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Out-of-pocket costs, primary care frequent attendance and sample selection: estimates from a longitudinal cohort design.

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Highlights

- Effect of out-of-pocket costs is sensitive to selection into level of cost.
- Logistic regression finds reduced FA status for higher costs.
- Counterfactual model adjusting for selection into cost levels finds no effect of cost.

This paper examines the effect of out-of-pocket costs on subsequent frequent attendance in primary care using data from the Personality and Total Health (PATH) Through Life Project, a representative community cohort study from Canberra, Australia. The analysis sample comprised 1,197 respondents with two or more GP consultations, and uses survey data linked to administrative health service use (Medicare) data which provides data on the number of consultations and out-of-pocket costs. Respondents identified in the highest decile of GP use

in a year were defined as Frequent Attenders (FAs). Logistic regression models that did not account for potential selection effects showed that out-of-pocket costs incurred during respondents' prior two consultations were significantly associated with subsequent FA status. Respondents who incurred higher costs ($15 to $35; or >$35) were less likely to become FAs than those who incurred no or low (<AUS$15 per consultation) costs, with no difference evident between the no and low-cost groups. However, a counterfactual model that adjusted for factors associated with the selection into payment levels did not find an influence of payment, with only a non-significant gradient in the expected direction. Hence these findings raise doubts that price drives FA behaviour, suggesting that co-payments are unlikely to affect the number of GP consultations amongst frequent attenders.

Keywords: Frequent attendance; out-of-pocket expenses; Primary health care

Introduction

In 2014 the Australian Health Minister noted that a small group of patients accounted for a large proportion of overall government funded health services and proposed a need to reconsider the way these patients were managed.[1] The most prolific users of primary health care services (frequent attenders (FAs)), commonly defined as the top 10% of attenders in a year, have been found to account for 33% of GP consultations[2] and generate five times as many prescriptions and hospital contacts as other patients.[3] FA's 3-year expenditures have been found to be higher than non-FAs, even after adjustment for patient and health care provider characteristics.[4] Data from Australia's universal health insurance scheme (Medicare) from 2012-13 show the top 12.5% of general practitioner (GP) attenders accounted for 41% of (non-hospital) Medicare expenditure.[5] Despite FA being signalled as a potential point for intervention it is not clear if frequent attendance necessarily reflects overuse of services or whether out-of-pocket costs are a determinant of their behaviour.

Under the Australian Medicare system, a scheduled fee is set for each type of health service or consultation. GPs can opt to accept this scheduled fee from Medicare and not charge their patients directly. Alternatively, GPs can charge patients an amount greater than the scheduled fee. In these cases, the patient can receive a rebate of up to 100% of the scheduled fee but the difference represents an out-of-pocket expense borne by the patient. Recent Medicare data indicated that over 80% of in-scope GP consultations incur no patient out-of-

pocket costs.[6] Consultations that incur no out-of-pocket costs are positively associated with chronic disease, and having a concession card and negatively with larger practice size, having an appointment for the visit, higher household income, having private health insurance, and inner and outer regional residence (compared to major cities).[7, 8] While Medicare covers the majority of consultations it does not cover all primary care consultations in Australia, excluding Department of Veterans' Affairs beneficiaries, patients receiving treatment under compensation agreements, and some telephone helpline or extended hours (nurse-led) walk in clinics. (for more information see[9])

Since universal health insurance was first introduced to Australia in 1975 there has been considerable variability in the proportion of GP consultations with no additional cost, suggesting that GP's decision on price charged may be sensitive to policy parameters and incentives. Concerns about unsustainable growth in health expenditure have prompted calls to introduce a price signal to reduce unnecessary and over use of health services.[10, 11] There has been much discussion about a mandatory co-payment[12, 13] and a freeze on the level of scheduled fees[14] which, over time, would increase pressure on GPs to charge above the set rebate.[15]

It is unclear if, and in what context, a mandatory co-payment or cost sharing would change attendance behaviour. In the USA, Medicaid recipients (who are enrolled in a private health plan which covers all or most of the recipient's healthcare needs) were more likely to be FAs than others.[16] Out-of-pocket expenses at the point of use have been shown to influence overall attendance at health care institutions[17-19] particularly when free.[20] There is some evidence of effects of mandatory co-payments in vulnerable populations including evidence of adverse health consequences for patients with heart failure and diabetes mellitus[21], and an impact on adherence to cardiovascular disease treatment [22] and attendance at obstetric emergency rooms.[23] Increases in co-payments in the US have been found to be related to decreased utilization of inpatient care, physician visits, brand-name medications, and emergency department visits.[24] The most comprehensive examination of co-payments, the RAND health insurance experiment, which has collected over 40 years of data, found that higher out-of-pocket expenses led to fewer medical visits and hospital admissions,[25, 26] and detrimental health effects for the sickest and poorest patients. In Australia, 14% of adults reported not attending the GP or getting appropriate care due to the cost [27, 28] including 24% of individuals with chronic health problems,[28] consistent with international evidence.[28, 29] While the ramifications of introducing co-payments in Australia are still being debated, the

relationship between out-of-pocket expenses and frequent GP attendance remains unclear.[30] Furthermore, many previous studies using observational data to examine attendance have not controlled for potential selection bias. This creates a problem as it is difficult to demonstrate causality with observational data as individuals are not randomly assigned to treatment groups. Patients who receive reduced or no cost consultations are potentially different from those who are charged more, and this introduces a possible source of bias in estimates of a causal effect of out-of-pocket costs on subsequent attendance.

We have previously used administrative Medicare data linked to longitudinal survey data to identify the characteristics of Australian primary-care FAs[2] and found that health related risk factors assessed in the survey explained over 50% of FA status and this increased a further 10% to 17% when the time varying nature of the risk factors was considered.[31] This research added to the literature linking FA status to a range of patient characteristics including socioeconomic status,[32] employment status (particularly unemployed),[33] being an immigrant,[3, 34] insecure attachment,[35] distress,[36] number of medical issues,[37] and somatising and somatic illness, [38-40] but did not examine the role of out-of-pocket expenses on frequent attendance behaviour.

The aim of this paper is to contribute to the ongoing policy debate in Australia and internationally on health care use and expenditure concerns, and examine whether the costs patients incur for GP consultations influence their likelihood of becoming a FA, using methods that adjust for potential selection effects. We assess whether the average costs incurred by a patient in two consultations influences subsequent attendance in the following 12-month period after controlling for a range of patient health and social circumstances (e.g., chronic physical conditions, medication use, mental health, and socioeconomic characteristics), and their previous year's health service use and costs. The linkage of administrative data of attendance at primary health care with rich survey data on health (which provide an independent marker of need) allows for a unique investigation of potential drivers of attendance and the relative effect of out-of-pocket costs in relation to need based drivers which have been identified as important in previous research.[e.g. 2, 4, 39, 41]

Method

Design

This study draws on data from the Personality and Total Health (PATH) Through Life Project, a longitudinal community study of health and wellbeing. The data, methods, and individual scales and measures are described in detail elsewhere.[42] Briefly, the PATH project follows three narrow age-range cohorts, randomly sampled from the electoral rolls for Canberra and Queanbeyan and reassessed on four occasions. This analysis considers data from wave four interviews conducted in 2012/13 with the mid-aged cohort who were then aged between 52 and 58 years. Overall, 2257 respondents remained in-scope for wave four and were invited to participate. Respondents who remained resident in the local region (n = 1615) were invited to participate in a face-to-face interview, which included physical, cognitive and clinical assessment, and asked to complete a comprehensive survey questionnaire online. Of these, 1570 (97%) participated. The remaining 642 in-scope respondents who had moved from the Canberra region were invited to complete an online survey alone, with 236 (36.8%) participating. Participants were asked to consent to release their administrative health service use (Medicare) data from a four-year period, and 1591 (88%) gave consent. The analysis is further restricted to those respondents identified with at least two GP consultations during a 12-month study period (thereby excluding 399 respondents). Thus, the analysis sample comprises 1192 respondents.

The Human Research Ethics Committee of the Australian National University approved all aspects of the PATH study including data linkage and participants provided written informed consent.

Measures

Data on out-of-pocket expenses for each individuals' last two consultations in the 12 months from July 2011 were used to define the exposure groups (average out-of-pocket costs). Analyses categorized the average cost of these two GP consultations as: none (both no-cost); low (less than $15); medium ($15 to $30); and high (greater than $30). These levels were chosen as $15 represents a previously proposed co-payment level [43] and $30 represents the median average payment in our cohort (further, the average ACT patient contribution for GP services in 2012/13 was $34.40). Attendance during the 12 month period immediately following the second of these visits was used to calculate FA status. Hence, there was a 12-month observation period for all participants but these could have different starting points. The analysis considers a comprehensive list of relevant GP Medicare item numbers (see [2]) representing all face-to-face Medicare services delivered by a GP. A cut-point was applied to

identify the (approximately) 10% of respondents (stratified by gender) with the greatest number of GP consultations consistent with the FA literature [4, 31]. Classification is stratified by gender as attendance behaviour has previously been found to differ for men and women[31] and the cut point was selected to classify approximately 10% for each gender. Similarly lagged FA status was determined by examining the consultations in the 12 months prior to the last of the two consultations used to define the average cost.

This analysis considers the level of out-of-pocket expenses that participants incurred in these two consultations as the "treatment", and the FA status in the following 12-months as the outcome. For clarity, this is represented in Figure 1. Additionally Medicare codes related to management and referral for chronic conditions (diabetes, heart problems etc.) were included in the above measures as well as coded separately and reported in the demographics of the sample.

Potential covariates in the PATH survey data were selected on the basis of the previous literature.[e.g. 2, 32, 33, 37, 39]

- Morbidity: Participants were asked if they experienced a range of chronic physical conditions (heart disease, cancer, arthritis, thyroid disorder, epilepsy, cataracts, asthma, diabetes and stroke). An additional question asking if the respondent had experienced a serious illness, injury or assault in the last 6 months was used as a marker of other medical issues not explicitly assessed. Each of the physical conditions and additional question were included separately in the models. While use of self-reported morbidity measures has some limitations (see discussion), it provides a measure of 'need' that is measured in a different manner to the exposure and outcome measures which are based on administrative data.
- Perceived health: Individual items from the SF-12 [44] assessed self-rated health, health-related impairment in daily activities and work, and pain.
- Health anxiety and depression: The 9-item Goldberg Depression scale was used as a measure of condition severity (the number of symptoms experienced: 0 to 9). Separate items from the Goldberg Anxiety scale were used to assess psychosomatic symptoms and aspects of health anxiety, including reported experience of i) headaches, ii) trembling, iii) sleep issues and iv) general worry about health.

- Socioeconomic characteristics: Labour-force status, educational attainment (higher education, completed high school vs not), receipt of welfare, low household income (less than $575 per week) and the experience of financial hardship (having pawned or sold something, went without meals, could not heat home or sought help from welfare organisations) were included as measures of individuals' socioeconomic circumstances.
- Medication use: Participants reported on their current medication use, including medication for blood pressure, anxiety and depression, sleep problems, memory problems, cholesterol, contraception, hormone replacement therapy, pain relief or other any problems. All variables were coded to reflect current use/not, aside from use of pain relief medication which was coded as a binary variable to reflect more than weekly (as compared to less frequent) use.
- Life satisfaction: Life satisfaction was used as an alternative outcome measure, and assessed using the Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985; Pavot & Diener, 1993).

Statistical analysis

A series of longitudinal logistic regression models were initially used to investigate the association between out-of-pocket expenses (in four categories) for the first two consultations of the (financial) year with the likelihood of being subsequently classified as a FA. Model A only controlled for gender, Model B included lagged (prior-year) measures of FA status, average out-of-pocket costs, and lack of GP consultations (no consultations vs at least one) (considered likely markers of the determinants of subsequent FA status) and Model C added the range of health, socioeconomic and medication-use measures, see Table 2 for the full list.

It is likely that differences in the out-of-pocket expenses paid by patients for their last two consultations (i.e., the "treatment") does not reflect a random process but is based on differences between patients that influence GP charging decisions, such as their level of need (health), their income (reflecting capacity to pay), the predisposition/default policy of the GP practice, or the patient's own active selection of a GP on the basis of billing practice. It may be these factors, rather than cost per se, that cause subsequent FA status. To take account of these limitations of observational data for causal inference, we draw upon the counterfactual framework[45] to implement an augmented inverse propensity weighted estimator (AIPW) to calculate average treatment effects (ATEs) to overcome potential selection bias. [e.g. 46, 47]

We used the teffect-procedure in STATA to estimate treatment effects. AIPW is a doubly-robust treatment effect approach that adjusts for factors associated with selection into different payment levels and equates groups via inverse probability weights and regression methods. The model used a multinomial logistic regression model to generate a weight reflecting the inverse probability of being in each payment "treatment" (the treatment model) and applied this to the outcome model which used regression to predict both potential outcomes (i.e., FA or non-FA status) for each respondent. A major advantage of this method is that it is robust against specification error in either the 'treatment model' or the 'outcome model'.[48]

We specify a treatment model including variables that would influence selection into payments levels; prior year FA status, prior (average) out-of-pocket costs, prior number of GP attendances, and previous income support receipt, physical and mental health, and medication use drawn from the wave 3 PATH data. We argue that these factors reflect the respondent differences that could cause differences in out-of-pocket expenses incurred. The outcome model included these terms, in addition to covariates reflecting current physical and mental health, current medication use, and current income support receipt. This model captures both likely long-term selection factors and recent changes that may be driving discontinuity in out-of-pocket costs (e.g., recent onset of chronic illness, improvement in financial circumstances).

A series of sensitivity analyses were conducted to assess the robustness of the findings. These include repeating the regression models in a subgroup analysis limited to those with greater capacity to pay for services (i.e. excluding those respondents who were identified as receiving welfare payments or who reported low income), a negative binomial regression considering the number of GP consultations (rather than FA status), and analysis using the same period of time consistently for all respondents; both defined by the calendar year and financial year (rather than the time period dependent on the participants consultations). Additionally, regression and selection models were rerun with life satisfaction as the outcome to examine if out-of-pocket expenses had an association with quality of life.

Results

FA status was defined separately by gender: with male FAs (10.1%) defined by seven or more consultations during the year while female FAs (10.2%) were those with 10 or more consultations. Overall FAs (10.18%) were responsible for 37.7% of all consultations. In total 35.8% of consultations incurred no out-of-pocket costs. 17.5% of GP patients were not required

to make an out-of-pocket payment for any of their consultations, while 66.6% of patients had no consultations without an out-of-pocket cost. 21.0% of patients identified as FAs made no out-of-pocket payment for any of their consultations. Consistent with our previous findings,[2, 31] FA status was associated with diabetes, number of life events, low income, lower educational achievement, anxiety, depression, cholesterol, and pain medication use as evidenced in the regression models and preliminary analyses. Some demographics are presented in Table 1 while demographics across payment levels are presented in Supplemental Table 1.

Logistic regression models (see Table 2) showed that small average costs were not associated with increased risk of FA status relative to no cost. However, respondents with medium or large average out-of-pocket costs had significantly lower likelihood of subsequently being classified as a FA (see Model A). These results held after controlling for prior (lagged) FA status and prior (lagged) access to no cost consultations (Model B: lagged characteristics) and all of the current health and socioeconomic covariates (Model C).

A subgroup analysis was conducted that focused on the effects for those patients with greater capacity to pay for services. This also showed that those with large average payments (but not medium) for their last two consultations were at decreased likelihood of becoming an FA compared to those who incurred no out-of-pocket costs. Similarly, analysis of total number of GP consultations rather than FA status both as the outcome (assessed using a negative binomial regression model) and as a lagged predictor also showed the same pattern of results. As such medium or large payments significantly predicted an increase in the number of subsequent consultations. Additionally all reported results hold whether we consider a consistent period for all participants (rather than a moving one as reported) regardless of whether we use financial year (as reported) or calendar year, with the effects for calendar being slightly weaker due to larger confidence intervals.

Table 3 presents the estimates derived from the AIPW treatment effect model. The results showed that, after adjusting for selection into payment levels there was no statistically significant difference in the likelihood of being a FA for those who incurred low, medium or high levels of out-of-pocket costs relative to those with no costs. Pairwise comparisons between all payment levels indicated that the treatment model adequately balanced the covariates for all

pairwise comparisons again the model reference "none" and, therefore, adjusted for the differences between groups that may reflect selection bias (see supplementary Table 7).

Regression models (Model A, B and C) were repeated predicting life satisfaction instead of FA status. When just considering the effect of payment (Model A) greater out-of-pocket costs was associated with *increased* life satisfaction (small β=1.80, $CI_{.95}$=[.16,3.45], p =.031; medium β=1.76, $CI_{.95}$=[.59,2.93], p =.003; large β=1.81 $CI_{.95}$=[.74,2.88], p =.001]) however this effect was no longer significant after including prior (lagged) FA status and prior (lagged) access to no cost consultations (Model B, all p>.1) or other health and socioeconomic covariates (Model C, all p>.3). Counterfactual models with overall life satisfaction as the outcome showed that, after controlling for factors likely to select individuals into different payment (treatment) levels, out-of-pocket costs did not significantly predict subsequent life satisfaction. Additional analyses, including results from the sensitivity analyses, are presented in the online supplementary materials.

Discussion

This study explored the association between out-of-pocket costs and subsequent frequent GP attendance over a 12-month period. The regression models show that the costs patients incurred for two GP consultations were associated with the likelihood of becoming a FA during the following 12 months. While there was no significant difference in the outcomes for those who had no out-of-pocket cost or low costs, the likelihood of becoming a FA was significantly reduced for patients charged a high (average) cost for their initial consultations. Fees around the median charged in the Canberra region did make some difference, but appeared to have a lesser effect than high costs, however regression models are confounded in observational data. Importantly, once we used the extensive data on previous health status, socioeconomic circumstances and prior GP use to model the factors leading to selection into payment levels the effect of payment level was no longer significant. While some evidence of an effect of out-of-pocket costs remained, as there was a gradient in the expected direction, it was reduced and no longer significant. Hence it appears that those with a history of frequent attendance or those identified with greater need were selected by practitioners to receive

low/no-cost consultations. Additionally increased patient costs were associated with greater life satisfaction. However, it is not possible to infer the direction of causation here as the reverse may also hold i.e. patients who are in better circumstances (e.g. higher income and wealth, and/or less economic insecurity relating to future income and wealth prospects), who tend to have higher life satisfaction all else equal, may be more likely to be charged higher out-of-pocket costs.

These results suggest out-of-pocket costs are a relatively minor determinant of frequent health service use. Consistent with previous research, our regression models found that FA status was associated with a range of factors including diabetes, number of life events, low income, lower educational achievement, anxiety, depression, cholesterol, and pain medication use. Attendance is also influenced by other factors beyond those related to the individual patient and their circumstances. GP attendance rates can also reflect the nature of the health care system, the intersection between health prevention, primary and tertiary care, broader social and cultural factors that may differ within and between countries, patient to GP communication, and characteristics of the health professional.[41, 49, 50] Studies such as this one are unable to explore all of these issues but do make an important contribution through consideration of some components of the relationship.

Strengths

A unique contribution of this study lies in the linkage of rich representative and longitudinal survey data with the objectivity of administrative data. The use of observational data is also taken into account and the lack of random selection controlled through the use of counterfactual analyses. Together our analyses explicitly model the temporal ordering of exposure and consequence, demonstrating robustness of results with many alternative model specifications, and draw on a range of covariates and methods to control for underlying predisposition and reverse causation. Thus, we provide comprehensive findings on the effects of out-of-pocket patient expenses on FA status, an area currently not well understood, but a pressing policy concern using rich data, removing biases which may influence 'selection' into different levels of health service cost.

Limitations

The current study is, however, limited by an exclusive focus on mid-aged respondents, which may restrict generalizability. Further, generalizability may be limited as the sample is drawn exclusively from residents of the Canberra region in South-Eastern Australia: an area

shown to have a relatively low GP consultations and a smaller proportion of consultations with no out-of-pocket costs for the population size compared to the Australian average (55.6% in 2015/16 vs 83.7% nationally).[5] Future research should seek to replicate this study in other areas of Australia and with a broader range of patient ages. Further, while our modelling of morbidity is a strength, providing a separate measure of health based need derived from a different data source to the exposure and outcome measures (i.e., linked administrative data) which reduces the likelihood of confounding due to measurement type, there is evidence that self-reported morbidity differs from that reported by a physician. While studies have shown the predictive utility of self-report morbidity (e.g.[51]), it should be noted that health condition and levels of educational attainment have been shown to impact the accuracy of self-reported morbidity [52]. The counterfactual model is limited to the variables which were available to account for selection into treatment levels (out-of-pocket costs) and not all factors which may influence this selection were measures in the survey or available in the data (e.g., GP characteristics). However, the comprehensive range of relevant potential selection characteristics that we were able to model showed that out-of-pocket costs no longer significantly predicted FA status. Future research with access to GP level information will be important to address this limitation.

Health Policy Implications

While the link between patient costs and attendance is a salient policy topic, there is currently not a strong evidence base on which to make policy decisions. In the analysis that did not control for selection biases, out-of-pocket expenses were associated with attendance behaviour in primary care, with those with high out-of-pocket GP costs less likely to be FAs than those with low or no out-of-pocket costs. However, we found that this difference between payment groups was largely explained by health and previous FA status, which were both considered markers of need for the patient. Further, once we controlled for selection effects that may determine an individual's out-of-pocket costs (such as their previous need and attendance history), there was no significant difference in FA based on out-of-pocket costs. This aligns with previous research indicating that FA status reflects health and that an individual's FA status varies over time with variability in health and need. As such the use of co-payments is likely to have little to no effect as a major deterrent of frequent attendance or address issues of over use. In fact, based on previous research, there are likely to be adverse unintended consequences of co-payments on some patients, particularly those in the most vulnerable circumstances.[25, 26]

Conclusion

The effect of out-of-pocket costs on the frequency of consulting a GP is sensitive to the inclusion of methods that control for potential selection bias. Using methods that control for selection bias co-payments were not found to influence subsequent use of GP services. Efforts to address frequent GP attendance may be more effective by considering non-monetary influences.

Competing interests: The authors declare that they have no competing interests.

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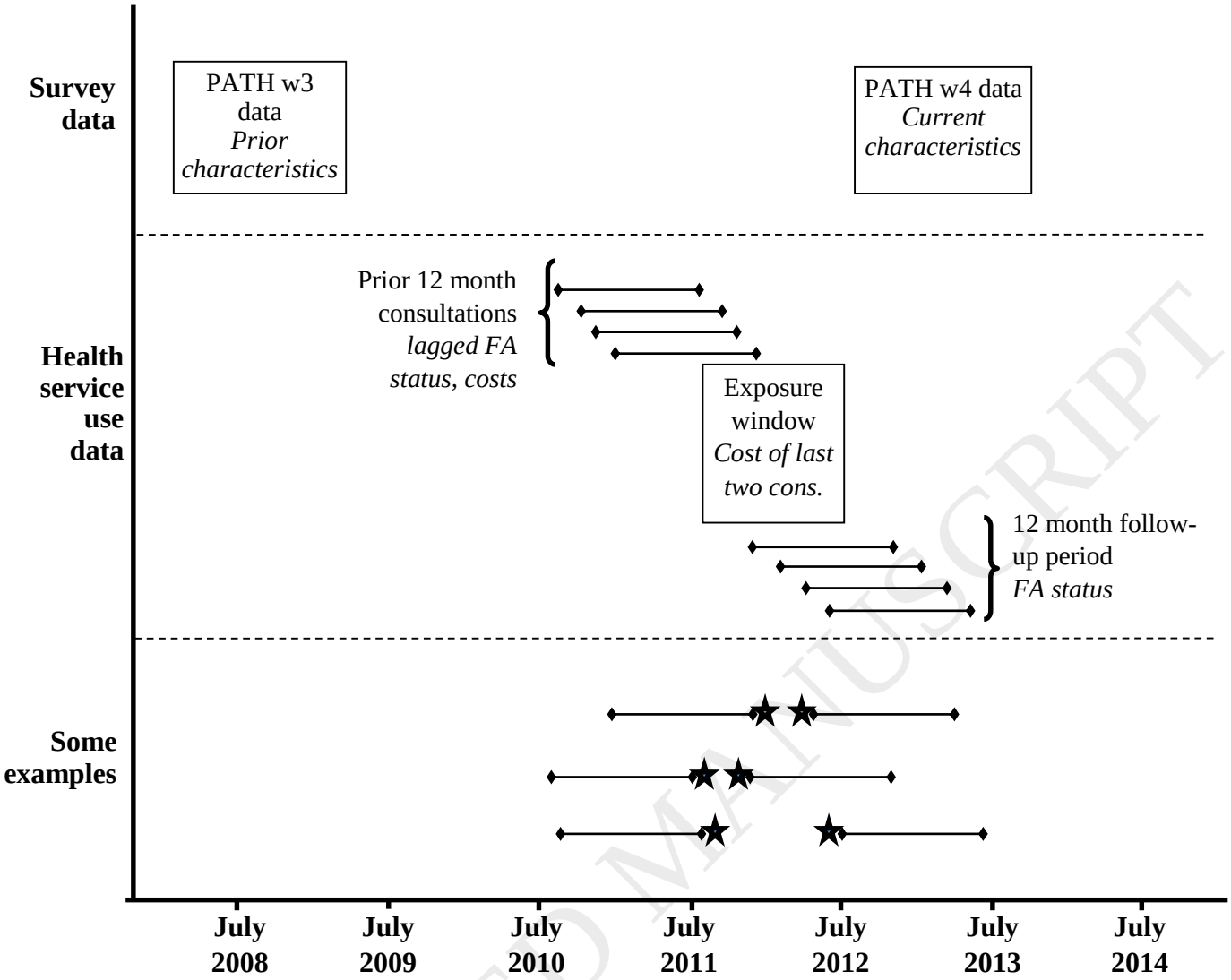

Figure 1. Timeline of measures. The timeline for which the treatment was defined was dependent on the consultation times of the participant hence some indicative examples are given where★indicates the consultations used to define out-of-pock costs for a participant.

Table 1.

Demographic summary

		Non-FAs	FAs	Overall	significance
N		1032	160		
Gender	(%Female)	56.6%	53.1%	56.1%	χ^2=.67, *p*=.411
Marital status	Married	69.5%	66.0%	69.1%	
	Separated/Divorced/Widowed	19.6%	25.2%	20.4%	
	Never Married	10.8%	8.8%	10.6%	χ^2=2.85, *p*=.241
Employment	Employed	83.7%	66.7%	81.4%	
	Unemployed	1.9%	6.3%	2.5%	
	Not in the labour force	14.4%	27.04%	16.12%	χ^2=29.59, *p*<.001
Welfare receipt		4.9%	11.9%	5.8%	χ^2=12.54, *p*<.001
Number of health problems, Mean (SD)		1.2 (1.0)	1.8 (1.2)	1.3 (1.1)	t(1167)=-5.76, *p*<.001
Number of medications, Mean (SD)		1.2 (1.1)	1.9 (1.2)	1.3 (1.2)	t(1166) = -7.51, *p*<.001
Payment across the year	Mean (SD)	$28.31 ($15.96)	$17.01 ($13.15)	$27.00 ($16.07)	t(1190) = 8.60, *p*< .001
Percentage provided all no cost consultations		37.8%	21.0%	36.08%	χ^2=17.81, *p*<.001
FA in previous time period (11/12)		6.2%	51.8%	10.8%	χ^2=315.08, *p*<.001
Average number of chronic problem consultation (SD)		.09 (.35)	.66 (1.2)	.16 (.13)	t(1190)=-12.42, *p*<.001

*All measures are for the 12 months following the two consultations which define the treatment (unless indicated with a '11/12') or are derived from the survey

Table 2.

Odds ratios and 95% Confidence Intervals (CI) from series of logistic regression models examining the association of payment level with subsequent FA status, controlling for previous years status and a range of risk factor covariates.

	Model A			Model B			Model C		
	Initial			Including lagged characteristics			Including all covariates		
	Odds Ratios	95% CI	Sig	Odds Ratios	95% CI	Sig	OddsRatio	95% CI	Sig
Average two payment *(no cost)*									
Small(Less than $15)	.62	.34-1.15	.131	.52	.24-1.10	.086	.45	.18-1.12	.088
Medium ($15 – $30)	**.40**	**.26-.63**	**< .001**	**.44**	**.24-.80**	**.007**	**.46**	**.23-.92**	**.028**
Large (Over $30)	**.25**	**.16-.39**	**< .001**	**.32**	**.18-.57**	**<.001**	**.36**	**.18-.72**	**.004**
Gender *(female)*	.88	.63-1.25	.491	.83	.57-1.21	.334	.66	.41-1.07	.096
FA at lag				**8.40**	**5.60-12.60**	**< .001**	**8.15**	**5.07-13.10**	**< .001**
No cost cons. at lag *(none)*									
Some				**2.54**	**1.32-4.91**	**.005**	**3.01**	**1.35-6.72**	**.007**
All				1.31	.62-2.79	.482	1.94	.79-4.78	.150
Diabetes							**2.06**	**1.05-4.04**	**.035**
Asthma							1.53	.87-2.68	.138
Thyroid							1.24	.61-2.53	.554
Arthritis							.66	.41-1.07	.094
Heart							1.31	.67-2.55	.428

Cancer/Leukaemia							1.06	.54-2.07	.863
Epilepsy							**7.63**	**2.15-27.11**	**.002**
Stroke							1.65	.51-5.29	.402
High blood pressure							1.00	.53-1.89	.991
Other health problem							**.42**	**.22-.80**	**.008**
Pension							.47	.18-1.24	.126
Low income							1.32	.59-2.95	.502
Refused to disclose income							.90	.27-3.02	.869
Experienced financial problems							1.18	.50-2.75	.705
Employment status *(employed)*									
Unemployed							**4.00**	**1.34-11.96**	**.013**
Not in labour force							1.61	.89-2.89	.113
Not secondary education									
secondary							1.09	.58-2.05	.798
tertiary							**.50**	**.29-.89**	**.018**
SF rated health							.61	.21-1.77	.362
SF health limit moderate activities							1.01	.54-1.90	.968
SF health limits climbing stairs							1.08	.69-1.67	.742
SF health means accomplish less							.58	.26-1.29	.183
SF health limits kind of activities							.49	.22-1.11	.089
SF pain interferes							1.07	.63-1.83	.797
Goldberg headaches or neck-aches							1.37	.85-2.22	.196
Goldberg trembling, tingling, dizzy spells etc.							1.25	.75-2.09	.389
Goldberg worried about health							.75	.43-1.30	.304
Goldberg lacking energy							1.12	.71-1.76	.635
Goldberg depression							1.02	.91-1.14	.756
Anxiety and dep medications							**1.91**	**1.15-3.18**	**.013**
Sleep medications							.73	.41-1.29	.280
Blood pressure medications							.81	.41-1.61	.548
Cholesterol medications							1.59	.97-2.60	.067

Pain medications							2.22	1.21-4.08	.010
Other medications							1.22	.78-1.90	.382

Cons.= consultations; values in brackets represent comparison category

Table 3.

Estimated proportion of FAs by payment category from augmented inverse propensity weighted estimator (AIPW) counterfactual models taking into account selection into payment categories and covariates reflecting current status

	Full Model with covariates [a]		
Payment	estimated potential-outcome means [95% CI]	AIPW coefficient *(v none)* [95% CI]	Significance
None	.163 [.065-.260]		
Small	.157 [.094-.220]	-.006 [-.125-.113]	.920
Medium	.124 [.090-.159]	-.038 [-.141-.064]	.461
Large	.091 [.067-.115]	-.072 [-.172-.028]	.159

[a] Lagged FA status, Lagged payment, Lagged GP attendance, wave 3 pension receipt, wave 3 physical and mental health, wave 3 medications in the selection model and covariates current physical and mental health, current medications and lagged payment, and lagged FA status in predictive model; [95% CI] = the 95% confidence interval