

# The determinants of GP visits in New Zealand

Jacqueline Cumming

*Health Services Research Centre, School of Government, Victoria University of Wellington, New Zealand*

Steven Stillman, Yun Liang, Michelle Poland

*Motu Economic and Public Policy Research, Wellington, New Zealand and Department of Economics, University of Waikato, New Zealand*

Grant Hannis

*Department of Communication, Journalism and Marketing, Massey University, New Zealand*

This paper uses data from the 1996/97 and 2002/03 waves of the nationally representative New Zealand Health Survey (NZHS) to examine the relationship between individual, household and community characteristics and the utilisation of healthcare services by New Zealanders. Primary healthcare is typically the first point of access into the healthcare system in New Zealand. Preventative checks and the diagnosis of health symptoms are carried out by general practitioners (GPs). This sector is government subsidised, but the nature of that subsidy has changed over time. During the time period examined in this paper, universal subsidies were provided for children, with the aim of free care provision for those less than six years of age. Adult New Zealanders, on the other hand, paid the full cost for their GP visits unless they were covered by a Community Services Card, which was available to individuals with low incomes, or a High Use Health Card, which was available to individuals who made frequent GP visits.<sup>1</sup>

In 2001, the government introduced the Primary Healthcare Strategy (PHCS), with the aim of improving access to primary healthcare, improving population health and reducing health inequalities.<sup>2</sup> Part of the PHCS involves moving from a targeted to a universal financing model, so that all New Zealanders are eligible for subsidised primary healthcare services. The PHCS led to

a significant increase in health expenditure, with a commitment of more than \$2.2 billion over seven years from 2002/03.<sup>3</sup> The PHCS began to be implemented just as the 2002/03 NZHS was under way, however take-up of new funding was quite slow during the initial financial year. Hence, one of the main objectives of this paper is to identify the characteristics of New Zealanders who utilised primary healthcare services prior to the implementation of the PHCS.

The literature on access to healthcare in New Zealand often identifies Hart's well-known inverse care law, whereby good medical care is inversely related to the need of the population served.<sup>4</sup> Studies have been undertaken to investigate access to primary healthcare for different population groups. In particular, concerns have been raised that the cost of GP visits creates a barrier to access for some New Zealanders. Despite lower fee charges, Māori and low-income earners have been shown to have lower utilisation of GP services relative to non-Māori and high-income earners.<sup>5,6</sup> It has been shown that people in disadvantaged populations receive, on a per capita basis, less than their equitable share of expenditure on primary healthcare services.<sup>7</sup> Utilisation rates also vary by location, with those living in remote rural (and often also deprived) areas appearing to have less access to GP care.<sup>8</sup> Another indication that cost may present a barrier to access is the finding that

## Abstract

**Objective:** To identify the characteristics of New Zealanders who utilised primary healthcare services prior to the implementation of the New Zealand Primary Healthcare Strategy (PHCS). **Methods:** This paper uses data from the 1996/97 and 2002/03 waves of the nationally representative New Zealand Health Survey to examine the relationship between individual, household and community characteristics and the utilisation of healthcare services by New Zealanders. Multivariate regression models are used to examine the correlation between particular characteristics and whether an individual visited a GP in the previous 12 months, the number of visits made to a GP in the previous 12 months, whether they reported needing to see a GP in the previous 12 months, but failed to do so, and whether they visited a secondary practitioner in the previous 12 months.

**Results:** Gender, age, and ethnicity are all found to be significantly related to healthcare utilisation, even when controlling for a fairly comprehensive set of characteristics. On the other hand, education, marital status, household composition, household income and community deprivation are found to be unrelated to healthcare utilisation. A strong relationship is found between employment status, health status and healthcare utilisation.

**Conclusions and implications:** We do not find any evidence of a relationship between socioeconomic status and healthcare utilisation after controlling for other measures of need. This and other findings suggest that the government subsidies in place prior to the implementation of the 2001 Primary Healthcare Strategy helped to ensure that user charges did not limit service utilisation in New Zealand for groups with lower socioeconomic status.

**Key words:** General practitioner, GP visits, utilisation, primary healthcare, New Zealand.

*Aust NZ J Public Health.* 2010; 34:451-7  
doi: 10.1111/j.1753-6405.2010.00589.x

Submitted: October 2009

Revision requested: December 2009

Accepted: February 2010

### Correspondence to:

Steven Stillman, Motu Economic and Public Policy Research, Wellington, New Zealand.  
Fax: +64 4 939 4251 e-mail: stillman@motu.org.nz

children whose parents have medical insurance visit the GP much more frequently than children whose parents do not have health insurance. This relationship holds after controlling for a variety of socioeconomic factors.<sup>9</sup>

Other research has focused on the experience of individuals in specific geographical areas in New Zealand. A survey of GP usage among different income groups in the Christchurch area, for example, also found less utilisation among the lower income group.<sup>10</sup> Research on utilisation in the Hamilton area found that Māori rates of utilisation were lower than non-Māori relative to risk (on average, Māori have higher mortality rates than non-Māori).<sup>11-14</sup> In contrast, research in South Auckland found that income, ethnicity and employment status were not significantly associated with GP utilisation.<sup>15</sup> Another exception to the inverse care law was found in a study of teenagers' utilisation of GP care for asthma in the Auckland region.<sup>16</sup> The research found that Māori and Pacific Island teenagers used GP services relatively more than their European counterparts. The authors speculate that this may represent a difference between acute care access (in the case of asthma) and preventative access which is more often investigated in other studies.

This paper expands on the current literature by using data from two waves of the NZHS and multivariate regression models to examine the relationship between individual, household and community characteristics and the utilisation of healthcare services by New Zealanders prior to the introduction of the PHCS.

## Methods

Run every four to six years, the NZHS collects representative cross-sectional data on the health status of New Zealanders, the prevalence of risk and protective factors associated with these health conditions, and the use of health services, including satisfaction with health services and barriers to accessing health services.<sup>17,18</sup> The survey is fielded using face-to-face interviews with New Zealanders aged 15 years and over – respondents in the 1996/97 survey also completed a questionnaire prior to the interview. The 1996/97 survey collected data from 7,862 adults, while the 2002/03 survey collected data from 12,529 adults (in both waves, one adult per sample dwelling).

Our analysis pools data from both waves, excluding a small number of individuals who reported they were in the armed forces or who were missing data on key variables. Our resultant analysis sample consists of 7,269 adults from the 1996/97 survey and 12,237 adults from the 2002/03 survey. Both surveys were designed as stratified random samples with certain ethnic and geographic groups oversampled to provide more reliable estimates. Hence, all results in this paper are calculated using the provided sample weights, which are designed to produce estimates for a representative sample of adult New Zealanders.

We examine four measures of healthcare utilisation: i) whether an individual has visited a GP in the previous 12 months; ii) the number of visits an individual has made to the GP in the previous 12 months; iii) whether an individual reports that there was at

least one instance in the previous 12 months where they needed to visit a GP, but failed to do so for any reason; and iv) whether an individual has visited a secondary practitioner (SP) in the previous 12 months.

We first present a limited number of descriptive results in tabular form. We then focus on the results from a multivariate regression analysis that examines the relationship between a range of socioeconomic and demographic characteristics and these four measures of health utilisation. The characteristics that are examined include the following: individual demographics (gender; age-group – corresponding to the groups used to determine age-specific health policies by the central government; ethnicity – when multiple ethnicities are reported, an individual is assigned to one based on the following prioritisation: Māori, Pacific Islander, Asian, European/Other; qualifications; and marital status); household composition; real (inflation adjusted) household income – defined using the mid-point of the response bracket or an appropriate top-code; employment status – individuals are employed full-time if they work at least 30 hours per week; occupation; having health insurance; self-reported health status; chronic health conditions (asthma, diabetes and high blood pressure); health behaviours (smoking and drinking); and community characteristics (rural/urban – based on the Statistics New Zealand classification of area units, with urban areas including all urbanised settlements with population 1,000 or greater; and the New Zealand Deprivation Index – decile 1 is least deprived areas, decile 10 is most deprived areas). Unless noted, data are classified as collected in the NZHS.

Each estimated regression model takes the form:

$$Utilisation_{it} = \alpha + \beta X_{it} + \delta Z_{it} + \gamma C_{it} + \alpha_t + \varepsilon_{it} \quad (1)$$

where  $i$  indexes individuals,  $t$  indexes time,  $Utilisation_{it}$  is one of four measures of healthcare utilisation discussed above,  $X_{it}$  is a vector of an individual's characteristics,  $Z_{it}$  is a vector of an individual's household characteristics,  $C_{it}$  is a vector of an individual's community characteristics,  $\alpha$  is the overall model intercept,  $\alpha_t$  is an indicator variable for the survey year of each record (which controls for aggregate changes in utilisation over time), and  $\varepsilon_{it}$  is the error term.

These models are estimated using the pooled data from both surveys. All estimation is done using STATA statistical software (version 10). For the three discrete outcomes, we estimate regression models using maximum likelihood probit regression. Ordinary least squares (OLS) regression is used when examining the number of visits. In each case, we report the marginal effect of a one-unit change in each independent variable on the likelihood of reporting "yes" for the discrete outcomes or on the number of doctor visits undertaken. For discrete independent variables, the marginal effect is calculated as the change in the independent variable that occurs when the variable is switched from zero to one (for example, the impact of being female instead of male).

Regression analysis allows us to determine which characteristics have the strongest association with primary health utilisation and to establish whether there is a statistically significant relationship

between each characteristic and each utilisation measure. These results do not indicate whether there is a causal relationship between particular characteristics and health utilisation, since it is quite likely that unobserved characteristics, such as whether an individual is generally healthy, are related to both utilisation and individual characteristics, such as whether the individual is employed.

## Results

### Summary statistics

Table 1 displays the sample means for our four measures of healthcare utilisation, separately by age group and survey wave. Most New Zealanders visited their GP at least once in the year prior to being surveyed and the majority made multiple visits. Overall, 79% of New Zealanders visited a GP in the past year in 1996/97, with 21% of those individuals having visited once, 23% having visited twice, 37% having visited three to five times, 11% having visited six to 11 times, and 7% having gone to the GP 12 or more times in the last year. Twenty-nine per cent of New Zealanders visited a SP during the previous year in 1996/97. Twelve per cent of New Zealanders reported that they needed to see a GP at some point in the past year, but did not. Rates of both primary and secondary healthcare utilisation were similar in 2002/03, with 81% of New Zealanders having visited a GP and 32% having visited a SP in the previous year. The distribution of the number of GP visits was similar in 2002/03 to that seen in 1996/97. There was no change across waves in the percentage of individuals reporting needing to see a GP in the previous year, but not doing so.

Both primary and secondary healthcare utilisation increased considerably with age. Pooling the two surveys, we see that

whereas 75-78% of 15-44 year-olds visited a GP and 21-28% visited a SP in the last year, 93-96% of individuals aged 65 or older visited a GP and 42-49% visited a SP in the last year. Older people were not only more likely to visit the GP, they also made considerably more visits. For example, 25-37% of individuals aged 65 or older visited the GP more than five times versus only 14-19% of 15-44 year-olds. The opposite pattern was found for individuals reporting that they needed to see a GP in the last year, but did not do so; 15-19% of 15-44 year-olds indicated that this occurred, but only 4-7% of individuals aged 65 or more.

Table 2 pools the data from both surveys and examines healthcare utilisation by age group and gender. We find that women were more likely than men to visit the GP across all but the oldest age group, where both genders had nearly the same utilisation rate. Gender differences were largest in the younger age groups, with more than 80% of 15-24 and 25-44 year-old women having visited a GP, compared with fewer than 70% of 15-24 and 25-44 year-old men. Women who visited the GP, especially those younger than 65, also made more frequent visits than men of the same age. Women younger than 65 were also much more likely to see a SP than men of the same age, but men aged 65 and older were more likely to visit a SP than were women of the same age. More women than men reported needing to see the GP but not doing so, but the gender difference was fairly small.

### Regression analysis

Table 3 presents the results from estimating regression model (1) for each of the four outcomes on the pooled data from both surveys. Notably, these regression models control for each individual's health insurance status, self-reported health status, chronic health conditions and health behaviours, which are all

**Table 1: Primary and secondary healthcare utilisation by age group and survey.**

Age group	15-24	25-44	45-64	65-79	80+	Overall
<b>1996/1997 Survey</b>						
Visited GP in last year	78%	75%	80%	93%	95%	79%
Number of visits to GP: 1 time	23%	24%	20%	13%	9%	21%
Two times	24%	27%	21%	16%	8%	23%
Three to five times	34%	33%	39%	46%	52%	37%
Six to 11 times	14%	9%	11%	14%	17%	11%
12 or more	4%	6%	9%	11%	14%	7%
Needed to see GP, but did not	19%	15%	7%	6%	4%	12%
Visited SP in last year	21%	25%	33%	42%	43%	29%
Number of individuals	944	3,024	1,931	1,090	280	7,269
Number reporting visit times	741	2,273	1,544	996	265	5,819
<b>2002/2003 Survey</b>						
Visited GP in last year	76%	76%	83%	94%	96%	81%
Number of visits to GP: 1 time	28%	29%	23%	9%	7%	24%
Two times	25%	28%	23%	14%	7%	23%
Three to five times	28%	29%	37%	47%	49%	35%
Six to 11 times	14%	9%	11%	20%	23%	12%
12 or more	5%	5%	6%	10%	14%	6%
Needed to see GP, but did not	16%	15%	9%	7%	5%	12%
Visited SP in last year	22%	28%	34%	49%	44%	32%
Number of individuals	1,452	4,964	3,665	1,674	482	12,237
Number reporting visit times	1,010	3,704	3,030	1,549	461	9,754

Note: All estimates are weighted to reflect the overall population.

covariates that are quite likely to be endogenously determined with utilisation. For instance, it is likely that the propensity to report health problems depends on how frequently an individual sees a GP. Similarly, an individual's decision to obtain health insurance is quite likely closely related to whether the individual expects to have health problems that require GP visits. Because of this issue, we also estimated regression models that excluded these variables as controls. Overall, this had a limited qualitative impact on our results, suggesting that endogeneity bias is not a serious concern in this particular application and hence we only report the results from the fully specified models.

Gender, age, and ethnicity were all significantly related to healthcare utilisation in the years being examined, even when controlling for a fairly comprehensive set of characteristics. For example, women were 9.3% more likely to visit a GP than were men; made, on average, 0.7 more GP visits per year; were 2.6% more likely to report needing to visit a GP, but not doing so; and were 3.4% more likely to visit a SP. There is a large age gradient for all four measures of healthcare utilisation. For example, individuals aged 65 or older were 10-11% more likely to visit a GP, made 0.5-1.0 more GP visits per year, were 7-8% less likely to report needing to visit a GP, but failing to do so, and were 3-7% more likely to visit a GP than were 25-44 year-olds. These gradients are generally monotonic by age group.

Ethnic differences in utilisation were most striking for Asians, who were 18% less likely to visit a GP, made 1.8 less GP visits per year, and were 16% less likely to visit a SP, compared to Europeans/Other. Māori also utilised healthcare less frequently than Europeans/other, with GP utilisation rates 6% lower, per year visits 0.3 lower, the likelihood of reporting needing to visit

a GP, but failing to do so, 4% higher, and SP utilisation rates 9% lower. Pacific Islanders had similar rates of GP utilisation and made a similar number of GP visits as Europeans/other, but were 3% more likely to report needing to visit a GP, but failing to do so, and 10% less likely to visit a SP.

There is little systematic relationship between education and healthcare utilisation, however better educated individuals were more likely to report that they needed to visit a GP at some point in the last year, but failed to do so. There is also no evidence that marital status or household composition were significantly related to healthcare utilisation. Household income was also found to be unrelated to healthcare utilisation. Not only were the coefficients on this variable insignificantly different from zero, but the magnitude of the potential effects were also small. For example, a \$10,000 increase in household income was associated with only a 0.3% increase in the likelihood of seeing a GP in the past year.

On the other hand, employment status was found to be strongly correlated with healthcare utilisation and being full-time employed was one of the most significant predictors of individuals not utilising healthcare. For example, individuals who worked full-time were 4% less likely to visit a GP, made 0.7 fewer GP visits per year, and were 7% less likely to visit a SP, than individuals who were not employed. Similarly, individuals who were employed part-time were 5% less likely to visit a GP and made 0.5 fewer GP visits per year than individuals who were not employed. An individual's occupation on the other hand was unrelated to healthcare utilisation.

Turning next to community characteristics, individuals living in rural areas were 4% less likely to visit the GP and made

**Table 2: Primary and secondary healthcare utilisation by age group and gender.**

Age group	15-24	25-44	45-64	65-79	80+	Overall
<b>Male</b>						
Visited GP in last year	68%	69%	79%	92%	96%	75%
Number of visits to GP: 1 time	33%	35%	24%	12%	8%	28%
Two times	27%	27%	22%	15%	9%	23%
Three to five times	28%	28%	37%	47%	50%	34%
Six to 11 times	9%	6%	10%	17%	18%	10%
12 or more	3%	4%	7%	10%	15%	6%
Needed to see GP, but did not	16%	14%	7%	5%	4%	11%
Visited SP in last year	17%	24%	32%	49%	47%	28%
Number of individuals	1,003	2,949	2,407	1,151	265	7,775
Number reporting visit times	656	1,955	1,901	1,036	255	5,803
<b>Female</b>						
Visited GP in last year	86%	81%	84%	94%	95%	85%
Number of visits to GP: 1 time	19%	20%	19%	10%	8%	18%
Two times	23%	28%	22%	15%	6%	23%
Three to five times	34%	34%	39%	47%	51%	38%
Six to 11 times	18%	11%	12%	17%	22%	14%
12 or more	6%	7%	8%	10%	13%	8%
Needed to see GP, but did not	19%	16%	9%	7%	4%	13%
Visited SP in last year	26%	29%	36%	43%	41%	32%
Number of individuals	1,393	5,039	3,189	1,613	497	11,731
Number reporting visit times	1,095	4,022	2,673	1,509	471	9,770

Note: All estimates are weighted to reflect the overall population.

**Table 3: The relationship between characteristics and healthcare utilisation pooling surveys.**

	Marginal effect of visiting a GP (SE)	Number of GP visits (SE)	Marginal effect of needing to visit a GP (SE)	Marginal effect of visiting a SP (SE)
Female	0.093 <sup>a</sup> (0.009)	0.722 <sup>a</sup> (0.078)	0.026 <sup>a</sup> (0.007)	0.034 <sup>a</sup> (0.011)
15-24 (default 25-44)	0.034 <sup>b</sup> (0.013)	0.131 (0.123)	0.006 (0.012)	-0.039 <sup>b</sup> (0.019)
45-64	0.013 (0.010)	0.178 <sup>b</sup> (0.086)	-0.053 <sup>a</sup> (0.007)	0.024 <sup>c</sup> (0.013)
65-79	0.101 <sup>a</sup> (0.011)	0.478 <sup>a</sup> (0.119)	-0.072 <sup>a</sup> (0.008)	0.066 <sup>a</sup> (0.020)
80+	0.113 <sup>a</sup> (0.013)	0.986 <sup>a</sup> (0.194)	-0.083 <sup>a</sup> (0.007)	0.030 (0.027)
Māori (default European/other)	-0.059 <sup>a</sup> (0.013)	-0.258 <sup>a</sup> (0.095)	0.042 <sup>a</sup> (0.012)	-0.089 <sup>a</sup> (0.013)
Pacific Islander	0.008 (0.017)	0.067 (0.127)	0.033 <sup>b</sup> (0.016)	-0.098 <sup>a</sup> (0.019)
Asian	-0.184 <sup>a</sup> (0.028)	-1.234 <sup>a</sup> (0.128)	-0.008 (0.015)	-0.163 <sup>a</sup> (0.019)
School qualification (default No Qualification)	-0.018 (0.015)	-0.184 <sup>+</sup> (0.110)	0.002 (0.012)	0.010 (0.018)
Vocational qualification	0.027 <sup>a</sup> (0.010)	-0.030 (0.080)	0.023 <sup>a</sup> (0.008)	0.014 (0.012)
University qualification	-0.010 (0.017)	-0.105 (0.120)	0.035 <sup>b</sup> (0.015)	0.027 (0.020)
Married / de facto	0.005 (0.011)	0.011 (0.084)	-0.013 (0.009)	0.019 (0.013)
Single parent (default no children in household)	0.009 (0.016)	0.033 (0.123)	0.018 (0.013)	0.015 (0.019)
Couple with children	0.015 (0.013)	0.100 (0.098)	-0.005 (0.011)	-0.013 (0.016)
Household size	-0.004 (0.004)	-0.065 <sup>b</sup> (0.029)	0.003 (0.003)	-0.010 <sup>c</sup> (0.005)
Real household income ('000s)	0.00029 <sup>c</sup> (0.00016)	0.001 (0.001)	-0.00002 (0.00013)	0.00034 <sup>c</sup> (0.0002)
Household income unreported	-0.004 (0.013)	0.045 (0.105)	0.005 (0.010)	-0.015 (0.015)
Full-time employed	-0.040 <sup>b</sup> (0.018)	-0.705 <sup>a</sup> (0.129)	0.012 (0.015)	-0.069 <sup>a</sup> (0.022)
Part-time employed	-0.049 <sup>b</sup> (0.022)	-0.491 <sup>a</sup> (0.141)	-0.007 (0.016)	-0.027 (0.024)
Professional (default legislator or manager)	0.019 (0.019)	0.045 (0.130)	-0.007 (0.015)	0.005 (0.024)
Technician or assoc. professional	0.028 (0.019)	0.332 <sup>b</sup> (0.167)	0.015 (0.021)	0.001 (0.028)
Clerk	0.022 (0.020)	0.039 (0.144)	0.004 (0.019)	0.008 (0.027)
Service and sales	0.010 (0.019)	0.242 (0.166)	0.013 (0.018)	-0.006 (0.026)
Agriculture and fishery	0.018 (0.020)	0.009 (0.149)	-0.005 (0.021)	-0.014 (0.028)

**Table 3: Continued.**

	Marginal effect of visiting a GP (SE)	Number of GP visits (SE)	Marginal effect of needing to visit a GP (SE)	Marginal effect of visiting a SP (SE)
Trades worker	-0.006 (0.022)	-0.040 (0.144)	0.006 (0.018)	-0.020 (0.027)
Operator or assembler	0.010 (0.022)	0.076 (0.148)	-0.007 (0.019)	-0.005 (0.030)
Elementary occupation	-0.001 (0.023)	-0.035 (0.148)	-0.020 (0.017)	-0.023 (0.029)
Has insurance	0.042 <sup>a</sup> (0.009)	0.321 <sup>a</sup> (0.069)	-0.019 <sup>a</sup> (0.008)	0.074 <sup>a</sup> (0.011)
Is a smoker	-0.036 <sup>a</sup> (0.010)	0.009 (0.080)	0.031 <sup>a</sup> (0.009)	-0.006 (0.012)
Is a drinker	0.030 <sup>b</sup> (0.012)	-0.067 (0.083)	0.016 <sup>b</sup> (0.008)	0.010 (0.013)
Health = very good (default = excellent)	0.070 <sup>a</sup> (0.010)	0.446 <sup>a</sup> (0.070)	0.032 <sup>a</sup> (0.011)	0.054 <sup>a</sup> (0.015)
Health = good	0.111 <sup>a</sup> (0.009)	1.276 <sup>a</sup> (0.092)	0.092 <sup>a</sup> (0.013)	0.142 <sup>a</sup> (0.016)
Health = fair	0.141 <sup>a</sup> (0.009)	2.893 <sup>a</sup> (0.157)	0.207 <sup>a</sup> (0.024)	0.262 <sup>a</sup> (0.023)
Health = poor	0.148 <sup>a</sup> (0.007)	5.299 <sup>a</sup> (0.327)	0.235 <sup>a</sup> (0.037)	0.503 <sup>a</sup> (0.027)
Has asthma	0.075 <sup>a</sup> (0.010)	1.068 <sup>a</sup> (0.092)	0.038 <sup>a</sup> (0.010)	0.025 <sup>c</sup> (0.014)
Has diabetes	0.118 <sup>a</sup> (0.013)	1.428 <sup>a</sup> (0.170)	0.002 (0.015)	0.165 <sup>a</sup> (0.025)
Has high blood pressure	0.106 <sup>a</sup> (0.009)	1.314 <sup>a</sup> (0.093)	0.001 (0.009)	0.027 <sup>b</sup> (0.013)
Lives in rural area	-0.038 <sup>a</sup> (0.014)	-0.228 <sup>b</sup> (0.092)	-0.011 (0.010)	-0.006 (0.016)
NZdep decile 2	-0.020 (0.021)	-0.081 (0.161)	-0.003 (0.018)	-0.010 (0.024)
NZdep decile 3	-0.013 (0.021)	-0.012 (0.165)	-0.007 (0.017)	-0.011 (0.024)
NZdep decile 4	-0.016 (0.021)	0.058 (0.162)	0.005 (0.019)	-0.012 (0.024)
NZdep decile 5	0.007 (0.019)	0.194 (0.159)	0.042 <sup>b</sup> (0.021)	0.010 (0.024)
NZdep decile 6	-0.021 (0.020)	0.072 (0.171)	0.018 (0.020)	-0.001 (0.024)
NZdep decile 7	0.006 (0.019)	0.018 (0.154)	0.023 (0.019)	-0.030 (0.022)
NZdep decile 8	-0.007 (0.020)	0.093 (0.151)	0.007 (0.018)	-0.019 (0.022)
NZdep decile 9	0.006 (0.019)	0.103 (0.155)	0.039 <sup>c</sup> (0.020)	-0.009 (0.023)
NZdep decile 10	-0.005 (0.020)	0.222 (0.162)	0.016 (0.019)	-0.031 (0.023)
Year = 2002	0.006 (0.014)	-0.121 (0.101)	0.008 (0.012)	0.056 <sup>a</sup> (0.018)
Year = 2003	0.013 (0.008)	-0.102 (0.067)	-0.006 (0.007)	0.034 <sup>a</sup> (0.010)
Observations	19,506	19,472	19,491	19,482

Note: All estimates are weighted to reflect the overall population. Significance: a) p<0.01, b) p<0.05, c) p<0.1.

0.2 fewer GP visits per year than those living in urban areas, but were equally likely to visit a SP and to report needing to see a GP, but not doing so. In contrast to much of the literature, once controlling for individual and household characteristics, we found no relationship between community deprivation and any of the measures of healthcare utilisation. This was also the case when we did not control for differences in health behaviours, self-reported health status and chronic health conditions, variables which are strongly related to both community deprivation and healthcare utilisation.

We next examine the relationship between health characteristics and healthcare utilisation. Individuals with health insurance were 4% more likely to visit the GP; made 0.3 more GP visits per year; were 2% less likely to report needing to see a GP, but not doing so; and were 7% more likely to visit a SP. Smokers were less likely to visit a GP than were non-smokers, whereas people who had consumed an alcoholic drink at least once in the past year were more likely to visit a GP than those who had not. Both regular smokers and those who have had a drink in the past year were slightly more likely to report needing to see a GP in the last year, but failing to do so. As expected, compared to those with excellent self-reported health, individuals in worse self-reported health were more likely to utilise healthcare. For example, those in poor self-reported health were 15% more likely to visit a GP; made 5.3 more GP visits per year; and were 50% more likely to visit a SP. Interestingly, people in worse self-reported health were also much more likely to report having needed to see a GP, but failing to do so. Even controlling for overall self-reported health status, individuals with chronic health conditions (asthma, diabetes or high blood pressure) were 8-12% more likely to visit the GP; made 1.1-1.4 more GP visits per year; and were more likely to visit a SP (slightly more so for those with asthma and high blood pressure, but much more likely for those with diabetes) than those without these conditions. Only those with asthma were more likely to report needing to see a GP, but not doing so.

## Discussion

This paper uses data from the 1996/97 and 2002/03 NZHS to examine the relationship between individual, household and community characteristics and the utilisation of healthcare services by New Zealanders in a multivariate regression framework prior to implementation of the PHCS.

Gender, age and ethnicity were all found to be significantly related to healthcare utilisation, even when controlling for a fairly comprehensive set of characteristics. Older individuals and women were more likely to visit a GP, made more visits per year and were more likely to visit a SP, while younger individuals, Asians and Māori were less likely to visit the GP, made less visits per year and were less likely to visit a SP. While older people were less likely to report having needed to visit a GP in the last year, but failing to do so, women, Māori and Pacific Islanders were more likely to report having this experience. These findings are largely consistent with findings in Canada,<sup>19</sup> but in contrast to a similar study of South

Auckland,<sup>15</sup> which found that ethnicity was not significantly related to healthcare utilisation. It is possible that utilisation differs by ethnicity for some parts of New Zealand, while in other parts, such as South Auckland, there is no significant variation.

Education, marital status and household composition were all found to be unrelated to healthcare utilisation. Household income and community deprivation were also found to be unrelated to healthcare utilisation. These findings suggest that the government subsidies in place prior to the PHCS were sufficient to ensure that fees were not preventing those in need from visiting a GP. Consistent with this, we found a strong relationship between health status and utilisation, with those with worse self-reported health status having been more likely to visit a GP, having made more frequent GP visits and having been more likely to visit a SP. Utilisation rates were also higher for individuals with asthma, diabetes or high blood pressure. Also, consistent with financial wellbeing not being an important determinant of healthcare utilisation, we found that individuals that were employed were significantly less likely to visit GPs or SPs.

However, there is some evidence that access might be more difficult for certain individuals. For example, GP utilisation was found to be lower in rural areas and individuals reporting poorer health status were also more likely to report having needed to see a GP, but not doing so. However, better educated individuals were also more likely to report that they needed to visit a GP at some point in the last year, but failed to do so, which suggests that this question captures more than an individual's access to healthcare. Overall, these findings are consistent with international research that concludes that GP co-payments are more likely to be a barrier to access for those at high risk of poor health than those on low-incomes.<sup>20</sup>

## Conclusion

One of the challenges for health policy is to ensure that utilisation of GP services is strongly associated with the need for the services rather than with patient characteristics, such as income or ethnicity. Although concerns have been raised in New Zealand that GP fees create a barrier to access for poorer individuals and may lead to lower rates of utilisation of GP services for such groups, using representative survey data from 1996/97 and 2002/03 we do not find any evidence of a relationship between socioeconomic status and healthcare utilisation after controlling for other measures of need. This suggests that the government subsidies in existence prior to the introduction of the PHCS, including the Community Services Card and the High Use Health Card, were sufficient to ensure that fees were not preventing those in need from visiting a GP.

One of the goals of the PHCS is to reduce health inequalities, in particular, for Māori, Pacific and low-income populations. Our results indicate that prior to the PHCS, Māori were less likely to visit the GP, made fewer visits per year and were less likely to visit a SP, and that Māori, Pacific Islanders and those in worse health status were more likely to report needing to visit the GP in the

last year, but failing to do so. Part of the challenge for the PHCS is to identify and reduce barriers to access for these groups. Thus, it will be important to assess the impact that fee reductions has on the utilisation of GP services by different population groups and the resultant health outcomes for these groups, if we are to be sure that the new government expenditure on primary healthcare is providing value for money and achieving the key goals of improving health and reducing inequalities in health.

## Acknowledgements

We would like to thank three anonymous referees for their comments and the Health Research Council of New Zealand for its financial support. The data used in this paper was funded by the Ministry of Health and its copyright is owned by the Crown. The authors are responsible for all opinions expressed and any errors and omissions.

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