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Affiliation with a primary care provider in New Zealand: Who is, who isn't☆

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ABSTRACT

Aims: New Zealand has a mixed public–private funded primary care system. In the last decade, considerable effort has gone into reducing the financial barriers to primary care, with some targeting of greater public funding of practices in more deprived areas. In this paper we explore the association of socio-demographic factors with affiliation with a primary care provider (PCP), and specifically examine the association with deprivation. Affiliation refers to having a doctor, nurse or medical centre one could go to if need arises.
Methods: We used data from the third wave (2004–2005) of an ongoing 8-year panel study of 22,000 adults that includes a health add-on. This paper utilises demographic, socio-economic and health behaviour characteristics of those who reported affiliation with a PCP at wave 3. Affiliation itself was measured with the question: "*do you have a doctor, nurse or medical centre you usually go to, if you need to see a doctor*?" Logistic regression is used to determine the independent association of a range of socio-demographic factors with affiliation with a PCP.
Results: Of the total of 18,320 respondents, 1530 (8.3%) reported no affiliation with a PCP. The odds of affiliation was significantly lower for males compared to females (OR 0.45, 95% CI: 0.39–0.50), never married compared to currently married (OR 0.48, 95% CI: 0.41–0.57), Asians compared to New Zealand Europeans (OR 0.47, 95% CI: 0.38–0.57), current smokers compared to never smokers (OR 0.79, 95% CI: 0.68–0.91) and those with post-school education compared to no education (OR 0.65, 95% CI: 0.55–0.76) and higher for older adults aged 65 years and over compared to young adults aged 15–24 years old (OR 5.14, 95% CI: 3.59–7.36), those reporting poor self-assessed health compared to those reporting good health (OR 1.45, 95% CI: 1.06–1.98), and those reporting one or more co-morbid conditions compared to no co-morbid conditions (OR 2.02, 95% CI: 1.78–2.29). However, there was no significant difference in affiliation with a PCP between those living in the most deprived areas and the least deprived areas.
Conclusions: Affiliation to a PCP is a measure of potential access to primary care. Overall, our data provide some support for the hypothesis that people with high health needs have high rates of affiliation with a PCP (e.g., elderly, women, Māori and those in poor health). The results also suggest that current health policies in New Zealand, with their emphasis on a strong primary health care system, are ensuring that people with greater health care needs are affiliated with a PCP.

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1. Introduction

There is a well-established body of international evidence that suggests that high quality primary care is important for improving health outcomes, controlling health care spending, and reducing health care disparities [1–13]. Affiliation, which refers to having a usual source of care (doctor, nurse or medical centre) or primary care provider (PCP) one could go to if need arises, is considered to be one of the four critical features of primary care [14]. Affiliation with a PCP or "having a regular source of care" has been considered both a measure of access and a determinant of access in health services research. Aday et al. [15–17] treat having a regular source of care as a structural component of the health care system that demonstrates an individual's uninhibited entry into the system. However, others have also considered regular source of care as a determinant of access [14].

Defining the characteristics of those not affiliated with a PCP at the individual level is especially important in the light of the fact that a PCP is usually the first point of contact for patients, and PCPs are "gatekeepers" who regulate access to more costly secondary and tertiary care. Affiliation with a PCP does not necessarily mean actual utilisation of primary care services. Rather, following Aday et al. [15–17], this study uses it is as a measure of potential access that makes it more likely that care will be used [18–21].

Studies, mainly from the US, have shown that potential access – having a regular provider of care – is strongly related to the likelihood of seeing a physician [15,16,22]; is one of the strongest predictors of access to health care services [17,23]; has been associated with greater use of preventive health services [24–26] and with fewer emergency department visits [27]. In addition, some studies have also reported that having potential access is also associated with 25% lower total costs of care compared with those not having regular source of primary care [28], and with greater satisfaction with the health care received [15]. The influence of having a usual source of care seems to grow as use becomes more discretionary [18,22]. For example, in the US Rundall and Wheeler found that the presence or absence of a usual source of care was more important than income in predicting use of preventive services among a sample of adults [22].

There is considerable policy interest in defining the characteristics of people who are affiliated/not affiliated with a PCP. First, there is evidence from the US that those not having a regular health care provider are more likely to rely on hospital outpatient and emergency departments as a regular source of care. This may increase costs to the publicly funded health care system [16,29]. Second, research has also shown that people who use hospitals or emergency departments as the usual source of care face more substantial barriers to access to physicians [18] and have few alternatives to outpatient care [30–35]. Many walk-in patients leave the emergency department without being seen because of long waiting periods [30,31]. Third, persons who lack a regular source of care are more likely to experience delays in seeking preventive health care services [24], and are therefore at greater risk of chronic health conditions. If not having a regular provider of care is related to substantial barriers to receiving care and increased use of emergency departments in hospitals for non-emergency or minor problems, as some research suggests, then one strategy to improve access, quality of health care and reduce costs may be to promote affiliation with a PCP.

The objective of this study is to use national survey data to determine who is affiliated with a PCP in New Zealand. The specific aims of the study are to explore: (1) the demographic, (2) socioeconomic and (3) health behaviour and health characteristics of people who are affiliated/not affiliated with a PCP. We hypothesise that after adjusting for demographic, socio-economic and behavioural factors, those who have a greater need are more likely to be affiliated with a PCP. While identification of subgroups who are affiliated/not affiliated with a PCP is of interest in its own right, it is particularly important in the New Zealand context, mainly because the 2001 New Zealand Primary Health Care Strategy aims to reduce inequalities in health and ensure greater access to and use of preventive health services [36]. Secondly, the bulk of research on this area has been carried out mainly on European and American data and it is important to examine this issue outside the US and Europe to see whether the pattern established there applies elsewhere.

1.1. New Zealand health system context

New Zealand has a largely tax-funded health system which, in its general form, looks similar to the United Kingdom's National Health Service, including its foundation of GP based primary health care. Yet New Zealand is unusual among welfare states of the liberal democratic model because primary health care is only approximately 60% funded by government [37]. Because of patient co-payments, the paucity of indigenous (Māori) and Pacific Islanders in the primary health care workforce [38], and the uneven distribution of GPs, significant financial, cultural and geographical barriers to access exist for primary health care in some parts of the country [39–41].

New Zealand's current *Primary Health Care Strategy* [36], released in 2001, aims to address some of these access barriers. The central feature of the strategy is the grouping of the primary care providers (general practitioners (GPs), primary care nurses and other health professionals such as Māori health providers and health promotion workers) into networks called Primary Health Organisations (PHOs). While joining a PHO was voluntary, primary care providers were encouraged to do so by more generous and regularly increasing subsidies paid to PHOs in line with the Consumer Price Index (CPI). PHOs are funded on a capitation basis for providing a specified set of treatment and preventive services to their enrolled populations regardless of whether contact is made during the period [42–44]. Two different PHO types (Access and Interim) were developed. 'Access' PHOs were those organisations that had an enrolled population with more than 50% identified as high need as determined by deprivation (those living in the two most socioeconomically deprived deciles) and ethnicity (Māori and Pacific). All other PHOs were 'Interim'. In order to make the biggest difference to those in greatest need, the higher subsidy rates were initially paid to people enrolled in Access

PHOs. However, the intention of the government was to roll out similar levels of funding to all PHOs and to include both GP services and pharmaceuticals. Higher subsidy rates included all age groups by July 2007. As a result of increased subsidies, the levels of co-payments for primary care have reduced substantially. For those who were previously not subsidised at all, GP charges have fallen from an average of $50 per GP visit to $25 or less, and some services are provided free of charge [45]. However, during the period under study higher subsidy rates were not applicable to those aged between 25 and 64 in Interim PHOs.

2. Methods

2.1. Data

This research used SoFIE-Health data, which is an add-on to the Statistics New Zealand-led Survey of Family, Income and Employment (SoFIE). SoFIE is a single fixed panel and is the largest longitudinal survey ever run in New Zealand. It is a nationally representative study of 22,000 adults drawn by random sampling of households, interviewed face-to-face. All adults in the original sample will be followed for a maximum duration of eight years starting from October 2002, even if their household or family circumstances change. It collects information once a year from the same individuals on income levels, sources and changes; and on the major influences on income such as employment and education experiences, household and family status and changes, demographic factors and health status. Every 2 years (waves 2, 4, and 6) it will also collect information on assets and liabilities to monitor net wealth and savings.

The SoFIE-Health add-on is comprised of 20 min of questionnaire time in waves 3 (2004–2005), 5 (2006–2007) and 7 (2008–2009), in the following health-related domains: SF-36 (short-form health survey), Kessler-10 (K-10), perceived stress, chronic conditions (heart disease, diabetes, and injury-related disability), tobacco smoking, alcohol consumption, health care utilisation, and access and continuity of primary health care, and an individual deprivation score. The health module was administered to the original sample members (OSM). The attributes of primary care are elicited from the SoFIE respondents themselves using a modified version of the Primary Care Assessment Tool (PCAT) [5,9]. This paper only includes analyses of the affiliation question.

2.2. Analysis

This paper provides cross-sectional analyses of wave 3. The population used in the analyses was 18,320 adults (15 years and above) OSM at wave 3. Analysis of data was carried out first using Chi-square tests to evaluate the associations between affiliation with a PCP and other variables. Multivariate modelling then used logistic regression to adjust for co-variates, including age, sex, region, marital status, ethnicity, household equivalised income, education, small-area deprivation and health behaviour and health variables such as smoking, self-assessed health, Kessler-10 (K-10) and chronic conditions. A difference was considered statistically significant if $p < 0.05$. The population used in the regression analyses was 17,145 adults (15 years and above) OSM at wave 3 who have complete information on all the socioeconomic, health behaviour and health characteristics. Three models were used to estimate differences in affiliation. Model 1 estimated the differences in affiliation after controlling for demographic factors, and Model 2 estimated the differences in affiliation after controlling for demographic and socio-economic factors. Model 3 achieved the same objective after controlling for demographic, socio-economic and behavioural factors simultaneously. However, for reasons of brevity only Model 3 is discussed. All counts presented in this paper are random rounded (up or down) to the nearest multiple of 5, with a minimum value of 10, as per the Statistics New Zealand protocol. All analyses were performed using SAS version 8.2 within the Statistics NZ data lab.

2.3. Measurement of study variables

The main outcome measure was affiliation with a PCP. Independent variables chosen for analyses were based on our review of the literature and on the behavioural model of health services utilisation [46]. The behavioural model served as a conceptual guide in the selection of variables that compromise access to health care for certain population.

2.3.1. Affiliation with a PCP

In this study affiliation with a PCP was measured by asking individuals "*do you have a doctor, nurse or medical centre you usually go to, if you need to see a doctor*?" Response categories included yes, no, do not know and refused. We recoded this measure into two categories that contrasted affiliated with not affiliated. For this paper, we excluded 'don't know' and 'refused' categories as there was no a priori way of categorizing these respondents as yes or no.

2.3.2. Geographical region

Major geographical regions of dwelling location were Auckland, Waikato, Wellington, Rest of North Island, Canterbury, and Rest of South Island.

2.3.3. Age

Age is calculated at the wave 3 interview date and categorised into 5-year age groups as 15–24, 25–44, 45–64, and 65+.

2.3.4. Ethnicity

This paper uses the 'prioritised' concept of ethnicity. In the 'prioritised' concept, each respondent was assigned to a mutually exclusive ethnic group by means of a prioritisation system commonly used in New Zealand: Māori, if any of the responses to self-identified ethnicity was Māori; Pacific, if any one response was Pacific but not Māori; Asian, if any one response was Asian but not Māori/Pacific; the remainder non-Māori non-Pacific non-Asian (nMnPnA) (mostly New Zealanders of European descent, but strictly speaking not an ethnic group).

2.3.5. Marital status

Marital status relates to legal marital status and is categorised into currently married, previously married (separated/divorced/widowed) and never married. Cohabitants are included in the never married category.

2.3.6. NZDep2001

NZDep2001 is a census-based small-area index of socioeconomic deprivation [47]. The deprivation index score of dwelling location is derived from NZDep and assigned to the small area of the dwelling. NZDep2001 deprivation scores apply to *areas* rather than individual people. The index scale used here is from 1 to 5, where 1 = the least deprived 20% of areas, and 5 = the most deprived 20% of areas.

2.3.7. Income

In SoFIE, income is collected from every individual over 15 years at every wave. All income is reported as gross (before tax) amounts. Information is collected on household and individual income, with detailed information on the types/sources of individual income. This information has been used to derive total annual household income and total personal income. For the analyses in this paper, equivalised household income at wave 1 is used. Household equalised income is adjusted for household structure and according to the Consumer Price Index (CPI) for the quarter ending December 2001 (the first reference quarter of the study). Income presented in tertiles is used: low (<$26,109), medium ($26,109–43,015) and high (≥$43,016).

2.3.8. Education

The education variable used in this analysis was the highest level of education at wave 3, categorised as no qualification, school qualification, and post-school qualification.

2.4. Health behaviour and health variables

The following health behaviour and health variables are used in this paper.

2.4.1. Smoking

A current smoking status variable is created from responses to questions "*Do you smoke cigarettes*", and "*Have you ever been a regular smoker*" and is coded into three categories: current smoker, ex smoker and never smokers.

2.4.2. General health

The global self-rated health question is asked at every wave of all respondents aged 15+ years. It was taken from the first SF36 question "*in general would you say your health is. . .*" with a five-point scale ranging from "excel-

Table 1
Demographic characteristics of respondents who reported having affiliation with a place/doctor versus those with no affiliation with a place/doctor[a].

Characteristics	Affiliation with a PCP					*p*-Value[*]
	N	Yes (*N*)	%	No (*N*)	%	
Total	18,320	16,735	91.3	1,515	8.3	
Major region						
Auckland	4,540	3,995	88.0	525	11.6	<0.0001
Waikato	1,660	1,515	91.5	145	8.5	
Wellington	2,430	2,170	89.2	225	9.3	
Rest of North Island	4,130	3,855	93.4	265	6.4	
Canterbury	2,960	2,740	92.6	210	7.1	
Rest of South Island	2,605	2,455	94.3	145	5.5	
Age						
15–24	2,775	2,280	82.1	480	17.3	<0.0001
25–44	6,235	5,575	89.4	640	10.2	
45–64	6,135	5,765	94.0	350	5.7	
65–74	1,740	1,700	97.5	35	2.1	
75+	1,425	1,405	98.7	15	1.0	
Sex						
Male	8,430	7,420	88.0	970	11.5	<0.0001
Female	9,890	9,315	94.2	540	5.5	
Marital status						
Currently married	9,575	9,025	94.3	515	5.4	<0.0001
Previously married	3,220	3,035	94.3	170	5.3	
Never married	5,515	4,665	84.6	825	15.0	
Ethnicity						
NZ/European	14,315	13,235	92.5	1,035	7.2	<0.0001
Māori	1,975	1,790	90.8	175	8.8	
Pacific	800	700	87.6	85	10.9	
Asian	925	735	79.1	185	20.3	
Others	310	270	88.1	30	10.6	

Note: Total *N* may not sum up to 18,320 because of random rounding and missing values.

[a] Unweighted counts are used in this study.

[*] *p*-value is for Chi-squared statistics comparing affiliated with non-affiliated.

lent" to "poor". We combined the categories excellent/very good/good (good health) and fair/poor (less than good health).

2.4.3. Kessler-10 scale

The Kessler-10 (K-10) is a scale measuring non-specific psychological distress [48,49]. The K-10 consists of ten questions about non-specific psychological distress and seeks to measure the level of current anxiety and depressive symptoms based on questions about negative emotional states a person may have experienced in the four weeks prior to interview. The scores were grouped into four levels according to the criteria developed by Andrews and Slade: low (10–15), moderate (16–21), high (22–29), and very high (30+) [50,51].

2.4.4. Chronic diseases

As part of the health module each respondent was asked "have you ever been told by a doctor that you had": asthma, high blood pressure, high cholesterol, heart disease, diabetes, stroke, migraines, chronic depression, manic depression or schizophrenia.

These data were coded into a co-morbidities index: 0, 1–2, >2 co-morbid diseases.

3. Results

Characteristics of those who were affiliated/not affiliated with a PCP are shown in Tables 1 and 2. Table 1 shows the bivariate association between the demographic variables and affiliation with a PCP. As can be seen, all

Table 2
Socio-economic and behavioural characteristics of respondents who reported having affiliation with a place/doctor versus those with no affiliation with a place/doctor[a].

Characteristics	Affiliation with a PCP					*p*-Value*
	N	Yes (*N*)	%	No (*N*)	%	
Total	18,320	16,730	91.3	1,515	8.3	
Income tertiles						
1 (low)	5,515	5,055	91.6	440	7.9	0.543
2	6,170	5,625	91.1	520	8.4	
3 (high)	6,635	6,055	91.2	560	8.4	
Missing	70					
NZDep						
NZDepQ1 (least deprived)	3,495	3,235	92.6	230	6.7	<0.001
NZDepQ2	3,580	3,280	91.5	295	8.2	
NZDepQ3	3,305	2,985	90.4	310	9.4	
NZDepQ4	3,835	3,505	91.5	310	8.2	
NZDepQ5 (most deprived)	3,505	3,185	90.9	305	8.7	
Missing	600					
Education						
No education	4,540	4,255	93.6	265	5.8	<0.0001
School	4,915	4,450	90.5	445	8.9	
Post-school vocational	6,275	5,755	91.7	505	8.0	
Degree or higher	2,585	2,275	87.9	305	11.9	
Missing	70					
Smoking						
Current	3,705	3,310	89.5	385	10.5	<0.0001
Ex	4,660	4,410	94.7	240	5.2	
Never	9,890	8,995	90.9	885	8.9	
Missing	65					
Self-assessed health						
Excellent, very good, good	16,450	14,945	90.8	1,460	8.9	<0.0001
Fair, poor	1,855	1,780	95.6	60	3.2	
Missing	10					
Kessler-10 groups						
Low (10–15)	14,120	12,895	91.3	1,210	8.6	<0.0001
Moderate (16–21)	2,725	2,505	92.0	215	8.0	
High, very high (22+)	1,245	1,170	94.0	75	6.0	
Missing	235					
Co-morbidity index						
0	8,305	7,220	86.9	1,070	12.9	<0.0001
1–2	8,150	7,715	94.7	425	5.2	
>2	1,810	1,795	98.9	15	1.0	
Missing	55					

Note: Total *N* may not sum up to 18,320 because of random rounding and missing values.

[a] Unweighted counts are used in this study.

* *p*-Value is for Chi-squared statistics comparing affiliated with non-affiliated.

Table 3
Odds ratios (OR) and 95% confidence intervals (CI) of having an affiliation, adjusting for effects of demographic, socioeconomic and health behavioural and health variables ($N = 17,145$): SoFIE-Health, 2004–2005[a].

Characteristics	Model 1		Model 2		Model 3	
	OR (CI)	*p*-Value	OR (CI)	*p*-Value	OR (CI)	*p*-Value
Major region						
Auckland	1.00		1.00		1.00	
Waikato	1.22 (0.98–1.52)	0.3357	1.23 (0.99–1.53)	0.3382	1.29 (1.03–1.61)	0.5831
Wellington	1.10 (0.92–1.31)	0.0057	1.10 (0.92–1.31)	0.0049	1.08 (0.90–1.30)	0.0014
Rest of North Island	1.52 (1.28–1.81)	0.0357	1.53 (1.28–1.82)	0.0348	1.59 (1.33–1.90)	0.0151
Canterbury	1.48 (1.23–1.78)	0.1167	1.49 (1.24–1.79)	0.1112	1.46 (1.21–1.76)	0.2834
Rest of South Island	1.81 (1.47–2.23)	<0.0001	1.83 (1.48–2.25)	<0.0001	1.89 (1.53–2.34)	<0.0001
Age						
15–24	1.00		1.00		1.00	
25–44	1.27 (1.08–1.48)	<0.0001	1.41 (1.20–1.66)	<0.0001	1.36 (1.52–1.60)	<0.0001
45–64	2.09 (1.71–2.55)	0.8587	2.25 (1.83–2.76)	0.9648	1.85 (1.50–2.29)	0.7306
65+	7.56 (5.35–10.68)	<0.0001	7.97 (5.62– 11.30)	<0.0001	5.14 (3.59–7.36)	<0.0001
Sex						
Female	1.00		1.00		1.00	
Male	0.43 (0.38–0.48)	<0.0001	0.43 (0.37–0.48)	<0.0001	0.45 (0.39–0.50)	<0.0001
Marital status						
Currently married	1.00		1.00		1.00	
Previously married	0.64 (0.53–0.78)	0.4104	0.64 (0.53–0.78)	0.4572	0.60 (0.50–0.74)	0.1538
Never married	0.48 (0.41–0.56)	<0.0001	0.48 (0.41–0.56)	<0.0001	0.48 (0.41–0.57)	<0.0001
Ethnicity						
NZ/European	1.00		1.00		1.00	
Asian	0.38 (0.32–0.47)	<0.0001	0.41 (0.33–0.50)	<0.0001	0.47 (0.38–0.57)	<0.0001
Māori	1.10 (0.92–1.32)	<0.0001	1.09 (0.90–1.31)	<0.0001	1.11 (0.91–1.34)	0.0006
Pacific	0.91 (0.71–1.17)	0.1355	0.90 (0.69–1.17)	0.2171	1.00 (0.76–1.31)	0.1026
Income tertiles						
1 (low)			0.90 (0.77–1.05)	0.4352	0.86 (0.73–1.00)	0.1485
2			0.90 (0.78–1.03)	0.4074	0.90 (0.78–1.04)	0.7122
3 (high)			1.00		1.00	
NZDep						
NZDepQ1 (least)			1.00		1.00	
NZDepQ2			0.79 (0.65–0.95)	0.4691	0.78 (0.64–0.94)	0.4457
NZDepQ3			0.70 (0.58–0.84)	0.0041	0.70 (0.58–0.85)	0.0091
NZDepQ4			0.84 (0.69–1.02)	0.7247	0.82 (0.68–1.00)	0.9151
NZDepQ5 (most)			0.82 (0.67–1.00)	0.9299	0.80 (0.65–1.00)	0.8578
Education						
No education			1.00		1.00	
School			0.89 (0.74–1.06)	0.2107	0.87 (0.73–1.03)	0.2772
Post-school			0.66 (0.56–0.78)	<0.0001	0.65 (0.55–0.76)	<0.0001
Smoking						
Never					1.00	
Current					0.79 (0.68–0.91)	0.0004
Ex					1.06 (0.90–1.25)	0.0304
Self-assessed health (%)						
Excellent–good					1.00	
Fair–poor					1.45 (1.06–1.98)	0.0175
Kessler-10 groups						
Low (10–15)					1.00	
Moderate (16–21)					1.05 (0.89–1.23)	0.7297
High/very high (22+)					1.18 (0.90–1.54)	0.3037
Co-morbidity index (%)						
0					1.00	
1–2					2.02 (1.78–2.29)	0.0183
>2					8.17 (4.75–14.03)	<0.0001
Initial −2 log-likelihood	9740.590		9740.590		9740.590	
−2 log-likelihood by all variables in the model	8707.572		8660.532		8415.014	
Δ − 2 log-likelihood	1033.018***		1080.058***		1325.576***	
R-square (Max-rescaled)	0.13		0.14		0.17	

[a] SoFIE = survey of family, income and employment.
*** $p < 0.0001$.

associations are significant. Of the total of 18,320 respondents, 16,735 (91.3%) reported an affiliation with a PCP and 1515 (8.3%) reported no affiliation with a PCP. Region specific estimates of persons who were affiliated with a PCP ranged from 94.3% in rest of the South Island (excluding Canterbury) to 88.0% in Auckland. In general, those living in any region of the North Island had lower affiliation with a PCP than those living in any region of the South Island.

Older adults were more likely to have an affiliation with a PCP than younger adults ($p < 0.000$). Men were less likely than women to have an affiliation with a PCP (88.0% and 94.2% respectively). A significantly lower proportion of never married people were affiliated with a PCP (84.6%). A lower proportion of Pacific and Asian (87.6% and 79.1% respectively) than NZ European and Māori (92.5% and 90.8% respectively) were affiliated with a PCP.

Table 2 shows the association between affiliation and socio-economic characteristics, health behaviours and health characteristics. There were no significant differences in affiliation by household equivalised income. A lower proportion of adults with a degree or higher qualification were affiliated with a PCP (87.9%) than those with no education (93.6%). People from the most deprived areas of New Zealand were significantly less likely to be affiliated with a PCP (90.9%), than people from the least deprived areas (92.6%). A lower proportion of current smokers (89.5 %) than ex-smokers (94.7%) were affiliated with a PCP. Respondents reporting fair and poor health were more likely to be affiliated with a PCP (95.6) than respondents reporting excellent, very good and good health (90.8%). Those reporting low levels of psychological distress were less likely to be affiliated (91.3%) than those reporting high and very high levels of psychological distress (94.0). Similarly 87% of the respondents reporting no chronic diseases were affiliated with a PCP as compared to 99% of those reporting more than two co-morbid diseases.

However, these results are unadjusted for age or any other co-variates. In order to control for confounding, we ran logistic regression analyses. Model 3 (Table 3) shows the odds of having an affiliation with a PCP after simultaneously controlling for demographic, socio-economic and health behaviour and health factors. Results from analyses (Model 3, Table 3) show that all the demographic factors are important predictors of being affiliated with a PCP. The odds of being affiliated with a PCP were higher in the North Island (excluding Auckland, Waikato and Wellington), Canterbury and the South Island (excluding Canterbury) compared with Auckland. The results also show age, gender, marital status, and ethnicity were significant predictors of having an affiliation with a PCP. For example, the odds of being affiliated with a PCP were 5.1 times higher for those 65 years or older than people in 15–24 years age group. Men were 55% less likely than women to have an affiliation with a PCP. Similarly being never married and of Asian ethnicity were associated with lower odds of being affiliated with a PCP.

There was no significant association between equivalised household income and affiliation with a PCP. While area deprivation was significantly associated overall with having an affiliation with a PCP, there was no significant difference in the odds of affiliation with a PCP between those living in the most deprived areas and the least deprived areas. Education had a significant but inverse association with affiliation with a PCP. People with post-school education were 35% less likely than those with no education to have an affiliation with a PCP. Similarly current smokers were 21% less likely than never smokers to have an affiliation with a PCP.

The odds of having an affiliation with a PCP was significantly higher for those reporting fair–poor health and one or more co-morbid diseases. It is important to note that the association between demographic factors and affiliation with a PCP remained unchanged even after ccontrolling simultaneously for demographic, socio-economic and health behaviour and health factors (Model 3, Table 3). Results shown in the last four rows of Table 3 indicate that demographic factors explain a higher percentage of the variance in predicting affiliation as compared to socio-economic, health behaviour and health factors. For example, the set of demographic factors account for 13% of the explained variance in predicting affiliation. This explained variance increases slightly to 17% in the model containing demographic, socio-economic health behaviour and health factors.

4. Discussion

4.1. Principal findings

Primary care in New Zealand is the most important gateway to the formal health care system, providing timely and comprehensive care and, when necessary, referrals for specialist care. Having an affiliation with a PCP or having a regular primary care provider has been used in this study as a measure of potential access that makes it more likely that services will be used.

The results of this study demonstrate the majority of our population reported having an affiliation with a PCP. However, the probability of having a regular health care provider varies across different population groups. The finding that older people and women were more likely to be affiliated with a PCP is consistent with previous research [52–55] and is most likely due to differences in health behaviour by age and gender. The J-shaped association between age and affiliation is to be expected and reflects an increase in chronic conditions and other morbidities with age. Women's higher probability of being affiliated with a PCP may partly be due to women's greater need for care as reflected by their higher rates of illness [56–62], but also to men's less cultural acceptance of the need for care. Studies have suggested that women are more likely to utilise health services than men for a number of reasons which may reflect women's greater use of health care services for contraceptive, pregnancy and child-related health care services, as well as perhaps the tendency for men to be less willing than women to seek professional help for certain kinds of health problems [63]. The regional variation in affiliation may be due to region specific supply factor.

However, of concern is the lower odds of affiliation with a PCP for the never married, people with high education, current smokers and Asian ethnic groups. The result of

lower odds affiliation with a PCP for the never married is in line with the research that suggests that in comparison to married people, the never married have a low utilisation of health services [64–66]. Identifying the main reasons for lower affiliation with a PCP for people with high education should be explored in further studies. Research has found that education inversely affects satisfaction with care received [67]. Less satisfaction with the quality of primary care (access and/ or patient-centeredness) may lead to a lower probability of highly educated people being affiliated with a PCP.

While a higher probability of being affiliated with a PCP for Māori people may reflect, among other things, higher health needs, the possible explanations for lower affiliation of Asian people include cultural factors (e.g., language ability and characteristics associated with being a non-English speaker, including differing knowledge of and beliefs about the health care system in general and primary care in particular), differences in health status or health seeking behaviour, and structural factors (e.g., lack of information, quality of care). For example, research from the US has shown that ethnic minority and immigrant groups may choose to go without a regular source of care because they trust God to protect them from illness, they lack appropriate information or because they regard health services as cold and disinterested [67,68]. Hence, consideration of cultural factors in health policy is warranted. While there have been a number of reforms in New Zealand to improve access to primary care for Māori populations, this may not be similar for other groups.

It is noteworthy that there is no significant difference in affiliation between those living in the most deprived areas and the least deprived areas. A number of studies have shown that New Zealanders living in the most deprived areas are more likely to experience certain illnesses such as heart disease and communicable diseases [69]. This should make these people more likely to be affiliated with a PCP. However, the results from this study show that those who lived in the most deprived areas were no more likely than people living in the least deprived areas to report an affiliation with a PCP. The finding that people living in the most deprived areas were not significantly different from those living in the least deprived areas in terms of affiliation with a PCP, is not entirely consistent with previous New Zealand research which, despite some conflicting results, gives an indication that people living in deprived areas have overall higher utilisation rates, or are more likely to be frequent users (six or more visits per annum) of GP services [63,70]. However, a previous New Zealand study found that people living in the most deprived areas did not have a statistically significant higher annual GP exposure than those living in the least deprived areas (after controlling for other co-variates) [71].

We also found that respondents who reported fair–poor self-assessed health and one or more co-morbid conditions were more likely to be affiliated with a PCP than were those who reported good health or no co-morbid conditions, even after controlling for confounders. This is in line with the research finding that perception of the need for care has an important influence on having a usual source of care. For example, the majority of Americans without a regular source of medical care report that they do not have one because they have little need for health services [52–54,72,73]. Overall, our data provide some support for the hypothesis that people with high health needs have higher rates of affiliation with a PCP (e.g., elderly, women, and those in poor health). However, the lower affiliation of the never married, people with high education, current smokers and Asian ethnic groups may suggest some discrepancy between affiliation and use of primary care. The fact that Asians, never married, and current smokers had low affiliation, indicates that these individuals are at risk of receiving less timely and appropriate preventive and other health services.

4.2. Policy implications

The results of this study have implications for policymakers. If potential access – having a regular provider of care – is associated with the likelihood of seeing a physician, better quality of care, increased access to and use of preventive health services and decreased use of emergency departments in hospital for non-emergency problems, then increasing affiliation with a PCP may result in improving accessibility of care, quality of care and reducing the overall cost of health care. This implies that a health policy that promotes individual affiliation with a PCP, targets those without an affiliation with a PCP and emphasises the health benefits of having an affiliation with a PCP might be more effective at promoting access than one that does not. While affiliation with a PCP is high in New Zealand, there is still some room for improvement, especially for Asians, never married, current smokers and those with post school qualifications. Efforts aimed at increasing the number of people who are affiliated with a PCP should target those of Asian ethnicity, never married, current smokers and those with a post-school education.

However, simply targeting the population who are without a PCP and promoting the benefits of affiliation is not enough as there are potential structural factors (e.g., patient-copayments, geographical location, waiting time, hours of operation) that may be associated with patterns of affiliation and potential access. Studies from the US have shown that only a small proportion of adults reported not having a usual source of care because of financial barriers and the majority (more than 60%) reported not having one simply because they do not want one [54,72]; the situation might be different in New Zealand where patients end up paying more for a GP visit if they are not affiliated with a PCP. Moreover, in New Zealand significant co-payment barriers exist which make access to primary care unaffordable for those with fewer financial resources [45]. In such a system, simply promoting the benefits of affiliation with a PCP and targeting the subgroups without affiliation with a PCP may not address the potential impact of a public/private health system reliant on patient co-payments. Where such systems exist, inevitably financial incentives are required to alter provider and/or consumer behaviour. In this case, incentives to develop and sustain affiliation with a PCP would seem to be warranted. Moreover, further research needs to be conducted identifying the reasons for affiliation/not affiliation with a PCP before

some conclusive policy formulations could be made. It may require different policies for those who are not affiliated by choice or those who are not affiliated because of cost.

4.3. Strengths and limitations of study

A major strength of the study is that it uses national survey data at an individual level. However, the findings are subject to some limitations. First, this study reports cross-sectional analyses which prohibit drawing causal conclusions. Follow-up data (wave 5) will allow conclusions regarding the direction of effects, allowing causal inferences to be drawn more confidently.

Second, this study assumes that affiliation with a PCP is a measure of potential access that in turn makes it more likely that care will be used. It may be, as some research suggests, that use causes the feeling of having an affiliation with a PCP not vice versa [74,75]. However, variables that might influence the affiliation with a PCP, for example, greater health care needs/or greater use of health services because of ill-health, are partially controlled for by health status adjustment. Moreover, Anderson and Aday [17] found that the indirect effect through illness of a regular source of care on physician use was small compared with its large direct effect.

Third, affiliation was measured on self-reported data not confirmed by a physician/administrator; our estimates may be subject to possible reporting error and recall bias not accounted for by statistical adjustments. Fourth, Asian and Pacific ethnicity did not take into account cultural variations among these large, heterogeneous groups. Fifth, although we have adjusted for many confounding variables, it is possible that the differences we found in outcome and exposure variables could be the result of other factors associated with outcome variable that we did not measure. For example, we did not measure residential mobility in our analyses. Presumably individuals who are more mobile may be less likely to be affiliated with a primary care provider (and this may also dilute some of the age effect, since younger individuals are more likely to be mobile). While not eliminating this unmeasured confounding bias, we are encouraged to see consistency in the findings with previous research in the areas explored here.

Another limitation is the potential for attrition in the data. In wave 3 of the SoFIE study, 83% of the original sample members were re-interviewed [76], which combined with the household response rate at wave 1 of 77% gives an estimated effective response rate of 64%. However, the attrition within the SoFIE study is low compared with other population-based longitudinal panel surveys [77,78]. Selection bias might arise in our analyses if individuals drop out of the survey in a non-random manner (i.e., the more unhealthy may be more likely to decline to participate in follow-up years). It is not possible to estimate whether such bias occurred. Given the large effect sizes in this study, it seems implausible that a large *positive* association of poor self-assessed health, for example, with affiliation with a PCP existed among those eligible but declined to participate, hence not included in the follow up.

5. Conclusions

In conclusion, this article examines the characteristics of those affiliated/not affiliated with a PCP and can serve as the baseline for other studies that use the newly available SoFIE-Health data to assess other aspects of primary health care. Some of the differences in affiliation with a PCP noted in this study suggest differential disadvantage in potential access to care (for example, Asian ethnicity), whereas others (age, gender) may reflect different patterns of health behaviour across subgroups. The finding that those who lived in the least deprived areas were no more likely than people living in the most deprived areas to report an affiliation with a PCP is encouraging because it suggests current health policies in New Zealand, with their emphasis on a strong primary health care system, are ensuring that people with greater health care needs have an affiliation with a PCP. Further efforts aimed at increasing the number of people who are affiliated with a PCP should target those of Asian ethnicity, never married, current smokers and those with a post-school education.

Statistics New Zealand security statement

Access to the data used in this study was provided by Statistics New Zealand in a secure environment designed to give effect to the confidentiality provisions of the Statistics Act, 1975. The results in this study and any errors contained therein are those of the authors, not Statistics New Zealand.

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