The Royal New Zealand
College of General Practitioners

Forecasting GP Workforce Capacity

Towards an understanding of GP workforce capacity, long-term forecasting and benchmarking tools

OCCASIONAL PAPER 8

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College of General Practitioners

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Abstract

A key objective of the 2005 Health Workforce Advisory Committee's Consultation Document, *Fit for Purpose and for Practice* (HWAC, 2005: 1) was to 'develop commitment to an agreed national health workforce planning strategy' – in other words, a national blueprint for health workforce development. One of the fundamental deficiencies in developing a centralised workforce plan is the lack of consistency on the use of a standardised GP workforce benchmark. This paper suggests some criteria for formulating an acceptable and appropriate GP workforce benchmark, designed specifically for the New Zealand health context. The issues raised here aim to generate discussion on whether a central advisory body should set a GP workforce benchmark and, if so, how a NZ GP workforce benchmark should be determined. It should be understood that the primary purpose of a GP benchmark is to determine GP workforce numbers to meet New Zealand's primary health care needs. It is also noteworthy that the actual GP to population ratio is falling because many of the GPs counted by the Government are either sub-specialised or working as part-timers. Of all the scenarios presented, Scenario 2 (1:1,012 or 99:100,000 GP:Popn.), Scenario 3 (1:946 or 106:100,000 GP:Popn.), Scenario 5 (1:1,046 or 96:100,000 GP:Popn.), Scenario 6 (1:977 or 102:100,000 GP:Popn. for rural NZ), and Scenario 9 (1:989 or 101:100,000 GP:Popn.) present the best working environments for GPs, with adequate time for consultations in a normal working week, sufficient time for continued medical education (CME[1]) and reasonable provision for a healthy lifestyle. These GP benchmarks will also ensure that the quality of primary health care is not compromised, and that every New Zealander has access to a GP.

[1] CME is a requirement from the Medical Council of New Zealand (MCNZ) for ongoing registration, and keeps GPs/Drs up-to-date with medical knowledge and skills.

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Introduction

It is important to clarify the terminology used here and draw a clear distinction between a benchmark and a ratio. By definition, a **benchmark** is a standard by which something can be measured or judged. One element of a benchmark is a **ratio**: a measure that accounts for the relation between two quantities expressed as the quotient of one divided by the other. Unfortunately, these terms are often used interchangeably by policy makers.

In New Zealand, the GP ratio essentially indicates **an adequate general practitioner (GP) workforce to service a population's health needs**. International studies have considered GP ratios as benchmarks on which to gauge workforce shortages and assess phenomena such as 'brain drain', educational matriculation and workforce retention. The very nature of a GP ratio presumes that the measure can be readjusted according to increasing workloads (i.e. the population count may stay the same but the needs of an ageing population may require an increased level of health care that consequently increases the demands on an existing workforce) and increasing population (i.e. an increasing population count demands a higher number of GPs in the workforce to cope with new patients). However, the simplicity and the development of such ratios can fall short of accurately describing the capacity of the health workforce. A GP workforce benchmark should not be based solely on a GP to population ratio.

At present, New Zealand has an official '**GP per Population ratio**' of 1:1,400 in Section 51 of the Health and Disability Services Act 1993, for the purpose of issuing a Notice to practise in a locality. However, this ratio is not used because its accuracy is considered questionable. The New Zealand Medical Association (NZMA, 2004)[2] notes that 'an ideal ratio of doctor per population for New Zealand conditions has not been established, so a measure of the service gap cannot be easily determined'. In this discussion paper it should be noted that, where possible, a general practitioner to population ratio is presented rather than an 'all-encompassing' doctor[3] to population ratio.

While this paper identifies the criteria for developing an NZ-specific GP workforce benchmark, a situation analysis of international GP ratios is also provided. International data allows quick comparisons, but there are many pitfalls to using 'their ratios' as opposed to having one specifically designed for the New Zealand context. The Australian GP ratio is still used as a guide for NZ workforce analysis (NZMA, 2004: 11). The issues raised here are meant to generate discussions on how New Zealand GP workforce benchmark should be determined.

[2] NZMA: An analysis of NZ GP Workforce (2004) has noted the impact of various ratios on the current level of GPs based on data collected in 2002. The conclusion remains the same; there is a GP shortage in New Zealand especially in rural areas.

[3] The term 'doctors' is often inclusive of other skilled health practitioners such as specialists, gynaecologists, anaesthetists etc. General Practitioners (GPs) form a specific section of the health workforce.

Why should New Zealand consider standardising a national GP workforce benchmark?

As the Australian Medical Workforce Advisory Committee (1996) concluded, '…the whole point of establishing benchmarks for medical workforce is to provide the basis for predicting what workforce size and composition will be desirable in the future, and to monitor whether the desirable level has been achieved (AMWAC, 1996: xxi). As with many other countries, there is growing concern in New Zealand that there will not be enough general practitioners to meet the expected demands of future health care needs. These concerns are based on the anticipated growth of the population and the projected increase in the ageing population, as the 'baby boomer' generation steadily reach the age of 65. For the purposes of forecasting shortages in health care provision, providing quality health care and adequate GP training levels, measuring the health workforce with a greater degree of accuracy and consistency is imperative.

In a recent study, Brabyn and Barnett (2004) provided a New Zealand ratio of '1400 patients per full-time GP – which is the number used by the Ministry of Health (2001) for a full-time work load' (Brabyn and Barnett, 2004: 3), however they give no reasoning as to how the ratio was established (more specifically, what constitutes a full-time workload) and acknowledge the inadequacy of such a simplistic ratio as 'a crude measure of geographical access'. Not only is this measure too simplistic to provide accuracy but it does not account for the dynamic nature of the NZ health system over the three year period since the Ministry of Health report. In recognition of its inadequacies as a measure, they incorporate two further methods of evaluation in their analysis: a least cost path analysis (LCPA) and an allocation technique that looks at the number of GPs available and considers how many people a GP can service. 'Both methods represent an improvement on traditional ratio measures of GP access, as they involve more detailed calculations of travel distances and travel times. In addition, they are not constrained by area boundaries and aggregation problems of ignoring the intra-district location of GPs relative to their patients' (Brabyn and Barnett, 2004: 3).

A longitudinal summary of New Zealand's GP:patient population ratio is provided in Table 1. The figures presented in Table 1 represent GPs who are vocationally registered or have an APC[4] with the New Zealand Medical Council (MCNZ). The MCNZ ratios for all doctors are given as a range so as to acknowledge the difference in how the MCNZ defined GPs and other specialist doctors i.e. they consider 'Active Medical Practitioners' (AMPs) and 'AMP and temporary registrants' as two distinct categories in their 2004 estimates. In some instances, temporary registrants have not been included in the MCNZ's workforce surveys even though a significant percentage of these are working in general practice. Very little is known about this group of doctors (temporary registrants).

[4] APC is the Annual Practicing Certificate issued by MCNZ to all current GPs and other doctors.

Table 1: Longitudinal Summary of New Zealand's GP:Population Ratio

Longitudinal Summary of New Zealand's GP:Population Ratio[5]					
Year	**Total Number of GPs***	**Population (est.)**	**Ratio:Pop^n**	**Ratio GPs: 100,000 Pop^n**	**MCNZ ***Ratio Drs: 100,000 Pop^n**
1999	3,191	3,851,200	1:1,207	83:100,000	157:100,000
2000	3,166	3,873,000	1:1,223	82:100,000	171:100,000
2001	3,037	3,912,100	1:1,288	77:100,000	190-195:100,000
2002	2,917	3,975,900	1:1,363	73:100,000	205-208:100,000
2003	3,006	4,039,400	1:1,344	74:100,000	223-234:100,000
2004	3,099** (est.)	4,084,200	1:1,318	76:100,000	213-233:100,000

* The information has been sourced from MCNZ (2004/2005) workforce reports with data from 2002–2003.

** This figure is derived from the percentage increase from MCNZ figures 2002 to 2003 (3.1%) applied to provide a 2004 estimate.

*** This figure is inclusive of the numbers of GPs in NZ including those working in the secondary and tertiary health systems. The two ratios (GPs vs All drs) is not directly comparable.

GP numbers have fluctuated over the period from 1999 to 2004. The 'GP count' from the RNZCGP (the College) and the MCNZ are not exactly comparable, because MCNZ records those GPs currently practising, and the College counts all members regardless of their work status i.e. some College members are retired, some are taking a break to raise families and some are working overseas. While there has been an increase in the number of GPs in 2003, the trouble with taking this increase as a sign that GP numbers will cope with the population's needs comes when one realises that other impacting factors are not taken into consideration, i.e. a declining interest in training as a GP (NZMA 2005), a growing part-time workforce, difficulty in retaining GPs[6] and a steadily increasing ageing population (Bryant et al. 2004; NZIER, 2004; RNZCGP Survey 2005/2006). These factors will undoubtedly have a significant impact on the adequacy of a GP ratio (RNZCGP Membership Survey Reports Part I, II, III; 2005/2006). Interestingly, the overall doctor to population ratio has actually increased since 1999 (right-hand column in Table 1). This indicates a shift to specialist care that is often expensive and contrary to the Primary Health Care Strategy (2001), and possibly 'masks' shortages in some specialist areas like general practice.

Generally, a health workforce is considered at risk if the GP:patient population ratio reaches 1:2000, an alert level (London, 2002). At present, the GP:patient population ratio is in the vicinity of a 1:1288 national average and 1:1350–1939 average for rural New Zealand (RNZCGP, 2005; NZMA, 2004).

In addition, this marginal increase in GP numbers could be skewed by an increase in Overseas Trained Doctors (OTDs) rather than maintaining a balance with a New Zealand trained workforce. The 2004 ratio itself, is worked on an approximation of the total number of GPs in NZ practising in 2004, i.e. there was a 3.1% increase in GP numbers from 2002–2003 (as per MCNZ Annual Report, 2005: 13) hence the 2003 figure has been multiplied by this percentage increase to provide approximate GP numbers for 2004.

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5 The data in this table is from the MCNZ APC forms. This excludes doctors who are temporary registrants.

6 An October 2004 study of 296 newly graduated doctors (158 respondents) revealed that 25% of the respondents intended to leave New Zealand after one year and nearly two-thirds of the respondents stated that they would consider leaving New Zealand within three years of graduation (O'Connell, 2004: 20-26).

Despite HWAC's own admission that the use of 'models for forecasting demand and supply requirements, such as the use of target practitioner to population ratios, are of limited use in complex and rapidly changing environments' (HWAC, 2005: 59), basic practitioner to population ratios continue to be used by policy makers to indicate sufficient or insufficient workforce capacity (HWAC, 2005: 5, 22, 23, 29–31, 110–111, 119–120; NZMA, 2004). Indeed, HWAC's 2005 stocktake of the health workforce expressed 'major concerns about the general practice workforce situation and the significant decline in the GP to population ratio in recent years' (HWAC, 2005: 5).

International estimations of health workforce capacity: A New Zealand comparison

This section examines what constitutes an adequate GP workforce benchmark for assessing international GP workforce requirements and aims to understand how workforce 'shortages' have been estimated overseas and what lessons can be learnt from the process of 'benchmarking' desirable workforce levels.

The table below (Table 2[7]) demonstrates, as far as it is possible, a comparison of international GP and all doctors:population ratios. The determination of these ratios is generally not explained and so, for most, it is unclear as to how the 'per 100,000 of population' ratio is arrived at or, in some cases, whether this ratio is considered adequate or inadequate. Using a ratio of GPs per 100,000 of population only provides a relative measure of patient access to primary health care and is flawed in simplicity – not every patient will go to the closest GP and many other factors (as we will discuss later) impact on a GP's capacity to see patients. While there are obvious limitations to using ratios and, indeed, to an international comparison of such ratios, it is interesting to see what ratios have been adopted overseas and what factors have come into play in their determination. Are they 'purely' ratios or are they complex benchmarks that include measures of GP/Dr workload, type of work and workforce composition?

Two of the most important factors that need to be considered when comparing international GP ratios are the international differences in health systems and health delivery. In terms of health systems, ratio comparisons with other countries must account for different mixes of public/private contributions to delivery of health care. In addition, countries may also vary on their delivery of health care. In some cases, health care may be provided by a team of health professionals, a team in which the GP may not necessarily take the lead role. It has been argued that nurse practitioners can also handle a workload that would otherwise be the domain of the GP. However this has yet to be demonstrated in New Zealand. These intrinsic differences in the provision of health care across countries are but another reason why international ratios may not 'fit' the New Zealand health context. For instance, the World Health Organization ratio of 1:3500 (Table 2) may well be adequate if the workforce on which the estimate is based also boasts a sizeable and complementary nurse practitioner workforce or for developing countries where resources are very limited but demand is excessive.

While this kind of 'head count' ratio can be useful in providing workforce estimations and projections, 'the geographic variation in the proportion of doctors working part-time restricts the usefulness of the measure. As such, a common workload unit is required to provide comparability' (ORMSA, 2002: 1).

[7] Information for this table was compiled from a number of sources including: Mullan, 2004 'Filling the Gaps: International Medical Graduates in the United States, The United Kingdom, Canada and Australia' Conference Paper. http://www.health.nsw.gov.au/amwac/amwac/pdf/8sess4_mullan.pdf.

Table 2: A Comparison of International Ratios

Country	Year	Number of Physicians/GPs	Population	Ratio – Drs*:per 100,000 population	Type of Health System/Delivery	Rural Distinction	Urban Distinction
World Health Organisation (WHO)	2004			29:100,000 = 1:3,500	Various international systems	N/A	N/A
New Zealand Area – 268,680km^2	1999	3,191	3,851,200	83:100,000 = 1: 1,207 (GP ratio) 157:100,000 (all dr. ratio- MCNZ)	Public/private mix with relatively few practice nurses	"	"
	2000 (OECD, 2001)	3,166	3,873,000	220:100,000 =2.2:1,000 = 1:455 (OECD) 82:100,000 = 1:1,223 (GP ratio) 171:100,000 (all dr. ratio- MCNZ)		"	"
	2001	3,037	3,912,100	77:100,000 = 1:1,288 (GP ratio) 190-195:100,000 (all dr. ratio-MCNZ)		"	"
	2002	2,917	3,975,900	73:100,000 = 1:1,363 (GP ratio) 205-208:100,000 (all dr. ratio-MCNZ)		"	"
	2003	3,006	4,039,400	74:100,000 = 1:1,344 (GP ratio) 223-234:100,000 (all dr. ratio-MCNZ)		"	"
	2004	3,099	4,084,200	76:100,000 = 1:1,318 (GP ratio) 213-233:100,000 (all dr. ratio-MCNZ)		"	"
United States Area – 9,631,418 km^2	1999 (OECD, 2001)			270:100,000 = 2.7:1,000 = 1:370 (all Drs.)	Private health care dominates	"	"
	2004 (Mullan, 2004)	796,013	285 million	279:100,000 = 2.8:1,000 = 1:358 (all Drs.)		"	"
United Kingdom Area – 244,820km^2	1999 (OECD, 2001)			180:100,000 = 1.8:1,000 = 1:556 (all Drs.)	Integrated health care with greater involvement of practice nurses	"	"
	2002 (NHS, 2005; Malcom, 2005)			44:100,000 = 1:2,273		"	"
	2004 (Mullan, 2004)	136,536	60 million	228:100,000 = 2.28:1,000 = 1:439 (all Drs.)		"	"

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Australia **Area – 7,686,850km^2**	1994 (AMWAC, 2002)	18,673		205:100,000 = 2.05:1,000 = 1:488 (all Drs.)	Practising clinicians National Average – Primary care workforce	N/A	N/A
	1995 (AMWAC, 1998)			254:100,000 = 2.54:1,000 = 1: 394		"	"
	1995 (AMWAC, 1998)			116:100,000 = 1:864		108:100,000 = 1.929	129:100,000 = 1:778
	1998 (CDHAC)			111:100,000 = 1:898 (GP ratio)		N/A	N/A
	1998 (AMWAC, CDHAC)	20,852		111:100,000 = 1:904 (GP ratio)		"	"
	1999 (Mullan, 2004)	50,221	20 million	247:100,000 = 1:405 (All drs.)		"	"
	2000 (DHAC)			111:100,000 = 1:898 (1:1153 FTW) (GP ratio)		99:100,000 = 1:1,012 (AMWAC)	"
	2000 (DHAC-RLRP est.)			78:100,000 = 1:1,280 (FTE) (GP ratio)		N/A	"
	2000 (Healthwiz)			91:100,000 = 1:1,100 (GP ratio)		"	"
	2000 (AMWAC)			110:100,000 = 1:904 (GP ratio)		"	"
	2001 (CDHAC)			93:100,000 = 1:1,076 (GP ratio)		"	"
	2001 (DHAC)			110:100,000 = 1:904 (GP ratio)		"	"
	2001 (Healthwiz)			91:100,000 = 1:1,097 (GP ratio)		"	"
	2002 (ABS, 2003)			96:100,000 = 1:1,042 (GP ratio)		"	"
	2002 (Productivity Commission)			85:100,000 = 1:1,176 (GP ratio)		"	"
	2002 (DoHA August)			76:100,000 = 1:1,319 (FTE) (GP ratio)		"	"
	2002 (DoHA November)			72:100,000 = 1:1,397 (FTE) (GP ratio)		"	"
	2004		20 million			"	"
	2005 (2002)			220:100,000 projection (All drs.)		"	"
Canada **Area – 9,984,670km^2**	1961 (Ward, 2004)			857:100,000 = 1:117 (All drs.)		"	"
	1971 (Ward, 2004)			671:100,000 = 1:149 (All drs.)		"	"
	1981 (Ward, 2004)			549:100,000 = 1:182 (All drs.)		"	"
	1991 (Ward, 2004)			475:100,000 = 1:211 (All drs.)		"	"
	2001 (Ward, 2004)			478:100,000 = 1:209 (All drs.)		"	"
	2002 (Mullan, 2004)	68,096	31 million	220:100,000 = 1:455 (All drs.)		"	"
	2004		32 million			"	"

* This figure is inclusive of GPs in the various countries. Where possible a separate figure for the number of GPs is listed separately. As discussed earlier, variations in international data recording means that it is not possible to provide direct comparisons. Here, we have tried to include a variety of specific GP classifications, ranging from those who are medical graduate (MG's) to registered GPs. The date given in brackets is the date this information was published. We have endeavoured to provide only the most recent references.

A review of overseas ratios reveals that these international measures are not always directly comparable and that they often vary according to:

- variations in the benchmark itself, that is, the population registered against the GP/Dr in the ratio;
- demographic disparities between countries and within countries, e.g. urban and rural differences;
- economic disparities between countries and within countries, e.g. this can be related to perceptions of what constitutes adequate care;
- data that encompasses a different variety of health practitioners, e.g. data can specifically refer to GPs only or equally include different health practitioners or specialists such as anaesthesiologists, cardiologists etc.;
- differences in data determinations based on remuneration, e.g. full-time workload equivalents [FWE], full-time equivalents [FTE], salaried practitioners, permanent part-time practitioners or locums;
- differences in data determination based on more specific workload estimates, i.e. the average hours worked by a GP each week;
- differences in terms of patient demographics, e.g. meeting the needs of an ageing population;
- differing definitions of how a GP or physician is classified, e.g. based on differing stages of vocational registration such as specialist registrars, GPs, GP registrars, or physicians;
- the inclusion of overseas trained doctors (OTDs), whether they are registered or temporary resident doctors.

Looking at a comparison of international benchmarks (Table 2), it seems obvious that standards set overseas are not suitable to evaluate the New Zealand health context. One must only look to the amount of variation amongst Australian health planners for the reason to standardise a benchmark for the New Zealand context. In fact, Australia, despite the benefits of setting benchmarks for the purposes of health workforce planning, has too many benchmarks and the 'benchmarks in use [in the Australian context] are consistently inconsistent' (NSW Rural Doctors Network, 2003).

To calculate, project and plan the GP workforce in New Zealand more accurately, a method similar to that used by the Australian Medical Workforce Advisory Committee needs to be adopted, a benchmark that recognises the number of practicing GPs, demographic fluctuations, regional differences, socio-economic deprivation levels, workforce dynamics (i.e. the number of assisting nurse practitioners) and average GP workloads. For more effective workforce planning and forecasting, a more appropriate way to determine workforce capacity is to consider a number of aspects of workforce supply such as:

- the hours worked by a full-time general practitioner;
- the level of staffing in primary health care teams (i.e. the numbers of nurse practitioners working with the GP);
- the number of practice nurses, and their current scope of practice (this could also include their ability to identify what and how much of the current GP's workload they could take over, other than paperwork);
- the burden of disease in the country/community (number of patient visits to GPs);
- patient distribution (i.e. rural and urban populations) and demographics (i.e. ageing population);
- patient access and socio-economic deprivation levels[8] (i.e. income levels, housing, distance to the nearest GP, etc.);
- the dynamics and context of the New Zealand health system.

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[8] Socio-economic levels have been linked to health outcomes in that lower socio-economic levels result in poorer health outcomes (MoH & Uni. Of Otago, 2006).

Calculating a GP workforce benchmark for New Zealand

As mentioned earlier, Brabyn and Barnett (2004) have proposed a GP ratio predominantly based on geographical location of patients and their ability to access a GP. The study used the predetermined ratio of 1:1,400 as suggested by the Ministry of Health. Once again, the ratio is solely based on population factors and very little is known about how this ratio was developed.

This is an attempt to develop a formula to calculate a GP workforce benchmark for New Zealand based on assumptions that highlight an 'ideal' working environment for GPs, i.e. from the perspective of the provider of the service. The formula will use data available from NZMA, MCNZ and the College membership surveys (2005/2006). The College Membership Survey (2005/2006) had a response rate of 60% (2,057 members). The assumptions are:

Current situation: (based on College Membership Survey 2005/2006)

- GPs work a 48-hour week (1.2 FTE). Based on the number of hours spent per week in general practice (48 hours); it can be assumed that GPs work at least six days/week or five days at 9.6hrs/day;
- GPs spend 58% of the week on patient consultations (28 hours/wk);
- GPs spend on average nine hours on patient-related paperwork and administrative work that is inclusive in the 48 hour week (NZ GPs noted in the College survey (2005) that there are significant amounts of administrative requirements);
- GPs work six hours on-call on average (this is inclusive in the 48hr week. Also rural GPs spend significantly more hours on on-call duties than urban GPs);
- GPs spend 2.5 hours per week on CME or related activity (115 hours per annum or approximately three weeks/annum);
- GPs feel that they need four weeks of holidays annually (soon to be the statutory minimum) + two weeks of public holidays. (From the College survey, approximately 50% [990] of participants said their 'ability to take a holiday' was between **average** and **very poor**). Hence the current scenarios will assume that GPs get one week holiday + the mandatory two weeks of public holidays (at least half of what they would like to have);
- Anecdotal and observational evidence would suggest that the actual number of consultations would be approximately three to four patients/hr or each patient consultation on average is 15 minutes excluding time for updating patient folders or a GP sees 19 patients per day (4.7 hours [actual hours available a day for patient consultation] x 4 patients/hr). It should be noted that this figures could vary substantially depending on type of practice, number of practitioners, population demographics, and the disease burden of the community;

- As recommended, the ideal number of patients to be seen in an hour is 2.5 (Graff, et al. 1993). Please note that if the above ideal patient consultation ratio is used then the actual time spent on patient-related administration will reduce;
- Very few nurse practitioners (approx. two) to complement GPs' work hence they are not considered;
- According to MoH Annual Report (2005) patients will most likely see their GP four times a year on average (young children and elderly patients may require more than four visits per year).

Benchmark Scenario 1:

Current situation

52 wks – (3 wks of holidays + 3 wks of CME) = 46 working weeks.

- 48 hours/wk – (9 hours [admin duties] + 6 hours [on call] + 5 hours [other work]) = **28 hours of patient consultation time per wk.**
- 28 hours consultation x 4 patients/hr = **112 patients/wk**
- 46 working wks x 112 pt/wk = **5,152 pt/annum/GP**
- According to MoH Annual Report (2005), if on average a patient makes **4 visits to the GP** then the ratio is 5152/ 4 visits = 1,288 patients/GP or **1:1,288 GP per population**
- 1:1,288 = 78:100,000[9] = 3182:4,080,000 GPs:NZ Population (2005)

Note: In MoH 2004/05 Annual Report (2005), the number of active GPs per 100,000 for 2003 was noted to be 78:100,000.

Benchmark Scenario 2:

Current situation but the number of patients seen per hour is the 'ideal' recommended of 2.5 patients/hour: Seeing 2.5 patients per hour would include doing patient-related paperwork thus reducing the administration time from 9 hours to 2 hours (approximately 7 hours of administration time is spent on patient-related paperwork)

52 wks – (3 wks of holidays + 3 wks of CME) = 46 working weeks.

- 48 hours/wk – (2 hours [admin duties] + 6 hours [on call] + 5 hours [other work]) = **35 hours of patient consultation time per wk**.
- 35 hours consultation x 2.5 patients/hr = **88 patients/wk**
- 46 working wks x 88 pt./wk = **4,048 pt/annum/GP**
- According to MoH Annual Report (2005), if on average a patient makes **4 visits to the GP** then the ratio is 4048/ 4 visits = 1,012 patients/GP or **1:1,012 GP per population**
- 1:1,012 = 99:100,000 = 4039:4,080,000 GPs:NZ Population (2005)

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[9] The total 'GPs per 100,000' figure has been rounded-off to the nearest whole number. Subsequent calculations are based on the rounded-off figures. This applies to all GP:100,000 Population ratios in the later 'Scenarios'.

Benchmark Scenario 3:

Current situation but the number of patients seen per hour is the 'ideal' recommended of 2.5 patients/hour: Seeing 2.5 patients per hour would include doing patient-related paperwork thus reducing the administration time from 9 hours to 2 hours, (approximately 7 hours of administration time is spent on patient-related paperwork). Also GPs are able to take their full holiday of 6 weeks.

52 wks – (6 wks of holidays + 3 wks of CME) = 43 working weeks.

- 48 hours/wk – (2 hours [admin duties] + 6 hours [on call] + 5 hours [other work]) = **35 hours of patient consultation time per wk**.
- 35 hours consultation x 2.5 patients/hr = **88 patients/wk**
- 43 working wks x 88 pt/wk = **3,784 pt/annum/GP**
- According to MoH Annual Report (2005), if on average a patient makes **4 visits to the GP** then the ratio is 3784/ 4 visits = 946 patients/GP or **1:946 GP per population**
- 1:946 = 106:100,000 = 4,325:4,080,000 GPs:NZ Population (2005)

In rural New Zealand

Rural general practice is quite different to urban general practice. One major difference is the after-hours care (24/7) expected of rural GPs. Other differences may include the scope of practice (variety in the types of conditions patients present with), isolation from peers and colleagues, and difficulties in attracting and retaining health professionals.

The formula will use data available from NZMA, MCNZ and the College membership survey (2005/2006). Please note that the percentages of time spent for each activity has been acquired from the College's membership survey 2005/ 2006, i.e. on average 48% of a rural GP's time is spent consulting with patients, 27% on on-call duties, 15% on administration including 11% for patient-related paperwork, 6% on CME related activities and 4% doing other types of work or taking a break from general practice:

Current Situation in rural New Zealand (based on College workforce survey 2005/2006):

- Rural GPs work a 60-hour week (1.5 FTE). Based on the number of hours spent per week in general practice (60 hours), it can be assumed that GPs work seven days/week, approximately 8.6 hours/day;
- Rural GPs spend 48–50% of the week on patient consultations (29–30 hours/wk);
- Rural GPs spend on average nine hours on patient-related paperwork and administrative work that is inclusive in the 60 hour week (NZ GPs noted in the College survey (2005) that there are significant amounts of administrative requirements);
- Rural GPs work 16 hours on-call on average (This is inclusive in the 60hr week. Also rural GPs spend significantly more hours on on-call duties than urban GPs);
- Rural GPs spend 3.5 hours per week on CME or related activity (160 hours per annum or approximately four weeks/annum). Some of this time is used for educating other health professionals, and rural GPs are spending more time on this activity compared to their urban colleagues.

- Rural GPs need four weeks of holidays annually + two weeks of public holidays (From the College survey, approximately 50% [990] of participants said their ‘ability to take a holiday’ was between **average** and **very poor**). Hence the current scenarios will assume that GPs get one week holiday + the mandatory two weeks of public holidays (at least half of what they would like to have);

- Anecdotal and observational evidence would suggest that the actual number of consultations would be approximately three to four patients/hr or each patient consultation on average is 15 minutes excluding time for updating patient folders or a GP sees 19 patients per day (4.8 hours [actual hours available a day for patient consultation (6 days)] x 4 patients/hr). It should be noted that this figure could vary substantially depending on type of practice, number of practitioners, population demographics, and the disease burden of the community;

- As recommended, the ideal number of patients to be seen in an hour is 2.5 (Graff, et al. 1993). Please note that if the above ideal patient consultation ratio is used then the actual time spent on administration will reduce;

- Very few nurse practitioners (approx. two) to complement GPs work hence they are not considered;

- According to MoH Annual Report (2005) patients will most likely see their GP four times a year on average (young children and elderly patients may require more than four visits per year).

Benchmark Scenario 4:

Current situation in rural New Zealand

52 wks – (3 wks of holidays + 4 wks of CME) = 45 working weeks.

- 60 hours/wk – (9 hours [admin duties] + 16 hours [on call] + 5 hours [other work]) = **30 hours of patient consultation time per wk**.

- 30 hours consultation x 4 patients/hr = **120 patients/wk**

- 45 working wks x 120 pt./wk = **5,400 pt/annum/GP**

- According to MoH Annual Report (2005), if on average a patient makes **4 visits to the GP** then the ratio is 5400/4 visits = 1,350 patients/GP or **1:1,350 GP per population**

- 1:1,350 = 74:100,000 = 3,019:4,080,000 GPs:NZ Population (2005)

- 1:1,350 = 74:100,000 = 426:571,000 (approx. rural population in NZ – 2005)

Benchmark Scenario 5:

Current situation but the number of patients seen per hour is the ‘ideal’ recommended of 2.5 patients/hour: Seeing 2.5 patients per hour would include doing patient-related paperwork thus reducing the administration time from 9 hours to 2 hours, (approximately 7 hours of administration time is spent on patient-related paperwork)

52 wks – (3 wks of holidays + 4 wks of CME) = 45 working weeks.

- 60 hours/wk – (2 hours [admin duties] + 16 hours [on call] + 5 hours [other work]) = **37 hours of patient consultation time per wk**.

- 37 hours consultation x 2.5 patients/hr = **93 patients/wk**
- 45 working wks x 93 pt./wk = **4,185 pt/annum/GP**
- According to MoH Annual Report (2005), if on average a patient makes **4 visits to the GP** then the ratio is 4185/ 4 visits = 1,046 patients/GP or **1:1,046 GP per population**
- 1:1,046 = 96:100,000 = 3,917:4,080,000 GPs:NZ Population (2005)
- 1:1,046 = 96:100,000 = 548:571,000 (approx. rural population in NZ – 2005)

Benchmark Scenario 6:

Current situation but the number of patients seen per hour is the 'ideal' recommended of 2.5 patients/hour: Seeing 2.5 patients per hour would include doing patient-related paperwork thus reducing the administration time from 9 hours to 2 hours, (approximately 7 hours of administration time is spent on patient-related paper-work). Also rural GPs are able to take their full holiday of 6 weeks.

52 wks – (6 wks of holidays + 4 wks of CME) = 42 working weeks.

- 60 hours/wk – (2 hours [admin duties] + 16 hours [on call] + 5 hours [other work]) = **37 hours of patient consultation time per wk**.
- 37 hours consultation x 2.5 patients/hr = **93 patients/wk**
- 42 working wks x 93 pt/wk = **3,906 pt/annum/GP**
- According to MoH Annual Report (2005), if on average a patient makes **4 visits to the GP** then the ratio is 3,906/ 4 visits = 977 patients/GP or **1:977 GP per population**
- 1:977 = 102:100,000 = 4162:4,080,000 GPs:NZ Population (2005)
- 1:977 = 102:100,000 = 582:571,000 (approx. rural population in NZ – 2005)

In a world of increased part-timers and locums

Many GPs are opting for part-time and locum work. From the College Membership Survey (2005/2006), approximately 311 (13.5%) of the participants did locum work, and 569 (25%) did part-time work either as a salaried GP or a self-employed GP. More women are choosing part-time and locum work, as they take time-off to have children and raise families. Some older GPs are also opting for part-time and locum work.

Another interesting observation made was that GPs who work part-time are actually working on average 36hrs/week (0.9 FTE), almost the same number of hours worked by locums and other GPs in non-general practice medical work or non-medical work. It should be noted that part-time GPs are working far more hours than part-timers in other professional groups (if one defined 'part-time work' to constitute half of a full time work position i.e. about 20–25hrs/week). If the above notion of part-time is held true for general practice then it is clear that very few of the GP groups are achieving a good work/life balance (RNZCGP Membership Survey Report 2005).

Before going any further, it is important to note that once the GP workforce is analysed to account for part-timers and locums, other types of work status such as those GPs in full-time general practice work and sub-specialities need to be taken into account. This is where the formula becomes complex and open to debate as to how these types of GPs should be accounted for when benchmarking for the adequacy of a GP workforce. An attempt at this will be made here. From the College's Membership Survey (2005/2006), the following statistics on the composition of the current GP workforce have been drawn:

- 13.5% are locums;
- 25% are part-timers (salaried & self-employed);
- 46% are full-timers (salaried & self-employed);
- 2% are sub specialised;
- 6% are in non-general practice medical work
- 1% are in non-medical work
- 1.5% are working overseas
- 5% are in other types of work including academia, management, unpaid work or retired.

Therefore, effectively only 86.5% of the current GP workforce (including the sub-specialised) is actually involved in traditional general practice work. In other words, 13.5% of the GP workforce is not actually doing general practice work even though they are identified as GPs; some of them may also be vocationally registered as GPs. Arguably, even some sub-specialised GPs do not do any general practice work. So, if currently there are 78 GPs for 100,000 people (Scenario One), then only 86.5% of these GPs are actually involved in purely general practice work which is 68:100,000 GP:population.

Furthermore, if the Scenario 1 ratio (78:100,000) is analysed for locums, part-time, sub-specialised, and fulltime GPs then the composition of the ratio would be something like this:

- 13.5% locums * 78:100,000 = 10:100,000 are locum GPs
- 25% part-time GPs * 78:100,000 = 20:100,000 are part-time GPs
- 46% full-time GPs * 78:100,000 = 36:100,000 are full-time GPs
- 2% sub-specialised GPs * 78:100,000 = 2:100,000 are sub-specialised GPs
- 13.5% non-general practice work * 78:100,000 = 10:100,000 non-general practice work.

Some other assumptions are made here based on statistics from the College Membership Survey (2005/2006). These groups of GPs identified below are working directly in general practice. There is a deficit of 13.5% based on those GPs who do not do any general practice work, hence the 13.5% will be proportionally divided and added to the existing percentages of GPs (who work in general practice) for the purpose of forecasting, i.e. the actual composition of the workforce can be limited to certain work statuses. So a GP workforce in future could comprise the following percentages of different types of GPs:

- 13.5% + 2% (of the 13.5%) are locums = **15.5% will be locums**;
- 25% + 4% (of the 13.5%) are part-timers (salaried & self-employed) = **29% will be part-timers**;
- 46% + 7.2% (of the 13.5%) are full-timers (salaried & self-employed) = **53.2% will be full-timers**;
- 2% + 0.3% (of the 13.5%) are sub specialities = **2.3% will be sub-specialised**.

Another set of assumptions from the College Membership Survey (2005/2006) include the following FTEs (1FTE = 40hrs/wk):

- Locums work 37hrs/wk = 0.93 FTE
- Part-timers work 36hrs/wk = 0.9 FTE
- Full-timers work 57hrs/wk = 1.4 FTE
- Sub-specialised work 44hrs/wk = 1.1 FTE

The following scenarios will address the impact of locums, part-time, full-time and sub-specialised GPs on the current and future GP workforce in New Zealand. Again, note that the percentages of time spent for each activity has been acquired from the College's Membership Survey (2005/2006):

- Locum GP: on average spent 59% of their time consulting with patients, 8% on on-call duties, 13% on administration including 11% for patient-related paperwork, 8% on CME-related activities and 12% doing other types of work like College work or taking a break from general practice.
- Part-time GP: on average spent 53% of their time consulting with patients, 10% on on-call duties, 15% on administration including 11% for patient-related paperwork, 10% on CME-related activities and 12% doing other types of work like College work or taking a break from general practice.
- Full-time GP: on average spent 60% of their time consulting with patients, 13% on on-call duties, 18% on administration including 13.5% for patient-related paperwork, 5% on CME-related activities and 4% doing other types of work like College work or taking a break from general practice.
- Sub-specialised GP: on average spent 47% of their time consulting with patients, 13% on on-call duties, 14% on administration including 8% for patient-related paperwork, 10% on CME-related activities and 16% doing other types of work like College work or taking a break from general practice.

For the following scenarios, the percentages above have been converted to actual hours worked. As an example of how to account for these differences, the statistics for part-time GPs are used to show how a ratio for each of the 'types of GPs' can be calculated. Thereafter a formula will be used to aggregate the findings and find the 'true' benchmark for New Zealand in 2005.

Benchmark Scenario 7:

Current situation with part-time GPs

52 wks – (3 wks of holidays + 3 wks of CME) = 46 working weeks.

- 36 hours/wk – (5 hours [admin duties] + 4 hours [on call] + 4 hours [other work]) = **23 hours of patient consultation time per wk**.
- 23 hours consultation x 4 patients/hr = **92 patients/wk**
- 46 working wks x 92 pt/wk = **4,232 pt/annum/GP**
- According to MoH Annual Report (2005), if on average a patient makes **4 visits to the GP** then the ratio is 4,232/ 4 visits = 1,058 patients/GP or **1:1,058 GP per population**
- 1:1,058 = 95:100,000 = 3,876:4,080,000 GPs:NZ Population (2005)

If the formula above is used then the following ratios are generated:

- For Locums it is: **1:1,150 = 87:100,000 = 3,550:4,080,000 GPs:NZ Population (2005)**
- For Part-timers it is: **1:1,058 = 95:100,000 = 3,876:4,080,000 GPs:NZ Population (2005)**
- For Full-timers it is: **1:1,702 = 59:100,000 = 2,407:4,080,000 GPs:NZ Population (2005)**
- For Sub-specialised it is: **1:1,150 = 87:100,000 = 3,550:4,080,000 GPs:NZ Population (2005)**

It is obvious from the ratios that full-time GPs are seeing far more patients due to working longer hours, having difficulty taking holidays, and as a consequence having little time for professional development and other types of work.

So to get better picture of the current GP workforce the following calculations will use these percentages as discussed earlier:

- 15.5% will be locums * 1:1,150 (ratio for locums) = **1:178**;
- 29% will be part-timers * 1:1,058 (ratio for part-timers) = **1:307**;
- 53.2% will be full-timers * 1:1,702 (ratio for full-timers) = **1:906**;
- 2.3% will be sub-specialised * 1:1,150 (ratio for sub-specialised) = **1:27**.

Therefore the true GP to patient ratio for 2005 (compared to that in Scenario 1 and in MoH Annual Report) was: **1:1,418 or 71:100,000 or 2,897:4,080,000** because:

- Not all registered GPs are doing general practice work;
- GPs in different types of employment are doing different hours (FTEs);
- The current GP ratios have not been accounting for the different GP work statuses;
- The population and the burden of disease are increasing.

Thus, as a result (From College Membership Survey Reports [2005/2006]):

- We have a overworked and stressed GP workforce;
- Some GPs are considering leaving general practice all together;
- General practice is not attracting enough new graduates (furthermore funding for training is limited to cater for all applying);
- The ratio matches the number of GPs in New Zealand in the 1995/96 periods, but since than there has been a significant increase in the population and an increase in the burden of disease, particularly chronic disease (NZMA, 2004 & MCNZ 2004/5);
- Some patients are having to wait longer to see a GP or their own GP (anecdotal evidence).

For the purpose of forecasting, it will be important to take into account the contributions made by locums and part-time GPs, and identify how many of each would be needed to sustain or improve on the current levels of primary health care delivery.

In an ideal world

The ideal work environment might have the following. Please note that the percentages of time spent for each activity has been acquired from the College's membership survey 2005/2006, i.e. on average 58% of a GP's time is spent consulting with patients, 12% on on-call duties, 18% on administration including 13.5% for patient-related paperwork, 6% on CME-related activities and 6% doing other types of work or taking a break from general practice. Also note that the following calculations are based on 1 FTE, i.e. part-time GPs are not accounted for here but can be using the method discussed previously.

In an ideal situation:

- GPs work a 40-hour week (1 FTE). Based on the numbers of hours spent per week in general practice (40 hours), it can be assumed that GPs work at least five days/week;
- GPs spend 58% of the week on patient consultations (23 hours/wk);
- GPs spend on average seven hours on administrative work that includes five hours for patient-related paperwork;
- GPs work five hours on-call (this is inclusive in the 40hr week);
- GPs have three weeks for Continuous Medical Education (CME) annually (120 hours per annum);
- GPs have four weeks of holidays annually + two weeks of public holidays;
- Each ideal patient consultation on average is 15 minutes + 9 minutes for updating patient folders or a GP sees 12 patients per day (4.6 hours [actual hours available a day for patient consultation] x 2.5 patients/hr) (recommended as ideal number of patients to be seen in an hour [Graff, et. al. 1993]). Please note that if the above ideal patient consultation ratio is used than the actual time spent on administration will be 2 hours/wk;
- Patients will most likely see their GP 4 times a year on average (young children and elderly patients may require more than 4 visits per year).

Benchmark Scenario 8:

Ideal work situation for GPs

52 wks – (6 wks of holidays + 3 wks of CME) = 43 working weeks.

- 40 hours/wk – (2 hours [admin duties] + 5 hours [on call] + 5 hours [other work]) = **28 hours of patient consultation time per wk**.
- 28 hours consultation x 2.5 patients/hr = **70 patients/wk**
- 43 working wks x 70 pt/wk = **3,010 pt/annum/GP**
- According to MoH Annual Report (2005), if on average a patient makes **4 visits to the GP** then the ratio is 3,010/ 4 visits = 753 patients/GP or **1:753 GP per population**
- 1:753 = 133:100,000 = 5,426:4,080,000 GPs:NZ Population (2005)

Benchmark Scenario 9:

Ideal situation but the number of patient consulted per hour is 4 instead of 2.5, thus the hours spent on administration that includes patient-related paperwork increases to 7 hours/wk.

52 wks – (6 wks of holidays + 3 wks of CME) = 43 working weeks.

- 40 hours/wk – (7 hours [admin duties] + 5 hours [on call] + 5 hours [other work]) = **23 hours of patient consultation time per wk**.
- 23 hours consultation x 4 patients/hr = **92 patients/wk**
- 43 working wks x 92 pt/wk = **3,956 pt/annum/GP**
- According to MoH Annual Report (2005,) if on average a patient makes **4 visits to the GP** then the ratio is 3956/ 4 visits = 989 patients/GP or **1:989 GP per population**
- 1:989 = 101:100,000 = 4,121:4,080,000 GPs:NZ Population (2005)

Benchmark Scenario 10:

Ideal situation but the number of patient consulted per hour is 4 instead of 2.5, thus the hours spent on administration that includes patient-related paperwork increases to 7 hours/wk. Also the average number of GP visits is six (6).

52 wks – (6 wks of holidays + 3 wks of CME) = 43 working weeks.

- 40 hours/wk – (7 hours [admin duties] + 5 hours [on call] + 5 hours [other work]) = **23 hours of patient consultation time per wk.**
- 23 hours consultation x 4 patients/hr = **92 patients/wk**
- 43 working wks x 92 pt/wk = **3,956 pt/annum/GP**

- If the average number of visits a patient makes increases to **6 visits** (as expected with an ageing population) then the ratio is 3,956/6 visits = 659 patients/GP or **1:659 GP per population**

- 1:659 = 152:100,000 = 6,202:4,080,000 GPs:NZ Population (2005)

Any increase in the number of patient visits is likely to have a significant impact on the workload of GPs. With an ageing population, this is very likely to happen. New models of care may help reduce the number of patient visits like increasing the time for consultations for the elderly and other illness-vulnerable groups.

Taking into account the socio-economic environment

New Zealand has developed a socio-economic deprivation index (NZDep91, NZDep96, and NZ Dep2001) that is primarily used for resource allocation, research, and advocacy (Salmond & Crampton, 2002). 'The 2001 Index combines a range of key socio-economic factors from the 2001 Census (like income, transportation, communications, support, ownership of homes, qualifications, employment, and living space) and estimates an overall score of material and social deprivation for a particular area, on a scale of 1 (least deprived) to 10 (most deprived). Deprivation scores generally reflect the ability of households in New Zealand to achieve positive outcomes in areas such as health, income, education and employment' (BigCities, 2006).

The rationale for using the NZ Deprivation Index in the calculation of a GP benchmark is to take into account the populations' socio-economic dynamics that would otherwise be quite difficult to do. Some researchers have noted the difficulty in accounting for some environmental factors such as geographical access (Brabyn & Barnett, 2004). The use of this Index also provides a balance to the proposed GP benchmark model that has been predominantly provider focused. It is hoped that with a bit of ingenuity, policy makers and health funders could set GP or other health professional benchmarks for the different regions in New Zealand using this model.

Table 3: NZDep2001 with Ascribed Values

The Deprivation Index	Values (DSV)
1	1
2	1.11
3	1.22
4	1.33
5	1.44
6	1.55
7	1.66
8	1.77
9	1.88
10	2

We use this Deprivation Index to calculate the number of GPs that may be required for different regions and areas around New Zealand. Some assumptions will be made, and some values will be attached to these assumptions.

- The Deprivation Index has a scale of 1 to 10 with 1 indicating the least deprived areas and 10 indicating the most deprived areas.

- We will use a simplistic application of the Index where a different value will be attached to all the scores from 1 to 10. Refer to Table 3 above.

- Population numbers for some areas will be used to demonstrate how the benchmark can be applied to different communities based on the Deprivation Index.

- The population for the following regions and their deprivation scores (DS) will used as examples:

  – Gisborne: population = 44,700 (2005 est. – Statistics NZ website, 2006); DS = 9 (for main urban areas). No other region in NZ has a DS of 9 based on available data.

  – Canterbury: population = 526,400 (2005 est. – Statistics NZ website, 2006); DS = 6 (for main urban areas). Auckland, Waikato, Taranaki, Wellington, Nelson, Otago and Southland have a DS of 6 based on available data.

  – Tasman: population = 46,600 (2005 est. – Statistics NZ website, 2006); DS = 4 (for main urban areas). No other region in NZ has a DS of 4 based on available data.

- The Deprivation Index will be applied to Scenario 7 to calculate current regional ratios; 1:1,414 or 71:100,000; this ratio closely reflects the current situation.

- The Deprivation Index will also be applied to Scenario 9 to calculate ideal regional ratios; 1:989 or 101:100,000; this ratio arguably reflects an ideal work environment for GPs.

It is argued that regions or areas that have a deprivation score of 1 (least deprived) need the minimum recommended allocation of resources, and the most deprived areas need the maximum (double or triple) the recommended allocation of resources. Hence, based on the above assumptions we attach the following values to the Deprivation Index, arguing for at least double the number of resources for the most deprived area (refer Table 3).

If the current ratio were applied to the most deprived areas in New Zealand, then the ratio should be 71:100,000 (GPs: Popn.) * 2 = 142:100,000 (GP: Popn.). The argument here is that the most deprived areas in NZ should have at least double the resources of least deprived areas. Hence the least deprived area should have the minimal recommended allocation of resources to achieve quality health outcomes. The national benchmark for GPs (for all of NZ regardless of region) could be the minimum recommended benchmark.

Scenario 11: Gisborne

So for a region like Gisborne the GP to population ratio currently should be 71:100,000 * 1.88 (DS = 9 [1.88] for Gisborne) = 133.5:100,000 (GP: Popn.).

Since the population of Gisborne is approximately 45,000, the ratio will actually be 133.5:100,000 * 0.45 (45,000/100,000) = 60:45,000 (GP: Population of Gisborne). The current allocation of GPs in this area is 32:45,000 (MoH, 2005 report based on 2003 data). This is significantly below the deprivation-adjusted threshold (approx. 47%).

If the ideal GP ratio (National Benchmark – the minimum recommended benchmark) were applied then the following will transpire:

- 101:100,000 * 1.88 (DSV) = 190:100,000 GP: population of Gisborne, therefore:

- 86:45,000 GPs: population of Gisborne.

- This ratio below does not take into account the deprivation index value because it can be argued that if the ideal number GPs were available to service New Zealand populations, then the use of the deprivation index in this context becomes redundant or could possibly overstate the amount of resources needed. Therefore, if the ideal GP benchmark were seen as adequate to deliver GP based primary health care, then the ratio would simply be 101:100,000 * 0.45 = **45.5:45,000** GP:Population of Gisborne.

Scenario 12: Canterbury

For a region like Canterbury the GP to population ratio currently should be 71:100,000 * 1.55 (DS = 6 [1.55] for Canterbury) = **110:100,000 (GP: Popn.)**.

Since the population of Canterbury is approximately 526 000, the ratio will actually be 110:100,000 * 5.26 (526,000/100,000) = **579:526,000** (GP: Population of Canterbury). The current allocation of GPs in this area is **479:526,000** (MoH, 2005 report based on 2003 data). This is notably below the deprivation-adjusted threshold (approx. 17%).

If the ideal GP ratio (National Benchmark – the minimum recommended benchmark) were applied then the following will transpire:

- 101:100,000 * 1.55 (DSV) = 157:100,000 GP:population of Canterbury, therefore:

- 826:526,000 GPs: population of Canterbury.

- This ratio below does not take into account the deprivation index value because it can be argued that if the ideal number GPs were available to service New Zealand populations, then the use of the deprivation index in this context becomes redundant or could possibly overstate the amount of resources needed. Therefore, if the ideal GP benchmark were seen as adequate to deliver GP based primary health care, then the ratio would simply be 101:100,000 * 5.26 = **531:526,000** GP:Population of Canterbury.

- Also according to MoH (2005), greater Canterbury currently enjoys some of the better GP to population ratios compared to the other parts of the country.

Scenario 13: Tasman

For a region like Tasman the GP to population ratio currently should be 71:100,000 * 1.33 (DS = 4 [1.33] for Tasman) = **94:100,000** (GP:Popn.).

Since the population of Tasman is approximately 47,000, the ratio will actually be 94:100,000 * 0.47 (47,000/100,000) = **44:47,000** (GP: Population of Tasman). The current allocation of GPs in this area is **43:47,000** (MoH, 2005 report based on 2003 data). This is slightly below the deprivation-adjusted threshold (approx. 2%). This also indicates that least-deprived areas might have a better GP:Population ratio.

If the ideal GP ratio (National Benchmark – the minimal recommended benchmark) were applied then the following will transpire:

- 101:100,000 * 1.33 = 134:100,000 GP: population of Tasman, therefore:
- 63:47,000 GPs: population of Tasman.
- This ratio below does not take into account the deprivation index value because it can be argued that if the ideal number GPs were available to service New Zealand populations, then the use of the deprivation index in this context becomes redundant or could possibly overstate the amount of resources needed. Therefore, if the ideal GP benchmark were seen as adequate to deliver GP based primary health care, then the ratio would just be 101:100,000 * 0.47 = **48.5:47,000** GP:Population of Tasman.

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Discussion

The above model, with all its assumptions and values, has tried to demonstrate that a holistic approach to setting a GP benchmark is possible. The use of the Deprivation Index in the model helps take into account the patient populations' environment, thereby not isolating the impact of GP numbers on the possible health outcomes of populations in the most deprived areas of New Zealand. This model could be applied in many settings especially within those DHBs which encompass several communities with vastly different deprivation scores.

One of the most critical factors in the formula above is the number of visits a patient makes to a GP per year. If the average number of patient visits increases beyond four per year, then we are likely to see an enormous increase in workload. With an ageing population, the number of visits to GPs *is* most likely to increase. According to the Ministry of Health Annual Report (2005), females over 65 years average six visits per year, compared to 5.2 visits for males in the same cohort. Of all the age groups, children under five years need the most visits to a GP (approximately eight per year).

These scenarios are meant to generate discussion around the different assumptions and variables presented above. If there were agreement on the importance of these variables then a universal workforce benchmark for GPs in New Zealand is possible. However, it should be noted that the formula presented above is simplistic, and may need more discussion about how to account for variables as discussed by Brabyn and Barnett (2004), and other variables like the impact of primary health care teams on GP functions, the increasing role of nurse practitioners, and the ageing population, the different geography, and the changing demographics.

By adjusting some of the variables like the number of patient consultations per hour and the number of patient visits per year, we may be able to take into account patients from high deprivation/low socioeconomic areas, the older generation, and patients with multiple health needs. For example, if GPs working in low socioeconomic areas could spend more time with patients then they would be able to address most of a patient's health problems in one consultation, thereby reducing the need for the patient to make multiple visits, and help poor patients save some money (fees) that may be better utilised in such things as medicines, better quality food, and improved housing. However, the current workload of GPs combined with a recognised shortage of GPs (HWAC, 2005), will only make it more difficult for them to spend adequate time with each patient.

Also, if other members of the primary health care team, especially practice nurses, become more involved in patient health care (as envisioned by the Primary Health Care Strategy [2001] and current policy makers), then GPs would have more time to spend with patients who have more complex needs. However, due to the lack of any clear direction and description of what a GP could hand over from their current workload to a practice nurse, it will be a while before a GP's workload is significantly reduced. Also, these changes in the health workforce may have further training implications for practice nurses. There is nothing to prevent a similar workforce analysis being done to estimate nursing workforce capacity and marrying of the benchmark results with that of GPs.

The formula presented above can also be used for forecasting purposes by manipulating the variable that states the total population of New Zealand as at 2005. By inserting a new population variable, the formula can be worked backwards to ascertain the number of GPs that will be required for a given population including ethnicity-based populations such as Maori and Pasifika.

Of all these scenarios presented above, **Scenario 2 (1:1,012 or 99:100,000 GP:Popn.), Scenario 3 (1:946 or 106:100,000 GP:Popn.), Scenario 5 (1:1,046 or 96:100,000 GP:Popn.), Scenario 6 (1:977 or 102:100,000 GP:Popn. for rural NZ), and Scenario 9 (1:989 or 101:100,000 GP:Popn.)** present the best working environments for GPs with adequate time for consultations in a normal working week, sufficient time for CME and reasonable provision for a healthy lifestyle. These GP benchmarks will also ensure that the quality of primary health care is not compromised, and assist with making New Zealand a healthier nation.

Towards Establishing a New Zealand GP Workforce Benchmark

It is imperative that if a benchmark is to be established to aid health workforce planning and forecasting in New Zealand, it needs to include a **standardised ratio** (acceptable to all stakeholders), established by **a centralised body** via a population-based formula so that all subsequent research is comparable.

Development of a New Zealand benchmark should use **standardised evidence-based research** that determines what particular aspects of workforce conditions are to be recorded (study leave, annual leave, average working hours – workload equivalents etc.) and specifics of the health practitioner (e.g. how the health practitioner is to be classified based on differing stages of vocational registration).

The benchmark must also take into account **patient demographics** (e.g. rural and urban workforce differences and the changing needs of the demographic patient base and socio-economic status as per NZ Dep2001). Interpretation of the ratio and the subsequent decisions made on the provision of quality health care in New Zealand also need to take into account changes in the health workforce. For instance, by March 2006 there are only 21 registered nurse practitioners including six working as independent prescribers, seven not employed as nurse practitioners and one primary aged care provider working part-time. The potential growth of the nurse practitioner workforce would see GPs anticipating greater 'task-sharing' and may possibly alleviate some of the GP workload. In this environment, more routine cases would be addressed by the nurse practitioner allowing the GP to concentrate on more complex cases. The effects of this shared workload are not yet evident.

Establishing a centralised, standardised benchmark for New Zealand must involve a number of stakeholders, but not exclusively, the:

- Ministry of Health (MoH)
- Health Workforce Advisory Committee (HWAC) and the Medical Reference Group and Maori Health and Disability Workforce Sub-Committee
- Medical Council New Zealand (MCNZ)
- Council of Medical Colleges (CMC)
- New Zealand Health Research Council
- New Zealand Medical Association (NZMA)
- College Research Group (CRG) of the Royal New Zealand College of General Practitioners (RNZCGP)
- Nursing Council of New Zealand
- District Health Boards New Zealand (DHBNZ) and Primary Health Care Organisations (PHOs)

- Departments of General Practice/Public Health/Primary Care at various New Zealand universities
- Statistics New Zealand (StatsNZ)
- New Zealand Health Information Services (NZHIS)
- Health Research Council of New Zealand
- Clinical Training Agency (CTA)
- New Zealand Treasury
- Independent Practitioners' Association Council of New Zealand (IPAC)
- New Zealand Overseas Doctors Association
- Association of International Medical Graduates of Australia and New Zealand
- Tertiary Education Commission (TEC)
- Confederation of Postgraduate Medical Education Councils (CPMEC)

It is imperative that a 'GP workforce benchmark' is established as a fundamental tool for measuring the adequacy of the general practice workforce in New Zealand. Without such a measure, there will always be confusion and debate on 'how many GPs is enough', while the access to primary health care and quality of treatment continues to be compromised.

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