



## The cost to the New Zealand Government of providing 'free' primary medical care: an estimate based upon the Rand Health Insurance Experiment

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### Abstract

**Aim** To estimate the likely cost to the New Zealand Government of providing universally free primary medical care.

**Methods** Estimates of current government expenditure on various categories of health were obtained from Ministry of Health sources. Information from the Rand Health Insurance Experiment was used to estimate the changes in demand for general practitioner (GP) visits, pharmaceutical, laboratory and other referred services, and hospital services. The effects of a supplier response and complement (pharmaceutical) prices were also considered.

**Results** Assuming that GPs act to control their patients' increasing demand for services, providing free primary care to all New Zealanders is likely to cost the Government between \$435 million and \$592 million (based upon 1998/99 year data).

**Conclusions** The difficulties and likely inexactness in making estimates of this sort are acknowledged; however, when considering such important changes in health policy, it is important to attempt to define likely costs (and benefits). Consideration of costs must go beyond simply estimating current private expenditure on primary medical care.

Accessible primary care is acknowledged as important for any health system. Access is determined by a number of factors, including the cost to the patient of using primary care services.<sup>1,2</sup> New Zealand has high user charges for general practice services by the standards of many OECD countries. A number of studies suggest that cost is a significant barrier to at least some New Zealanders' access to GPs.<sup>3-7</sup>

The Primary Health Care Strategy makes it clear that the funding of primary healthcare is on the Government's agenda.<sup>8</sup> There are a number of important advocates for free primary care. For example, in 2000 the National Health Committee recommended that 'The Government should preferentially invest in primary health care services with the intention of moving to fully-funded care over the next five years.'<sup>9</sup>

The cost to the Government of following such a policy is unknown. This paper attempts to estimate this cost using available data on the cost of health services and estimates of increased utilisation of health services that are derived from the Rand Health Insurance Experiment (Rand HIE).<sup>10-12</sup> The Rand HIE remains the only randomized controlled trial of the effect of user charges on health services utilisation. Whilst the costs derived can be considered only as tentative estimates, they are based upon the best information available and may lead to useful discussion.

## Methods

This section necessarily summarises the methods used to calculate the cost of free care. Those who would like a more detailed account should contact the author.

The costs to Government of fully funding general practice care are considered under three categories:

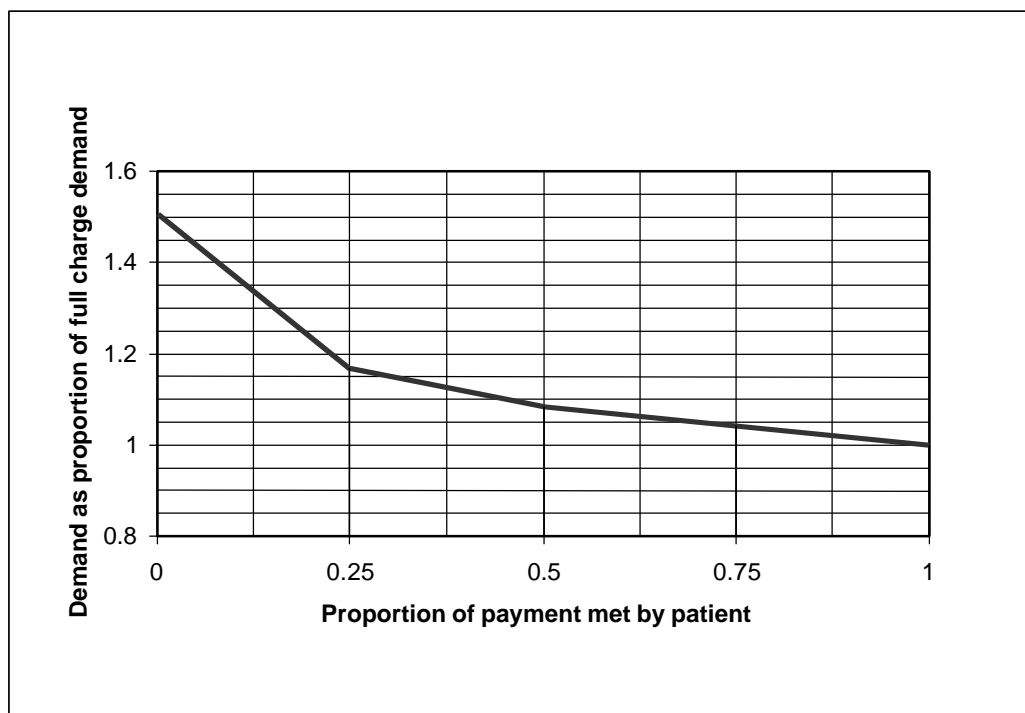
- The costs entailed by the Government taking responsibility for current general practice services that are at present paid for by the private sector.
- The costs of paying for an increase in utilisation of general practice services that occurs because the services are free.
- The costs of paying for any additional health services that result from this increased general practice use (for example, if consumers see GPs more often they are likely to use more medicines).

The costs in this article are calculated using 1998/99 year data. These were the most recent data available to the author. Data on health service expenditure are taken from the Ministry of Health publication *Health expenditure trends in New Zealand 1980–1999*.<sup>13</sup>

**Payment for current GP services** It is assumed that in moving to free general practice care the Government would agree to pay general practices the same amount that the practices currently claim from patients and other private sources. Unfortunately, this amount is not known directly. Ministry of Health estimates are based upon data extrapolated from the Household Economic Survey.<sup>13</sup>

**The cost of paying for new general practice services** The cost of extra GP services used under a free system is dependent upon how much demand increases with a fall in price (the price elasticity of demand, or  $\eta$ ). The best information that is available comes from the Rand HIE.<sup>10–12</sup> Figure 1 shows the number of doctor visits demanded when care is subsidised as a ratio of the number demanded when patients pay the full cost. People who received free doctor visits utilised services just over 50% more than those who paid for all their care.

**Figure 1. Demand for doctor visits with varying user charges (from Rand HIE)**



In New Zealand, many people do not pay the full cost of GP visits (for example because they receive GMS or ACC subsidies, disability allowance or have medical insurance). To estimate the increase in demand for these groups should care become free, it is necessary to estimate their current position on the graph, ie, what proportion of the total cost they currently pay and thus what their current level of demand is as a ratio of full-cost demand. By using this as a baseline we can estimate what their likely increase in utilisation would be if they were to receive free care. For example, if a group is currently

paying half of the full-cost fee, their utilisation is estimated to represent 117% of full-cost utilisation. If they were to receive free care, we could expect them to represent 151% of full-cost utilisation. The increase in demand for this group is therefore estimated to be 151/117, or 129% of their current utilisation. In other words, we would expect their demand to increase by 29%.

The Rand HIE also clearly showed that although Figure 1 represents the overall population's responsiveness to price changes, some groups are more or less responsive than this average.<sup>10,12</sup> In particular, children and lower-income earners were more responsive to price changes than adults and higher-income earners. Therefore, in calculating the expected changes in utilisation, appropriate adjustments were made for these groups. Community services card (CSC) status was used as a proxy for income group.

The Ministry of Health provided estimates of current consultation numbers. It was assumed that children under six years old already receive free care and therefore no change in demand is expected. This may not be entirely accurate, but a 2001 survey of 180 GPs by IMS Health showed that 70% of GPs never charge for children under six and only 5% always charge.<sup>15</sup> Costs are otherwise calculated assuming a standard GP consultation charge of \$38. This figure was estimated using a number of sources.<sup>16,17</sup>

**Doctors' responses to increased demand** The Rand HIE determined utilisation changes due to a 'pure demand' effect of changes in user charges. This means it did not take into account doctors' responses to the increases in demand. The patients enrolled in the experiment made up only a very small part of each doctor's practice. Therefore, even if the enrolled patients increased their demand by 50%, their doctor would not notice any appreciable increase in workload and would be unlikely to respond.

If, as predicted, the public's demand for general practice consultations increases by 28% it seems likely that GPs would act to control this increased workload.

Unfortunately, there is limited empirical evidence about this type of situation. Observational studies suggest that where changes in user charges have been introduced to an entire system (in Great Britain in 1948, Saskatchewan in 1968, and Montreal in 1970), changes in utilisation do seem to have been lower than the Rand HIE suggests.<sup>18-20</sup> New Zealand studies of subsidy changes also suggest lower elasticities of demand.<sup>21,22</sup> Because of these uncertainties, estimates are given for costs at two lower estimates of increased overall utilisation (14% and 7%, Scenarios B and C respectively).

**The price of complements** A further complication of estimating changes in utilisation of general practice care is that demand is likely to be affected by the price of what economists call 'complements' as well as the price of GP consultations. A 'complement' in this context is any service or good that people usually purchase at the same time as the GP consultation. Important complements are medicines and diagnostic tests. The implication of this is that even if GP consultations are free, people will still perceive a cost in seeing a doctor if they expect to pay for a prescription or some other service. For example, if an adult without a CSC now expects to pay \$38 for a consultation and \$15 for a prescription (total \$53), then under free primary care they will still perceive a cost of \$15.

If we make the assumption that patients base their demand on the price of the GP consultation and the cost of one prescription, we can recalculate the increase in demand for different groups using the same techniques as previously (Scenarios D and E).

**The cost of other health service utilisation changes** The Rand HIE suggested that changes in demand for medicines and diagnostic tests were in direct proportion to changes in demand for doctor visits.<sup>12,14</sup> It was therefore assumed that a 10% increase in the utilisation of GP consultations will lead to a 10% increase in the use of medicines and other referred services.

The Rand HIE also found that decreasing user charges for doctors' visits led to an increase in hospital admissions, although this increase was only about one fifth of the rise in visit utilisation (when hospital services were free throughout).<sup>10,11</sup>

No attempt was made to calculate what changes would occur in the use of mental health or disability support services as there is no information available on how the utilisation of these services alter with changing primary care utilisation.

## Results

**Payment for current GP services** In the year ending June 1999, \$262 million was spent by private sources on GP services (\$197 million out-of-pocket and \$65 million by insurance companies).<sup>13</sup>

**The cost of paying for new general practice services** Based upon the Rand HIE, Table 1 shows that if all user charges for general practice consultations were removed we could expect an increase in the demand for consultations of between 19% and 47% depending upon the group involved, and 28% overall. The cost of paying for these extra consultations is calculated at \$202 million.

**Table 1. Calculation of increased number of consultations and costs associated with free general practice**

Group	Demand increase (%)	Current consults (n)	New consults (n)	New costs (\$)
<b>Non-ACC</b>				
<b>Child Y</b>		2 884 020	0	
<b>Child J</b>				
Card holder	47	974 789	456 419	17 343 917
Non-card holder	32	938 347	297 630	11 309 935
<b>Adult</b>				
Card holder	39	5 644 789	2 215 069	84 172 640
Non-card holder	28	6 095 011	1 716 388	65 222 751
<b>Total</b>	28	16 536 956	4 685 506	178 049 242
<b>ACC</b>				
<b>Child Y</b>		16 335		
<b>Child J</b>				
Card holder	39	133 060	51 312	1 949 875
Non-card holder	29	264 062	65 018	2 470 695
<b>Adult</b>				
Card holder	30	764 539	229 955	8 738 280
Non-card holder	19	1 526 371	283 889	10 787 777
<b>Total</b>	23	2 704 367	630 174	23 946 627
<b>TOTAL Non-ACC +ACC</b>				
<b>Child Y</b>				
<b>Child J</b>				
Card holder				19 293 791
Non-card holder				13 780 630
<b>Adult</b>				
Card holder				92 910 920
Non-card holder				76 010 528
<b>TOTAL</b>				<b>201 995 869</b>

**The cost of other health service utilisation changes** Table 2 shows costs for various referred services for 1998/99 and calculated new costs given increased demand due to free general practice care in the base scenario. Twenty eight per cent increase in demand is used for public and private expenditure and 23% for ACC expenditure.

Table 3 shows the equivalent costs for increased use of medical and surgical hospital services. The cost of providing for the increased utilisation of hospital services is calculated at \$136 million.

**Table 2. Referred service costs for free general practice care, 1999 (\$ millions)<sup>13</sup>**

	Public		ACC		Total new cost
	Existing	New	Existing	New	
Medicines	763.4	215.7	1.5	0.3	216.0
Specialist	21.9	6.2	19.8	4.6	10.8
Laboratory	205.6	58.1	0.3	0.1	58.2
Physiotherapy	0	0.0	57.9	13.3	13.3
Diagnostic	29.7	8.3	44.8	10.3	28.6
Other	17.1	4.8	7.6	1.7	6.5
<b>Total</b>		<b>293.0</b>		<b>30.3</b>	<b>323.3</b>

**Table 3. Existing and new costs for institutional medical and surgical care, 1999 (\$ millions)<sup>13</sup>**

	Public		ACC		Total new cost
	Existing	New	Existing	New	
Public institutions	1956.9	121.6	103.5	6.5	128.1
Private institutions	110.1	6.8	8.8	0.6	7.4
<b>Total</b>	<b>2067.0</b>	<b>128.5</b>	<b>112.3</b>	<b>7.0</b>	<b>135.5</b>

**Overall cost of free general practice care** The total cost of free general practice care to the Government according to these calculations is in the order of \$922 million (Scenario A, Table 4).

**Table 4. Total new costs to the government of free general practice care ('pure demand' effect)**

Category of costs	Scenario A (\$ million)
<b>General practice</b>	
Transfer of current user charges to government	262
Costs of extra consultations	202
<b>Other</b>	
Referred service costs	323
Hospital costs	136
<b>Total</b>	<b>922</b>

**Doctors' responses to increased demand** The above costs do not take into account doctors' responses to increased demand. As discussed above, it is assumed that GPs do act effectively to reduce this increase in utilisation by 50% or 75%. Therefore, there is a 14% or 7% increase in use of GP services rather than 28%. The total cost to the government with this scenario is therefore \$592 or \$428 million (Scenarios B and C, Table 5).

**Table 5. Total new costs to the government of free primary care (with GP response)**

Category of costs	Scenario B 50% of 'pure demand' utilisation increase (\$ million)	Scenario C 25% of 'pure demand' utilisation increase (\$ million)
<b>General practice</b>		
Transfer of current user charges to government	262	262
Costs of extra consultations	101	51
<b>Other</b>		
Referred service costs	161	81
Hospital costs	68	34
<b>Total</b>	<b>592</b>	<b>428</b>

**The price of complements** Table 6 is calculated using the additional assumption that patients base their demand on the price of the GP consultation and the cost of one prescription. The overall increase in demand for GP consultations with this assumption is 15% (compared with 28% previously). Again, this increase can be halved to account for doctor's response to this demand increase. Table 6 indicates that the cost to Government with these assumptions is \$435 million or \$349 million (scenarios D and E).

**Table 6. Total new costs to the Government of free primary care (with GP response and accounting for continued prescription costs)**

Category of costs	Scenario D 50% of 'pure demand' utilisation increase (\$ million)	Scenario E 25% of 'pure demand' utilisation increase (\$ million)
<b>General practice</b>		
Transfer of current user charges to government	262	262
Costs of extra consultations	54	27
<b>Other</b>		
Referred service costs	84	42
Hospital costs	35	18
<b>Total</b>	<b>435</b>	<b>349</b>

## Discussion

Before any major change in health policy is made, it is important to at least estimate the likely costs and benefits. This study has attempted to estimate the costs of providing free primary care in New Zealand. Perhaps one of the outstanding results of attempting this process is the realisation of the degree of uncertainty there must be around these estimates. They are based upon limited data, estimates of price elasticity that may not be valid in the New Zealand situation, and several important assumptions.

Accounting for current user charges might seem to be the simplest part of this exercise. Yet user charges for GP consultations are not currently recorded on a national basis. The estimate used here is taken from the Ministry of Health publication *Health Expenditure Trends in New Zealand 1980–1999* and this in turn is extrapolated from the Household Economic Survey.<sup>13</sup> An alternative approach is to multiply the estimated annual number of GP consultations by an estimate of user charges in each group. User charges can be estimated by deducting the GMS subsidy from the estimated average charge of \$38. This approach, however, gives a much greater figure of \$433 million as the total cost of GP user charges. The majority of the \$171 million difference can probably be explained by the fact that GPs often do not charge for consultations, or charge substantially less than their normal fee. Tilyard and Dovey showed that in one region in 1993 GPs charged their normal or advertised fee in only 37% of cases.<sup>23</sup>

Estimates of increased GP use and referred service and hospital use are based upon the Rand HIE. This was a randomized controlled trial that compared health service utilisation among groups of people who were subject to different co-payments. This paper assumes that the differences in utilisation by groups facing different co-payments can reasonably be equated to changes in demand that would occur if people faced equivalent co-payment changes. The Rand HIE was carried out in several centres in the USA in the late 1970s. The elderly and many people with disabilities were excluded from the study because they were already covered by public health insurance. Using a 25-year-old study, performed in the USA, which excluded important groups of the population is clearly less than ideal. However, it is the only experimental study of this sort ever performed and the only study that has looked at utilisation over a range of user charges.

It is not surprising that decreasing the cost of general practice consultations will lead to an increase in demand and utilisation of these services. However, the shape of the curve in Figure 1 is perhaps less predictable than one would think and has important implications. It shows that the majority of patients' response to user charges occurs with small charges. The size of demand increases when shifting from full user charges to 25% user charges were much smaller than those that occurred when shifting from 25% user charges to free care. If this were to be repeated in New Zealand it would have two important implications. First, even though many patient groups in New Zealand already receive substantial subsidies for general practice care, if their care became free we should expect large demand increases. Second, if the Government did wish to limit demand increases, whilst reducing the financial burden of primary medical care on households, this could be achieved by maintaining modest user charges.

Whilst the Rand HIE provides the best available information on increased demand for doctors' consultations with decreasing user charges, it tells us nothing about how doctors might respond to this increased demand. It seems clear that doctors have some degree of control over utilisation of their services, even when they have no control over price.<sup>24–26</sup> If changes in user charges are introduced to an entire health system the size of utilisation changes may well be smaller than expected.

When free care was introduced to Great Britain in 1948 it was estimated that utilisation of physician visits, for those groups not previously covered by National Health Insurance, increased between 10.7% and 16.2%.<sup>18</sup> The introduction of free

care in Montreal in 1970 led to a 21.8% increase in utilisation of office or home visits, balanced by a reduction in phone consultations and hospital-based care (which was already free).<sup>19</sup> The introduction of a 33% co-payment for office visits in Saskatchewan in 1968 saw a fall in utilisation that was estimated to be between 5.6% and 7.2%.<sup>20</sup>

In New Zealand, an opportunity to study the effect of moving from subsidised GP consultations to free care for children under six years occurred with the introduction of the Free Child Health Care Scheme (FCHCS) in 1997. An evaluation compared GP utilisation for the year prior to the scheme's introduction with the year following introduction.<sup>21</sup> Depending upon the database analysed, the increase in utilisation was estimated at between 6% and 23%. Another New Zealand study examined utilisation changes that occurred with changes in GP consultation subsidies in 1992 and again suggested a lower price elasticity of demand than the Rand HIE (about 18%).<sup>22</sup> The degree to which doctors may wish to exercise this control with the introduction of free care will depend upon the circumstances in which it is introduced. If doctors are paid under a capitation arrangement they will have a greater incentive to control demand than if they are paid by fee-for-service. The supply, morale and workload of doctors will have a strong impact upon the increased provision of services. The number of doctors in primary care is currently declining, and if this were to continue it would limit any increase in utilisation. Nurse and other primary care professional consultations may be substituted for GP consultations and the ability and willingness of these healthcare professionals to meet increased demand will also be important factors.

One of the alleged shortcomings of user charges for primary care is that they raise overall costs by causing people to delay seeking care, leading to worsening of conditions and the subsequent need for more intensive and expensive care (especially hospitalisation). Certainly, there would seem to be considerable scope for primary care to prevent hospitalisations. Nineteen per cent of hospitalisations in New Zealand in 1996 and 1997 were classified as ambulatory sensitive hospitalisations meaning that they were potentially avoidable by utilisation of good primary care.<sup>27</sup> The rate of ambulatory sensitive hospitalisations has been increasing over the last decade.

However, the Rand HIE clearly showed that, for adults at least, decreased user charges for primary care led to an increased utilisation of hospitals.<sup>10,11</sup> It is certainly not clear that this should be regarded as a negative effect. It may be that increased utilisation of primary care allowed the recognition of disease that had been previously under-treated. It should also be noted again that the Rand HIE excluded many who might have benefited most from the primary care management of chronic disease, ie, the elderly and those eligible for Medicaid. Further, the experiment followed enrolled patients for three or five years only.

A further issue is that the provision of free primary medical care in New Zealand might encourage a change in style of practice as well as an improvement in access. Free care would assist the primary care sector in taking a population and preventive focus. This, in turn, may lead to an improvement in health and reduced hospitalisation.

In summary, the costs to the Government of providing 'free' general practice care are very difficult to estimate with any accuracy. What is clear is that when trying to

estimate these costs it is important to move beyond simple estimates of how much is currently privately paid for general practice services. If the primary reason for making general practice free is to improve access we must expect some increase in utilisation of these services. Compensation for this increase in utilisation is essential. In addition, any increase in utilisation will have implications in downstream costs that are likely to be large. Pharmaceutical, laboratory and other referred service costs will increase, and it is quite possible that hospital costs will also increase. Certainly, it would seem to be naive to assume they will decrease.

Estimates based upon the Rand HIE made in this article vary widely from \$349 million to \$922 million depending upon assumptions. A best estimate would include some degree of limitation on increased utilisation due to doctors' responses and a further reduction due to the continued costs of medicines and other complements. This would imply a total expense to the government of between \$435 and \$592 million (scenarios D and B). These costs need to be balanced against potential benefits, which are not discussed here.

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#### References:

1. International Conference on Primary Health Care. Primary health care: report of the International Conference on Primary Health Care, Alma-Ata, USSR. Geneva: World Health Organisation; 1978.
2. Penchansky R, Thomas JW. The concept of access: definition and relationship to consumer satisfaction. *Med Care* 1981;19:127-40.
3. Ministry of Health. Taking the pulse: the 1996/97 New Zealand health survey. Wellington: Ministry of Health; 1999.
4. Manukau City. Manukau quality of life survey. Auckland: Manukau City; 1993.
5. Dixon F, Watt J, Thompson R, et al. The influence of increased health care costs on general practitioner consultations and prescription collection. *NZ Med J* 1994;107:353-5.
6. Barnett RJ, Coyle P. Social inequality and general practitioner utilisation: assessing the effects of financial barriers on the use of care by low income groups. *NZ Med J* 1998;111:66-70.
7. Health and Disability Analysis Unit, Midland Health. Family health services in the Midland Health Region. Hamilton: Midland Health; 1997.
8. King A. The primary health care strategy. Wellington: Ministry of Health; 2001.
9. National Health Committee. Closing the gaps through primary health care in New Zealand. Wellington: National Health Committee; 2000.
10. Manning WG, Newhouse JP, Duan N, et al. Health insurance and the demand for medical care: evidence from a randomised experiment. *Am Econ Rev* 1987;77:251-77.
11. Newhouse JP, Manning WG, Morris CN, et al. Some interim results from a controlled trial of cost sharing in health insurance. *N Engl J Med* 1981;305:1501-7.

12. Lohr KN, Brook RH, Kamberg CJ. Use of medical care in the Rand Health Insurance Experiment. Diagnosis- and service-specific analyses in a randomized controlled trial. *Med Care* 1986;24(9Suppl):S1-87.
13. Ministry of Health. Health expenditure trends in New Zealand. Wellington: Ministry of Health; 1999.
14. Leibowitz A, Manning WG, Newhouse JP. The demand for prescription drugs as a function of cost-sharing. *Soc Sci Med* 1985;21:1063-9.
15. IMS Health. Kids still free but GPs want a rise in subsidy. *NZ Doctor*, 1 August 2001.
16. Consumer's Institute. What do you pay your doctor? *Consumer* 1996;347:24-5.
17. Yeoman Contracting Ltd. Audit of Ministry of Health GMS cost model. Wellington: Yeoman Contracting Ltd.; 2001.
18. Stewart W, Enterline PE. Effects of the National Health Service on physician utilisation and health in England and Wales. *N Engl J Med* 1961;265:1187-94.
19. Enterline PE, McDonald JC, McDonald AD, et al. Effects of "free" medical care on medical practice – the Quebec experience. *N Engl J Med* 1973;288:1152-5.
20. Beck RG, Horne JM. Utilization of publicly insured health services in Saskatchewan before, during, and after copayment. *Med Care* 1980;18:787-806.
21. Dovey S, Tilyard M, editors. Evaluation of the Free Child Health Care Scheme: a report to the Health Funding Authority. Dunedin: University of Otago; 1998.
22. O'Dea D, Szeto K, Dovey S, Tilyard M. The effects of changes in user charges on visits to New Zealand GPs. Paper for the NZ Association of Economists conference. Christchurch: Lincoln University; 1993.
23. Tilyard MW, Gurr E, Dovey SM. Changes in payments for general practice consultations 1989-93. *NZ Med J* 1996;109:252-4.
24. Kutzin, J. The appropriate role for patient cost sharing. In: Saltman RB, Figueras J, Sakellarides C, editors. Critical challenges for health reform in Europe. Buckingham: Open University Press; 1998.
25. Fahs MC. Physician response to the United Mine Workers' cost-sharing program: the other side of the coin. *Health Serv Res* 1992;27:25-45.
26. Davis P, Gribben B, Lee RL, McAvoy B. The impact of the new subsidy regime in general practice in New Zealand. *Health Policy* 1994;29:113-25.
27. Ministry of Health. Our health, our future: hauora pakari, koiora roa. Wellington: Ministry of Health; 1999.