necessities and increasing their credit card debt to pay for their prescription drugs. As identified by Becker (1954) and Grossman (1972), individuals consume healthcare subject to a budget constraint. As user charges increase the proportion of the prescription drug cost borne directly by the patient, the amount of prescription drugs the patient can afford will be reduced, therefore restricting the patient's access to prescription drugs. These results indicate that prescription drug user charges in Ireland may have a regressive impact as patients with lower incomes appear to be most affected by the cost than patients with higher incomes (Adams et al., 2001, Contoyannis et al., 2005, Gibson et al., 2005b, Lexchin and Grootendorst, 2004, Smith and Kirking, 1992).

Finally, the results indicate that GMS patients, patients with no community drug cover, higher prescription drug costs and patients with low incomes are more likely to engage in cost-coping strategies as a result of their prescription drug costs. These cost-coping strategies are as follows: using cheaper OTC and generic drugs, requesting free medication samples from the GP or purchasing prescription drugs from an online pharmacy. As the patients reporting this type of behaviour already reported financial distress as a result of prescription drug user charges, it is expected that these patients would engage in strategies which may reduce the cost of their medication.

While this research shows that GMS patients, patients with no prescription drug cover, higher prescription drug costs and lower income level are most likely to engage in decreased adherence, financial distress and cost-coping behaviours, the nature of the prescription drugs which are subject to this behavioural change need to be assessed. User charges for prescription drugs were introduced in Ireland as a method of contributing towards prescription drug financing. In order to assess if this objective is a success, the nature of the drugs that are subject to patients' behavioural response ned to be evaluated. In other words, are these patients reducing their use of essential or non-essential drugs? This is discussed further in Section 6.4.

The following section, Section 4.5, concludes this chapter.

4.5 Conclusion

This chapter identified the impact prescription drug user charges have on patient behaviour in Ireland in terms of decreased adherence, financial burden and cost-coping behaviours. Using a specifically designed self-completion questionnaire, the research collected primary data from patients attending six GP surgeries in Cork. This ensured patients subject to the various forms of prescription drug user charges in Ireland; co-payments (GMS), deductibles (DPS) and full OOP costs (no form of cover), would be included in the sample. This enabled the research to assess the impact that various prescription drug user charges have on patient choice.

This research finds the various types of prescription drug user charges in Ireland; co-payments, deductibles and full OOP costs do cause patients to engage in decreased adherence, financial burden and cost-coping behaviours as a result of cost. Patients reported decreased adherence if they reduce their medication without the advice of their doctor, do not refill an existing prescription or if the patient does not fill a new prescription. Patients report the user charge as a financial burden if they borrow money to pay for medication, go without a necessity to pay for medication and/or increase credit card debt to afford medication. Finally, if patients report any of the following; substituting prescription medication for OTC remedies, substituting brand name to generic drugs, borrowing medication from others, requesting free samples from a doctor, purchasing prescription drugs from an on-line pharmacy and/or splitting tablets on the advice of the doctor, they are engaging in cost-coping strategies as a result of the prescription drug user charge.

The research finds GMS patients who face a flat co-payment per prescription item are the highest reporters of decreased adherence and financial burden as a result of prescription drug costs. DPS patients are the highest reporters of cost-coping strategies as a result of prescription drug costs.

Using a MNLM, this research finds that patients with GMS cover, patients without any form of prescription drug cover, patients with high prescription drug costs and patients with a low monthly income level (€1,000-€2,249) are more likely to engage in all three types of behavioural change as a result of prescription drug user charges. The results of this research are supported by previous literature and theory which also reveal vulnerable patients may struggle in terms of accessibility and affordability when attempting to purchase prescription drugs. As recommended by previous literature, the results of this research highlight that the drugs which are subject to the behavioural response need to be investigated further. This will indicate if the user charges for prescription drugs in Ireland are successfully reducing the over-consumption of unnecessary drugs or if the user charges are inadvertently reducing patients use of essential prescription drugs. While this research does indicate that prescription drug user charges reduce patients' utilization of prescription drugs, future research would identify the extent of this reduction; if user charges are having the intended effect by successfully reducing patients' use of prescription drugs or if the user charges are causing adverse effects as a result of the user charge being too high and creating affordability issues for the most vulnerable in society.

Chapter 4 finds co-payments, deductibles and a full OOP user charge to impact patient behaviour for a healthcare service such as prescription drugs. Similar to Chapter 3, Chapter 4 is also supported by economic theory that the higher the proportion of a patients' income spent on a healthcare service, the higher the response. Similar to the results in Chapter 3 of this thesis, Chapter 4 also finds that user charges can create accessibility and affordability issues for prescription drugs. However, before this can be definitively identified, the nature of the prescription drugs that are affected by users charges need to be examined to determine if the user charges are having the desired effect of reducing non-essential prescription drugs.

Chapters 3 assessed the impact of user charges on patient choice for a private service for which a user charge exists while Chapter 4 assessed the impact of impact of user charges on patient choice for a mainly public or part-publicly financed service for which a user charge also exists. In contrast, Chapter 5 will assess the potential application of user charges for both public and private healthcare services. While Chapters 3 and 4 suggest that user charges in healthcare create accessibility and affordability issues for some patients, Chapter 5 will assess the hypothetical application of user charges for three healthcare services where choices are made as part of a time-money choice, a convenience choice and a preference choice. Chapter 5 is conducted in the context of user charges becoming more prevalent in healthcare systems over time.

5 WHAT ARE IRISH PATIENTS WILLING TO PAY FOR HEALTHCARE SERVICES IN IRELAND (BLOOD TESTS, MRI SCANS AND BRANDED PRESCRIPTION DRUGS)?

5.1 Introduction

Understanding consumers' value of a good or service is a crucial component of the pricing decision process (Breidert et al., 2006). Researchers agree that estimating consumers' WTP for a good or service is key to developing a successful pricing strategy. WTP values can be used to predict consumers' response to a price (Breidert et al., 2006). Assessing consumers' response to price is essential in the healthcare system and is particularly important in a healthcare system where user charges are gaining popularity as a method of healthcare financing.

As stated in Section 1.1 of this thesis, user charges are a common policy introduced in healthcare systems as a method of sharing the cost between the patient and provider. They are payments made in an OOP manner by users of healthcare services as a contribution towards their costs (Morris et al., 2007). These patient-targeted user charge policies are grounded in the economic theory of consumer choice and how price can be used as a tool to change consumer behaviour. While user charges are intended to help alleviate financial pressure on healthcare systems, it is crucial that healthcare services are provided at a price that patients are willing and able to pay to access the services. Therefore, understanding consumers' WTP for healthcare services is important as consumers' response to price will influence utilization of healthcare services (Uzochukwu et al., 2010).

To assess consumers' WTP for a healthcare service, a Contingent Valuation Method (CVM) is commonly applied in health economics literature (Baji et al., 2012, Basu, 2013, Carrere et al., 2008, Milligan et al., 2010, Olsen and Donaldson, 1998). This method uses a survey-based approach to estimate patients' WTP for a healthcare service (Diener et al., 1998). This research adapts a survey-based methodology to estimate patients WTP to receive blood tests in GP surgeries, faster access to MRI scans and a branded over a generic prescription drug.

5.1.1 Affordability and Accessibility

As described in Section 2.4.1 and 2.4.2, the impact of user charges is examined in terms of affordability and accessibility. Healthcare costs influence patients' decisions to seek healthcare and particularly impact on patients who cannot afford the applicable user charge for a healthcare service. User charges can be "regressive" with larger effects on patients who spend a larger proportion of their income on a particular healthcare service, namely, the sick and the poor (Adams et al., 2001, Contoyannis et al., 2005, Gibson et al., 2005b, Lexchin and Grootendorst, 2004, Smith and Kirking, 1992). User charges increase patient OOP expenditure, which contribute to the financially constrained health sector but can lead to a welfare loss for patients who cannot afford the necessary healthcare services (Srivastava and McGuire, 2015). While user charges are gaining popularity as a method of funding healthcare expenditure, affordable and accessible care for all patients must be at the centre of healthcare delivery.

5.1.2 Research Question and Aim

What are Irish Consumers Willing to Pay for Selected Healthcare Services in Ireland?

This question led to three more specific objectives that include:

- Reveal patients' willingness-to-pay (WTP) values for three healthcare services.
- Identify discrepancies between patients reported WTP and the current market price.
- Using a two-part model, identify the factors that are associated with patients WTP values for the three selected healthcare services.

Through the construction of an original questionnaire, the objective of this study is to estimate what Irish patients are WTP for three selected healthcare services in Ireland. The three healthcare services measure a time-money choice (using MRI scans), a convenience choice (using blood tests) and a preference choice (choosing a branded or generic prescription drug). These services are valued in the context of user charges becoming more prevalent in healthcare systems over time. This research collects primary data from patients in the waiting rooms of selected GP surgeries in Cork. The research controls for age, GMS, PHI, education, self-reported health status and individual level gross monthly income level.

There are numerous reasons for selecting these three particular healthcare services. The first service is blood tests. Blood tests are taken to assess a patient's general state of health, for detection of a virus or bacteria and to test how well organs are functioning

(HSE, 2013b). Until 2013 in Ireland, GPs provided blood tests for GMS patients free of charge. However, recent cut backs in general practice in Ireland have resulted in a number of GPs charging GMS patients to receive blood tests in their surgeries. In general, GPs charge GMS patients on average a €5 user charge for blood tests. This €5 charge is to cover transport costs to get the blood tests to and from the hospital lab.[114] Not all GPs enforce this cost as charging patients for blood tests depends on GP preferences and regular practice.[115] Should a GMS patient wish to avoid this charge, they can attend a public hospital and receive a blood test free of charge. Despite receiving this service for free in a hospital, the access route to this service can in fact be costlier than the €5 user charge. The patient must make an appointment with the hospital, wait to receive an appointment and then attend the hospital for the blood test. Thus, in Ireland, a GMS patient can pay the user charge in the GP surgery to receive a blood test immediately or alternatively the patient can enter a public hospital and receive the test for free but with a potentially longer and costlier access route. In this case, the GMS patient faces a time-money trade-off.

While GMS patients face an increase in the user charge for blood tests to cover transport costs, non-GMS patients may also face a similar increase in blood test charges. It is possible that GPs can increase the regular consultation charge for non-GMS patients from the national average of €51 (Nolan et al., 2014) if a non-GMS patient requires a blood test. Similar to above, not all GPs enforce this cost as it can depend on GP preferences and regular practice.[116] Similar to GMS patients, non-GMS

[114] Expert opinion. This information was retrieved following a qualitative discussion with two GPs in Cork.
[115] See footnote 113.
[116] See footnote 113.

patients can also avoid the charge by attending a public hospital to receive the blood test for free.

The second service included in the research is an MRI scan. Access to MRI scans in Ireland poses a similar time-money trade-off for patients. An MRI scan is used to diagnose health conditions affecting organs, tissue and bone (HSE, 2013b). In Ireland, all out-patients must be referred by their GP for an MRI scan. With a GP referral a patient faces two payment options to access this service; the patient can either receive an MRI for free by entering the public system but may face a possible waiting time of 6 months to one and a half years (Ryan, 2016), or the patient can pay OOP and receive a scan within a much shorter time frame, such as 2 weeks.[117] Patients with PHI may be covered for the cost of an MRI but patients who do not have PHI for this service must decide whether they want to wait to receive an MRI scan for free or whether they are willing to pay OOP to receive the scan within two weeks.

The final service included in the research focuses on branded over generic prescription drugs. The active ingredient in generic medicine is identical to the brand medicine. The generic versions are as safe and effective as the branded versions. In Ireland previous to 2013, a pharmacist could only dispense what the GP prescribed on a patient's prescription irrespective of whether a cheaper generic version was available. Since the implementation of the Health (Pricing and Supply of Medical Goods) Act in 2013,[118] pharmacists are now obliged to dispense the generic version of a prescription

[117] Expert opinion. It is not possible to find actual statistics for MRI waiting times as the HSE proposes to start the publishing of this data in March 2016.

[118] The Health (Pricing and Supply of Medical Goods) Act 2013 commenced in Ireland in June of the same year and introduced generic substitution and reference pricing for prescription drugs. This Act was to provide value for money in the supply of prescription drugs. This in turn encourages

drug to all patients provided the drug has been identified as safely interchangeable by the Irish Medicines Board (IMB). Only in cases when the prescribers write "Do not Substitute" on a prescription, the pharmacist must dispense what is written on the prescription and cannot substitute the item for a cheaper generic version (HSE, 2013e). In addition to generic substitution, the HSE has set reference prices for each group of interchangeable medicines. The reference price is what is reimbursed to the pharmacist for all medicines in the group irrespective of the medicines' cost. Patients covered by the GMS and DPS will not incur additional costs for medicines priced at or below the reference price. However, should a patient prefer to receive a particular brand that costs in excess of the reference price, the patient must cover the difference between the reference price and the cost of the branded version. In the case of a GMS patient, they must also pay the relevant user charges and DPS (non-GMS) patients still pay up to a €144 monthly threshold (HSE, 2013e).

Since the introduction of the 2013 Act, patients face two options when purchasing their prescription medications. They either receive the generic version should there be one designated and pay the relevant user charge[119] or request a preferred branded version and pay the difference between the reference price and the branded version.

The reasons for choosing these three particular healthcare services are as follows; patients' WTP for blood tests was chosen for inclusion due to GPs in Ireland starting

competition among suppliers and consequently lower prices for patients which saves money for the taxpayers and the patient (HSE, 2013e).

[119] This will depend on what community drug scheme the patient is covered under. As mentioned in Chapters one and two of this thesis, GMS patient pay a flat co-payment of €2.50 per prescription item while DPS patients pay the cost of their medication until they reach the monthly threshold of €144 after which the cost of the prescription drugs are covered by the State. Patients with an LTI book do not pay any user charge for illness related prescriptions and patient without any form of community drug cover must pay the full cost of their prescription medications.

to implement user charges for this service. WTP for MRI scans are included in this study for three reasons; firstly, they are revealed to be the most commonly referred scan made by GPs on behalf of their patients,[120] secondly, due to the variation in waiting time and costs for MRI scans and thirdly, due to their presence in previous international research (van Helvoort-Postulart et al., 2009). WTP for prescription drugs are evaluated due to the introduction of generic substitution and reference pricing in Ireland in 2013. The three selected healthcare services currently exist in the Irish healthcare system. Consequently, the objective is not to estimate "a perfect" WTP as prices are already available but to provide evidence on the price that patients are WTP for these services. These services are valued in the context of user charges becoming more prevalent in healthcare systems over time to help fund the system.

5.1.3 Motivation

With €510 million in supplementary funding required by the HSE in 2014 and €600 million additional funding required in 2015, it is reasonable to assume that user charges will continue to play a crucial role in the financing of healthcare in Ireland. With user charge policies in place in Irish healthcare, it is important to establish the level of user charges which contribute towards healthcare but also provides affordable and accessible care to patients. With this in mind, patients' WTP for healthcare services must be measured.

Understanding patients' WTP helps to gauge the patients' likely utilization of the healthcare services. Estimating the price incentives from the patients' perspective will

[120] This was revealed through qualitative discussions with two GPs practicing in Co. Cork.

promote sufficient access and affordability to the selected healthcare services based on patients' reported WTP values. Consequently, this reduces concerns associated with patient accessibility and affordability for the three healthcare services. With this in mind, this research aims to estimate what patients are WTP for the healthcare services to identify a user charge which promotes affordable and accessible care to these services.

5.1.4 Chapter Structure

Section 5.2 presents previous WTP literature in health economics. Section 5.3 presents the methodology that was employed to estimate what patients are willing to pay for the three selected healthcare services in Ireland. Section 5.4 describes the econometric methods that were utilized and Section 5.5 concludes this chapter with recommendations for future research.

5.2 Literature Review

5.2.1 Introduction

This section provides a critical review of existing literature on studies using the Contingent Valuation Method (CVM) with a particular focus on WTP research. The literature review was guided using the following search words in databases such as Academic Search Complete (willingness-to-pay, healthcare, contingent valuation, cost-benefit analysis, stated preference techniques and elicitation formats). A citation approach was adopted where citations were recorded and from there reference lists were scanned until such a time it was thought that all key paper/authors were retrieved. The criteria extracted from each study was as follows; data source, outcome measurements, elicitation methods, analysis and study results. Section 5.2.2 provides a general description of CVM and WTP methods. Section 5.2.3 provides a comparison of various elicitation formats. Section 5.2.4 describes methodological issues which arise in WTP studies such as; ordering effects, the embedding effect and protest zeros. Section 5.2.5 provides a review of WTP healthcare studies in order to provide an understanding of what has been conducted in studies of this kind and Section 5.2.6 concludes this section.

5.2.2 Overview of CVM and WTP

As mentioned in Section 5.1 of this chapter, a WTP study is a Contingent Valuation Method (CVM) which is a survey-based hypothetical approach to elicit patients' monetary value for a healthcare service (Diener et al., 1998). Generally, contingent valuation (CV) techniques ask respondents to indicate the value they place on their health or the value they hold for a particular healthcare service (Bayoumi, 2004). The format of the question commonly asks respondents the maximum amount they are willing to pay to receive the service in question. The subjects of the CV study do not necessarily have to be users of the service and do not have to be at risk of the particular illness for which the service treats. CV studies can be targeted at both users of the service or potential users of the service (Bayoumi, 2004, Olsen and Donaldson, 1998). There are several benefits associated with CVM;

CV is a form of cost-benefit analysis (CBA) which is firmly rooted in welfare economic theory (O'Brien and Gafni, 1996). Technical and allocative efficiency can be assessed using CBA.

In comparison to cost-utility analysis (CUA) where no sufficient method exists for aggregating utility scores, the aggregation of benefits in a CVM is more straightforward (Bayoumi, 2004).

1. A single unit of measurement for costs and consequences facilitates the estimation of uncertainty of the estimation results (Stinnett and Mullahy, 1998).

2. CV allows for a prompt comparison and combination of health outcomes with externalities (non-health outcomes) (Bayoumi, 2004).

3. As the outcomes in CV studies are measured in monetary terms, the translational use of the results for decision and policy makers is heightened (Bayoumi, 2004).

Despite numerous advantages associated with CVM, the main disadvantage associated with this technique is the difficulty in acquiring valid and reliable WTP estimates (Diener et al., 1998). It is argued that CVM estimates are only the stated intention of the respondent and actual observed behaviour may be different. This methodological issue is discussed further in Section 5.2.4.

Focusing on survey-based techniques, WTP values can be elicited directly (stated preference) or indirectly (revealed preference technique) (Johannesson, 1996). Using the direct method, respondents state their maximum WTP for a service or their maximum WTP to be in good health. In this case, WTP is based on the expected behaviour of the respondent. Using an indirect method, respondents rate or rank their preferences for healthcare services and WTP is revealed from the observed behaviour of the respondent (Klose, 1999).

As this research collects data directly from patients who may already use the services or may be potential users, the research adapts a direct, stated preference approach to estimate what Irish patients are willing to pay for blood tests, MRI scans and a branded over a generic prescription drug. Estimating the WTP values directly from patients in the Irish healthcare system should promote the translational effect of this research to encourage policy makers to design successful pricing strategies providing accessible services at an affordable price for patients.

5.2.3 Comparison of the Elicitation Formats

In healthcare literature there is debate surrounding the appropriate elicitation format for measuring WTP values. The elicitation format refers to the method in which the WTP question is asked. Five possible formats exist in the literature; 1) open-ended; 2) bidding game; 3) payment scale; 4) discrete-choice and 5) discrete-choice with follow-up.

An open-ended question asks the respondent to directly state his/her maximum amount they are willing to pay (Smith, 2000). For example, when estimating what women are willing to pay for a bone density scan, Donaldson *et al* (1997) asked the following open-ended question: “What is the most you would pay to have the scan?” Respondents were asked to write the maximum amount in the space provided. While open-ended questions are easy to administer and analyse and do not require a very large sample size the responses are unreliable and highly subject to strategic bias (Donaldson et al., 1997, Smith, 2000). Strategic bias is when the respondents’ WTP value is a representation of what they would like to pay for the good or service and not the maximum amount they would be willing to pay to receive the good or service (Bergmo and Wangberg, 2007). Open-ended questions do not have a reference point which results in the respondent estimating the cost of the good or service and stating this value rather than their WTP for the service. The open-ended method does not capture the consumer surplus (Donaldson et al., 1997).

To overcome these challenges, the bidding game and payment scale techniques were developed. A bidding game presents respondents with an initial amount which they either accept or reject. Subsequent to acceptance or rejection, they are bid up or down in increments until the WTP is reached (Smith, 2000). Using the bidding technique, Schafie *et* al (2014) estimated WTP for a Quality-Adjusted Life Year (QALY) among the Malaysian population. They used the following bidding question:

> *Imagine that you are stricken with a serious illness that immediately threatens your life. Now, please assume that Medication A has been developed to treat your illness and that if you take it, your life will be extended for one full year and you will be completely healthy (without being confined to bed) for one full year. Please assume, however, that Medication A will not be covered by health insurance or Government Hospital and you will have to pay the full amount to receive the product, which will cost MYR xxxx*. In this case, would you purchase the product? (*xxxx is bidding value)* (Shafie et al., 2014).

If a positive WTP response was given, a bidding game approach with three different starting bids of 20,000 MYR (Malaysian Ringgit), 40,000 MYR and 100,000 MYR was used.

The bidding game format requires face-to-face interviews with respondents. The nature of the data collection classifies questionnaires as an inappropriate data collection method for the bidding game format (Frew et al., 2004). Face-to-face interviews are not conducive to a large sample size and are a time-consuming method of data collection. In comparison to the open-ended format, the bidding game format does provide the respondent with a reference point to estimate their WTP value. Despite this improvement on the open-ended format, the technique is prone to bias as a result of the starting bid. Research has found respondents' final WTP value estimated using the bidding game technique is influenced by the starting point which began the bidding process. In other words, higher starting bids lead to higher WTP values. In comparison to questionnaire formats, e.g. open-ended and payment scale (discussed in following paragraph), bidding game formats produce higher WTP values. Higher WTP values lead to unreliable results as an intervention valued using a bidding process will appear more valuable than an intervention valued using a questionnaire format (Frew et al., 2004).

Payment scales present a range of values to respondents. Respondents indicate the maximum amount they are willing to pay. The scale begins at 0 and presents incremental values with a blank space at the end for respondents to fill in WTP if it is beyond the range presented (Smith, 2000). Donaldson *et al* (1997) used a combination of a payment scale and open-ended question. Once respondents answered the open-ended question, they were presented with a range of values in a list ranging from £0 to £100 in £5 increments with a blank space at the end. Respondents were instructed to write their maximum amount they are willing to pay if it was in excess of £100. Next to this range of values respondents were given the following instruction:

*"Put a √ next to the amounts that you are sure you **would** pay. Put an X next to the amounts that you are sure you **would not** pay. Put an O around the **maximum amount** that you are sure you would be prepared to pay."(Donaldson et al., 1997)* p. 83/4)

In comparison to the open-ended and bidding game format, payment scales are more representative of real life situations. Payment scales allow respondents to "shop around" for the value which best represents their WTP for a good or service (Donaldson et al., 1997). Consequently, in contingent valuation studies in healthcare, the payment scale approach is the most popular format (Diener et al., 1998, Klose, 1999, Smith, 2000). Payment scales reduce starting point bias as the payment scale begins with 0. Despite reducing starting-point bias, the payment scale is subject to range bias and mid-point bias. Range bias is when the values presented on the payment scale can influence the respondents' WTP value (Ryan et al., 2004) while mid-point bias is when respondents state their WTP value as the middle of the card. Range bias can be reduced in the design of the payment scale by including a blank space at the end of the range so the respondent can state their WTP should it exceed the range that is presented (Smith, 2000). In comparison to open-ended questions, respondents are more likely to answer payment scale questions, payment scales generate consistent mean and median values and a stronger association between WTP and ability to pay is achieved using a payment scale (Donaldson et al., 1997).

Discrete choice experiments (DCEs) are generally used in questionnaires and include numerous choice sets which include hypothetical options between which the respondents choose (Lancsar and Louviere, 2008). Each choice set is defined by a set of attributes, and each attribute is set at one of several levels. The levels present different ranges of the attributes. For example, travel time may be a key attribute for patients when choosing a GP. In a DCE, this attribute can be set at different levels such as 5, 15 or 60 minutes (Lancsar and Louviere, 2008). Respondents make decisions based on the varying attributes of a service which may be based on quality or price difference. In this manner, DCEs encourage respondents to make trade-offs between attributes (Lancsar and Louviere, 2008). If cost is included as an attribute, it is possible to estimate the WTP for that good or service. DCEs can include choices between multiple options, a pair of alternatives or binary choices (yes/no) (Lancsar and Louviere, 2008). Figure 5.1 provides an example of a DCE and the type of attributes that can be compared.

Figure 5.1 Discrete Choice Experiment Example

Scenario1	**Clinic A**	**Clinic B**
Attitudes of staff towards you	Good	Bad
Chance of taking home a baby	25%	35%
Continuity of contact with the same staff	No	Yes
Time on waiting list for IVF attempt	18 months	18 months
Cost to you of IVT attempt	£1,500	£3,000
Follow-up support	No	No

Which Clinic would you prefer? *(Please tick one box only)*

Prefer Clinic A Prefer Clinic B

(Ryan, 1999)

Similar to the payment scale, it is suggested that the DCE is a realistic representation of a real-life market as the respondent is faced with characteristics and price variations at which they must decide whether or not to purchase (Ryan et al., 2004). This provides the respondent with an understanding of the scenario which leads to reliable WTP estimates. DCEs also reduce strategic bias. Strategic bias is reduced in the DCE as respondents are presented with only one bid, they cannot disproportionally influence the overall WTP estimate (Mitchell and Carson, 1989). This is in comparison to the open-ended and payment scale methods. Using the open-ended format, a respondent has no reference point and can state their maximum WTP pay. This format is highly vulnerable to strategic bias as the respondent can simply state the price they would like to pay as they are not guided by any reference price. While a range of values are presented to the respondent on a payment scale, the respondent can report a lower WTP value which represents what they would like to pay for the service rather than the true maximum value they are willing to pay. In a DCE, the respondents are presented with one bid, which is strategically selected to represent an acceptable market price for the service. This way, the respondent cannot strategically manipulate their WTP estimate. They either accept or reject the bid.

However, this can lead to a disadvantage associated with the DCE that is referred to in the literature as “yea-saying”. This is when the respondents give a “Yes” answer to the offered bid as saying yes to the bid is deemed the socially desirable response (Yeung et al., 2006). “Yea-saying” can also occur when the respondent is presented with hypothetical pairs in a DCE. The respondent is forced to choose between the two pairs and in practice, the respondent may choose neither. While this can be minimised in the design of the DCE by allowing respondents to opt-out or choose neither option, DCEs must acknowledge this risk when analysing results (Lancsar and Louviere, 2008). “Yea-saying” in DCEs can result in values which are biased in an upwards direction when compared to the open-ended format and payment scales (Ryan et al., 2004). Thus, the DCE generates higher WTP values in comparison to other elicitation formats. The final disadvantage associated with the discrete choice approach is the requirement for a large sample size. A large sample size is necessary due to the low level of information retrieved from respondents using the discrete choice approach (Kjaer, 2005).

The information generated from the DCE can be enhanced by asking a follow-up question. This method is referred to as a discrete-choice with follow-up (Kjaer, 2005). Depending on the respondent’s first bid (accept or reject), the DCE with follow-up provides a second bid that is either increased (if initial bid is accepted) or decreased (if initial bid is rejected) from the first bid. While this method does provide the researcher with more information, the format is subject to strategic bias as the respondent has more than one bid to choose from.

There are conflicting views regarding the most appropriate elicitation format to choose when conducting a WTP study. A number of studies have been done which compare the various elicitation formats in healthcare studies (Frew et al., 2004, Ryan et al., 2004). Frew *et al* (2004) compared the bidding game technique with the open-ended and payment scale formats. They found WTP values for colorectal cancer screening were higher when using the bidding game format than the WTP values estimated using the open-ended or payment scale formats. The authors also found statistically significant differences in WTP values when respondents were presented with different starting bids. They suggested that it showed the presence of starting-point bias in the bidding game. While the open-ended and payment scale formats are not subject to starting-point bias, neither is without criticism. As the open-ended format does not provide the respondent with any clues as to a reasonable valuation, the open-ended questions are difficult for respondents to answer and may result in hasty valuations. This raises concerns about the validity of open-ended questions as they do not reflect real-life situations for respondents. The payment scale alleviates this problem as the payment scale does reflect real-life situations due to the presentation of a range of values to the respondent with which they are familiar with.

Conflicting with earlier concerns regarding the payment scale, Ryan, Scott and Donaldson (2004) found no evidence of range bias or starting-point bias associated with payment scale responses. The authors used an initial payment scale and an amended payment scale with a different range of values. They found no significant difference in the WTP values between both payment scales. This shows that starting point and mid-point bias was not an issue when using the payment scale. Guidelines for WTP studies indicate that the open-ended format should be avoided when conducting contingent valuation studies (Arrow et al., 1993, Donaldson et al., 1997, Johannesson et al., 1991). Consequently, payment scales and the discrete-choice formats are favoured in healthcare evaluations (Donaldson et al., 1997, Johannesson et al., 1991).

5.2.4 Methodological Issues

There are a number of methodological issues which need to be addressed before implementing a WTP study to evaluate healthcare services. Ordering effects, embedding effects and protest zeros are three recurring methodological concerns that can arise when using any of the CVM elicitation methods (Fonta et al., 2010, Stewart et al., 2002).

5.2.4.1 Ordering Effects

The ordering effect is of concern when a study aims to estimate WTP values for more than one healthcare service. The ordering effect refers to the order in which the scenarios are presented to the respondent and whether this order impacts on their reported WTP estimates (Drummond et al., 2015, Stewart et al., 2002). When estimating WTP for three health care programmes (an increase in pain-relieving treatment for cancer patients, increase in number of heart operation and increase in community care services) Stewart *et al* (2002) tested for the existence of the ordering effect by examining if WTP values change when the services were presented to the respondents in a different sequence. Respondents in the study were told that each of the three services were competing for funding yet they were instructed to ignore the other two services when reporting their WTP value for each one (Stewart et al., 2002). The sample was divided in two and each sample was presented with the services in different arrangements. The order in sample 1 first presented the cancer service followed by the heart service and then the community care service. Sample 2 presented the community care service first followed the heart service and finally the cancer service. Examining the mean WTP values for the three services, the researchers found the mean WTP values were different in both samples. If ordering effects were not evident, the mean WTP for the services would be consistent between the two samples.

Stewart *et al* (2002) suggest that ordering effects may occur due to a concept known in the literature as fading glow. Fading glow is when respondents gain moral satisfaction or a warm glow from contributing to a publicly provided healthcare service (Stewart et al., 2002). The first good or service in a sequence usually receives the majority of this moral satisfaction. Stewart *et* al (2002) found that regardless of income, when valuing public goods respondents exaggerated their WTP for the first service in each sequence. The succeeding valuations are lower as contributing to the first presented programme generates the highest utility for the respondent. The authors suggest the respondents may have felt they met their social obligations once they contribute to the first programme (Stewart et al., 2002).

In this current Irish research, more than one healthcare service is valued. Therefore, ordering effects may arise. However, the risk of ordering effects is reduced as the services are not competing with each other for funding as described in the study conducted by Stewart *et al* (2009). Also, the services are not publicly funded. Respondents are informed that access to the healthcare services rely on OOP payment made by the respondent to the health service provider. This reduces the risk of fading glow as the respondents have no incentive to generate moral satisfaction as they are not contributing to a publicly financed good. The separate valuation of the healthcare services and the method of payment in this research negates the risk of ordering effects and warm glow.

5.2.4.2 Embedding Effect

The embedding effect (also referred to as part-whole effect, symbolic effect or disaggregation effect) (Kahneman and Knetsch, 1992) is another methodological issue that needs to be controlled for when conducting a CV study. The embedding effect occurs when a respondents' WTP for a good is not significantly different from the respondents' WTP for the overall good from which the identified good is part of (Bateman et al., 1997, Beattie et al., 1998, Boyle et al., 1994, Morrison, 2000). In other words, a "respondent values a broader or narrower policy package than the one intended by the researcher" (Mitchell and Carson, 1989, p. 231). Respondents' insensitivity to the characteristics of the good under valuation has significant implications for the reliability of WTP studies (Morrison, 2000).

A detailed description of what the respondent is to value can potentially alleviate the embedding effect from a study (Mitchell and Carson, 1989). This is particularly useful for studies which aim to elicit a WTP value for a basket of goods. By identifying what is included in the package along with the various attributes of the service that are to be valued, the respondent can separate the embedded good from the overall good and provide an unbiased WTP value.

Even though this research does not aim to elicit WTP values for a basket of goods, the scenarios included in the questionnaire provide detailed descriptions of the separate healthcare services so the respondents know exactly what attributes they are to value. Respondents provide WTP values for each individual service rather than a WTP value for a healthcare package.

5.2.4.3 Protest Zeros

Protest zeros in WTP studies are a form of item non-response (Mitchell and Carson, 1989). Protest zeros occur when respondents who object to the questionnaire simply do not respond and when respondents report a zero value for a good that they actually value (Carrere et al., 2008). Literature proposes reasons as to why respondents engage in this behaviour. When eliciting WTP values for a public good, some respondents consider placing a monetary value on public goods as unethical while others dispute that public goods should be provided "free of charge" (Halstead et al., 1992). Distinguishing protest zeros from respondents who report a genuine zero WTP is challenging. Debriefing questions are generally used by researchers to distinguish protest zeros from true zero values (Fonta et al., 2010). When eliciting WTP for a proposed community-based malaria control scheme, Fonta *et al* (2010) used the following debriefing questions to identify a protest zero; "do not have faith in community trust fund", "wait for government" and "do not know". To categorize a true zero value, the authors included the following two debriefing questions; "cannot pay due to lack of income" and "the scheme is not important to us". Debriefing questions of this nature are typically used in face-to-face interviews (Hughes and DeMaio, 2002). It is difficult to include debriefing questions in a self-completion questionnaire as there is no opportunity for detailed probing questions.

Protest zeros have no economic significance and do not reflect the patients' preference for the service (Lindsey, 1994). In WTP studies, it is inevitable that protest zeros will occur and the correct approach needs to be adopted to effectively deal with this. One of the most commonly used strategies to deal with protest zeros is to remove the protest responses. This approach results in sample selection bias if the sample characteristics of the protest respondents are different. Therefore, discarding protest zeros can result in biased estimates. The second solution to deal with protest zeros is to address them directly in the analysis. As there may be other reasons for zero responses other than a genuine zero WTP, it is possible that different factors influence WTP values and zero values (Donaldson et al., 1998). Positive WTP values are as a result of an economic decision-making process whereas zero responses are due to both economic responses and protest responses. Health economics literature proposes the double-hurdle approach as the best method for dealing with zero values and protest responses (Halstead et al., 1992). The econometric analysis in this study uses a two-part model to control for selection bias as a result of zero values. This is discussed in more detail in Section 5.4 of this chapter.

5.2.5 Review of WTP Healthcare Studies

There is large variation in healthcare WTP studies in terms of the study objectives, study population, the elicitation format and the consequent analysis of the study (Baker et al., 2008, Diener et al., 1998). While there is no standard method of designing and conducting a WTP study, reviewing the healthcare literature and acknowledging best practice guidelines is the most effective way to design a reliable study. This section reviews previous healthcare WTP literature in terms of the study objectives, the study population, the elicitation format, the econometric analysis and the results.

Table 5.1 Synopsis of WTP Healthcare Literature

Author(s)	Date	Study Population	Outcomes	Elicitation Method	Econometric Analysis	Results
Asgary et al	2004	Face-to-face interviews with the head of rural households in Iran (N = 2139)	Estimate the demand and WTP for health insurance.	Iterative bidding game	Regression analysis	Age, education level, health care facilities, access to medical care services, and households' medical needs statistically significantly impacts on WTP for health insurance. Average WTP, $2.77 per month.
Baji et al	2012	Data from two DCE experiments (used in a national survey) which focus on 2 healthcare services (N =1037)	Elicit consumers' preference about the choice of health care providers for out-patient service (visit to specialist) and in-patient service (planned surgery).	Results from DCE	Binary probit with random effects. Backward stepwise procedure was implemented for model specification.	Young and elderly consumers with higher education and income are WTA a higher cost for the improvement of the quality of health care services.
Basu	2013	Health and Retirement Survey (N = 678).	Estimate WTP to prevent Alzheimer's Disease	Double-bounded technique	Interval regression analysis	Patients with higher perceived risk of Alzheimer's and greater household wealth report a higher WTP value.
Bergmo and Wangberg	2007	Patients were recruited via a questionnaire given to all adults (>18 years) in the waiting area of a primary clinic in Norway (N = 199)	Patients' WTP for electronic communication with their GP.	Open-ended WTP question	Summary statistics are produced for WTP amounts. Spearman's correlation coefficient. Mann-Whitney U test for between group differences. Logistic regression.	52% were willing to pay for electronic GP contact. The group of patients with access (Intervention) revealed a significantly lower WTP than the group without such access (Control group).

Carrere et al	2011	Prospective, non-randomized study. Face-to-face interviews with patients in a Comprehensive Cancer centre, Lyon (N = 139).	Estimate WTP for home blood transfusion and to analyse determinants of their choice	Bidding process	Summary statistics for patients' characteristics and WTP amounts. Type 11 Tobit and a truncated regression model to check the robustness of the results.	The median WTP was €26.50. Long home-hospital distance, poor quality of life and previous experience of home care were the determinants of patients' WTP.
Donfuet, Makaudze, Mahieu and Malin	2011	A face-to-face questionnaire was administered to rural households in Bandjoun (West Province, Cameroon) during November 2009 (N = 410)	Identifying the factors that influence WTP for a community-based prepayment scheme.	Double-bounded discrete choice	Heckman two step. Participating equation for whether or not the respondent agrees to take part in the valuation. And a WTP equation.	Age, religion, profession, knowledge of community-based health insurance, awareness of usual practice in rural areas, involvement in association and income are the key determinants of WTP. WTP 2.5US dollars /person/month.
Golinowska and Tambor	2012	Household budget surveys of the CSO in Poland and a representative questionnaire (N = 723) and (N = 156)	Analyse the level and structure of OOP expenditure in Poland and factors influencing patients' WTP.	Not clear what elicitation format was used.	Logistic Regression	Age, income, health status and place of residence influence patients' WTP.
Liu et al	2013	Non-institutionalised elderly residents in Hong Kong (60+) (N = 1164).	What patients are WTP for private primary care services	Payment Scale. All respondents shown the same card.	Univariate analysis, cross-tabs, ANOVA tests. Multivariate analysis. OLS for each type of service. Participation equation and consumption equation to address selection bias.	Age negatively impacts WTP. Income and higher health status increase WTP. WTP for chronic conditions and preventative care fell below the market price.

Milligan, Bohara and Pagan	2010	Survey data from the 2002 Health and Retirement Study (N = 463)	Assessing WTP for cancer prevention	Double-bounded elicitation technique	Threshold modelling. Two equations; one measuring Ln(WTP) and the other measuring the probability of getting cancer.	Age is negatively related to WTP. Income and the probability of developing cancer are positively related to WTP.
Nosratnejad et al	2014	Cross-sectional study using a structured telephone interview with household heads in Iran (N = 290)	Estimated WTP for health insurance in Iran to suggest an affordable social health insurance.	Double bounded discrete choice	Interval Regression analysis	Mean WTP is $5.5US per person. Education, family size, and the number of insured family members and income are significant variables of the WTP.
Olsen and Donaldson	1998	Residents in Troms in Norway (N =143)	WTP in increased earmarked taxation for three different health care programmes: *a helicopter ambulance service, more heart operations and more hip replacements.*	Payment Scale	OLS regressions Same regression analysis for each programme.	For hips, women are willing to pay more, education and age have a sig. negative impact on WTP for helicopters.

Source: Authors Own

5.2.5.1 Study Objectives and Study Population

Previous studies have assessed WTP for healthcare services in general (Baji et al., 2012, Golinowska and Tambor, 2012), WTP for health insurance (Asgary et al., 2004, Donfouet et al., 2011, Nosratnejad et al., 2014), WTP for primary care services; both public and private (Bergmo and Wangberg, 2007, Liu et al., 2013) and WTP for prevention services such as cancer and Alzheimer's disease (Basu, 2013, Milligan et al., 2010). It is common for WTP studies to assess WTP values for more than one service (Olsen and Donaldson, 1998). Generally, WTP is elicited for programmes or services that exist in the market at the time of the study (Donaldson, 1990, Johannesson et al., 1991, Neumann and Johannesson, 1994) but studies can also elicit WTP for hypothetical programmes or services (O'Brien et al., 1995, Thompson, 1986). This research assesses patients' WTP for three existing healthcare services in Ireland; two of which are primary care services (blood tests and prescription drugs) while the other is a secondary healthcare service (MRI scan). The nature of these services (public or private) is determined by the access route (as described in Section 5.1.2) the patient takes, or is directed to take to utilize these services.

WTP for services may be elicited from current users and potential users of the service (O'Brien and Gafni, 1996). Best practice guidelines recommend that WTP values are estimated from all patients who are affected directly or indirectly by the service; not just current patients (O'Brien and Gafni, 1996). Focussing on current patients leads to biased WTP estimates as patients with previous experience of the service could yield very different WTP values than non-users (O'Brien and Gafni, 1996). This research controls for this bias by asking patients whether they have used each of the services before.

5.2.5.2 Elicitation Methods

The elicitation formats used in the studies are either direct (open-ended, payment scale or bidding game) or discrete (discrete choice experiment) (Klose, 1999). A review including 66 articles conducted by Lin *et al* (2013) reveal DCEs (30.3%) to be the most widely used elicitation format in healthcare literature. The authors found payment scales (15.2%) to be the second most commonly occurring method followed by the bidding game format (13.6%) and finally open-ended questions (10.6%). The review found that a number of studies (21.2%) use more than one elicitation format (Olsen and Smith, 2001, Ryan and Watson, 2009, van Helvoort-Postulart et al., 2009, Whynes et al., 2003). Research shows the elicitation format is influenced by the mode of data collection and vice versa. Studies which use bidding techniques conduct face-to-face interviews with the study population (Asgary et al., 2004, Basu, 2013, Carrere et al., 2008, Donfouet et al., 2011, Milligan et al., 2010, Nosratnejad et al., 2014). Elicitation formats requiring interviews or interactive communication with potential respondents are costly and time-consuming to implement. The most common mode of data collection is self-administered questionnaires (Lin et al., 2013). Self-administered questionnaires are easily produced and distributed to a large sample. While there is no opportunity to probe further information from the respondents, self-administered questionnaires allow for effective data collection thereby generating a large sample. Consequently, due to time and financial constraints, a self-administered questionnaire, containing a payment scale is chosen as the data collection method for this research.

5.2.5.3 Previous Method of Analysis

Three features shape the method of analysis of WTP studies. Firstly, the type of WTP question asked influences the analysis, questions regarding respondents' preferences about the alternatives being offered influence the type of analysis and finally, underlying theoretical implications influence the type of analysis and the nature of the variables that should be included (Donaldson et al., 1998).

Analysis of WTP data generally begins with descriptive statistics of patient characteristics and the mean and median WTP values. Depending on data distribution, parametric t-tests or non-parametric Kruskal-Wallis and Mann Whitney tests are implemented to test for significant difference in WTP values between groups (Baji et al., 2012, Bergmo and Wangberg, 2007, Carrere et al., 2008, Liu et al., 2013, Nosratnejad et al., 2014, Olsen and Donaldson, 1998). Depending on the nature of the WTP question (elicitation format) and consequent dependent variable, the econometric analysis is determined. Studies using payment scales and bidding games generally have a continuous dependent WTP variable and consequently implement an OLS regression to identify the factors associated with patient WTP values (Asgary et al., 2004, Liu et al., 2013, Olsen and Donaldson, 1998). The double-bounded technique can give way to various econometric analysis. For example, if the dependent variable has interval censoring, in other words, the researcher knows which ordered category the observation falls into, an interval regression can be used (Basu, 2013, Nosratnejad et al., 2014).

WTP is viewed as a two-step decision making process. The patient initially decides whether or not they are willing to pay for the service and if they decide they are willing to pay, the patient must decide on the maximum amount they are WTP. As the patient decides whether they are willing to pay or not, the decision to pay is a non-random selection process. The non-random selection process can lead to sample selection bias in WTP studies. Sample selection bias is defined as an "Error introduced when the study population does not represent the target population" (Delgado-Rodriguez and Llorca, 2004, p. 240). Depending on the goal of the analysis, a Heckman selection model or a two-part model can be implemented in WTP studies to control for sample selection bias. The Heckman selection model generally uses a probit model to begin with to estimate the probability of observing a positive WTP. The second step in the Heckman model uses an OLS regression on the observations that have a WTP value above zero. A two-part model follows the same two-step equation approach; the first equation is the participation equation and estimates whether or not a patient is willing to pay for the service. The second equation in the model is the consumption equation which estimates how much the patient is WTP for the service. A two-part model is appropriate if the second part of the model (the regression) is a result of taking the logarithm of zero values (Manning et al., 1987). This is generally the case in WTP studies where the second equation focuses on the amount patients are willing to pay, therefore only including respondents with a positive WTP value. If the objective of the analysis is to predict the value of the dependent variable observed in the absence of selection, the Heckman approach is most appropriate. When the objective is to predict an actual response, a two-part model is more sufficient (Manning et al., 1987).

Literature reveals the type of models included in the two-part models are influenced by the WTP question and the nature of the dependent WTP variable. Using a bidding game process to elicit WTP values, Carrere *et al* (2011) used a Type 11 Tobit model to measure French cancer patients' WTP for home blood transfusion. This is a two-part equation controlling for sample selection. When estimating elderly patients' WTP values for primary care services in Hong Kong using a payment scale, Liu *et al* (2013) initially used an OLS regression of individuals' WTP values on their characteristics. However, the large number of zero WTP values prompted the use of the Heckman 2-step approach. Donfuet *et al* (2011) implemented a double-bounded discrete choice technique to elicit WTP values for a community-based prepayment scheme in Cameroon. The researchers also used a Heckman 2-step approach to analyse the results.

Finally, when conducting the analysis of a WTP study, Mitchell and Carson (1989) recommend to test the construct validity of the method. Construct validity determines if the data is consistent with theoretical expectations that should be present if the WTP values are measuring the values as intended by the researcher (Drummond et al., 2015, Klose, 1999). There are two concepts from economic theory that can be tested. First, a positive income elasticity of demand is expected, i.e. a higher income level should be associated with a higher willing to pay (Drummond et al., 2015). Second, the more of a positively valued good provided by a programme, the higher a respondents' WTP (Drummond et al., 2015). Construct validity can be tested by regressing WTP values on individual characteristics.

5.2.5.4 Factors Influencing WTP Values

The association between WTP values and patient characteristics vary across studies. Some studies indicate that WTP values are positively influenced by age (Asgary et al., 2004, Bergmo and Wangberg, 2007) while other studies find younger patients are more willing to pay than older patients (Basu, 2013, Donfouet et al., 2011, Golinowska and Tambor, 2012, Liu et al., 2013, Milligan et al., 2010, Olsen and Donaldson, 1998). Most studies find a positive relationship between WTP values and patient income (Baji et al., 2012, Basu, 2013, Donfouet et al., 2011, Golinowska and Tambor, 2012, Liu et al., 2013, Milligan et al., 2010, Nosratnejad et al., 2014) and education (Asgary et al., 2004, Baji et al., 2012, Nosratnejad et al., 2014). Patient health status is also found to influence WTP values. The better the health status of the patient, the higher the WTP value (Golinowska and Tambor, 2012, Liu et al., 2013). Conversely, patients with a lower health status are less willing to accept charges for healthcare services (Baji et al., 2012). When eliciting WTP values for preventative services, the patient's perceived risk of the disease positively influences their WTP value (Basu, 2013, Milligan et al., 2010). A patient's previous experience of the service is found to influence their WTP. A number of studies have found previous experience to positively impact on patients' WTP (Carrere et al., 2008, Donfouet et al., 2011) while Bergmo and Wangberg (2007) found previous experience reduced patients' WTP for electronic communication with their GP.

Similarly, while estimating patients' WTP for three selected healthcare services, this research controls for age, income, health status and previous use of the particular service.

5.2.6 Conclusion

The articles reviewed in Sections 5.2.5.1 to 5.2.5.4 reveal age, income, education level, health status and previous experience of the service as significant factors influencing patients' WTP value for healthcare services. Patients' WTP for a healthcare service and the factors affecting this value need to be identified to provide evidence to promote sufficient access and affordability to healthcare services. The findings within these studies are varied with respect to the elicitation format such as: open-ended, bidding game format, payment scale, discrete-choice and discrete-choice with follow-up, and the consequent data collection method that was appropriate to facilitate the elicitation method such as: interviews, self-completion questionnaires, telephone interviews, face-to-face questionnaires and secondary sources such as the Health and Retirement Study in the US (Asgary et al., 2004, Basu, 2013, Bergmo and Wangberg, 2007, Donfouet et al., 2011, Milligan et al., 2010, Nosratnejad et al., 2014). Overall, the study findings are consistent with theoretical expectations that patients with a higher income level are willing to pay more for healthcare services and patients with a lower income level are willing to pay less for healthcare services.

As noted from the studies in this review, the data sources for the studies are predominantly primary sources (Asgary et al., 2004, Baji et al., 2012, Basu, 2013, Bergmo and Wangberg, 2007, Carrere et al., 2008, Donfouet et al., 2011, Milligan et al., 2010, Nosratnejad et al., 2014, Olsen and Donaldson, 1998) while two studies used a secondary data source to estimate patients' WTP (Basu, 2013, Milligan et al., 2010). As this research aims to estimate what patients are willing to pay for three specifically selected healthcare services, primary data is necessary to answer the research question effectively.

The originally designed questionnaire that is specifically constructed for this research was designed in a manner which controls for the methodological issues that arise in WTP studies as reviewed in this section; ordering effects, embedding effect and protest zeros. The WTP scenarios presented in the research are designed to minimise these effects as described in Section 5.2.4.

5.3.11 A Comparison of the Factors Affecting WTP Decisions and how much Individuals are WTP

This section compares the results of the Chi2 and Fishers Exact test in Section 5.3.9 with the results of the Mann Whitney and Kruskal-Wallis tests in Section 5.3.10. The purpose of this analysis is to identify whether similar patient characteristics influence both the patients' decision to pay for the selected service and the amount they are willing to pay for the service.

When analysing these sections, it is apparent that socio-economic characteristics such as; PHI cover, GMS cover, DPS cover, education level and income are the main drivers in the patients' decision to pay and the amount patients' are willing to pay for each service.

While patients' WTP for a brain MRI scan was the only service to be significantly related to patients' gross monthly income level, the other significant socio-economic characteristics serve as a proxy for income such as; PHI cover, GMS cover, DPS cover and education. In Ireland, patients with higher income levels are those who are more likely to purchase PHI (HIA, 2014c). The descriptive statistics shown throughout Tables 5.8 and 5.9 indicate that patients with PHI cover are willing to pay more; to receive blood tests in the GP surgery; for quicker access to MRI scans; for receiving a branded version of a prescription drug relative to patients who do not have PHI cover. These significant relationships are consistent with economic theoretical expectations that people earning a higher income are willing to pay more. As discussed in Section

5.2.5.3, O'Brien and Gafni (1996) refer to this concept as construct validity which is an indication of reliable WTP values.

Construct validity is also confirmed when analysing the relationship between patients' WTP and GMS status. In Ireland, GMS status is granted primarily on an income basis; individuals below a certain income threshold are granted a GMS card. Table 5.8 and 5.9 show GMS patients are less willing to pay for blood tests, a brain MRI scan and a branded version of a prescription drug. These significant relationships are expected as GMS patients have a lower income and as suggested by economic theory, these patients are willing to pay less.

It is expected that patients with a higher education have a higher income level and subsequently, are willing to pay more for a service. Tables 5.8 and 5.10 confirm this expectation as patients with a third level education are willing to pay more for blood tests, a brain MRI and a shoulder MRI scan. More specifically in Table 5.10, patients with a third level education are found to be willing to pay more than patients with a lower education level.

In addition to socio-economic factors, patients' previous experience of the healthcare services also significantly influences patients' WTP. Patients who have previously had a blood test and patients who have previously had an MRI scan are willing to pay more for these services than patients who have not used these services before.

5.3 Methodology

5.3.1 Introduction

Section 5.3 presents the methodology used to answer the research question in this chapter;

What are Irish healthcare consumers willing to pay for three selected healthcare services (Blood tests, MRI scans and branded versus a generic prescription drug)?

A cross-sectional questionnaire was purposely designed to collect primary data from patients attending selected GP surgeries in Cork. The structure of the methodology for this research follows the best practice guidelines developed by O'Brien and Gafni (1996). O'Brien and Gafni's (1996) framework comprises nine considerations grouped into five general questions; 1) what question(s) does the research need to answer? 2) what type of measure is appropriate (WTP or Willingness-to-Accept (WTA))? 3) who forms the study sample, users or potential users of the healthcare services? 4) what characteristics of the healthcare services need to be defined in the scenarios? 5) what is the most appropriate elicitation format? (O'Brien and Gafni, 1996). Each of these questions is addressed in this section.

Section 5.3.2 describes the location of the data collection. Section 5.3.3 describes the data source. Section 5.3.4 explains the data collection procedure. Section 5.3.5 describes the questionnaire construction. Section 5.3.6 will present the descriptive statistics on the population sample. Section 5.3.7 presents the descriptive statistics on patients' WTP for each of the selected healthcare services. Section 5.3.8 presents the descriptive statistics on patients' previous use of the healthcare services while Sections 5.3.9 to 5.3.11 present the relationships between WTP and patient characteristics. Section 5.3.12 concludes the methodology section.

5.3.2 Location of Data Collection

Patients attending selected GP surgeries in Cork formed the data source. As suggested by the best practice guidelines, WTP values may be elicited from current users or potential users of the healthcare service that are the subject of evaluation (O'Brien and Gafni, 1996). As all GP surgeries provide and/or refer to the three selected healthcare services in this research, the waiting room of GP surgeries is an appropriate location for data collection as patients included in the sample are either current users or potential users of the healthcare services being valued.

Initially the questionnaires were to be distributed in pharmacies throughout Cork as patients waited for their prescriptions to be dispensed. This was because this questionnaire was initially only designed for Chapter 4 which focuses on prescription drugs. The decision was then made to distribute the questionnaire in GP surgeries, and following this decision, the questions for this chapter were added in. GP waiting rooms were identified as an appropriate location as patients have no choice but to wait for their consultation, therefore, having more time to complete the questionnaire.[121]

[121] As the questionnaire also collected data for the previous chapter in this thesis, "What impact have prescription drug user charges had on patient behaviour in Ireland?" this added to the length of the questionnaire and it was important respondents would have sufficient time to complete the entire questionnaire in order to provide data to answer both research questions.

5.3.3 Data Source

Access to the GP clinics was a continuing process (Marshall and Rossman, 2010, Robson, 2011). Initial contact was made with a doctor practising in Ballincollig, Co. Cork, Dr. Eamonn O'Grady.[122] Liaising with Dr. O'Grady, a list of 10 surgeries in Cork was generated as possible locations for data collection. There are currently 2,500 GPs in Ireland (HSE, 2013c) and 394 GPs practicing in Cork (PCRS, 2013).[123] A target of 10 GP surgeries was chosen due to time and financial constraints. Consequently, a convenient, non-probability sample forms the sample for this research. While the fast and inexpensive nature of this method of sampling is an advantage there is the inherent bias that a convenience sample may not be representative of the study population (Gravetter and Forzano, 2012). This research attempts to reduce this bias by including at least one GP surgery from each of the four Local Health Offices (LHO) in the Cork HSE region; North Cork, West Cork, Cork South Lee and Cork North Lee (see Table 5.2). Table 5.2 shows three surgeries included in the sample are found in the Cork South Lee region while there is only one GP representative for each of the other LHOs. This generates concerns regarding over-representation of Cork South Lee. However, Cork South Lee is the largest LHO in Cork with 156 GPs (PCRS, 2013), therefore it was important for the sample to sufficiently represent this area. Representation bias was further reduced as GPs in Ireland treat all patients. Consequently, including patients from the four LHO regions in Cork controls for varying patient demographics and socio-economic characteristics.

[122] Dr. Eamonn O'Grady became the supporting GP for the data collection process.
[123] This figure is a combination of the number of GPs in Cork South Lee (156 GPs), Cork North-Lee (130), North Cork (62) and West Cork (46) (PCRS, 2013).

The contact process involved a phone call to each surgery to introduce the researcher and the research and to request that the questionnaire be distributed in the surgery. Following a request for the surgery's email address and with permission from the administration staff, a follow-up email was sent to each surgery with a cover letter from the supporting GP (see Appendix C.1) and a copy of the questionnaire (see Appendix C.2). Of the 10 surgeries contacted in Cork, six of the surgeries agreed to the distribution of the questionnaire to patients in their waiting rooms (see Table 5.2).[124] Following best practice, this access approach was adopted as recommended by Saunder, Lewis and Thornhill (2009).

The Social Research Ethical Committee (SREC) in University College Cork approved the research protocol and the questionnaire (see Appendix C.3).

[124] The overall excuse for refusal was concerns regarding patient confidentiality and fears that patients may feel uncomfortable disclosing information required in the questionnaire such as income level.

Table 5.2 General Practitioner List

Surgery Number	Contact Doctor	Surgery Name	Address	Local Health Office
1	Dr. Gerard O'Shaughnessy	Skibbereen Medical Centre	Market Street, Skibbereen, Cork.	West Cork
2	Dr. Denis Twomey	Classes Lake Medical Centre	Classes Lake, Ballincollig, Cork.	Cork South Lee
3	Dr. Tom English	Broad lane Family Practice	72 Great William O'Brien Street	Cork North Lee
4	Dr. Eamonn O'Grady	The Clinic*	Old Quarter Ballincollig, Cork	Cork South Lee
5	Dr Eamonn O'Grady	Barnagore*	Ovens, Co. Cork	Cork South Lee
6	Dr. Brendan Payne	High Street Medical Centre	High Street, Newmarket, Co. Cork	North Cork

Note: *The data collected from the Clinic and Barnagore practices were merged together by the administration staff as the same contact doctor was located in both.

Source: Authors Own

5.3.4 Data Collection Procedure

Questionnaire distribution began in December 2014 and finished at the end of January 2015. Due to the convenient nature of the sample and based on previous literature, 300 patients were sampled. Questionnaires were randomly distributed by the administration staff to patients over 18 years of age as they entered the surgeries. Administration staff were given a brief to deliver to the potential respondents (see Appendix C.4). In this brief, potential respondents were informed that this questionnaire was part of a research project in University College Cork and they were assured anonymity. The respondents were advised to complete the questionnaire as they waited for their consultation with the doctor. The patient was then invited to return the completed questionnaire to a clearly labelled box provided at reception. On average, questionnaires were distributed by the administration staff in each surgery for 4 weeks during this two-month period. These two months were chosen for data collection as December and January are two of the busiest months in a GP practice (according to expert opinion). These busy periods would allow for a larger sample size within this short timeframe.

It is important to note that face-to-face interviews were another consideration for data collection but this method was not conducive to generating a large sample size and proved to be more time-consuming in the pilot study. The nature of the data collected in the questionnaire was sensitive and therefore, it was not appropriate to conduct such interviews in this location.

5.3.5 Questionnaire Construction

When deciding on the data collection instrument, it was important to acknowledge the sample source in order to ensure a reliable sample and ensure minimum disruption to the services in the GP waiting room. Interviews with patients were not deemed appropriate due to the enclosed nature of GP waiting rooms. Patient confidentiality would be at risk in this situation. Therefore, a self-completion questionnaire was most appropriate to answer the research question accurately. This methodology allowed for efficient data collection from a large group of respondents.

As the same information was required from all patients in the six surgeries, a standardized self-completion questionnaire was suitable. The self-completion questionnaire also ensured anonymity for the patient as possible reactive effects of direct contact between the researcher and respondent were eliminated (Sim and Wright, 2000). However, this eliminated the possibility to explore questions in depth or seek clarification from the respondent (Sim and Wright, 2000). Due to the factual nature of the answers required this concern was overcome due to a well-constructed standardized questionnaire including pre-determined responses generated from the literature review and discussions with the supporting GP. Further clarification from the respondent was not necessary. Another disadvantage associated with this methodology is that there is no guarantee the respondent will answer the questionnaire as anticipated by the researcher i.e. at the correct time or in the correct order (Sim and Wright, 2000). This was controlled using clearly labelled instructions and questions throughout the questionnaire.

To achieve reliable results, the questionnaire was easy-to-follow and used clear direction and instructions. This was accomplished using factual questions for the majority of the questionnaire. The reliability of the questionnaire was tested by conducting a pilot study (1st and 2nd July 2014). The pilot study was conducted in two GP surgeries in Cork; The Clinic and Classes Lake Medical Centre where 10 surveys were distributed and collected in each surgery. Consistent reliable results were found which indicated a reliable questionnaire had been constructed. Assessing the validity of the questionnaire proved to be more difficult as validity is usually established after the event (Oppenheim, 1992). Following the guidelines of O' Brien and Gafni (1996), the validity of the questionnaire was conducted by examining the relationship between the independent variables and the dependent variables to examine the conformity of the results with theoretical explanations (See Sections 5.3.9, 5.3.10 and 5.3.11). If the expected results were found, the validity of the measurement was confirmed (O'Brien and Gafni, 1996).

To contain costs, the questionnaire was printed in black and white; except for page 5 of the questionnaire. This was due to colour coded instructions that were necessary to include on this page. The questionnaire was printed back-to-back which resulted in two pages in total. It was acknowledged that shorter questionnaires with concise completion time encourage a higher response and this was taken into consideration in the questionnaire design process (Dillman, 2000). This was important as the patient was completing the questionnaire in the GP waiting room and it was the researcher’s aim that patients would complete and submit the questionnaire before their consultation. This reduced the risk of incomplete and/or mislaid questionnaires.

Each questionnaire included an introduction to inform potential respondents of the questionnaire’s aims and why this area of research was chosen. In addition, respondents were informed why they were chosen as a suitable candidate. Once they agreed to take part, they were asked to indicate this on the attached consent form.

The questionnaire required information regarding community drug cover, PHI cover and patients’ income level. Due to the confidential nature of this information, it was assured that this information would not be disclosed to anyone. To ensure anonymity, the respondents’ name was not required on the questionnaire. Respondents are more willing to provide information if they know the questionnaire is anonymous (Babbie, 2009). The potential respondent was advised that participation was voluntary and they could leave the questionnaire at any stage.

Due to the nature of the questionnaire, a debriefing process was not necessary. However, if the respondent had questions regarding the questionnaire (before/after completion) they could consult a list of FAQs, which were available at the reception of the surgery (see Appendix C.5).

In the questionnaire itself, there are three sections in total. The questionnaire adopted a funnel approach i.e. it began with broad demographic questions such as the respondent's age and gender, socio-economic variables such as education, nationality and healthcare cover. The questions then narrowed down to measure the dependent variables; WTP for blood tests, WTP for MRI scans and WTP for a branded over a generic prescription drug.

The following paragraphs will discuss the three sections included in the questionnaire to identify and justify the nature of the variables included in each section.

Section 1 explored patient demographics, community drug cover, PHI cover, health status and number of chronic illnesses. This section included nominal, continuous and categorical variables in order to generate an understanding of the customer base in the GP surgeries. Section 2 measured patients' income in terms of their monthly gross income level. To minimise non-response for this variable, respondents were presented with an interval scale including 6 ranges. Finally, Section 3 measured the dependent variables which estimate patients' WTP for the identified healthcare services. The dependent variables are continuous in nature as they measure the monetary value the patients place on each healthcare service.

The majority of the questions that appeared in the questionnaire are closed-ended. This research is of a quantitative nature, therefore, valid and reliable results were required. Closed-ended questions were chosen as they are less time-consuming and more concise given the time constraints placed on the patients (Oppenheim, 1992). Consequently, closed-ended questions are associated with a high response rate (Dillman, 2000). This permitted easier interpretation and coding of the data. The codebook can be found in Appendix C.6.

5.3.5.1 Development of Elicitation Format

As described in Section 5.2.3 of this chapter, various questionnaire formats can be implemented in contingent valuation studies such as; open-ended, bidding, payment scale, discrete choice and discrete choice with follow-up questions (Smith 2000). Each format has its own strengths and weaknesses to be assessed before deciding on the most appropriate format. Immediately, the open-ended format was dismissed for the current research due to the strategic bias that arises when using this format (Smith, 2000). The bidding game was also rejected due to the nature of the format which requires interview techniques to present the different bids to the respondents. Before finalising the elicitation format, a number of issues had to be addressed; 1) The length of the format was of concern as the WTP estimates were collected on the same questionnaire that was used in chapter 4 of this PhD; "What impact do prescription drug user charges have on patient behaviour in Ireland?" 2) Selecting a feasible method for measuring WTP was constrained. Time and monetary constraints determined the method of the elicitation format. The DCE was deemed inappropriate as a large sample size is necessary for this format to be efficient, therefore requiring a lengthy data collection time-frame. Similar to the bidding game format, a discrete choice with a follow-up question was also considered unsuitable for this research as interviewing patients for the follow-up questions was not possible. Due to these limitations and the identified mode of data collection (self-completion questionnaire), a payment scale was identified as the most appropriate method of elicitation.

5.3.5.2 Payment Scale Construction

The elicitation format was constructed in three phases. First, the CVM literature in healthcare was reviewed to identify the general structure of the elicitation format. Second, once the format was constructed, it was reviewed by a healthcare professional for content validity. Finally, the entire questionnaire including the elicitation format was pilot tested on 10 patients between the 1st and 2nd of July 2014.

As explained in Section 5.2.3 of this chapter, the payment scale technique was developed by Mitchel and Carson (1981) and is one of the most widely used elicitation format in healthcare studies (Klose, 1999, O'Brien and Gafni, 1996, Smith, 2000). Payment scales present a range of values to respondents. Respondents indicate the maximum amount they are willing to pay. The scale begins at 0 and presents incremental values with a blank space at the end for respondents to fill in WTP if it is beyond the range presented (Smith, 2000). There are a number of advantages associated with this format; payment scales mimic real-life situations (Ryan et al., 2004). In comparison to the open-ended format and the bidding game, payment scales provide a context for the bids which reduces outliers, they encourage a high response rate when the scenarios are easily interpreted (Donaldson et al., 1995) and a strong association is found between WTP and ability to pay when using payment scales (Donaldson et al., 1997). This refers to the concept of construct validity as discussed in Section 5.2.5.3. WTP results elicited using payment scales are consistent with theoretical expectations such as; a higher WTP values associated with higher income levels (Drummond et al., 2015). Construct validity is tested in Sections 5.3.9 and 5.3.10. The main disadvantage associated with the payment scale format is the risk of bias relating to the values used on the card. To overcome this, the best practice guidelines produced by O'Brien and Gafni (1996) were followed throughout the construction of the WTP scenarios to make the scenarios as realistic as possible. It was important for the WTP scenarios to fit in the context of the Irish healthcare system and to incorporate a method of payment which the respondents are familiar with (O'Brien and Gafni, 1996).

The WTP scenarios present a detailed description of each healthcare service; the service as it currently exists in Ireland and the features of the service which were contingent on the patient making the payment. As this research estimates WTP for three healthcare services, three WTP scenarios were constructed. The scenarios are presented separately and independently on the questionnaire (see Appendix C.2). Presenting the scenarios independently ensures respondents will not perceive their WTP responses as cumulative and consequently reduce their WTP amount for the other healthcare services (Donaldson et al., 1997, Frew et al., 2004). This reduces the impact of the ordering effect as discussed in Section 5.2.4.1.

In each scenario on the questionnaire, respondents are presented with a payment scale consisting of a series of values listed from low to high (including zero) and increasing in defined increments. Each scenario presents the same payment scale to all respondents; payment scales are not varied. Respondents are instructed to indicate the maximum amount they were WTP OOP for each service. OOP payment was chosen as the payment vehicle as patients in Ireland are becoming more exposed to direct user charges as a form of payment for healthcare. Literature also deems this an appropriate method for payment when the patient is personally involved in the payment for the services (Carrere et al., 2008). Patients who were willing to pay a value that was not included on the payment scale were instructed to indicate their WTP value in the blank space provided at the end of the payment scale. This technique reduced the risk of range bias (Liu et al., 2013).

Patients are also asked to report if they have previously used each of the three healthcare services. CVM literature identifies patients' previous experience of a service to impact their valuation of that service (Stewart et al., 2002). It is also argued that respondents who have previous experience with a particular programme have a better understanding of its value to them and consequently will not be influenced by the order of the WTP questions (Boyle et al., 1993, Kartman et al., 1996). Consequently, this research controls for patients' previous experience.

The first scenario measures patients' WTP to receive blood tests in GP surgeries (See Figure 5.2).[125] Following best practice guidelines by O'Brien and Gafni (1996), the

[125] The quality of care when receiving blood tests is assumed to be equal in both the GP surgery and hospital setting. Regardless of the access route the patient follows; the blood tests are tested in a hospital lab. The €5 charge in the GP surgery is only to cover transport costs to transport the blood test to the hospital. The user charge in the GP surgery is not a reflection of the quality of care. The

scenario provides the respondent with a description of the service, indicates that the service already exists in the Irish healthcare system and acknowledges the features of the service for which the patient will pay OOP. Receiving faster and more convenient access to blood tests is contingent on the patient paying a user charge. The payment scale presents a range of €0, €5, €10, €15, €20, €25, €30 and €35 with a blank space provided at the end should the patients' WTP exceed these values. This is included to reduce range bias (Donaldson et al., 1997, Liu et al., 2013).

The second scenario asks patients their WTP for an MRI test. As shown in Figure 5.3, there are two scenarios presented to respondents to estimate their WTP for MRI scans.[126] The first MRI scenario estimates patients WTP for an MRI scan as a result of shoulder pain while the second scenario estimates patients WTP for an MRI due to persistent headaches. When estimating WTP for MRI scans, it is important to note that the associated diagnosis influences a patients WTP (Lin et al., 2013). Estimating WTP for a shoulder MRI and a brain MRI controls for patients' perceived severity of the expected diagnosis. Similar to scenario 1, the second scenario defines an MRI scan, explains the current access route to this service in the Irish healthcare system, which consequently identifies the attributes which are contingent on the patient making an OOP payment. In this scenario, the attributes contingent on payment speed up access to MRI scans. The payment scale in both scenarios present values ranging from €0 to €400 in increments of €50. To reduce potential range bias, a blank space was provided at the end of the payment scale should patients' WTP exceed the presented range of

quality of care in both locations is equal. However, the quality of the service may differ as a result of the different access routes and subsequent waiting time as described in Figure 5.2.

[126] The quality of care when receiving an MRI scan in a hospital or scan centre is assumed to be equal as the same equipment (MRI scanner) is used in each location. However, depending on the patients' WTP, the quality of the service will differ with regard to waiting time, as described in Figure 5.3.

values (Donaldson et al., 1997, Liu et al., 2013). The third scenario asks the participants their WTP value for a branded instead of a generic version of a cholesterol-lowering drug (See Figure 5.4). Cholesterol-lowering medication was chosen for inclusion as it was amongst the top 10 most commonly prescribed drugs under the GMS and DPS community drug scheme in 2013 (PCRS 2013).[127] At the time, there was a significant price discrepancy between the generic price (Rosuva) and branded price (Crestor) of the cholesterol lowering drug. A one-month supply (28 tablets) of Rosuva 10mg was €7.94 while a one-month supply of Crestor 10mg was €19.44. Despite this cost difference, GMS patients still pay €2.50 per item regardless of whether they receive the branded or generic version[128] while non-GMS patients will pay the actual costs. On the basis of price variation between branded and generic versions, these cholesterol drugs were chosen for inclusion in this WTP scenario. As shown in Figure 5.4, the same scenario is presented to GMS and non-GMS patients while slightly different payment scales are presented in order to capture the cost difference for GMS and non-GMS patients. This enforces a more realistic scenario for patients.[129] The scenario defines branded and generic drugs and refers to the concept of generic substitution on behalf of the pharmacist. Receiving a branded drug over a generic drug is contingent on the patient increasing their OOP cost.[130] The intended payment scale for GMS payments runs from €0 to €30 in increments of €5. The payment scale for patients without a GMS card begins at €0, continues with €10 and

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[127] At the time there were two cholesterol-lowering ingredients in the top 10 most commonly dispensed drugs under the DPS and GMS schemes (PCRS, 2013). One of these ingredients was atorvastatin which is the ingredient in the branded version "Lipitor" while Rosuvastatin was also amongst the top 10 most commonly dispensed prescription drugs which is the branded version "Crestor". Atorvastatin was the most common amongst the two, however Lipitor came off patent in Ireland in late 2011 and consequently there was no price difference between the generic and branded version of this drug.

[128] This was the case until generic substitution and referencing pricing was introduced Ireland in 2013.

[129] The data collected in this scenario from both GMS and non-GMS patients are combined into one variable to estimate what patients are willing to pay for a branded version of cholesterol drug instead of a generic version of the same drug.

[130] This is the case unless the prescribing GP writes "Do not substitute" on a patients' prescription.

increases in values of €5 up to €30. The payment scale for non-GMS patients does not include a €5 value as this value is lower than the existing market price. This is the only difference between the payment scales for GMS and non-GMS patients. To achieve reliable results for use by policy makers, it was desirable to include values based on actual market prices. In both payment scales a blank space is provided should the respondents' WTP exceed the values they are presented with.

Figure 5.2 WTP Scenario for Blood Tests

EXAMPLE 1: Blood tests help doctors check for certain diseases and conditions. In Ireland, a GP can perform blood tests in the surgery but you may face a charge for this service. Alternatively, you can arrange an appointment in the outpatient department of a hospital where you can receive the blood tests for **free** but with a longer waiting time.

Q20. What is the maximum price **you** are willing to pay to the GP for blood tests in the GPs surgery?

☐ €0, I would rather wait to receive the blood tests for free as an outpatient

☐ €5 ☐ €10 ☐ €15 ☐ €20 ☐ €25

☐ €30 ☐ €35

☐ OR please state the maximum amount you are willing to pay €____

Q21. Have you had a blood test before?

☐ Yes ☐ No

Figure 5.3 WTP Scenarios for MRI Scans

EXAMPLE 2: An MRI (Magnetic Resonance Imaging) is a type of scan that is often used to diagnose health conditions that affect organs, tissue and bone. In Ireland, you can receive an MRI for **free** but with a possible waiting time of 6 months to one and a half years. Alternatively, you can **pay** to receive an MRI within a shorter time frame (e.g. 2 weeks) in a hospital or scan centre.

Q22. Please assume situation A AND B in a healthcare system where private health insurance DOES NOT exist.

Situation A:
You have been suffering with **shoulder pain** for the last month. Your GP has referred you for an MRI scan.
What is the maximum price **you** are willing to pay to the hospital/scan centre to receive this scan within 2 weeks from the time of the referral?

☐ €0, I would rather wait to recieve the MRI for free

☐ €50 ☐ €100 ☐ €150

☐ €200 ☐ €250 ☐ €300

☐ €350 ☐ €400

☐ OR please state the maximum amount you are willing to pay €______

Situation B:
You have been suffering with **headaches** for the last month. Your GP has referred you for an MRI scan.
What is the maximum price **you** are willing to pay to the hospital/scan centre to receive this scan within 2 weeks from the time of the referral?

☐ €0, I would rather wait to recieve the MRI for free

☐ €50 ☐ €100 ☐ €150 ☐ €200

☐ €250 ☐ €300 ☐ €350 ☐ €400

☐ OR please state the maximum amount you are willing to pay €_______

Figure 5.4 WTP Scenario for a Branded Over a Generic Cholesterol Lowering Drug.

Q24. Are you currently taking a prescribed drug to treat a high cholesterol level?

☐ Yes ☐ No If yes, please name the drug

_________________________ (Please State)

→ ***If you have a <u>LONG-TERM ILLNESS (LTI)</u> book, you may now submit the survey***

→ ***If you have a <u>MEDICAL CARD</u> please read example 3 and answer Q25 ONLY.***

→ ***If you have <u>NO LTI OR MEDICAL CARD</u>, please read example 3 and answer Q26 ONLY and then submit the survey.***

<u>EXAMPLE 3:</u> Your cholesterol is at a high level which could mean you are at risk of having a heart attack or a stroke. As a result, your GP has prescribed a cholesterol lowering drug. Your pharmacist, over the course of your treatment, may substitute a prescribed branded drug for a generic drug to treat a high level of cholesterol. The generic is as effective as the branded drug.

Q25. <u>MEDICAL CARD HOLDERS ONLY: PLEASE ASSUME THE FOLLOWING SITUATION:</u>

You currently pay €2.50 for the generic version of this drug (For example: Rosuva 10mg, 28 tablets).

What is the maximum price **<u>you</u>** are willing to pay to the pharmacy for the branded version of this drug (For example: Crestor 10mg, 28 tablets)?

☐ Not willing to pay any extra ☐ €5 ☐ €10 ☐ 15 ☐ €20 ☐ €25 ☐ €30

☐ OR please state the maximum amount you are willing to pay €_____

Q26. <u>NON-MEDICAL CARD HOLDERS: PLEASE ASSUME THE FOLLOWING SITUATION:</u>

You currently pay €7.94 for the generic version of this drug (For example: Rosuva 10mg, 28 tablets).

What is the maximum price **<u>you</u>** are willing to pay to the pharmacy for the branded version of this drug (For example: Crestor 10mg, 28 tablets)?

☐ Not willing to pay any extra ☐ €10 ☐ €15 ☐ €20 ☐ €25 ☐ €30

☐ OR please state the maximum amount you are willing to pay €_____

It was necessary to construct the scenarios in a manner which effectively defined the good and the features which were contingent on payment by the patient. As three scenarios are presented it was necessary not to "overload" the respondents with too much information. This would complicate the scenarios for respondents and obscure the results. Therefore, concise and comprehensible information was critical in the construction of each scenario.

The payment vehicle is defined as a direct OOP payment made by the patient to the provider of the particular health service. As user charges are gaining popularity as a method of financing Irish healthcare, a direct OOP payment is an appropriate payment vehicle for this research. Including this payment method creates a sense of realism for the respondent as this method fits in the context of Irish healthcare (Carrere et al., 2008). The research presumes that direct OOP payments capture WTP values better than a payment method that spreads the cost across other users also.

5.3.6 Descriptive Statistics

Initially, 220 questionnaires were collected out of 300 questionnaires. Six questionnaires were excluded from the analysis as they were incomplete. This resulted in a total of 214 respondents with a response rate of 71%. The collected data was analysed using STATA 14. Descriptive statistics on patient characteristics (demographic and socio-economic) are presented. Percentage frequencies are examined to generate a response profile for WTP for the 3 selected healthcare services (Liu et al., 2013, Marvasti, 2006). Finally, relationships between patients' WTP and socio-economic and demographic characteristics are examined.

5.3.6.1 Patient Demographics

Table 5.3, shows the sample is predominantly female (68%) and Irish (95%).[131] The average age is 46 years.[132] Half of the sample, (50%) report a health status between good, fair and poor health. As the patients in the sample are waiting to see their GP, it is presumed they are sick. This will influence their self-reported health status. Corresponding to the self-reported health status statistics, just over half of the sample report having at least one chronic illness (52%).[133]

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[131] The gender composition of this sample is slightly different from the national statistic where there is a broadly equal prevalence of males and females. The location of the data collection for this research may be the cause for the over-representation of females in this sample as females are higher users of GP services (Nolan & Smith 2012) . The nationality of this sample is representative of the national average where the majority of the population is Irish (88%) (CSO. 2014c).

[132] This is slightly higher than the national median age in Ireland (36.1 years) (CSO. 2014a).

[133] The number of chronic illnesses is controlled for in the questionnaire by asking respondents to report whether they have taken a prescription medication in the last 12 months to treat a chronic illness. In question 12 in the questionnaire, the patients are presented with a list of 17 chronic conditions from which they can choose from. The number of conditions they report represents the number of chronic illnesses a patient has.

Table 5.3 Patient Demographics

	Surveyed Patients N = 214	%
Gender		
Male	67	(31.31)
Female	145	(67.76)
Missing	2	(0.93)
Total	**214**	**(100)**
Age		
Mean	45.86	
Range	19-84	
Nationality		
Irish	204	(95.33)
UK	6	(2.80)
Other	3	(1.40)
Missing	1	(0.47)
Total	**214**	**(100)**
Marital Status		
Single	54	(25.23)
Married	139	(64.95)
Separated	3	(1.40)
Divorced	8	(3.74)
Widowed	10	(4.67)
Total	**214**	**(100)**
Health Status		
Excellent	27	(12.62)
Very good	79	(36.92)
Good	76	(35.51)
Fair	25	(11.68)
Poor	7	(3.27)
Total	**214**	**(100)**
Number of Chronic Illnesses		
No chronic illness	102	(47.66)
1 chronic illness	63	(29.44)
2 chronic illnesses	31	(14.49)
3 or more chronic illnesses	18	(8.41)
Total	**214**	**(100)**
Reason for Visit		
Minor illness	83	(38.79)
Repeat prescription	22	(10.28)
Routine check-up	28	(13.08)
Chronic illness follow-up	10	(4.67)
Doctors certificate	3	(1.40)
Accompanying child	27	(12.62)
Maternity check-up	8	(3.74)
Other	13	(6.07)
More than 1 reason	18	(8.41)
Missing	2	(0.93)
Total	**214**	**(100)**

5.3.6.2 Socio-Economic Characteristics

In Table 5.4, at least 50% of the sample have a gross monthly income level below the national average[134] yet 58% of the sample report a third level education Within the sample, 35% of the sample are in possession of a GMS card. This is relatively representative of the 40% national average figure (PCRS, 2013). The presence of GMS patients in the sample is justifiable as GMS status in Ireland is primarily granted on an income basis.[135] With regard to the other two main community drug schemes, 35% of the sample have a DPS card while 14% of the sample have LTI cover.[136] Within this sample, 33% have no form of community drug cover. There is a high presence of PHI cover in the sample (64%) in comparison to the 44% national figure (HIA, 2014c).

[134] The gross monthly average earnings in Ireland are €3,023 (CSO, 2015).

[135] For example, to be eligible for the GMS scheme, the gross weekly rate income threshold for a person under 65 years living alone is €184 (HSE, 2015c)

[136] With regard to GMS and DPS, these figures are representative of the national average where 40% of the population have a GMS card and 31% have a DPS card. The LTI coverage in the sample population is much higher than the national average where almost 2% of the population have an LTI card.

Table 5.4 Socio-Economics Characteristics

	Surveyed Patients N = 214	%
Education		
Primary	13	(6.07)
Secondary	72	(33.64)
Third level	125	(58.41)
Other	3	(1.40)
Missing	1	(0.47)
Total	**214**	**(100)**
Gross Monthly Income		
<€1,000	47	(21.96)
€1,000 - €2,249	62	(28.97)
€2,250 - € 3,499	34	(15.89)
€3,500 - €4,749	22	(10.28)
€4,750 - €5,999	11	(5.14)
€6,000+	15	(7.01)
Other[137]	9	(4.21)
Missing	14	(6.54)
Total	**214**	**(100)**
Private health insurance		
Yes	137	(64.02)
No	77	(35.98)
Total	**214**	**(100)**
Community Drug Cover		
GMS	75	(35.05)
DPS	74	(34.58)
LTI	31	(14.49)
No community cover	71	(33.18)
Total	**251**[138]	

[137] When reporting gross monthly income (Question 19), patients were given the opportunity to tick an "other" category if their monthly income level was not listed. Patients who chose this category were asked to state what their monthly income was. The responses from the 9 respondents included; student income, semi-retired, old age pension and unemployed.

[138]As seen in Table 5.4, the total figures (251) under community drug cover are higher than the sample size (214). This is due to patients in the sample having more than one form of community drug cover. A patient with an LTI book may apply for a DPS and/or a medical card should they be eligible. In this case, it most commonly occurs when a prescription drug unrelated to the long-term illness is prescribed to the patient. This drug will not be covered under the LTI scheme therefore the patient will need to pay the full cost of the medication. People should not have both GMS and DPS cover in Ireland but there are some exceptions. Due to the rare circumstances where patients have more than one form of cover, this is not accounted for in the analysis in this section but it is noted.

5.3.7 Patients' WTP for the 3 Selected Healthcare Services

Table 5.5 presents the WTP statistics for the selected healthcare services reported by patients in the sample. The number of patients who are willing to pay (WTP>0) and not willing to pay (WTP=0) for each service are presented in this table. Table 5.6 presents the median WTP values for each healthcare service. The research presents the median WTP value rather than the mean WTP value as the mean response is subject to bias due to outliers in WTP values (Buckland et al., 1999). The median value reports the WTP value that the 50th percentile are willing to pay (Heiman, 2011).

Table 5.5 Patients' WTP for the Selected Healthcare Services

Service	Surveyed patients (n)	%
WTP for blood tests		
WTP = €0	27	12.62
WTP > €0	171	79.91
Missing	16	7.48
Total	**214**	**(100)**
WTP for shoulder MRI		
WTP = €0	30	14.02
WTP > €0	156	72.90
Missing	28	13.08
Total	**214**	**(100)**
WTP for brain MRI		
WTP = €0	23	10.75
WTP > €0	163	76.17
Missing	28	13.08
Total	**214**	**(100)**
WTP for a branded drug		
WTP = €0	98	45.79
WTP > €0	79	36.92
Missing	37	17.29
Total	**214**	**(100)**

Table 5.6 Median WTP Values for the Selected Healthcare Services

Service	Median WTP	Current Market Price
Blood Test	€20[139]	
GMS	€12.50	€5
Non-GMS	€20	€10 (depending on type of test)
Shoulder MRI	€100	€200 (without PHI)
Brain MRI	€150	€200 (without PHI)
Branded drug	€10[140]	
GMS	€5	€2.50
Non-GMS	€10	Drug cost (subject to deductible)

The following sections will discuss the descriptive statistics for whether or not patients are WTP for the healthcare services and will also identify the amount they are WTP for each with a comparison to the existing market price.

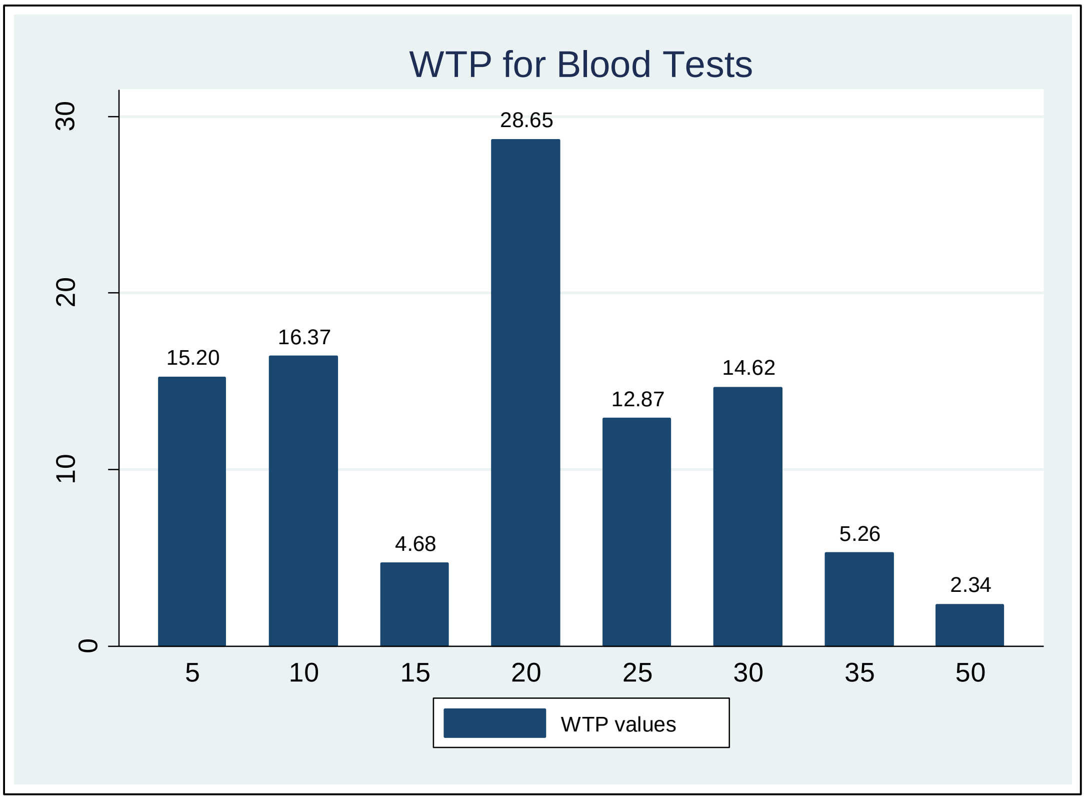
5.3.7.1 WTP for Blood Tests

In Table 5.5, 80% of the sample are willing to pay (WTP > €0) to receive blood tests in their GP surgery while 13% are not willing to pay (WTP = €0) for this service. These statistics indicate that patients are willing to pay to receive blood tests in their GP surgery to avoid the time-consuming process of attending a public hospital to receive the service for free. These statistics suggest patients' value convenient care. Figure 5.5 shows the percentage frequencies of the WTP values for blood tests within the sample. Only observations with a positive WTP value (WTP>0) for blood tests are presented in Figure 5.5. Of the patients who are willing to pay for blood tests, 15%

[139] This median value presents the combined median value reported by both GMS and non-GMS patients.
[140] See footnote 139.

are willing to pay €5 for this service, 16% are willing to pay €10, 5% are willing to pay €15, 29% are willing to pay €20, 13% are willing to pay €25, 15% are willing to pay €30, 5% are willing to pay €35[141] and 2% are willing to pay €50.

Figure 5.5 WTP for Blood Tests



As shown in Table 5.6, the patients' median WTP for blood tests is €20. It is necessary to examine this WTP value in terms of GMS patients and non-GMS patients and whether the reported WTP values are comparable to the existing market cost. The median WTP for blood tests in GP surgeries reported by GMS patients is €12.50. As shown in Table 5.6, the current market cost for GMS patients to receive blood tests in GP surgeries is €5.[142] These descriptive statistics show that 50% of GMS patients in

[141] It is important to note that €35 was the highest value presented on this payment scale. Any values beyond this are WTP values that were stated by the respondent.
[142] As explained in Section 5.1.2, this recently introduced user charge is to cover hospital transport costs.

this sample are willing to pay over twice the amount than the market price. The median WTP value for blood tests reported by non-GMS patients is €20. As described in Section 5.1.2, it is at the discretion of the GP whether they charge non-GMS patients for blood tests. If so, GPs generally increase their consultation cost by €10 should a non-GMS patient require a blood test. The descriptive statistics in this research reveal non-GMS patients are willing to pay double the potential user charge.

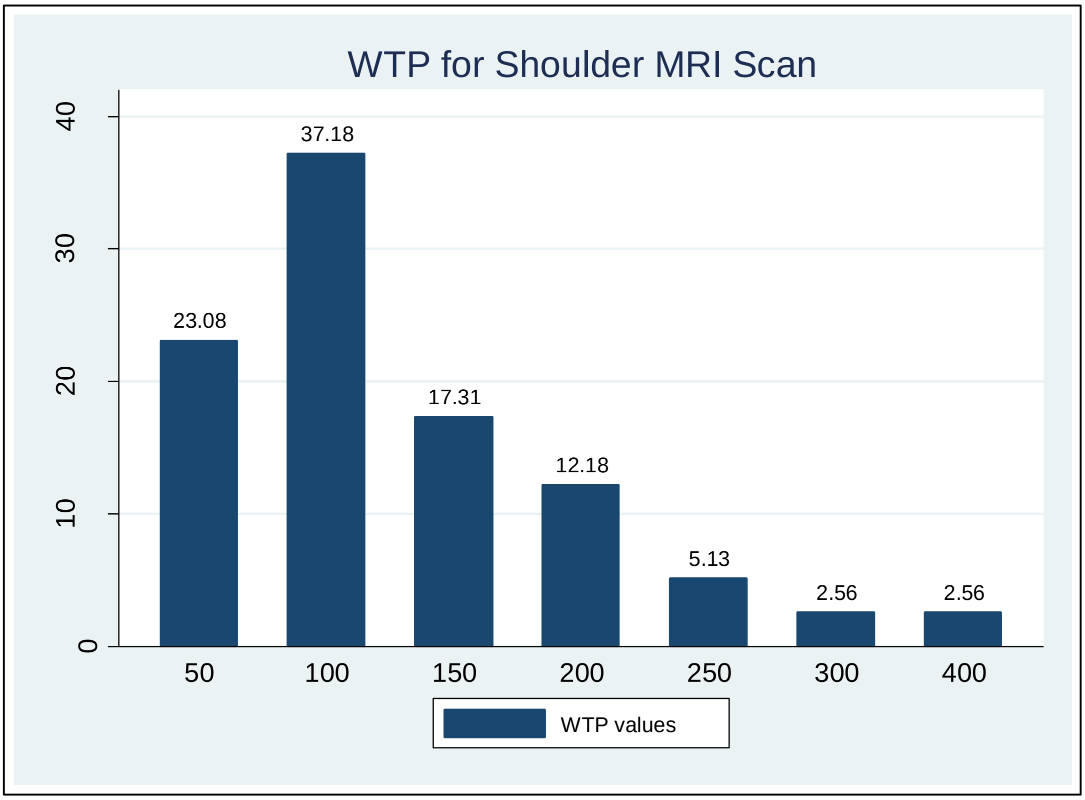
These statistics suggest that non-GMS patients are willing to pay more (€20 median) than GMS patients (€12.50 median) for blood tests in GP surgeries. As GMS cards are primarily granted on an income basis, the possession of a GMS card serves as a proxy for patient income levels. These statistics show that patients with higher incomes (non-GMS patients) are willing to pay more than patients with a lower income level (GMS patient). This indicates that the data is consistent with theoretical expectations which strengthens the credibility of the WTP values elicited by the patients in the sample (Drummond et al., 2015, Klose, 1999).

5.3.7.2 WTP for MRI Scans

As mentioned in Section 5.3.5, two scenarios were constructed when estimating patients' WTP for MRI scans; WTP for a shoulder MRI and WTP for a brain MRI. As acknowledged in previous literature, this was to control for the severity of the diagnosis. Therefore, descriptive statistics are presented in this section for both types of MRI scans.

In Table 5.5, just under three quarters of the sample (73%) are willing to pay (WTP > 0) to receive a shoulder MRI scan within 2 weeks while 14% of the sample are not willing to pay (WTP = 0) to receive faster access to this service. These patients are willing to wait 6 months to one and a half years to receive the scan. Figure 5.6 presents the percentage frequencies of the WTP values for the patients who are willing to pay to receive quicker access to a shoulder MRI scan. Only observations with a positive WTP value (WTP>0) for shoulder MRI scans are presented in Figure 5.6. In Figure 5.6, 23% of these patients are willing to pay €50, 37% are willing to pay €100, 17% are willing to pay €150, 12% are willing to pay €200, 5% are willing to pay €250, 3% are willing to pay €300 and 3% are willing to pay €400. No patient in the sample was willing to pay in excess of €400. As shown in Table 5.6, the median WTP value in the sample for a shoulder MRI scan is €100. As the current market price to receive an MRI scan (without PHI) is €200, this statistic indicates that 50% of patients in this sample are only willing to pay half of this price to receive faster access to a shoulder MRI scan and over three quarters of people who are willing to pay are willing to pay less than €200.

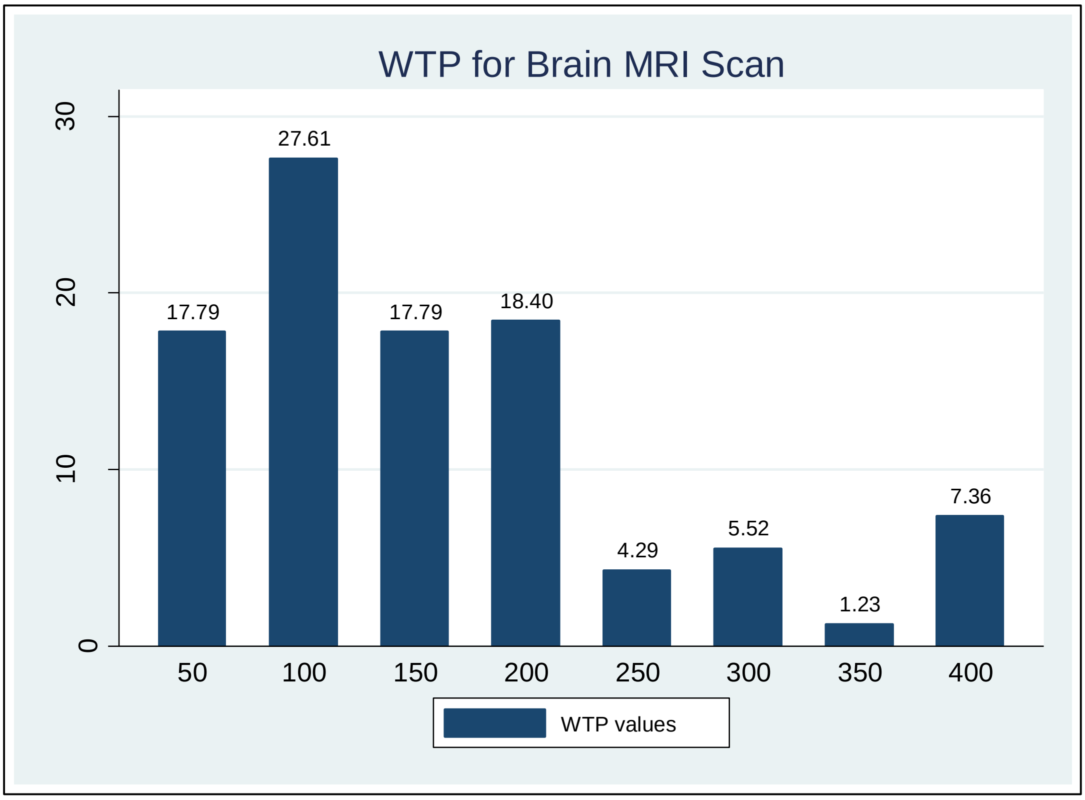
Figure 5.6 WTP for a Shoulder MRI Scan



With regard to WTP values for an MRI scan due to persistent headaches, Table 5.5 shows 76% of patients are willing to pay (WTP>0) OOP to receive quicker access to this service while 11% of patients are not willing to pay (WTP=0) for this service. These patients are willing to wait six months to one and a half years to receive the scan. Figure 5.7 presents the percentage frequencies for patients' WTP for a brain MRI Scan. Only observations with a positive WTP value (WTP>0) for brain MRI scans are presented. In Figure 5.7, 18% of these patients are willing to pay €50 for quicker access, 28% are willing to pay €100, 18% are willing to pay €150, 18% are willing to pay €200, 4% are willing to pay €250, 6% are willing to pay €300, 1% are willing to pay €350 and 7% are willing to pay €400. No patient in the sample was willing to pay in excess of €400. The median value that patients are willing to pay OOP to receive quicker access to a brain MRI is €150 (see Table 5.6). Figure 5.7 shows that over 60%

are not willing to pay the market price of €200 for an MRI scan on the brain (without PHI cover).

Figure 5.7 WTP for Brain MRI Scan



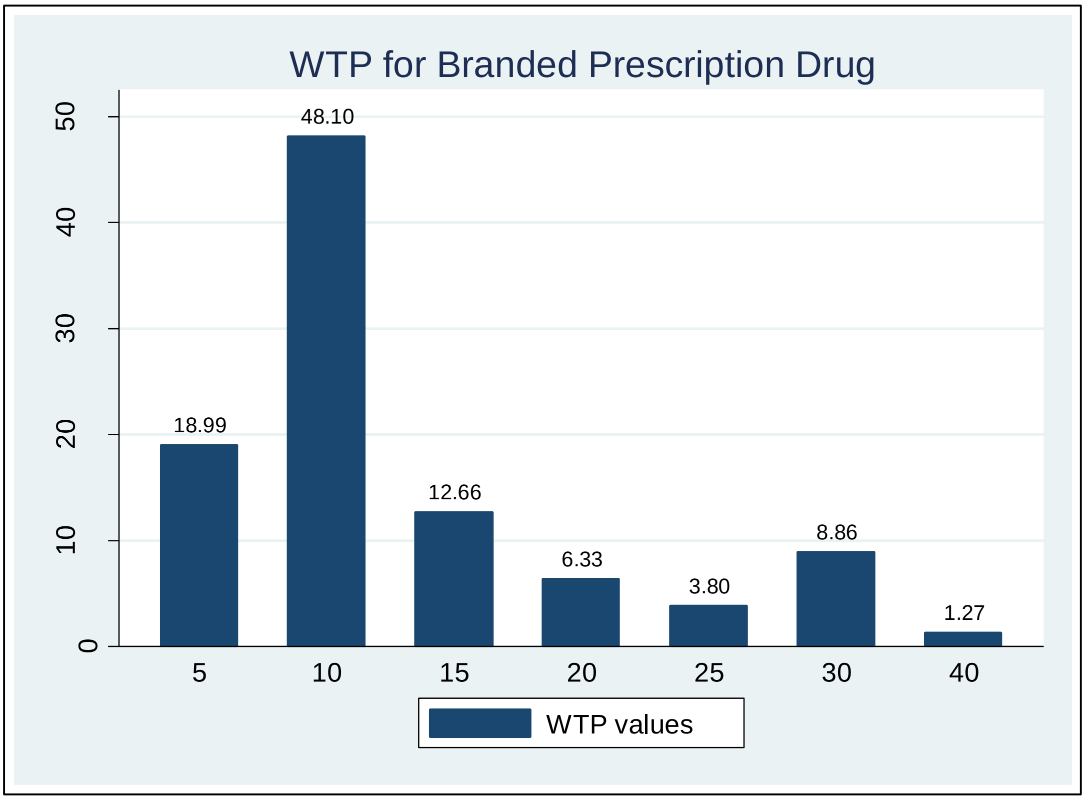
When comparing the median WTP values for an MRI scan of the brain (€150) and shoulder (€100), patients are willing to pay more for an MRI of the brain. This finding is consistent with previous research which suggests that WTP values are influenced by the associated diagnosis (Lin et al., 2013). It is reasonable to assume that patients would place a higher value on quicker access to a brain MRI due to a potentially more threatening diagnosis than a shoulder MRI scan. While a large proportion of the sample are willing to pay to receive quicker access to MRI scans, it is important to acknowledge that in both scenarios, patients are willing to pay less than the market price (€200 without PHI) to receive an MRI scan.

5.3.7.3 WTP for a Branded Over a Generic Cholesterol Lowering Drug.

As shown in Figure 5.4, two scenarios were constructed when eliciting patients' WTP for a branded over a generic cholesterol-lowering drug. Two scenarios were constructed due to the different user charges faced by GMS and non-GMS patients. The data collected from both GMS and non-GMS patients are combined to examine what patients are willing to pay for a branded cholesterol-lowering drug.

Table 5.5 reports that 37% of the patients in the sample are willing to pay (WTP>0) to receive the branded version of a cholesterol drug while 46% are not willing to pay. Patients who are not willing to pay are prepared to accept the generic version of the drug. Figure 5.8 shows the percentage frequencies for patients who are willing to pay for a branded cholesterol-lowering drug. Only observations with a positive WTP value (WTP>0) for a branded drug are presented in Figure 5.8. In Figure 5.8, 19% of these patients are willing to pay €5, 48% are willing to pay €10, 13% are willing to pay €15, 6% are willing to pay €20, 4% are willing to pay €25, 9% are willing to pay €30 while only 1 patient is willing to pay €40.

Figure 5.8 GMS Patients' WTP for a Branded Over a Generic Drug



As shown in Table 5.6, patients' median WTP for a branded version of a cholesterol-lowering drug is €10. Due to the various user charges that exist under the community drug schemes in Ireland, it is necessary to examine this WTP value in terms of GMS patients and non-GMS patients. As discussed in Section 5.1.2, GMS patients pay a €2.50 flat co-payment per prescription item while non-GMS patients can apply for a DPS card. With a DPS card, a patient pays the cost of their prescription medication until they reach the monthly €144 deductible after which the cost of their prescription drugs are covered by the HSE.

Within the sample, 34% of the GMS patients are willing to pay for a branded version of the drug. As shown in Table 5.6, the median value that GMS patients are willing to pay for a branded version of the prescription drug is €5. This indicates that GMS patients in the sample are willing to pay double the €2.50 flat co-payment in order to receive a branded version of a prescription drug. The statistics show that these GMS patients are accepting of generic substitution that was introduced in 2013 as a large proportion of GMS patients (66%) are not willing to pay to receive a branded version of a prescription drug. The reverse side of this finding is that despite a large proportion of GMS patients not being willing to pay to receive a branded version of a prescription drug, 34% of the GMS patients are willing to pay. If a GMS patient wishes to receive a branded version of a prescription drug, the GMS patient must cover the difference between the reference price and the cost of the branded version (HSE, 2013e) unless their GP has deemed them exempt from substitution on a medicinal basis (see Section 5.1.2). This generates revenue under the concept of reference pricing that was also introduced in the Health Act 2013.

There are 139 non-GMS patients in the sample and 51% are willing to pay for the branded version of the drug while 49% are not. The non-GMS patients who are not willing to pay extra are prepared to accept the generic version of the drug and pay the relevant user charge. Table 5.6 shows the median value that non-GMS patients are willing to pay to receive a branded version of the drug is €10. As mentioned in Section 5.3.5.2, non-GMS patients currently pay €7.94 for a month's supply of the cholesterol-lowering drug. When comparing the discrepancies in market value, non-GMS patients are only willing to pay 20% more than the market price while GMS patients are willing to pay 50% more than the current co-payment in order to receive a branded version of their prescription drug. As non-GMS patients already pay a higher OOP cost for prescription medication than GMS patients, it is reasonable to conclude that non-GMS would be less willing to pay a higher proportion of the current market price than GMS patients.

5.3.8 Patients' Previous Use of the Healthcare Services

Table 5.7 shows patients' previous use of the healthcare services that are evaluated in this research. CVM literature identifies patients' previous experience of a service to impact on their valuation of that service (Stewart et al., 2002). It is also argued that respondents who have previous experience with a particular programme have a better understanding of its value to them and consequently will not be influenced by the order of the WTP questions (Boyle et al., 1993, Kartman et al., 1996). As shown in Table 5.7, 88% of the sample have previously received a blood test, 47% of the sample have had an MRI scan while 15% of the sample are currently taking a prescribed cholesterol-lowering drug. Since most patients have previous experience of at least one of the healthcare services evaluated in this research, the risk of ordering effects as discussed in Section 5.2.4.1 are reduced.

Table 5.7 Patients' Previous Use of the Healthcare Services

Healthcare Service	Surveyed patients	
	n	%
Blood test		
Yes	189	88.32
No	5	2.34
Missing	20	9.35
Total	**214**	**(100)**
MRI Scan		
Yes	100	46.73
No	58	27.10
Missing	56	26.17
Total	**214**	**(100)**
Taking cholesterol-lowering drug		
Yes	33	15.42
No	159	74.30
Missing	22	10.28
Total	**214**	**(100)**

5.3.9 Investigating Relationships between the Decision to pay and Patient Characteristics.

This section examines the relationships between the dependent variables measuring WTP for the three selected healthcare services (blood tests, MRI scans and a branded over a generic prescription drug) and patient characteristics. In previous literature, parametric and non-parametric tests are used to investigate relationships between the dependent and independent variables (Coolidge, 2013). The type of test depends on the nature of the variables, whether they are categorical, ordinal or interval and also relies on the distribution of the data i.e. normal distribution or non-normal distribution.

In this section, the dependent variable measures the patient's decision to pay or not to pay for each service. Thus, the dependent variables in this section are categorical in nature and are coded as 0 if the patient is not willing to pay (WTP=0) and coded as 1 if the patient is willing to pay for the service (WTP>0). The independent variables measuring patients’ demographic and socio-economic characteristics in this research are all categorical in nature with 2 or more categories. As this research aims to investigate the relationships between categorical dependent variables and categorical independent variables with two or more categories, the non-parametric chi square test is appropriate (Coolidge, 2013). There are three assumptions of the chi square test which this data satisfies; individual observations are independent, there is a minimum of 5 frequencies in each cell and the dependent variable is a categorical variable (Coolidge, 2013). If the second assumption of minimum cell frequencies is violated, a chi square test can be substituted with a Fishers exact test (Everrit, 1992). The Fishers exact test provides a p-value but does not provide a test statistic.

Table 5.8 presents the significant relationships that are found between patients’ WTP for the selected health services and patients’ demographic and socio-economic characteristics. The variables marked with asterisks are the variables that had cells containing less than five observations. Therefore, the Fishers exact test was performed on these variables. As shown in Table 5.8, only the p-value is presented for these variables as a test statistic is not produced by this test.

Table 5.8 Investigating the Relationship between WTP and Patient Characteristics

Dependent variable	Independent variable	Chi2 Statistic	p-value
WTP for Blood Tests	Age (75+ years)	3.12	0.078[143]
	PHI cover	3.72	0.050
	GMS cover	4.82	0.028
	LTI cover	3.52	0.061
	Nationality*	-	0.005
	Health status*	-	0.012
WTP for Shoulder MRI Scan	PHI cover	8.92	0.003
	GMS cover	9.88	0.002
	LTI cover	5.30	0.021
	Previous MRI	5.01	0.025
WTP for Brain MRI Scan	PHI cover	14.72	0.000
	GMS cover	10.58	0.001
	DPS cover*	-	0.054
	LTI cover	9.34	0.002
	Nationality*	-	0.042
	Education*	-	0.055
	Income*	-	0.080
WTP for a branded prescription drug	PHI cover	6.74	0.009
	GMS cover	5.02	0.025
	Nationality*	-	0.055

***These dependent variables violated the Chi square assumption which requires a minimum of 5 observations in each cell. Consequently, a Fishers exact test was conducted on these variables.**

Using a chi square test, this research found PHI cover (χ^2 = 3.72, p = 0.05), GMS cover (χ^2 = 4.82, p = 0.03), LTI cover (χ^2 = 3.52, p = 0.06) and age (75+ years) (χ^2 = 3.12, p = 0.08) are significantly related to a patients' decision of whether they are willing to pay or not willing to pay to receive blood tests in their GP surgery. A Fishers exact test reveals patient nationality (p = 0.01) and health status (p = 0.01) also significantly influence whether a patient is willing to pay or not willing to pay for a blood test.

[143] Age was originally collected as a continuous variable but was recoded into 5 categories; 19-29, 30-44, 45-59, 60-74 and >75 years.

Comparable relationships are also found for patients' WTP for a shoulder MRI scan and health care cover. Significant relationships are found between PHI cover (χ^2 = 8.92, p = 0.00), GMS cover (χ^2 = 9.88, p = 0.00) and LTI cover (χ^2 = 5.30, p = 0.02), and patients' WTP for a shoulder MRI scan. Patients' previous experience of an MRI scan was also found to be significantly related to a patients' WTP to receive quicker access to this service (χ^2 = 5.01, p = 0.03)

Patients' health care cover such as PHI (χ^2 = 14.72, p = 0.00), GMS (χ^2 = 10.58, p = 0.00) and LTI cover (χ^2 = 9.34, p = 0.00) also have significant relationships with patients' WTP for a brain MRI scan. A Fishers exact test also found DPS cover (p = 0.05), patients' nationality (p = 0.04), education level (p = 0.06) and patients' income level (p = 0.08) to be significantly related to a patients WTP for a brain MRI.

With regard to patients' WTP for a branded prescription drug, a chi square test found PHI cover (χ^2 = 6.74, p = 0.01) and GMS cover (χ^2 =5.02, p = 0.03) are significantly related to patients' WTP for a branded version of the drug over a generic version. A Fishers exact test also found nationality (p = 0.06) to be significantly related to a patients' WTP for a branded prescription drug.

The Chi square and Fishers Exact tests reveal that it is predominantly patient socio-economic characteristics (health care cover, income and education) which have a significant relationship on patients' decision to pay for the selected healthcare services. Patient demographics such as nationality and self-reported health status are also found to be significantly related to a number of the healthcare services.

5.3.10 Investigating the Relationships between Values and Patient Characteristics

This section tests the relationships between patients' WTP value for the healthcare services and patient demographic and socio-economic characteristics. Only patients who are willing to pay (WTP>0) are included in this section. In this section, the dependent variables are continuous in nature and measure patient's maximum WTP for each service (WTP for blood tests, WTP for MRI scans and WTP for a branded over a generic prescription drug). The independent variables included in this section are the variables which were found to be significant in Section 5.3.9; PHI cover, GMS cover, LTI cover, income, education, age, nationality and self-reported health status and patients' previous use of the service. In the literature, depending on the nature of the variables, parametric tests such as ANOVAS and t-tests are performed on the data to test for significant relationships. These parametric tests assume the variables are normally distributed. In this research, normality of the dependent variables is tested using the Shapiro-Wilk test in Stata (see Appendix C.7). The *p* values for the continuous dependent variables in the Shapiro-Wilk test are significant. Therefore, the research rejects the hypotheses that the continuous dependent variables are normally distributed. Consequently, non-parametric tests are appropriate in this section to test for significant relationships between patient characteristics and their WTP values for the three healthcare services.

A Mann Whitney test is used to compare the continuous dependent variables and the categorical independent variables which have two groups; PHI cover, GMS cover, DPS cover, LTI cover, age[144] and previous use of the service. A Mann Whitney test is a non-parametric test and unlike its parametric version (t-test), this test makes no assumptions about normality and therefore is appropriate for this data. This test measures whether there is a significant difference between two groups by comparing the median values. A Kruskal-Wallis test is used to assess the relationships between the continuous dependent variables and the categorical independent variables that have more than two groups; education level[145], health status[146], monthly gross annual income level[147] and nationality[148]. The data satisfies the Kruskal-Wallis assumption that the observations are independent (Schlotzhauer, 2007).

Table 5.9 shows the results of the Mann Whitney tests that were conducted on the continuous dependent variable and the categorical independent variables that are found to be significantly related to the amount patients are willing to pay for the three healthcare services. Table 5.9 presents the variable categories, the observations in each, the rank sum, the *z* test statistic and the *p* value.

Table 5.10 presents the results from the Kruskal-Wallis tests that were conducted on the continuous dependent variable and the categorical independent variables (with more than 2 groups) that significantly affect the amount patients are willing to pay for the selected healthcare services. Table 5.10 presents the variable categories, the observations in each, the rank sum, the Kruskal-Wallis test statistic and the *p* value.

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144 See footnote 143.

145 The four categories in the education independent variable are primary education, secondary education, third level education and other education.

146 The five categories in the health status variable are excellent health, very good health, good health, fair health and poor health.

147 The seven categories in the income variable are <€1,000, €1,000-€2,249, €2,250 - €3,499, €3,500-€4,749, €4,750-€5,999, €6,000+ and finally, the patient had the option to provide another income level on a blank space provided on the questionnaire.

148 The three categories in the nationality variable are Irish, UK and other.

With regard to patients' WTP for blood tests, Tables 5.9 and 5.10 show that PHI cover, education, previous experience and GMS cover significantly impact the amount patients are willing to pay to receive blood tests in their GPs surgery. A patient with PHI cover (U = 10582, z = -2.321, p = 0.02), a patient with a third level education (R = 9793.50, χ^2 = 7.82, p = 0.05) and patients who have previous experience of a blood test (U = 13076.5, z = -2.92, p = 0.03) are willing to pay more to receive a blood test in the GP surgery. Patients with GMS cover are willing to pay less to receive this service (U =3427, z = 3.575, p = 0.00).

Focussing on a shoulder MRI scan, PHI cover and patients' previous experience of the service influence the amount patients' are willing to pay to receive faster access to this service. Patients with PHI cover (U = 9343.5, z = -3.739, p = 0.00) and patients who have previously used an MRI scan before are willing to pay more for faster access to a shoulder scan (U =5963.5, z = -3.709, p = 0.00) than patients without PHI and who have no experience of an MRI scan.

With regard to WTP for a brain MRI scan, Tables 5.9 and 5.10 show PHI, education level, income, previous experience of the service, GMS and DPS cover are significantly related to the amount patients are willing to pay to access this service. Patients with PHI (U = 9895.5, z = -3.164, p = 0.00), patients with a third level education (U = 9286.0, z = 9.242, p = 0.03), patients with a gross monthly income level of €1,000 to €2,249 (U = 3445.0, z = 15.853, p = 0.01) and patients with previous experience of the service (U = 5829, z = -2.491, p = 0.01) are willing to pay more for quicker access to a brain MRI scan. Patients with GMS cover (U = 3564, z = 1.968, p = 0.05) and patients with DPS cover are willing to pay less for this service (U = 5132,

z = -1.925, p = 0.05) than patients who do not have these forms of community drug cover.

Table 5.9 shows PHI GMS cover and age (75+ years) are significantly related to the amount a patient is willing to pay for a branded prescription drug. A patient with PHI cover (U = 2619, z = -3.955, p = 0.00) is willing to pay more for a branded version while patients with GMS cover (U = 682, z = 3.161, p = 0.00) are willing to pay less for a branded prescription drug. A patient over 75 years (U = 123, z = -1.737, p = 0.08) is willing to pay less for a branded prescription drug.

Table 5.9 Mann Whitney Test Results

WTP FOR BLOOD TESTS (WTP>0)					
Variable	**Category**	**Obs**	**Rank sum**	**Z statistic**	***p* value**
PHI	No Yes Total	56 115 171	4124 10582 14706	-2.321	0.02
GMS	No Yes Total	119 52 171	11279 3427 14706	3.575	0.00
Previous blood test	No Yes Total	4 158 162	126.5 13076.5 13203	-2.192	0.03
	WTP FOR SHOULDER MRI SCAN (WTP>0				
Variable	**Category**	**Obs**	**Rank sum**	**Z statistic**	***p* value**
PHI	No Yes Total	49 107 156	2902.5 9343.5 12246	-3.739	0.00
Previous MRI Scan	No Yes Total	43 83 126	2037.5 5963.5 8001	-3.709	0.00
	WTP FOR BRAIN MRI SCAN (WTP>0)				
Variable	**Category**	**Obs**	**Rank sum**	**Z statistic**	***p* value**
PHI	No Yes Total	53 110 163	3470.5 9895.5 13366	-3.164	0.00
GMS	No Yes Total	113 50 163	9802 3564 13366	1.968	0.05
DPS	No Yes Total	107 56 163	8234 5132 13366	-1.925	0.05
Previous MRI Scan	No Yes Total	47 82 129	2556 5829 8385	-2.491	0.01
	WTP FOR A BRANDED DRUG (WTP>0)				
Variable	**Category**	**Obs**	**Rank sum**	**Z statistic**	***p* value**
PHI	No Yes Total	22 57 79	541 2619 3160	-3.955	0.00
GMS	No Yes Total	55 24 79	2478 682 3160	3.161	0.00
Age (75+ years)	No Yes	52 3	1417 123	-1.737	0.08

Table 5.10 Kruskal-Wallis Test Results

WTP FOR BLOOD TESTS (WTP>0)					
Variable	**Category**	**Obs**	**Rank sum**	**Chi2**	***p* value**
Education	Primary	7	445.00	7.82	0.05
	Second level	53	4400.00		
	Third level	108	9793.50		
	Other	3	67.50		
WTP FOR BRAIN MRI SCAN (WTP>0)					
Variable	**Category**	**Obs**	**Rank sum**	**Chi2**	***p* value**
Education	Primary	6	309.00	9.242	0.03
	Second level	50	3449.00		
	Third level	104	9286.00		
	Other	2	159.00		
Income	<€1,000	33	2126.5	15.853	0.01
	€1,000 - €2,249	46	3445.0		
	€2,250 - €3,499	32	3105.0		
	€3,500 - €4,479	18	1671.0		
	€4,750 - €5,999	9	427.50		
	€6,000+	12	1010.50		
	Other	7	617.50		

5.3.12 Conclusion

Following the best practice guidelines proposed by O'Brien and Gafni (1996), an original questionnaire was constructed to collect primary data from patients to estimate what patients are willing to pay for three selected healthcare services (Blood tests, MRI Scans and a branded over a generic prescription drug). The descriptive statistics reveal that patients who are willing to pay for blood tests report a median WTP value of €20, patients who are willing to pay for a shoulder and brain MRI scan report a median WTP value of €100 and €150 respectively while patients who are willing to pay for a branded version of a prescription drug report a median WTP value of €10. The factors influencing patients' WTP for the healthcare services are predominantly socio-economic characteristics and patients' previous experience of the healthcare service. The relationships between patients' WTP for the services and patient characteristics are as expected as patients' with higher incomes are willing to pay more while patients with lower incomes are willing to pay less for the services. These significant relationships are consistent with theoretical expectations and consequently provide reliability to the WTP estimates generated in this research.

This research acknowledges that, as with all CVM research, this chapter measures only what patients claim they would be willing to pay. The estimated values may be more of a reflection of what they would like to pay (strategic bias) rather than an accurate reflection of what they would actually pay. This is recognized in the interpretation of the results.

Section 5.4 describes the econometric methodologies that were employed to identify the factors which influence patients WTP for healthcare services when the choice is part of a time-money choice (MRI scans), a convenience choice (blood tests) and a preference choice (branded prescription drug)

5.4 Results

5.4.1 Introduction

This section presents the econometric methodologies that were employed to investigate the factors influencing patients' WTP for blood tests, MRI scans and a branded prescription drug. Section 5.4.2 discusses the rationale as to why the particular method was chosen. Section 5.4.3 presents the econometric model while Section 5.4.4 presents the model specification and model tests. The results are presented in Section 5.4.5.

5.4.2 Econometric Rationale

Multivariate analysis is used to determine which independent factors influence patients' WTP for the three identified healthcare services. The analysis is conducted using the primary data collected from patients in GP waiting rooms in Cork. While modelling the factors affecting patients' WTP, the nature of the WTP question, underlying theoretical implications (Donaldson et al., 1998) and the consequent nature of the dependent variables, determined the econometric methodologies. As identified in Section 5.3.5, there are three dependent variables in this study which are continuous in nature measuring patients' WTP for each of the three healthcare services.

Identifying the factors which affect patients' WTP is modelled as a joint process. The first step involves whether a patient is willing to pay for a service or not while the second stage includes the patients' decision on the maximum amount they are willing to pay. The dependent variable is split into two parts: ‘y > 0’ and ‘y|y > 0’. Consequently, a two-part model is appropriate to determine what Irish patients are willing to pay for the three selected services. The first part of the model is a probit regression which is used to estimate the patients’ decision to pay. The second part of the model is an OLS regression which is used to estimate what factors are associated with the maximum amount a patient is willing to pay for the healthcare services.

As the second part of the model (OLS) estimates the factors associated with the maximum amount a patient is willing to pay, only the positive WTP values (WTP>0) are included. As the OLS regression only includes the non-zero values, there is a possibility of selection bias in this part of the model (Donnell et al., 2008). The patients’ decision to pay is not a random process as the decision is made by the patient. Therefore, patients who are willing to pay constitute a self-selected sample and not a random sample. Consequently, selection bias needs to be controlled for. The inverse mills ratio (IMR) is generated using the probit coefficient and included in the OLS regression to control for selection bias (Heckman, 1976). If sample selection is not controlled for, it can result in biased estimates (Heckman, 1976).

The two-part model is appropriate as the model does not aim to make inferences regarding parameters but simply predict the conditional means (Duan et al., 1983). The model predicts patients’ WTP conditional on age, health care cover, education, self-reported health status, income level, and previous use of the service.

5.4.3 Econometric Model

As presented in Section 5.4.2, the determinants of WTP values for the healthcare services are modelled as a joint decision process. First, the patient decides whether or not they will pay for the service (i.e. participation equation), and second, having decided to pay, they decide on the maximum amount they are willing to pay (i.e. consumption equation). The participation equation (5.1) is assumed to be a probit model where *Z* denotes a binary variable; 1 if the dependent variable is observed and 0 otherwise. In the consumption equation (5.2) *Y* is a continuous variable and represents patients' maximum WTP value. *x* and *w* are the matrices for the independent variables for the participation and consumption equations respectively. In the model, the error terms, ε_i and μ_i are assumed to be normally distributed with a mean of zero, variance equal to 1 and a correlation coefficient ρ. The two decisions are independent when ρ = 0 and the two equations can be estimated separately (Fonta et al., 2010). In equation 5.3, where $\lambda(x_i\alpha) = \phi(x_i\alpha)|\Phi(x_i\alpha)$ is the inverse mills ratio, σ is the standard deviation and ϕ and Φ are the standard normal density and standard normal functions, respectively (Fonta et al., 2010).

$$Z^* = x_i\alpha + \varepsilon_i$$
$$Z_i = 0 \text{ if } Z_i \leq 0; \qquad (5.1)$$
$$Z_i = 1 \text{ if } Z_i > 0$$

$$Y^* = w_i\beta + \mu_i$$
$$Y_i = Y^* \text{if } Z_i = 1; \qquad (5.2)$$
$$Y_i \text{ not observed if } Z_i = 0$$

$$E\,(Y_i|Z_i = 1, w) = w_i\beta + \rho\sigma\lambda\,(x_i\alpha) \qquad (5.3)$$

The first step of the model uses a probit of 5.1 to find a consistent estimator of α. The α value is then used to construct the mills lambda (λ). In the second step, λ is included as a regressor in 5.2 allowing the parameters of the consumption equation to be consistently estimated using OLS.

As the probit model is nonlinear, it is difficult to describe the relationship between a variable and its outcome probability. For ease of interpretation of the results from the participation equation, the marginal effects at the mean (MEM) of the significant categorical variables are presented. For all binary explanatory variables in the model, the marginal effects measure the discrete change; how the predicted probabilities change as the explanatory variable changes from 0 to 1 (Cameron and Trivedi, 2005). For a categorical variable the discrete change is computed as follows (Cameron and Trivedi, 2005):

$$Xk = Pr(Y = 1|X, Xk = 1) - Pr(y=1|X, Xk = 0) \qquad (5.4)$$

5.4.4 Model Specification

With regard to the participation equation (probit), the dependent variable is binary in nature. The variable was generated from the continuous variables and coded as 0 if the patient is not willing to pay for the service and 1 is the patient reported a WTP>0. The explanatory variables included in this model are based on economic theory, previous literature and the variables which were found to be significantly related to the dependent variables as described in Sections 5.3.9 and 5.3.10. If economic theory could not defend the inclusion of an explanatory variable it is not included in the model

(Kennedy, 2003). The explanatory variables included in the model are a combination of binary variables (GMS and PHI) and categorical variables (age, education, health status and income).

The dependent variable used in the consumption equation (OLS regression) includes only the positive WTP values. This results in a variable which is right skewed and consequently the variable takes the logarithmic form of the continuous WTP values. The explanatory variables included in the consumption equation are the same as those included in the participation equation with the addition of the inverse mills ratio controlling for selection bias and the variable measuring patients' previous use of the service. Patients' previous use of a service is included in the consumption equation as empirical work suggests that the amount a patient is willing to pay is influenced by their previous experience of the service (Bergmo and Wangberg, 2007, Carrere et al., 2008, Donfouet et al., 2011). A positive previous experience with a particular service is also associated with the patients' perceived value of that service (Qin and Prybutok, 2013). A positive previous experience is associated with a higher WTP value while a negative previous experience is associated with a lower WTP value.

Due to the small sample size it was necessary to merge the categories of one of the independent variables in order to meaningfully predict WTP using regression analysis. The variable measuring gross monthly income level was originally measured in 7 categories (<€1000, €1000-€2249, €2250-€3499, €3500-€4749, €4750-€5999, €6000, Other[149]). There were 9 observations in the category measuring "other" income. These 9 observations were recoded as low income as it is assumed that students with no

[149] See footnote 137

income, unemployed individuals and individuals who receive the state pension will have a gross monthly income level less than €1,000. The remaining six income categories were then merged into three categories; low income (€<1,000 and €1,000-€2,249) middle income (€2,250 - €3,499 and €3,500-€4,749) and high income (€4,750-€5,999 and €6,000). The income categories are classified by CSO earnings (CSO, 2015). CSO figures report an average weekly wage of €698 per person in Q2 2015 (CSO, 2015). This was transformed into an average annual wage of €36,271[150] and subsequently converted into an average monthly earning of €3,023. The merging of the categories is based around this average figure provided by the CSO.

With regard to the consumption equation, it is also important to note that the variance inflation factor (VIF) was investigated after each OLS regression. The VIF quantifies the level of multi-collinearity in the OLS regressions (Ott and Longnecker, 2015). If multi-collinearity is not addressed, it results in large standard errors and consequently results in inaccurate estimates. A VIF of 1 means there is no collinearity but a VIF of 10 indicates a considerable issue with collinearity (Ott and Longnecker, 2015). On further inspection of the variables in all OLS regressions in this research, high collinearity was found only amongst the self-reported health status variables (VIF > 10). This was in particular for the variable measuring a "good" self-reported health status. This variable was dropped from each consumption equation and consequently multi-collinearity was immediately reduced.

A two-part model is constructed to estimate the factors influencing patients' decision to pay and their maximum WTP for each of the healthcare services; blood tests, a

[150] €698 x 52 weeks.

shoulder MRI scan, a brain MRI scan and branded over a generic version of a cholesterol-lowering prescription drug. The independent variables, as described in the previous paragraphs are identical in all of the models.

5.4.5 Results

The following paragraphs present the WTP results for all three healthcare services. Each results table (Table 5.11 to 5.14) presents the independent variables, the probit coefficients (participation equation coefficients), the marginal effect coefficients, the OLS coefficients (consumption equation coefficients) and the significant *p* values. The results tables also present the probit and OLS model estimates at the end of each table.

5.4.5.1 Blood Tests

Table 5.11 presents the results of the two-part model that was used to identify the factors which influence a patient's decision to pay for blood tests (participation equation) and the factors which are associated with the amount the patient is willing to pay (consumption equation).

Interpreting the probit regression using the marginal effects at the mean, Table 5.11 shows that if a patient is aged between 30-44 years it increases a patients WTP for blood tests by 14% relative to patients in the 19-24 year age category. Holding all other parameters at their mean, WTP for blood tests increases by 23% when patients report a "very good" health status and 27% if they report their health status as "good" relative to someone who reports their health status as "poor" (see Appendix C.8 and C.9).

Table 5.11 shows the results of the consumption equation in the fourth column. Once a patient decides to pay for a blood test, a patient with an “excellent” self-reported health status and a patient who has previous experience of a blood test are willing to pay more for the service (see Appendix C.12).

The probit and OLS models are significant overall (p = 0.0278 and p = 0.0626). The adjusted R squared value in the OLS regression indicates that 6% of the variation of the dependent variable (log of WTP for blood tests) is explained by the independent variables.

Table 5.11 Two-Part Model Results for Blood Tests

Independent Variable	Probit (Participation equation)	MEM (dy/dx)	OLS (Consumption Equation)
19-29 years	*base category (age)*		
30-44 years	0.70* (0.37)	0.14* (0.07)	-0.29 (0.21)
45-59 years	0.44 (0.41)	0.09 (0.09)	-0.11 (0.21)
60-74 years	0.48 (0.50)	0.09 (0.10)	-0.05 (0.23)
75+ years	-0.23 (0.62)	-0.04 (0.12)	0.16 (0.31)
GMS cover	-0.16 (0.24)	-0.03 (0.05)	-0.16 (0.13)
PHI cover	0.37 (0.27)	0.07 (0.51)	-0.10 (0.14)
Primary education	-0.18 (0.54)	-0.03 (0.10)	-0.16 (0.27)
Secondary education	0.05 (0.28)	0.01 (0.013)	-0.00 (0.12)
Third level education	*base category (education)*		
Other Education[151]	Omitted	Omitted	Omitted
Excellent health	0.62 (0.69)	0.12 (0.13)	0.43* (0.24)
Very good	1.23* (0.65)	0.23* (0.13)	0.16 (0.12)
Good[152]	1.41** (0.60)	0.27** (0.12)	-
Fair	0.43 (0.66)	0.08 (0.13)	0.36 (0.31)
Poor	*base category (health status)*		
Low income (<€1,000 and €1,000-€2,249)	1.20 (0.40)	0.04 (0.08)	-0.15 (0.18)
Mid income (€2,250-€3,499 and €3,500 - €4,749)	0.26 (044)	0.05 (0.09)	0.05 (0.18)
High income (€4,750 - €5,999 and €6,000)	*base category (income)*		
Previous blood test	-[153]	-[154]	0.84*** (0.32)
Inverse mills ratio	-[155]	-	-0.87 (0.71)
cons	-0.70 (0.83)	-	2.40*** (0.48)
Probit	**OLS**		
No. of obs. = 188	No. of obs. = 153[157]		

[151] Stata automatically dropped this variable as it predicts success perfectly.
[152] I omitted this variable due to multi-collinearity as reported by the VIF (See Appendices C.10 and C.11).
[153] As described in Section 5.4.4., this variable was only included in the OLS (Consumption equation).
[154] See footnote 153.
[155] The IMR is created using the probit coefficients and is included only in the OLS (consumption equation).
[157] There is a difference in the sample size in the two models as the OLS regression only includes the observations whose WTP is greater than 0. Therefore, the sample size in all consumption equations

Wald Chi2(14) = 25.75 Prob > chi2 = 0.0278 Pseudo R2 = 0.1411[156]	F (15, 143) = 1.68 Prob > F = 0.0624 R squared = 0.1551 Adjusted R2 = 0.0626 Root MSE = 0.60372

Note: * = significance at 1% level, **=significance at 5% level, *=significance at 10% level.**

5.4.5.2 Shoulder MRI Scan

Table 5.12 presents the results of the two-part model used to identify the factors which influence patients' decision to pay for a shoulder MRI scan (participation equation) and which factors are associated with the amount the patient is willing to pay (consumption equation) to receive quicker access to a shoulder MRI scan.

Interpreting the probit regression using the marginal effects at the mean, Table 5.12, shows that patients' earning a low (<€1,000 and €1,000-€2,249) and middle level of income per month (€2,250-€3,349 and €3,250-€4,749) are 52% and 51% less likely to be willing to pay for quicker access to a shoulder MRI Scan in comparison to patients who have a higher gross monthly income level (€4,750-€5,999 and €6,000+) (see Appendix C.13 and C.14). Table 5.12 also shows that patients with an "other" education level are less likely to be willing to pay to receive faster access to a shoulder MRI scan.

Table 5.12 also shows that once a patient decides to pay for quicker access to a shoulder MRI scan, a patient aged 75 years and over is willing to pay more for quicker access to this service. Patients with a middle income level (€2,250-€3,349 and €3,250-

(OLS) for all healthcare services is smaller than the sample size in the participation equations (probit regression).

[156] The probit regression does not have an equivalent to the R squared statistic as in the OLS regression. The Pseudo R squared in the probit model is not interpreted in the same manner.

€4,749) are also willing to pay more in comparison to a patient earning a higher income. A possible explanation for this may be that individuals with higher incomes are more likely to have PHI (HIA, 2014c) and this could affect their decision to pay for an MRI scan as they are aware that in reality their PHI will cover the cost of this. Therefore, patients with higher incomes may have a lower WTP as they know PHI will cover the cost. A patient who has previously used the MRI service is also willing to pay more for quicker access (see Appendix C.17).

The probit and OLS models are significant overall (p = 0.000 and p = 0.0305). The adjusted R squared value in the OLS regression indicates that approximately 11% of the variation of the dependent variable (log of WTP for a shoulder MRI scan) is explained by the independent variables.

Table 5.12 Two-Part Model Results for a Shoulder MRI Scan

Independent Variable	**Probit**	**MEM (dy/dx)**	**OLS**
19-29 years	*base category (age)*		
30-44 years	-0.07 (0.41)	-0.01 (0.04)	0.15 (0.16)
45-59 years	0.47 (0.43)	0.05 (0.05)	0.03 (0.19)
60-74 years	0.31 (0.47)	0.03 (0.05)	0.18 (0.20)
75+ years	0.66 (0.67)	0.07 (0.07)	0.70** (0.31)
GMS cover	-0.46 (0.32)	-0.05 (0.03)	0.14 (0.16)
PHI cover	0.37 (0.30)	0.04 (0.03)	0.16 (0.15)
Primary education	-0.64 (0.56)	-0.07 (0.06)	-0.09 (0.31)
Secondary education	-0.07 (0.31)	-0.01 (0.03)	-0.04 (0.12)
Third level education	*base category (education)*		
Other Education	-0.84 (0.74)	-0.09 (0.07)	0.13 (0.57)
Excellent health	0.18 (0.78)	0.02 (0.08)	-0.07 (0.19)
Very good	0.55 (0.70)	0.06 (0.07)	0.11 (0.12)
Good	0.68 (0.68)	0.07 (0.07)	-[158]
Fair	0.17 (0.74)	0.02 (0.08)	0.09 (0.19)
Poor	*base category (health status)*		
Low income (<€1,000 and €1,000-€2,249)	-5.09*** (0.43)	-0.52*** (0.11)	0.28 (0.24)
Mid income (€2,250-€3,499 and €3,500 - €4,749)	-5.00*** (0.53)	-0.51*** (0.11)	0.37* (0.22)
High income (€4,750 - €5,999 and €6,000)	*base category (income)*		
Previous MRI scan	-[159]	-[160]	0.24**
Inverse mills ratio	-[161]	-	-0.23 (0.63)
cons	5.42*** (0.93)	-	4.05*** (0.24)
Probit	**OLS**		
No. of obs. = 179 Wald Chi2(15) = 528.82 Prob > chi2 = 0.00 Pseudo R2 = 0.1594[162]	No. of obs. = 120[163] F (15, 143) = 1.88 Prob > F = 0.0305 R squared = 0.2261 Adjusted R2 = 0.1059		

[158] I omitted this variable due to multi-collinearity as reported by the VIF (See Appendices C.15 and C.16)

[159] As described in Section 5.4.4 this variable was only included in the OLS (Consumption equation).

[160] See footnote 159

[161] The IMR is created using the probit coefficients and is included only in the OLS (consumption equation).

[162] The probit regression does not have an equivalent to the R squared statistic as in the OLS regression. The Pseudo R squared in the probit model is not interpreted in the same manner.

[163] See footnote 157.

	Root MSE = 0.52562

Note: * = significance at 1% level, **=significance at 5% level, *=significance at 10% level.**

5.4.5.3 Brain MRI Scan

Table 5.13 presents the results of the two-part model that was used to identify the factors which influence patients' decision to pay for a brain MRI scan (participation equation) and which factors are associated with the amount the patient is willing to pay (consumption equation) to receive quicker access to a brain MRI scan.

Interpreting the participation equation using the marginal effects at the mean, Table 5.13, shows having PHI increases patients' WTP by 5% relative to those who do not have PHI holding all else at the mean. Table 5.13 shows that patients' earning a low (<€1,000 and €1,000-€2,249) and middle level of income per month (€2,250-€3,349 and €3,250-€4,749) are 34% and 31% less likely to be willing to pay for quicker access to a brain MRI Scan in comparison to patients who have a higher gross monthly income level (€4,750-€5,999 and €6,000+) (see Appendix C.18 and C.19).

Table 5.13 shows the results of the consumption equation in the fourth column. Patients with a second level education are willing to pay less for quicker access to a brain MRI scan than those with a third level education. Unexpectedly, a negative relationship is found between a low and middle income level and patients' WTP value. Patients who report a low and middle income level are willing to pay more for faster access to a brain MRI scan 1relative to the high income base category (see Appendix C.22). Similar to the explanation in Section 5.4.5.2, individuals with higher incomes are more likely to have PHI (HIA, 2014c) and this could affect their decision to pay for an MRI scan as they are aware that in reality their PHI will cover the cost of this. Therefore, these patients may have a lower WTP as they know PHI will cover the cost.

The probit and OLS models are significant overall (p = 0.000 and p = 0.0578). The adjusted R squared value in the OLS regression indicates that approximately 8% of the variation of the dependent variable (log of WTP for a brain MRI scan) is explained by the independent variables.

Table 5.13 Two-Part Model Results for a Brain MRI Scan

Independent Variable	Probit	MEM (dy/dx)	OLS
19-29 years	*base category (age)*		
30-44 years	0.14 (0.42)	0.01 (0.03)	-0.15 (0.17)
45-59 years	0.45 (0.42)	0.03 (0.03)	-0.16 (0.21)
60-74 years	0.06 (0.50)	0.01 (0.04)	0.07 (0.21)
75+ years	0.36 (0.71)	0.03 (0.05)	0.56 (0.38)
GMS cover	-0.18 (0.33)	-0.01 (0.02)	0.05 (0.15)
PHI cover	0.72** (0.31)	0.05** (0.03)	-0.02 (0.21)
Primary education	-0.48 (0.56)	-0.04 (0.04)	-0.23) (0.34)
Secondary education	-0.05 (0.33)	-0.00 (0.02)	-0.27* (0.14)
Third level education	*base category (education)*		
Other Education[164]	-0.17 (0.74)	-0.01 (0.05	0.52 (0.61)
Excellent health	0.57 (0.80)	0.04 (0.06)	0.04 (0.19)
Very good	0.82 (0.72)	0.06 (0.05)	0.0. (0.13)
Good[165]	0.84 (0.67)	0.06 (0.05)	-
Fair	0.42 (0.73)	0.03 (0.06)	0.04 (0.20)
Poor	*base category (health status)*		
Low income (<€1,000 and €1,000-€2,249)	-4.70*** (0.45)	-0.34*** (0.09)	0.52** (0.26)
Mid income (€2,250-€3,499 and €3,500 - €4,749)	-4.70*** (0.57)	-0.31*** (0.10)	0.56*** (0.21)
High income (€4,750 - €5,999 and €6,000)	*base category (income)*		
Previous MRI scan	-[166]	-[167]	0.15 (0.12)
Inverse mills ratio	-[168]	-	-0.84 (0.80)
cons	4.61*** (9.92)	-	4.65 (0.29)
Probit		**OLS**	
No. of obs. = 179 Wald Chi2(15) = 414.54 Prob > chi2 = 0.0000		No. of obs. = 123[170] F (16, 112) = 1.70 Prob > F = 0.0578 R squared = 0.2041 Adjusted R2 = 0.0839	

[164] Stata automatically dropped this variable as it predicts success perfectly.
[165] I omitted this variable due to multi-collinearity as reported by the VIF (See Appendices C.20 and C.21).
[166] As described in Section 5.4.4 this variable was only included in the OLS (consumption equation).
[167] See footnote 166.
[168] The IMR is created using the probit coefficients and is included only in the OLS (consumption equation).
[170] See footnote 157.

Pseudo R2 = 0.2019[169]	Root MSE = 0.5814

Note: * = significance at 1% level, **=significance at 5% level, *=significance at 10% level.**

5.4.5.4 Branded Over a Generic Prescription Drug

Before presenting the results for Section 5.4.5.4, it is important to note that the sample sizes in the participation equation (n=166) and consumption equation (n=90) for this healthcare service are much smaller than the previous services. This is as a result of a large number of missing observations for this service. There are two possible reasons for these missing values. The first is protest non-response where respondents are protesting against the concept of having to pay more for a branded version of a prescription drug. This methodological issue is discussed in Section 5.2.4.3. The second reason may be due to respondents running out of time to complete the questionnaire. This scenario was the final one presented on the questionnaire and consequently may not have been completed by all respondents as they may have been called by the GP for their appointment.

While the variables in this model remain the same as the previous models, some minor changes have been made due to the smaller sample size and the nature of the healthcare service. The reference category for the age variable is changed to 75+ years from 19-29 years. Previous research has shown older age groups are less likely to change their habits (Beache and Guell, 2015). It was assumed in this research that older patients would be less likely to switch to generic version of a branded drug and it was assumed that younger age groups would be less likely to pay for a branded version of a prescription drug. Therefore, the last category; 75+ years is used as the base category.

[169] The probit regression does not have an equivalent to the R squared statistic as in the OLS regression. The Pseudo R squared in the probit model is not interpreted in the same manner.

The self-reported health status variable is merged into a dummy variable; 1 if patient reports “excellent” or “very good” and 0 for “good”, “fair” or “poor”. The variable is merged into a dummy variable due to the small sample size. Reducing the number of independent variables increases the degrees of freedom. The final change made to this model was to drop the PHI variable. PHI in Ireland does not cover the costs of prescription drugs. Therefore, PHI would not be an influential factor in WTP for a branded prescription drug.

Table 5.14 presents the results of the two-part model used to identify the factors which influence patients’ decision to pay for a branded version of a cholesterol-lowering prescription drug (participation equation) and which factors are associated with the amount a patient is willing to pay for a branded version of the drug (consumption equation).

Interpreting the participation equation using the marginal effects at the mean, Table 5.14 shows patients aged between 30-44, 45-59 and 60-74 years are less willing to pay for a branded version of a drug, at 45%, 51% and 43% respectively compared to patients aged 75 and over. Patients with GMS cover are 21% less likely to pay for a branded version of the prescription drug. Finally, patients with an “excellent” self-reported health status are 18% less likely to pay for a branded version of the drug (See Appendices C.23 and C.24)

The consumption equation shows patients who are currently taking a prescribed cholesterol-lowering drug are willing to pay more to receive the branded version (see Appendix C.27).

The probit and OLS regression are significant overall (p = 0.05 and p = 0.02). The adjusted R squared value in the OLS regression indicates that approximately 14% of the variation of the dependent variable (log of WTP for a shoulder MRI scan) is explained by the independent variables.

Table 5.14 WTP for a Branded Over a Generic Cholesterol-Lowering Prescription Drug

Independent Variable	Probit	MEM (dy/dx)	OLS
19-29 years	-0.69 (0.58)	-0.27 (0.23)	-0.32 (0.40)
30-44 years	-1.16** (0.53)	-0.46** (0.21)	-0.02 (0.38)
45-59 years	-1.30** (0.52)	-0.51** (0.21)	0.25 (0.42)
60-74 years	-1.09** (0.53)	-0.43** (0.21)	-[171]
75+ years	*base category (Age)*		
GMS cover	-0.52** (0.26)	-0.21** (0.10)	-0.58 (0.35)
Primary education	*base category (Education)*		
Secondary education	-0.13 (0.49)	-0.05 (0.19)	-0.74 (0.75)
Third level education	0.03 (0.52)	0.01 (0.20)	-0.64 (0.75)
Other form of education	-0.13 (0.95)	-0.05 (0.19)	-1.07 (1.19)
Excellent health	-0.45** (0.22)	-0.18** (0.09)	0.07 (0.27)
Low income (<€1,000 and €1,000-€2,249)	0.08 (0.34)	0.03 (0.14)	0.06 (0.34)
Mid income (€2,250-€3,499 and €3,500 - €4,749)	0.16 (0.35)	0.06 (0.14)	0.22 (0.34)
High income (€4,750 - €5,999 and €6,000)	*base category (Income)*		
Taking cholesterol drug	-[172]	-[173]	0.83** (0.33)
Inverse mills ratio	-[174]	-	-0.27 (0.61)
cons	1.05 (0.68)	-	3.56 (0.83)
Probit		**OLS**	
No. of obs. = 166 Wald Chi2(12) = 20.98 Prob > chi2 = 0.0506 Pseudo R2 = 0.0991[175]		No. of obs. = 90[176,177] F (12,77) = 2.20 Prob > F = 0.0199 R squared = 0.2550 Adjusted R2 = 0.1389 Root MSE = 0.91924	

Note: * = significance at 1% level, **=significance at 5% level, *=significance at 10% level.**

[171] I left out age 60-74 years due to multi-collinearity as reported by the VIF (See Appendices C.25 and C.27).
[172] As described in Section 5.4.4 this variable was only included in the OLS (consumption equation).
[173] See footnote 172.
[174] The IMR is created using the probit coefficients and consequently is included only in the OLS (consumption equation).
[175] The probit regression does not have an equivalent to the R squared statistic as in the OLS regression. The Pseudo R squared in the probit model is not interpreted in the same manner.
[176] See footnote 157.
[177] See also the beginning of this Section (5.4.5.4) for an explanation of the small sample size in this model.

5.4.6 Discussion

As discussed in Sections 1.4 and 5.2.5.1, the three healthcare service included in this research are a mixture of public and private primary and secondary services. Blood tests and prescription drugs are identified as primary services and are a mainly public or part-publicly financed service while MRI scans are classified as a secondary or referred service and are generally privately financed services. This discussion of the results presented in Sections 5.4.5.1 to 5.4.5.4 are discussed in this manner.

The results presented in the previous sections reveal that it is mostly socio-economic factors; income level, PHI cover and education level[178] which influence patients' WTP for the more expensive secondary privately financed healthcare services; brain and shoulder MRI scan. This finding highlights the construct validity of the WTP values found in this research. Patients with a higher income level and higher healthcare cover are willing to pay more for MRI scans (O'Brien and Gafni, 1996). While patients with low and middle incomes are less willing to pay for MRI scans, the low and middle income patients who do decide to pay are willing to pay more than higher income patients (see Tables 5.12 and 5.13). A possible reason for this unexpected finding is that patients with higher incomes are more likely to have PHI (HIA, 2014c) and this could affect their decision to pay for an MRI scan as they are aware that in reality their PHI will cover the cost of this. Therefore, patients who have a higher income may report a lower WTP as they know PHI will cover the cost. This was reported on two questionnaires. Two respondents wrote on the questionnaire that they would be only

[178] Education level is a proxy variable for income. The higher the education level, the higher the income (Day and Newburger, 2002.

WTP €50 for an MRI scan as they had PHI and were aware that their PHI would cover the cost of the scan.

In contrast, patients' WTP for the primary services included in this research; blood tests and branded prescription drugs, is mainly influenced by age and self-reported health status. While these variables influence patients' WTP for both of these primary services, the effect of the variables on both models are in fact opposite. This is due to the different base categories used in both models (see Section 5.4.5.4). With regard to blood tests, patients in the 30-44 year age group are more willing to pay to receive blood tests in the GP surgery relative to patients in the 19-29 year age group. Patients in this older age category may use the GP more frequently than the younger age group and consequently require more blood tests. If these patients receive blood tests more frequently, they may be more willing to pay as it is more convenient for these patients rather than attending a public hospital every time they require a blood test. Another possible reason for this finding is that patients in the 30-44 year age group may have higher incomes, as they are likely to be further on in their careers. If they have higher incomes, they will be more willing to pay for a healthcare service. Regarding patients' WTP for a branded over a generic version of a prescription drug, patients aged between 30 and 74 are less willing to pay for this service relative to a patient who is 75 years and over. These results show that the majority of the age groups included in this research are less willing to pay for a branded version of a prescription drug should one exist. This indicates that the majority of individuals are directly or indirectly supporting the concept of generic substitution. As discussed in Section 5.4.5.4, older patients are less likely to change their habits (Beache and Guell, 2015) and as a result will be cautious to switch from a branded prescription drug that is on a long-term prescription to a generic version of the same drug. While this research finds older age groups are more willing to pay for a branded prescription drug, this finding should be explored further by examining actual prescription drug cost-sharing in this age group to identify if the individuals actually do pay the difference between the reference price and the cost of the drug or do they simply request their GP to write "Do Not Substitute" on the prescription. This recommendation is discussed further in Section 6.4.

The results of this research also find self-reported health status as an influential factor for patients' WTP for blood tests and branded versions of prescription drugs. Considering WTP for blood tests first, patients with an excellent or very good health status are willing to pay more to receive this service in their GP surgery. Patients who are in excellent health are more likely to want to maintain this standard and therefore, are willing to pay more to receive faster access to this service. This finding is consistent with the theory presented in Section 2.4.1 and 2.4.2. When patients invest in health, this increases their stock of health which provides benefits in the future (consumption of health) in terms of increased time available for other activities such as work and leisure (Grossman, 1972). Patients with an excellent health status are willing to pay more to receive faster access to blood tests so they are not wasting valuable time that could be used for other work and leisure activities. Excellent health status can also be linked to education. Patients with a higher education may have more knowledge regarding the maintenance of good health.

In contrast, patients with an excellent (or very good) self-reported health status are less likely to be willing to pay for a branded version of a prescription drug. The expected benefit from consuming a branded version of a prescription drug is lower than the cost of paying the difference between the reference price and cost of the drug, therefore, a patient in excellent health is less willing to pay for a branded prescription drug and more likely to accept the generic version for the appropriate user charge.

Patients' previous use the healthcare service is a factor which influences patients' WTP for all three healthcare services included in this research. This is consistent with previous literature which also finds patient are more willing to pay for a service if they have used the service previously (Philips et al., 2010, Shearer et al., 2015). A positive previous experience increases the patients perceived value of a healthcare service (Qin and Prybutok, 2013).

5.5 Conclusion

This chapter identified what patients are willing to pay for three selected healthcare service in Ireland and also identified the factors which influence their WTP. The healthcare services included are blood tests, Magnetic Resonance Imaging (MRI) scans and a branded over a generic form of a prescription drug. Assessing patients' response to a price change is essential in the healthcare system and is particularly important in a healthcare system where user charges are gaining popularity as a method of healthcare financing.

Using a specifically designed self-completion questionnaire, the research collected primary data from patients attending six GP surgeries in Cork. The research finds that some patients are willing to pay for each of these services, yet there are discrepancies when comparing patients' WTP and the current market price. The descriptive statistics reveal that patients who are willing to pay for blood tests report a median WTP value of €20 while the current price is €5 for GMS and €10 for non-GMS. Patients who are willing to pay for a shoulder and brain MRI scan report a median WTP value of €100 and €150 respectively while the current price is €200 without PHI. Patients who are willing to pay for a branded version of a prescription drug report a median WTP values of €10. The current price for a GMS patient is €2.50[179] while the current price for a non-GMS patient is €7.95.

Using a two-part model to control for selection bias, the research finds socio-economic factors such as income, healthcare cover and education affect patients' WTP for the more expensive, secondary service included in the research; MRI scans while mainly demographic factors such as age and self-reported health status influence patients' WTP for the primary services; blood tests and a branded version of a prescription drug.

These results show that patients are willing to pay to receive these healthcare services in Ireland. While patients are willing to pay for the services, it is important to note that patients with lower income are willing to pay, yet are willing to pay less then higher income patients.

Chapters 3 and 4 of this research revealed different types of user charges may cause affordability and accessibility issues for low income patients when accessing services such as privately funded walk-in UCCs and public or part-publicly funded prescription

[179] If a GMS wishes to purchase the branded version of the cholesterol-lowering drug, they must pay the difference between the reference price (€2.52) (HSE 2015) and the actual cost of the drug (€7.17) plus the GMS co-payment fee (€2.50). Therefore, a GMS patient would pay a user charge of €9.67 to receive a one-month supply of the branded version of a cholesterol-lowering prescription drug.

drugs. Despite these results, Chapter 5 finds that patients with low, middle and high income levels are WTP for healthcare services such as blood tests in GP surgeries, MRI scans and branded prescription drugs. While there are discrepancies between the reported WTP values and the actual market price, the results indicate that patients in this sample are willing to contribute towards their healthcare costs. Chapter 5 indicates that patients are willing to pay for healthcare services based on their ability to pay. It is acknowledged that lower income individuals are willing to pay less than higher income individuals, however the results show that patients in this sample are willing to contribute towards their healthcare costs. These findings indicate that user charges may be a viable source of part-funding healthcare in Ireland once the user charge is determined from the patients' perspective taking into account their ability to pay.

The following chapter, Chapter 6 concludes this thesis by presenting the overall research findings, contributions and recommendations for future studies.

6 CONCLUSION

6.1 An Overview

This research assessed the impact of user charges in the context of consumer choice to ascertain how user charges impact on patient behaviour in Ireland. The study objectives, as set out in Section 1.2, were achieved by designing two specifically constructed questionnaires to collect primary data from patients in the Irish healthcare system who are subject to user charges for healthcare. This research examined three different topics in the Irish healthcare system and consequently, generated three datasets. The first topic assessed the impact of a full user charge paid OOP by the patient for a privately funded walk-in UCC in Ireland. The second topic collected primary data from patients for whom a user charge had been recently introduced or increased, for a mainly public or part-publicly provided service to reveal patient response. This topic investigated the impact of co-payments, deductibles and full user charges on patient behaviour for prescription drugs. The third and final topic examined patients' attitudes towards the potential application of OOP user charges for both public and private healthcare services when the choice is part of a time-money choice (MRI scans), convenience choice (blood tests) and preference choice (branded prescription drug).

In Ireland, OOP payments as a percentage of total healthcare financing has increased from 15% to 18.1% between 2007 and 2011 (OECD, 2013). With an extra €510 million in additional healthcare funding required by the end of 2014 and €600 million supplementary funding required for public services at the end of 2015, it is evident that the Irish health sector is under increasing pecuniary pressure and user charges will need to remain to help contribute towards healthcare financing (Hurley and Johnson, 1991, Robinson, 2002, Usher et al., 2012, Xu et al., 2006). This research examined the impact of user charges on patient choice of healthcare services in Ireland in the context of whether user charges are a viable method of part-funding healthcare.

Topic 1 in Chapter 3 used a self-completion questionnaire to collect primary data from patients attending three private walk-in UCCs in Ireland. This methodology was consistent with international empirical research studies conducted in walk-in UCCs across the US, UK and Canada (Bell and Szafran, 1992, Hunter et al., 2009, Rizos et al., 1990, Salisbury et al., 2002, Scott et al., 2009). A zero-truncated negative binomial (ZTNB) model was used to estimate the factors which influence patient choice of these clinics in Ireland. A probit regression was then used to identify the factors which increase the likelihood of the patient being a first-time user at the clinics.

Topic 2 in Chapter 4 developed a questionnaire, based on a previous study conducted by Reed *et al* (2008), to examine the impact that prescription drug user charges have on patient behaviour in Ireland. This questionnaire estimated three types of patient behaviour that can result from an increase in user charges for prescription drugs; decreased adherence, financial constraints and cost-coping strategies (Reed et al., 2008). Behavioural responses were assessed by measuring the percentage of patients who report any behavioural change (decreased adherence, financial burden or cost-coping behaviours). A multinomial logit model (MNLM) was then used to measure the association between behavioural response and individual characteristics.

Finally, topic 3 in Chapter 5 is a contingent valuation method (CVM) which used a questionnaire-designed stated preference approach to identify what healthcare consumers are willing to pay for three selected healthcare services in Ireland (blood tests, MRI scans and a branded prescription drug). The econometric analysis of this section was shaped by how the WTP question was asked and any underlying theoretical implications (Donaldson et al., 1998). Percentages and frequencies were examined to generate a response profile for WTP for the 3 identified healthcare services (Liu et al., 2013, Marvasti, 2006). A two-part model (probit and OLS regression) was used to identify the factors associated with patients' WTP for the three services.

6.2 Research Findings

The successful completion of the specific objectives as outlined in Section 1.3 are described in this section. Chapter 3 aimed to identify the factors which influence patient choice of walk-in UCCs in Ireland in the face of user charges. The chapter included patients who already made the decision to pay the user charge for this private health service in order to identify what drives patient choice. The first objective of Chapter 3 was to characterize the type of patient who chooses a walk-in UCC in Ireland, the second objective was to identify using a ZTNB model, the factors which influence patients' decision to pay a higher user charge to attend this alternative provider of care (compared with the cheaper traditional providers) and the final objective was to assess, using a Probit regression, the factors which affect the likelihood of the patient being a first-time user of the walk-in UCC.

Chapter 3 reveals that patients who use these clinics are more likely to be between 25 to 64 years of age with a high socio-economic status indicated by a high prevalence of third level education and over half of the sample reporting an income level above the national average.[180] It is mainly privately insured patients who use the clinics, as expected, and there are very few GMS patients who use these clinics. The ZTNB model found PHI, GMS, income (€70,000-€84,000), parking and travel time to the clinic significantly influence patient choice when choosing this alternative provider of urgent care. The significant socio-economic variables (PHI, GMS and income) are related to a patients' ability to pay. Finally, the probit regression in Chapter 3 reveals that GMS patients and patients with longer travel time to the clinics are more likely to be first time users of the walk-in UCC. Therefore, this finding suggests that GMS patients and patients with a longer travel time to the clinic are less likely to be repeat or multiple users of private walk-in UCCs. Patients with PHI cover, an income level of €70,000 to €84,000 and patients who report the importance of extended opening hours and sufficient parking are less likely to be first-time users and consequently more likely to be repeat or multiple users of the clinic.

In addition to the main objectives identified in Chapter 3, this chapter also found that 66% of the sample were successfully treated at a walk-in UCC and did not require further treatment. If these walk-in UCCs were not available, these patients may have presented at a traditional provider of urgent care; a GP surgery or an A&E department. The high treatment success rate found in this research indicates that alternative providers of urgent care, such as Vhi SwiftCare Clinics, can relieve pressure on traditional urgent care providers in Ireland. If patients choose to attend alternative

[180] See footnote 52.

providers and are successfully treated at these locations, these patients are not attending traditional providers, which reduces pressure for the latter providers. This research concludes that if it were not for these alternative providers of care, patients would have no choice but to attend an A&E department or GP surgery; thereby putting additional pressure on these services.

Discussions with individuals throughout this research process at conferences[181] and presentations[182] revealed a lack of knowledge surrounding the existence of alternative urgent care providers such as Vhi SwiftCare Clinics. A significant number of individuals were either not aware of Vhi SwiftCare Clinics and if they were aware, a number of individuals were of the opinion these clinics were only available to Vhi healthcare members. This research suggests the need for a privately funded information campaign advocating the services that these clinics offer and emphasising that these clinics are available to every individual who is willing to pay the necessary user charge. This would promote these clinics with a view to redirecting some patients away from the traditional providers of urgent care to this alternative location for some specific illnesses and injuries.

In conclusion to Chapter 3, the high socio-economic status of the users of the clinics and the significant socio-economic variables (PHI cover, GMS cover and income) which were found to influence patient choice, indicate that ability to pay influences patient choice when choosing a walk-in UCC. Since these clinics do not accept GMS cards as a method of payment, the potentially higher user charge may act as a deterrent

[181] Irish Society of New Economists (ISNE), NUI Galway, 5th September 2014.
[182] School of Economics, University College Cork, 25th February 2015.

for GMS patients who have a lower income. This raises concerns regarding accessibility as patients with lower income levels do not have the same access to the convenient care that is offered by the alternative provider of urgent care as patients with higher income levels. Chapter 3 reveals that patients with a higher socio-economic status are more likely to be repeat users of these clinics in comparison to patients with lower income levels who are less likely to be repeat users of the clinics. This research concludes that the affordability of more expensive services such as private walk-in UCCs is not an issue for high income patients who place a higher preference on the convenient care offered by these clinics.

Chapter 4 assesses the impact of prescription drug user charges on patient behaviour. The chapter examines patients for whom a user charge has been recently introduced or increased for this mainly public or part-publicly provided service, to reveal patient response. The chapter investigated the impact of the main types of user charges which exist for prescription drugs in Ireland; co-payments, deductibles and full OOP cost. The impact of the user charge focused on three types of behavioural change as a result of prescription drug costs; decreased adherence, financial burden and cost-coping strategies. A patient reported decreased adherence if they took less of a prescribed drug without the advice of their GP, if they stopped filling a prescription for a new medication or stopped filling a prescription for an old medication. Patients reported the cost of prescription drugs as a financial burden if they reported borrowing money from friends or family to pay for medication, spending less on food/heat or other basic needs to pay for medication or increasing credit card debt to pay for medication. A patient engaged in cost-coping strategies if they reported using cheaper OTC drugs before purchasing prescription drugs, switching to cheaper drugs such as generic drugs, requesting free medication samples from the GP or purchasing drugs from an on-line pharmacy.

The first objective of Chapter 4 was to identify the effect that different forms of prescription drug user charges have on patient behaviour. The second objective of Chapter 4 was to use a MNLM to measure the association between patient behaviour (decreased adherence, financial burden and cost-coping behaviours) and individual characteristics.

Chapter 4 suggests GMS patients who pay a flat co-payment per prescription item are the highest reporters of decreased adherence. In other words, GMS patients reduce their prescription drug use and stop filling old and new prescriptions as a result of prescription drug costs. This finding can have both positive and negative implications. Firstly, this type of decreased adherence may be as a result of patient stock-piling. As GMS co-payments have increased since 2010, GMS patients may be becoming more cost-conscious of unnecessarily purchasing prescription drugs they may have stock-piled during times when the user charge was lower and when GMS patients had no incentive to avoid requesting a prescription drug. Alternatively, this finding may have negative implications as the patient may be decreasing their use of essential drugs as a result of the user charge. If so, user charges can create adverse outcomes such as hospitalization and deteriorating health status (Goldman, 2007).

Chapter 4 also finds GMS patients are the highest reporters of prescription costs creating a financial burden. Prescription drug user charges result in GMS patients borrowing money to pay for prescription drugs, spending less on food/heat or other basic needs and increasing credit card debt to pay for medication. This finding raises affordability concerns for GMS patients.

DPS patients who are subject to a monthly deductible are the highest reporters of cost-coping strategies as a result of prescription drug costs. DPS patients are the highest reporters of using cheaper OTC drugs, switching to generic drugs, requesting free medication samples from the GP and purchasing drugs from an on-line pharmacy. While DPS patients are the highest reporters (35%) of switching to generic drugs, Chapter 4 finds that GMS and LTI patients also report this type of behaviour (28% and 25% respectively). This finding highlights that generic substitution which was introduced in Ireland as part of the Health (Pricing and Supply of Medical Goods) Act 2013 is proving to be successful. DPS, GMS and LTI patients in this sample who pay OOP for prescription drugs, may either accept the generic version of the prescription drug and pay the relevant user charge or in order to receive the branded version, they must pay the difference between the reference price and the cost of the drug. There is however, another alternative for GMS patients. Should a GP believe a GMS patient must be exempt from generic substitution, for medicinal reasons, the GP can write “Do Not Substitute” on the patients’ prescription. The pharmacist dispensing the prescription must then dispense the branded version of the drug to the GMS patient at the regular co-payment of €2.50 per item (DOH, n.d.). These results show that despite a percentage of the GMS patients in the sample engaging in generic substitution, there is still a large number of respondents (69%) who are not engaging in this type of behaviour.

The findings from the first objective of Chapter 4 reveal different types of user charges such as co-payments, deductibles and full OOP user charges have different impacts on patient choice. Supported by economic theory, the results prove that the larger the proportion of a patient's income is spent on a service, the higher the degree of patient response.

The second and final objective of Chapter 4 was to use a MNLM to measure the association between patient behaviour (in relation to prescription drug user charges) and individual characteristics. The MNLM reveals patients with GMS cover, patients without any form of prescription drug cover, patients with high prescription drug costs and patients with a low monthly income level (€1,000-€2,249) are more likely to engage in all three types of behavioural change; decreased adherence, financial burden and cost-coping strategies as a result of prescription drug user charges. These findings suggest that prescription drug user charges in Ireland have the largest impact on the most vulnerable populations; the sick and the poor.

The results of Chapter 4 raise considerations in terms of patient affordability and accessibility for prescription drugs in Ireland. The research implies that the user charges for prescription drugs in Ireland may be regressive as patients with lower income levels (vertical affordability) and higher prescription drug costs (vertical accessibility) are patients who are most likely to decrease their adherence to prescription drugs, report a financial burden as a result of prescription drug user charges and engage in cost-coping strategies in an attempt to reduce their OOP payments.

Chapter 5 examined patients' attitudes towards the potential application of user charges for both public and private healthcare services when the choice is part of a time-money trade-off (MRI scans), a convenience choice (blood tests) and a preference choice (branded drug). The chapter identified what patients are willing to pay for the three selected healthcare services in Ireland and also identified the factors which influence patients' WTP. The first objective of Chapter 5 was to reveal patients' WTP values for three healthcare services. The second objective was to identify discrepancies between patients' reported WTP values and the current market price. The third and final objective of Chapter 5 was to identify using a two-part model the factors that are associated with patients' WTP values for the three selected healthcare services.

The research reveals that patients are willing to pay €20[183] to receive a blood test in a GP surgery. More specifically, GMS patients report they are willing to pay €12.50 to receive a blood test in a GP surgery while non-GMS patients are willing to pay €20. In the sample, patients report they are willing to pay €100 to receive faster access to a shoulder MRI scan and €150 to receive quicker access to a brain MRI scan. GMS patients are willing to pay €5 for a branded version of a cholesterol-lowering drug while non-GMS patients are willing to pay €10 to receive a branded version of the drug.

When comparing the amount patients are willing to pay with the current market price for each service, the research found patients are willing to pay more than the market price for the lower costing primary care services (blood tests and a branded drug) and

[183] Median Value. The research presents the median WTP value rather than the mean WTP value as the mean response is subject to bias due to outliers in WTP values (Buckland et al., 1999). The median value reports the WTP value that the 50th percentile are willing to pay (Heiman, 2011). All WTP values presented in this paragraph report he median values, unless otherwise stated.

patients are willing to pay less than the market price for the more expensive secondary care service (MRI scan). The higher cost of this secondary care service may be the reason patients' WTP values are lower than the market price. This supposition is supported by the economic theory of Becker (1965) and Grossman (1972) as a much larger proportion of patients' income is spent on an MRI scan in comparison to the primary care services (blood tests and a branded prescription drug).

Finally, the two-part model finds socio-economic factors such as income, healthcare cover and education level to influence patients' WTP for the more expensive, secondary service included in the research (MRI scans), while mainly demographic factors influence patients' WTP for the lower costing primary care services (blood tests and a branded version of a prescription drug). These findings support the construct validity of the WTP values reported by patients in this research where patients with lower income are willing to pay less than patients with higher incomes.

Chapter 5 indicates that patients are willing to pay for healthcare services based on their ability to pay. It is acknowledged that lower income individuals are willing to pay less than higher income individuals, however the results show that patients in this sample are willing to contribute towards their healthcare costs. The findings from this chapter indicate that user charges may be a viable source of part-funding healthcare in Ireland once the user charge is determined from the patients' perspective taking into account their ability to pay.

6.3 Research Contributions

Collecting primary data from a subset of the population in walk-in UCCs and GP surgeries, this research contributes to the literature by examining user charges in the context of consumer choice to determine how they impact on patient behaviour in Ireland. This study contributes to data as it identifies the impact of user charges on consumer choice from the patients' perspective to assess whether user charges are a viable source to part-fund healthcare in Ireland. This contribution is important at a time of increasing financial pressure in the Irish healthcare system in which user charges are gaining popularity as a method of healthcare financing.

The study found that user charges have a different impact on private, public and part-publicly funded healthcare services.

The study suggests private walk-in UCCs improve access to urgent care for patients who are willing and able to pay the potentially higher user charge for this service. If patients who can afford to pay for urgent care at alternative providers continue to do so, this would relieve pressure on GPs and A&E departments in Ireland. This needs to be recognised by the private urgent care providers who wish to increase the utilization of their service.

This study also proves that user charges can disproportionately affect lower income groups and result in adverse effects such as patients decreasing their adherence to prescription drugs without the advice of their GP and identifying user charges as a financial burden. The study also indicates that patients engage in cost-coping behaviours as a result of drug costs such as switching to cheaper OTC drugs, generic drugs, purchasing drugs from an on-line pharmacy and requesting free medication samples from their GP.

Despite the negative impact of user charges on lower income earners as portrayed in Chapters 3 and 4, the results obtained from the CVM in Chapter 5 suggest that patients from all income backgrounds are willing to pay for healthcare services in Ireland. Lower income individuals are willing to pay for healthcare services, albeit at a lower user charge than higher income earners.

The results in this thesis regarding patient response to different types of user charges for private, public and part-publicly funded healthcare services in Ireland generate an important policy contribution. At a time of increasing financial pressure in Irish healthcare, and with evidence provided by this study that patients are willing to pay for healthcare services, user charges in healthcare need to be developed based on patients' ability to pay. While a standard costing approach is mandatory in the user charge process, the results of this study indicate that greater consideration should also be given to patients' ability to pay when setting user charges for healthcare. This would ensure user charges are set at a level which contribute towards healthcare financing while also providing affordable and accessible care to patients. This could reduce the risk of any adverse effects associated with user charges such as; decreased adherence and subsequent deteriorating health.

6.4 Research Limitations and Future Recommendations

This section presents research limitations together with a number of recommendations for future studies that developed throughout this research process.

In Chapter 3 of this research, only users of the alternative urgent care providers are included. To expand knowledge in this area, future research could include both users and non-users of alternative urgent care providers. A full demand study of this kind would identify why patients choose a traditional provider of urgent care and not an alternative provider. This would provide insight into the urgent care system in Ireland in order to achieve a system where the needs of patients are met in an affordable manner while achieving efficiency in access as a result of shorter waiting times.

Due to inaccessible Irish data, this research was unable to identify the number and type of prescription drugs that were subject to behavioural change as a result of prescription drug user charges., If possible, future studies should include the number and type of drugs that are analysed in the context of user charges. This would identify whether patients reduce their use of high-cost drugs or all drugs, essential or non-essential drugs (Gibson et al., 2005a).

In an Irish context, when assessing patients' WTP for branded versus generic prescription drugs, more focus needs to be given to patients over 75 years of age. While the self-reported data in this research reveals this age group are willing to pay to receive the branded version of the drug, patients' actual behaviour also needs to be assessed. Results would indicate whether this age cohort actually pay for the branded version or whether they request that their GP writes “Do Not Substitute” on their scripts in order to receive the branded version without having to pay the difference between the reference price and the cost of the drug? If it is the latter, then policy makers need to reassess this option from the prescribers’ perspective to ensure they only deem the patient exempt from substitution on medicinal grounds and not as result of the request of the patient.

When conducting a contingent valuation using a WTP study, protest zeros are a methodological concern which need to be dealt with accordingly. Generally, protest zeros are explored using debriefing questions in face-to-face interviews. As this research used a self-completion questionnaire to collect the data, it was not possible to include debriefing questions in a face-to-face manner. However, future studies that also use a self-completion questionnaire could investigate protest zeros by providing reasons on the questionnaire as to why a patient may not be willing to pay for a healthcare service. While this method may not be as informative as face-to-face interviews, it would provide additional information on protest zeros.

6.5 Conclusion

This research has assessed the impact of user charges in the context of consumer choice to ascertain how user charges impact on patient behaviour in Ireland. Using two specifically designed questionnaires, the research objectives were achieved by collecting primary data from patients in the Irish healthcare system who are subject to user charges. This research has provided a direct insight into the public’s response to user charges in healthcare The study was conducted in the context of whether user charges are a viable source for part-funding healthcare in Ireland.

Examining the economic theories of Becker (1965) and Grossman (1972), the research has assessed the impact of user charges on patient choice in terms of affordability and accessibility in healthcare. The research examined a number of public and private healthcare services in Ireland for which varying levels of user charges exist depending on patients' healthcare cover. The results indicate that the impact of user charges on private and public healthcare services vary according to socio-economic status.

Chapters 3 and 4 of this research reveal different types of user charges such as; co-payments, deductibles and full OOP user charges, cause affordability and accessibility issues for low income patients when accessing services. Despite these results, Chapter 5 suggests that patients with low, middle and high income levels are WTP for healthcare services. While there are discrepancies between the reported WTP values and the actual market price, the results of this research indicate that patients in this sample are willing to contribute towards their healthcare costs. Lower income patients are willing to pay for healthcare services, albeit, at a lower price than higher income earners. However, the results show that even low-income patients in this sample are willing to contribute towards their healthcare costs.

In conclusion, this study suggests that user charges may be a feasible source of part-financing Irish healthcare once the user charge is determined from the patients' perspective, taking into account their ability to pay.

It is hoped this research will inspire further studies into this evolving method of healthcare financing.

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Appendix A.1 Ethical Approval

ucc
Coláiste na hOllscoile Corcaigh, Éire
University College Cork, Ireland

Oifig an Leas - Uachtaráin Taighde agus Nuálaíochta
Office of the Vice President for Research and Innovation

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Aimee Fox,
Economics Dept.

28th March 2013

Dear Aimee,

Thank you for submitting your research (project entitled What Factors Affect the Demand for Vhi SwiftCare Clinics?") to SREC for ethical perusal. I am pleased to say that we see no ethical impediment to your research as proposed and we are happy to grant approval.

We wish you every success in your research.

Yours sincerely,

S Hammond

Sean Hammond
Chair of Social Research Ethics Committee

Professor Anita R. Maguire [illegible]
Vice President for Research and Innovation

Ollscoil na hÉireann, Corcaigh
National University of Ireland, Cork

Appendix A.2 Questionnaire for Urgent Care Clinics

"What Factors Influence Patient Use of Vhi SwiftCare Clinics?"

As a PhD student in Health Economics at University College Cork (UCC), it is required that I carry out a research study. The study aims to assess the factors that influence patient use of Vhi SwiftCare Clinics in Ireland.* As you are a Vhi SwiftCare Clinic user you have been asked to take part.

The survey should only take 5 minutes to complete. Instructions are provided after each question for ease of completion.

Any information you provide will remain **anonymous and confidential**.

You have the option of withdrawing from this survey at **any** stage.

If you need any further information, you can contact me: Aimée Fox by phoning 087-7674497 or emailing me at a.fox@ucc.ie

Consent Form

I agree to participate in Aimée Fox's research study.

Yes/No (Please circle)

The purpose and nature of the study has been explained to me.

I am participating voluntarily.

Signed.. (Optional) Date....................

* Approval for this study has be granted by the Social Research Ethical Committee and the School of Economics in UCC

P.T.O

What Factors Influence Patient Use of Vhi SwiftCare Clinics?"

Please indicate whether you are the patient **or** if you are a parent/guardian/relation or friend filling in this form ***on behalf of the patient.***
Any information you provide will remain **anonymous and confidential**.

( ) PATIENT ( ) PARENT ( ) GUARDIAN ( ) RELATION ( ) FRIEND

Background

Q1. Patient's gender? (Please tick appropriate box)

☐ Male ☐ Female

Q2. Patient's age? (Please State) ____________________ Years

Q3. Patient's nationality (Please tick appropriate box)

☐ Irish ☐ Other EU ☐ UK ☐ Non EU Citizen

Q4. Patient's highest level of education achieved at this current time? (Please tick appropriate box)

☐ No Education ☐ Primary Education ☐ Secondary Education ☐ Third Level ☐ Other (Please State)

____

Q5. How long did it take the **patient** to travel to this Vhi SwiftCare Clinic today? (Please State)
____________________ Minutes

Q6. Does the **patient** have a medical card? (Please tick appropriate box)

☐ Yes ☐ No

Q7. (a) Does the **patient** have private health insurance? (Please tick appropriate box)

☐ Yes ☐ No

Q7. (b) If yes, of which health insurance company is the **patient** a member? (Please State)

____

Previous Vhi SwiftCare Clinic Use

Q8. (a) Has the **patient** ever attended a Vhi SwiftCare Clinic before? (Please tick appropriate box)

☐ Yes ☐ No

Q8. (b) If yes, how many times previously? (Please State)

____

Q9. (a) Has the **patient** ever attended another minor injury clinic before? (E.g. Mercy Urgent Care Clinic or Mater Smithfield Rapid Injury Clinic)

☐ Yes ☐ No

Q9. (b) If yes, which minor injury clinic has the **patient** previously used? (Please State)

____________________ **P.T.O**

Current Vhi SwiftCare Clinic Use

Q10. Please rate the **importance** of the following characteristics of Vhi SwiftCare Clinics in influencing the **patient's** decision to visit this clinic today. (Please tick appropriate box for each characteristic)

Characteristic	Very important 1	Important 2	Neither important nor unimportant 3	Unimportant 4	Very unimportant 5
Location (Convenient location of the SwiftCare Clinic)	☐	☐	☐	☐	☐
Waiting Times (1 hour treatment policy)	☐	☐	☐	☐	☐
Appropriate Treatment Setting (Knowledge that injury was treatable at the Vhi SwiftCare clinic)	☐	☐	☐	☐	☐
Cost (Knowledge of possible cost of treatment)	☐	☐	☐	☐	☐
Non-appointment Service (No appointment necessary before visit to clinic)	☐	☐	☐	☐	☐
General Practitioner (GP) referral (Referred by GP to the SwiftCare Clinics)	☐	☐	☐	☐	☐
Parking (Parking access)	☐	☐	☐	☐	☐
Word of Mouth (Someone else's experience)	☐	☐	☐	☐	☐
Cleanliness (Cleanliness of clinic)	☐	☐	☐	☐	☐
Accessibility (Opening hours: 8am-10pm 7 days a week)	☐	☐	☐	☐	☐
Previous A&E department use (Previous experience in A&E)	☐	☐	☐	☐	☐
Cost Reimbursement ***(For health insurance members only)*** (Reimbursement of part of the cost e.g. Vhi, Allianz Pupil Personal Accident Insurance)	☐	☐	☐	☐	☐

P.T.O

Income

Q11. Please tick the annual **gross income*** category which best applies to the patient. If the patient is a child (under 18) please choose the annual gross income category of the individual responsible for payment to the Vhi SwiftCare Clinic. ***Gross income**: income level before any deductions (e.g. Tax). All information provided will remain **anonymous and confidential**

☐ <€25,000 ☐ €55,000 - €69,000

☐ €25,000 - €39,000 ☐ €70,000 - €84,000

☐ €40,000 - €54,000 ☐ €85,000+

Q12. What minor injury/illness did the **patient** have treated at this clinic today? (Please tick appropriate box)

☐ Sprain/Strain ☐ Minor Eye/Ear Condition ☐ Fracture/Break ☐ Sport Injury ☐ Minor Burn ☐ Cut Requiring Stitches ☐ Minor Illness (Please State) _____ ☐ Other (Please State) _______

Q13. Is the **patient** being referred to? (Please tick appropriate box)

☐ GP ☐ A&E department ☐ Non-referral ☐ Other (Please State) __________ ____________

Q14. How much did this visit cost in total **after** possible discounts/reimbursements were applied? (Please State)__________________ Euro

Q15. Please rank how **satisfied** the patient was with each of the following characteristics at this Vhi SwiftCare Clinic today. (Please tick appropriate box for **each** characteristic)

Characteristic	**Very Satisfied** 1	**Satisfied** 2	**Neither satisfied nor dissatisfied** 3	**Dissatisfied** 4	**Very dissatisfied** 5
Staff (Staff Approach)	☐	☐	☐	☐	☐
Treatment (Quality of treatment received)	☐	☐	☐	☐	☐
Waiting Times (Length of time waiting prior to treatment)	☐	☐	☐	☐	☐
Privacy (From other patients/individuals)	☐	☐	☐	☐	☐
Parking (Parking access)	☐	☐	☐	☐	☐
Cleanliness (Cleanliness of clinic)	☐	☐	☐	☐	☐

P.T.O

Q16. In the future, if necessary, how likely would the **patient** be to return to a Vhi SwiftCare Clinic?

☐ Very likely ☐ Likely ☐ Neither likely nor unlikely ☐ Unlikely ☐ Very unlikely

Q17. If you wish, please provide any comments you feel necessary?

____

____

____

taking the time to complete this survey. You may now place the survey in the box provided at reception. Thank

Appendix A.3 Frequently Asked Questions for Patients

Purpose of the Study. As a PhD student in Health Economics at University College Cork (UCC), it is required that I carry out a research study. The study aims to assess the factors that influence patient use of Vhi SwiftCare Clinics.

What will the study involve? The study will involve collecting information from Vhi SwiftCare Clinic patients. Surveys will be used to collect this information. The survey will take 3-5 minutes to complete.

Why have you been asked to take part? As a Vhi SwiftCare Clinic patient you have been asked to take part. As an alternative, you may also have attended a GP surgery or an A&E department. So for that reason, I am interested in what made you decide to visit the Vhi SwiftCare Clinic instead of a GP or A&E department for the treatment of your minor injury/illness.

Do you have to take part? No. Participation is voluntary. There is a consent form that you will sign to say you agree to participate. You have the option of withdrawing from this research at **any** stage.

Will your participation in the study be kept confidential? Yes. The survey does not require any personal details (name, address etc.). I will ensure that no clues to your identity appear in the thesis.

What will happen to the information which you give? The data will be kept confidential for the duration of the study. On completion of the thesis, they will be retained for a further six months and then destroyed.

What will happen to the results? The results will be presented in the thesis. They will be seen by my supervisors, a second marker and the external examiner. The thesis may be read by future students on the course. The study may be published in a research journal.

What are the possible disadvantages of taking part? There are no disadvantages in taking part in this study.

Who has reviewed this study? This study has been reviewed and approved by the Social Research Ethical Committee and the School of Economics in UCC.

Any further queries? If you need any further information, you can contact me: Aimée Fox by phoning 087-7674497 or emailing me at a.fox@ucc.ie

Thank you!

UCC
Coláiste na hOllscoile Corcaigh, Éire
University College Cork, Ireland

Vhi
SwiftCare Clinics

Appendix A.4 Codebook for Urgent Care Clinics

Full Variable name	**Variable Name**	**Coding Instruction**
Respondent	resp	1 = Patient 2= Parent 3= Guardian 4= Friend . = Missing
Gender	sex	0= Female 1 = Male
Age	age	in years
Nationality	nation	1 = Irish 2 = Other EU 3 = UK 4 = Non EU citizen . = Missing
Education	educ	1 = No education 2 = Primary education 3 = Secondary education 4 = Third level 5 = Other . = Missing
Travel time	travel	In minutes
Medical card	medc	0 = No 1 = Yes
Private health insurance	phi	0 = No 1 = Yes
Health insurance company	phicov	Name
Vhi SCC previous use	sccprev	0 = No 1 = Yes
Times previously	scctimes	Times
Previous MIU use	miuprev	0 = No 1 = Yes . = Missing
MIU name	miuname	Name
Location	location	1 = Very important 2 = Important 3 = Neither important nor unimportant 4 = Unimportant 5 = Very unimportant . = Missing
Waiting times	waittime	1 = Very important 2 = Important 3 = Neither important nor unimportant 4 = Unimportant

		5 = Very unimportant . = Missing
Treatment Setting	apptreatset	1 = Very important 2 = Important 3 = Neither important nor unimportant 4 = Unimportant 5 = Very unimportant . = Missing
Cost	cost	1 = Very important 2 = Important 3 = Neither important nor unimportant 4 = Unimportant 5 = Very unimportant . = Missing
Non-Appointment Service	nonappserv	1 = Very important 2 = Important 3 = Neither important nor unimportant 4 = Unimportant 5 = Very unimportant . = Missing
GP referral	gpref	1 = Very important 2 = Important 3 = Neither important nor unimportant 4 = Unimportant 5 = Very unimportant . = Missing
Parking	park	1 = Very important 2 = Important 3 = Neither important nor unimportant 4 = Unimportant 5 = Very unimportant . = Missing
Word of mouth	wom	1 = Very important 2 = Important 3 = Neither important nor unimportant 4 = Unimportant 5 = Very unimportant . = Missing
Cleanliness	cleanliness	1 = Very important 2 = Important 3 = Neither important nor unimportant 4 = Unimportant 5 = Very unimportant . = Missing

Accessibility	accessibility	1 = Very important 2 = Important 3 = Neither important nor unimportant 4 = Unimportant 5 = Very unimportant . = Missing
Previous A&E Use	preva&euse	1 = Very important 2 = Important 3 = Neither important nor unimportant 4 = Unimportant 5 = Very unimportant . = Missing
Cost Reimbursement	costreim	1 = Very important 2 = Important 3 = Neither important nor unimportant 4 = Unimportant 5 = Very unimportant . = Missing
Annual gross income	income	1= <€25,000 2 = €25,000 - €39,000 3 = €40,000 - €54,000 4 = €55,000 - €69,000 5 = €70,000 - €84,000 6 = €85,000+ . = Missing
Minor injury/illness treated	illtreat	1 = Sprain/Strain 2 = Minor ear/eye condition 3 = Fracture/break 4 = Sport injury 5 = Minor burn 6 = Cut requiring stitches 7 = Minor Illness 8 = Other . = Missing
Further referral	referral	1 = GP referral 2 = A&E department 3 = Non-referral 4 = Other . = Missing
Cost of visit	visitcost	In euro
Staff Approach	staffsat	1 = Very satisfied 2 = Satisfied 3 = Neither satisfied nor dissatisfied 4 = Dissatisfied 5 = Very dissatisfied . = Missing
Treatment Quality	treatsat	1 = Very satisfied 2 = Satisfied

		3 = Neither satisfied nor dissatisfied 4 = Dissatisfied 5 = Very dissatisfied . = Missing
Waiting Times	waittimesat	1 = Very satisfied 2 = Satisfied 3 = Neither satisfied nor dissatisfied 4 = Dissatisfied 5 = Very dissatisfied . = Missing
Privacy from others	privsat	1 = Very satisfied 2 = Satisfied 3 = Neither satisfied nor dissatisfied 4 = Dissatisfied 5 = Very dissatisfied . = Missing
Parking access (free)	parksat	1 = Very satisfied 2 = Satisfied 3 = Neither satisfied nor dissatisfied 4 = Dissatisfied 5 = Very dissatisfied . = Missing
Cleanliness	cleansat	1 = Very satisfied 2 = Satisfied 3 = Neither satisfied nor dissatisfied 4 = Dissatisfied 5 = Very dissatisfied . = Missing
Future use of SCC	futureuse	1 = Very Likely 2 = Likely 3 = Neither likely nor unlikely 4 = Dissatisfied 5 = Very dissatisfied . = Missing
Comments	comments	State

Appendix A.5 Original Urgent Care Clinic Survey

What Factors Affect the Demand for Vhi SwiftCare Clinics?"

Please indicate whether you are the patient **or** if you are a parent/guardian/relation or friend filling in this form ***on behalf of the patient.***

Any information you provide will remain anonymous and confidential.

( ) Patient ( ) Parent ( ) Guardian ( ) Relation ( ) Friend

Background

Q1. Patient's gender? (Please tick appropriate box)

☐ Male ☐ Female

Q2. Patient's age? (Please State) ____________________ Years

Q3. Patient's nationality (Please tick appropriate box)

☐ Irish ☐ Other EU ☐ UK

☐ Non EU Citizen

Q4. Patient's highest level of education achieved at this current time? (Please tick appropriate box)

☐ No Education ☐ Primary Education ☐ Secondary Education

☐ Third Level ☐ Other (Please State) ____________

Q5. How long did it take the patient to travel to this Vhi SwiftCare Clinic today? (Please State) ____________________ Minutes

Q6. Does the patient have a medical care? (Please tick appropriate box)

☐ Yes ☐ No

Q7. (a) Does the patient have private health insurance? (Please tick appropriate box)

☐ Yes ☐ No

Q7. (b) If yes, of which health insurance company is the patient a member of? (Please State) ____________________

Previous Vhi SwiftCare Clinic Use

Q8. (a) Has the patient ever attended a Vhi SwiftCare Clinic before? (Please tick appropriate box)

☐ Yes ☐ No

Q8. (b) If yes, how many times previously? (Please State)____________________

Q9. (a) Has the patient ever attended another minor injury clinic before? (E.g. Mercy Urgent Care Clinic or Mater Smithfield Rapid Injury Clinic)

☐ Yes ☐ No

Q9. (b) If yes, which minor injury clinic has the patient previously used? (Please State) __________

Current Vhi SwiftCare Clinic Use

Q10. Please rank in order of **importance** the following characteristics of the Vhi SwiftCare Clinic in influencing the patient's decision to visit this clinic today.
(Please tick appropriate box for each characteristic)

Characteristic	**Very important** **1**	**Important** **2**	**Neither important nor unimportant** **3**	**Unimportant** **4**	**Very unimportant** **5**
Location (Convenient location of the SwiftCare Clinic)	☐	☐	☐	☐	☐
Waiting Times (1 hour treatment policy)	☐	☐	☐	☐	☐
AppropriateTreatment Setting (Knowledge that injury was treatable at the Vhi SwiftCare clinic)	☐	☐	☐	☐	☐
Cost (Knowledge of possible cost of treatment)	☐	☐	☐	☐	☐
Non-appointment Service (No appointment necessary)	☐	☐	☐	☐	☐
GP referral (Referred by GP)	☐	☐	☐	☐	☐
Parking (Parking access and cost)	☐	☐	☐	☐	☐
Word of Mouth (Someone else's experience)	☐	☐	☐	☐	☐
Facilities (Phones, Refreshments, Toilets)	☐	☐	☐	☐	☐
Accessibility (Opening hours)	☐	☐	☐	☐	☐
Healthcare Reimbursement *[For health insurance members only]* (Reimbursement of part of the cost)	☐	☐	☐	☐	☐

Income

Q11. Please tick the individual gross income* category which best applies to the patient. If the patient is a child (under 18) please choose the gross income category of the individual responsible for payment to the Vhi SwiftCare Clinic.

*Gross income: your individual income level before any deductions (e.g. Tax)

You can choose income per year, per month or per week.

Annually	Monthly	Weekly
☐ <€15,000	☐ <€1250	☐ <€288
☐ €15,000 - €24,999	☐ €1,250 - €2,083	☐ €288 - €479
☐ €25,000 - €34,999	☐ €2,084 - €2,916	☐ €480 - €672
☐ €35,000 - €44,999	☐ €2,917 - €3,749	☐ €673 - €864
☐ €45,000 - €54,999	☐ €3,750 - €4,582	☐ €865 - €1,056
☐ €55,000 - €64,999	☐ €4,583 - €5,415	☐ €1,057 - €1,249
☐ €65,000 - €74,999	☐ €5,416 - €6,249	☐ €1,250 - €1,441
☐ €75,000 - €84,999	☐ €6250 - €7,083	☐ €1,442 - €1,634
☐ €85,000 +	☐ €7,083 +	☐ €1,635 +

Previous Use of A&E Department

Q12. (a) Has the patient ever attended an A&E department before? (Please tick appropriate box)

☐ Yes ☐ No

If the patient has never attended an A&E department before please proceed to Q18 after treatment is received in this clinic today).

Q12. (b) If yes, how many times previously has the patient used an A&E department? (Please State)

______________________ (Times)

Q12. (c) How many times has the patient used an A&E department **after** 2005? (Please State)

______________________ (Times)

Q13. When the patient **last** used an A&E department were they referred to the department by a GP? (Please tick appropriate box)

☐ Yes ☐ No

Q14. Following treatment on the last visit to an A&E department, was the patient admitted as an in-patient to the hospital? (Please tick appropriate box)

☐ Yes ☐ No

Q15. Did the patient receive treatment for any of the following injuries during the **last** visit to an A&E department? (Please tick appropriate box/boxes)

☐ Sprain/Strain ☐ Minor Eye Condition ☐ Possible Break

☐ Sport Injury ☐ Minor Burn ☐ Minor Ear Condition

☐ Cut Requiring Stitches

☐ Other (Please State) ______________________

Q16. Please rank how **satisfied** the patient was with each of the following characteristics during their **last** visit to an A&E department (Please tick appropriate box for **each** characteristic)

Characteristic	**Very Satisfied** 1	**Satisfied** 2	**Neither Satisfied Nor Dissatisfied** 3	**Dissatisfied** 4	**Very Dissatisfied** 5
Staff (Staff Approach)	☐	☐	☐	☐	☐
Treatment (Quality of treatment received)	☐	☐	☐	☐	☐
Waiting Times (Length of time spent prior to treatment)	☐	☐	☐	☐	☐
Privacy (From other patients/individuals)	☐	☐	☐	☐	☐
Parking (Parking access and cost)	☐	☐	☐	☐	☐
Facilities (Phones, Refreshments, Toilets)	☐	☐	☐	☐	☐
Layout (Directions/signs to different areas within the clinic)	☐	☐	☐	☐	☐

Q17. In the future, if necessary, how likely would the patient be to return to an A&E department? (Please tick appropriate box)

☐ Very Likely ☐ Likely ☐ Neither likely nor unlikely

☐ Unlikely ☐ Very unlikely

AFTER TREATMENT

Q18. What minor injury did the patient have treated at this clinic today? (Please tick appropriate box)

☐ Sprain/Strain ☐ Minor Eye Condition ☐ Possible Break

☐ Sport Injury ☐ Minor Burn ☐ Minor Ear Condition

☐ Cut Requiring Stitches

☐ Other (Please State) ________________________

Q19. Has the patient been referred to.................? (Please tick appropriate box)

☐ GP ☐ A&E department ☐ Non-referral

☐ Other (Please State) ___________

Q20. How much did this visit cost in total? (Please State)

______________________ Euro

Q21. Please rank how **satisfied** the patient was with each of the following characteristics at this Vhi SwiftCare Clinic today. (Please tick appropriate box for **each** characteristic)

Characteristic	**Very Satisfied** 1	**Satisfied** 2	**Neither Satisfied Nor Dissatisfied** 3	**Dissatisfied** 4	**Very Dissatisfied** 5
Staff (Staff Approach)	☐	☐	☐	☐	☐
Treatment (Quality of treatment received)	☐	☐	☐	☐	☐
Waiting Times (Length of time spent prior to treatment)	☐	☐	☐	☐	☐
Privacy (From other patients/individuals)	☐	☐	☐	☐	☐
Parking (Parking access and cost)	☐	☐	☐	☐	☐
Facilities (Phones, Refreshments, Toilets)	☐	☐	☐	☐	☐
Layout (Directions/signs to different areas within the clinic)	☐	☐	☐	☐	☐

Q22. In the future, if necessary, how likely would the patient be to return to a Vhi SwiftCare Clinic?

☐ Very Likely ☐ Likely ☐ Neither likely nor unlikely

☐ Unlikely ☐ Very unlikely

Q23. If you wish, please provide any comments you feel necessary?

____

____

____

____

Thank you for taking the time to complete this questionnaire. You may now either hand it back to the receptionist or if you prefer place in the box provided at reception. Thank you.

Appendix A.6 Questionnaire Brief

“Would you mind, if you have a few minutes before you leave the clinic - to complete this survey. It is being conducted as part of a research study in UCC on why people use the Vhi SwiftCare clinics.
It is completely anonymous and confidential and you can place the completed survey in the black box over there.”

Appendix A.7 Estimating Goodness of Fit

Bayesian Information Criteria (BIC) for the Zero-Truncated Poisson Regression Model

.

Model	Obs	ll(null)	ll(model)	df	AIC	BIC
.	263	-444.4238	-410.7296	22	865.4592	944.0466

Note: N=Obs used in calculating BIC; see **[R] BIC note**.

Bayesian Information Criteria for the Zero-Truncated Negative Binomial Regression

.

Model	Obs	ll(null)	ll(model)	df	AIC	BIC
.	263	-417.5807	-399.1421	23	844.2842	926.4438

Note: N=Obs used in calculating BIC; see **[R] BIC note**.

Appendix A.8 Correlation between Clinic Characteristics

	parkimp	cleanimp
parkimp	1.0000	
	293	
cleanimp	0.2889*	1.0000
	0.0000	
	293	294

Appendix A.9 Chi 2 Tests of Independence

Chi 2 Test of Independence between PHI and Income (€85,000)

private health insurance	85000+ 0	1	Total
no	44 38.0 97.78	1 7.0 2.22	45 45.0 100.00
yes	205 211.0 82.00	45 39.0 18.00	250 250.0 100.00
Total	249 249.0 84.41	46 46.0 15.59	295 295.0 100.00

Pearson chi2(1) = 7.2129 Pr = 0.007

Chi 2 Test of Independence between GMS and Income (€25,000)

Medical card	25,000 0	1	Total
no	247 241.5 90.48	26 31.5 9.52	273 273.0 100.00
yes	14 19.5 63.64	8 2.5 36.36	22 22.0 100.00
Total	261 261.0 88.47	34 34.0 11.53	295 295.0 100.00

Pearson chi2(1) = 14.3829 Pr = 0.000

Appendix A.10 ZTNB with Interaction Variable (*phiy17)*

Truncated negative binomial regression	Number of obs	=	263
Truncation point: 0	LR chi2(22)	=	38.22
Dispersion = mean	Prob > chi2	=	0.0173
Log likelihood = -398.47042	Pseudo R2	=	0.0458

clinicrecode	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
age1	.3651128	.7099733	0.51	0.607	-1.026409	1.756635
age2	.5268659	.7276918	0.72	0.469	-.8993839	1.953116
age3	.5604126	.6991142	0.80	0.423	-.8098262	1.930651
age4	.3346443	.7047788	0.47	0.635	-1.046697	1.715985
sex1	-.1038566	.1523232	-0.68	0.495	-.4024045	.1946913
medc1	-1.090862	.4780804	-2.28	0.023	-2.027882	-.1538413
travel	-.0119112	.0062912	-1.89	0.058	-.0242417	.0004194
phi1	.6096513	.2532021	2.41	0.016	.1133843	1.105918
phiy17	16.85628	4939.963	0.00	0.997	-9665.292	9699.005
inc13	.0113132	.2489289	0.05	0.964	-.4765786	.4992049
inc14	-.0379268	.2601485	-0.15	0.884	-.5478086	.4719549
inc15	-.2853266	.2996836	-0.95	0.341	-.8726957	.3020425
inc16	.4849328	.2882764	1.68	0.093	-.0800785	1.049944
inc17	-16.63546	4939.963	-0.00	0.997	-9698.784	9665.513
waittimeimp	-.0642258	.5847545	-0.11	0.913	-1.210324	1.081872
nonappimp	.1535733	.3179105	0.48	0.629	-.4695199	.7766665
gprefimp	.1054992	.1649184	0.64	0.522	-.217735	.4287334
accessimp	.1391994	.4526723	0.31	0.758	-.748022	1.026421
locationimp	-.177205	.2231029	-0.79	0.427	-.6144786	.2600687
injuryimp	.0290469	.5449782	0.05	0.957	-1.039091	1.097185
parkimp	.4278491	.1884689	2.27	0.023	.0584569	.7972414
costimp	-.2932348	.1820716	-1.61	0.107	-.6500885	.0636189
_cons	-.463954	1.187339	-0.39	0.696	-2.791096	1.863188
/lnalpha	-.7096196	.4169832			-1.526892	.1076524
alpha	.4918313	.2050854			.2172098	1.113661

LR test of alpha=0: chibar2(01) = 22.80 Prob >= chibar2 = 0.000

Appendix A.11 Zero Truncated Negative Binomial Results

Truncated negative binomial regression		Number of obs =	263
Truncation point: 0		LR chi2(21) =	36.88
Dispersion = mean		Prob > chi2 =	0.0174
Log likelihood = -399.1421		Pseudo R2 =	0.0442

clinicrecode	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
age1	.3575222	.711868	0.50	0.616	-1.037713	1.752758
age2	.5279682	.7297379	0.72	0.469	-.9022919	1.958228
age3	.5680333	.7009159	0.81	0.418	-.8057367	1.941803
age4	.338507	.7066431	0.48	0.632	-1.046488	1.723502
sex1	-.1106457	.1529644	-0.72	0.469	-.4104504	.189159
medc1	-1.09202	.480134	-2.27	0.023	-2.033066	-.150975
travel	-.0118465	.0063187	-1.87	0.061	-.0242308	.0005378
phi1	.6462285	.2524221	2.56	0.010	.1514904	1.140967
inc13	.0075757	.2500733	0.03	0.976	-.482559	.4977104
inc14	-.0425946	.2614064	-0.16	0.871	-.5549418	.4697525
inc15	-.2942626	.3010243	-0.98	0.328	-.8842594	.2957341
inc16	.4806834	.2895842	1.66	0.097	-.0868913	1.048258
inc17	.2010403	.2727263	0.74	0.461	-.3334934	.735574
waittimeimp	-.0575464	.5872903	-0.10	0.922	-1.208614	1.093521
nonappimp	.1604378	.3193088	0.50	0.615	-.465396	.7862716
gprefimp	.1099915	.1655948	0.66	0.507	-.2145683	.4345514
accessimp	.1365482	.4544933	0.30	0.764	-.7542422	1.027339
locationimp	-.1810313	.224036	-0.81	0.419	-.6201337	.2580711
injuryimp	.032492	.5470329	0.06	0.953	-1.039673	1.104657
parkimp	.4306522	.1893472	2.27	0.023	.0595386	.8017659
costimp	-.3003669	.1828057	-1.64	0.100	-.6586595	.0579257
_cons	-.5051317	1.19175	-0.42	0.672	-2.840919	1.830656
/lnalpha	-.6922385	.4168293			-1.509209	.124732
alpha	.5004546	.2086041			.2210848	1.132845

LR test of alpha=0: chibar2(01) = 23.17 Prob >= chibar2 = 0.000

Appendix B.1 Cover Letter from Supporting GP

OVENS - BALLINCOLLIG MEDICAL CENTRE

The Clinic,
Old Quarter,
Ballincollig, Cork.
Phone: 021 487 2555
Fax: 021 487 5538

www.corkdoctor.com

Barnagore,
Ovens,
Cork.
Phone: 021 487 0135
Fax: 021 487 0939

28 November 2014

RE: Phd Thesis by Ms Aimee Fox, UCC entitled:
"Irish Healthcare: User charges and willingness to pay"

Dear Brendan

Aimee is a family friend. She is currently in the final year of her Phd and is doing a thesis on health economics in Ireland. She needs to collect data from a representative sample of patients in the community, both private and public, over a wide geographical and socio-economic demographic.

I would be most appreciative of your help in this regard. It would involve asking your administrative staff to distribute a "tick-box" questionnaire randomly to about forty patients over a week and holding on to the responses for collection.

I am all too aware of the pressures on everyone working in general practice today but I feel the results of this thesis may be interesting and, indeed, relevant to us in the provision of services into the future.

In anticipation of your help,
Is mise le meas

Eamon

Dr Eamonn O'Grady

Dr Patrick J Crowley MB LMCC DCh MA
Dr Eamonn O'Grady MB DCh MICGP DObs
Dr Julie Burns MB MICGP BObs DCh

Dr Ann Nicholson MB DCh DOb MRCGP
Dr Shane McCarthy MB MICGP DOccMed
Dr Elaine Tho MBBS BMedSc RACGP DCh

Appendix B.2 Questionnaire for Prescription Drugs

"Irish Healthcare: User Charges and Willingness-to-Pay"

As a PhD student in Health Economics at University College Cork (UCC), it is required that I carry out a research study. The study aims to assess patients' response to prescription drug user charges in Ireland and will also estimate what Irish patients are willing-to-pay for healthcare services in Ireland.* As you are a patient at this surgery you have been asked to take part.

The survey should only take 5 minutes to complete. Instructions are provided after each question for ease of completion.

Any information you provide will remain **anonymous and confidential**.

You have the option of withdrawing from this survey at **any** stage up to the point of submission.

If you need any further information, you can contact me: Aimée Fox by phoning 087-7674497 or emailing me at a.fox@ucc.ie

Consent Form

I agree to participate in Aimée Fox's research study.

Yes ☐

No ☐

The purpose and nature of the study has been explained to me.

I am participating voluntarily.

UCC

* Approval for this study has been granted by the Social Research Ethical Committee and the School of Economics in UCC.

P.T.O

"Irish Healthcare: User Charges and Willingness-to-Pay"
Any information you provide will remain **anonymous and confidential**.

Background

Q1. Gender?

☐ Male ☐ Female

Q2. Age? (Please State) ________________ (Years)

Q3. Nationality?

☐ Irish ☐ UK ☐ Other EU ☐ Non EU Citizen

Q4. Highest level of education achieved at this time?

☐ Primary ☐ Secondary ☐ Third Level ☐ Other (Please State)

Q5. What is your current marital status?

☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Widowed

Q7. Do you have a medical card?

☐ Yes ☐ No

Q7. (a) If yes, how many people are covered by your medical card? ___________________ (Please State)

Q8. Do you have a Drugs Payment Scheme (DPS) card?

☐ Yes ☐ No

Q8. (a) If yes, how many people are covered by your DPS card? __________________ (Please State)

Q9. Do you have a Long-Term Illness (LTI) book?

☐ Yes ☐ No

Q10. (a) Do you have private health insurance cover?

☐ Yes ☐ No

Q10. (b) If yes, of which health insurance company are you a member? (Please State)

____

Q11. In general, would you say your health is.......................

☐ Excellent ☐ Very Good ☐ Good ☐ Fair ☐ Poor

Q.13 What is the main reason for your visit to the GP today?

☐ Consult for a minor illness/injury ☐ Doctor's certificate for work due to illness

☐ For a repeat prescription ☐ To accompany a child

☐ Routine check-up/test ☐ Maternity check-up

☐ Follow-up visit for a chronic illness ☐ Other ________________ (Please State)

Q12. Have you taken prescription medication for any of the following conditions in the **last 12 months**? (Please **mark all** that apply e.g. ~~Angina~~)

Angina	Chronic bronchitis/COPD/Emphysema	Osteoarthritis	Urinary incontinence
Asthma	Heart attack	Osteoporosis	Other mental health problems
Anxiety/Depression	Heart failure	Permanent Injury due to accident	Other condition (Please State) ______________________
Cancer	High blood pressure	Rheumatoid arthritis	
Chronic back conditions	High cholesterol	Stroke	

Prescription Drug Utilization

Q14. In the past 12 months, have you paid for prescription drugs?

☐ Yes ☐ No

(If **no**, please go to **Q. 19**)

Q15. On average, how much do you spend on prescription drugs per month? (Please State in Euro)

€__________

Q16. In the past 12 months, has the **cost** of your prescription drugs caused you to do any of the following,

Take less of a prescription drug (skipping or decreasing dose) to make it last longer, without advice from doctor? ☐ Yes ☐ No

Not fill a prescription for new medication? ☐ Yes ☐ No

Not fill a prescription for existing medication? ☐ Yes ☐ No

Q17. In the past 12 months, has the **cost** of your prescription drugs caused you to do any of the following,

Borrow money from friends or family to pay for medication? ☐ Yes ☐ No

Spend less on food/heat or other basic needs to pay for medication? ☐ Yes ☐ No

Increase credit card debt to pay for medication? ☐ Yes ☐ No

Q18. In the past 12 months, as a result of the **cost** of your prescription drugs, did you find yourself in any of the following situations?,

Using cheaper over-the-counter medications before purchasing prescription drugs? ☐ Yes ☐ No

Switching to cheaper drugs such as generic drugs? ☐ Yes ☐ No

Requesting free medication samples from the GP? ☐ Yes ☐ No

Purchasing drugs from an on-line pharmacy? ☐ Yes ☐ No

Other cost reducing efforts? ______________________ (Please State)

P.T.O

Income

Q19. Please tick the **monthly gross income*** category which best applies to **you** as an individual.
***Gross income** is the income level before any deductions (e.g. Tax). Please remember all information provided will remain **anonymous and confidential.**

☐ <€1,000 ☐ €1,000 - €2,249 ☐ €2,250 - €3,499 ☐ €3,500 - €4,749 ☐ €4,750 - €5,999 ☐ €6000+

☐ Other ________________ (Please State)

Health Care Services in Ireland

PLEASE READ THE FOLLOWING 3 EXAMPLES:

EXAMPLE 1: Blood tests help doctors check for certain diseases and conditions. In Ireland, a GP can perform blood tests in the surgery but you may face a charge for this service. Alternatively, you can arrange an appointment in the outpatient department of a hospital where you can receive the blood tests for **free** but with a longer waiting time.

Q20. What is the maximum price **you** are willing to pay to the GP for blood tests in the GPs surgery?

☐ €0, I would rather wait to receive the blood tests for free as an outpatient

☐ €5 ☐ €10 ☐ €15 ☐ €20 ☐ €25 ☐ €30 ☐ €35

☐ OR please state the maximum amount you are willing to pay €____

Q21. Have you had a blood test before?

☐ Yes ☐ No

EXAMPLE 2: An MRI (Magnetic Resonance Imaging) is a type of scan that is often used to diagnose health conditions that affect organs, tissue and bone. In Ireland, you can receive an MRI for **free** but with a possible waiting time of 6 months to one and a half years. Alternatively, you can **pay** to receive an MRI within a shorter time frame (e.g. 2 weeks) in a hospital or scan centre.

Q22. Please assume situation A AND B in a healthcare system where private health insurance DOES NOT exist.

Situation A:
You have been suffering with **shoulder pain** for the last month. Your GP has referred you for an MRI scan.
What is the maximum price **you** are willing to pay to the hospital/scan centre to receive this scan within 2 weeks from the time of the referral?

☐ €0, I would rather wait to recieve the MRI for free

☐ €50 ☐ €100 ☐ €150 ☐ €200 ☐ €250

☐ €300 ☐ €350 ☐ €400

☐ OR please state the maximum amount you are willing to pay €______

Situation B:
You have been suffering with **headaches** for the last month. Your GP has referred you for an MRI scan.
What is the maximum price **you** are willing to pay to the hospital/scan centre to receive this scan within 2 weeks from the time of the referral?

☐ €0, I would rather wait to recieve the MRI for free

☐ €50 ☐ €100 ☐ €150 ☐ €200 ☐ €250

☐ €300 ☐ €350 ☐ €400

☐ OR please state the maximum amount you are willing to pay €______

Q23. Have you had an MRI scan before?

☐ Yes ☐ No

P.T.O

Q24. Are you currently taking a prescribed drug to treat a high cholesterol level?

☐ Yes ☐ No If yes, please name the drug ______________________ (Please State)

→ ***If you have a LONG-TERM ILLNESS (LTI) book, you may now submit the survey***

→ ***If you have a MEDICAL CARD please read example 3 and answer Q25 ONLY.***

→ ***If you have NO LTI OR MEDICAL CARD, please read example 3 and answer Q26 ONLY and then submit the survey.***

EXAMPLE 3: Your cholesterol is at a high level which could mean you are at risk of having a heart attack or a stroke. As a result, your GP has prescribed a cholesterol lowering drug. Your pharmacist, over the course of your treatment, may substitute a prescribed branded drug for a generic drug to treat a high level of cholesterol. The generic is as effective as the branded drug.

Q25. MEDICAL CARD HOLDERS ONLY: PLEASE ASSUME THE FOLLOWING SITUATION:

You currently pay €2.50 for the generic version of this drug (For example: Rosuva 10mg, 28 tablets). What is the maximum price **you** are willing to pay to the pharmacy for the branded version of this drug (For example: Crestor 10mg, 28 tablets)?

☐ Not willing to pay any extra ☐ €5 ☐ €10 ☐ 15 ☐ €20 ☐ €25 ☐ €30

☐ OR please state the maximum amount you are willing to pay €____

Q26. NON-MEDICAL CARD HOLDERS: PLEASE ASSUME THE FOLLOWING SITUATION:

You currently pay €7.94 for the generic version of this drug (For example: Rosuva 10mg, 28 tablets). What is the maximum price **you** are willing to pay to the pharmacy for the branded version of this drug (For example: Crestor 10mg, 28 tablets)?

☐ Not willing to pay any extra ☐ €10 ☐ €15 ☐ €20 ☐ €25 ☐ €30

☐ OR please state the maximum amount you are willing to pay €____

Thank you for taking the time to complete this survey. You may now place the survey in the box provided at reception. Thank you.

Appendix B.3 Ethical Approval

UCC
University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

Oifig an Leas - Uachtaráin Taighde agus Nuálaíochta
Office of the Vice President for Research and Innovation

4th Floor, Block E,
Food Science Building,
University College Cork,
College Road, Cork, Ireland.

T +353 (0)21 4903500
E vpresearch@ucc.ie
www.ucc.ie

Aimee Fox,
School of Economics

23rd October 2014

Dear Aimee,

Thank you for submitting your research (project entitled: "Irish Healthcare: User Charges and Willingness-to-Pay") to SREC for ethical perusal. I am pleased to say that we see no ethical impediment to your research as proposed and we are happy to grant approval.

We wish you every success in your research.

Yours sincerely,

Mike Murphy

Mike Murphy,
Chair of Social Research Ethics Committee

Professor Anita R Maguire BSc PhD CChem MRSC
Vice President for Research and Innovation

Ollscoil na hÉireann, Corcaigh
National University of Ireland, Cork

Appendix B.4 Questionnaire Brief

“While you are waiting for Dr. (Doctors Name), would you mind filling in a short questionnaire that is being conducted as part of a research project in UCC? Dr. (Doctors Name) is in support of this research and would be very grateful if you would complete this questionnaire. If you have any questions regarding the research or questionnaire, please see this list of FAQs. The questionnaire is completely anonymous and confidential and you can place the completed questionnaire in the box over there.”

Appendix B.5 Frequently Asked Questions for Patients

Purpose of the Study. As a PhD student in Health Economics at University College Cork (UCC), it is required that I carry out a research study. The study aims to assess the patients' response to prescription drug user charges in Ireland and to estimate what Irish patients are willing to pay for healthcare services in Ireland.

What will the study involve? The study will involve collecting information from patients as they wait in GP waiting areas. Surveys will be used to collect this information. The survey will take 3-5 minutes to complete.

Why have you been asked to take part? As a patient attending this surgery you have been asked to take part.

Do you have to take part? No. Participation is voluntary. There is a consent form that you will sign to say you agree to participate. You have the option of withdrawing from this research at **any** stage.

Will your participation in the study be kept confidential? Yes. The survey does not require any personal details (name, address etc.). I will ensure that no clues to your identity appear in the thesis.

What will happen to the information which you give? The data will be kept confidential for the duration of the study. On completion of the thesis, they will be retained for a further six months and then destroyed.

What will happen to the results? The results will be presented in the thesis. They will be seen by my supervisors, a second marker and the external examiner. The thesis may be read by future students on the course. The study may be published in a research journal.

What are the possible disadvantages of taking part? There are no disadvantages in taking part in this study.

Who has reviewed this study? This study has been reviewed and approved by the Social Research Ethical Committee and the School of Economics in UCC.

.

Any further queries? If you need any further information, you can contact me: Aimée Fox by phoning 087-7674497 or emailing me at a.fox@ucc.ie

Thank you!

UCC
Coláiste na hOllscoile Corcaigh, Éire
University College Cork, Ireland

Appendix B.6 Codebook

Full Variable Name	Variable Name	Coding Instruction
Number	number	Number (of respondent)
Gender (Binary)	sex	. = missing 0 = male 1 = female
Age (Continuous)	age	Number (in years)
Nationality (Categorical)	nation	. = missing 1 = Irish 2 = UK 3 =Other EU 4 = Non EU citizen
Education Status (Categorical)	educ	. = missing 1 = Primary 2 = Secondary 3 = Third Level 4 = Other
Marital Status (Categorical)	maritalstat	1 = Single 2 = Married 3 = Separated 4 = Divorced 5 = Widowed
Medical Card (Binary)	medc	0 = no 1 = yes
Medical Card Total (Continuous)	medcno	Number (of people)
Drugs Payment Scheme (Binary)	dps	. = missing 0 = no 1 = yes
Drugs Payment Scheme Total (Continuous)	dpsno	Number (of people)
Long Term Illness (Binary)	lti	. = missing 0 = no 1 = yes
No community drug cover	nocomm	0 = no 1 = yes
Private Health Insurance (Binary)	phi	0 = no 1 = yes
Private Health Insurance Company (Categorical)	phicov	. = missing -8 = nophi 1 = vhi 2 = aviva 3 = laya 4 = glohealth 5 = HSF healthplan 6 = Other
Other		Please state

Health Status (Categorical/Ordinal)	healthstat	1 = excellent 2 = very good 3 = good 4 = fair 5 = poor
Visit Reason (Categorical)	visit	. = missing 1 = consult for injury 2 = repeat prescription 3 = routine check-up/test 4 = chronic illness follow-up 5 = doctors cert for illness 6 = to accompany a child 7 = maternity check-up 8 = other 9 = more than 1 reason
Comment		Please state
No chronic illness	chronicno1	0 = no 1 = yes
One chronic illness	chronicno2	0 = no 1 = yes
Two chronic illness	chronicno3	0 = no 1 = yes
Three or more chronic illnesses	chronicno4	0 = no 1 = yes
Monthly Gross Income Level (Categorical/Ordinal)	income	. = missing 1 = <€1,000 2 = €1,000 - €2,249 3 = €2,250 - €3,499 4 = €3,50 - €4,749 5 = €4,750 - €5,999 6 = €6,999+ 7 = Other
Prescription payment in last 12 months (Binary)	rxpay	-9 = missing 0 = no 1 = yes
Prescription Cost (Continuous)	rxcost	Number (cost)
Take less of a prescribed drug (Binary)	rxdrugless	. = missing 0 = no 1 = yes
Avoid Rx for new drug (Binary)	newrx	. = missing 0 = no 1 = yes
Avoid Rx for old drug (Binary)	oldrx	. = missing 0 = no 1 = yes
Borrow money (Binary)	borrow	. = missing 0 = no 1 = yes

Spend Less on other necessities (Binary)	spendless	. = missing 0 = no 1 = yes
Increase credit card debt (Binary)	increasecred	. = missing 0 = no 1 = yes
Substitute with OTC (Binary)	otcsub	. = missing 0 = no 1 = yes
Switch to generic drug (Binary)	generic	. = missing 0 = no 1 = yes
Request free meds (Binary)	reqfreemed	-9 = missing = no 1 = yes
Purchase drugs from on-line pharmacy (Binary)	onlinephar	. = missing 0 = no 1 = yes
Other measures	other	State (Strategies)

Appendix B.7 MNLM with Perfect Prediction

```
Multinomial logistic regression                   Number of obs     =        143
                                                  LR chi2(45)       =      66.28
                                                  Prob > chi2       =     0.0211
Log likelihood = -129.11999                       Pseudo R2         =     0.2042
```

responseno	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
noresponse	(base outcome)					
oneresp						
age2	-.5557818	.7169456	-0.78	0.438	-1.960969	.8494056
age3	-.3285884	.7479207	-0.44	0.660	-1.794486	1.137309
age4	-.6010488	.8438686	-0.71	0.476	-2.255001	1.052903
age5	-1.73373	1.255233	-1.38	0.167	-4.193942	.7264822
medc	.8354276	1.507657	0.55	0.579	-2.119526	3.790382
dps	1.207448	1.41151	0.86	0.392	-1.559061	3.973957
nocomm	1.309655	1.459667	0.90	0.370	-1.55124	4.17055
rxcost	.007591	.0054198	1.40	0.161	-.0030316	.0182136
incomeone	-.3358564	.8149857	-0.41	0.680	-1.933199	1.261486
incometwo	-1.223728	.6965974	-1.76	0.079	-2.589034	.1415776
incomethree	-1.034246	.7231666	-1.43	0.153	-2.451626	.3831349
incomefour	-1.165801	.8552695	-1.36	0.173	-2.842098	.5104967
incomesix	-.7320625	.8428472	-0.87	0.385	-2.384013	.9198876
excellhealth	.4070477	.6079932	0.67	0.503	-.7845971	1.598693
chronicno4	-.7467906	.8737196	-0.85	0.393	-2.45925	.9656684
_cons	-.8984585	1.562844	-0.57	0.565	-3.961576	2.164659
tworesp						
age2	1.649653	1.219585	1.35	0.176	-.7406902	4.039997
age3	.5610848	1.364908	0.41	0.681	-2.114086	3.236255
age4	.7726062	1.436838	0.54	0.591	-2.043544	3.588756
age5	.4715207	1.613025	0.29	0.770	-2.689951	3.632993
medc	.8977065	2.110348	0.43	0.671	-3.238499	5.033912
dps	-.2160513	1.934888	-0.11	0.911	-4.008361	3.576259
nocomm	.3460261	2.004874	0.17	0.863	-3.583456	4.275508
rxcost	-.0008551	.0103275	-0.08	0.934	-.0210965	.0193864
incomeone	-.0517723	1.143103	-0.05	0.964	-2.292214	2.188669
incometwo	-1.479744	1.112129	-1.33	0.183	-3.659477	.6999886
incomethree	-.3415691	1.061411	-0.32	0.748	-2.421896	1.738758
incomefour	-1.847031	1.422352	-1.30	0.194	-4.634789	.9407278
incomesix	-18.27102	4268.801	-0.00	0.997	-8384.967	8348.425
excellhealth	.2710743	.8436346	0.32	0.748	-1.382419	1.924568
chronicno4	-.471194	1.315056	-0.36	0.720	-3.048656	2.106268
_cons	-2.114585	2.336079	-0.91	0.365	-6.693216	2.464046
allresp						
age2	-.043877	1.020596	-0.04	0.966	-2.044209	1.956455
age3	-1.405312	1.57643	-0.89	0.373	-4.495059	1.684435
age4	-20.23933	2249.806	-0.01	0.993	-4429.778	4389.299
age5	-17.74561	4383.294	-0.00	0.997	-8608.844	8573.353
medc	6.739184	2.417423	2.79	0.005	2.001123	11.47725
dps	4.758956	2.367922	2.01	0.044	.1179154	9.399997
nocomm	6.303857	2.470783	2.55	0.011	1.461212	11.1465
rxcost	.0565297	.0204759	2.76	0.006	.0163977	.0966617
incomeone	2.972745	3.411057	0.87	0.383	-3.712804	9.658295
incometwo	5.223597	3.662686	1.43	0.154	-1.955136	12.40233
incomethree	.7162547	2.910045	0.25	0.806	-4.987329	6.419838
incomefour	-11.02507	3000.187	-0.00	0.997	-5891.284	5869.234
incomesix	-20.16064	3249.555	-0.01	0.995	-6389.172	6348.851
excellhealth	-14.77126	2262.311	-0.01	0.995	-4448.819	4419.277
chronicno4	-.5359574	1.33391	-0.40	0.688	-3.150373	2.078458
_cons	-13.54234	5.566003	-2.43	0.015	-24.4515	-2.633172

Appendix B.8 Multinomial Logit Model Results

```
Multinomial logistic regression                   Number of obs     =        143
                                                  LR chi2(30)       =      43.58
                                                  Prob > chi2       =     0.0520
Log likelihood = -140.46751                       Pseudo R2         =     0.1343
```

responseno	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
noresponse	(base outcome)					
oneresp						
age2	-.1305576	.5116518	-0.26	0.799	-1.133377	.8722614
age3	.1849511	.5410862	0.34	0.732	-.8755583	1.245461
medc	.2975249	1.343664	0.22	0.825	-2.336009	2.931059
dps	.5916306	1.269696	0.47	0.641	-1.896928	3.080189
nocomm	.7734514	1.31463	0.59	0.556	-1.803177	3.350079
rxcost	.0077382	.0050933	1.52	0.129	-.0022445	.0177209
incomeone	.2033682	.6778011	0.30	0.764	-1.125098	1.531834
incometwo	-.6368786	.5332693	-1.19	0.232	-1.682067	.4083099
incomethree	-.5078814	.5673703	-0.90	0.371	-1.619907	.6041441
chronicno4	-.6389132	.8480021	-0.75	0.451	-2.300967	1.02314
_cons	-1.327773	1.418097	-0.94	0.349	-4.107193	1.451646
tworesp						
age2	1.072161	.7693225	1.39	0.163	-.4356834	2.580006
age3	.1477478	.9802034	0.15	0.880	-1.773416	2.068911
medc	.3823745	1.93461	0.20	0.843	-3.409392	4.174141
dps	-.7106364	1.825928	-0.39	0.697	-4.28939	2.868117
nocomm	-.1959365	1.884283	-0.10	0.917	-3.889063	3.49719
rxcost	.0013174	.0092396	0.14	0.887	-.0167917	.0194266
incomeone	1.252073	.967279	1.29	0.196	-.6437589	3.147905
incometwo	-.1312617	.8998587	-0.15	0.884	-1.894952	1.632429
incomethree	1.029723	.8228582	1.25	0.211	-.583049	2.642496
chronicno4	-.1122647	1.266743	-0.09	0.929	-2.595036	2.370506
_cons	-2.468528	2.146637	-1.15	0.250	-6.675859	1.738803
allresp						
age2	.9576661	.9297395	1.03	0.303	-.8645899	2.779922
age3	.4136619	1.227152	0.34	0.736	-1.991512	2.818836
medc	5.435104	1.972521	2.76	0.006	1.569034	9.301174
dps	3.009208	1.850578	1.63	0.104	-.6178579	6.636274
nocomm	4.945	2.062023	2.40	0.016	.9035091	8.98649
rxcost	.0324496	.010794	3.01	0.003	.0112937	.0536054
incomeone	2.027264	2.25625	0.90	0.369	-2.394904	6.449432
incometwo	4.111345	2.057843	2.00	0.046	.0780457	8.144644
incomethree	1.128678	2.250501	0.50	0.616	-3.282223	5.539578
chronicno4	.43132	1.09477	0.39	0.694	-1.714389	2.577029
_cons	-11.63209	3.489526	-3.33	0.001	-18.47144	-4.792745

Appendix B.9 Chi Square Tests of Independence

Chi 2 Test of Independence between GMS and Income (<€1,000)

<1,000	Medical card possession no	yes	Total
no	126 109.0 75.45	41 58.0 24.55	167 167.0 100.00
yes	13 30.0 28.26	33 16.0 71.74	46 46.0 100.00
Total	139 139.0 65.26	74 74.0 34.74	213 213.0 100.00

Pearson chi2(1) = 35.4221 Pr = 0.000

Chi 2 Test of Independence between GMS and Income (€2,250-€3,499)

2,250 - 3,499	Medical card possession no	yes	Total
no	110 116.8 61.45	69 62.2 38.55	179 179.0 100.00
yes	29 22.2 85.29	5 11.8 14.71	34 34.0 100.00
Total	139 139.0 65.26	74 74.0 34.74	213 213.0 100.00

Pearson chi2(1) = 7.1637 Pr = 0.007

Appendix B.10 MNLM with Interaction Variables

```
Multinomial logistic regression                   Number of obs     =        143
                                                  LR chi2(33)       =      49.95
                                                  Prob > chi2       =     0.0295
Log likelihood = -137.28091                       Pseudo R2         =     0.1539
```

responseno	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
noresponse	(base outcome)					
oneresp						
age2	-.1263049	.5112173	-0.25	0.805	-1.128272	.8756626
age3	.1711321	.540522	0.32	0.752	-.8882715	1.230536
medc	.3806019	1.42734	0.27	0.790	-2.416933	3.178137
dps	.5407156	1.247535	0.43	0.665	-1.904409	2.98584
nocomm	.6958168	1.30042	0.54	0.593	-1.85296	3.244593
rxcost	.0078183	.0051255	1.53	0.127	-.0022274	.017864
incomeone	.5296806	.8605722	0.62	0.538	-1.15701	2.216371
incometwo	-.6604202	.5356983	-1.23	0.218	-1.71037	.3895291
incomethree	-.5091607	.5646946	-0.90	0.367	-1.615942	.5976204
inc1medc	-.60709	1.357893	-0.45	0.655	-3.26851	2.054331
chronicno4	-.6671017	.8461788	-0.79	0.430	-2.325582	.9913782
_cons	-1.275722	1.38888	-0.92	0.358	-3.997877	1.446432
tworesp						
age2	1.065249	.7615418	1.40	0.162	-.4273451	2.557844
age3	.0550007	.9805877	0.06	0.955	-1.866916	1.976917
medc	.7733783	1.94394	0.40	0.691	-3.036674	4.58343
dps	-.9003402	1.819587	-0.49	0.621	-4.466666	2.665986
nocomm	-.4591982	1.896379	-0.24	0.809	-4.176033	3.257637
rxcost	.0008951	.009352	0.10	0.924	-.0174346	.0192247
incomeone	1.994941	1.169047	1.71	0.088	-.2963489	4.286231
incometwo	-.2574866	.92534	-0.28	0.781	-2.07112	1.556146
incomethree	1.102151	.8356053	1.32	0.187	-.5356052	2.739907
inc1medc	-1.589562	1.554543	-1.02	0.307	-4.63641	1.457285
chronicno4	-.1640124	1.2612	-0.13	0.897	-2.63592	2.307895
_cons	-2.292411	2.123879	-1.08	0.280	-6.455137	1.870316
allresp						
age2	1.25712	.9882519	1.27	0.203	-.6798181	3.194058
age3	1.26675	1.312539	0.97	0.334	-1.305779	3.839278
medc	21.65145	2331.228	0.01	0.993	-4547.472	4590.774
dps	19.13209	2331.228	0.01	0.993	-4549.991	4588.255
nocomm	20.87425	2331.228	0.01	0.993	-4548.249	4589.998
rxcost	.032908	.0114534	2.87	0.004	.0104598	.0553562
incomeone	4.560237	2.636574	1.73	0.084	-.6073533	9.727828
incometwo	4.829256	2.608437	1.85	0.064	-.2831871	9.9417
incomethree	-13.44459	2331.228	-0.01	0.995	-4582.567	4555.678
inc1medc	-35.51826	4092.745	-0.01	0.993	-8057.15	7986.114
chronicno4	1.030787	1.190093	0.87	0.386	-1.301754	3.363327
_cons	-28.71548	2331.232	-0.01	0.990	-4597.846	4540.415

Appendix C.1 Cover Letter from Supporting GP

OVENS - BALLINCOLLIG MEDICAL CENTRE

The Clinic,
Old Quarter,
Ballincollig, Cork.
Phone: 021 487 2555
Fax: 021 487 5538

www.corkdoctor.com

Barnagore,
Ovens,
Cork.
Phone: 021 487 0135
Fax: 021 487 0939

28 November 2014

RE: Phd Thesis by Ms Aimee Fox, UCC entitled:
"Irish Healthcare: User charges and willingness to pay"

Dear Brendan

Aimee is a family friend. She is currently in the final year of her Phd and is doing a thesis on health economics in Ireland. She needs to collect data from a representative sample of patients in the community, both private and public, over a wide geographical and socio-economic demographic.

I would be most appreciative of your help in this regard. It would involve asking your administrative staff to distribute a "tick-box" questionnaire randomly to about forty patients over a week and holding on to the responses for collection.

I am all too aware of the pressures on everyone working in general practice today but I feel the results of this thesis may be interesting and, indeed, relevant to us in the provision of services into the future.

In anticipation of your help,
Is mise le meas

Eamon

Dr Eamonn O'Grady

Dr Patrick J Crowley MB LMCC DCh MA
Dr Eamonn O'Grady MB DCh MICGP DObs
Dr Julie Burns MB MICGP BObs DCh
Dr Ann Nicholson MB DCh DOb MRCGP
Dr Shane McCarthy MB MICGP DOccMed
Dr Elaine Tho MBBS BMedSc RACGP DCh

Appendix C.2 Questionnaire for WTP for Healthcare Services

"Irish Healthcare: User Charges and Willingness-to-Pay"

As a PhD student in Health Economics at University College Cork (UCC), it is required that I carry out a research study. The study aims to assess patients' response to prescription drug user charges in Ireland and will also estimate what Irish patients are willing-to-pay for healthcare services in Ireland.* As you are a patient at this surgery you have been asked to take part.

The survey should only take 5 minutes to complete. Instructions are provided after each question for ease of completion.

Any information you provide will remain **anonymous and confidential**.

You have the option of withdrawing from this survey at **any** stage up to the point of submission.

If you need any further information, you can contact me: Aimée Fox by phoning 087-7674497 or emailing me at a.fox@ucc.ie

Consent Form

I agree to participate in Aimée Fox's research study.

Yes ☐

No ☐

The purpose and nature of the study has been explained to me.

I am participating voluntarily.

UCC

* Approval for this study has been granted by the Social Research Ethical Committee and the School of Economics in UCC.

P.T.O

"Irish Healthcare: User Charges and Willingness-to-Pay"

Any information you provide will remain **anonymous and confidential**.

Background

Q1. Gender?

☐ Male ☐ Female

Q2. Age? (Please State) ________________ (Years)

Q3. Nationality?

☐ Irish ☐ UK ☐ Other EU ☐ Non EU Citizen

Q4. Highest level of education achieved at this time?

☐ Primary ☐ Secondary ☐ Third Level ☐ Other (Please State)

Q5. What is your current marital status?

☐ Single ☐ Married ☐ Separated ☐ Divorced ☐ Widowed

Q7. Do you have a medical card?

☐ Yes ☐ No

Q7. (a) If yes, how many people are covered by your medical card? ___________________ (Please State)

Q8. Do you have a Drugs Payment Scheme (DPS) card?

☐ Yes ☐ No

Q8. (a) If yes, how many people are covered by your DPS card? __________________ (Please State)

Q9. Do you have a Long-Term Illness (LTI) book?

☐ Yes ☐ No

Q10. (a) Do you have private health insurance cover?

☐ Yes ☐ No

Q10. (b) If yes, of which health insurance company are you a member? (Please State)

____

Q11. In general, would you say your health is........................

☐ Excellent ☐ Very Good ☐ Good ☐ Fair ☐ Poor

Q.13 What is the main reason for your visit to the GP today?

☐ Consult for a minor illness/injury ☐ Doctor's certificate for work due to illness

☐ For a repeat prescription ☐ To accompany a child

☐ Routine check-up/test ☐ Maternity check-up

☐ Follow-up visit for a chronic illness ☐ Other ________________ (Please State)

Q12. Have you taken prescription medication for any of the following conditions in the **last 12 months**? (Please **mark all** that apply e.g. ~~Angina~~)

Angina	Chronic bronchitis/COPD/Emphysema	Osteoarthritis	Urinary incontinence
Asthma	Heart attack	Osteoporosis	Other mental health problems
Anxiety/Depression	Heart failure	Permanent Injury due to accident	Other condition (Please State) ______________________
Cancer	High blood pressure	Rheumatoid arthritis	
Chronic back conditions	High cholesterol	Stroke	

Prescription Drug Utilization

Q14. In the past 12 months, have you paid for prescription drugs?

☐ Yes ☐ No

(If **no**, please go to **Q. 19**)

Q15. On average, how much do you spend on prescription drugs per month? (Please State in Euro)

€__________

Q16. In the past 12 months, has the **cost** of your prescription drugs caused you to do any of the following,

Take less of a prescription drug (skipping or decreasing dose) to make it last longer, without advice from doctor? ☐ Yes ☐ No

Not fill a prescription for new medication? ☐ Yes ☐ No

Not fill a prescription for existing medication? ☐ Yes ☐ No

Q17. In the past 12 months, has the **cost** of your prescription drugs caused you to do any of the following,

Borrow money from friends or family to pay for medication? ☐ Yes ☐ No

Spend less on food/heat or other basic needs to pay for medication? ☐ Yes ☐ No

Increase credit card debt to pay for medication? ☐ Yes ☐ No

Q18. In the past 12 months, as a result of the **cost** of your prescription drugs, did you find yourself in any of the following situations?,

Using cheaper over-the-counter medications before purchasing prescription drugs? ☐ Yes ☐ No

Switching to cheaper drugs such as generic drugs? ☐ Yes ☐ No

Requesting free medication samples from the GP? ☐ Yes ☐ No

Purchasing drugs from an on-line pharmacy? ☐ Yes ☐ No

Other cost reducing efforts? ______________________ (Please State)

P.T.O

Income

Q19. Please tick the **monthly gross income*** category which best applies to **you** as an individual.
***Gross income** is the income level before any deductions (e.g. Tax). Please remember all information provided will remain **anonymous and confidential.**

☐ <€1,000 ☐ €1,000 - €2,249 ☐ €2,250 - €3,499 ☐ €3,500 - €4,749 ☐ €4,750 - €5,999 ☐ €6000+

☐ Other ________________ (Please State)

Health Care Services in Ireland

PLEASE READ THE FOLLOWING 3 EXAMPLES:

EXAMPLE 1: Blood tests help doctors check for certain diseases and conditions. In Ireland, a GP can perform blood tests in the surgery but you may face a charge for this service. Alternatively, you can arrange an appointment in the outpatient department of a hospital where you can receive the blood tests for **free** but with a longer waiting time.

Q20. What is the maximum price **you** are willing to pay to the GP for blood tests in the GPs surgery?

☐ €0, I would rather wait to receive the blood tests for free as an outpatient

☐ €5 ☐ €10 ☐ €15 ☐ €20 ☐ €25 ☐ €30 ☐ €35

☐ OR please state the maximum amount you are willing to pay €____

Q21. Have you had a blood test before?

☐ Yes ☐ No

EXAMPLE 2: An MRI (Magnetic Resonance Imaging) is a type of scan that is often used to diagnose health conditions that affect organs, tissue and bone. In Ireland, you can receive an MRI for **free** but with a possible waiting time of 6 months to one and a half years. Alternatively, you can **pay** to receive an MRI within a shorter time frame (e.g. 2 weeks) in a hospital or scan centre.

Q22. Please assume situation A AND B in a healthcare system where private health insurance DOES NOT exist.

Situation A:
You have been suffering with **shoulder pain** for the last month. Your GP has referred you for an MRI scan.
What is the maximum price **you** are willing to pay to the hospital/scan centre to receive this scan within 2 weeks from the time of the referral?

☐ €0, I would rather wait to recieve the MRI for free

☐ €50 ☐ €100 ☐ €150 ☐ €200 ☐ €250

☐ €300 ☐ €350 ☐ €400

☐ OR please state the maximum amount you are willing to pay €______

Situation B:
You have been suffering with **headaches** for the last month. Your GP has referred you for an MRI scan.
What is the maximum price **you** are willing to pay to the hospital/scan centre to receive this scan within 2 weeks from the time of the referral?

☐ €0, I would rather wait to recieve the MRI for free

☐ €50 ☐ €100 ☐ €150 ☐ €200 ☐ €250

☐ €300 ☐ €350 ☐ €400

☐ OR please state the maximum amount you are willing to pay €______

Q23. Have you had an MRI scan before?

☐ Yes ☐ No

P.T.O

Q24. Are you currently taking a prescribed drug to treat a high cholesterol level?

☐ Yes ☐ No If yes, please name the drug ______________________ (Please State)

→ ***If you have a <u>LONG-TERM ILLNESS (LTI)</u> book, you may now submit the survey***

→ ***If you have a <u>MEDICAL CARD</u> please read example 3 and answer Q25 ONLY.***

→ ***If you have <u>NO LTI OR MEDICAL CARD</u>, please read example 3 and answer Q26 ONLY and then submit the survey.***

<u>EXAMPLE 3:</u> Your cholesterol is at a high level which could mean you are at risk of having a heart attack or a stroke. As a result, your GP has prescribed a cholesterol lowering drug. Your pharmacist, over the course of your treatment, may substitute a prescribed branded drug for a generic drug to treat a high level of cholesterol. The generic is as effective as the branded drug.

Q25. <u>MEDICAL CARD HOLDERS ONLY: PLEASE ASSUME THE FOLLOWING SITUATION:</u>

You currently pay €2.50 for the generic version of this drug (For example: Rosuva 10mg, 28 tablets). What is the maximum price **<u>you</u>** are willing to pay to the pharmacy for the branded version of this drug (For example: Crestor 10mg, 28 tablets)?

☐ Not willing to pay any extra ☐ €5 ☐ €10 ☐ 15 ☐ €20 ☐ €25 ☐ €30

☐ OR please state the maximum amount you are willing to pay €____

Q26. <u>NON-MEDICAL CARD HOLDERS: PLEASE ASSUME THE FOLLOWING SITUATION:</u>

You currently pay €7.94 for the generic version of this drug (For example: Rosuva 10mg, 28 tablets). What is the maximum price **<u>you</u>** are willing to pay to the pharmacy for the branded version of this drug (For example: Crestor 10mg, 28 tablets)?

☐ Not willing to pay any extra ☐ €10 ☐ €15 ☐ €20 ☐ €25 ☐ €30

☐ OR please state the maximum amount you are willing to pay €____

Thank you for taking the time to complete this survey. You may now place the survey in the box provided at reception. Thank you.

Appendix C.3 Ethical Approval

UCC
University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

Oifig an Leas - Uachtaráin Taighde agus Nuálaíochta
Office of the Vice President for Research and Innovation

4th Floor, Block E,
Food Science Building,
University College Cork,
College Road, Cork, Ireland.

T +353 (0)21 4903500
E vpresearch@ucc.ie
www.ucc.ie

Aimee Fox,
School of Economics

23rd October 2014

Dear Aimee,

Thank you for submitting your research (project entitled: "Irish Healthcare: User Charges and Willingness-to-Pay") to SREC for ethical perusal. I am pleased to say that we see no ethical impediment to your research as proposed and we are happy to grant approval.

We wish you every success in your research.

Yours sincerely,

Mike Murphy

Mike Murphy,
Chair of Social Research Ethics Committee

Professor Anita R Maguire BSc PhD CChem MRSC
Vice President for Research and Innovation

Ollscoil na hÉireann, Corcaigh
National University of Ireland, Cork

Appendix C.4 Questionnaire Brief

<u>"While you are waiting for Dr. (Doctors Name), would you mind filling in a short questionnaire that is being conducted as part of a research project in UCC? Dr. (Doctors Name) is in support of this research and would be very grateful if you would complete this questionnaire. If you have any questions regarding the research or questionnaire, please see this list of FAQs. The questionnaire is completely anonymous and confidential and you can place the completed questionnaire in the box over there."</u>

Appendix C.5 Frequently Asked Questions for Patients

Purpose of the Study. As a PhD student in Health Economics at University College Cork (UCC), it is required that I carry out a research study. The study aims to assess the patients' response to prescription drug user charges in Ireland and to estimate what Irish patients are willing to pay for healthcare services in Ireland.

What will the study involve? The study will involve collecting information from patients as they wait in GP waiting areas. Surveys will be used to collect this information. The survey will take 3-5 minutes to complete.

Why have you been asked to take part? As a patient attending this surgery you have been asked to take part.

Do you have to take part? No. Participation is voluntary. There is a consent form that you will sign to say you agree to participate. You have the option of withdrawing from this research at **any** stage.

Will your participation in the study be kept confidential? Yes. The survey does not require any personal details (name, address etc.). I will ensure that no clues to your identity appear in the thesis.

What will happen to the information which you give? The data will be kept confidential for the duration of the study. On completion of the thesis, they will be retained for a further six months and then destroyed.

What will happen to the results? The results will be presented in the thesis. They will be seen by my supervisors, a second marker and the external examiner. The thesis may be read by future students on the course. The study may be published in a research journal.

What are the possible disadvantages of taking part? There are no disadvantages in taking part in this study.

Who has reviewed this study? This study has been reviewed and approved by the Social Research Ethical Committee and the School of Economics in UCC.

.

Any further queries? If you need any further information, you can contact me: Aimée Fox by phoning 087-7674497 or emailing me at a.fox@ucc.ie

Thank you!

UCC
Coláiste na hOllscoile Corcaigh, Éire
University College Cork, Ireland

Appendix C.6 Codebook

Full Variable Name	Variable Name	Coding Instruction
Number	number	Number (of respondent)
Gender (Binary)	sex	. = missing 0 = male 1 = female
Age (Continuous)	age	Number (in years)
Nationality (Categorical)	nation	. = missing 1 = Irish 2 = UK 3 =Other EU 4 = Non EU citizen
Education Status (Categorical)	educ	. = missing 1 = Primary 2 = Secondary 3 = Third Level 4 = Other
Marital Status (Categorical)	maritalstat	1 = Single 2 = Married 3 = Separated 4 = Divorced 5 = Widowed
Medical Card (Binary)	medc	0 = no 1 = yes
Medical Card Total (Continuous)	medcno	Number (of people)
Drugs Payment Scheme (Binary)	dps	. = missing 0 = no 1 = yes
Drugs Payment Scheme Total (Continuous)	dpsno	Number (of people)
Long Term Illness (Binary)	lti	. = missing 0 = no 1 = yes
No community drug cover	nocomm	0 = no 1 = yes
Private Health Insurance (Binary)	phi	0 = no 1 = yes
Private Health Insurance Company (Categorical)	phicov	. = missing -8 = nophi 1 = vhi 2 = aviva 3 = laya 4 = glohealth 5 = HSF healthplan

		6 = Other
Other		Please state
Health Status (Categorical/Ordinal)	healthstat	1 = excellent 2 = very good 3 = good 4 = fair 5 = poor
Visit Reason (Categorical)	visit	. = missing 1 = consult for injury 2 = repeat prescription 3 = routine check-up/test 4 = chronic illness follow-up 5 = doctors cert for illness 6 = to accompany a child 7 = maternity check-up 8 = other 9 = more than 1 reason
Comment		Please state
No chronic illness	chronicno1	0 = no 1 = yes
One chronic illness	chronicno2	0 = no 1 = yes
Two chronic illness	chronicno3	0 = no 1 = yes
Three or more chronic illnesses	chronicno4	0 = no 1 = yes
Monthly Gross Income Level (Categorical/Ordinal)	income	. = missing 1 = <€1,000 2 = €1,000 - €2,249 3 = €2,250 - €3,499 4 = €3,50 - €4,749 5 = €4,750 - €5,999 6 = €6,999+ 7 = Other
WTP for blood tests	plebwtp1	. = missing 0 = no 1 = yes
WTP value for blood tests	wtppleb	. = missing value in €
Previous blood test	plebprev	. = missing 0 = no 1= yes
WTP for shoulder MRI	mrishoulwtp1	. = missing 0 = no 1= yes
WTP value for shoulder MRI	mrishoul	. = missing value in €
WTP for brain MRI	mribrainwtp1	. = missing 0 = no 1= yes

WTP value for brain MRI	mribrain	. = missing value in €
Previous MRI	prevmri	. = missing 0 = no 1= yes
WTP for a branded prescription drug	wtpbrand	. = missing 0 = no 1= yes
GMS patients WTP for a branded drug	wtpcholmedc	. = missing -8 = nongms 0 = no 1 = yes
GMS patients WTP value for a branded drug	cholmedc	. = missing -8 = nongms Value in €
Non-GMS patient WTP	wtpcholnonmed	. = missing 0 = no 1= yes
Non-GMS patient WTP for a branded drug	cholnonmed	. = missing -8 = nongms Value in €

Appendix C.7 Shapiro-Wilk Test

Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
wtppleb	198	0.97343	3.930	3.147	0.00082
mrishoul	186	0.94485	7.724	4.686	0.00000
mribrain	186	0.95249	6.654	4.345	0.00001
wtpcholmedc	209	0.91806	12.702	5.861	0.00000
wtpcholnon~d	182	0.87185	17.615	6.569	0.00000

Appendix C.8 WTP for Blood Tests (Probit Results)

```
Probit regression                               Number of obs     =        188
                                                Wald chi2(14)     =      25.75
                                                Prob > chi2       =     0.0278
Log pseudolikelihood = -66.442672               Pseudo R2         =     0.1411
```

plebwtp1	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
age2	.7011041	.3668781	1.91	0.056	-.0179638	1.420172
age3	.4433108	.4055159	1.09	0.274	-.3514857	1.238107
age4	.4849142	.5034453	0.96	0.335	-.5018204	1.471649
age5	-.2279045	.6154711	-0.37	0.711	-1.434206	.9783967
medc	-.1579655	.2400181	-0.66	0.510	-.6283923	.3124612
phi	.3723509	.2672555	1.39	0.164	-.1514602	.896162
primaryeduc	-.1757102	.5442579	-0.32	0.747	-1.242436	.8910156
secondaryeduc	-.0461487	.2767706	-0.17	0.868	-.5886092	.4963117
othereduc	0	(omitted)				
excellhealth	.6198105	.6890073	0.90	0.368	-.730619	1.97024
vgoodhealth	1.219248	.6489362	1.88	0.060	-.0526441	2.491139
goodhealth	1.407302	.6040583	2.33	0.020	.22337	2.591235
fairhealth	.4280687	.6590372	0.65	0.516	-.8636204	1.719758
lowinc	.1974585	.4032121	0.49	0.624	-.5928226	.9877396
midinc	.2594991	.441638	0.59	0.557	-.6060956	1.125094
_cons	-.6993018	.832644	-0.84	0.401	-2.331254	.9326505

Appendix C.9 WTP for Blood Tests (Marginal Effects)

```
Conditional marginal effects                    Number of obs     =        188
Model VCE    : Robust

Expression   : Pr(plebwtp1), predict()
dy/dx w.r.t. : age2 age3 age4 age5 medc phi primaryeduc secondaryeduc othereduc excellhealth vgoodhealth goodhealth fairhealth lowinc
at           : age2            =    .4042553 (mean)
               age3            =    .2606383 (mean)
               age4            =    .1542553 (mean)
               age5            =    .0478723 (mean)
               medc            =    .3297872 (mean)
               phi             =    .6542553 (mean)
               primaryeduc     =    .0531915 (mean)
               secondarye~c    =    .3191489 (mean)
               othereduc       =           0 (mean)
               excellhealth    =    .1276596 (mean)
               vgoodhealth     =    .3776596 (mean)
               goodhealth      =    .3510638 (mean)
               fairhealth      =    .1223404 (mean)
               lowinc          =    .5744681 (mean)
               midinc          =    .2925532 (mean)
```

	dy/dx	Delta-method Std. Err.	z	P>|z|	[95% Conf.	Interval]
age2	.1351069	.071402	1.89	0.058	-.0048384	.2750522
age3	.0854286	.0787228	1.09	0.278	-.0688652	.2397225
age4	.0934458	.0967851	0.97	0.334	-.0962495	.2831411
age5	-.0439185	.1187376	-0.37	0.711	-.2766399	.1888028
medc	-.0304409	.0461916	-0.66	0.510	-.1209747	.060093
phi	.0717542	.0516914	1.39	0.165	-.0295591	.1730676
primaryeduc	-.0338604	.104869	-0.32	0.747	-.2393998	.171679
secondaryeduc	-.0088931	.0531245	-0.17	0.867	-.1130153	.0952291
othereduc	0	(omitted)				
excellhealth	.1194411	.1328352	0.90	0.369	-.1409111	.3797934
vgoodhealth	.2349562	.1256078	1.87	0.061	-.0112306	.4811429
goodhealth	.2711955	.1186811	2.29	0.022	.0385847	.5038062
fairhealth	.0824914	.1271309	0.65	0.516	-.1666806	.3316633
lowinc	.0380514	.0783191	0.49	0.627	-.1154513	.1915541
midinc	.050007	.085799	0.58	0.560	-.118156	.21817

Appendix C.10 WTP for Blood Tests (OLS Before Controlling for Multicollinearity)

note: othereduc omitted because of collinearity

Source	SS	df	MS
Model	9.69490462	16	.605931539
Residual	49.4065931	136	.363283773
Total	59.1014977	152	.388825643

Number of obs	=	153
F(16, 136)	=	1.67
Prob > F	=	0.0601
R-squared	=	0.1640
Adj R-squared	=	0.0657
Root MSE	=	.60273

logwtppleb	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
age2	-.0273034	.3052463	-0.09	0.929	-.6309466	.5763398
age3	.0782821	.2570993	0.30	0.761	-.4301475	.5867116
age4	.1746637	.2937666	0.59	0.553	-.4062775	.7556049
age5	.023238	.3343878	0.07	0.945	-.6380342	.6845101
medc	-.2205009	.1384566	-1.59	0.114	-.4943072	.0533053
phi	.0478974	.1864109	0.26	0.798	-.3207414	.4165362
primaryeduc	-.3012389	.2987992	-1.01	0.315	-.8921324	.2896547
secondaryeduc	-.0325055	.1277674	-0.25	0.800	-.2851734	.2201624
othereduc	0	(omitted)				
excellhealth	1.07844	.5856485	1.84	0.068	-.0797151	2.236596
vgoodhealth	1.024103	.7301127	1.40	0.163	-.4197392	2.467945
goodhealth	.9377486	.7782317	1.20	0.230	-.6012519	2.476749
fairhealth	.8514559	.5071364	1.68	0.095	-.1514373	1.854349
lowinc	-.0610928	.1913315	-0.32	0.750	-.4394624	.3172768
midinc	.1455953	.1941092	0.75	0.455	-.2382675	.529458
plebprev	.8275849	.3179956	2.60	0.010	.1987292	1.456441
invmills1	.3525166	1.239156	0.28	0.776	-2.09799	2.803023
_cons	.9771229	1.272403	0.77	0.444	-1.539131	3.493377

Appendix C.11 Testing WTP Consumption Equation for Multicollinearity

Variable	VIF	1/VIF
goodhealth	60.04	0.016656
vgoodhealth	53.82	0.018580
invmills1	17.99	0.055602
excellhealth	14.99	0.066689
age2	9.66	0.103529
fairhealth	9.00	0.111057
age3	5.20	0.192422
age4	4.47	0.223480
lowinc	3.81	0.262686
midinc	3.42	0.292695
phi	3.11	0.321064
age5	1.77	0.563596
medc	1.65	0.604549
primaryeduc	1.64	0.609155
secondarye~c	1.45	0.691760
plebprev	1.08	0.922250
Mean VIF	12.07	

Appendix C.12 WTP for Blood Tests (OLS)

note: othereduc omitted because of collinearity

Source	SS	df	MS			
				Number of obs	=	153
				F(15, 137)	=	1.68
Model	9.16743066	15	.611162044	Prob > F	=	0.0624
Residual	49.9340671	137	.364482241	R-squared	=	0.1551
				Adj R-squared	=	0.0626
Total	59.1014977	152	.388825643	Root MSE	=	.60372

logwtppleb	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
age2	-.2908509	.2132792	-1.36	0.175	-.7125959	.1308941
age3	-.1072489	.2062349	-0.52	0.604	-.5150643	.3005665
age4	-.048105	.2286749	-0.21	0.834	-.5002939	.4040839
age5	.164751	.313602	0.53	0.600	-.4553754	.7848775
medc	-.1637001	.1303997	-1.26	0.211	-.4215565	.0941563
phi	-.0993702	.1409876	-0.70	0.482	-.3781635	.1794231
primaryeduc	-.1581563	.2746434	-0.58	0.566	-.7012447	.3849321
secondaryeduc	.0011011	.1248918	0.01	0.993	-.2458638	.248066
othereduc	0	(omitted)				
excellhealth	.4323952	.2360334	1.83	0.069	-.0343446	.8991351
vgoodhealth	.1565427	.1213984	1.29	0.199	-.0835144	.3965997
fairhealth	.3635743	.3058745	1.19	0.237	-.2412714	.96842
lowinc	-.1549621	.1750424	-0.89	0.378	-.5010964	.1911721
midinc	.0498633	.1773978	0.28	0.779	-.3009286	.4006553
plebprev	.8427596	.3182699	2.65	0.009	.2134029	1.472116
invmills1	-.8716935	.7106228	-1.23	0.222	-2.276901	.5335142
_cons	2.397356	.4801754	4.99	0.000	1.447842	3.34687

Appendix C.13 WTP for Shoulder MRI (Probit Results)

```
Probit regression                               Number of obs     =        179
                                                Wald chi2(15)     =     528.82
                                                Prob > chi2       =     0.0000
Log pseudolikelihood = -66.653762               Pseudo R2         =     0.1594
```

mrishoulwtp1	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
age2	-.0731314	.4134194	-0.18	0.860	-.8834186	.7371558
age3	.4686444	.4286832	1.09	0.274	-.3715593	1.308848
age4	.3145349	.4710643	0.67	0.504	-.6087342	1.237804
age5	.6610294	.6705493	0.99	0.324	-.6532232	1.975282
medc	-.4551795	.3233477	-1.41	0.159	-1.088929	.1785703
phi	.3709457	.2984841	1.24	0.214	-.2140724	.9559638
primaryeduc	-.6439531	.5633869	-1.14	0.253	-1.748171	.4602649
secondaryeduc	-.0672999	.3134592	-0.21	0.830	-.6816686	.5470688
othereduc	-.83539	.7393224	-1.13	0.259	-2.284435	.6136553
excellhealth	.1821657	.7830355	0.23	0.816	-1.352556	1.716887
vgoodhealth	.5469205	.701388	0.78	0.436	-.8277748	1.921616
goodhealth	.6824766	.6801554	1.00	0.316	-.6506036	2.015557
fairhealth	.1722555	.7437852	0.23	0.817	-1.285537	1.630048
lowinc	-5.090343	.4254146	-11.97	0.000	-5.924141	-4.256546
midinc	-5.006311	.5323943	-9.40	0.000	-6.049785	-3.962838
_cons	5.418232	.9309581	5.82	0.000	3.593588	7.242877

Note: 0 failures and 15 successes completely determined.

Appendix C.14 WTP for Shoulder MRI (Marginal Effects)

```
Conditional marginal effects                    Number of obs     =        179
Model VCE    : Robust

Expression   : Pr(mrishoulwtp1), predict()
dy/dx w.r.t. : age2 age3 age4 age5 medc phi primaryeduc secondaryeduc othereduc excellhealth vgoodhealt
at           : age2            =    .4022346 (mean)
               age3            =    .2569832 (mean)
               age4            =    .1564246 (mean)
               age5            =    .0558659 (mean)
               medc            =    .3519553 (mean)
               phi             =    .6424581 (mean)
               primaryeduc     =    .0502793 (mean)
               secondarye~c    =    .3296089 (mean)
               othereduc       =    .0111732 (mean)
               excellhealth    =    .1284916 (mean)
               vgoodhealth     =    .3798883 (mean)
               goodhealth      =    .3296089 (mean)
               fairhealth      =    .1340782 (mean)
               lowinc          =    .5865922 (mean)
               midinc          =    .2905028 (mean)
```

	dy/dx	Delta-method Std. Err.	z	P>|z|	[95% Conf.	Interval]
age2	-.0074971	.0421783	-0.18	0.859	-.090165	.0751708
age3	.0480431	.0454788	1.06	0.291	-.0410938	.13718
age4	.0322446	.0490408	0.66	0.511	-.0638736	.1283628
age5	.0677655	.0691912	0.98	0.327	-.0678468	.2033778
medc	-.0466628	.0320561	-1.46	0.145	-.1094916	.016166
phi	.0380275	.0312799	1.22	0.224	-.02328	.0993351
primaryeduc	-.0660149	.0560267	-1.18	0.239	-.1758251	.0437953
secondaryeduc	-.0068992	.032033	-0.22	0.829	-.0696828	.0558843
othereduc	-.0856401	.0746493	-1.15	0.251	-.23195	.0606699
excellhealth	.0186747	.0806179	0.23	0.817	-.1393334	.1766828
vgoodhealth	.0560676	.0738315	0.76	0.448	-.0886395	.2007747
goodhealth	.0699641	.0717182	0.98	0.329	-.0706009	.2105292
fairhealth	.0176588	.0768959	0.23	0.818	-.1330544	.1683719
lowinc	-.5218369	.1107047	-4.71	0.000	-.7388141	-.3048597
midinc	-.5132223	.1133743	-4.53	0.000	-.7354319	-.2910127

Appendix C.15 WTP for Shoulder MRI (OLS before Controlling for Multicollinearity)

Source	SS	df	MS			
				Number of obs	=	120
				F(17, 102)	=	2.00
Model	9.18541623	17	.540318602	Prob > F	=	0.0179
Residual	27.5852345	102	.270443475	R-squared	=	0.2498
				Adj R-squared	=	0.1248
Total	36.7706507	119	.308997065	Root MSE	=	.52004

logmrishoul	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
age2	.1563321	.1585637	0.99	0.327	-.1581782	.4708423
age3	.1102762	.1915176	0.58	0.566	-.2695981	.4901505
age4	.2565751	.2050881	1.25	0.214	-.1502162	.6633665
age5	.7442891	.3124076	2.38	0.019	.12463	1.363948
medc	.0917851	.1585506	0.58	0.564	-.2226993	.4062694
phi	.2346733	.1586006	1.48	0.142	-.0799103	.5492569
primaryeduc	-.1942464	.311446	-0.62	0.534	-.811998	.4235051
secondaryeduc	-.0689619	.121478	-0.57	0.571	-.3099129	.1719891
othereduc	.021533	.563964	0.04	0.970	-1.097087	1.140153
excellhealth	.6071959	.4218358	1.44	0.153	-.2295135	1.443905
vgoodhealth	.8261045	.4166259	1.98	0.050	-.000271	1.65248
goodhealth	.7519894	.4189937	1.79	0.076	-.0790828	1.583061
fairhealth	.7737628	.4226147	1.83	0.070	-.0644914	1.612017
lowinc	.165124	.2476444	0.67	0.506	-.3260775	.6563255
midinc	.2538392	.2282824	1.11	0.269	-.1989579	.7066364
prevmri	.2411931	.1127907	2.14	0.035	.0174733	.4649128
invmills2	.226942	.6697187	0.34	0.735	-1.101442	1.555326
_cons	3.254596	.4998931	6.51	0.000	2.26306	4.246131

Appendix C.16 Testing for Multicollinearity

Variable	VIF	1/VIF
vgoodhealth	18.35	0.054493
goodhealth	18.26	0.054773
excellhealth	8.14	0.122896
fairhealth	7.13	0.140205
invmills2	6.95	0.143875
lowinc	6.73	0.148478
midinc	4.93	0.202784
age3	3.24	0.308182
age2	2.71	0.368793
medc	2.45	0.408670
phi	2.38	0.420115
age4	2.16	0.463685
secondarye~c	1.40	0.716115
age5	1.40	0.716632
primaryeduc	1.39	0.721065
prevmri	1.28	0.778695
othereduc	1.17	0.857449
Mean VIF	5.30	

Appendix C.17 WTP for Shoulder MRI (OLS)

Source	SS	df	MS			
				Number of obs	=	120
				F(16, 103)	=	1.88
Model	8.31428254	16	.519642659	Prob > F	=	0.0305
Residual	28.4563681	103	.276275419	R-squared	=	0.2261
				Adj R-squared	=	0.1059
Total	36.7706507	119	.308997065	Root MSE	=	.52562

logmrishoul	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
age2	.145646	.1601512	0.91	0.365	-.1719761	.4632681
age3	.0329831	.1886141	0.17	0.862	-.3410884	.4070546
age4	.1780266	.2025128	0.88	0.381	-.2236097	.5796629
age5	.6981249	.3146861	2.22	0.029	.0740193	1.32223
medc	.1409425	.1578418	0.89	0.374	-.1720994	.4539844
phi	.1570235	.1542218	1.02	0.311	-.1488391	.4628861
primaryeduc	-.0915515	.3094279	-0.30	0.768	-.7052286	.5221257
secondaryeduc	-.0431573	.1219178	-0.35	0.724	-.2849525	.1986378
othereduc	.1256248	.56699	0.22	0.825	-.9988662	1.250116
excellhealth	-.067254	.1936986	-0.35	0.729	-.4514095	.3169015
vgoodhealth	.1092387	.1197525	0.91	0.364	-.1282621	.3467395
fairhealth	.0908308	.1858483	0.49	0.626	-.2777555	.4594171
lowinc	.2752403	.2424968	1.14	0.259	-.2056949	.7561754
midinc	.3694148	.2213602	1.67	0.098	-.0696009	.8084305
prevmri	.2393756	.1139957	2.10	0.038	.0132919	.4654592
invmills2	-.2315708	.6257162	-0.37	0.712	-1.472531	1.00939
_cons	4.046791	.237172	17.06	0.000	3.576416	4.517165

Appendix C.18 WTP for Brain MRI (Probit Results)

```
Probit regression                               Number of obs     =        179
                                                Wald chi2(15)     =     414.54
                                                Prob > chi2       =     0.0000
Log pseudolikelihood = -53.237035               Pseudo R2         =     0.2019
```

mribrainwtp1	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
age2	.1350279	.417022	0.32	0.746	-.6823202	.952376
age3	.4491549	.4175275	1.08	0.282	-.3691839	1.267494
age4	.0616654	.4951398	0.12	0.901	-.9087907	1.032121
age5	.3606849	.7099836	0.51	0.611	-1.030857	1.752227
medc	-.1839949	.3305944	-0.56	0.578	-.831948	.4639582
phi	.7206897	.3095604	2.33	0.020	.1139625	1.327417
primaryeduc	-.4778532	.5614377	-0.85	0.395	-1.578251	.6225444
secondaryeduc	-.0542546	.3280947	-0.17	0.869	-.6973084	.5887992
othereduc	-.1685541	.7469391	-0.23	0.821	-1.632528	1.29542
excellhealth	.5685724	.8043746	0.71	0.480	-1.007973	2.145118
vgoodhealth	.8202646	.7150506	1.15	0.251	-.5812088	2.221738
goodhealth	.8359055	.6682771	1.25	0.211	-.4738936	2.145705
fairhealth	.4169241	.7315293	0.57	0.569	-1.016847	1.850695
lowinc	-4.700036	.4501375	-10.44	0.000	-5.582289	-3.817782
midinc	-4.277653	.5744259	-7.45	0.000	-5.403507	-3.151799
_cons	4.60589	.9199962	5.01	0.000	2.802731	6.40905

Note: 0 failures and 15 successes completely determined.

Appendix C.19 WTP for Brain MRI (Marginal Effects)

```
Conditional marginal effects                      Number of obs     =        179
Model VCE    : Robust

Expression   : Pr(mribrainwtp1), predict()
dy/dx w.r.t. : age2 age3 age4 age5 medc phi primaryeduc secondaryeduc othereduc excellhealth vgoodhealth g
at           : age2            =     .396648 (mean)
               age3            =    .2681564 (mean)
               age4            =    .1564246 (mean)
               age5            =    .0502793 (mean)
               medc            =    .3519553 (mean)
               phi             =    .6256983 (mean)
               primaryeduc     =    .0502793 (mean)
               secondarye~c    =    .3128492 (mean)
               othereduc       =    .0167598 (mean)
               excellhealth    =    .1284916 (mean)
               vgoodhealth     =    .3798883 (mean)
               goodhealth      =    .3296089 (mean)
               fairhealth      =    .1340782 (mean)
               lowinc          =    .5921788 (mean)
               midinc          =    .2905028 (mean)
```

	dy/dx	Delta-method Std. Err.	z	P>|z|	[95% Conf.	Interval]
age2	.0099086	.0314388	0.32	0.753	-.0517103	.0715276
age3	.03296	.033092	1.00	0.319	-.0318991	.0978191
age4	.0045251	.0365126	0.12	0.901	-.0670382	.0760885
age5	.0264679	.0525617	0.50	0.615	-.0765512	.1294869
medc	-.013502	.024191	-0.56	0.577	-.0609154	.0339115
phi	.0528858	.0251153	2.11	0.035	.0036607	.1021109
primaryeduc	-.0350659	.0399236	-0.88	0.380	-.1133147	.0431828
secondaryeduc	-.0039813	.0238619	-0.17	0.867	-.0507497	.042787
othereduc	-.0123689	.0544924	-0.23	0.820	-.119172	.0944343
excellhealth	.0417231	.0590651	0.71	0.480	-.0740424	.1574886
vgoodhealth	.0601928	.0548529	1.10	0.272	-.0473169	.1677026
goodhealth	.0613406	.0512488	1.20	0.231	-.0391052	.1617864
fairhealth	.0305948	.0555225	0.55	0.582	-.0782273	.1394169
lowinc	-.3448991	.0949473	-3.63	0.000	-.5309924	-.1588058
midinc	-.3139037	.0958615	-3.27	0.001	-.5017888	-.1260187

Appendix C.20 WTP for Brain MRI (OLS before Controlling for Multicollinearity

Source	SS	df	MS
Model	10.3959798	17	.611528225
Residual	34.6199234	105	.329713557
Total	45.0159033	122	.368982814

Number of obs	=	123
F(17, 105)	=	1.85
Prob > F	=	0.0304
R-squared	=	0.2309
Adj R-squared	=	0.1064
Root MSE	=	.57421

logmribrain	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
age2	-.0917178	.174951	-0.52	0.601	-.4386134	.2551777
age3	-.0496178	.2112361	-0.23	0.815	-.4684599	.3692244
age4	.1315866	.2136123	0.62	0.539	-.2919671	.5551402
age5	.5918157	.3787592	1.56	0.121	-.1591939	1.342825
medc	.0311766	.1452742	0.21	0.830	-.2568754	.3192286
phi	.1595937	.2264797	0.70	0.483	-.2894738	.6086611
primaryeduc	-.355334	.3428557	-1.04	0.302	-1.035153	.3244855
secondaryeduc	-.2943279	.138146	-2.13	0.035	-.5682459	-.0204098
othereduc	.4767988	.6015949	0.79	0.430	-.7160529	1.66965
excellhealth	.9025064	.4886846	1.85	0.068	-.066465	1.871478
vgoodhealth	.934936	.4878202	1.92	0.058	-.0323213	1.902193
goodhealth	.9229125	.4817198	1.92	0.058	-.032249	1.878074
fairhealth	.8947708	.4872224	1.84	0.069	-.0713012	1.860843
lowinc	.3568391	.2698313	1.32	0.189	-.1781864	.8918647
midinc	.4521105	.2111999	2.14	0.035	.0333402	.8708808
prevmri	.1559127	.1190733	1.31	0.193	-.0801876	.392013
invmills3	-.0577903	.888936	-0.07	0.948	-1.820386	1.704806
_cons	3.576372	.6310921	5.67	0.000	2.325033	4.827711

Appendix C.21 Testing for Multicollinearity

Variable	VIF	1/VIF
vgoodhealth	21.42	0.046691
goodhealth	19.68	0.050804
excellhealth	10.08	0.099193
invmills3	8.36	0.119603
fairhealth	7.80	0.128258
lowinc	6.69	0.149491
phi	4.14	0.241346
midinc	3.55	0.281483
age3	3.27	0.306020
age2	2.79	0.358878
age4	2.03	0.493213
medc	1.75	0.571567
secondarye~c	1.47	0.678490
primaryeduc	1.38	0.724790
age5	1.27	0.785259
prevmri	1.24	0.807541
othereduc	1.09	0.918489
Mean VIF	5.77	

Appendix C.22 WTP for Brain MRI (OLS)

Source	SS	df	MS			
				Number of obs	=	123
				F(16, 106)	=	1.70
Model	9.18574744	16	.574109215	Prob > F	=	0.0578
Residual	35.8301558	106	.338020338	R-squared	=	0.2041
				Adj R-squared	=	0.0839
Total	45.0159033	122	.368982814	Root MSE	=	.5814

logmribrain	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
age2	-.1481323	.1746141	-0.85	0.398	-.4943218	.1980572
age3	-.1584674	.2059991	-0.77	0.443	-.5668806	.2499458
age4	.0723245	.2140068	0.34	0.736	-.3519647	.4966137
age5	.5550156	.3830073	1.45	0.150	-.2043337	1.314365
medc	.0487795	.1467984	0.33	0.740	-.2422625	.3398216
phi	-.0176107	.20932	-0.08	0.933	-.432608	.3973866
primaryeduc	-.2279029	.3405526	-0.67	0.505	-.9030815	.4472757
secondaryeduc	-.2677837	.1391702	-1.92	0.057	-.5437021	.0081347
othereduc	.520495	.6086882	0.86	0.394	-.6862884	1.727278
excellhealth	.0374762	.1892987	0.20	0.843	-.3378268	.4127792
vgoodhealth	.0333241	.13007	0.26	0.798	-.2245522	.2912005
fairhealth	.038979	.1970057	0.20	0.844	-.351604	.429562
lowinc	.5172831	.2597179	1.99	0.049	.0023671	1.032199
midinc	.5573975	.2064776	2.70	0.008	.1480355	.9667594
prevmri	.152416	.1205497	1.26	0.209	-.0865855	.3914176
invmills3	-.8439164	.7984414	-1.06	0.293	-2.426904	.7390714
_cons	4.650155	.2937229	15.83	0.000	4.067821	5.23249

Appendix C.23 WTP for a Branded Cholesterol-Lowering Drug (Probit Results)

```
Probit regression                               Number of obs     =        166
                                                Wald chi2(12)     =      20.98
                                                Prob > chi2       =     0.0506
Log pseudolikelihood = -102.96639               Pseudo R2         =     0.0991
```

wtpbrand	Coef.	Robust Std. Err.	z	P>|z|	[95% Conf.	Interval]
age1	-.6862237	.5779998	-1.19	0.235	-1.819082	.446635
age2	-1.155279	.5263684	-2.19	0.028	-2.186942	-.1236155
age3	-1.297245	.5209679	-2.49	0.013	-2.318324	-.2761668
age4	-1.085867	.5338345	-2.03	0.042	-2.132163	-.0395701
medc	-.5229138	.2559841	-2.04	0.041	-1.024633	-.0211942
phi	.3323709	.2516221	1.32	0.187	-.1607994	.8255412
thirdeduc	.030068	.5164543	0.06	0.954	-.9821638	1.0423
secondaryeduc	-.1285255	.4867682	-0.26	0.792	-1.082574	.8255228
othereduc	-.1333331	.9508871	-0.14	0.888	-1.997038	1.730371
excellenthealth	-.4463087	.222422	-2.01	0.045	-.8822479	-.0103695
lowinc	.0832468	.3433962	0.24	0.808	-.5897973	.7562909
midinc	.1555647	.3500191	0.44	0.657	-.5304601	.8415896
_cons	1.054718	.6806641	1.55	0.121	-.2793594	2.388795

Appendix C.24 WTP for a Branded Cholesterol-Lowering Drug (Marginal Effects)

```
Conditional marginal effects                      Number of obs     =        166
Model VCE    : Robust

Expression   : Pr(wtpbrand), predict()
dy/dx w.r.t. : age1 age2 age3 age4 medc phi thirdeduc secondaryeduc othereduc excellenthealth lowinc midinc
at           : age1            =    .1445783 (mean)
               age2            =    .3975904 (mean)
               age3            =    .2590361 (mean)
               age4            =    .1385542 (mean)
               medc            =    .3855422 (mean)
               phi             =     .626506 (mean)
               thirdeduc       =    .6144578 (mean)
               secondarye~c    =    .3072289 (mean)
               othereduc       =    .0180723 (mean)
               excellenth~h    =    .4879518 (mean)
               lowinc          =    .6204819 (mean)
               midinc          =    .2590361 (mean)
```

	dy/dx	Delta-method Std. Err.	z	P>|z|	[95% Conf.	Interval]
age1	-.2713556	.2287565	-1.19	0.236	-.7197101	.1769989
age2	-.4568354	.2086149	-2.19	0.029	-.865713	-.0479578
age3	-.5129737	.2063856	-2.49	0.013	-.9174821	-.1084653
age4	-.4293876	.2115695	-2.03	0.042	-.8440563	-.014719
medc	-.2067774	.1012988	-2.04	0.041	-.4053194	-.0082355
phi	.1314305	.0994522	1.32	0.186	-.0634923	.3263533
thirdeduc	.0118899	.2042268	0.06	0.954	-.3883874	.4121671
secondaryeduc	-.0508232	.1924627	-0.26	0.792	-.4280431	.3263967
othereduc	-.0527243	.375992	-0.14	0.888	-.7896552	.6842066
excellenthealth	-.1764853	.0880222	-2.01	0.045	-.3490055	-.003965
lowinc	.0329185	.1358016	0.24	0.808	-.2332476	.2990847
midinc	.0615155	.1383991	0.44	0.657	-.2097419	.3327728

Appendix C.25 WTP for a Branded Cholesterol-Lowering Drug (OLS before Controlling for Multicollinearity)

Source	SS	df	MS
Model	22.626308	13	1.74048523
Residual	64.7058488	76	.851392747
Total	87.3321567	89	.981260188

Number of obs	=	90
F(13, 76)	=	2.04
Prob > F	=	0.0279
R-squared	=	0.2591
Adj R-squared	=	0.1323
Root MSE	=	.92271

lnbrandamnt	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
age1	-.5835595	.5716939	-1.02	0.311	-1.722187	.5550675
age2	-.4623549	.7818724	-0.59	0.556	-2.019589	1.094879
age3	-.2700922	.8996107	-0.30	0.765	-2.061822	1.521638
age4	-.4796964	.7381434	-0.65	0.518	-1.949836	.9904436
medc	-.8274429	.5210633	-1.59	0.116	-1.86523	.2103446
thirdeduc	-.6781856	.7547828	-0.90	0.372	-2.181466	.8250945
secondaryeduc	-.8254856	.7645974	-1.08	0.284	-2.348313	.6973421
othereduc	-1.235118	1.219614	-1.01	0.314	-3.66419	1.193954
excellenthealth	-.1067211	.3808903	-0.28	0.780	-.8653298	.6518876
midinc	.2085548	.2562735	0.81	0.418	-.3018581	.7189677
highinc	-.0701107	.337582	-0.21	0.836	-.7424635	.6022421
choldrug	.8634667	.3388995	2.55	0.013	.1884898	1.538443
invmills4	.3259838	1.107856	0.29	0.769	-1.880502	2.53247
_cons	3.720223	.8063639	4.61	0.000	2.11421	5.326236

Appendix C.26 Testing for Multicollinearity

Variable	VIF	1/VIF
age2	15.19	0.065832
age3	13.69	0.073056
thirdeduc	12.65	0.079072
secondarye~c	12.09	0.082747
invmills4	9.95	0.100474
age4	8.00	0.125008
medc	5.13	0.194770
age1	4.54	0.220345
excellenth~h	3.82	0.261988
choldrug	2.02	0.494560
othereduc	1.73	0.578812
midinc	1.52	0.659534
highinc	1.29	0.773738
Mean VIF	7.05	

Appendix C.27 WTP for a Branded Cholesterol-Lowering Drug (OLS)

Source	SS	df	MS			
Model	22.2667397	12	1.85556164	Number of obs	=	90
Residual	65.065417	77	.845005416	F(12, 77)	=	2.20
				Prob > F	=	0.0199
Total	87.3321567	89	.981260188	R-squared	=	0.2550
				Adj R-squared	=	0.1389
				Root MSE	=	.91924

lnbrandamnt	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
age1	-.3191237	.400064	-0.80	0.428	-1.115753	.4775055
age2	-.0195351	.3819912	-0.05	0.959	-.7801768	.7411066
age3	.2465717	.4194046	0.59	0.558	-.5885695	1.081713
medc	-.5759988	.3476922	-1.66	0.102	-1.268342	.1163448
thirdeduc	-.6350815	.7490372	-0.85	0.399	-2.126605	.8564421
secondaryeduc	-.7394233	.7502114	-0.99	0.327	-2.233285	.7544384
othereduc	-1.069351	1.18816	-0.90	0.371	-3.435279	1.296577
excellenthealth	.0671551	.2700739	0.25	0.804	-.4706309	.604941
lowinc	.0606883	.336003	0.18	0.857	-.6083791	.7297557
midinc	.2204471	.3407858	0.65	0.520	-.4581442	.8990383
choldrug	.8266181	.3328667	2.48	0.015	.1637957	1.48944
invmills4	-.2726119	.6132473	-0.44	0.658	-1.493743	.9485195
_cons	3.559962	.8270755	4.30	0.000	1.913044	5.206879