

## Predictors of Health Care Utilisation in Community Dwelling New Zealand Māori



**Ross Flett**

*School of Psychology, Massey University, Palmerston North, New Zealand*

**Paul Hirini**

*School of Psychology, Massey University, Palmerston North, New Zealand*

**Nigel Long**

*School of Psychology, Massey University, Palmerston North, New Zealand*

**Michelle Millar**

*Human Factors International, Canberra, Australia*

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### Abstract

*Using Andersen's behavioural model of health care use we examined the predictors of health care utilisation (visits to general practitioners/family physicians, and hospital/outpatient and emergency services) via a cross sectional survey of 502 community dwelling New Zealand Māori (the indigenous population of New Zealand). We found that the model was of limited utility in accounting for variation in health care use in this group. In line with other research findings health need and worries about health emerged as the most salient predictors. We argue that this model may be limited in its applicability to this cultural group and that some re-evaluation of the ways in which health professionals have traditionally dealt with members of the Māori population, may be necessary.*

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A widely researched model of health service use was first presented by Andersen in the 1960's (Hulka & Wheat, 1985; Wan, 1989; Wolinsky & Johnson, 1991). Andersen (1995) summarises some of the work in this area and emphasises the importance of continued research on health services' use and access to care. The essential features of the model have been described in extensive detail elsewhere (e.g. Flett, Millar, Long & Macdonald, 1998; Hirini, 2004) but are reviewed briefly below. The model argues that use of health services is a function of predisposing, enabling and need characteristics of individuals.

The predisposing component centres on the idea that some people have a greater inclination for using health services than others and this tendency can be predicted from individual characteristics prior to an illness episode. The predisposing characteristics have 3 dimensions - demographics (e.g. age, gender, area of residence, marital status), social structure and health beliefs. Demographic variables also include variables like access to a car and telephone. Social structure is seen in the model as employment, education and ethnicity which are argued to reflect a position in an overall social structure and the commensurate lifestyles to which people in those positions become socialised. Health beliefs include notions such as health worries, and control over future health. These 3 dimensions are seen as the 'sociocultural' element of the model.

The enabling component centres around the idea that people may well be predisposed to using

health services but also need some means of obtaining them. The kinds of factors that typically make health services available for consumption are measured here. These include income, ratings of satisfaction with standard of living and ability to get by on income (Eve, 1988), private health insurance coverage, having a regular physician (Lloyd et al., 1991), geographic stability (Wolinsky & Johnson, 1991). The notion of geographic stability (or simply put, living in the same place for a long time) is argued to impact on health service utilisation in the sense that such stability means that people become more aware of health services available and are more likely to have an established relationship with a health service provider.

Clearly predisposing and enabling characteristics are necessary for health service use but the individual must also have or perceive some illness. This need is seen as the most immediate cause of health service use and has 2 dimensions - the first represents the amount of illness that an individual perceives exists - in most studies this is a single item global rating of health status. The second dimension is seen as professionally evaluated need (i.e. ratings by a physician). Most of the time this is not possible or practical so measures of activity limitation and mobility limitation are routinely used as proxies of physician assessments.

Health care utilisation is typically measured via physician visits, hospital nights, bed disability days, use of home health services and use of other health professionals. This is a relatively simplistic level of measurement but is very common in the service utilisation literature. The Andersen model has provided a comprehensive research agenda for health care use studies since its inception in the late 1960's (Aday & Awe, 1997) but the effectiveness of the model when applied to indigenous populations is less clear.

There is clearly a need to understand health care utilisation in indigenous populations in order to anticipate their health needs more effectively (e.g., Blum, Potthoff & Resnick, 1997). The results for the model when applied to these populations are mixed. Rios (1996) notes that the model provides some insights into understanding patterns of mental health service utilization among Mariel Cubans. The concepts derived from the model also appears to have some utility in predicting health and mental health service use in Native American populations (e.g. Chapleski, Gelfand & Pugh, 1997; Gurley et al., 2001) while other authors have suggested that the behavioural model of health care use might not be appropriate for a "culturally different" population (Duclos, 1999).

With this in mind, and following on from previous research (Flett, Millar, Long & MacDonald, 1998; Hirini, Flett Kazantzis, Long, Millar & MacDonald, 1999), the present study sought to consider predictors of health care use in a sample of New Zealand Māori. Many writers have drawn attention to the potential empowering effects for Māori of maintaining a sense of cultural identity and active participation in the New Zealand political context (Durie, 1997a,b). At the same time they are over-represented in New Zealand statistics for injury, intentional harm, mental illness, and many negative physical health outcomes (Hirini, 2004).

## Method

### *Participants*

The data reported here were collected as part of a larger study which has been described in detail elsewhere (Flett et al., 1998; Flett et al., 2002; Hirini, Flett, Kazantzis, Long, Millar & McDonald, 1999; Hirini, 2004).

Respondents were 502 Māori recruited from throughout New Zealand. Data collection took place over a three-month period using structured face-to-face interviews. The survey was ethnically and geographically stratified, employing a three-stage cluster design. The overall study included both non-Māori and Māori.

A three-stage cluster sampling methodology was employed to select the participants. The first stage involved the random selection of 150 census enumeration districts from both New Zealand islands. In order to reliably investigate the experience of Māori the sampling design allowed for the deliberate over sampling of individuals of Māori ancestry. Individuals were included in the sample who chose “New Zealand Māori” as the option which ‘best described’ the ethnic group to which they belonged. While this stratification does not reflect a household probability sampling methodology, it is similar to that used in prior surveys (e.g., Hornblow, Bushnell, Wells, Joyce & Oakley-Browne, 1990).

The second stage of the sampling strategy involved the random selection of a sample of dwellings from each of the enumeration districts. Households were contacted by trained National Research Bureau (NRB) staff on behalf of the Massey University research team, and up to three visits were made to each dwelling before substitution (in the event of non-contact). In total, 150 enumeration districts were sampled and an average of 10 interviews conducted in each<sup>1</sup>.

The third stage of the sampling strategy involved sampling an eligible participant from each household. If there was more than one eligible individual in a given household (i.e., greater than 18 years of age), then individuals were listed in descending order of age onto a sampling grid. The individual selected for an interview was the individual with the next birthday. Using this sampling strategy, 2,590 households were successfully contacted. Of this total, 1,090 refused to be interviewed yielding a sample of 1500 (Māori and non-Māori), and a response rate of 58%.

### ***Measures***

The measures utilised in this study are described in detail in Hirini (2004). The categorisation of measures as predisposing, enabling and need variables are reported in Table 1 along with relevant descriptive statistics. Among need characteristics, physical health measures included chronic health conditions assessed via a modified version of the Checklist of Serious Medical Conditions (Belloc, Breslow, & Hochstim, 1971). Physical symptoms were assessed via a 28-item version of the Pennebaker Inventory of Limbic Languidness (PILL; Pennebaker, 1982). The single-item self-rated health measure was reported in Wolinsky and Johnson (1991). The activity and mobility limitations measures were derived from the Activities of Daily Living Index and are also reported in Wolinsky and Johnson (1991). The Mental Health Inventory (Veit & Ware, 1983) was included to provide an estimate of overall psychological distress and well-being. The remainder of the predisposing and enabling characteristics variables have been reported in similar studies of health care utilisation elsewhere (e.g. Flett et al., 1998; Hirini, 2004; Hirini et al., 1999). Health service use was recorded as the number of general practitioner (GP or family physician visits) in the previous year.

Table 1  
*Means, standard deviations and coding algorithms for health care use predictor variables*  
 (N=502)

	<i>Mean</i>	<i>SD</i>	<i>Coding Algorithm / Percentages</i>
<b>Predisposing Characteristics</b>			
Age	40.10	14.98	Age in years
Gender			32% male, 68% female
Married/currently partnered			51% yes, 49% no
Area			50% urban, 50% rural
Qualifications	1.92	1.47	1 = no school quals, 2 = School Cert, 3 = 6 <sup>th</sup> form/Uni Entrance, 4 = Bursary/Scholarship, 5 = Trade/Prof. quals, 6 = Uni degree, 7 = Postgrad.
Telephone access			71% yes, 29% no
Vehicle access			77% = yes, 23% no
Life events	3.41	2.30	Actual no. of events experienced (1 - 20)
Social contacts	1.11	.31	No. of contacts (0 - 3)
Drink alcohol	1.34	.47	89% yes, 11% no
Health worries	2.86	.95	4 item scale (1 - 4) 1 = great deal, 2 = some, 3 = hardly any, 4 = none
Health control	1.75	.74	4 item scale (1 - 4) 1 = great deal, 2 = some, 3 = hardly any, 4 = none
<b>Enabling Characteristics</b>			
GP waiting times	25.77	21.23	Actual no. of minutes
GP fees limit access	1.83	1.07	4 item scale (1 - 4) 1 = not at all, 2 = occasionally, 3 = some of the time, 4 = often
Satisfaction with standard of living	2.99	.77	4 item scale (1 - 4) 1 = very dissatisfied, 4 = very satisfied
Adequacy of income	2.31	.82	4 item scale (1 - 4) 1 = can't manage, 2 = just enough, 3 = little over, 4 = always extra
Income	15,475.24	14,678.04	Annual income (\$NZD)
Time with same GP	4.04	1.24	5 item scale (1 - 5) 1 = 0-3 mths, 2 = 4-12 mths, 3 = 1-2 yrs, 4 = 3-5 yrs, 5 = 5+ yrs
Gender of GP			84% male, 16% female
Paid employment			37% yes, 63% no
Private health insurance			17% yes, 83% no
Community services card	1.28	.44	72% yes, 28% no
<b>Need Characteristics</b>			
Self rated health status	1.96	.74	1 = excellent, 2 = good, 3 = not so good, 4 = poor
Psychological distress	58.48	25.21	Score from Mental Health Inventory (Min - 24, Max - 112)
Psychological wellbeing	75.62	15.11	Score from Mental Health Inventory (Min 17, Max -98)
Chronic health conditions	1.55	2.16	No. of chronic health problems (Min - 0, Max - 17)
Physical symptoms	39.40	11.90	Composite symptom score (Min - 28, Max - 104)
Activity	.70	1.75	15 item scale (Sum of Basic, Household and Advanced ADL's)
Mobility	1.85	2.02	11 item scale (Sum of Upper and Lower Body Limitations)

### **Procedure**

Participants were given a detailed information sheet that described the nature of the study, their rights as participants and the responsibilities of the researchers (as specified in the New Zealand Psychological Society Code of Ethical Conduct in Research). Participants were informed that their responses would be kept anonymous and confidential, that they could skip or omit any of the interview questions, and they could discontinue participation in the study at any time. Given the nature of the present study, involving sensitive issues about experiences of traumatic events, participants were interviewed in their homes by trained NRB staff. Procedures were outlined to participants through which they could access further counselling or related assistance if it was required. All respondents were able to contact the researchers through a free phone number. All NRB staff were professional interviewers who had extensive experience with population interviews and surveys. After pilot testing, all interviewers spent seven hours practising for this project, with the help of a one-hour structured interview designed specifically for this study<sup>2</sup>. Data collection was conducted over a three-month period in 1995.

### **Results**

The utility of the predisposing, enabling and need variables in accounting for variability in physician visits, was examined via a hierarchical regression analysis. After appropriate data screening analyses as specified by Tabachnik and Fidell (1989), the analyses were modelled on the strategies reported in Wolinsky & Johnson (1991, 1992), Bazargan, Bazargan & Baker (1998) and Nelson (1993). Predisposing variables were entered first, enabling variables were next and finally need variables.

The rationale for entering variables in this order is based on the general observation that need characteristics have tended to dominate the proportion of variance in health care use explained by the Andersen model. Wolinsky and Johnson decided to enter the least consequential independent variables (i.e., predisposing and enabling) before need characteristics. This sequence of variable entry enables the assessment of impact from need-based variables on health care use above and beyond the proportion of variance explained by predisposing and enabling variables.

The results of this analysis with physician visits as the dependent variable are presented in Table 2. As Table 2 indicates, at the first step  $R$  was significantly different from zero ( $F(12, 482) = 5.04, p < .001$ ). Predisposing characteristics were therefore found to account for 11% (9% adjusted  $R^2$ ) of the variance in number of yearly visits to the family doctor. Educational qualifications and health worries contributed significantly to prediction of doctor visits. The direction of these effects was such that, on average, a higher frequency of doctor visits was exhibited by those with lower educational qualifications and more worries about their health.

At step two, with the inclusion of enabling characteristics into the equation,  $R$  was significantly different from zero ( $F(21, 473) = 3.5, p < .001$ ) and 13% of the variance (10% adjusted  $R^2$ ) was explained after entering enabling characteristics. The  $R^2_{change}$  statistic was not significant. This indicated that no unique contribution was made by enabling characteristics in predicting family doctor visits.

At step three, with the inclusion of need characteristics,  $R$  was again significantly different from zero ( $F(28, 466) = 4.2, p < .001$ ) and 20% of the variance (15% adjusted  $R^2$ ) was explained after accounting for the combined influences of predisposing, enabling and need characteristics. Results at step three indicated that a unique and significant contribution of 7% ( $R^2_{change} = .068, p < .001$ ) was made by need characteristics in predicting family doctor visits. In particular, self-rated health contributed significantly to prediction of doctor visits. The direction of the effect was such that, on the average, those who reported their health as 'not so good' or 'poor' were more

likely to visit their general practitioner. The effects of educational qualifications became less significant on this step in the analysis suggesting that the effects of qualifications may be mediated, at least in part, by the need variables.

Table 2

*Hierarchical multiple regression of predisposing, enabling and need characteristics on Family doctor visits (N=495).*

Predictor	Step 1	Step 2	Step 3
<b>Predisposing characteristics</b>			
Age	-.002	-.001	-.073
Gender	.037	.025	.033
Married/de facto	.001	-.007	-.017
Area (rural/urban)	.041	.022	.015
Qualifications	-.133**	-.118**	-.103*
Phone	-.015	-.046	-.019
Vehicle	.008	-.005	-.055
Life events	.012	-.002	-.001
Social contacts	-.023	-.025	-.064
Alcohol	.050	.052	.037
Health worries	-.283***		-.288***
-.187***			
Health control	.018	.025	-.031
<b>Enabling characteristics</b>			
Doctor's gender		-.022	-.019
Time with same Dr		.059	.060
Fees limiting access		-.067	-.061
Waiting time		.015	-.020
Income		.005	.018
Adequacy of income		-.011	.009
Satisfaction with standard of living		-.014	.015
CS card		-.112	-.089
Health insurance		.025	.018
<b>Need characteristics</b>			
Self-rated health status			.253***
Psychological distress			-.047
Psychological wellbeing			.095
Physical symptoms			.016
Activity			.066
Body			.062
Chronic			.000
<i>R</i>	.333	.365	.449
Total <i>R</i> <sup>2</sup>	.111	.133	.201
Adjusted <i>R</i> <sup>2</sup>	.089	.095	.153
<i>R</i> <sup>2</sup> change	.111***	.022	.068***
<i>F</i>	5.04***	3.46***	4.20***
	(12, 482)	(21, 473)	(28, 466)

\**p*<.05\*\**p*<.01\*\*\**p*<.001

In summary then, predisposing variables explained 9% of variance in GP visits for the year

preceding the interview, whilst need variables accounted for a further 7% of GP utilisation. In all a total 15% of variance in GP use was explained here by the Andersen model. Enabling characteristics were not a significant contributor to the overall regression equation. The data suggest that having fewer educational qualifications, more health worries and rating one's health more poorly are associated with higher use of GP services in the past year.

### Discussion

Although the Andersen model was able to account for significant variability in health care use (specifically family doctor visits) in this indigenous population, one must be cautious about over interpreting this finding. About 15% of the variance was accounted for by the model, a finding in line with other research in the area. In their study of the health care use patterns of older American adults, Wolinsky et al. (1983) found 23% of variance in physician visits were explained by use of the Andersen model. In a later study of the same age group, Wolinsky & Johnson (1991) found that 17% of physician visits were explained by the model. In examining levels of doctor contact, hospital contact and nights in hospital (i.e., volume) for African and European Americans, Keith & Jones (1990) found the model explained up to 17% of the variance in these three forms of care for both ethnic groups of older US citizens.

There is an increasing recognition among indigenous populations, both in New Zealand and elsewhere, that traditional western models of health service provision and health care use may not always facilitate effective health care among such populations (e.g. Hirini et al., 1999). Chapleski et al. (1997) noted that, for Native American elders, there can be barriers associated with (lack of) trust in service providers, having negative past experiences, and the extent to which the service is culturally acceptable. Other writers have noted the importance of developing culturally appropriate models of health/mental health in order to better meet the needs of indigenous populations both in New Zealand (e.g. Hirini, 2004) and elsewhere (e.g. Johnson & Cameron, 2001; Lin & Cheung, 1999). There is a growing recognition of the need to accommodate both traditional healing practices and western approaches in order to offer effective health care to indigenous and minority populations (e.g. Ensink & Robertson, 1999; McNeil & Kennedy, 1997; Novins, Duclos, Martin, Jewett, & Manson 2000; Phan & Silove, 1999; Tolman & Reedy, 1998).

What is the importance and usefulness of assessing Māori experience of health services and the antecedents and consequences of those experiences? We propose a number of products of value to social scientists, to policy makers and implementers of policy, and to those involved in health service delivery. First, there is value in getting some baseline measures against which we can compare subsequent measures and trends of change so that we will know where we are heading. Are health services in New Zealand Māori communities becoming more or less accessible? Is there stability in some areas and change in others? Is there more service utilisation occurring in some areas and less in others?

Second, there is value in knowing how health service utilisation, health experiences and related concerns are distributed in Māori communities. How do different subgroups feel? What about the rich and the poor, the married and unmarried, men and women? Is there change in some subgroups of Māori society and stability in others?

Third, there is value in understanding how Māori people integrate their experiences of health services into their overall health quality of life. What aspects of the person, the health service and the context in which this interaction occurs, are more important than others in determining one's global health quality of life? How do some individuals adapt to health difficulties? How can those with health difficulties who do not or cannot access appropriate health services successfully best be helped?

The importance of research in this area does not need to be defended. Those that would lay claim

to expertise regarding what is best or feasible for a society would agree that understanding the dynamics of health service delivery in a way that offers the most potential for health gain for Māori, is an extremely important social goal.

The issue of communication of research findings is also important here. Flett, Biggs and Alpass (1995a,b) note that there is often a gap between researchers and practitioners - the 'producers' and 'consumers' of health-related research findings. There is often little awareness of research findings by practitioners, case managers, consultants, clinicians and others involved in health service delivery. We argue that it is important for the types of findings reported herein to be communicated to health practitioners and conceivably some insights gained into the nature, sources, and effects of health-related service delivery issues that concern their clients on a daily basis.

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**Endnotes**

<sup>1</sup> Geographic distribution of enumeration districts ( $N = 150$ ) were as follows: Northland ( $n = 16$ ); Auckland ( $n = 23$ ); Waikato ( $n = 19$ ); Bay of Plenty ( $n = 28$ ); Gisborne ( $n = 16$ ); Hawkes Bay ( $n = 7$ ); Taranaki ( $n = 5$ ); Manawatu-Wanganui ( $n = 8$ ); Wellington ( $n = 10$ ); Nelson-Marlborough ( $n = 2$ ); West Coast ( $n = 2$ ); Canterbury ( $n = 7$ ); Otago ( $n = 4$ ); Southland ( $n = 3$ ).

<sup>2</sup> A complete copy of the interview questions and administration procedure is available upon request from the senior author.

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**Authors' Note**

Correspondence concerning this article should be addressed to Dr. Ross Flett, School of Psychology, Massey University, Palmerston North, New Zealand.

E-mail: [R.A.Flett@massey.ac.nz](mailto:R.A.Flett@massey.ac.nz).

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Flett, RA

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