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Title Page

Title

The international generalisability of evidence for health policy: a cross country comparison of medication adherence following policy change

Running title

Generalisability of evidence for pharmaceutical policy

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Conflicts of Interest

SJS and HW have no conflicts of interest. At the time that the study was carried out, JMP received salary support from CVS Caremark for unrelated research on medication adherence. JMF received salary support from CVS Caremark and Merck for unrelated research on medication adherence.

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Highlights

- We addressed the question of how generalisable evidence for policy making is across health systems by using a case study of two similar copayment policies in two different health systems and assessing the impact of each policy on adherence.
- Two similar copayment policies, in apparently similar health systems, did not invoke similar responses in adherence to medications. Nuanced differences between the health systems and the patients within them may affect differences in impact of policies.
- Before applying evidence from one health system to the another health system, critical questions of the local applicability of the evidence are key to maximising its' utility.

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Abstract

Introduction of copayments for prescriptions may increase morbidity and mortality. Relevant data can inform policy to minimize such unintended effects. We explored the generalisability of evidence for copayments by comparing two international polices, one in Massachusetts and one in Ireland, to assess whether effects on medication adherence were comparable. We used national prescription data for public health insurance programmes in Ireland and Medicaid data in the U.S. New users of oral anti-hypertensive, anti-hyperlipidaemic and diabetic drugs were included (total n= 14,259 in U.S. and n= 43,843 in Ireland). We examined changes in adherence in intervention and comparator groups in each setting using segmented linear regression with generalised estimating equations.

In Massachusetts, a gradual decrease in adherence to anti-hypertensive medications of -1% per month following the policy occurred. In contrast, the response in Ireland was confined to a -2.9% decrease in adherence immediately following the policy, with no further decrease over the 8 month follow-up. Reductions in adherence to oral diabetes drugs were larger in the U.S. group in comparison to the Irish group. No difference in adherence changes between the two settings for anti-hyperlipidaemic drugs occurred.

Evidence on cost-sharing for prescription medicines is not ‘one size fits all’. Time since policy implementation and structural differences between health systems may influence the differential impact of copayment policies in international settings.

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Introduction

Health policy interventions such as copayments for prescription drugs aim to control third party payer costs. Despite their rational underpinning, a large body of research has accumulated over the past four decades detailing the negative impact of prescription copayments on prescription drug use and subsequent health outcomes. [1-3] Most studies have found that as the price of the copayment increases, patients reduce their adherence to essential life-prolonging drugs that are used in the treatment of chronic disease.[1, 4, 5] Copayments for prescription drugs are therefore directly and indirectly associated with increased morbidity, mortality and increased health care costs. [3, 6-8]

While the results of previous research on copayments are mostly consistent, the majority of studies included in existing systematic reviews have been conducted in the U.S. and Canada. [1, 2, 5, 9-11] For example, all studies included in a review by Gibson et al. were from the U.S. or Canada, 54 out 65 studies in a review by Goldman et al. were from North America or Canada and so were 18 out of the 21 studies in a Cochrane review on the same topic.[1, 2, 9] The limited geographic diversity of the available evidence raises questions about the generalisability of results to European health care systems with dissimilar financing, organisation and delivery of pharmaceutical care. [12] Given that the development of evidence-based policy is contingent upon the availability of valid, reliable evidence pertinent to the health system of interest, this issue of uncertain generalisability may hinder international policymakers seeking to design prescription drug cost-sharing policies in their unique regional settings. [13, 14] For example, when policymakers in countries outside of the U.S. and Canada are planning their own prescription copayment policies, they will turn to the extant body of systematic reviews and primary research for guidance on the effectiveness of

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these policies. The challenge they face in this task is assessing how this evidence applies to their own local setting. [13, 15]

Cross country comparisons of drug adherence related to cost have been carried out in the past. [16, 17] However, these studies were not focused on analysing the impact of a policy intervention, rather they reported on prevalence of existing self-reported non-adherence. Thus, these results are not useful in providing context for developing copayment policies [18], or in anticipating potential patient behaviours resulting from such policies.

To formally address this question of potential international heterogeneity, we designed a case study to compare the effects of similar changes in prescription copayment policies, one in Massachusetts and one in Ireland, on subsequent adherence. By comparing analogous policy changes, we assessed whether changes in adherence behaviours, in response to pharmaceutical policy intervention, were broadly generalisable across these two health systems. We discuss our findings using the framework suggested by Lavis et al. to demonstrate how international evidence should typically be assessed for local applicability.[13]

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Methods

Ethics

Ethical approval was granted by the Clinical Research Committee of the Cork Teaching Hospitals, Ireland and the Institutional Review Board at Brigham and Women's Hospital, Boston, MA, USA.

The General Medical Services scheme and Medicaid

The General Medical Services (GMS) scheme is the national tax-funded public primary care insurance program in Ireland for people on low incomes and people aged ≥70yrs. It provided hospital services and primary health care, including General Practitioner visits and prescription drugs, to approximately 40% of the population (1.85 million people) in 2013. [19] In the U.S., Medicaid is the main public health insurance for low-income parents and children, caregivers, pregnant women, disabled adults and low income seniors. [20] In 2011, Medicaid provided healthcare for 41 million people across the U.S. including 864,500 people in Massachusetts (~13%) and 1.6 million people in Pennsylvania (~13%).[21]

Policy interventions

In January 2013, individuals on the GMS scheme were required to pay a €1.50 copayment per prescription dispensed, an increase of €1 from the previous charge of 50c. Beginning January 2003, Medicaid beneficiaries in Massachusetts were exposed to an increase in their copayment, from 50c/prescription to $2/prescription.

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Patient Populations and Data Sources

The GMS population comprised the Irish intervention group. The comparator group included patients in the publicly funded Long Term Illness (LTI) scheme, because there was no policy change on this scheme throughout the study period. LTI coverage provides free prescriptions only and is provided to approximately 60,000 individuals who have been diagnosed with one of 16 chronic conditions e.g., diabetes or epilepsy, regardless of their income. [22] If an individual has a long term illness, but is also low-income, he/she will qualify for the GMS. Person level pharmacy claims data for the GMS and LTI schemes were retrieved from the Health Service Executive Primary Care Reimbursement Services (HSE-PCRS) national database years 2012-2013.

To provide a global comparison, we used person level prescription data from Massachusetts and Pennsylvania Medicaid beneficiaries in the U.S. Medicaid Analytic Extract database (MAX), 2002-2004. Pennsylvania Medicaid beneficiaries served as a comparator group for this policy change because the copayment in this state remained static ($1/item) throughout the study period. Both MAX and PCRS databases have been shown to accurately reflect medication use. [23, 24]

Eligible patients were 21-65 years and had continuous eligibility on their respective insurance schemes for the study period.

Study Design

We employed a repeated measures retrospective study. We included new users (no drug claim in that medication group in the previous 6 months) of an oral drug for hypertension, hyperlipidaemia and/or diabetes in the 6 months prior to policy initiation.[25, 26] Follow up

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ran from cohort entry until 8 months after policy implementation (**Supplementary Information 1**). New users of chronic disease drugs follow a well-defined pattern of adherence, with typically 50% of new users remaining adherent 6 months post initiation.[27-29] Our study design allowed new user adherence patterns to occur as expected, but allowed analysis of the additional difference in adherence that occurred in response to policy changes.

Covariates

We adjusted our estimates of adherence for age and sex. The study design was advantageous in that it eliminated confounding by time-invariant variables such as socio-economic status.[30]

Study endpoints

The outcome was adherence to an oral anti-hypertensive, anti-hyperlipidaemic or diabetic drugs, measured monthly based on the Proportion of Days Covered (PDC) method.[27] The PDC is typically constructed using two variables; days' supply and dispensing date. Because a days' supply variable is not recorded in the Irish data, a days' supply variable was created using the number of World Health Organisation (WHO) Daily Defined Doses (DDDs).[31] The method of calculating a days' supply variable using the DDD and its concordance with the conventional days' supply variable is outlined in our previous work. [32]

Monthly PDCs were calculated for each patient, running consecutively from cohort entry to the end of follow up for each individual. If a dispensing occurred before the previous dispensing ran out, the new dispensing was assumed to begin the day after the end of the prior dispensing and the diary was adjusted accordingly. The PDC was truncated at 1. If an individual was taking more than one drug within a medication class, the number of days that a patient had at least one of their drugs was calculated.[33] Switching drugs within a

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medication class was permitted. In the PCRS data, drugs were identified by WHO Anatomical Therapeutic Class grouping (level 3). In Medicaid, National Drug Codes were used.

Statistical analysis

A segmented generalised linear regression model for each country was used to detect changes in adherence that occurred after policy implementation. The models included a constant, a baseline slope term and terms estimating changes in the level (immediate change in adherence) and changes in slope (changes in adherence in the months following the policy). [34] [35] An indicator was included to differentiate between the intervention and the comparator group in each country. Policy effects were included in the model as interaction terms between exposure group and the policy-specific intercept and slope terms. A one month lag period was incorporated to allow the impact of the policy change to take effect, acknowledging that most prescriptions are filled every 30 days. We adjusted for correlations between repeated measures using generalised estimating equations with a gaussian family, an identity link and an autoregressive covariance structure.[36]

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Results

The gender breakdown in the GMS and Medicaid groups was reasonably similar; however, the LTI population had an approximate ratio of 30:70 female to male. Age was broadly comparable between the LTI (52.2yrs) and GMS (49.9yrs) populations, but the Medicaid population was slightly younger, with an average age of 47.2yrs in Massachusetts and 47.6yrs in Pennsylvania (**Table 1).**

Insert Table 1 here

Anti-hypertensive drugs

Controlling for baseline trends, and relative to the U.S. comparator group, a small, but insignificant intercept change indicated no real change in adherence (-0.5%, 95% CI -2.4 to 1.0) to anti-hypertensive drugs in the Massachusetts Medicaid group immediately after the policy was initiated. In contrast, a significant change in slope (-1.1%, 95% CI -1.9 to -0.4) indicated that adherence fell in the months following the policy change **(Table 2)**.

In the Irish GMS group, a significant change in intercept was observed, indicating a 2.9% (95% CI -4.2 to -1.6) reduction in adherence to anti-hypertensive drugs relative to the comparator LTI group **(Table 2)**. However, in the months following the policy a positive change in slope for the GMS group relative to the LTI group indicated that adherence to anti-hypertensive drugs did not decline any further in the months following the policy change (**Table 2).** See **Supplementary Information 2** for graphical trends and **Supplementary Information 3 for** demonstration of how a positive change in a previously negative slope results in a more gently declining slope.

Comparing the Massachusetts and Irish policy changes, a 2.4% immediate decrease (intercept change) in adherence to anti-hypertensive drugs occurred in Ireland relative to Massachusetts. **(Table 2 and Figure 1)**. In the months following the policy (slope changes), changes in

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adherence in Ireland appeared to stabilise whereas adherence further declined in Massachusetts (**Table 2)**.

Insert Table 2 here

Insert Figure 1 here

Anti-hyperlipidaemic drugs

For anti-hyperlipidaemic drugs, both intercept and slope changes were no different between the Irish and Massachusetts populations, after baseline trends and comparator groups were taken into account (**Table 2 and Figure 1).** In both settings intercept changes were negligible and insignificant suggesting that the policy interventions had no impact on adherence in the immediate aftermath. Slope changes were positive, suggesting no long term ramifications on adherence to anti-hyperlipidaemic drugs in Ireland or in Massachusetts.

Oral diabetes drugs

A significant intercept change indicated a reduction in adherence (-3.1%, 95% CI -5.2 to -1.0) to oral diabetes drugs in Massachusetts immediately after the policy was initiated, relative to the comparator group. A negative change in slope (-1.2%, 95% CI -2.4 to -0.1) indicated that the fall in adherence continued in the months following the policy change **(Table 2)**.

In the Irish GMS group, a negative change in intercept was observed relative to the comparator group, although this was not significant **(Table 2)**. Nor was the difference between the Irish intervention and comparator groups for slope change significant, indicating no sustained decreases in adherence to oral diabetes drugs.

Comparing the Massachusetts and Irish policy changes, a 1.8% immediate decrease (intercept change) in adherence to oral diabetes drugs occurred in Massachusetts relative to Ireland

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(**Table 2 and Figure 1)**. In the months following the policy changes (slope changes), further declines in adherence occurred in Massachusetts in comparison to Ireland where there was no evidence of further declines (**Table 2)**.

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Discussion

We conducted a cross country study to examine whether two similar prescription copayment policies impacted on adherence differently in a North American setting and in Ireland.

Compared with their Massachusetts Medicaid counterparts, the Irish GMS population had a greater immediate decrease in adherence to anti-hypertensive (-2.4%) drugs.
However, in the months following the copayment policy, adherence in the Irish intervention group declined no further, whereas sustained reductions in adherence of ~1% per month were observed in the U.S. group. This finding for gradual declines in adherence agrees with the findings of prior research on a copayment change in North America on adherence to beta-blockers.[37] Over the course of the 8 month follow up period in our study, this 1% per month reduction would have resulted in a similar absolute reduction in adherence as occurred in Ireland in the immediate term. It is difficult to explain why the Irish intervention group had an immediate reaction to the policy change, while the Massachusetts group had a slower sustained response. Elucidation of the reasons for these differences would augment our understanding of international policy changes in the future, and point to concrete explanations for lack of generalizability between health systems.

We found both an immediate and sustained reductions in adherence to oral diabetes drugs in the Massachusetts group. These reductions in adherence were larger than observed reductions for anti-hypertensive or anti-hyperlipidaemic medicines, agreeing with previous research which suggests that patients in the North American setting may value cardiovascular drugs over their diabetes drugs.[38, 39] In contrast, the policy elicited no significant change in adherence to oral diabetic drugs in the Irish setting. This may be attributable in part to the

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role out of a national clinical care programme for diabetes in Ireland, initiated in 2010, with the aim of improving care for people with diabetes.[40]

Our study is an extreme example of how to ask and answer several questions about using international evidence to inform local policy making. [13] In most instances, there will not be sufficient time or resources to conduct a study like ours. Rather, policymakers should focus on the three question framework devised by Lavis et al. which emphasises that the transferability and applicability of evidence from one health system to another should be a focus for informing policy decisions.[13]. First, consider structural differences in health systems. For example, in our study, the Medicaid and GMS populations were broadly similar in that they are both government provided insurance programmes for low-income individuals. Although we sought out two similarly structured public health insurance schemes to compare policy interventions, we most likely did not capture the diverse structural nuances and cultural aspects of international health systems. For example, primary care is not generally a focus of the U.S. health system, whereas in Ireland health care relies heavily on the primary care service.[41] Differences in chronic care policies are also a feature: for example the presence of a national clinical care programme for diabetes in Ireland may have acted as a safeguard against decreases in adherence after the introduction of the policy. Second, assess whether there are any differences in the perspectives of health system stakeholders. In our study, we did this by looking at patient behaviours in response to the policies. We found divergent responses to the copayment policy for anti-hypertensive and oral diabetes drugs in each setting, indicating potential international differences in values held for certain diseases. Or perhaps this may be reflective of structural differences between the systems as discussed above. Third, what is the balance between potential benefits and harms of the policy? Policymakers might map out conditions that are highly prevalent or problematic in a

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population before applying a policy that might worsen preventive and treatment campaigns. For example, in Ireland, only 52% of those with hypertension aged ≥50yrs have their blood pressure controlled to target levels, a proportion not dissimilar to 46.5% of the adult hypertensive population in the U.S. [42, 43] Any additional barriers to anti-hypertensive medication adherence may further worsen blood pressure control, and subsequently associated cardiovascular health outcomes. This is especially true for a population who is high risk, by virtue of their current treatment status. Considering Lavis' framework by applying the above three questions helps to tease out the particulars of the policy context, which extend beyond geography alone to also include political, economic, population values, public health and timing influences.[44]

Our results should be interpreted with some limitations in mind. Potential confounding variables were often not available in both datasets, a common challenge in using international datasets. However we adjusted for age and gender; these factors are amongst the strongest predictors of adherence and likely serve as proxies, at least in part, for other variables we could not measure.[45] For example, we did not adjust for polypharmacy in our models, which might have been informative regarding burden of cost per person, but age is strongly correlated with multi-morbidity and the polypharmacy that goes with this.[46] As a control group, the LTI population was suboptimal, given that beneficiaries can qualify on the basis of disease independent of income. Despite this, the LTI population served as an informative comparison group because any extraneous changes in prescribing practices, clinical guidelines or health promotion campaigns for each of the three study diseases would have been reflected in this population and therefore conditioned out of the estimation of cost-sharing policy-specific effects.[47] Our case study examined policy effects on a Medicaid programme in Massachusetts and on a public health insurance scheme in Ireland, thus the study results are relevant only for low-income health insurance settings. Related to this,

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because the population in this study was limited to those aged ≤65yrs, the impact of the copayment policy is not generalizable to the whole GMS population in Ireland. These results can be found elsewhere.[48] Finally, the policy changes were separated in real time by approximately 10 years. However, we believe that the non-contemporaneous nature of the interventions had minimal impact because our results resembled decreases in adherence observed after a small copayment in a low income population in the 1970s, implying that copayments of small monetary value affect adherence independent of time.[49] Last, positive intercept changes were observed in some instances in Massachusetts and Pennsylvania. Our study was strengthened by using the most appropriate analysis possible to analyse medication use after policy change.[34] We also used large scale pharmacy claims data, which confer statistical benefits given the numbers of patients included.[50]

This study is the first attempt to compare differences in patients' medication behaviours in response to changes in copayment policy in international settings. We found that adherence changes were similar for anti-hyperlipidaemic drugs, but divergent responses were observed for anti-hypertensive and oral-diabetes drugs. Thus, international populations do not necessarily respond in similar ways to the introduction of a copayment policy. Differences may be related to: the length of time since policy implementation; nuanced differences at the level of the health system, for example the national clinical care programme for diabetes in Ireland; and the value that international populations place on drugs for certain diseases.

Our study has demonstrated how practical questions surrounding the context of the policy can be addressed, thus maximising the utility of international evidence for local policy making. From our work, the automatic generalisability of evidence for policy from one setting to another appears unwise. Further research can improve on our work by including data from several copayment policy interventions in various U.S. states, and in Canada also, and compare these to Irish and possibly other European interventions. Such a study would shed

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light on how policies affect globally diverse populations, and would enhance our understanding of generalisability of evidence in the policy realm.

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Figure Legends

Figure 1: Intercept changes in Irish and U.S. intervention groups relative to respective comparator groups after policy

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Tables

Table 1 Baseline descriptive characteristics of intervention and comparator groups in Ireland and the U.S.

	Mass	Penn	Difference	GMS	LTI	Difference
New users of anti-hypertensive drugs	n= 5,184	n=2,555		n= 19,199	n= 2,217	
Female n (%)	3,245(62.6)	1,551(60.7)	1.9%	10,548(54.9)	752(33.9)	21.0%
Mean age yrs (SD)	45·0 (10.5)	45·8 (10.4)	-0.8yrs	48.3(11.4)	52.8(9.1)	-4.5yrs
Ethnicity						
White n (%)^	3,380(65.2)	2,057(80.5)	-15.3%	-	-	
Black n (%)	582(11.2)	327(12.8)	-1.6%	-	-	
Other n (%)	1,222(23.6)	171(6.7)	16.9%	-	-	
Other drug use at baseline						
Anti-hyperlipidaemic drugs	1,806(34.8)	891(34.9)	-0.1%	2019 (10.5)	306(13.8)	-3.3%
Oral hypo-glycaemic drugs	1,115(21.5)	605(23.7)	-2.2%	498 (2.6)	433(19.5)	-16.9%
New users of anti-hyperlipidaemic drugs	n=2,984	n=1,374		n=14,274	n=2,455	
Female n (%)	1,833(61.4)	846(61.6)	-0.2%	7,017 (49.2)	824(33.6)	15.6%
Mean age yrs (SD)	49.1(9.3)	49.2(9.2)	-0.1yr	52.2(9.2)	52.7(8.7)	-0.5yrs
Ethnicity						
White n (%)^	2,116(70.9)	1,195(87.0)	-16.1%	-	-	
Black n (%)	200(6.7)	95(6.9)	-0.2%	-	-	
Other n (%)	668(22.4)	84(6.1)	16.3%	-	-	
Other drug use at baseline						
Anti-hypertensive drugs	2,413 (71.8)	1,055(76.8)	-5%	2895(20.3)	422 (17.2)	-3.1%
Oral hypo-glycaemic drugs	1,026(34.4)	505(36.8)	-2.4%	700(4.9)	609 (24.8)	-19.9%
New users of oral diabetes drugs	n=1,419	n=743		n=3, 483	n=2,215	
Female n (%)	908(64.0)	459(61.8)	2.2	1,669 (47.9)	810 (36.6)	-11.3%
Mean age yrs (SD)	48.2(10.3)	47.5(9.8)	0.2yr	49.3 (11.4)	51.1 (10.0)	-1.8yrs
Ethnicity						
White n (%)^	911(64.2)	562(75.6)	-11.4%	-	-	

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Black n (%)	164(11.6)	97(13.1)	-1.5%	-	-	
Other n (%)	344(24.2)	84(11.3)	12.9%	-	-	
Other drug use at baseline						
Anti-hypertensive use	1,084(76.4)	555(74.7)	1.7%	1001 (28.7)	256 (11.6)	17.1%
Anti-hyperlipidaemic use	844(59.5)	393(52.9)	6.6%	797 (22.9)	287 (13.0)	9.9%

Mass: Massachusetts (U.S. intervention group). Penn: Pennsylvania (U.S. comparator group)
GMS: General Medical Services scheme (Ireland intervention group). LTI: Long Term Illness scheme (Ireland comparator group)
^data on race not available in Irish dataset
Notes: Other medication use at baseline was measured at study entry.

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Table 2 Intercept (immediate) and slope (gradual) changes in country specific intervention and comparator groups

	Ireland			U.S.		
	% adherence	95% CI	p-value	% adherence	95% CI	p-value
New users of anti-hypertensive drugs						
Intervention intercept change	-5.5	-6.0 to -5.1	p<0.0001	2.9	-1.4 to 1.2	p<0.0001
Comparator intercept change	-2.7	-3.8 to -1.5	p<0.0001	3.4	2.2 to 4.6	p<0.0001
Between group difference in intercept	-2.9 (-4.2 to -1.6, p<0.0001)			-0.5 (-2.4 to 1.0, p = 0.5139)		
Intervention slope change	3.4	3.2 to 3.6	p<0.0001	6.9	2.9 to 4.1	p<0.0001
Comparator slope change	1.3	0.9 to 1.7	p<0.0001	8.0	7.4 to 8.6	p<0.0001
Between group difference in slope	2.1 (1.7 to 2.6, p<0.0001)			-1.1 (-1.9 to -0.4, p= 0.0025)		
New users of anti-hyperlipidaemic drugs						
Intervention intercept change	-5.0	-5.6 to -4.4	p<0.0001	3.3	1.9 to 4.6	p<0.0001
Comparator intercept change	-4.3	-5.6 to -3.0	p<0.0001	3.5	1.8 to 5.2	p<0.0001
Between group difference in intercept	-0.7 (-2.2 to 0.7, p = 0.3152)			-0.3 (-2.4 to 1.9, p= 0.8126)		
Intervention slope change	2.4	2.2 to 2.6	p<0.0001	8.9	8.4 to 9.5	p<0.0001
Comparator slope change	1.6	1.2 to 2.0	p<0.0001	7.9	7.1 to 8.6	p<0.0001
Between group difference in slope	0.8 (0.3 to 1.2, p=0.0017)			1.0 (0.2 to 2.0, p = 0.0222)		
New users of oral diabetes drugs						
Intervention intercept change	-6.1	-7.2 to -5.0	p<0.0001	-0.1	2.0 to 5.4	p=0.90094
Comparator intercept change	-4.8	-6.1 to -3.5	p<0.0001	3.0	1.4 to 4.5	p=0.00023
Between group difference in intercept	-1.3 (-3.0 to 0.4, p= 0.1291)			-3.1 (-5.2 to -1.0, p= 0.00358)		
Intervention slope change	-0.4	-0.5 to -0.2	p<0.0001	3.5	8.0 to 9.4	p<0.0001
Comparator slope change	-0.2	-0.4 to -0.04	p=0.0121	4.7	3.7 to 5.7	p<0.0001
Between group difference in slope	-0.2 (-0.4 to 0.03 , p= 0.1147)			-1.2 (-2.4 to -0.1, p= 0.03587)		

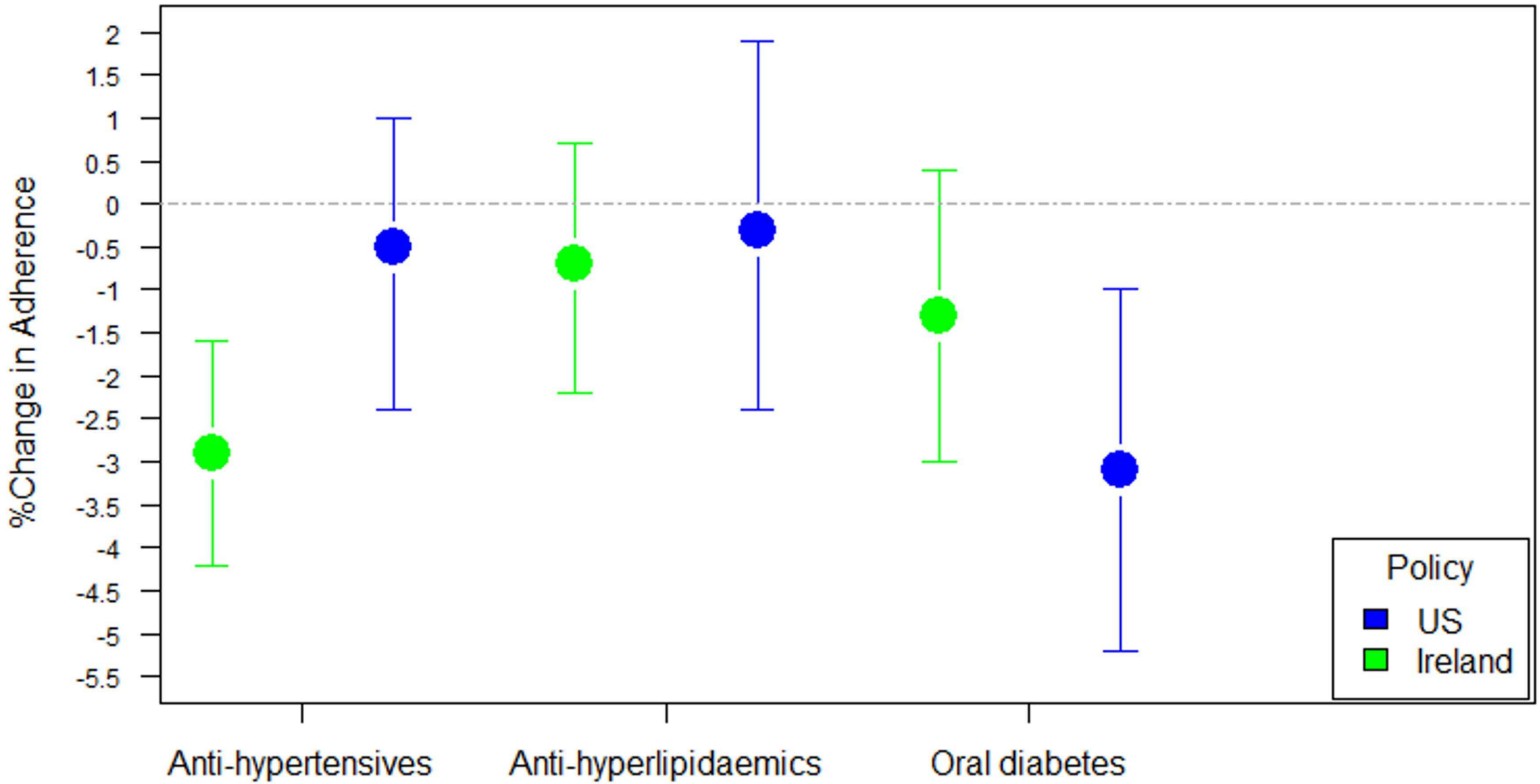
Intervention group Ireland: General Medical Services (GMS) scheme. Comparator group Ireland: Long Term Illness (LTI) scheme

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Intervention group U.S.: Medicaid Massachusetts. Comparator group U.S.: Medicaid Pennsylvania

Graphs demonstrating trends provided in **Supplementary Information 2.**

Baseline intercepts and baseline slopes provided in **Supplementary Information 4**.


%Change in Adherence
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
Anti-hypertensives
Anti-hyperlipidaemics
Oral diabetes
Policy
US
Ireland