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Authors	McElroy, Brendan
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Empirically-derived weights for GMS capitation payments to General Practitioners

Dr Brendan McElroy
School of Economics
University College Cork
Western Road
Cork
Ireland
b.mcelroy@ucc.ie

Abstract

Unlike other weighted capitation schemes used in Irish health service financing and in health systems internationally, the GMS capitation payments scheme for General Practitioners lacks transparency in both the data used and the model employed. In this study, evidence-based weights were generated from four difference sources of utilisation data. These were compared to current payment weights. Evidence-based weights indicated that over 70s had higher payments per consultation than other groups. Considerable intra-age band differences in capitation payment were detected, suggesting that current age bands should be narrowed. The implications for the efficiency and equity of general practice in Ireland are discussed.

Introduction

In 2012, the Irish Department of Health proposed that General Practitioner (GP) care would be free at the point of contact and a primary care-focused chronic disease management programme would be introduced. The GP contract would be renegotiated and a transparent and objective formula for resource allocation would be developed [1]. Since 1989, almost all GPs have received a capitation payment for their General Medical Services (GMS) patients. Up until 2010, the capitation formula was based on patient age, gender and distance to the GP's principal surgery. Since then, only age and gender have been used. This study examines the transparency and empirical basis of the weighted capitation formula used for GMS payments to GPs.

Weighted capitation attempts to compensate providers or insurers for differences in the needs profile of their patients. A number of measures of health need can be considered, including age, gender and morbidity. Internationally, many health care systems use weighted capitation mechanisms for payment in general practice. These range in sophistication from models that account for health need using an age weighting only - Czech Republic, Estonia, Latvia and Slovenia for instance[2] – to ones that include characteristics of the patient's area of residence – Spain[3] and the Netherlands[4]. The UK model is the most sophisticated in Europe. It uses multivariate regression techniques to generate patient weighting based on age, gender, additional health needs, local labour costs, rurality, patient list turnover and living in a nursing/residential home[5]. Of these, the inclusion of additional health needs, as measured by chronic illness and area-level mortality, is the most important for predicting patient costs. Additional health needs can be measured in a number of ways. In Ontario they are measured through previous use of inpatient and ambulatory health services[6]. Measures of chronic illness generated from prescription medicine claims have been used for weighted capitation

models in the US and the Netherlands[7, 8], while they were used for the GMS prescribed medicines budget in Ireland[9].

Aside from GP capitation payments, the Irish health care system has a number of examples of weighted capitation financing, including the national casemix programme for public hospital services; the Risk Equalisation Scheme in private health insurance and the now defunct Indicative Drug Target Scheme. In the national casemix programme, hospital patients are coded into Diagnostic-Related Groups (DRGs) which are used to alter hospital budgets to account for variations in case complexity. In the Risk Equalisation Scheme, health insurance companies are compensated or penalised based on the age and gender profile of their claimants. The Indicative Drug Target Scheme used age bands to generate indicative drug expenditure targets for each GP's GMS panel. In these three cases the data sources used for the model are transparent. This is not the case for the GP capitation model. Therefore it is not possible to explain the payment differentials found in the GP capitation scheme with currently available information.

This study generated capitation weights based on the association of age and gender with consultations and compared them to current capitation weights. As such it assumed that consultation time and associated administration is equal across age/gender groups and therefore each consultation should be compensated equally. This may not be the case for certain age/gender groups such as those with a higher proportion of multi-morbid patients, who tend to be older [10] or women of childbearing age. There is Irish evidence to suggest the elderly have more ailments addressed per consultation [11] and UK evidence that finds that this leads to longer consultation times [12]. Nevertheless alternatives such as time per consultation can also be problematic (personal communication, CompleteGP) and utilisation is the most commonly used measure of resource use in weighted capitation internationally. In addition, in the private market for GP consultations in Ireland all age/gender groups pay the

same basic fee, although particular age/gender groups – typically sicker ones including the elderly - may have to pay for additional services such as blood tests.

Methods

Data

There is no routinely generated dataset that links GP utilisation to GMS patient characteristics in Ireland. Two approaches were examined. The first is the use of an administrative database which could contain sampling bias; the second is the use of several patient self-reported surveys, which could contain recall bias. In order to compare utilisation across the chosen datasets, over 18s only were examined.

First, Behan et al. (2013)[13] (hereafter Behan13) published age-related utilisation rates for GMS recipients in a number of GP practices in Ireland using data from an administrative database. Second, the Quarterly National Household Survey (QNHS)[14], Healthy Ireland [15] and The Irish Longitudinal Study on Aging (TILDA)[16, 17] were used. The microdata for Healthy Ireland and TILDA were accessed through the Irish Social Sciences Data Archive[18].

The Behan13 data were extracted from the GP administrative records of six practices in 2012/13. It covered 27,080 patients of whom 42% were GMS-entitled. The over 18 population was 20,706 so the over 18 GMS population was estimated at approximately 8,697 (20,706*0.42). It appears to be reasonably representative of national demographics, although it may underrepresent remote rural and inner-city populations, or particular socio-economic groups. The latter was found to be the case for sentinel practices in England and Wales[19]. In addition, it may be unrepresentative of General Practice in Ireland, with respect to age and gender distribution of the GPs and other clinical and support staff, or with respect to quality

standards. Also, home visits and telephone consultations were collected in one practice only and extrapolated to all six.

The principal focus of the QNHS is to collect data on labour market outcomes and related socio-economic and demographic factors for the population aged over 18. Modules in areas of special interest are conducted quarterly. Health modules were conducted in Quarter 3 of 2001, 2007 and 2010. As it is the most recent, this study used the 2010 data. It was nationally representative with a sample size of 6,232 GMS recipients.

Healthy Ireland is a nationally representative annual survey of the population over 15, run by the Department of Health and Ispos/MRBI and first conducted in 2014/15[15]. It has a GMS sample of 3,444. The Irish Longitudinal Study on Ageing or TILDA[16] collects data on various aspects of the lives of people aged 50 and over, including GP utilisation. It is conducted every two years. This study used Wave 1 (hereafter TILDAw1), as it allows GP utilisation to be calculated. Wave 1 was conducted from 2009 to 2011 and had a sample size of 8,504, of whom 4,014 were GMS-entitled and aged 50 or over.

There are a number of other self-reported surveys that were excluded. The Irish Health Survey[20] reports proportion attending GP only, not frequency of attendance. The Growing Up in Ireland[21] study does not include over 18s and the Household Budget Survey[22] is not conducted at individual level and has only 3 age groups comparable to those in this study.

The definition of consultation was slightly different in the datasets used. Behan13, the QNHS 2010:Q3 (hereafter QNHS10) and Healthy Ireland used the same definition, which included consultations in clinics, home visits and by phone. However, in Behan13 and the QNHS10,

some types of telephone consultations such as discussion of test results were excluded. TILDAw1 excluded telephone consultations[23].

For a relatively infrequent activity such as GP utilisation, retrospective, self-reported surveys must choose a recall window that is wide enough to ensure completeness (e.g. that there are not a disproportionate number of zeroes) but narrow enough to ensure that responses are accurate. There is no consensus in the literature on optimal recall period, but it appears to depend on the objective of the survey, and the frequency and saliency of the encounters [24-26]. Retrospective recall has been associated with underreporting, especially of community-based health care services [24, 26]. QNHS10 and TILDAw1 chose a recall period of 12 months and Healthy Ireland chose 4 weeks. The European Health Interview Survey[27], which covers all EU countries, Iceland and Norway, and of which the Irish Health Survey[20] is a component part, uses a 4 week recall period. In other Irish surveys of GP utilisation, a 2 week period was used in the QNHS in 2001[28]; a 4 week period was used in the Household Budget Survey[22] and a 12 month period was used in the Growing Up in Ireland study[21].

Results

Table 1 presents the GP consultations by age and gender.

Table 1 GP consultations by Age/Gender group and Survey

Age Group	Behan13		QNHS10		Healthy Ireland		TILDAw1	
	Male	Female	Male	Female	Male	Female	Male	Female
18-24	4.1		3.8		2.1	5.1		
25-34	5.2		4.9		3.3	5.8		
35-44	5.8		4.7					
45-54	6.5		5.6		6.1	6.6		
55-64	7.5		6				5.4	5.6
65-69	8.8		5.2		8.4	8.5	5.6	5.0
70+	9.8		5.6				5.3	5.3

Sources: Behan et al., 2013 [13];CSO, 2011[14]; Irish Social Science Data Archive[18].

The first two datasets, Behan13 and QNHS10, did not disaggregate by gender. Therefore the same utilisation was applied to both genders. Behan13 rose steadily from 4.1 consultations per annum for 18-24 year olds to 9.8 per annum for over 70s. The annual consultation rate in the QNHS10 was lower than Behan13 and peaks at 6 consultations per annum for 55-64 year olds.

One of the advantages of including Healthy Ireland and TILDAw1 data is that they disaggregate by gender. Healthy Ireland used wider age groups (18-24, 25-44, 45-64 and 65+). The only comparable age/gender groups from TILDAw1 were 55–64 and above. There was a strong age gradient in Healthy Ireland, with male consultations rising from 2.1 for males aged 18-24 to 8.4 for males aged over 65 and female consultations rising 5.1 for females aged 18-24 to 8.5 for females aged over 65. TILDAw1 did not exhibit an age gradient, with peaks in age group 65-69 for males, and in age group 55-64 for females.

There were considerable differences in utilisation across datasets. In Healthy Ireland, the simple average of males and females aged 18-24 was 3.6 in Healthy Ireland, which was similar to QNHS10 and slightly lower than Behan13. For those aged 25-44 it was 4.5 which again was similar to QNHS10 and lower than Behan13. For age group 45-64, it was 6.4, which was closer to Behan13 than QNHS10 or TILDAw1. For the over 65 age group 65 it was 8.4, which was closer to Behan13 than either QNHS10 or TILDAw1.

A notable feature of the Healthy Ireland data was the considerable gender difference in utilisation, where female utilisation exceeded that of males, although the gap narrowed with age.

Across all 4 datasets and taking the simple average of males and females in Healthy Ireland, Behan13 recorded the highest levels of utilisation for all age groups. For the datasets reliant on self-reported data, QNHS10 had higher rates than Healthy Ireland for adults under 45 and Healthy Ireland had higher rates for those 45 and over. TILDAw1 had the lowest rates of utilisation for all age/gender groups except for males 65-69, where QNHS10 was lower.

Table 2 presents capitation payments for each age/gender group by survey.

Table 2: Capitation Payments by Age/Gender group and Survey

Age Group	Capitation		Behan		Healthy Ireland		QNHS10		TILDAw1	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
18-24	0.50	0.82	0.55		0.34	0.83	0.63			
25-34	0.50	0.82	0.69		0.54	0.95	0.82			
35-44	0.50	0.82	0.77				0.78			
45-54	1.00	1.10	0.87		1.00	1.08	0.93			
55-64	1.00	1.10	1.00				1.00		1.00	1.04
65-69	1.05	1.17	1.17		1.37	1.39	0.87		1.02	0.91
70+	2.46	2.46	1.31				0.93		0.98	0.97

Sources: Primary Care Reimbursement Service, 2013[29]; Behan et al., 2013 [13];CSO, 2011[14];Irish Social Sciences Data Archive[18].

All data are indexed to males 55-64=1.00 as this is the first comparable age/gender group for which we have TILDAw1 data. The most notable feature of the capitation payments is the 146% jump in the index for those aged over 70 compared with the base group, which is almost 5 times the payment to males aged 18-44. Capitation payments based on Behan would range from 55% to 131% of the base group, rising consistently with age. Based on Healthy Ireland, payments would vary from 34% to 137% of the base group for males, again rising consistently with age. For females, the age gradient would be flatter, varying from a payment of 83% of the base group for the youngest group to 39% greater than the base group for the over 70s. This pattern is reasonably similar to current capitation payments for females up to the age of 65. Payments based on QNHS10 would peak at the base group and would be 63% of base group payment for the youngest age group, 93% thereof for over 70s. Based on TILDAw1, payments would vary very little for males, somewhat more for females.

There are also notable intra-band differences in utilisation. Current payments do not changes from ages 18-44, or from 45-64. However, payments to those aged 18-44 would vary from between 0.55 to 0.77 according to Behan13; 0.63 to 0.78 according to QNHS10 and 0.34 to

0.54 for males or 0.83 to 0.95 for females according to Healthy Ireland. There would also be intra-band differences for those aged 45-64, again varying by data source.

Discussion

The source of the dataset used to calculate current GMS capitation payments is not publicly known. This study sought to highlight this lack of transparency by deriving age/gender-related capitation weights from published sources and comparing these with the current age/gender-related capitation weights. Significant differences emerged. In particular, empirically-derived weights indicated that the over 70s had a much higher ratio of capitation payment to utilisation than other age groups.

Utilisation varied considerably within the current capitation age groups. Narrowing the age groups for GP capitation payment to, perhaps, 5 year bands (as is the typical age grouping for weighted capitation models) may be worth considering.

Patients over 70 carried a particularly high capitation payment relative to utilisation. The weekly income limit for entitlement to GMS services for a single person over 70 was €500 in 2015 whereas it was €184 for a single person under 65 (by way of comparison Jobseekers Allowance was €188 and median income was €367 in 2013[29]). As such, relatively wealthy over 70s qualify as against relatively poor under 70s. Given the long established link between health and socio-economic deprivation, a GP serving a relatively wealthy population of over 70s is likely to be better off than their counterpart serving a relatively deprived population of over 70s, and probably a good degree better off than their counterpart serving a GMS population of under 70s[1]. This is compounded by the fact that premature mortality is so much

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[1] Although beyond the scope of this study due to data limitations, under 6s, who are universally entitled to visit GPs for free (at point of contact) since 2015, received a capitation payment of €125 per annum. Before

higher in deprived populations in Ireland[30, 31] such that GPs serving such populations do not benefit from the higher payments to over 70s for as long as their counterparts serving richer over 70s. Thus an inequity may arise, which would undermine government policy on health service development[1, 32].

The emergence of the significantly higher payments to over 70s can be traced to the significant increase in the income thresholds relating to that group in 2001 [33] which expanded the numbers eligible for GMS to approximately 95% of all over 70s. As a consequence of this expansion in eligible numbers, a new capitation rate for those over 70s who were eligible for GMS services for the first time was agreed. This continued until 2009, when one payment was made for all over 70s. In 2015, a new capitation rate for under 6s was agreed with GPs for the expansion of the Doctor Visit card to all in that age group. These *ad hoc* changes to capitation rates may not reflect actual relativities in utilisation rates, suggesting that a comprehensive, evidence-based review of the GMS capitation model is warranted.

The study found material differences in reported utilisation in the self-reported surveys, depending on the recall period. Meanwhile, Behan13 does not suffer from recall bias but may suffer from sampling bias. Weighted-capitation models used in other health systems use much larger, and in some cases population-wide, administrative data,[5, 7, 8] which overcomes any sampling bias.

The ideal weighted capitation model would perfectly predict patient expenditure and base capitation on that prediction. As described above, the inclusion of a robust measure of additional health needs, markedly improves predictability[5,8]. Many fall short of the ideal because data on each need variable must be available for all recipients of the service. Age and gender are the only variables available universally in many instances. An Irish study[9] used

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this change, the drop in capitation payment for those who remain on the GMS scheme at age 6 was €30.17, a 41% fall. Since 2015, the fall is at least €81.47, a 65% fall.

information from prescription medicine claims to generate measures of chronic illness for all GMS recipients in a weighted capitation model that was developed for the Indicative Drug Target Scheme. The predictive power of the model was over three times greater than an age-gender based model. Should GP utilisation data become available routinely, a similar approach could be adopted for the GP capitation scheme in Ireland, enhancing transparency and improving the equity and efficiency in use of health care resources.

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