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***TESTING TIMES:***

**New Zealand's Clinical Laboratories under the 1990s  
Health Sector Reforms**

A thesis  
submitted in fulfilment  
of the requirements for the Degree  
of  
Doctor of Philosophy in Health Development and Policy  
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by  
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## Abstract

This thesis examines New Zealand's clinical laboratory services during the 1990s, a recent period of major neo-liberally driven health sector change in New Zealand. Internationally, although estimates of expenditure on laboratory services vary, the importance attributed to their pivotal role in health decision-making and expenditure is consistent. Consequently, changes impacting on the clinical laboratory system have the potential to resound throughout a national health service in unexpected ways.

The 1990s New Zealand health reforms were characterised by a downplaying of the role of technical, scientific and clinical expertise in management decision-making, a reduced role in management and planning for central government, and moves towards the creation of a 'health market' composed of consumers, rather than citizens. The transfer of occupational control from pathologists to managers in the clinical laboratory sector, and other attempts to contain state expenditure on clinical laboratories are monitored in the body of this thesis using both qualitative and quantitative data.

Pre-reform weaknesses already present in the clinical laboratory service, particularly the dual systems for laboratory remuneration that hinge on specimen origin, were thrown into strong relief by the 1990s reforms. Furthermore, evidence gathered in this study suggests the reforms became counter-productive, even in their own terms. Thus, the change towards market controls not only destroyed strengths of the existing centrally controlled laboratory system, but also, by fostering a focus on outputs, greatly increased volume-driven state expenditure on laboratory testing. This occurred largely without improvement in disease 'pick-up' rates, avoidable hospitalisations, or cost-efficiencies. The

internal market compromise proved powerless to avoid laboratory services monopoly development by foreign investor owned companies. As a consequence it neither indicated the most efficient test prices, nor engendered the physical laboratory amalgamations that have occurred overseas in the interests of cost-efficiency.

The thesis concludes that the kind of structural reform introduced into the New Zealand health sector in the 1990s was a poor instrument for achieving cost effectiveness. Specific technological changes in laboratory practice, along with globalisation in health service provision, are identified as examples of design influences that will strongly re-shape the supply-side of New Zealand laboratory services. Their considered incorporation into a revived central, evidence-based, laboratory services redesign plan is strongly recommended. Unfortunately, the partially decentralised governance structure introduced by the Labour-led coalition in 2001 appears to have the potential to frustrate that recommendation.

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Throughout the research process I have been entrusted with the frank perspectives and responses of health service managers and senior members of the Royal College of Pathologists of Australasia. My thesis, I believe, has been greatly strengthened by that interchange.

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## Foreword

Diagnostic and treatment decision support provided by laboratories has become increasingly important for fully effective health care. In the United States, for example, where half of all clinical laboratory tests are performed in a community hospital setting, laboratory services, at less than five percent of the total hospital budget, have been estimated to leverage 60-70 percent of all critical decision-making (Forsman, 1996). Changes that impact on clinical laboratory services, therefore, have the potential to resound throughout a national health service in significant unexpected ways. Despite its pivotal role in the health system and fully state-funded status, however, New Zealand's clinical laboratory system has received very little attention from policy-makers since its inception in the early 1940s.

I came to this study of New Zealand clinical laboratory services from a background in hospital laboratory methods-related research, having trained initially in chemistry and biology at the University of Canterbury, New Zealand, (BSc) and in biochemistry at University College, London (MSc). I have worked in Christchurch, Wellington and Hamilton in the laboratory discipline of clinical chemistry, eventually specialising in immunoassay and gas chromatographic techniques, but I also have a longstanding interest in laboratory services organisation. I am, by now, thoroughly familiar with procedures, systems and policies in New Zealand clinical laboratories over the past three decades.

My research interests have shifted from clinical chemistry to health services research over the last six years, and have included a period of formal retraining in health development and policy studies at the University of Waikato (B Soc Sc Hons). The move was precipitated by the steadily increasing commercialisation of clinical laboratory method development, and the low priority given by New

Zealand research funding bodies, including the hospitals, to researching the clinical diagnostic process.

When market-style controls were imposed on the New Zealand health sector in the early 1990s, I was working at the Health Waikato Laboratory in Hamilton, a large laboratory servicing a major public base hospital. I shared with many of my colleagues an increasing unease with the health sector structural reforms that were at first mooted in 1991 and then implemented with unseemly haste in 1993. The personal and practical implications of the structural changes seemed very likely to be negative. Of more serious concern, however, was the conviction that the philosophical shift underlying the reforms would exacerbate longstanding flaws and inefficiencies in the country's clinical diagnostic laboratory system. It has been the principal task of this thesis to gather and analyse evidence to test, and at least partially explain, this 'exacerbation' hypothesis.

The research process led inexorably to a breadth of multidisciplinary reading and inquiry that was unanticipated by me and, therefore, challenging. An inquiry of this breadth proved to be fruitful, however, yielding a breadth of understanding of my research topic that was, again, unanticipated. My thesis grew beyond initial expectations for other reasons. I had expected to be undertaking a long-overdue study of an obscure, though fundamental, area of the public health service. During the course of writing and researching, however, my subject achieved unaccustomed topicality as a consequence of two events. One was an Official Enquiry into the misreporting of cervical smear slides in Gisborne conducted, under intense media scrutiny, over several months in 2000. The second occurred in January, 2001. This was the failure of the newly constructed Auckland Hospitals combined laboratory, A+, to receive official accreditation owing to quality deficiencies. These deficiencies were said to be long-standing and were still receiving media attention by late 2001. The need for a comprehensive study of New Zealand's clinical laboratory services, and the factors underlying their now very conspicuous failures, suddenly became acute, and the findings of my

study likely to assume greater than expected significance. With this added incentive in mind, I have endeavoured to structure this thesis with the aims of minimising potential sources of bias, and focusing on issues of greatest moment to New Zealanders.

Part one of the thesis, the 'Background' section, describes New Zealand's clinical laboratory services, in context, in the years leading up to the so-called 'health reforms' of the 1990s, emphasising pre-existing tensions, contradictions and weaknesses inherent in the laboratory service structure that made them vulnerable to the reforms. An outline and critique of the stated objectives, nature and implementation of the 1990s health sector reforms, focusing on their implications for clinical laboratory services, follows.

In Part two of the thesis some organising structures applicable to the study of public policy-related research and the particular evaluation undertaken in this thesis are outlined. The issues generated in Part one of the thesis are grouped and prioritised for further investigation and methodological concepts and contributions to the thesis are detailed and explained.

Part three explores two dominant themes central to the health sector reforms of the 1990s, and directly relevant to this thesis, which were generated by the clinical laboratory-related textual data and, particularly, the empirical interview data:

- (i) Professional control, the changes to which led, it is argued, to unforeseen, pervasive effects on the quality of laboratory services, and
- (ii) Privatisation in health services, which in the extreme form experienced by laboratory services, led to multiple, unforeseen effects on their public accountability.

Part four contributes to the overall clinical laboratory-related impact evaluation through a series of five quantitative database analyses. These triangulate to the

textual archival and empirical interview material, and are directed at informing issues of cost-efficiency, cost-effectiveness and access. Explanations for the trends noted are attempted, using multiple data sources.

In Part five, an analysis of arguments generated during the thesis development is made, and potential directions for the further resolution of issues related to New Zealand laboratory services are explored. The thesis concludes with an assessment of the requirements and potential for achieving cost-effective laboratory services in the new, New Zealand philosophical and structural health environment of 2001 and onwards.

## ***Part one: Background***

### **Chapter 1: The setting for reform**

The hypothesis at the core of this thesis is that market-style resource control for New Zealand's laboratory services not only failed to meet the wider objectives of policy architects, but exacerbated cost-inefficiencies already endemic to the service design of this sector.

To address a hypothesis of this 'before and after' sort one must begin with a baseline: in this case, an outline of the history of publicly funded, clinical laboratory services in New Zealand up to 1993, with emphasis on the specific problems and anomalies that made them especially vulnerable to the 1990s reforms. The problems and anomalies isolated in this chapter are:

- factors underlying increased utilisation
- the existence of perverse incentives to efficient management
- the impact of technological developments.

Several long-standing problems have characterised the New Zealand public health system over the 20<sup>th</sup> century. Laugesen and Salmond (1994) identified these broadly as: central/peripheral control tensions; poor management and accountability; the growth of hospitals; and a lack of service integration. To some extent, New Zealand's clinical laboratories can be viewed as a case study in these wider systemic problems. Laboratories also face other problems, however, related to their ambiguous status as a medical/technical support service, their high

technology dependence, and their tenuous relationship with patients: almost always mediated through third parties.

### **Medical support service/burgeoning industry**

The New Zealand Board of Health Report: 'Clinical and Public Health Laboratory Services' (1974) resulted from a Committee of Inquiry into the country's clinical laboratory services. The Committee held the first of 16 meetings in March 1971 at the height of what has been termed the 'cottage industry' phase of medical practice (Conn and Snyder, 1997). The Committee comprised two senior members of the Hospitals Division, Department of Health (both medically qualified) who took the chair in succession, two senior academic/hospital pathologists, one senior academic/hospital physician, a senior private/hospital pathologist, a senior consultant venereologist/general practitioner, and a senior technologist/tutor. Individual laboratories at the time were relatively small-scale, labour intensive and, whether publicly or privately owned, catered to a localised 'captive' clientele. The Committee defined this clientele in terms of their phase of medical care: primary and secondary (served by private laboratories), tertiary (public hospital laboratories, or private laboratories in the case of patients admitted to private hospitals), and quaternary (special laboratories - all located in public hospitals).<sup>1</sup>

Privately owned laboratories received then (as now), almost their entire income from the laboratory fee-for-service benefit under the Social Security Regulations (Laboratory Diagnostic Services) introduced in 1946. Hospital laboratories were also funded in this way until 1964, but thereafter until 1993 received support from the Department of Health hospital maintenance grant allocated through elected Hospital Boards, largely on the basis of previous funding levels. A central Laboratory Services Advisory Committee, made up of two pathologists in private practice (one also with a part-time hospital appointment), a hospital pathologist

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<sup>1</sup> This terminology differs from that in current use, where secondary services would refer to general practitioner-referred patient treatment services, both specialist and base hospital-located.

and an academic pathologist made annual adjustments to the 'Schedule of Tests and Payments'. This committee also advised the Department of Health on the recognition of pathologists.

In the early 1970s, almost a third of the 95 pathologists in practice in New Zealand divided their time between public hospital and private laboratories (NZ Board of Health, 1974). A further 26 had full-time hospital positions, 15 were in full-time private practice, and the rest were either full- or part-time in academic positions. Medical laboratory technologists made up the largest group of clinical laboratory professionals. They received Technical Institute (tertiary, but non-university level) and on-the-job training for their basic three-year training qualification. Two years' specialist laboratory practice then followed, after which they were eligible for examination and registration by their professional Board (made up of senior members of their own profession, with some pathologist representation). Some science graduates, usually with postgraduate degrees, were employed - principally as specialist analysts - in public hospital special purpose and research laboratories.

### **Systemic anomalies**

The 1974 Board of Health Report strongly endorsed the professional status of senior laboratory personnel and acknowledged their pivotal role in diagnosis and patient management. As might be expected from a Committee with very broad terms of reference ("To consider and make recommendations regarding pathology services...." and "...any other matters relating to laboratory services which may be referred to the committee") the recommendations resulting were very wide-ranging. They covered organisation and facilities; between-laboratory relationships and funding; administration, control and planning; staffing and education; and integration into the Health Department. They were aimed primarily at fostering a high-quality service and, in retrospect, assumed a more stable future than subsequent conditions: technological, economic and political; were to deliver. One cautionary theme, however, emerged from their Report and

remains still unresolved after nearly thirty years: the need for co-ordination of laboratory services in the interests of cost-effectiveness. To this end, widely representative national and regional Laboratory Services Co-ordinating Committees were recommended. The Committee of Enquiry also recommended that

*“....regional laboratory committees”* be instructed to *“consider the setting up of regional (possibly national) central pools of expensive automated equipment, which would be available to both private and public sectors”* and to *“.....standardise reports as far as possible ..... Tests should not be repeated merely because they have been done in another laboratory”* (NZ Board of Health Report Series: No 22, 1974, p. 59).

*“Consideration should be given to instituting arrangements whereby private and hospital laboratories contract work to each other, depending on the availability of automated processing and special facilities, as determined by the regional laboratory committees.”* (NZ Board of Health Report Series: No 22, 1974, p 114).

Other recommendations, apparently aimed at curtailing profiteering from the Social Security Fund or (later) Vote Health were:

*“The Laboratory Diagnostic Services Benefit to be continued, and adjusted to allow for benefits of increasing laboratory turnover and automated testing”* (NZ Board of Health Report Series: No 22, 1974, p 71).

This implies an expectation that any economies of scale will be passed on to the state, i.e. that the prices on the Schedule will be adjusted to reflect the cost of providing the service, and should fall, therefore, with increasing volumes and automation.

*“The original application for recognition by a pathologist should contain a declaration that he is entering practice on his own account and will engage in no arrangements with commercial enterprises which would result in their gaining*

*access to Social Security funds...*" (NZ Board of Health Report Series: No 22, 1974, p 105).

In addition, deficient manpower planning, including an acute shortage of pathologists, was documented at length in the Report. This, as with the equipment and protocols already referred to, implied a need for co-ordinated, and co-operative planning at a national (and in some cases, an international) level.

Included as an Appendix in the same 1974 Report, is a commentary on the Committee's findings from Professor Ian Wootton, then Chief Scientist at the British Department of Health and Social Security, and an academic clinical chemist. He drew attention to the dual system of private and public-hospital laboratories both supported by state funds that was unique to New Zealand at that time. (In Britain, there were very few pathologists in private practice, he said, and these conducted privately funded pathology services.) In the private sector of laboratory work in New Zealand, he observed, the demands of doctors in private practice ensured ample money for development. This, however, could prove detrimental to the hospital system.

*"As populations increased ..... and inflationary pressures continued, he foresaw difficulties with the dual system ..... which might well arise when it became necessary to allocate priorities. There was no doubt that, at present, practitioners were provided with a service that was entirely satisfactory to them. In the future, this service might not necessarily provide the best system for the patient"* (NZ Board of Health, 1974, p 135).

Underlying the above, is a pervading theme of perverse incentives: neither medical practitioners nor registered laboratory professionals had had reason to rationalise the use of expensive equipment, or to innovate in other ways, under a system of assured third party (state) payment. Opportunities for patient and/or taxpayer input were minimal: not only was there a third party payer, but the initiating request came from another provider (the medical practitioner) whose

income was also a function of patient throughput. Substantial numbers of pathologists (along with other medical specialists) divided their time between public and private service provision and had, therefore, a disincentive to press strongly for public provider cost containment.

At this point, it is instructive to read the reflections of Conn and Snyder (1997) on the American clinical laboratory scene at the time of the 1974 New Zealand Board of Health Report.

*“Because hospital laboratories were the bellwethers in setting laboratory charges, the field was attractive to large independent laboratories which could easily perform the same tests and sell their services at a much lower price. Physicians in office practice could send specimens to these laboratories for analysis, and it was common practice to add large mark-ups to the charges and bill the patients for the inflated charges”* (Conn and Snyder, 1997 p 42-3).

The American health system does not combine predominantly state funded health ‘insurance’ with dual, public/private service provision as in New Zealand, but rather a multiplicity of both insurers and providers, predominantly private, but including state/federal agencies. Most American clinical laboratories were initially hospital based. While the laboratories’ real unit costs were diminishing steeply with the advent of automation, American hospital management saw them as convenient ‘profit centres’ that could be used to support deficit-producing hospital operations. These ‘distorted economics’ were to set the stage for the ‘wrenching’ laboratory reorganisations taking place in America by 1997, including widespread consolidations of laboratories and of diagnostics suppliers, reversal of the previous laboratory personnel shortage and a ‘significant’ projected surplus of pathologists (Vance, 1997). Although the New Zealand and American clinical laboratory systems were never exactly analogous, parallels can be drawn, particularly with respect to the potential flow-on effects of poor financial accountability in the publicly controlled hospital sector.

In his comprehensive History of Pathology in New Zealand (1997), Professor DT Stewart regretted that the 1974 Board of Health Report, which should have been the 'Magna Carta' for pathology services in New Zealand, was effectively 'pigeon-holed' despite protests from the Laboratory Services Advisory Committee of the time. One reason for this neglect, suggested Stewart, was the untimely departure overseas of Dr H J H Hiddlestone, Director, Division of Hospitals, who had been a prime instigator of the report. A change of government from Labour to National (Conservative) in 1975 might also have given the ear of policy makers to an alternative set of advisors for the succeeding decades.

Present-day laboratory professionals will be struck by the wide divide between the predominantly co-operative between-stakeholder direction of the 1974 Board of Health Committee Report recommendations and the course set almost two decades later by the 1990s health reforms.

### **Some drivers of rising laboratory workloads**

At the time of the 1974 New Zealand Board of Health Report, State expenditure on hospital and privately-controlled laboratories was divided about equally between sectors, and rising at approximately 18 percent per annum, mainly because of increases in test range and throughput (rather than in price per test). A report written for the Department of Health in 1978 by RT Kennedy, then Principal Technologist at Auckland Hospital Laboratories, foreshadowed what were to become recurring themes in the ensuing years, as the 'cottage' health industry of the '60's moved into more challenging technological and economic times. His report (published together with a recommended method for national clinical laboratory workload measurement) was entitled: 'The rising laboratory workload: a critical appraisal of cause and effect'. In his foreword to this 1978 report, Dr GC Salmond, then Director of the Management Services and Research Unit, Department of Health, drew attention to the four-fold increase in benefits paid for laboratory services over the 10 years 1967-1977.

*“In future we simply cannot afford the uncontrolled growth of medical technology. Far greater responsibility must be taken by scientists, clinicians, technicians and administrators alike to ensure that value is obtained for money spent not only on technology, but on all aspects of health care. Mr Kennedy’s paper suggests that at present we are not getting value for money spent on laboratory services, and indicates a number of ways in which services could be improved and savings made”* (Salmond, 1978).

The Kennedy (1978) report attributed much of the rising laboratory workload to the following:

- The trend towards biochemical and haematological ‘profiling’ made possible by the development of multi-channel ‘continuous flow’ auto-analysers capable of performing up to 20 analyses on the same blood specimen simultaneously. By 1978, as Kennedy documented, ‘profiling’ had been discredited, both as a way of improving the overall diagnostic efficiency of laboratory testing, and as a means of reducing the length of hospital stays. However, it took time, and inevitably further investment, before advances in technology (especially digital technology) made ‘discrete’ or ‘random access’ analysers that performed only the requested analyses on each specimen, an economic alternative.
- Improved access to services. In hospitals, this meant that provision of a laboratory-staffed collection service to hospital wards freed ward staff from previous practical constraints on test ordering. Kennedy felt that the too-convenient service was often abused, when nursing or junior medical staff failed to check the patient’s previous testing-history, or to appreciate the difficulties in sampling certain patients and simply requested further testing.
- Laboratory request form layout. In particular, Kennedy cited the common practice of offering test ‘blocks’ to suit the laboratory analyser configuration, while not necessarily reflecting individual clinical requirements.
- Decreasing hospital stays. Because of a heavy test-requesting load on admission, the trend towards decreasing day stay contributed to the higher

laboratory workload. (Day stay has decreased even further in the intervening years, with the introduction of minimally invasive surgical techniques.)

- Indiscriminate requesting, often owing to the use of entrenched, inflexible ward protocols.
- Misleading results due to an inadequate definition or appreciation of normality.
- Influence of the recent literature. Publications featuring certain tests could create a ‘fashion’ for that test that, once established, was difficult to curtail.
- Association with a medical school (with unqualified staff needing to rely more heavily on clinical support service ‘props’ than those with more experience). Kennedy cited a 1971 American study in a teaching hospital where the costs of laboratory tests reached 25 percent of the total hospital bill per patient<sup>2</sup>.

Kennedy is even-handed in apportioning the blame for these wasteful practices between laboratory management, and medical staff. He makes some particularly clear-sighted comments in his summing up, firstly in relation to laboratory management:

*“Somewhere along the line, sound management has to prevail or local decision-making will be further eroded by an increasing bureaucracy”* (Kennedy, 1978, p 27).

And in relation to medical staff:

*“The sad fact is that practices learnt from this introduction to laboratory medicine find their way into private medical practice with resulting overuse of the laboratory services once again”* (Kennedy, 1978, p 29).

Sensible though these recommendations were they do not appear to have prevailed over the disincentives to cost-effective practice ‘built in’ to a system

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<sup>2</sup> An average of six percent of the total costs for surgical conditions, and nine percent for medical conditions was more typical for US laboratory costs by 2000 (Young, Sachais and Jefferies, 2000).

already confronted with the spiralling costs of technology and the technology-augmented curtailment of laboratory job opportunities and career structures. It is assumed that careful pinpointing of the sources of waste and the means required to prevent it will be sufficient to ensure an appropriate response. There is a focus on the content of managerial decisions, rather than the context in which they are made. Daly, McDonald and Willis (1992) make the same point, when discussing the doubtful effectiveness of controlled trials in changing health care practice:

*“The tendency is to call for ‘stronger’ methods of evaluation ... This ignores the possibility that change is resisted not because physicians are irrational but because they have professional or financial motives for not changing. These, the social aspects of practice, are commonly ignored in technical studies in the incorrect belief that they will yield to rational persuasion based on evidence of effectiveness”* (Daly, McDonald and Willis, 1992, p 1).

Two of Kennedy’s (1978) more specific recommendations for controlling waste, illustrate this point:

- Where the cost justification for purchase (of expensive laboratory equipment) is based on a reduction in staff, administrators should see in fact that there is a reduction in staff. (However, a counter-incentive was in play here: one factor influencing the grading of senior technologists in the public sector was the number of staff they controlled.)
- Proper management of laboratory resources implies that the laboratory administration must have some control over external demands on its services. (But falling workloads would be detrimental to professional interests and personal careers.)

Kennedy’s perspective, typical of the time, fails to take account of drivers of professional behaviour other than the common good: he overlooked personal incentives or disincentives and group power struggles. New Zealand clinical laboratory services, primarily as a consequence of this failure, were an obvious

target for the 'New Public Management' in the 1990s for cost efficiency measures.

### **Rising laboratory expenditure in primary care**

Although laboratory managers in public hospitals frequently felt caught between hospital budgetary constraints and the demands of medical staff, they were not 'demand driven' in the sense that their counterparts in the primary care sector were, as part of the 'fee-for-service' chain. Malcolm (1993) has analysed longitudinal trends in New Zealand primary medical care-related services and expenditure over the decade 1982/83 to 1992/93. Growth in expenditure on total primary care-related services exceeding inflation had occurred over most of this period, and Malcolm's analysis attributes most of this to increased utilisation of the primary care support services (pharmaceuticals, laboratory and maternity services) rather than to increased general practitioner utilisation.

In the 1992/93 financial year, an increase in laboratory benefit expenditure of 10.1 percent occurred despite a marked decline in general medical services benefit (GMS) expenditure. Malcolm (1993) gave no explanation for the anomalous increase in laboratory expenditure. The following are possible explanations:

- Malcolm ascribes some of the parallel increase in maternity benefits to cost shifting from area health boards to the private sector. The same process might also have been a factor in the community laboratory expenditure increase, as secondary services became increasingly constrained under the capped funding regime of the area health boards (Howden-Chapman and Ashton, 1994).
- It is possible that compliance with area health board directives to improve patient access to laboratory collection services was a factor in either offsetting the

expected decline in volume, increasing total service costs (which would be added to the price per test), or both.

- Another factor is that additional laboratories were set up in some centres (e.g. Hamilton, Christchurch) in anticipation of the competitive tendering for services signalled by the National government as a key tenet of its health services reform plan. The following passage from Stewart's History captures the mood of the time:

*“The 1990 merger of Pearson and Godfrey laboratories [in Christchurch] gave the opportunity for starting a second laboratory in Christchurch to serve doctors in private practice.*

*This chance was seized by the Aoraki Corporation Ltd – ‘a world leader in information technology research, development and management’. It is a private company owned and headquartered in Christchurch and has internationally renowned subsidiaries, the Unisys Development Centre and the Cardinal Network. The corporation was keen to show how it could ‘improve the levels of service available in the health industry by upgrading the standard of information technology in use..... To be able to demonstrate this to local and overseas health professionals interested in acquiring the company’s system, it was necessary to set up a ‘state of the art’ laboratory - known as the Cardinal Community Laboratory ‘to provide a test bed for new computer systems which can improve the efficiency of pathology testing’ ” (Stewart, Private Labs, 1997, pp 42-3).*

This initiative, and others similarly aimed at taking advantage of testing new systems technology in a freer, more open market, might have had an effect on test utilisation per capita similar to increasing access to collection services. A high correlation between service availability and utilisation has been observed many times in cross sectional data according to Malcolm (1993).

- Alternatively, having similar test volumes shared across the extra laboratories might have offset previous economies of scale, also increasing the mean price per test.

Any of these, or a combination of them, could explain the anomalous increase in laboratory expenditure in 1992-93 in the face of reduced GP utilisation. It is worth noting that 1993 was the last year for which positive adjustments to both test price and range could be made nationally to the old laboratory benefits schedule. From 1993, payment for tests became a matter for negotiation between each of the four newly formed regional health authorities (as purchasers), and the providers of laboratory services.

Despite the 1992-3 anomalies, it is significant that over the previous eight years the mean (inflation adjusted) 12.1 percent per annum increase in expenditure on GMS, is largely attributed by Malcolm to a price effect (i.e. to increases in the schedule price paid per consultation). The lower comparative figure for laboratory benefits of 7.1 percent increase per annum, attributed mainly to volume increases, gives an indication of the extent to which laboratories were able to absorb increases in working costs, including salaries, by increasing automation and other efficiencies.

By the start of the major health reform process in 1993, public hospital 'complexity adjusted' inpatient and outpatient discharges (major influences on hospital laboratory throughputs) were increasing at rates of 4.0 and 7.2 percent per annum respectively (Ministry of Health, 1994). However, analyses of area health board expenditure over the 1983-90 period put their average total annual expenditure increase at only 0.5 percent in real terms (Malcolm, 1993), suggesting real efficiency gains throughout the hospital system. The hospital-based services had been funded for some years through the fixed budgets of the area health boards, and so had had an incentive to contain costs (Malcolm, 1996). Some cost shifting to the private sector, and 'running down' of assets might also have been factors in containing hospital services costs throughout the 1983-92 period (Howden-Chapman and Ashton 1994). Nevertheless, it is likely that hospital laboratories, like those privately owned, were able to offset the costs of increasing test volumes by efficiency improvements up to this point.

### **Pressures from technological change**

Running parallel with the economic and ideological shifts since the Board of Health Committee Report in 1974, have been rapid advances in technology, developed almost exclusively offshore. Kricka, Parsons and Coolen (1997) have written a comprehensive summary of changes in the practice of laboratory medicine in the United States, from the dual perspectives of an academic medical centre and the diagnostics industry. They emphasise the disproportionate rise, largely technology driven, in the costs of health care over the 1990-95 period. Clinical laboratories worldwide have been both victims and beneficiaries of these advances because of their high technology dependence and their central, and potentially lucrative, niche in the health care sector.

Developments in measurement (e.g. automation and total systems integration, miniaturisation, monoclonal antibody and molecular diagnostic systems); digital technology (computer hardware and software); communication (local and world wide networking); and transportation technology have conferred, in themselves, a profound effect on the organisation, staffing, equipping and operation of modern clinical laboratories (Burtis, 1996). Modern information technology has the potential to co-ordinate information, and to improve the quality of both laboratory reporting and test requesting beyond anything envisaged in 1974. Diagnostic molecular pathology has also developed rapidly in the wake of the American human genome project, and a shift from phenotypic to genotypic diagnosis has been predicted, with diagnostic molecular pathology expected to comprise 5-10 percent of all testing by the early 21<sup>st</sup> century.

Burtis also pointed to the paradox whereby clinical laboratory testing was becoming simultaneously both more centralised (on large high-throughput analysers), and decentralised ('point-of-care' testing, usually by nursing staff). Both trends, of course, would have similar implications for the traditional medical laboratory technologist workforce. In addition, a new generation of

automated analytical systems became available by the early '90's that could provide rapid throughput and a wide repertoire of clinically relevant assays, crossing the boundaries of traditional laboratory disciplines (e.g. biochemistry, microbiology, haematology) that had previously been organised according to manual analysis techniques. This would also be expected to impact on staffing and, through both de-skilling and loss of middle management positions, on technologist career structures. At the same time, the increasing availability of commercially prepared, analytical 'kits' for the measurement of almost every clinically useful marker, (including molecular pathology markers) undercut the traditional role of the specialist analyst. The old need for technical skill was being replaced by a new need for technically sophisticated professionals with strong evaluative and communication skills, for liaison and educational outreach. An urgent requirement for re-skilling opportunities had arisen.

Vance (1997) has suggested that the skills used by pathologists to co-ordinate clinical decisions across a wide range of medical specialities would be easily transferable to 'outcomes management'. This emergent discipline encompasses statistical process control, economics, epidemiology and team management, and aims to reduce health care expenses to a level of appropriateness while ensuring that under-utilisation is also detected.

To respond constructively to these challenges within the severe budgetary constraints that, by the early 1990's, had become inevitable, clinical laboratory services needed to contain costs. They could have developed the degree of inter-laboratory (and inter-service) co-operation foreshadowed, but largely ignored, in the 1974 New Zealand Board of Health Report. The 1993 reforms, however, took them down a different path.

The following chapter outlines and critiques the stated objectives, nature and implementation of the 1990s New Zealand health sector reforms, and their implications for clinical laboratory services.

## **Summary of main issues arising in Chapter 1**

1. Perverse incentives embedded in the NZ health system made clinical laboratory services a prime target for reform. These included:

- a dual system of publicly- and privately-controlled laboratory services, both state funded, duplicating expensive equipment, materials, and staff structures;
- demand for services mediated through other professionals, rather than patient initiated;
- third party payment;
- professional incomes/career structures strongly influenced by service volume.

2. Discrepant evidence exists regarding the part played by the following factors in increasing clinical laboratory utilisation per capita up to 1993:

- increased GP availability;
- increasing overuse by doctors;
- increasing use of more expensive, specialised tests;
- increased subsidisation of certain social groups;
- increased access to collection services;
- proliferation of laboratories.

3. Developments in expensive, imported technology reinforced the need for rationalisation and co-ordination of available clinical laboratory resources.

## Chapter 2: Change by remote control

The chief argument advanced in this chapter is that critical changes introduced to the New Zealand public health sector in the early 1990s were ideologically driven and imposed on the sector. No attempt was made prior to their introduction to obtain democratic input into an assessment of the *status quo* and, similarly, no such input fed into the formulation and implementation of the policies themselves. They remained, with minor modifications, until mid-2000. The chapter interprets the course of events in the health sector through the period 1991-9 as an attempt by the National (conservative)-led administration to distance itself from these fundamental accountability shifts in a particularly sensitive area of the former Welfare State. To achieve this distancing, a focus on the use of competitive market mechanisms, in combination with delegated decision-making, was chosen to effect change. Both strategies had critical implications for clinical laboratories.

The changes to the health sector in the early 1990s, while extensive, were part of a continuum of public sector change since 1984 aimed at supporting a systematic programme of 'structural adjustment' by reducing the total size of the public sector (Boston, 1995, Kelsey, 1995; Kelsey, 1999). Easton (1997) attributes two major objectives to the New Zealand Treasury in the period prior to the health reforms of the early 1990s: the first to 'cost-shift' in order to reduce fiscal stress; the second to reduce the government's involvement in management of resources through increasing privatisation of the state sector.

One notable outcome for the health sector was a steady decline (88.2 percent to 76.4 percent over the period 1980 to 1995) in the proportion of total health expenditure funded by the state (Scott, 1998). While total inflation adjusted expenditure on health actually increased by 2.2 percent over this period, containment of state expenditure had occurred, at least in part, through shifting

the burden of some of the cost to individual patients, either directly, or through private insurance.

### **User part charging: economising on expenditure and utilisation**

User part charging (sometimes called co-payment) is a strategy often adopted for containing third party-funded health costs. The history of user part-charges for New Zealand medical services is almost as long as that of the country's Social Welfare system (Baker, 1998; Richards, 1994). It grew out of a 1941 compromise between the first Labour Government and the New Zealand branch of the BMA, when a general medical services (GMS) benefit was first considered as part of the promised, state-insured social welfare programme, in 1938 (Richards, 1994).

The medical profession resisted comprehensive state funding for health care, preferring limited, income-related state insurance targeted at the needy (Richards, 1994). Doctors also believed that direct payment from patient to doctor for services rendered, underpinned their status as independent professionals, and their moral obligation to patients. The proposed system of set payment proportional to the population serviced would imply a state wage, and possibly 'state control' in their view (Baker, 1998). As a consequence, the government's preference for a per-capita system of payment was eventually waived in order to secure the broader aim of a comprehensive, state-insured health system, and a fee-for-service reimbursement system was instituted in 1941. By the end of the 1960's, however, the state GMS subsidy made up only about a third of the average consultation charge, the remainder being the user part-charge (Baker, 1998). By 1983, the subsidy level had fallen even further to less than 20 percent of the average consultation fee (Ashton, 1992).

This user part-charging regime, in place at the start of the 1990s, had been criticised on several counts. It clearly provided inadequate support for low-income patients and was inconsistently applied across the various health services, sending misleading signals to users regarding the true costs for those services

(Upton, 1991). Sometimes these signals distorted patient management decisions: the inappropriate use of (fully subsidised) laboratory tests would be one example. The pre-reform changes of 1991 included an increase to the level of GMS subsidies for low-income patients and the extension of user part-charging to secondary care.

Although the history of pharmaceutical user part-charging follows that of general medical services, New Zealand laboratory services have been without charge to patients since the introduction of the laboratory services benefit in 1946 (Stewart, 1997). There are three main reasons for this continued exclusion of laboratory services from part charging. First, there is evidence that the desired effects of part-charges on responsible usage are strongest if patients themselves initiate the demand for the service. Upton (1991) cites the Rand Health Insurance experiment in the United States 1974-82 as evidence. In New Zealand, patients are normally tested following a doctor's referral, so that the patient has a reduced decision-making role in the process.

Secondly, part-charges might provide a disincentive for patients to proceed with essential, requested testing. This was the basis of the New Zealand Medical Association's advice against any future introduction of part charging for laboratory testing (NZMA, 1998b). Studies by Tilyard and Dovey (1996) of changes in sources of payments for general practice consultations between 1989 and 1993, and by Gardner, Dovey and Tilyard (1996) on prescribed versus dispensed medications over 1992, both show a negative correlation between increasing user charges, and service, or prescribed medication, uptake.

The third reason, often advanced against user charges for government services in general, is that any financial gains would be offset by the transaction costs involved in administering and collecting the service fees, which in this case would be relatively small and numerous. According to one estimate (Tuck, 1996), a user part-charge of \$8.00 would be needed to cover the administration and other

costs associated with the introduction of a laboratory fee charging system that costs only \$2.00 net per patient.

### **Contestable state funding: the supply-side focus of the reforms**

Central to the New Zealand public health sector reforms promulgated in 1991, and introduced in mid-1993, was a new structure with clearly separate functions for the purchasers (four regional health authorities, RHAs) and the providers (public, private and not-for-profit) of health services (Upton, 1991). Cost control was to be achieved through the mechanism of competition between providers for state-funded health service contracts developed and administered by the four RHAs. Quality (to be defined through wide consultation) was stressed as a criterion for contest 'winners', along with cost-efficiency. The overall expressed aims of the health sector changes were, in brief:

- equity of access, affordability for all New Zealanders,
- efficiency, flexibility, innovation,
- reduced waiting times,
- widened consumer choice,
- enhanced working environment for health professionals,
- improved health promotion,
- increased sensitivity and responsiveness.

Elsewhere in Upton's (1991) paper, New Zealand's deteriorating economic position was cited as a precipitating factor for the reforms, along with changing demographics, new technology, and higher consumer expectations. With hindsight, it is difficult to see compatibility between all the individual aims cited above, let alone compatibility between these and an underlying need to curb state expenditure. Similarly, the necessity for achieving the cited aims through the proposed radical and costly restructuring is not obvious. As Blank (1994) has pointed out, New Zealand's unitary political system, with power concentrated in the national parliament (effectively in caucus), allows radical policy change to

occur rapidly even in situations where a more incremental approach might be preferable.

The content and rationale for Upton's 1991 policy statement draw heavily on a report (Danzon and Begg, 1991) commissioned by the New Zealand Business Roundtable. The report built upon earlier themes in a Government commissioned report (Gibbs, Fraser and Scott, 1987), and attributed the recently created Area Health Board 'inefficiencies' to a lack of competition. To address the assumed inefficiencies the authors concluded that public hospitals should be 'corporatised' just as the more commercial areas of state activity had been. The intermediary (largely funding prioritisation) and health provision functions of the old Area Health Boards would need to be separated.

Easton (1997) traced the history of this report and documented the 'extraordinary' series of appointments made to positions of influence in the health sector of members and associates of the Business Roundtable following its release. Easton (1997, p153) criticised the basis upon which initial claims of health sector inefficiency were made, drawing attention to an inflation adjustment in a crucial Treasury paper that misled analysts over trends in public spending on health. Thus, the Danzon and Begg Report signalled a particular policy direction that might have been unnecessary given Easton's subsequent finding. Such a policy direction would also, as its proponents comment:

*'... be a sensible transition path if more far-reaching reform is contemplated. Privatisation of the provision of services could occur any time following corporatisation, independent of the track taken for insurance..... A private insurance option (with or without subsidies and the requirement to purchase), could be viewed as a final stage towards which a mixed public/private system with opting out could evolve'* (Danzon and Begg, 1991, p 83).

Kelsey (1995) has pointed out that full privatisation can, in itself, reduce efficiency owing to the need for private insurance organisations to build a large

capital base and, ultimately, to return profits to shareholders. (Very large private provider chains would also be in the same position.) On the way to privatisation, the state's regulatory role can easily become compromised along with its reducing fiscal stake in health care provision. Then as health care costs rise with increasing private sector involvement, the inevitable outcome is reduced state entitlements, or reduced access and consumer choice for the relatively poor: an expanding sector of the New Zealand population through the 1980s and 1990s (Kelsey and O'Brien, 1995; Randerson, 1992). Since cost reductions in a labour intensive area like health care can most readily be achieved by staff cuts, which were also a feature of previous non-health sector state corporatisations (Kelsey, 1995), an enhanced working environment for health professionals, and increased client satisfaction, were other unlikely outcomes of the proposed changes.

Supply-side controls on health expenditure (of which the creation of market conditions is one example) are generally considered to be more effective (Blank, 1994) than demand-side strategies like part charging, or (for clinical laboratories, with medical clients) general practitioner group capitated funding:

*"The critical question is whether the reduced use of medical resources produced by these [demand side] policies leads to lower levels of health....."* (Blank, 1994, p78).

Supply side controls include a number of strategies such as direct, centralised controls on levels of remuneration, prices, fees, charges, medical practice, medical manpower, and expensive, duplicated technology usage. None of these state interventionist controls, however, were part of the 1990s reforms.

Creation of a 'quasi (or internal) market' is a supply side cost control mechanism used with equivocal results in the United States (Medicare), Britain, and other OECD countries, before its introduction here (Culyer and Posnett, 1990; Ferlie, 1997). A 'quasi market', whereby health service providers compete for limited, prospective, state agency-dispensed funding, while not empowering individual 'health consumers' as fully as a portable entitlement, does have the potential to

deliver significant efficiency gains - according to a British analysis of American data (Culyer and Posnett 1990). Economic theory predicts that competitive markets will generate incentives for efficiency, and the contracting process should encourage quality and appropriateness.

Translation of the 'quasi market' to the New Zealand health sector was always going to be problematic. In many parts of the country, the relatively low population density would support only one provider, particularly for high-tech health services. This was true for many public hospital-provided services at the start of the reforms. Accounting systems put in place in public hospitals were therefore designed to 'unbundle' separate secondary service costs, service by service, in anticipation of public/private competition for individual service contracts (Ashton and Press, 1997).

Some of the services provided by hospitals would have initial set-up costs high enough to provide a disincentive to likely competitors entering the market. In the case of laboratories however, most equipment could be hired, and the government clearly envisaged competitive tendering as one mechanism for controlling laboratory unit costs. Furthermore, although only one laboratory might be required in any one geographical area, it is possible for a competitive environment (and some economies of scale) to be maintained, and a monopoly provider situation with its attendant price-controlling power avoided, by a process of horizontal integration throughout the country. This could be achieved by integrating formerly independent, pathologist-owned, laboratories on a countrywide network basis (provided more than one viable network exists), so that laboratory managerial and professional expertise is shared, and negotiation for contracts and supplies co-ordinated. Thus, competition between networks for contracts would be theoretically feasible even where the area serviced is sparsely populated.

In the privately controlled sector, however, two large companies came to dominate throughout New Zealand in the period 1990-97: Medlabs, owned by the Societe Generale de Surveillance SA of Switzerland (SGS), and Diagnostics, which was New Zealand-owned. By 1999, only about one third of private laboratories remained independent and pathologist-owned. Competition between Crown Health Enterprises (CHEs) was also a key part of the competitive model adopted in 1993. Hospital laboratories achieved effective co-ordination at a regional level only as one consequence of that expected competition.

In the two years to 1997, the number of individual privately owned clinical laboratories reduced from 23 to 17, and several hospital laboratory contracts were taken over by private organisations (Association of Community Laboratories, personal communication). The 1993 reforms allowed individual CHEs to make a business decision about 'contracting out' laboratory services, rather than providing them in-house.

The mean price-per-test for RHA regions, which in 1992/3 had varied between approximately \$9.20 and \$11.70, converged at approximately \$10.00 throughout the country by 1994/95, remaining fairly constant thereafter (Ministry of Health 1996, 1998). These figures, and the information above, indicate that reorganisation for competitive tendering had achieved some consolidation (not necessarily a co-ordinated rationalisation), and more uniformity in prices across the country (not necessarily cost efficiency) for privately controlled laboratories: a modest achievement, at best.

Meanwhile, overall expenditure on primary referred laboratory testing had risen markedly from \$89.1 million in 1990/91 (Upton, 1991) to \$140.7 million by 1996/97 (Ministry of Health, 1998). This 3-year expenditure growth rate to 1996/97 of 18.39 percent exceeded those for both the GMS (8.51 percent) and pharmaceuticals (adjusted for statins, 16.44 percent). In 1998/99 the HFA spent \$167 million on laboratory testing in the primary sector, and estimated that these

costs were increasing at 5 percent per annum 'with no clear evidence of health gain'. By comparison, the HFA also estimated that hospital in- and outpatient Laboratory Services: some sub-contracted to privately controlled laboratories; were costing a further estimated \$180-200 million (Health Funding Authority, 1999).

In his *History of Pathology in NZ*, Stewart (1997) recalls that in the early '70's, the Laboratory Services Advisory Committee referred a resolution concerning 'commercialisation' (received from the New Zealand Society of Pathologists) to the NZ Board of Health Committee on Clinical and Public Health Laboratory Services. In its final report (New Zealand Board of Health, 1974) this Committee resolved that a pathologist in private practice should 'engage in no arrangements with commercial enterprises which would result in their gaining access to Social Security funds' (p 105). 'Perhaps' comments Stewart dryly; 'the SGS [laboratory financing company, Societe Generale de Surveillance SA of Switzerland] is an altruistic organisation, and possibly the Aoraki Corporation<sup>3</sup> regards the obtaining of a demonstration laboratory as an adequate return' (Stewart, 1997, p 43).

Meanwhile, hospital-based services had been funded through the capped budgets of the AHBs during the late 1980s prior to the introduction of contracting, and so already had an incentive to minimise costs (Howden-Chapman and Ashton, 1994). Despite this, in the CHEs, developments preparatory to competitive tendering for individual services saw moves towards the creation of stand-alone clinical treatment units, with support services, including hospital laboratories, outside the core business of the CHE (Lawrence and Doolin 1997). In the early years of the 1990's reforms, however, only the Midland and Southern RHAs attempted to open the market fully, to allow competition between public hospital and private sector laboratories. Ironically, in Midland RHA, the approach was abandoned owing to 'resistance' from private laboratories. In the Southern

region, the approach was modified, after consultation with providers. Although no reasons are given for this abandonment of open competition, the Ministry's Performance Management Unit commented that separate RHA negotiation with providers directly, rather than through a single joint agency like PHARMAC, made the achievement of efficiency gains 'difficult' owing to provider resistance (Ministry of Health, 1997). [Subsequently, in a Brief of Evidence to the Ministerial Inquiry into Under-reporting of Cervical Smear Abnormalities in the Gisborne Region, a spokesman for the Association of Community Laboratories gave a telling reason for the private laboratories' strong opposition to competitive tendering in the early 1990s: the 'contest' as planned was viewed by the privately owned sector as being heavily weighted in favour of hospital laboratories. Hospital laboratories 'could not at that stage even identify their actual overhead costs, let alone make provision for them' (Beer, 2000, p6).] Thus, it would seem that, in the case of laboratory services, the health reform reorganisation never achieved a fully operative internal 'quasi' market as originally envisaged even though the relatively low population density was no barrier to horizontal integration, and (theoretically) to inter-network competition.

In part, this failure to operate the quasi market as intended might have resulted from the contracting process itself. Contracting incurs additional transaction costs (which vary from service to service), and these may be so high as to either negate the advantages of competition, or make short-term contracts impractical (Ashton, 1998). Risk insurance would constitute a high transaction cost for laboratories (despite the ease of material entry and exit) owing to the high cost and level of training of staff and, consequently, the high cost of severance. Ashton (1998) has also pointed to two factors strongly influencing transaction costs in the New Zealand quasi-market for health. These are the legal status of health service contracts, which often leads to protracted, detailed and costly negotiations, and (until mid-1998) the duplication involved in operating four health authorities.

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<sup>3</sup> See p 16, this thesis

The problem of ensuring public accountability when both funding and responsibility for quality are devolved to privately controlled organisations has been a further stumbling block to public acceptance of quasi market-driven cost control. Women's Health Action Director, Sandra Coney, pointed to the following consequences of state funding for private health care provision:

*“It is highly experimental... decisions about public funds will be made in the private sector.... This will result in fragmentation, inconsistency nationally, and a loss of co-operative effort....Most businesses do not expect to engage in dialogue with the public or implement participatory democracy”* (Coney, 1998 p29).

In agreeing to abandon competitive tendering for laboratory service contracts in 1996, the Midland RHA opted for direct contracts with all providers

*“.....covering improved information, accreditation, quality standards, and a review of the laboratory test schedule over time”* (Ministry of Health, 1997, p58).

This suggests that the Midland RHA and laboratory service providers negotiated a trade-off at that point between cost-efficiency gains that might have arisen from competitive tendering, and gains in quality. The new, centrally based Health Funding Authority (HFA) formed in a 'reform within a reform' in 1998 to replace the four RHAs was not amenable to this compromise, however. In its proposed 5-year plan for general practice, it listed the following strategic 'supply side' directives aimed at paying efficient prices for laboratory services (NZMA, 1998b):

- using contestable processes to help establish and test efficient price levels and reduce unnecessary duplication of services
- continuing to explore with providers, models for establishing efficient prices through benchmarking and other analysis
- realignment of the current schedule prices to better reflect actual costs
- working with providers and referrers to achieve efficiencies in the way services are delivered.

The overtly competitive phase of that period of the reforms has been strongly criticised by Malcolm (1996). He argued for collaboration as being more effective than competition in the provision of health care. A comment from a hospital-based pathologist is equally critical:

*“The previous commercially driven, competitive model was destructive, and has clearly not been cost effective. However, it will now take many years to re-establish the trust and level of professional communication which existed previously, and in some cases these links are unlikely to ever be re-established because of the private take-over of so many hospital laboratories”* (Personal communication, 1997).

With Coney, both these commentators stress a loss of collegiality and co-operative effort resulting from an open competitive contest for public funds. The effects of this loss are, of course, impossible to quantify. Further serious and more quantifiable failings, however, were also claimed: that the reforms had failed to improve health service efficiency and equity of access, despite an estimated 20 to 30 percent increase in expenditure (Malcolm, 1996).

### **Capitation and budget-holding: constraining referrer-demand**

Open competition for state health service contracts from 1993 was primarily directed at cost-efficiency gains. Overlapping these, however, were further changes directed towards a perceived misuse of laboratories.

The Performance Monitoring Unit used two indices to measure the annual regional variation in laboratory utilisation: tests per capita, and tests per referral. The Northern region had consistently had higher mean levels of tests per capita (4 to 4.5) than the three remaining regions (3 to 3.5), a result the Unit attributed to the large number of doctors servicing the region. However, the Northern region is also markedly demographically distinct and this might underlie their higher figure. A higher burden of morbidity among Maori and Pacific Islanders (National Health Committee, 1998) and large underestimates of Pacific Islanders in census data (Simmons, Gatland, Fleming and Leakehe, 1994) could provide

alternative explanations for the anomalously high tests per capita calculated for the Northern region.

The movement towards rationalisation of laboratory testing patterns has a long history. Kerr, Malcolm, Shousboe and Pimm (1997) listed several approaches to the problem of laboratory cost control that have been tried by health funders, both here and elsewhere, with generally limited success. These included punitive limitation of test availability; education programmes; feedback of general information on the numbers and costs of procedures; 'bribery' with educational allowances; the institution of practice guidelines and protocols; and the redesign of request forms. Kerr, et al. (1997) inferred that successful control must rely upon the incentive of professional satisfaction built into systems of reward:

*"The potential for professional incentives, based upon collaboration between providers and focussing on improving patient outcomes, could be a far more powerful approach to achieving improved access, greater efficiencies and health gains, than the competitive strategies advanced as potential solutions to these issues in the early stages of the current reforms"* (Kerr, Malcolm, Shousboe and Pimm, 1997, p336).

The inter-provider, collaborative solution to optimising primary care efficiency outlined above would replace the individual 'fee-for-service' GMS subsidy with one of a number of 'bulk funded' systems generically termed 'managed care'. Managed care has been defined as the provision and co-ordination of health care for a registered population from a primary care level, within an agreed budget (Malcolm, 1996). Support-service funding allocations are devolved from the state purchasing authority to a primary care-based organisation. Independent Practitioner Associations (IPAs) are groupings of GPs servicing a geographical locality, sharing a common administrative structure: a form of 'managed care' organisation that evolved in New Zealand through the mid-1990s. IPAs attempt to achieve maximum health benefit overall for a fixed per-capita budget, which they control.

From their inception, RHAs saw IPA ‘budget-holding’ as a key strategy for controlling ‘demand driven’ primary care-related expenditure (Malcolm, Wright and Barnett, 1999). In attempting to maximise the health care they could provide within budget, IPAs produced a striking falloff in laboratory expenditure in the North Health region (McCafferty, 1996, Sinclair, 1997, Sinclair, 1998a, b) and in part of the Southern region (Kerr et al., 1997) early in the budget-holding development. Cardinal Community Laboratories, the Christchurch-based Aoraki Corporation initiative used as an example of pre-1993 laboratory proliferation in the previous chapter, was placed in receivership in August 1996 with debts of more than \$3 million, and later put into liquidation (Christchurch Press, June 10, 1999). In May 1999, the country’s two largest pathology laboratories, Medlab Auckland and Diagnostic Auckland announced their administrative merger, in response to a ‘squeeze on funding’. The new company became known as Diagnostic Medical Laboratory, but retained its separate operations (Online Doctor – News, May 28, 1999). SGS, the international Swiss based company owning the Medlab chain, sold its ‘non core’ medical testing holdings, following a ‘very bad March year’ to a larger company based in Australia, but still with SGS links (personal communication, 1999).

There was, however, wide concern about the potential effects of IPA budget-holding on patient outcomes fuelled particularly by reportedly adverse effects from similar systems of ‘bulk’ health funding in America and summarised by a New Zealand laboratory manager as follows:

*“Managed care in the USA resulted in ...reduced volume of tests, reduced screening...increased use of large reference laboratories...increased alleged unethical/illegal laboratory practice and ordering behaviour.... The outcome of the changes has been reduced service, access and profitability. There is a reduction in training and research and development, and a glut of available pathologists/ technologists.....In this environment, economies of scale are*

*paramount. Implosion of laboratories has resulted along with dramatic price reduction” (Pratt, 1996, p14).*

These effects were confirmed and enlarged upon by Kricka, Parsons and Coolen (1997) who cited an example of one laboratory consolidation that, despite in- and outpatient increases of 10 percent and 51 percent, achieved savings of 11.6 and 21.9 percent respectively. The main contribution to these savings was a 26 percent decline in salary expenses. (This saving is typically achieved once only, however: ongoing cost control would require a more subtle strategic approach.) Burtis (1996) described American laboratory professionals as ‘experiencing a degree of anxiety about their careers and profession that is unprecedented in the history of laboratory medicine’ (p 1744). Other commentators observe that following the failure of Clinton’s Health Security Act in 1993:

*“...Both the Executive and Legislative Branches of government retreated to let the ‘marketplace’ enforce its reforms through an incremental approach. Managed care organisations, particularly for-profit Health Maintenance Organisations, have taken a leadership role and are rapidly enrolling members, or ‘covered lives’ to use their terminology, to their ranks. Importantly, where organised medicine, governments at all levels, and the public were unable to identify incremental solutions for specific problems, the profit motive has opened the floodgates of medical care reform in a truly unplanned and unanticipated manner” (Conn and Snyder, 1997, pp34-35).*

The evolution of health maintenance organisations (HMOs) in America from small, not-for-profit groupings to large, for-profit companies exploiting economies of scale to recruit members and to return a profit to share holders, was traced by Ginzberg (1998). A parallel ‘massive’ growth in independent (not hospital or clinic based), for-profit laboratories also occurred: economies arising from large test volumes and bulk purchasing of supplies, enabled American for-profit laboratories to successfully compete for services to the large HMOs (Conn and Snyder, 1997).

Just as the ongoing requirement to continue returning a profit led to unacceptable compromises in both quality and access for HMOs, so also were American hospital laboratory services compromised, following strong price competition from large for-profit organisations (Kricka, Parsons and Coolen, 1997). Fiscal and regulatory pressures led to 'an understandably' conservative attitude towards expansion and development that adversely affected the availability, frequency and range of tests on offer. Kricka, et al. (1997) described a shift in focus, from a view of laboratories as being 'an integral part of the hospital committed to contributing to the diagnosis and management of patients', to a 'cost centre': a description they regard as derogatory and demeaning (p 28). These observations have relevance, less to the form of (non-risk holding) HMO that appeared to be evolving in New Zealand (Malcolm, 1999), than to the continued incursion of for-profit companies, some with substantial overseas shareholdings, into the New Zealand laboratory services market.

Sinclair (1998b) has reported results obtained by Auckland haematologist Dr J. Cleland who explored an indirect marker of population health status. He analysed over two million anonymous private laboratory (Medlab) test results before and after the widespread introduction (in 1996) of IPA-budget holding in Auckland. He found no significant change in the proportion of abnormal results obtained, despite a marked reduction in the volume of test referrals associated with the introduction of budget holding. He concluded that the budget-holding-induced reduction in laboratory testing resulted, not in improved discriminatory ordering on the part of GPs but in fewer reported diagnoses (Sinclair, 1998b). Of particular concern to Cleland, were likely delays in the diagnosis of progressive myeloma or diabetes. He commented:

*"We believe these data are enough to define the urgent need for recognition of the experimental nature of these health changes and therefore the need for appropriately defined protocol, accepted not only by the health planners, but also all professional groups involved and not least the public patients whose informed*

*consent would clearly be required for such an experimental exercise* (Personal communication, 1998).

The following comments from a senior representative of the Royal College of Pathologists of Australasia express the unease, isolation and vulnerability felt by the pathology community as managed care principles: starting with general practitioner-group budget holding; were implemented throughout the country:

*“.....managed care is a contentious issue.....One of the hooks in this approach is that much of the decision making is given to one group, in this case general practitioners, and there is concern that appropriate safeguards which other professional groups must comply with may be omitted or bypassed. The College would certainly prefer a collaborative to a competitive approach to achieving cost control, but not from a position of weakness, which is one of the potential consequences of managed care”* (Personal communication, 1997).

A loss of inter-professional collaboration had accompanied the market-style supply side measures imposed to control prices. Similarly, to the pathologist quoted above, a loss of collaborative potential was also seen an underlying risk of GP laboratory budget holding.

The remote, hands-off stance taken by the government in its early efforts to impose general practice capitation was probably a strategic mistake. Very early in the reform process, Scott (1994) called upon the government to use its regulatory powers to ensure the efficiency and equity of health care, whether undertaken in the public or the private sector. This, as she pointed out, is in its best long-term interests, since it is the state that usually funds the health care of high-risk and low-income groups.

### **Defining core services for state funding – the bottom line**

Failure to clearly define core health services severely curtailed any potential benefits of the New Zealand health sector 1993 reforms. Scott (1998) viewed as

the reforms' most significant achievement, the ability to combine the funding and purchasing of a wide range of health care services within a single agency (the RHA, HFA), making possible the integration of all (public and private) primary, hospital and disability support services. However, assuming that the current 'mixed' system of public/private health service provision would continue into the future, she commented:

*“The challenge of developing a private sector that supports public policy goals is a major one...it will be important to try to assist any strategy which allows for clarity of public entitlement to care.... Only by getting greater transparency of the government's core entitlements will it be possible to develop appropriate supplementary insurance products and get the much needed clarity between the roles of the public and private sectors”* (Scott, 1998, pp3,4).

Laboratory services were also in need of regularly updated re-definitions of core diagnostic testing. If they were to continue to be fully state funded, a collaborative effort organised at a national level seemed an appropriate safeguard. The approach planned, however, was typically market led, rather than centrally led.

### **Papering over the cracks**

Between December 1998 and May 1999 a HFA project team developed a Laboratory Services Strategy focussing on 'prices and providers' of laboratory services (HFA, 1999). Separate initiatives on doctor budget holding, best practice education for primary referrers, part charging, and the development of a new order form were signalled at the same time. Submissions in response to the document (focussed on specific issues) were invited, initially for a closing date 6 weeks ahead. Newspaper reports carried claim and counterclaim (NZ Herald 17/6/99 “*User-pays plan for lab testing*”, and “*Labs 'skimming profits'*” on 18/6/99). The closing date for submissions was extended a further month. The promised best practice education initiative appeared in June 1999 as a Request

for Proposals dated 5/5/99, again with limited provision for 'clarifications', and constrained within a very short time frame.

Much of the Strategy document reiterated and advanced the proposals covered in the 1998 Discussion document to which the NZMA responded (1998b). Some novel ideas were fielded, however. A Laboratory Services Advisory Group (LSAG) with membership independent of ownership interests in either Hospital Health Services (HHS) or private laboratories was proposed (similar to the membership of the Pharmaceutical and Therapeutics Advisory Committee, which provides advice to PHARMAC). Elsewhere in the 1999 Laboratory Strategy document, conflict of interest incompatible with LSAG membership was defined as having a 'personal stake' in either a private or HHS laboratory: a very broad definition. This generalist LSAG would assist with evidence-based decisions on the range of tests to be funded (or part funded) by the state, as part of the primary care system: the national, primary-referred schedule tests. While specialist clinical sub-committees might be set up for specific purposes, these would be subject to LSAG review. The management of contracting for primary referred services would be the responsibility of PHARMAC, a subsidiary of the HFA already in operation (Health Funding Authority, 1999).

The arrangement proposed would minimise the transaction costs of contracting - for the HFA at least. It seemed that the parallels between a New Zealand-based diagnostic service and a range of imported commodities used for therapy further down the health care stream were being exaggerated to fit exigencies. However, it is possible that the diagnostic service envisaged by the HFA would ultimately be largely owned, like pharmaceutical companies, offshore.

To encourage competition (and to allow further mergers and consolidations to occur without infringing the Commerce Commission's anti-monopoly legislation), the strategy document made a string of proposals that carried as a corollary the limited membership of the LSAG outlined above. Both primary-

schedule testing and non-schedule testing (at the time done, from a capped HFA budget, by hospital laboratories) would be fully opened to competition. Factors and measures offsetting any unfair advantages the HHS laboratories might have were discussed. The following comment seemed significant:

*“ Private laboratories may also be seen to have some advantages. They do not face the same political pressures or costs of public accountability and usually therefore have greater management discretion to minimise costs. They also have far greater freedom to raise private capital”* (Health Funding Authority, 1999, Laboratory Services Strategy, p 23).

This statement provides some basis for the public and professional quality concerns articulated from the inception of the ‘quasi-market’. It also lends support to Easton’s (1997) contention that the covert objectives of the 1990s health reforms were to reduce state expenditure and managerial involvement in healthcare through eventual privatisation.

To further encourage competition ‘clusters’ of tests, e.g. anatomical pathology would be subject to separate tenders, as would blood collection services. A tendering arrangement was envisaged whereby

*“those who bid the lowest price for a ‘cluster’ of services, and who meet all other criteria, are awarded their tender price.... ‘Losing’ laboratories will receive this price less a discount. This encourages laboratories to bid low, but does not automatically exclude losers”* (Health Funding Authority, 1999, Consultation on Strategy, p 5).

Fixed and variable components of the cost payments would be treated separately to encourage savings from economies of scale while retaining geographical coverage (should tendering lead to a further reduction in the number of providers). Tendering rounds would be at intervals long enough to ‘make the transaction costs of a tender worthwhile’.

It would seem that, by 1999, regulating the quasi market needed greater government agency involvement than was originally anticipated. ‘Material’

savings were expected (HFA 1999). The Strategy document justified competitive tendering for contracts because it

*“can reveal the lowest price that bidders are willing to accept – that essential but highly elusive information needed by fee administrators”* (Health Funding Authority, 1999 Laboratory Services Strategy, p 24).

Several requests for clarifications of the HFA’s Request for Proposals to provide Best Practice Education to Primary Referrers (otherwise unremarkable apart from its context and form – i.e. it is not itself a proposal) centred on clause 4.5: Conflicts of Interest. The clarification substitutes the following for the original, apparently unclear, clause:

*“The HFA reserves the right not to consider proposals from proposers who have a conflict of interest. A conflict of interest may exist where the proposer has any financial or other interest..... inconsistent with the objectives of best practice education.... including the objective of increasing the revenue of the proposer through increasing demand for laboratory services”* (HFA RFP for Best Practice Education – answers to clarifications, 29 July 1999).

It is made clear that HHS providers (but not IPA’s or academic units) might have a conflict of interest ‘where the provider organisation has a financial incentive to increase the number of laboratory tests undertaken’. Providers with a stated potential conflict of interest would be considered only if their proposal was made jointly with another organisation having no such conflict. The competitive market focus of the 1993 reforms was apparently not negotiable.

### **Underneath the reforms**

The clinical laboratory management strategies that derived from the 1993 reforms sit uncomfortably with the putative customer-focused objectives of the health reforms promoted by Upton in 1991, primarily because of their potential to impact negatively on service quality and access. In reviewing similar government responses to rapidly increasing laboratory throughputs in Australia, Conyers (1999) was blunt in dismissing them as ‘effectively cost-cutting activities’. More

effective measures for ensuring appropriate use of laboratory testing, he suggested, would include quality improvement techniques, critical-pathways analysis, process re-engineering, and research into the diagnostic process. But these more incremental approaches would involve consultation and investment beyond the 1990s New Zealand governments' vision particularly if, as Easton (1997) suggested, a second imperative driving the reform process was to downsize government through eventual privatisation.

By numerous policy modifications and 'U-turns' between 1993 and the late 1990s, National and National-led coalition governments appeared to lose faith in their own formula, even as a cost-cutting device. Scott (1998) reflected on the original reform agenda, as follows:

*"Looking back at the 1993 proposals, one is struck by the way in which modifications have been made. Areas which come to mind concern public health, the definition of 'core' services, introduction of the purchaser-provider split and associated hospital and primary care reform, health care plans, and greater competition and contestability in service delivery"* (Scott, 1998, p2).

To these could be added the 1999 competition-oriented laboratory services management strategy, which might legitimately be described as a 'U-turn on a U-turn', since the government seemed to turn away from competitive market control in health during the brief term of the coalition government of 1996-98 (Ham, 1997).

These continued modifications could be interpreted either as responsiveness to public concerns, or as deficient formulation of policy from the outset. Tesh (1990), in her examination of unacknowledged ideology underlying disease prevention policy in America, demonstrated how values and assumptions always underpin policies whether acknowledged or not. The New Zealand 1990s health policy reforms were underpinned by values and assumptions including, that private sector control will be more efficient than public, that reduced taxation can be traded off against reduced state provision of medical services without net loss,

and that the state should interfere minimally in the lives of individuals. Failure to allow any public discussion, pursue any social consensus or to clarify core health entitlements and guidelines, generated the marked public and professional unease that accompanied the health and other reforms' implementation.

Analogous to the reductionism cited by Tesh (1990), was the narrow approach to public accountability shaping the health reforms. Upton (1991), in his statement of government policy, had stressed increased public expectations of health care as being an important catalyst for organisational change. Analyses by critics of the reforms, however (Lawrence, Alam and Lowe 1994, Lawrence and Doolin 1997), suggested that in their implementation phase these 'customer-focussed' rationales for reform became conflated with adherence to an ideologically-based framework of financial management reform. They traced the shift in power and domination from clinicians with patient-focussed medical accountability, to non-clinical managers with a dominant business ethic, financial accountability only, and an aversion to engaging in 'discussion [with outsiders] of direction and values' other than their own (Lawrence and Doolin 1997).

Laboratory services are especially vulnerable to cost-control that sacrifices quality. They are an area of the health system easily identified by financial accounting techniques as a cost, but almost invisible to health service users. This invisibility might have made laboratory services a convenient pilot study for the transition to privatisation of health service provision, and allowed a more rapid ascendancy of generic management than occurred in more politically sensitive areas of the health services (such as child health, mental health, surgery). From a wider perspective, however, cost-control that impinges on the capacity for the health system to undertake early diagnoses could be detrimental in the long term to both the public health and the public purse.

## **Summary of main issues arising in Chapter 2**

1. Exemption from user part-charges was a mixed blessing for clinical laboratories. While cushioning them from 'market forces', it left them dependent on third party (state) funding in the absence of any agreed definition of core health entitlements. From the point of view of patients and their GPs, however, it secured access to laboratory diagnoses: a security that could be threatened by inefficiencies in both the community laboratory service and the primary sector.
  
2. Initial attempts to impose contestable contracts for public funding of laboratory services met with strong provider resistance. The eventual official response was to impose stronger control over the quasi market: a response that appeared to confirm the underlying pro-market and privatisation agenda of successive governments through the 1990s.
  
3. 'Demand side' control through GP budget holding reportedly achieved reductions in primary care-related expenditure. However, the strategy was introduced without the national guidelines necessary to ensure service quality, and without adequate outcome monitoring. Belated attempts to rectify this situation appeared designed to by-pass most practising pathologists.
  
4. Failure on the part of government agencies to consult appropriately has been attributed to an unacknowledged ideological orientation towards the increased privatisation of health care: both its provision and its funding. Changes in the ownership and control of New Zealand clinical laboratory services throughout the '90's seem to have exemplified this policy bias.
  
5. Public and professional concerns over the outcomes of reforms aimed at containing state laboratory expenditure, merit fuller investigation.

## ***Part Two: Approaching the Analysis***

### **Chapter 3: Viewing and weighing change in the public sector**

This chapter outlines organising structures applicable to the initial prioritisation of issues needing further research scrutiny and the final analysis of arguments generated in the thesis. These organising structures are then placed in a procedural sequence appropriate for an evaluation of major public policy change.

#### **The New Zealand health system in context**

Walt (1994) has described the liberal democratic political systems of the Western world, Japan, and India as being typified by diversity. Diverse groups and diverse institutions independent of the state, participate in public policy. The resulting health policies are similarly diverse, with widely varying mixes of public and private health service provision. Blank (1994) classified health systems into the private insurance model (United States), the social insurance model (Germany, France, Japan) or the national health service model (Britain, Sweden, New Zealand, Norway), forming a continuum of increasing state involvement. Blank also made a distinction between 'positive' and 'negative' rights. Positive rights imply state obligations for service provision, and form the basis of welfare states. Negative rights, however, would free well-resourced patients to maximise their use of health care and leave medical professionals free to practice with minimal regulation. A functional national health system must balance these two opposed views within its particular social and economic context.

In the US, which has traditionally relied most heavily on a minimally regulated market to provide health care, Colton, Frisof and King (1997) labelled the health care system as ‘an industry affected with the public interest’. As hallmarks of such industries, they cited the following: the provision of essential public services, the receipt of public funding, and a potential for causing great public harm if mismanaged. Like the telecommunications and power industries, health care in the US had been subjected to deregulatory pressures designed to facilitate competition and thus control costs. They argued that facilitation of competition would never eliminate the need for regulating industries ‘affected with the public interest’ and that regulation should be aimed at securing the following three requirements:

- universality of access,
- public accountability
- quality of service.

These three critical requirements form an appropriate guide for the focus and prioritisation of research evaluating the impact on clinical laboratory services of nearly a decade of New Public Management reform in the New Zealand health sector. Questions addressing aspects of access, accountability and quality of laboratory services were selected, therefore, to direct research underpinning the overall evaluation.

### **Public health system reform in context**

The following section introduces a dialectical view of change and presents a framework of opposed recurrent arguments that have been applied to radical policy change, as a basis for weighing the evidence to be gathered for this thesis. The wave of large-scale structural change that overtook many publicly funded health systems in the 1990s, particularly those of the English-speaking world, was typified by government-led efforts aimed at cost-efficiency, market (as against state) controls and managerial (rather than professional) empowerment (Ferlie, 1997). ‘New Public Management’, as a generic term, is associated with attempts to curb the size of central government and reduce the burden of taxation

(Hood, 1995; Osborne and Gaebler, 1993). University of Otago economists, Wallis and Dollery (1998), discussed the New Public Management reforms within a binary framework of historically recurrent reactionary arguments and their progressive counterparts (see Table 3-1).

Table 3-1: Recurrent arguments used in the New Public Management debate.

<b>REACTIONARY POSITION</b>	<b>PROGRESSIVE POSITION</b>
<p><u>Jeopardy Thesis</u></p> <p>The historic achievement of the bureaucratic paradigm in establishing a unified, trustworthy public service may be threatened by the drive to make it more efficient and economical.</p>	<p><u>The Imminent Danger thesis</u></p> <p>The failure to make the public service more efficient and economical may threaten the future provision of public services in an environment of fiscal austerity.</p>
<p><u>Perversity Thesis</u></p> <p>Public sector reforms can exacerbate the conditions they set out to remedy e.g. it is possible that the NPM may make the public service less effective, efficient and economical.</p>	<p><u>The Desperate Predicament Thesis</u></p> <p>Government failure has become so entrenched that it can only be addressed by a radical reconstruction of the public sector regardless of any counterproductive consequences.</p>
<p><u>Futility Thesis</u></p> <p>Reforms will fail to realise the intentions of the reformers e.g. NPM will have little impact on the craft and coping activities of public organisations.</p>	<p><u>Futility of Resistance Thesis</u></p> <p>It is futile to resist NPM-style reforms since it is imperative that public organisations adapt to changes in the global environment.</p>

(Wallis and Dollery, 1998)

To help weigh up evidence in support or refutation of my initial hypothesis, I assembled, and attempted to balance, arguments or conclusions generated in this thesis bearing on these six positions (see Chapter 11). Wallis and Dollery see such an approach to policy change as pragmatic:

*“pragmatists follow a cyclical approach to policy development in which open-ended evaluation and learning from the outcomes of policies tends to ensure that no one cluster of values or interests dictates the direction of policy for too long” (Wallis and Dollery, 1998, p15).*

This view of the change process derives from the dialectical view of reality developed from its Taoist origins by Western philosophers to explain how economic and social contradictions within a society generate its self-transformation (Morgan, 1986).

In the New Public Management debate, Wallis and Dollery’s (1998) analysis attributes to both sides a concept of ‘the public interest’ that is narrow, perpetuated by the rhetoric used, and fundamental to the arguments being advanced. Pragmatists hold the balance of power between those arguing for or against reform. In practice it is asserted, pragmatists decide the course that policy will take. The task of pragmatic leadership in leading opposing forces through the present impasse, they suggest, involves ‘directing attention to the narrowness of the concept of public interest each is advocating, in the hope of engaging both on a broader quest that incorporates and yet transcends these particularist views of the public interest’ (Wallis and Dollery, 1998, p19).

### **An evaluatory framework for public policy reform**

Ideas of what constitutes appropriate programme or policy evaluation paradigms, especially for major Government-led change (Laughlin and Broadbent, 1996), have themselves changed through several stages, or ‘generations’ (Guba and Lincoln, 1989). The earliest of these generations progressed through (i) the quantification of measurable markers, (ii) measurement with ‘description’, to (iii) measurement with ‘judgement’. Guba and Lincoln criticised all three approaches to evaluation on the grounds of bias towards the ‘client’ or evaluation sponsor, failure to accommodate value pluralism, and over-reliance on quantification, thus marginalizing important qualitative data about the process of change.

On another level, any evaluation can be viewed as a persuasive device, highly political in design and process as well as in outcome. That quantitative analyses are particularly subject to this misuse has been well illustrated by Oakes, Considine and Gould (1994) in an American study of cost benefit analysis (a stylised and ostensibly objective form of evaluation in health care).

*“Cost benefit analysis involves a particular way of informing and/or justifying resource allocations. It involves a set of rules about the appropriate language, form and style for such research... and ...is conducted to influence decisions affecting many people who are not directly involved with these studies or who are in effect excluded from utilising this form of intervention into the health care system”* (Oakes, Considine and Gould, 1994, p 20).

The authors imply that there is a whole stratum of potentially relevant and valuable information that is overlooked or excluded in an evaluation of health resource allocation dependant on cost benefit analysis alone.

To address these criticisms, Guba and Lincoln (1989) developed a more democratic, and interactive process of evaluation, which they termed ‘fourth generation’. In challenging the British Government to initiate a full, broad-based review to account for its vast investment in public sector reforms, Laughlin and Broadbent (1996) endorsed, with certain modifications, the ‘fourth generation’ evaluation model. Four broad phases form the framework of this evaluative approach: (i) identification of ‘stakeholders’ and their ‘claims, concerns and issues’; (ii) exposure of stakeholder circles to all possibly-relevant information available; (iii) a further gathering, or uncovering, of information focussing upon unresolved conflict; and (iv) a debate aimed at reaching consensus. A doctoral thesis would seem an unsuitable vehicle for a complete playing-out of Guba and Lincoln’s evaluative phases. However, it should be possible to go some considerable way towards satisfying the requirements of phases one to three, within the constraints of this format.

## Chapter 4: Clarifying the issues: research questions

Chapters 1 and 2 reviewed, from a variety of perspectives, New Zealand's clinical laboratory services as they first confronted, and then underwent the New Public Management reforms of the 1990s. Following broadly the framework for public policy evaluations proposed by Guba and Lincoln (1989), an identification of stakeholder 'claims, concerns, and issues' has been made in the chapter summaries. The 'stakeholder' groups in this evaluation are many, and include the public as taxpayers and as potential users of laboratory services, laboratory service providers (both public and privately-owned), clinicians, health and treasury officials and administrators. To advance the policy evaluation further, Guba and Lincoln (1989) advocate the gathering, in a reflexive manner, of information focussing upon unresolved conflict'.

Preconditions for optimising the utility of policy evaluations are identified in this chapter, potential problems are anticipated, and the information-gathering process is focussed. Finally, some practical observations on the preparatory work for this thesis are made.

In the 1970s the new discipline of health services research was conceived quite narrowly as inquiry into 'the structure, processes or effects of personal health services' (Aday, 2001, p183). By 1995, the field of health services (or health systems) research had expanded to encompass the environmental context in which health care delivery takes place, including health systems and policy at national as well as local levels. Such widened scope demanded a multidisciplinary approach to health services and policy analysis: an incremental process exploiting 'triangulation' or multiple reinforcing strands. Information in support or refutation of any theory generated should, therefore, be gathered by a variety of means:

*“Quantitative methods may be mixed with qualitative methods; different interviewing techniques used at different points in a study; primary data may be combined with, and compared with, secondary data. The only limitations are time, cost, and what really makes sense in terms of the task in hand”* (Barker, 1996, p 75).

Barker adds, however, that effort should be focussed on issues of most importance, and on ensuring that any recommended course will be acceptable to a wide audience: especially those most involved in their implementation.

### **Some problems and pre-conditions for effective research**

Salmond (1999) defined health systems research as ‘a broad set of activities largely dealing with the needs for and functioning of the health system’. He acknowledged recent improvements in the resource levels available to public health research, but the broader area of health systems research remained, in his view, a relatively neglected area. Despite considerable investment in health information technology, especially in the last decade or so, recurring structural changes in New Zealand have meant that information systems have not realised their potential for improving health sector direction and functioning. Salmond’s paper, written with future requirements as its focus, points to the systemic problems faced by health systems researchers through the 1990s.

Duignan (1998), in a discussion of social programme evaluation focussing mainly on qualitative approaches, outlined practical difficulties encountered by the would-be programme evaluator, many of which are also relevant at the level of public policy evaluation. These include the long time frames for expected outcomes, with attendant pressures on resources; the lack of experimental control; difficulties in isolating the contribution of the intervention being studied from other potential influences on a desired outcome; and the multiplicity of interdependent outcomes engendered. ‘Social programme evaluation’ says Duignan ‘is inherently very hard’.

Other commentators (Davis and Howden-Chapman, 1996) have drawn attention to policy-related research failures frustrating to health researchers. One was the recent implementation of major health policy shifts without prior research. Frustrations also arose where evidence-based medicine research was increasingly advocated and encouraged, but when completed, seldom translated into practice. Davis and Howden-Chapman's analysis of the influence of research on health policy suggested that close collaboration between researchers and policy makers from the early stages and throughout the research process is a key to optimising the chances of its adoption. 'Stakeholders' and/or experts, particularly medical professionals who belong legitimately to both groups, often dominate policy making in the health area (Tenbensal and Gauld, 2001) and should be seen as important collaborators. In similar vein, Salmond (1999) identified competency in building relationships and in making linkages as fundamental for building health systems research capacity. These competencies are also crucial requirements of governance: defined broadly in this paper as 'a combination of the many means by which individuals and communities, private and public, arrange their affairs'. The broadening of health services research into the policy domain thus obliges the researcher to prepare strategically as well as practically, if the research's value is to be optimised. These considerations are consistent with the essentially dynamic and reciprocal nature of the data-gathering and analysis processes as conceived by Guba and Lincoln.

### **Questions arising**

*"Our thesis is short: the question being asked determines the appropriate research architecture, strategy, and tactics to be used – not tradition, experts, paradigms, or schools of thought"* ( Sackett and Wennberg, 1997, p1636).

*"Perhaps the only dictum to expound with confidence is that no research method is inherently better or worse, only more or less appropriate to the research problem posed"* (McKinlay, Plumridge and Daly, 1999, p51).

As both the above quotations emphasise, a choice of research approach should hinge on the research question asked or the problem posed. This project incorporates components of both critical policy analysis and policy evaluation (Thomas, 2001) focusing on a specific clinical support service as a case study. 'Claims concerns and issues' arising from laboratory service functioning through the 1990s and questions and problems are many, and can be determined at all levels of health policy-making. On the broadest level they may be relevant to the effectiveness of demand-side controls on health spending (like budget holding and subsidy targeting in primary care), and the cost efficiency of the 'quasi market' for health.

Feeding into these broader issues are questions that deal specifically with laboratory services delivery, and are directed at evaluating the impact of the 1990s reforms on clinical laboratory services. As justification for the focus of the evaluation, these questions are grouped broadly under the three 'touchstones' against which policy 'affected with the public interest' should be judged (Colton, Frisof and King, 1997): equality of access, public accountability (i.e. demonstrable effectiveness and cost efficiency) and service quality.

*A: Have the changes favoured equality of access to laboratory services?*

1. Has laboratory utilisation dropped, levelled or risen by region, or by social group?
2. What effects might user part-charges have on access?
3. Have avoidable hospital admissions for disease groups involving laboratory diagnosis changed by region, or by social group?

*B: Have the changes been demonstrably cost efficient and effective?*

1. How were test volume, test mix and costs interrelated over the 1990s?
2. How did providers try to contain costs/optimize income?
3. Did doctors become more discriminatory in their test requesting?

4. Did avoidable hospital admissions for disease groups involving laboratory diagnosis improve during the 1990s?

*C: What effects on service quality can be attributed to the changes?*

1. Effects on staffing, training and career structures?
2. Effects on intra- and inter-service relationships/co-ordination?
3. Effects on research and innovation?

In considering options for information gathering for this thesis it became clear that multiple methods would be required to explore some questions adequately (e.g. A: 2), and that some methods (e.g. key informant interviews) would inform almost every question. The effects of policy initiatives are often complex and it was not anticipated that any question would provide unambiguous answers, i.e. they were intended to provide complementary strands of information in order to theory-build.

### **Data sources**

A wide range of relevant archival published and unpublished material of both primary and secondary origin was available for collection. Such material included newspaper articles and research reports, official strategy documents and reviews, letters and electronic mail in reply to requests for information, Internet accessible sites, internal health organisation reports, and Official Inquiry transcripts. Personal correspondence (letters and electronic mail), and interview notes or transcripts yielded much valuable data.

In addition, several databases were available for access. These contained longitudinal information, through the period of interest, for monitoring:

- community laboratory utilisation: test volumes, expenditure on tests, and test mix by test type and health authority region (Health Benefits Limited [HBL]);

- general practice laboratory referral patterns (Royal New Zealand College of General Practice [RNZCGP] Research Unit databases);
- anonymous test result details, i.e. total volumes and aggregate numbers positive for selected test types (Hamilton community laboratories);
- avoidable, or ‘ambulatory-sensitive’, public hospitalisations by age grouping, ethnicity (Maori/non-Maori) and gender (New Zealand Health Information Service [NZHIS]);
- key financial and quality performance indicators (Health Waikato Laboratory).

All of the above were used to collect both exploratory and reinforcing/dissenting information for use in the development of this thesis.

### **In practice**

Laying the foundations for the research process entailed wide consultation with others involved in related investigations, both to generate potential issues of importance for investigation, and to gain a wide perspective on the potential and limitations of the various data sources listed above. Much of this consultation was informal. Conscious prior consultation with a wide range of pathologist groupings (i.e. local, not local, in public or in private practice) as potential stakeholder policy-makers also proved invaluable. Such consultation was continued throughout the research process, again, as a deliberate strategy.

Ethical approval was obtained (see Appendix 1) following reviews from the Waikato and Otago Ethics Committees prior to the start of the research process. These were aimed at ensuring the confidentiality of interviewee and participant textual data, and justifying research access to anonymous individual patient records.

Because of the time frame of the project, it was necessary not only to focus the evaluation on the ‘high priority’ areas indicated but, in the case of longitudinal

numerical data, to sequence the information gathering process in order to obtain the maximum lengths of data series possible in the time frame of the thesis. This strategy proved practical for another reason: the interpretation and analysis of trends identified in the numerical data benefited considerably from the availability of qualitative information already gathered.

## Chapter 5: Methodology and methods

*“In some senses all data are qualitative; they refer to essences of people, objects, and situations”* (Miles and Huberman, 1994, p2).

This chapter discusses the methodology and methods I found to be useful for elucidating the impact of New Zealand’s 1990s health reforms on clinical laboratories while maintaining fidelity with fourth generation evaluation principles. The impetus for Guba and Lincoln’s (1989) approach to policy evaluation was their contention that previous evaluators over-relied on quantification, leaving themselves open to various forms of bias and failing to accommodate value pluralism. I have, therefore, used the fourth generation approach both to structure the evaluation procedures used in this thesis and to defend the methodologies that have contributed to it.

### **Choosing indicators**

*“An emerging key issue in evaluation of the impacts of policy implementations is the identification and development of trustworthy indicators of effectiveness”* (Thomas, 2001)

Performance indicators, however broadly defined, are essential to any attempt at assisting decision-makers in weighing options. Van Peursem, Pratt and Lawrence (1995) have reviewed health management performance indicators within a broad classificatory framework that accommodates the concepts of economy (resource utilisation) plus efficiency (utilisation of inputs) and effectiveness (outcomes and quality of care). Measures and indicators reviewed are sub-categorised as nominal, ordinal/cardinal and interval, and the authors urge that a balance of indicator types be used in order to ‘avoid the impression that precision has been

achieved' in the assessment of health management performance by selective and more limited use of indicator types. Such an impression, they comment, would both distort reality, and encourage the selective use of findings for political purposes. Non-ratio indicators, which often involve a component of subjectivity, become especially important in the assessment of effectiveness. However, as Van Peurse et al. (1995) point out, even input measures can be too readily restricted to cost or expenditure figures, unless non-ratio indicators, like staff qualifications, are included in the concept of input.

Duignan (1998) commented on the welcome return to a focus on health outcomes, following a decade of New Zealand public sector reform preoccupied with measuring outputs. The difficulty is that in policy-related research, a single input is almost never associated uniquely with a single outcome, and associations can seldom be tracked within the timeframe of a fundable project. This problem is especially acute where the output or technology being tracked is predominantly diagnostic (like laboratory services) rather than therapeutic, owing to the much more tenuous links between output and outcome for the diagnostic technologies which are usually only one element in clinical decision-making (van Walraven and Naylor, 1998).

Some attempts have been made, nevertheless, to make direct links between output and outcome for clinical laboratory interventions. Witte (1995) reviewed studies that he and colleagues have undertaken among well Americans presenting for laboratory tests in public health fairs and employee groups. In one example, sensitive thyrotropin measurements provided to ambulant individuals identified a new diagnosis in 1.2 percent, and initiated a change in therapy in an additional 1.1 percent. The researchers calculated the incremental cost of adding thyrotropin to a screening panel of tests under these conditions, at \$US87 per benefit achieved. Limited though this calculation is, particularly in its disregard of the dimensions of benefit, it represents one of the very few attempts that have been made to link laboratory outputs to outcomes.

Owing to the dearth of more patient-centred data linked to diagnostic services, a common compromise uses output indicators (e.g. laboratory volumes and expenditures, GP laboratory referrals, laboratory case-finding or 'pick-up' rates) as proxies for health outcomes over periods of change, and this approach has been used in much of this thesis, particularly in monitoring the policy changes directly affecting both community and hospital laboratories.

Use of the proxy measure is more defensible where access to a diagnostic service across regions or across social groups is the outcome being compared. The availability of databases recording GP consultation and referral data by demographic and social group, gave me a convenient method for comparing access to laboratory diagnoses between groups, using GP laboratory referrals as a proxy indicator of access. Implicit in the use of such proxy 'outcomes', however, is the ideal that doctors order laboratory tests in conformity with guidelines based on rigorous clinical audit: an unjustified assumption (van Walraven and Naylor, 1998). Use of output measures, therefore, carries the reservation that more will not necessarily correspond to better.

Laboratory 'case-finding' rates have been used (in addition to their use as proxy patient outcomes) as an indicator of GP test ordering discrimination (Sinclair, 1998b). In this mode they could be viewed as a secondary outcome, since one aim of recent New Zealand policy initiatives like GP group budget holding was to optimise test-ordering behaviour. I have used trends in local community laboratory 'case-finding' rates as an indicator of GP test ordering discrimination in Chapter 9 of this thesis. Cleland, in Auckland, measured 'percent abnormal' rates for several moderate- to high-volume tests for a six-month period before, and two six-month periods immediately after the rapid introduction of budget holding contracts in the North Health region in mid-1996 (Sinclair, 1998b). He demonstrated constant 'percent abnormal' rates despite sharply reduced test volumes (a 4.6 percent reduction in North Health total test volumes between

1995/96 and 1996/97 – see Chapter 8), and concluded that the overall effect of the new policy, at least over the short time frame monitored, was a reduction in diagnoses made rather than more judicious use of laboratory testing. Cleland also noted (personal communication, 1998) that some of his observed reduction in test volumes might have resulted from additional demand control measures taken by the North Health RHA in association with the introduction of budget-holding contracts: restriction of blood collection depot sites, removal of certain tests considered by GP advisors to be of ‘lesser value’ from laboratory referral forms, and the conspicuous printing of test prices on forms. Although similar directives were given to other health authorities at the time, implementation appears to have been less zealous outside North Health.

‘Avoidable hospitalisations’ (i.e. hospitalisations for conditions that can often be treated out of hospital or avoided altogether) have been used to measure the quality of ambulatory care both in this country and in the US (Pappas, Hadden, Kozak and Fisher, 1997; Salmond and Crampton, 2000; Weissman, Gatsonis and Epstein, 1992). Two American cross-sectional studies have used avoidable hospitalisations as indicators of the efficiency of ambulatory care *in toto* for defined social groups. Weissman, Gatsonis and Epstein (1992) compared rates of avoidable hospitalisations by patient insurance status in two American states, using age- and gender-standardised hospital discharge data. They found that uninsured or Medicaid covered patients had higher rates of avoidable hospitalisations. These higher rates were taken to indicate a lower standard of, or poorer access to, primary care. In a more comprehensive American survey (Pappas, Hadden, Kozak and Fisher, 1997), rates of potentially avoidable hospitalisations showed income and racial differences that persisted among the privately insured, and racial differences that persisted within areas having defined median incomes. They took these results to indicate real disparities in access to health care across social groups, independent of insurance status or environment.

In New Zealand, Salmond and Crampton (2000) have reported similar cross-sectional studies based on public hospital discharge data for 1996-97. They found that, regardless of age, gender or ethnicity, the socio-economically deprived had higher rates of hospitalisation overall, and higher rates of 'ambulatory sensitive' hospitalisations. (The definition of 'avoidable hospitalisations' given in their report is: 'hospitalisations that may be considered potentially avoidable through the provision of health promotion, disease prevention or other clinical services in ambulatory settings'.) When stratified by 'deprivation of area of residence', as well as by age, gender and ethnicity, total Maori hospitalisations were generally lower than expected, given the known poorer health status and under-utilisation of primary health care of Maori (Malcolm, 1996). Total avoidable hospitalisations, however, were relatively high for Maori in the 45 to 64 year age group across all deprivation strata (Salmond and Crampton, 2000).

As part of its evaluation of the Free Child Health Care Scheme (FCHCS, see Chapter 9) a team of national researchers commissioned by the Health Funding Authority (HFA, 1998) followed the acute avoidable hospitalisations of children under the age of six, between the year before, and the year after, the FCHCS was introduced in 1997. Admissions for respiratory and digestive tract disorders reduced between the two years monitored. Also noted, was an increase in the numbers of claims for prescriptions for children under six, which was especially marked for respiratory drugs. Increases were found in most admissions of under-six's for infectious diseases. The researchers point out, however, that because only one year prior to the introduction of the FCHCS initiative was included in their analysis, the longer-term trends for the indicators followed could not be estimated.

Brown (1999) has also reported a longitudinal study of the health outcome effects of policy change in New Zealand. Following trends in standardised mortality ratios (SMRs) over the period 1952 to 1994, he established deteriorating mortality trends for middle-aged Maori, relative to the New Zealand population

as a whole, dating from 1987. He posits that the New Zealand economic reforms of 1987 resulted in increased stress for working-aged Maori, and this, in turn, adversely affected their health. Brown presents strong arguments for this interpretation.

The diagnostic technologies are crucially important in avoiding disease progression towards the point of secondary or tertiary intervention. Thus, avoidable hospitalisations provide an indirect outcome measure of the impact of policy change on, e.g. clinical laboratories. Avoidable hospitalisations may have multiple causes, however, so their link with any one component of primary health care will always be weak.

Relevant New Zealand hospital discharge rates over the period of major health policy change were followed as part of the development of this thesis. Within-group changes over time were monitored as a longitudinal study, rather than absolute, or cross sectional, differences between groups, which might reflect varied access to services, economic or cultural circumstances.

Outcome measures like mortality and morbidity rates were used throughout the 1990s as performance indicators for total health care effectiveness, along with similarly imperfect measures, e.g. birth weight as an indicator of maternity care quality, and children free of dental caries at age five as an indicator of dental care quality (Ministry of Health, 1998). In addition, prevention of certain avoidable hospitalisations (for asthma, diabetic ketoacidosis) listed by both Weissman et al. (1992) and the Ministry of Health employs laboratory tests in therapy monitoring mode as well as in diagnostic mode. This made their use more defensible as outcome indicators for policy affecting laboratories, and they proved to be particularly useful in the context of the multi-stranded approach of this study.

### **Quantitative analysis in perspective**

In the wider field of health systems research, which is concerned with policy at the national as well as the local or service level, Barbour (1999) made a strong case for combining quantitative with qualitative approaches. Combination meant the twin goals of prediction (quantitative) and intelligibility (qualitative) could be accommodated. As quantitative contributions within a qualitative paradigm, Barbour lists: analysis of (grouped) data; sampling strategies; and amalgamation of findings from separate studies, or meta-analysis. Variations on the first were found to be particularly useful in this project.

With high internal validity conferred by the ability to hypothesis-test, the experimental method is a powerful technique for assessing those health care interventions that can be isolated from potential confounders. The experimental method, however, has limited application for the assessment of complex processes like policy change, where numerous interacting variables and indicators operate, and there is little opportunity, for practical and/or ethical reasons, to isolate and control them.

One way of widening the scope of experimental designs, albeit at the cost of some internal validity, is through the use of quasi-experimental techniques (Campbell and Stanley, 1966; Cook and Campbell, 1979). In these, control groups are assigned without randomisation. Alternatively, historical controls and time series data can provide mechanisms for making the comparisons of interest using the same group over time under different conditions (Daly, McDonald and Willis, 1992, pp7-8). Threats to validity arise from the lack of control over extraneous variables, and from the origin of much of the data in administrative activities. The data employed in policy-related research are often not primarily collected for that purpose, but for patient management, reimbursement, or contract negotiation purposes. Thus, the criteria on which they are based may lack stability (Crombie and Davies, 1996). There is no opportunity to select candidates for the groups being compared, or for researchers to control the policy

intervention being examined. However, by employing logically interrelated studies, useful contributory information about the effects of policy change on laboratory utilisation and expenditure, laboratory performance and some relevant outcomes can be revealed under quasi-experimental conditions, and this was the justification for using databases primarily compiled for non-specific research purposes, or for non-research purposes, in this thesis.

As indicated in the previous chapter, community laboratories, general practitioners, reimbursement agencies and hospitals collect numerical data relevant to the research goal, in time series. These indicators (for case-finding, laboratory referrals, laboratory expenditure and utilisation, and relevant morbidity) were followed over the period of policy change in the quantitative section of this thesis. In this type of design, each group acts as its own control before the policy intervention and, where possible, a comparable group monitored over the same time period acts as a further control for any measured change. Where a policy 'intervention' was staggered between regions, as was the introduction of 'budget holding', inferences based on the 'interrupted time series with switching replications' quasi-experimental model (Cook and Campbell, 1979) became possible, since some data, e.g. that available from HBL and NZHIS, could readily be disaggregated by region. Other data that form simple interrupted time series with no comparison group were assessed for generalisability using standard descriptive statistics, and the 'comparison of several proportions' Chi square test (Brown and Swanson Beck, 1994) as described further below.

Threats to the validity of these quantitative quasi-experimental data analyses were minimised in several ways:

- Analyses were restricted to markers that were measurable in large samples (e.g. only high-throughput tests were tracked) in order to reduce the chances of missing a real change.

- Multiple markers over the same period were used, where possible, to add weight to any association found.
- The same markers were compared over different Funding Authority regions.
- Analyses were performed at the lowest possible level of aggregation. Several writers have demonstrated pitfalls in the use of summary statistics, which can mask or misrepresent patterns of potential interest observable in the disaggregated data (Scott, Camden and Scott, 1998).
- Possible explanations for results were explored using a wide range of qualitative data. Although it is not possible to determine causation from naturalistic comparisons, statistical evidence of association can be highly suggestive, especially if supported by other evidence.

### **Handling datasets: analytical methods**

In this section details of the large serially collated databases that I accessed, and methods I used for analysing the datasets I obtained, are provided.

Chapter 8 of this thesis follows trends in the utilisation of laboratory tests and in GP laboratory referral patterns by accessing two large databases: the Health Benefits Limited (HBL) database and the Royal New Zealand College of General Practice (RNZCGP) Research Unit database. HBL, the state health benefit reimbursement agency, collects serial data on community laboratory test volumes and expenditure by laboratory, region, individual test, and test grouping. (Age, gender and ethnicity data are also recorded on laboratory-claims forms, although ethnicity records are not generally regarded as reliable.) The data extractions I specified cost approximately \$900 in total.

During the seven health-years under consideration, HBL data collection was disrupted in three ways. North Health RHA took over payment of laboratory claims from April 1996, and long delays occurred in passing the detailed records on to HBL. From July 1997, Pegasus, the large Christchurch Independent

Practitioners Association, also began collecting its own data, and this was subsequently lost from the main database. Finally, since early 2000, a private company has managed all data collected up to June 1996. Its charges for making data extractions (\$120 per hour) are almost double those of HBL. The data used for this research were compiled over a three-year period (1998-2000 inclusive) with the help of four different data managers at three different locations in succession: Christchurch, Auckland and Wellington; as New Zealand's health management was repeatedly restructured. The dataset is complete with the exception of a loss from the North Health records of three months both at the end of the 1995/ 96 year (to June) and the beginning of the 1996/ 97 year; Pegasus data after June 1997; and sub-regional Midland data by laboratory, prior to July 1996. The difficulty in assembling retrospective data from this source has been noted by other researchers. It frustrated efforts to evaluate the very policies that required improved transparency and accountability from health service providers.

I extracted data from the RNZCGP Research Unit database in Dunedin personally. This was a condition of access, as was formal approval from the Otago Ethics Committee (see Appendix 1). No charges applied. (All other data were sent as electronic mail attachments in spreadsheet format, usually Excel) Two papers: Dovey and Tilyard (1996) and Tilyard, Dovey and Spears (1995), have described these databases in detail. The consultations recorded include all annotated consultations with practice GPs and nurses, prescription repeats, and electronically reported laboratory result entries into patient case-note computer files, for participating primary care organisations. (Doctors did not type laboratory referral details into their computer 'notes' field, unless the results were expected in hard copy form only, i.e. the notes served as a reminder to consult the hard copy if necessary, but an electronic report would be sufficient reminder.) The samples analysed were based on approx. 210,000 encounters generated by the same six large IPAs for each of three years: 1995/96, 1997/98 and 1998/99. The six IPAs included representatives from the North and South Islands, and rural and urban areas, but their precise location was not revealed to me, owing to

privacy restrictions. Data for the first six months of 1999 had not been received from two of the practices when the final analysis (1998/99) was done in Dunedin in January of 2000. Consequently, results for that year are not included in the **encounter rate** analyses. In 1996, Dovey and Tilyard described the RNZCGP computer network as having a geographical skew, with the two biggest clusters of practices being at opposite ends of the country, in Auckland and Otago. They could detect no significant differences from other practices, however, in either the characteristics of the patients, or the outcomes from their attendance (including referrals and investigations).

I made three extractions of each yearly composite table of general practice encounter records from the Royal New Zealand College of General Practice (RNZCGP) Research Unit databases. This was necessary in order to select out all consultations utilising laboratory tests using character strings from the 'Notes' field, as the number of such character strings exceeded the capacity of the criterion section of the Access query dialogue box by almost three times. For 'social group' analyses, a 'joined table' was formed so that each extracted record was linked to a corresponding patient detail record, and select queries made of the joined table. Details of the query criteria used to make these extractions, and examples of the methods used to correct for overlap between successive extractions, are given in Appendix 2.

All tabulated databases were sorted, grouped and summed with the use of queries (select and 'make table' queries) in Microsoft Access, then further analysed graphically and statistically in Microsoft Excel. For correlates with time (years) values of  $R^2$  (the proportion of variability due to the correlation - rather than to chance) are listed. Where appropriate, all year-on-year changes in proportions (e.g. in patient encounters utilising laboratory tests) were tested for statistical significance using a  $2 \times n$  Chi squared comparison of proportions template in Excel (following Brown and Swanson-Beck, 1994, p 79), where  $n$  = number of years in the series. Because of the large sampling frames, the criterion for

statistical significance was quite stringent:  $p < 0.001$  AND a confidence interval for the between-year difference that did not include zero (Brown and Swanson-Beck, 1994).

Detailed data on the changing percentages of general practitioners in budget holding practices at the start of each health-financial year, by region, were obtained or estimated from the literature (Ministry of Health, 1995, 1996 and 1997; Malcolm, Wright and Barnett, 1999 and 2000). Population estimates were obtained from Ministry of Health (1995, 1996, 1997, 1998 and 2000a), and (for Greater Hamilton and Tauranga) from Bedford and Goodwin (1997).

Chapter 9 of this thesis follows trends in the outcomes of changes in general practice, again, by accessing two databases. The first consisted of individual anonymous test result details held in pooled Hamilton community laboratory records from 1993-2000, and was monitored as a potential indicator of changes in GP discrimination in test ordering, or as an indicator of quality in GPs' laboratory utilisation<sup>1</sup>. A total charge of \$1000 was made for extracting data to my specifications.

'Percent abnormal' rates for 10 moderate- to high-volume tests, already suggested as having volume-insensitive 'percent abnormal' rates in Cleland's study (Cleland, unpublished data obtained on request, 1999; Sinclair, 1998b), were followed retrospectively by analysing pooled data from Hamilton area community laboratory records (Medlab Hamilton and Pathlab), January to March, for each of the eight years 1993-2000 inclusive. Originally, it was intended that mid-stream urines screened for evidence of urinary infection would be monitored as well, but between-lab variability in reporting conventions made it impossible for the database management systems used to extract positive findings consistently. The ten tests chosen for monitoring, with their usual abbreviations

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<sup>1</sup> A condition for access to the Hamilton community laboratories data was that reported results would relate to pooled data only.

and use (Duthie and Abbasi, 1991, Eastham, 1976, Health Waikato, 2001) were as follows: thyroid-stimulating hormone (TSH, used to diagnose thyroid disease and monitor its therapy), vitamin B12 (B12, used to diagnose pernicious anaemia/ malabsorption/ pancreatic disease), calcium (Ca, used to indicate the presence of malignancy/ hyperparathyroidism), haemoglobin (Hb, used to diagnose and monitor treatment of iron deficiency anaemia), erythrocyte sedimentation rate (ESR, a non-specific indicator of early infection or degenerative disease – mainly used to monitor treatment), C-reactive protein (CRP, a more sensitive indicator of inflammation and tissue damage than ESR, and tending to replace it), hepatitis B surface antigen (HBsAg, part of the hepatitis B viral coat, used to diagnose current infection or carrier status), cholesterol (Chol, used to diagnose susceptibility to cardiovascular disease and to monitor treatment for its reduction), glucose (Gluc, used to diagnose diabetes mellitus, and to monitor its treatment), gamma glutamyl transferase (GGT, used to diagnose and monitor treatment of drug or alcohol abuse). All are measured in serum or plasma, except for the ESR (measured on whole blood).

Although the B12 and HBsAg are seldom used in treatment-monitoring mode, in most other cases a test result outside normal limits will not necessarily represent a new diagnosis, but might indicate the need to change a current treatment regime: also a valid use of the laboratory. Because Cleland's survey (Sinclair, 1998b) covered only 18 months, and monitoring of some conditions would not be frequent, his abnormal test results represent a higher proportion of 'new' diagnoses, as opposed to 'sub-optimally controlled disease' diagnoses, compared with those followed in the study reported in this thesis.

The second database accessed for Chapter 9 was collated by the New Zealand Health Information Service (NZHIS) and contained data on public hospital discharges by DRG (diagnosis related group) category, age group, gender and

socio-cultural<sup>2</sup> ethnicity (Maori/ non-Maori) from 1995/ 96 to 1999/ 2000, and was accessed and analysed to indicate primary care system (including laboratory diagnosis) accessibility and effectiveness over that time. Charges of \$1600 in total were made for extracting data to my specifications. For this study, data were obtained from the NZHIS on hospitalisations in specific DRG categories designated by consensus among US researchers as preventable by timely ambulatory care (Weissman, Gatsonis and Epstein, 1992), and analysed for the years 1995/ 96 to 1998/ 99. The data were obtained stratified by region, ethnicity (socio-cultural Maori/non-Maori), age group (5year bands) and gender. The six avoidable hospital conditions (AHCs) chosen for this study fell into the following disease groups (the appropriate ICD-9-CM<sup>3</sup> coded DRG classifications are given in brackets): asthma (493), cellulitis (681,682), congestive heart failure (CHF) (428, 402.01, 402.11, 402.91), diabetes (250.1, 250.2, 250.3, 251.0), pneumonia (481, 482, 483, 485, 486) and pyelonephritis (590.0, 590.1, 590.8). Six further AHCs on Weissman et al.'s list would have involved relatively small numbers, particularly of Maori in the Southern region, making tests of statistical significance unreliable.

National AHC public hospital discharge rates per 1000 population were followed from 1995/96 to 1998/99 (the start date was chosen because the disease classification system changed from the 1995/96 year, and the definition of Maori was broadened in the March 1996 census to coincide with hospital classification practice [Reid, 1999]). Changing proportions of Maori to non-Maori were tested for significance. Because most hospital admissions for asthma and pneumonia are for infants, the 0-4 year age group was also analysed separately in the case of asthma and pneumonia AHCs. Women's health advocates (Oparil, 1996) have suggested that cardiovascular disease is under-diagnosed and under-treated in postmenopausal women. Because this group might, therefore, be vulnerable to cost and demand constraints in primary care, changing proportions over time in

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<sup>2</sup> For a discussion on changes up to 1996 in the Census and other official definitions of Maori, see Reid, 1999.

CHF AHCs were also analysed by gender. Since 94.8 per cent of CHF avoidable hospitalisations were for patients over the age of 50, no age selection was made in comparing male/female CHF trends. National AHC discharge rates/1000 Maori or non-Maori were calculated for 1995/ 96 in order to make Maori/ non-Maori avoidable hospitalisation rate comparisons. Age standardised morbidity rates and standard morbidity ratios (SMRs) were calculated by region and ethnicity for the year 1995/ 96, in order to make between-region comparisons with the relevant ethnic New Zealand population.

As before, tabulated databases were sorted, grouped and summed or counted with the use of queries in Microsoft Access, then further analysed graphically and statistically in Microsoft Excel. For correlates with time (years), values of  $r$  (the product-moment correlation coefficient) and its statistical significance level, and  $R^2$  (the proportion of variability due to the correlation - rather than to chance) are listed. Where appropriate, all year-on-year changes in proportions (e.g. in Maori, or female, avoidable hospitalisation rates) were tested for statistical significance using a 2 x n Chi squared comparison of proportions template in Excel (following Brown and Swanson-Beck, 1994, p 79), where  $n$  = number of years in the series. Because of the large sampling frames, the criterion for statistical significance was quite stringent:  $p < 0.001$  AND a confidence interval for the between-year difference not encompassing zero (Brown and Swanson-Beck, 1994).

Regional age standardised morbidity rates were calculated, for the year 1995/96, by direct age standardisation against either the total Maori or the total non-Maori NZ population, obtained from the 1996 census. Because numbers of some avoidable hospitalisations were low, especially for Maori in the Southern region, regional standard morbidity ratios (SMRs) were also calculated by indirect age standardisation (Borman, 1995). Regional population age compositional data by socio-cultural ethnicity (Maori/ non-Maori) and by gender, from the 1996 census,

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<sup>3</sup> ICD-9-CM indicates 'International Classification of Diseases, Ninth Revision, Clinical Modification'.

were obtained from Sandra Baxendine, statistician, Population Studies Centre, University of Waikato.

### **Working Qualitatively**

*“Qualitative method is indispensable for the study of those aspects of health care which depend upon the social interactions of individuals or groups. Its contribution is made primarily in the study of.....the cultural, historical and political circumstances which influence the nature of health care and its delivery”* Daly, McDonald and Willis (1992), p 9.

A wide range of unstructured material, existing or generated, may serve as data for qualitative analysis: taped and transcribed interviews or conversations, newspaper reports, historical records, letters, official reports. The distinguishing feature of good qualitative analysis is that it accounts plausibly for observed social interactions, i.e. it is theory generating. The criterion for overall validity is ‘the ability of the theory to fit existing knowledge in a coherent manner and to explain and predict phenomena in a convincing fashion’ (Daly, McDonald and Willis, 1992, p10). A wide range of qualitative data was gathered for this thesis as set out in the previous chapter. This was triangulated against the results of quantitative analyses and quasi-experiments.

One-on-one, unstructured or semi-structured interviews of key informants: senior pathologists and medical laboratory technologists; laboratory, hospital and health service managers, and hospital accountants, were an important source of information for this thesis, particularly for exploring the quality dimension of service delivery over the period of the reforms. Interviews for input from subjects in their own words using open, non-directive probes proved compatible with the interactive phase of data gathering advocated by Guba and Lincoln (1989). Relevant probes focused on unresolved issues: staffing experience levels, perceived reasons for turnover, staff relations/collegiality, in-service training opportunities, systems development/quality improvement initiatives, working

environment, planning ability, service predictions, and practical problems experienced. Possibly because subjects did not wish to reveal their personal views to colleagues in such a politicised area, individual interviews (rather than focus groups) tended to provide the more revealing information. Focus group-type interchanges did arise, however, informally.

The number of individual interviews required for a given research objective usually varies with the richness of the data obtained at each interview. 'There is an inverse relationship between the amount of useable data obtained from each participant and the number of participants' (Morse, 2000). This is one reason for restricting interviewing to key informants in policy-related research, i.e. to participants who, whether by reason of their position or experience are able to provide specific information or insights (Thomas, 2001).

Former colleagues suggested likely key informants from throughout the country and from both the hospital and private sectors. In all, I interviewed 10 senior pathologists and four senior laboratory or IPA managers from throughout New Zealand: Auckland, Hamilton, Wellington, Christchurch and Dunedin; and had input from a further two senior pathologists and two HFA managers by mail or telephone in response to requests for information. Participants were approached by letter, telephone or electronic mail. At least 8 of these interviews could be described as very rich in data, identifying many unanticipated critical issues, developing emerging themes, and reinforcing information from other sources. Two senior Australian pathologists responded to requests for specific information by electronic mail.

In their elaboration of 'fourth generation evaluation', Guba and Lincoln (1989) advocated a 'hermeneutic dialectic circle' process during which stakeholder groups attempt to negotiate a resolution between unresolved claims, concerns and issues. In this process, the researcher completes a succession of open interviews during which each individual subject in turn is asked to provide a critical

commentary in response to the latest in a series of increasingly informed constructions based on the preceding interviews. Negotiations ‘continue until the smallest number of viable constructions has evolved.’ Translated to this project, the reciprocal and dynamic nature of the researcher/researched relationship that Guba and Lincoln (1989) identified as crucial implied a need for repeated consultation with key informants during the whole research process for delineation, comment, elaboration, interpretation and further comment. This reflexive approach was adopted and proved extremely valuable in the development of the thesis.

Interpretation, according to Sarantakos (1993), should be an inductive process, generating unanticipated issues, hypotheses and theories for further exploration or examination. The process described fits closely with the ‘general inductive’ approach to qualitative analysis described by Thomas (2000) that ‘allows research findings to emerge from the common, dominant or significant themes inherent in the raw data’ (Thomas, 2000, p4). The ‘general inductive’ approach was used in the analyses contributing to this thesis. Thematic categories were necessarily embedded in a temporal sequence for this project. The trustworthiness of findings was assessed by comparison with other related findings: triangulation from within the project, and feedback from participants.

### **Assigning privilege**

Laughlin and Broadbent (1996) drew attention to the potential implicit in fourth generation evaluation for privileging both evaluator and client. The paying client occupies a position of relative power, while the evaluator, even in the role of mediator and facilitator, has access to a range of information wider than any other participant. In putting the case for a wide-ranging evaluation of recent public sector reforms, Laughlin and Broadbent argued for some deliberate and acknowledged privileging of experts in order to offset potential evaluator/client dominance:

*“The concept of expertise.....acknowledges that some, but not all, tasks are complex and need to be defined and refined by autonomous experts”* (Laughlin and Broadbent, 1996, p440).

Several commentators (Easton, 1997, Blank, 1994) have drawn attention to the critical role of the medical profession in determining health policy in New Zealand: a role that has no parallel in any other area of public policy. Blank made the point that health policy that does not have the passive approval of medical professionals, at least, is unlikely to succeed. Barker (1996) also emphasised the need to collaborate closely with those most involved in policy implementation, and listed as one important approach to health policy intelligence gathering, ‘asking experts’. In this category, is a technique she refers to as ‘reconnoitre of technological advance’: methodologically a simple consultation process, though requiring some appropriate technical knowledge on the part of the researcher (Barker, p70). The technical nature of many health services makes it difficult for individual patients to evaluate them at any but a very superficial level (McFadden, 1997), and this is especially true of laboratory services. In the context of this project, where the service concerned provides support primarily to other professionals, and where technical advances are among the most crucial changes feeding into policy directions, some privileging of expert medical opinion proved to be both appropriate and realistic.

## ***Part Three: Understanding the Impacts of Change***

### **Chapter 6: Pathologists: a case study in external occupational control.**

*“Without question the effective use of resources by clinicians (doctors, nurses and health technicians) has been one of the persistent problems [in the New Zealand health sector] for at least a quarter of a century” (Easton, 1997, p170).*

In arguing for the deliberate privileging of experts in public sector reform evaluations (see Chapter 5), Laughlin and Broadbent (1996) acknowledged the crucial importance of experts in defining complex service roles. The quotation introducing this chapter draws attention to the role of health professionals in a more fundamental sphere: the use and, by implication, control over state health system resources. The strong influence of health professionals, especially doctors, on health service management provoked attempts by governments in New Zealand through the 1990s to impose versions of the New Public Management (Hood, 1995) on the health sector. It is not, therefore, surprising that one theme emerging strongly from interviews undertaken for this evaluation was the progressive disenfranchisement of pathologists in New Zealand through the 1990s, and its effect on the quality of clinical laboratory services. This theme is explored and analysed here.

Major political, social and economic forces have moulded clinical laboratory professional roles, along with those of New Zealand's total health professional workforce, and in many respects the fortunes of all follow a similar course. Laboratory professionals are particularly vulnerable, however, to recent changes favouring commercial management techniques. Their dependence on expensive, rapidly evolving technology, the ease with which their services can be codified, and their indirect relationship with patients, all make them an obvious target for external control.

Pathologists, traditionally the most autonomous group among clinical laboratory professionals, potentially wield the most political power. Over the last two decades in New Zealand, as elsewhere, external controls have been variously applied to pathologists, and through them to the laboratory services they influence so strongly. These external controls were effected directly by generic managers, mediated through competition for state funding, or mediated through other medical professionals.

This chapter begins by outlining some perspectives on professionalism, including the 'trusted expert', the 'exclusionary guild member', and the 'political scapegoat'. Illustrative archive and interview material are interleaved here, as throughout the chapter. The concept of professionalism as an ongoing negotiated accommodation is introduced in the wider context of occupational control. The shift in decision-making power from pathologists to external management is then traced through four successive phases. Differing concepts of service quality frequently underlie the different approaches to controlling health professionals. The interplay between governmental control strategies, and their outcomes for pathology service quality is explored in the sections that follow.

### **Aspects of professionalism**

At the heart of New Public Management (NPM) is the concept of management as a specialised function focussed on achieving optimal cost-efficiency in state services. Its associated techniques are assumed to be portable to almost any sphere of activity in either the public or private sector (Easton, 1997; Hood, 1995). New Zealand, like most western nations, has seen the rise of NPM in recent decades. It was adopted in the non-health areas of the New Zealand public services from the mid-1980s, but only fully in the health sector in 1993, in a progression that occurred later in this country than elsewhere (Easton, 1997). External managerial control over health, and especially medical professionals was destined to be problematic for NPM-oriented administrations as they moved to include health services in a concept of efficient management borrowed from commerce:

*“In the end we have a clash of culture between generic managers focussed on profit and clinicians focussed on patients, with the commercialisers ineffectually claiming the two objectives are much the same thing”* (Easton, 1997, p 171).

A clash of cultures arises when differing assumptions about the characteristics, motivations and role of professionals operate in the same context. Harrison and Pollit (1994) have outlined three enduring, but potentially incompatible, perspectives on professionalism germane to the thrust of this study.

**The ‘trusted expert’:** This perspective assumes that protecting the interests of the individual client /patient requires the professional to be free from outside, non-health-related influence (i.e. autonomous) and the profession itself to be self-regulating. Lundberg (1999), for example, urges pathology professionals to adopt the role of patient advocate, particularly where funding for diagnostic and therapeutic resources is under tight constraints. The true consumer of diagnostic tests is the patient, he stresses, not ‘the physician, the nurse, the insurance company, the government, the employer, the union, the managed care company,

or the family' (Lundberg, 1999, p6). This point of view: the pathology professional as patient advocate; is reflected in the following interview quote from a spokesperson for the Royal College of Pathologists of Australasia (RCPA, NZ Branch), in response to Health Funding Authority (HFA) laboratory management strategy in 1999:

*"I think they actually want to keep the Colleges out, because the Colleges have too much knowledge. They can - if they get involved - they can probably marshal arguments which the HFA won't like - which will force them to admit that they're actually not really funding pathology adequately, and they're not organising it appropriately."*

An important strength of the 'high-trust' professional control form of organisation is its potential for fostering cross-institutional and cross-disciplinary collaboration between peers, and for delivering skill flexibility in contexts of rapid change. The low-trust insinuations of managerial control devices deployed over the last two decades, however, carry a danger of becoming self-fulfilling. If heavily prescriptive controls never admit of initiative or innovation, these desirable traits are unlikely to be forthcoming (Hunter, 1996).

**The 'exclusionary guild member':** This completely opposed perspective views professionalism as a strategy for the exercise of control over the numbers admitted to the profession, and the rewards for which they will work. Proponents of this view argue that the touchstones of autonomy and self-regulation are ideals of convenience, pressed into service to benefit professionals themselves, rather than their clients. Such motives are often ascribed to doctors. With their occupational control traditionally reliant on collegial relations between peers, doctors are especially resistant to outside control. The 'self-promoting' view of professionalism, however, underlies the push for tighter managerial control by health system reformers of NPM persuasion, both in Britain and New Zealand. It was clearly in the mind of the Director of Personal Health, New Zealand Health

Funding Authority (HFA), when he commented that the authority's strategy on privately controlled (community) laboratory testing was aimed at:

*"...tightening down the screws on the fat profitability that appears to be in the community laboratories whilst keeping the service free for patients"* (Johnston, 1999).

Management strategy is represented as having appeal for the citizen as both taxpayer and potential patient, and the interests of health professionals as being hostile to both.

**The 'political scapegoat':** A further perspective on professionalism reflects the government's stake in the negotiated bargain that allows professionals to maintain their privileged position in the labour market (Macdonald, 1995). In the 'scapegoat' view, the 'medicalisation' of health is a social construct behind which state responsibility for the social and economic causes of ill health may shelter. Medical 'autonomy' is a way of narrowing decision-making in health to the strictly biological, and of devolving difficult rationing decisions on to professionals. Similarly, the collegial control of professions argument can be used to absolve governments from responsibility for their own acts or omissions, as the following comment from a New Zealand pathologist, in response to a journalist's suggestion that the medical profession might run a 'closed shop', illustrates:

*"It is interesting to see how the public and media have been led to believe that the Medical Council has inherent power and authority which can somehow overrule the wishes of the politicians. In fact the Medical Council acts in accordance with the rules and regulations set by the Department of Health and Minister of Health. The politicians know very well why those standards are set and maintained, but they are happy for the Medical Council to take the flak for restricting registration of overseas specialists. The Colleges are also portrayed as having duties and responsibilities to the taxpayer (e.g. to detect and re-train wayward pathologists). In fact, the Colleges have no legislative power, have no*

*official way of finding out about problem doctors in New Zealand, and can only offer help when they are made aware of a problem and it is requested”* (Email response to my request for comment, May, 1999).

Emphasised here, is that professional control is not a form of organised surveillance or devolved responsibility, sanctioned (and funded) by the government, but in fact relies on the more informal constraints of ‘peer pressure’. Surveillance and immigration policy remain state responsibilities, despite public impressions of the all-encompassing power of professionals.

The political convenience of ‘medicalising’ health has further implications. Glover and Leopold (1996), in a thoughtful look at (NHS) management strategy, asserted that most problems with the NHS lie, less on the supply side (professionals and their management), than on the demand side, with consumers of health services. Citizens should be encouraged, they say, to:

*“wean themselves off the notion that acute medicine can offer quick fixes for any unpleasant condition from acne or boredom to heart failure or cancer of the colon. Citizens should be educated to be more active in looking after their own health...”* (Leopold and Glover, 1996, p 261).

The implication is that some consumers of health services have developed unrealistically high expectations of health professionals. Such exaggerated views of professional power can diminish personal acceptance of responsibility for avoidable ill health. Thus, in encouraging medical professionals to ration social spending by ‘medicalising’ health, governments may have inadvertently produced a costly and counterproductive dependence by the public on the very mechanism intended to contain expenditure.

Salmond (1998), drawing upon the work of Freidson (1994), has considered New Zealand health services as a labour market, with several possible models of control. He distinguishes three elements of health labour market control contributing to a balanced occupational control system: free market, bureaucratic,

and professional, and expresses concerns about the shift away from the last of these in post-1993 reform New Zealand. He encapsulates the potential dangers as follows:

*“Inappropriately applied free market measures have the potential to destabilise the whole system. The same may be said for policies that intensify elements of the bureaucratic model, so as to stifle those of the professional model that is at the heart of the present system”* (Salmond, 1998, p3).

Shon (1987) underlines the value of a broad, reflexive approach to professional practice, where day-to-day problems seldom conform to textbook precision. He contrasts technical knowledge with professional wisdom (or artistry), and sees important roles for both. Shon also warns that the ability to make decisions under conditions of uncertainty can be undermined by the erosion of professional autonomy.

*“Shrinking professional autonomy reduces practitioners’ inclination to practice online research and reflection; and proponents of technical rationality claim to make reflection-in-action dispensable by replacing it with proceduralized, science-based technique”* (Shon, 1987, p 316).

It is important to note that Shon’s concept of technical rationalism, which places emphasis on the technical aspects of professional work to the exclusion of ‘artistry’, also encompasses a formulaic approach to effectiveness like that favoured by NPM-oriented managers.

Salmond’s three elements of occupational control are necessarily linked. Like adherents of the interactionist school (Larson, 1977; Macdonald, 1995), he conceptualises professionalism as a dynamic state, constantly open to challenge and re-negotiation with the laity, or its representatives, the state. Professionals are also dependant on a functioning market to establish the monopoly position that provides their power base. All professionals must defend their ground in the marketplace against challengers in order to maintain it (Macdonald, 1995). In

practice, while he favours a predominantly professional model of organisational control, Salmond advocates employing elements of the others as corrective supplements that do not undermine it. To achieve publicly credible professional occupational control, however, he concludes:

*“health practice must be infused with a spirit of openness. All decisions must be routinely open to inspection and evaluation”* (Salmond, 1998, p 4).

Whether professionalism is viewed as one component in a balance of group power, or as an element in an occupational control system, socially optimal outcomes would seem to rely upon open dialogue between professionals and the communities they serve (or their representatives).

### **Recent managerial strategy progression**

In New Zealand, as in Britain, successive governments over the period 1987 to 1999 attempted to strengthen health service management, perhaps seeing this as a more politically expedient approach to rationing services than overtly cutting the health budget. Managers were ‘turned into agents of central government as a means of controlling professional behaviour’ (Harrison and Pollit, 1994, p 29). In both countries, the recent history of managerial strategy has followed a similar progression. However, approaches to professional control in New Zealand needed to accommodate the distinct funding mechanisms for public hospitals and primary sector: bulk allocation and fee-for-service respectively. Thus, in exploring below the effects of those approaches in the context of this chapter, public hospital-based and private sector pathologists are considered in turn.

Until the late 1980’s, New Zealand public hospitals were managed by what Harrison and Pollitt (1994) call the ‘diplomat’ model. This, they characterised as involving facilitation rather than direction. Typically three executives represented the three major work groups in hospitals: a doctor, nurse and administrator, and this pattern flowed through the whole organisation (Gibbs, Fraser and Scott, 1987). The doctor, as medical superintendent, always held ultimate responsibility

and was in charge. The chief nurse headed the largest work sector in any hospital and the administrator, or hospital 'secretary', was responsible to the medical superintendent for administrative and fiscal operations. Professional (especially medical) autonomy was seen as the most appropriate guide for public expenditure on health care. Management was largely reactive, and change was incremental, with very little critical evaluation of the range or quality of services traditionally offered. Symptomatic of this in the New Zealand hospital laboratory service, was the inertia encountered whenever it became necessary to replace obsolete tests (Stewart, 1997).

In New Zealand public hospitals this consensus, or triumvirate, management system persisted some years after it was abandoned in Britain. By 1987, however, it was being roundly criticised on the grounds that it 'stifles leadership, dilutes accountability and makes for poor management relations at the lower levels of the organisation... ..each professional group sees its member of the troika as its representative rather than as a manager' (Gibbs, Fraser and Scott, 1987, p 19). The Hospital and Related Services Taskforce, in what became known as the 'Gibbs Report', recommended general managers rather than triumvirates. Appropriate training courses were already in place by 1987 (Gibbs, Fraser and Scott, 1987).

The introduction of 'general management' in the late '80's began the separation of managerial from professional operations and accorded to management a distinct and relatively high status. Information gathering, quantification, performance measurement and clinical audit received a new emphasis. However, as long as doctors could retain control over the last of these, the medical profession was to remain effectively untouched by the change (Harrison and Pollitt, 1994). That New Zealand hospital medical staff remained, in effect, outside the management hierarchy, was due to some extent to their freedom to 'play off' hospital against private practice. Danzon and Begg (1991, p14), in their

influential report on New Zealand health-care, remarked that 'public hospitals have been able to retain specialists because such employment provides non-monetary benefits... ..By one estimate, specialists can expect to earn 3 to 5 times their public sector hourly earnings in their private practices.' They also suggested that one factor contributing to the 'poor performance' of the public hospitals was the fact that 'specialists rather than managers control the rate of output through their control of scheduling' (p 14).

Pathologists, like other specialists, had the option of moving completely or partly to private specialist-controlled practice throughout the 80's. Data supplied by the Medical Council (NZHIS, 1998) suggest that no such movement occurred over this period. In 1980 42.7 percent of pathologists were employed wholly or partly in private specialist practice. By 1989 the comparable figure was 42.4 percent. On the other hand, the numbers of pathologists employed wholly or partly in public hospital practice rose, from 75.2 percent to 81.8 percent over the same period, suggesting that any movement through the 1980's would have been away from full-time private specialist practice. This indicates that the 'fat profitability' referred to by the HFA spokesman above might have been slimming down for pathologists even then. Alternatively, the institution of general management in hospitals was not a strong disincentive to hospital pathology practice.

Although the introduction of general management in New Zealand hospitals apparently had little effect on the autonomy of the medical profession, for non-medical health professionals it had the potential to cut across traditional hierarchical systems of occupational control. Even where the manager had an appropriate professional background, the management hierarchy was designed to take precedence over professional concerns. The extent to which this occurred, however, was limited by the 'inflexibility of wages and work practices' that Danzon and Begg (1991, p14) suggested as another reason for the 'poor performance' of public hospitals in the short era of general management.

Certainly, hospital laboratory technologists in New Zealand were successful in using their numerical dominance to avoid the devolution of hospital laboratory work to lesser-paid laboratory assistants, and the numbers of professionally active technologists appear to have increased up until at least 1991 (NZHIS, Health Workforce data<sup>1</sup>), despite increasing automation. This contrasts with the fate of British and American nurses, for whom polarisation within their profession was to enhance their controllability, through management-led downsizing of the professional, 'elite' workforce (Brannon, 1996; Harrison and Pollitt, 1994).

By 1991 in New Zealand, however, the passage of two pieces of legislation had weakened the position of all the heavily unionised, non-medical health professions, including technologists. The State Sector Act of 1988 had undermined the state servants' traditional security of tenure. The Employment Contracts Act (1991) meant that instead of dealing with a central agency as unified, distinct professions, they were forced to bargain directly, frequently as cross-disciplinary groupings, with their individual employing institutions (Kelsey, 1995).

Since the inception of socialised health care in New Zealand, several attempts (including one in the late 1980's) had been made to curtail the freedom of primary care providers to respond, as they saw fit, to individual patient servicing needs. All had been successfully resisted by the medical profession (Baker, 1988). The introduction of the purchaser /provider split into New Zealand's public health system, in 1993, offered an opportunity to impose powerful external controls on all health professionals who were state funded or state subsidised (i.e. most) by way of the contract for services process.

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<sup>1</sup> Over the period 1990-98 the number of current licence holders peaked at approx. 1300 in 1995/96 (up from 978 in 1990/91). However, those responding as professionally active fell 23% (from 856 to 658) over the last 7 years of the period. The numbers of professionally active non-responders are not known (Data source: NZHIS).

Early attempts to institute competitive tendering for state clinical laboratory contracts met with strong opposition, particularly from the privately controlled sector. The basis for this resistance was the high transaction cost associated with contracting for such a skilled and constantly changing service that required expensive, highly specialised equipment and facilities. New Zealand's thinly spread population, making the development of regional monopolies likely, the highly legalised form of contract used, and the duplication involved in operating four purchasing authorities (Ashton, 1998) were further reasons for the general failure of provider competition, and the mid '90's were a period of compromise. By 1997, the 'Blitzkrieg' approach to culture change within the health service was judged to have failed (Easton, 1997), and New Zealand was widely regarded as having moved away from the market model of health resource control (Ham, 1997).

Events in a provincial city hospital illustrate one view of the incoming external control. There, an impending competitive market provided the impetus to appoint a full-time clinical director of pathology. Management regarded that change positively, indicating that the appointee had 'got those guys [the part-time public/private sector pathologists] under control' (Hospital laboratory manager, 1998). The same manager welcomed the opportunity to compete for business with privately controlled laboratories, in what had become an over-serviced region. In another city, a private company now controlled the hospital-based laboratory, which performed tests for primary sector as well as hospital patients following the change. A pathologist gave this shift in emphasis, guarded approval:

*"The service overall has seen few impacts, and most of these positive. [The management change] has provided a revenue source, uniforms and an image. On balance it has probably helped morale in most areas, and provided the stimulus for a number of staff and structural changes.... The lab is now working closer to its full capacity"* (Senior hospital-based pathologist, 1999).

The same speaker did comment that some, at least, of these service changes would have occurred in any case ‘because of changes in the way in which modern medical services are now delivered’.

Other laboratory professionals, like those associated with the Aoraki Corporation and its ill-fated Cardinal Community Laboratories discussed in Part One of this thesis (see pp 16 and 34), saw opportunities for corporate investment and private gain. Most established private sector pathologists, however, noted with disquiet a ‘lack of concern’ for quality issues on the part of the health funding authorities (Beer, 2000, p8).

Meanwhile, a succession of strategies was undertaken using a more oblique approach to medical professional control: that of incorporating doctors into management. Harrison and Pollitt define this approach as:

*“.....government/managerial tactics to control health professionals by encouraging some of them to become involved on manager’s terms, in management processes which involve a degree of control over their professional colleagues”* (Harrison and Pollitt 1994, p 74).

In New Zealand public hospitals, this strategy was facilitated by various accounting techniques for sheeting home to individual clinicians, or to clinical units, the costs of the clinical support services that they used. Support service costs were then built into the individual accounting unit, the diagnosis related group (DRG) cost (Lawrence, Alam, Northcott and Lowe, 1997). These formed the basis for funding each hospital’s pre-negotiated, pre-purchased, patient throughput. Whether or not clinicians ‘held budgets’, the effect on hospital laboratories appeared to be twofold. Firstly (especially in Auckland, where a billing system was introduced for individual hospital clinicians), an initial decrease in test throughput occurred that reinforced the technology-driven trend towards laboratory consolidation. Although the reduction in tests performed per patient persisted subsequently, test numbers increased again owing to increased

patient throughput, according to the senior hospital-based pathologist quoted below from an interview (and others):

*“Well, they’re not back up to where they were, but they’re heading back up again. I think we’re seeing more patients than we’ve ever seen before ... the throughput’s faster, so even though we’re probably doing more tests, we’re probably still doing a lot less tests per patient.”*

Secondly, although this is more difficult to attribute directly to the shift in decision-making power away from pathology professionals, some deterioration in status might have occurred. Here the same senior pathologist comments on the location of the new, consolidated Auckland Hospitals Laboratory:

*“Technologists get very little personal contact or interaction with clinicians. When we get shifted away down there they won’t get any. It’ll just be a distant place that does tests..... Eventually, when the new hospital goes up, we’ll be next door, but it’s still not the same as being in the same building. Now, you just get in the lift to see lab staff. Then, you’ll get in a lift, go down a corridor and then down a walkway and get in another lift, to arrive in a lab that’s totally secure, where you only meet people outside, in a meeting room. Then it won’t happen, it just won’t happen. They won’t come.”*

In the primary sector, New Zealand Health Authorities incorporated doctors into management by encouraging the formation of general practitioner (GP) groupings (Independent Practitioner Associations or IPA’s) that ‘held budgets’ for primary-referred services, including laboratory services, but not for secondary services (although this was planned). As in the public hospital sector, an initial sharp fall in test volumes occurred, particularly in the Auckland region where a drop of almost 12 percent in workload was experienced between 1995 and 1997 (Sinclair, 1998, Ministry of Health, 1998), and several laboratory mergers followed. These mergers, involved the private company take-over of about two thirds of the

country's formerly pathologist-owned laboratories<sup>2</sup> (and several public hospital laboratories), but no physical amalgamations.

The most notable impact of the IPA budget-holding strategy on New Zealand pathologist status arose from this commercial take-over (which was, in turn, eased by the official bias towards NPM). The following are interview responses from, firstly, a hospital-based pathologist:

*"I think the pressure comes on when you get older pathologists about to retire. That's when no other young pathologist could possibly afford to buy them out, ... but a big company can. So that's when they become vulnerable to take-overs, though ... they may not be guaranteed a job in the new company and that prospect is not so attractive to younger people."*

from a private sector pathologist:

*"...it's certainly changed the environment for pathologists in private and I would say not for the better. It's not really a great career prospect when you're likely to end up being just an employee of someone else's - without much of a stake in the business, and really just employed as a reporting pathologist..."*

and from a pathologist whose hospital-based laboratory had merged with an existing private company-owned community laboratory, in a sub-contractual 'partnership' arrangement:

*"Well, it was a fairly major change as far as I was concerned, because I was the part-time manager of Pathology. But it became apparent that with an increased load of 'customers', if you like, it was going to be a full-time job... so a new manager was appointed and I dropped back to being a pathologist, and doing some other management jobs."*

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<sup>2</sup> Between 1995 and 1998, although the proportion of pathologists giving private practice as their main employer remained constant at approx. 35%, of these, the proportion employed by a commercial company/private hospital (as opposed to solo or group practice) rose from 6–59%. Over a similar period, the proportion of active technologist/survey respondents working in private practice rose from 16 to 32% (Data source: Medical Council/NZIIIS).

In Britain, the increased purchasing power conferred by the ability to ‘fundhold’ was welcomed by GP’s accustomed to relatively low status in the highly polarised medical profession of that country (Llewellyn, 1997). No evidence, however, was found that New Zealand pathologists had suffered a loss of status relative to GP’s as a result of this country’s more limited experiment with managed care. The impression gained overall, was one of medical solidarity. Some New Zealand pathologists expressed initial reservations about the new concentration of decision-making power with budget-holding GP’s, for example: “...*managed care is a contentious issue.....One of the hooks in this approach is that much of the decision making is given to one group, in this case general practitioners...*”(Letter in response to my request for information, 1997).

Nevertheless, collegial relations between pathologists and their clinical clients do not appear to have suffered. New Zealand GPs, on the whole, were reluctant ‘front liners’ in the rationing battle. The New Zealand Medical Association, for example, expressed strong reservations about the imposition of demand side constraints on laboratory testing through GP budget holding, in submissions to the HFA.

*“We would stress..... that there is a grave risk of under-servicing in this area if GP’s have to operate within a finite budget for laboratory services, particularly if the financial risk is carried by the doctor..... We... have serious concerns regarding the intention to introduce performance related payments, as these may encourage practices that have a negative effect on patient access to services”* (NZMA, 1998b).

Subsequently, a nation-wide survey of 30 IPA’s revealed their almost total opposition to the retention of savings as personal benefits for members, as well as strong opposition to taking on the risk of going over budget (Malcolm, 1999). In addition, wide medical representation on any proposed Laboratory Services Advisory Committee was recommended by both the NZMA (1998b), and the RCPA (NZ Branch):

*“I think it’s probably fair to say that, in fact, we recommended that the laboratory advisory group had representatives from non-pathology specialities”* (RCPA spokesperson, interviewed 1999).

By early 1999, the HFA was confronted with (a) continually increasing laboratory service costs that, it claimed, were out of line with those elsewhere in the health service; and (b) the probability of private company-controlled laboratories developing regional monopolies. The HFA, which had recently consolidated the original four regional health authorities into a single centrally located body, then revisited its earlier market-mediated laboratory resource control strategy. This resulted in the proposals described in Chapter 2 (p 38) to reshape and extend competitive contracting for state funded laboratory services to the primary sector. A Laboratory Services Advisory Group with membership ‘independent of ownership interests in either public hospital or private laboratories’ was also proposed (Health Funding Authority, 1999). The proposals effectively treated professional services as commodities: a perspective reinforced by the analogy made repeatedly in the strategy document between laboratory tests and pharmaceuticals.

The HFA proposals should be seen in context. One public safeguard seen as critical for the ceding of secondary service utilisation control to general practitioner ‘budget-holding’ groups was the development of best practice guidelines. Whereas for several other medical speciality areas, the Guidelines group of the National Health Committee had developed such guidelines centrally (with co-option of appropriate specialists), pathology was selected for a market-led approach. A Request for Proposals to provide best practice education to primary referrers was released by the HFA in June 1999. In this, and associated documentation, a ‘conflict of interest’ was defined in such a way as to limit the participation of practising pathology specialists (and possibly some other medical specialists as well) in test usage education (see Chapter 3). This suggests that the

HFA was promoting ‘best practice education’ primarily as a means of curbing expenditure on laboratory tests, rather than as a means of optimising test usage for efficient patient management.

### **The management intervention continuum**

The following is an outline of increasingly interventionist strategies for the management of clinical activity, used by Hunter (1996) in the context of the British NHS.

MINIMAL	-----→	MAXIMAL
Raising professional standards	Involving professionals in management	External management control of professionals.
<i>Medical audit Standards and guidelines</i>	<i>Budgets for doctors Doctor-managers</i>	<i>Managing medical work. Extending provider competition.</i>

(Hunter, 1996)

By the mid-90s, when this outline was devised, assessments of the impact of managerial control strategies within the NHS had been inconclusive (Ferlie, 1997). Some members of the medical profession, in particular, had proved to be adept at circumventing control strategies, and the decline in policy-making power in favour of management appeared to have affected the medical profession, of health professions, least (Harrison and Nutley, 1996). Abernethy and Stoelwinder (1995) emphasise that professional / bureaucratic conflict should be conceived as a matter of degree rather than as an absolute. Even the vulnerability of professional control to market discipline, at the extreme right of the management intervention continuum above, had been found to vary widely within professions (McNulty, Whittington and Whipp, 1996).

In placing New Zealand pathologists in this continuum, it becomes clear that the extended provider competition proposed by the HFA in 1999, would, if implemented, mount the strongest attack yet on their autonomy and influence. As pointed out earlier, while medical specialists retain control over clinical audit, standards and guidelines pertaining to their particular speciality area, they can remain shielded from outside direction. A move to the proposed competitive, though highly regulated, managerial control strategy would place a severe restriction on the role of pathologists in influencing the uptake of new knowledge in their sub-speciality areas. It would influence their career satisfaction, their incomes, and recruitment into their speciality<sup>3</sup>, which was already thought by some within the profession to be inadequate (Online Doctor, 1999). Of most concern, however, was the quality of advice likely to be available to decision-makers on the appropriateness and utility of available laboratory tests, should most practising pathologists be excluded from advisory bodies. Pathology is a rapidly changing discipline, firmly based in the natural / physical sciences, and arguably among the least amenable to assessment by non-specialists. The following speaker is an experienced pathologist and RCPA spokesperson:

*“If you look at the PHARMAC example (which is what things seem to be following) I gather there was a group of academics and managers and IPAs who took on the role of educating people into the use and selection of drugs - on a sort of contractual basis like this - without really any track record.....That’s the sort of thing, which the laboratory advisory group ought to be doing. And I think the group ought to include representatives of the specialities that use the service: particularly GP’s, physicians, maybe private surgeons - although they’re not involved quite so much..... But they [the HFA] obviously don’t see the need to actively include pathologists, and that, to me, is just astounding”* (Interview, 1999).

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<sup>3</sup> Between 1990 and 1998 pathologist numbers increased by 22% from 144 to 176. Increases were most noticeable in the histo- and cyto-pathology sub-specialities, reflecting the demands of the new national

Extension of the managed market, however, would simply have completed, and made overt, a process of progressive disempowerment of pathologists that accompanied the development of a commercial approach to New Zealand health personnel management through the 1990s. The pathologist-dominated, but balanced, Laboratory Services Advisory Committee (LSAC) became defunct with the establishment of the Regional Health Authorities in 1993, after almost twenty years during which it had been consulted less and less frequently. A pathologist spokesperson for the RCPA summarises, at interview in 1999, attitudes to expert advice that had prevailed over the previous decade:

*“The College doesn’t get asked for anything, basically. We have repeatedly asked for representation, and for opportunities to have meaningful input into decision-making, and the Health Funding Authority, and we have simply been shut out for years now. They haven’t called more than ad hoc advisory groups for probably a decade at least.”*

Pathologists, as providers of a clinical support service, had been subjected by the health reforms to the full range of external managerial constraints on autonomy and, more importantly for service effectiveness, to a progressive narrowing of opportunities for the exercise of a critical reflexive approach to professional practice. This was to have unanticipated outcomes in the context of New Zealand pathology.

### **Concepts of quality**

Clinical laboratories have long been voluntary participants in programmes that monitor technical analytical quality control (accuracy and precision), some of which are organised or facilitated by professional bodies (Beer, 2000). This activity, however, has always been recognised as being, in the wider medical

context, an extremely limited view of clinical laboratory service quality (Burnett, Mackay, Costaganna and Shaw, 1993; Witte, 1993). The following quote encapsulates a wider view of quality:

*Quality laboratory medicine means doing the right tests, doing the tests right, and facilitating the right medical action”* (Witte 1993, p 1530).

It is generally accepted that most problems in laboratory testing arise from the pre- and post-analytical portions of the testing cycle, i.e. to test choice and uses made of test data. Test choice should be determined, not just by analytical quality, but by ‘predictive value’, which, in turn, depends on disease prevalence, and the clinical sensitivity (pick-up rate) and specificity (false positive rejection rate). Furthermore, as is suggested by the quotation above, translating the implications of laboratory test results for use in decision-making by clinicians, patients, family members, and policy-makers, should be a part of any clinical laboratory service of good quality. This implies that careful evaluations of laboratory ‘interventions’ have been undertaken, with the co-operation of laboratory professionals, together with all of the above stakeholders and, sometimes, test-system suppliers - often over a long time frame. Although Australasian laboratory professional bodies have been active in promoting the generation of such information and in disseminating information generated elsewhere, there is a paucity of ‘high level’ (randomised controlled trial) evidence evaluating the role of diagnostic tests for use in clinical audit (Van Walraven and Naylor, 1998). Lower level evidence relies heavily upon the consensual judgement of experts, and this also implies a need for experienced laboratory professional involvement (Lundberg, 1999).

Expert input from pathology professionals, however, was effectively suppressed over the 1990s, as the previous section attested. No sooner, it seems, had automated capacity reduced the need for manual skills, and the electronic means of tracking data become available (Burtis, 1996), than the brief for hospital pathology services became limited to the strictly technical with the adoption of

business methods of management, and that which was most easily and reliably measurable became the main focus. Quality took on its most narrow meaning of 'doing the tests right' as this cynical quote illustrates:

*"In the past, I think, the laboratory tended to provide a reservoir of experience, of knowledge, of opinion. Now the emphasis is on a laboratory that delivers the results, the raw material, to the doctors - and as quickly as possible. It isn't a disadvantage in today's climate not to have experienced people, because those people just aren't really going to be questioned or consulted"* (Hospital laboratory manager, 1997).

Hospital pathology postgraduate-level scientist positions were either disestablished in 1993 or (in the case of Auckland) lost by attrition throughout the 1990's.

*"Certainly we don't have the scientists like we used to, doing developmental work.... Technologists are good at getting kit-sets up and running, but not for covering new innovative, particularly creative work ... they're just not trained to do it, they're not trained as basic chemists and scientists..."* (Senior hospital pathologist, 1999).

### **Beyond quality control**

New Zealand witnessed in mid 2000, a Ministerial Inquiry into the under-reporting of cervical smear abnormalities by a Gisborne pathologist through the 1990s to 1996 (Ministerial Inquiry into Under-reporting of Cervical Smear Abnormalities in the Gisborne Region, 2000). Accused of some measure of culpability for the errors, the RCPA, through a representative, pointed to its badly eroded relations with the HFA:

*"If there is a properly constituted body providing advice to the Ministry, or the Funding Authority, I would hope they would have a better grasp of the situation than the position I was in when I was consulted at short notice, and briefly, in this matter, in April of 1999"* (Ministerial Inquiry, Gisborne : Transcript of proceedings 13 July, 2000, p75).

Fragmentation of the screening service provision, a feature of the multiple service contracts involved, together with constant changes in the health organisational infrastructure, had complicated the collection of appropriate data for clinical audit. Even practitioners like the gynaecologist referred to below, who endeavoured to audit her own practice, were discouraged by a combination of bureaucratic and market deterrents:

*"Van de Mark tried to find statistics on incidence and mortality rates in Gisborne but was unsuccessful. It appeared the hospital, the cervical smear programme, the Cancer Society and Midland Health [RHA] did not have any to give her, and the Cancer Register told her each request for information would cost \$800"* (Alexander, 2000).

Non-clinical researchers like epidemiologists, on the other hand, were completely frustrated in their efforts to link laboratory results with disease incidence by obstructive privacy legislation (Skegg, 2000). It is unlikely that the RCPA, as representatives of a clinical support service, could have negotiated this particular bureaucratic stricture, which effectively precluded any meaningful clinical audit of the National Cervical Screening Programme throughout the 1990s.

For pathologists, however, the final negation of the 'professional wisdom, or artistry' ideal (Shon, 1987), was the impact of NPM pro-market emphases on continuing education in the application of their specialty:

*"...the provision for training and education of pathologists ... has been essentially just ignored on the assumption that someone will do it. With the proposals that they're making to shove the hospitals into the private market, I can't see how hospitals, which will already feel that they're fairly heavily committed, are going to be capable, anyway, of providing training and education, let alone continuing education, for pathologists"* ( RCPA spokesperson, 1999).

In an article on the Otago Medical School, Hunter (1998) regretted that previous regulatory legislation committing hospital boards to undergraduate medical

teaching was omitted from the Health Reforms Act of 1993. Medical teaching and research were no longer to be regarded as core services of the ‘teaching’ hospitals: a seemingly astounding situation.

### **Possible futures**

Harrison and Pollitt, writing in 1994, concluded their exploration of managerial control of health professionals with an outline of factors likely to counter the managerial ascendancy within the NHS at that time. By the late 1990’s, it was possible to see some counter-managerialist factors emerging in New Zealand’s ‘reformed’ state funded health system.

The autonomy of medical professionals is protected to some extent by the substantive nature of their expertise. Within the medical profession, although an implicit hierarchy of specialists has always existed, the necessity to share diagnostic resources - and patients - meant that self-interest was unlikely to completely dominate intra-professional relationships in medicine (Bennett, 1996). There are signs in the continuing strong support given from New Zealand Medical Association spokespeople that the strength of pathology might rest in its indispensability as a shared diagnostic resource:

*“Once again the health authorities in this country discount the majority of the experts in a field who may hold some mana in their professional community, condemning them as unable to manage a potential conflict of interest. It will be very difficult for them to find clinicians with sufficient skills and experience in this area who are not involved in the industry – are we to see, yet again, a ‘clinical’ advisory group that is only a rubber stamp for HFA cost cutting?”* (MacKay, 1999, p2).

Despite this support, loss of control over entry to the pathology profession could potentially offset the value of substantive expertise. As noted elsewhere, massive retrenchment in laboratory services in the US following the growth of managed

care organisations, has given rise to predictions of a surplus of pathologists in that country. However, most pathologists interviewed thought that relatively unfavourable rates of remuneration in New Zealand (MacKay, 1999) would mean that American pathologists were unlikely to wish to relocate here.

Laboratory services would seem particularly prone to erosion of expertise through the development of automation and electronic decision support or 'expert' systems. The effects of automation on workforce size and career structures have been described by Conn and Snyder (1997) for medical laboratory technologists in America, and are reflected to some extent in the New Zealand workforce data (Note 1). Training institutions report no difficulty in placing new graduates for the practical component of their training, however (Personal communication, Medical Laboratory Technology course convener, 1999). Although there has been increased interest in codifying the process of data interpretation using expert computer systems, the high rate of technological change in pathology would suggest a need for ongoing input from pathologists and other senior laboratory professionals in the refinement of these and other guidelines for medical decision-making.

In Britain, the option of private practice has been available to most specialists, and to a small number of laboratory professionals, as an escape from certain state-imposed constraints. Although clinical laboratory tests have been almost totally state funded since 1946 in New Zealand (Stewart, 1997), so that complete freedom over income and standards would never have been possible in this country, Stewart saw this 'escape' as the reason NZ pathologists chose to enter pathologist-owned practice in New Zealand:

*".....there were the attractions of 'being your own boss'; freedom to improve accommodation and to order equipment when needed, as against often a minimum of a year's delay in hospitals; virtual absence of night and weekend call*

*duties and comparative freedom to attend scientific conferences and undertake overseas postgraduate study” (Stewart, 1997, Private Laboratories, p 41).*

By late 1999, the threat of tight NPM-mediated controls on both prices and practice in pathology was in danger of curtailing the already limited freedom of pathologist-owned practice in New Zealand, and many pathologists were opting for employee status in private, shareholder-owned companies. On the question of ‘part-charging’ for laboratory tests in this country, however, pathologists in privately owned laboratories have consistently favoured a ‘core’ approach, that would impose charges for tests of ‘borderline’ clinical value only, while retaining free status for the majority of commonly requested tests:

*“I think most people, for pragmatic reasons, would like to see a list of tests which were fully funded, drawn up, but cut off at a certain point, so that what money was available from the public purse could be spent on those tests. The other tests would have to be arranged in some other way. But at least you wouldn’t have the wasteful transaction costs of part-charging. If they’re going to part-charge on every test, then you’re probably going to lose a lot of what you gain in the short term.” (Private sector-based pathologist, 1999).*

The pathologist-recommended approach, of course, leaves the profession vulnerable to external control, and its adoption, in practice, might well depend on the acceptability to the profession of the control systems proposed. Under restrictive external ‘output’ controls, the temptation to settle for targeted state subsidies, with additional fees set by the individual laboratories (which is the situation pertaining in general practice), would be strong.

By 1998, commentators were suggesting that fragmentation of management (similar to that predicted by Harrison and Pollitt in 1994 for the NHS), was occurring in the New Zealand health system, particularly in the area of priority setting:

*“Holding New Zealand purchasers accountable for purchasing outputs and processes...requires greater commitment on the part of the funder to setting priorities more clearly; specifying the range and level of outputs to be purchased and the terms of access to those services; and funding services to this level”* (Cumming and Scott, 1998, p 66).

The following comment from a spokesperson for the RCPA, after the HFA released its laboratory services management proposals in 1999, expands on this:

*“I think, personally, part of the problem is the relationship between the Ministry and the HFA - which is poor. The HFA, I think, is given far too much rope in setting its own policy, whereas the Ministry seems to have just contracted down to a sort of consumer protection agency - and that is about their only meaningful brief. They don't seem to be willing to be involved in any active management - which doesn't help matters at all.”*

The extract below is from a NZ Herald article by the Minister of Health, in reply to criticism of his government's health policy:

*“... the law was changed in 1997 to remove the profit motive completely from public hospitals. Our political opponents never seem to acknowledge this and continue to repeat the false mantra that the health system is a market model/commercialised system”* (Creech, 1999).

The development of a degree of managerial fragmentation is clearly borne out by this ministerial comment, when considered with the overtly market-led control proposals released by the HFA for clinical laboratories (both hospital and community based) only four and five months previously. Consequently, even a right-of-centre government might have found it inexpedient to continue support for the more-market agenda that seemed, by late 1999, to be largely purchaser authority-driven. As commentators on the British NHS observed:

*“.....the particular political powers which have fostered the growth to prominence of the management function are ultimately fickle ones”* (Harrison and Pollitt, 1994, p 146).

Thus, while health professionals, and especially laboratory professionals, had clearly lost autonomy to external controls in New Zealand through the 1990s, the indications were that this trend might well have been arrested, whatever the national election outcome in late 1999.

### **Towards a workable model of professional control**

New Zealand's small and thinly spread population makes it vulnerable to some of the pitfalls of NPM business-oriented approaches in health. Fragile, but crucial, professional collegial relations among its small specialist communities are especially vulnerable to the divisive aspects of free market occupational control measures. The community of pathologists is only about 180 strong, and many of these divide their time between public and privately controlled laboratories, either concomitantly (as a consequence of the generally low population density of the country), or over the course of a career. More importantly, as the National Cervical Screening Programme failures testify, the NPM approach to external occupational control compromised pathology service effectiveness, along with progressively eroding professional autonomy.

In a cross-sectional study set in a large Australian teaching hospital, Abernethy and Stoelwinder (1995) demonstrated that the conjunction of a strong professional ethic with a control system emphasising output controls (rigid, externally imposed budgets and financial targets), underlay the most severe role conflict experienced by professionals. Their results also supported the thesis that reducing role conflict improved service performance overall, as well as individual job satisfaction. 'Behaviour' controls, such as supervision by a professional superior, appeared to be perceived no differently from 'professional' controls (autonomy, with informal peer control). In support of these findings, a qualitative study of clinical directors in British hospitals (Kitchener, 2000) concluded that

such directors were able to promote high levels of clinical autonomy for professionals under their control.

From the present study of pathologists, whether in the hospital or primary sector, protection of professional autonomy by other professionals would appear to depend heavily on the degree of between-doctor co-operation that can be achieved, regardless of where the locus of budgetary control nominally lies. The efficiency-driven consolidation of New Zealand hospital pathology laboratories on sites remote from many of their medical 'clients' poses a potential bar to such co-operation, as does the mistrust, and exclusion from decision-making, that has accompanied the competitive contracting process. Although the Labour-led New Zealand government elected in 1999 has undertaken to abandon the competitive element of contracting for state health service funding, it is not clear that this policy reversal will pertain for clinical 'support' services like laboratories.

Effective professional occupational control in pathology, as well as in more visible areas of a publicly funded health system, would appear to require the engagement of appropriate experts in the full range of decision-making affecting their professional practice. To maintain the 'spirit of openness' (Salmond, 1998) needed to counterbalance the potential for self-interested behaviour, such engagement should be located within a framework of central accountability, transparency and freedom of information.

## Chapter 7: Clinical laboratories: piloting the market-led control of health resources.

This chapter explores the theme that New Zealand clinical laboratory services exemplify trends in market-driven health sector resource control that have disturbing access, cost and quality implications for other areas of health care, as well as for laboratory services themselves. It begins by outlining the benefits claimed for market-led resource control, and for its corollary in the New Zealand context, of foreign investment. Critical perspectives on both these economic strategies are presented. Extension of the market-led control philosophy into the area of publicly funded health care is described, and management strategy for the state-funded clinical laboratory services is examined in detail, as a potential indicator of long-term impacts of the 1993 health reforms.

A central feature of the 1993 health reforms in New Zealand, as elsewhere, was a shift from central management of publicly funded health resources, towards market-led control (Upton, 1991). One 'pilot' service attribute convenient for the trial of such a contentious policy initiative would be comparative public invisibility. Laboratory services constituted a prime candidate in that regard. Features of their management through the 1990s, and responses to it, should therefore usefully inform both the policy evaluation at the core of this thesis, and policy development in other areas of the health sector.

### **Balancing supply and demand**

The market-led approach to determining an appropriate price for goods or services promotes unregulated markets, in which individuals pursue their own

self-interest in the exchange process, as a means to achieving the best results for society as a whole. It is argued that perfect competition in an unfettered market will favour the cost-efficient production of high quality goods, innovation, and more rapid transmission of local supply- and demand-information than any centralised control system could achieve. A common moral argument for a market-led economy derives from its assumed contribution to personal autonomy (Johnson, 1995).

The countervailing view stresses the potentially damaging effects of unregulated markets and the inapplicability of the market principle to certain areas of economic activity (especially public goods, where the beneficiary is the community at large, or the benefit is long-term). Further objections centre on the difficulties in achieving, and maintaining, in practice, the fully competitive conditions upon which both market efficiency and real personal autonomy depend – particularly in areas requiring specialised expertise, where the consumer is probably not in a position to judge what is in his/her best interests (McFadden, 1997).

Externalities, factors affecting the welfare of others that are not reflected in market signals, are a second source of ‘public good’ market failure frequently cited by detractors of market control. An example would be industrial pollution costs not borne by the producers and factored into their product prices, though still paid by society in general through taxation, in the form of public control or clean-up interventions. (Similarly, the market necessarily undervalues the social benefits of full and fair employment, so that goods produced by an exploited labour force are cheaper than their true cost to the taxpayer in welfare expenditure would justify.)

*“The market, by ignoring external costs and benefits, tends to overvalue goods which incur external costs and undervalue goods which incur external benefits.*

*This leads to over-production of the former and underproduction of the latter”* (Johnson, 1995, p5).

Some of this chapter and most of the preceding one are largely concerned with externalities bearing upon the market-led approach set in train in 1993 for controlling supply prices and resources for New Zealand clinical laboratory services. They are presented here to inform aspects of the access, costs and quality of the country’s clinical laboratory services that are not accessible to quantification.

Climates of opinion concerning what constitutes an optimally functioning economic system follow cyclical patterns, to some extent predictably (Brown, 1996). In New Zealand, the colonial export-orientated economy of the late 19<sup>th</sup> and early 20<sup>th</sup> centuries persisted into the 1930’s. Following the international economic malaise and widespread social stress that accompanied the great depression of the 1920’s and early ‘30’s, a ‘Keynesian welfare state’ economy that focussed on maintaining demand and consumption through full employment, was developed (Barnett and Barnett, 1999). Consequently, the New Zealand post-world war II economic regime was characterised by tight central control of prices, wages, imports, and investment capital (Akoorie, 1997). By contrast, the period from 1984, when an incoming Labour government introduced sweeping structural reforms, has seen more governmental devolution of decision-making, more focus on minimising the costs of labour, and less interest in maintaining a public demand for goods and services. As a strategy, this was well attuned to the global structural adjustment programme first adopted by the International Monetary Fund in Chile, Mexico, and other Latin American countries through the 1980’s - in co-operation with the governments of these heavily indebted nations - as a means of securing the investment income of international lending organisations (George, 1988). The legacy of structural adjustment, however, fell heavily on the people of the debtor nations:

*“You may search the literature in vain for any sign of compassion on the part of the bankers for the ordinary people who will wind up paying the debt.... ... the victims of reckless lenders and improvident borrowers will take the consequences. When governments must devote every last centavo to servicing debt, they cut expenditures at home, drive down salaries, sack public workers, stop paying for health, education and welfare and generally neglect their own populations (George, 1988, p44).*

The World Bank itself, in its World Development Report (1993), while advocating the targeting of health and welfare services to the poor as a ‘safety net’, strongly endorsed the ‘market’ solution to quality and cost control issues in the area of social services. In New Zealand, however, the overt rationale for the shift in emphasis away from central control was twofold: to achieve greater competitiveness in an expanding global market, and to address perceived failures in the Keynesian welfare economy (Barnett and Barnett, 1999). Increasing reliance on the market control of resources in the 1990s thus became the favoured mechanism for dismantling a complex and extended economic structure designed to maintain public welfare: a structure that, ironically, had itself been instituted in the 1930s as a response to free-market failure of the late 1920s /early 1930s, the ‘Great Depression’.

### **The New Zealand market and foreign investment**

Because of its size and distance from markets the New Zealand economy has been, from the beginning of European settlement, an international one though linked in changing ways to the world economy (Enderwick, 1997a). The period since 1945 saw a huge growth in international business activity, although this impacted most strongly on the New Zealand economy only in the last two decades of the 20<sup>th</sup> century, with the lifting of formerly restrictive trading regulations. In a country like New Zealand, with limited resources available domestically, foreign investment:

*“... extends the production possibility boundary by allowing the external sourcing of resources... [Multinational enterprises] create cost advantages where they successfully internalise high-cost market transactions. Their scale and scope yield opportunities for specialisation and the more effective utilisation of resources”* (Enderwick, 1997a, p10).

Advocates of foreign investment also stress its positive flow-on effects: the stimulus to training, knowledge exchange, the importation of innovative management practices, flexibility, and technology transfer (Enderwick, 1997b).

New Zealand critics of foreign investment (Kelsey, 1995, W. Rosenberg, 1997) focus on its macroeconomic distortions (e.g. increased foreign debt servicing), on adverse internal distributional effects (unemployment and mal-distribution of income), and on loss of sovereignty. Kelsey (1995) viewed the rapid and extensive shift to a market-led economy following 1984 in New Zealand as an extreme response to the globalisation of trade, such that finance capital was able to dictate the terms of any internal policy (including taxation and welfare policy) that affected global competitiveness.

*“International trade between nation-states increasingly gave way to global economic transactions between and within trans-national corporate enterprises. Their inherent flexibility, and their superior access to finance, technology, skills and economies of scale, enabled these firms to dominate a national economy and evade its regulatory regimes. Inflows of capital could crowd out smaller domestic investors who were more likely to be committed to the particular industry, workforce, domestic economy and local community”* (Kelsey, 1995, p 16).

Much recent foreign investment in New Zealand has been fostered by a governmental policy of privatisation (Scott-Kennel, 1997), a key plank in the structural adjustment programmes implemented around the world with the support of the World Bank. The privatisation of formerly state-owned assets became common in many OECD countries throughout the 80's and 90's, as governments

sought to divest control of resources in an avowed attempt to achieve greater efficiency and competitive advantage given the increasingly global marketplace. In New Zealand, foreign investment was one way of obtaining sufficient financial resources for privatisation. Enderwick (1997b) suggests that the opening up of asset sales to foreign investors provided a larger and stronger market, with better subsequent sale prices. Although no evidence is provided for this contention, it is assumed that widening the market will usually lead to a fairer valuation at the time of a sale. Enderwick also stresses a wider importance of asset sales, however: that of signalling to foreign investors a governmental attitude supportive of private economic activity.

W. Rosenberg (1997) has argued that foreign investment should be subject to strategic host government control if it is to perform to the advantage of the country as a whole. As he and others have pointed out, however, New Zealand's now very high dependence on foreign investment: by some measures, easily the most dependent among developed economies (B. Rosenberg, 1997), places serious limits on the policy options available to it.

*“ ‘Sound policies’ from the viewpoint of overseas investors, which focus on security of investment and international profit and interest rates, may not coincide with New Zealander's needs for social welfare, health, education and employment”* (B. Rosenberg, 1997, p63).

### **The New Zealand health market compromise**

The pro-market philosophy - often referred to as economic liberalism - had its beginnings in the early 19<sup>th</sup> century. As Brown (1996) has pointed out, modern economic rationalist thought builds on an economic liberal foundation by postulating an extension of the market to encompass 'collective' or 'merit' goods (like health and welfare) as well as private ones, using the device of an artificially constructed or 'managed' public market. One indication of economic rationalist

influence on public policy is the substantial increase in private market provision of health services seen within all democratic capitalist states over the last two decades. The pace and extent of this, has varied widely. Sweden on the one hand and the United States and Britain on the other represent extremes (Johnson, 1995). Johnson does not refer to the status of the New Zealand health market, but other commentators (Easton, 1997; Ferlie, 1997; Kelsey, 1995) place it at the latter (high and rapid penetration of market-led private provision) extreme. In parallel with the trend towards private provision of formerly publicly provided health services, the privatisation of formerly publicly owned health facilities has also been either contemplated or accomplished by governments everywhere 'wanting to reduce public expenditure and in desperate need in many places... ..to replace outdated infrastructure' (Smith, 1999).

In New Zealand, although the impetus for the 1990's health reforms owed much to economic rationalist thinking, the rationale behind the purchaser /provider market split instituted in 1993, and the associated contest for state funding, reflects a more moderate, 'welfare pluralist' compromise. Mixed public /private service providers would compete for funding, initially at least, from a dominant (state) insurer. In order to offset the potential for exploitation inherent in the delivery of health care, a technically complex area, a central role was delegated to an agency created for the purpose of purchasing, within a capped budget, an appropriate mix and level of services on the consumer's behalf. The market was to be regulated to promote competition, and to ensure acceptable standards. The resulting 'quasi' market sacrificed some potential for cost efficiency (because of the high costs of regulation) and most capacity for individual autonomy compared with the market-led control model promoted by 19<sup>th</sup> century liberals (Brown, 1996).

Another advantage claimed for classical, market-led price and resource control, was its responsiveness, although recent advances in information technology have

largely offset this. Nevertheless, versions of welfare pluralism were promoted in several formerly centralised state health systems besides New Zealand's through the 1980s and 1990s: most notably that of Britain. British commentators (Maynard and Bloor, 1996) have emphasised the comparative cost-effectiveness of the pre-reform British National Health system, which had been one of the most centralised in the OECD. Concluding that the British reforms had not yet demonstrated cost-efficiencies, they also observed that 're-disorganisation' of health service structures would be unlikely to yield gains that kept pace with the ever-increasing calls on the health system caused by stresses elsewhere in the (deregulated, market-dominated) economy:

*"Inequities in financing and access to health care have been reduced, but increasing disparities in income (due to rising unemployment and changes in the distribution of income, such as that resulting from the increasing number of part-time jobs) continue to add to these inequities"* (Maynard and Bloor, 1996, p 607).

In New Zealand, where pronounced income disparities have developed during 15 years of pro-market policy operation in the non-health sectors of the economy (Kelsey and O'Brien, 1999), the reservations quoted above have particular force.

### **A market trial for publicly funded health: its ideological links and its critics**

The content and rationale for the 1993 health reforms draw heavily on a report (Danzon and Begg, 1991) commissioned by the New Zealand Business Roundtable (see Chapter 2, p 25).

As a consequence of that report's ideological underpinnings, the welfare pluralist compromise adopted in 1993 has been considered by some (Easton, 1997; Keene, 1998; Kelsey, 1995) to be a way station *en route* to full privatisation of health insurance, as well as of service provision. (In anticipation of this, there has been an increase in numbers of health insurance schemes offered in New Zealand and

the entry into the New Zealand market of major overseas insurance companies.) Eventually, subsidisation would be the 'safety-net' option, available only for those unable to insure themselves.

In view of this possibility, it is of interest to consider other methods available to the state for private health care market support (Johnson, 1995), in addition to the regulated quasi market allocation of state funds. The following have been used, or considered for use, in New Zealand, particularly since 1993 (Keene, 1998):

- Direct contracting-out to the private sector, of services supporting public provider institutions.
- Introducing or increasing charges for publicly provided services.
- Full or part subsidisation of private provider service fees.
- Reduction in the scale or scope of public provision.
- Reductions in income tax. (This and the previous three incentives encourage a shift to private health funding, as well as provision.)
- State subsidisation of research and professional training costs.

A state initiated market incentive not introduced in this country is:

- Tax rebates for private insurance fees.

As Powell (2000) has pointed out, however, the influential Danzon and Begg report (1990) advocated individual 'opting out' of the public health system with the payment of 'premiums'. This approach was eventually incorporated into the then Minister of Health's policy paper (Upton, 1991) in the form of health care plans with a portable entitlement or 'voucher' system, a strategy that was to be postponed indefinitely while core entitlements and regulatory systems were developed.

Especially important in the New Zealand context, has been the provision of a commercial, legal, and infra-structural environment favourable to foreign

investors. This was essential to realise the potential of market-led resource control generally (Enderwick, 1997b), and has particular relevance to the New Zealand health market, given that few local investors could be expected to compete with the state for either comprehensive health insurance, or for large-scale provision of specialised health services.

The institution of the quasi-market for publicly funded health care in New Zealand in 1993 met with strong resistance from both health professionals and the public, spearheaded by the Coalition for Public Health (Easton, 1997). Behind the public unease was the administration's tardiness in clarifying public entitlements to health care, whether undertaken in the public or the private sector (Scott, 1998). Furthermore, by 1996, it had become clear that definitions of core services and risk ratings were proving too difficult for any form of portable entitlement plan (admitting an element of consumer choice) to be implemented (Brown, 1996; Scott, 1998). However, the move away from market-led control during the (prematurely shortened) term of the National-New Zealand First coalition government of 1996-8 was probably precipitated by two other factors: the high 'transaction, cost of operating the purchaser-provider split (Ashton, 1998), and the loss of support for both major 'reformist' political parties in the 1996 election.

An apparent anti-market stance taken in 1997 by the National-New Zealand First coalition government placed a new emphasis on the devolution of decision-making power on to health professionals (Malcolm, 1996). The vehicles for this power-shift were to be co-operative, community-based health provider structures: independent practitioner associations (IPAs) and integrated care groupings. Critics, however, were suggesting that the new 'co-operative' strategies signalled not so much a change of direction away from competition, as a slightly more covert step towards the ultimate goal of full privatisation of the health service (Keene, 1998). Keene drew parallels between (privately-controlled) budget

holding IPA's and (often private insurance company-backed) integrated care organisations; and the American managed care organisations that undertake to provide global health care to a registered, direct premium-paying population. A joint risk-holding venture (First Health) between the large New Zealand IPA Prime Health and the American-based health insurance company Aetna, has been viewed (Keene, *ibid*) as an early prototype for a fully privatised managed care organisation.

Aetna, a large American HMO that is in partnership arrangements with a New Zealand IPA, experienced difficulties when their American share prices fell sharply. Factors precipitating the financial difficulties for this company, and for others, were analysed in an article in *The Economist* entitled *Finance and Economics: Aetna explodes* (21 March, 2000, p 79). These include: an increasingly heavy drugs bill, rising consumer expectations, doctor resistance, expensive patient lawsuits, over-expansion with the acquisition of other HMO's at too extravagant a price, and over-exposure to the (highly cost-conscious) American federal health-insurance scheme for the elderly, Medicare. The last of these financial strictures, in particular, bears on the situation of health-related financing companies based offshore should the Labour-led government elected in New Zealand in late 1999 move towards greater universality of health care benefits with tighter central control of costs. Under such circumstances it might be predicted that New Zealand would no longer be an attractive investment destination and such companies would undergo further 'rationalisations' or withdraw altogether. Neither the merger nor the withdrawal option seems conducive to the stability optimal for efficient health system operation and planning. (Aetna has since withdrawn and sold out to established New Zealand health insurers, Southern Cross [Simon, 2001].)

Besides pointing out the potential for increased overall cost pressures in organisations of the ‘managed care’ genre, Keene (ibid.) also pointed to public-provider privatisation pressures under the administration of the mid-90’s:

*“The annual reports of former crown health enterprises ... show that the invisible hand of Government has encouraged such initiatives and other ‘joint ventures’ with private organisations through its pricing practices. Often hospitals and communities are presented with Hobson’s choice about the future of their services: invite private enterprise or risk the financial viability of the hospital”* (Keene, 1998, p15).

Although the integration of formerly fragmented services is claimed as a major strength of the ‘partnership’ initiatives, experience in the British NHS has suggested that private funding involvement in public health provision ‘undermines the rational planning of health services’ (Boyle, 1997), thus leading to greater fragmentation nationally. In the New Zealand environment, where much private financing inevitably involves overseas investment (Smith, 1996), this problem is likely to be accentuated.

Pool (1999) has drawn attention to the dangers inherent in basing comprehensive health care programmes on current service users as the basic unit, rather than on defined populations.

*“There is a real danger with this approach that unmet need becomes invisible, and that existing service inequities are perpetuated”* (Pool, 1999, p 76).

Pockets of under-utilisation of both primary care and specialist services had been well documented over the 14-year period to 1999 (Howden-Chapman, 1999). With no central system in place to address questions of equitable access, continuing devolution of accountability on to the private sector remained a risk.

### **The laboratory ‘guinea pig’**

Pathologists, with their science and technology support staff, have always worked largely behind the scenes, dealing with specimens, rather than with patients. This relative public invisibility appears to have made pathology services in New Zealand a convenient candidate for the trial of an extreme strategy in market-led health care. During the period following the introduction of competitive tendering for state funding in 1993, New Zealand clinical laboratories achieved some rationalisation and more uniformity in test fees across the country. Overseas companies made considerable investments in already-existing laboratories, both publicly and privately owned. Despite this, the 3-year post-reform laboratory expenditure growth rate to 1996/97 of 18.39 percent exceeded that for the general practice subsidy (8.51 percent) and for pharmaceuticals (adjusted for statins, 16.44 percent) (Ministry of Health, 1998). Clearly, the internal market had failed to achieve its primary goal of greater cost efficiency over the period. The administration appears to have attributed this failure largely to health authority operating inefficiencies:

*“...Unlike the case with pharmaceuticals, RHAs negotiate directly with service suppliers rather than jointly through an agency. RHAs have arrived at a variety of strategies for increasing efficiency in this area, but have had difficulty implementing some of these due to provider resistance”* (Ministry of Health, 1997, p58).

Commentaries from participants in this study, and other contemporary research findings, however, suggest at least the following three causes for the failure of competitive laboratory services tendering in the three years to 1996:

- high service-related transaction costs associated with competitive contracting.

*“They say that they want to maintain competition, but I don’t think they really know what the effects of competition are in medicine. And one of the things that they don’t seem to be prepared to acknowledge, which there’s certainly plenty of*

*evidence about, is that if you have competition, well, you're actually increasing the amount of work being done, by and large. You don't necessarily reduce it..."*  
(Senior pathologist, 1999)

Ashton (1998) performed a qualitative transaction cost analysis for the contracting process for four different health services: rest homes, primary care clinics, surgical services, and acute mental health services; using a transaction cost economics framework. Transaction costs in this instance include 'the cost of establishing contracts and acquiring the necessary information, of designing, negotiating, monitoring and enforcing contracts; and of avoiding and resolving conflict' (Ashton, 1998, p357). The characteristics of services thought to influence the transaction costs of contracting most strongly are: asset specificity (capacity for alternative asset uses), uncertainty (degree of specificity possible in the contract), optimal frequency of tendering, and measurability (for ease of monitoring). By analogy with Ashton's analysis, a relatively high transaction cost for laboratory service contracting would be expected. Assets in this case, especially staff skills and accommodation for the enterprise, are highly specific. Epidemics and ongoing changes in technology affect the specificity possible in the contract, and make frequent transactions ideal. Although quantitative monitoring is simple, appropriate monitoring of quality in the laboratory service area is both time- and expertise-intensive.

- the loss of former co-operative working and purchasing arrangements. Some regions, prior to the reforms, had instituted co-operative purchasing and specimen exchange arrangements among their state hospital-based laboratories in order to optimise efficiency. The advent of competitive contracting, however, cut across these potentially cost-saving initiatives, as indicated by the following speaker:

*"When the Area Health Boards came in we had consultants coming in telling us the only way we were going to survive was to all combine together in the Auckland region, and work together. Then once things were opened up to the*

*private sector, suddenly overnight we were told 'what you must do is divide up into Crown Health Enterprises and compete against each other'. That's the only way we could save money in fact! It's just nonsense. Co-operation beats competition every time"* (Senior pathologist, 1999).

- failure to take advantage of economies of scale resulting from private company acquisitions. Despite the fact that private companies acquired chains of laboratories throughout the country, individual laboratories remained largely independent:

*"With reference to the mergers, or the acquisitions, of laboratories in New Zealand by SGS, I'm not sure they have created enormous economies of scale in terms of consolidating in operations to fewer sites. They still seem to have laboratories in most of the sites where they were previously, and although some work is now sent away that previously would have been dealt with on site, I'm not convinced that there has been a major efficiency in that"* (Senior pathologist, 1999).

A change of tactics occurred in laboratory service management from mid 1996 on, when the government abandoned contestable contracting, and moved to encourage IPA laboratory test and pharmaceutical budget holding. Although initial economies resulted from suppressed demand (Kerr, et al., 1997), they were not sustained. By 1998/99 the Health Funding Authority (HFA), which had recently consolidated its original four regional health authorities into a single, centrally located body, estimated that expenditure on community laboratories was increasing at 5 percent per annum 'with no clear evidence of health gain'. This time, the HFA appeared to attribute failure to the high costs of public accountability, and the relative inaccessibility (of the public hospitals and health authorities) to private capital:

*" Private laboratories ..... do not face the same political pressures or costs of public accountability and usually therefore have greater management discretion*

*to minimise costs. They also have far greater freedom to raise private capital”* (Health Funding Authority, 1999, Laboratory Services Strategy, p 23).

The following comments from senior pathologists provide other possible reasons for the failure of laboratory testing costs to moderate in the late ‘90’s, e.g.

- the need for corporate investors to make a profit:

*“I believe, whenever a laboratory gets privatised, you know, it must be more expensive. Somebody has got to make a profit out of it. We’re supposed to be doing that in the hospital now as well. It’s still produces the same thing with a lot more bookkeeping. So privatisation has to be an expensive option”* (Senior hospital-based pathologist, 1999).

- increased compliance costs for providers of laboratory services:

*“The compliance costs of dealing with the HFA now are substantial.....All these business things mainly benefit lawyers and accountants”* (Senior pathologist, privately-controlled laboratory, 1999).

There are also suggestions in the following comments from senior pathologists in mid-1999 that overseas companies might have paid excessively for New Zealand laboratories, given that these were, at the time, the privately controlled sector of a publicly funded laboratory service in dire need of rationalisation. (Or, alternatively, overseas companies were able to buy cheaply in the absence of local purchasing power, in anticipation of a shift to private funding for laboratory services.):

*“I don’t think there’s the money in private practice that there used to be. I think the schedule is pretty tight, that they’re proposing. I think the pressure comes on when you get older pathologists about to retire. That’s when no other young pathologist could possibly afford to buy them out, but a big company can..... It was a matter of capital”* (Senior hospital-based pathologist, 1999).

This statement implies that a local expert valuation based on local knowledge and with reasonable expectations of a fair return on a partnership investment, was never going to be competitive with any bid from a large company.

*“I guess it [the SGS takeover of Auckland Diagnostics Laboratory] was driven by business.... It doesn't seem good for pathology throughout the country, to me. I don't have all the facts about it, but I can't see how it can help anybody but the Diagnostic pathologists. And even then, it's likely to be short-term”*

(Senior pathologist, privately-controlled laboratory, 1999).

Again, there are implications in this statement that local pathologists have been ‘bought off’, that they are at a disadvantage both economically and politically to the big investor.

*“I can't say that I think there are really many advantages at all to be got from that trend [towards overseas company acquisitions]. But it does seem to be one which is pretty hard to resist on account of the money that's being brought in from overseas firms - in particular SGS, which has really sunk a fair bit of money into New Zealand to get its market share. Although it's going through some rationalisation at the moment, I can't see them making a reversal of the situation.”*

It seems likely that SGS at the time of its heavy investment was very confident of government support for privately provided and funded health services. (Note: further ownership changes were to come, however. These are documented in Chapters 8 and 10.)

There is an obvious parallel between the shift from small, local pathologist-owned laboratories to large for-profit shareholder-owned laboratories, and similar shifts in the American health-care industry. It has been argued that where overseas investment facilitates economies of scale, it should result in greater cost-efficiencies. However, the need to comply with often-detailed host country regulations, and to return a profit to shareholders, offsets these economies,

leading to frequent changes of ownership, and pressure to cost-shift on to users (Keene, *ibid.*). The 1990's saw many laboratories in New Zealand change ownership: in some cases, several times. It is likely that in the New Zealand environment, overseas investment might simply have facilitated a shift to a more expensive laboratory service overall, though not necessarily one of improved quality and job potential compared with a fully state-funded alternative.

*"...I don't think the impact of the health reforms on people working out there on the bench has been noticeable ... except that there are less people out there to do the work ... less people to pay"* (Senior pathologist, 1999).

Underlying all the above reasons for the failure of government initiatives to curb laboratory costs through the 90's, is the rise in income inequality and relative poverty consequent upon New Zealand's economic restructuring (Kelsey and O'Brien, 1995). It has been suggested that while the recent growth in social and economic differences is not confined to this country '...it is the speed of change and the depth of inequality that sets us aside as an extreme case' (Pool, 1999, p61). The National Health Committee (1998) has documented this in their study of the social, cultural and economic determinants of health:

*"A number of studies have assessed trends in the distribution of individual income in New Zealand. The overall pattern is of reduced income inequality from 1951 to the mid 1980's with increasing income inequality in subsequent years"* (National Advisory Committee on Health and Disability, 1998, p25).

The Committee go on to point out that this increase in income inequality has been associated with reduced real disposable income for wage and salary earners at the bottom 20 percent of the income scale, and with marked increases in the levels of registered unemployed. An article *Inequality: for richer for poorer* (The Economist, 1994, Nov 5) dates the widening of the income inequality gap in Britain from 1977 – almost a decade earlier than that recorded for New Zealand. Shoen, et al. (2000) performed a comparative study of access to health care in five English-speaking countries. They found that user part-charges, along with

private health insurance involvement, posed an access barrier to those with the greatest health care needs. Their measured access indicator disparities were two to three times greater in the US, Australia and New Zealand compared with Britain and Canada, which have no part-charges for basic medical services. An international comparison of health system effectiveness devised by the World Health Organisation (2000) ranked New Zealand in 41<sup>st</sup> place – behind the US at 37<sup>th</sup> and Australia at 32<sup>nd</sup>, and well behind Britain at 18<sup>th</sup>.

Throughout the 1990's, New Zealand laboratory services saw increases in both costs and test throughput, despite temporary deceleration of the rates of increase following the introduction of IPA budget holding (Health Funding Authority, 1999, Ministry of Health, 1998). Increasing income disparities over the period could affect laboratory test throughputs in two ways: rising morbidity due to the inadequate diet and overcrowding typical of relative poverty (Howden-Chapman, 1999); and late presentation of symptomatic patients to the health system owing to the financial hurdle of part-charges in general practice. These effects are reflected in the following comment regarding Maori patients, a generally low-income group:

*“...Certainly they tend to present much later at our hospital than Europeans do ... later and more complex”* (Senior pathologist, 1999).

Pool (1999) suggests that New Zealand may have passed through more extreme fertility oscillations over the last 70 years than is true for other OECD countries: a phenomenon reinforced by migration flows. The economic restructuring of the late 80's ignored, however, 'the arrival at the labour market of the inflated birth cohorts born 1966-75, at the second peak of the baby boom' (Pool, 1999, p76). The resulting burden of unemployment fell disproportionately on the young of racial minorities, and on the rural population. One implication of this, is that whereas in Britain improvements in access to health care tended to be offset by increasing income disparity (Maynard and Bloor, 1996), in New Zealand, more

rapid and demographically uneven increases in income disparity might have proved an overwhelming influence on the economics of publicly funded health care. Thus, the fundamental reason for the failure of successive attempts to contain laboratory and other health-related expenditure might lie outside the health sector itself, and relate to the failure of successive government strategists to integrate the economic and social domains of policy.

### **1999 HFA laboratory service strategy as a signal**

A major influence on the final shape of the Health and Disability Services Act (often called the Health Reform Act) of 1993 was a report from major consultancy agency CS First Boston NZ Ltd (1991) prepared for the National Interim Provider Board. This report stressed the importance of actively promoting new entrants to health care provision, in order to achieve competition and avoid monopoly. In order to further this goal they recommended that:

- public, private and voluntary providers should receive equal treatment from health authorities
- there should be minimal regulatory impediments to new entrants
- opting into health care plans should be encouraged
- public sector health infrastructure should be contracted out to the private sector.

Although the 1993 Act was amended during the term of the 1997/98 coalition government, the legislative changes were:

*“...more of form than of substance with minimal impact on the post-1991 drive to convert the health system from a social service into a commodity producer based on a commercial transaction process”* (Powell, 2000, p 104).

In 1999, the HFA responded to the ever-increasing laboratory costs by revisiting its earlier market-mediated laboratory resource control strategy as detailed in Chapter 3 (Health Funding Authority, 1999). This time, however, more emphasis

seemed to be placed on regulation for ‘fairness’ to competing providers, and less on regulation for service quality. Advisory and educational aspects of the laboratory service were to be placed at arm’s length from government: the crucial educational function, in fact, to be managed by private contractors (Health Funding Authority, Request for Proposals for Best Practice Education, 1999).

On further analysis, a number of provisions and statements contained in the 1999 Laboratory services strategy documents seem to reassert the CS First Boston Report’s tenets for promoting market control of health resources. An overview of laboratory services strategy reveals the following pointers to a long-term administrative goal of health sector privatisation in New Zealand:

- A trend towards increasing regulation to maintain market conditions:
 

*“Of course the Commerce Commission seems to have managed to avoid coming down on the monopoly ownership of laboratories by re-defining the boundaries, and by basically considering the laboratory market to include hospital laboratories. And I think that’s worked to the advantage of big commercial firms because they were previously getting, I think, close to the limits that they were going to be allowed to own and operate without contravening the commission’s requirements when they came into competition”* (Senior pathologist, 1999).
- A climate increasingly favourable towards reduced public spending on laboratory services:
 

*“Laboratory tests are the only significant private based personal health service.....that are without cost to the patient. Given most tests are reasonably cheap, co-payments could significantly reduce the cost of labs, depending on co-payment levels for [low income, high-users and under-sixes]. ...\$24 million could be saved if 25 percent of the population paid up to a \$20 co-payment...”* (Health Funding Authority, 1999, Laboratory Services Strategy, p 19).

*“Dr Mathews said the association [of Community Laboratories] had put up a user-charges scheme only on the [Health] authority's prompting. He said the authority had stated that if the laboratories wanted a price rise – Auckland prices had been frozen since 1993 despite cost rises of 20 percent - they should devise a scheme with partial user charges. It did so but its preference was still the adequate funding of the current regime”* (Johnston, NZ Herald, 1999).

Although the thorny issue of part charging for laboratory tests was to be deferred until after the 1999 national election, the introduction of a targeted part-charging regime (like that introduced earlier in the decade for the general medical subsidy and pharmaceuticals) seemed very likely by late 1999.

- a trend towards the privatisation of service provision.

By 1998 laboratory contracts for Northland Base, North Shore, Taranaki Base, Palmerston North, Dunedin, and Invercargill Hospitals had been let to private companies.

*“I certainly didn't think the private companies would take over hospital laboratories - and at a time when hospitals laboratories were not allowed to do private work. There was this free market business that Jenny Shipley was preaching when she was Health Minister, but I mean it was all very much one-way”* (Senior pathologist, 1999).

- a trend towards laboratory consolidation, and investor-funded private service provision, with company shareholders increasingly off shore.

*“Their latest proposals involve moves which are designed to make access to the private market easy for hospital laboratories, by eventually cutting off specimen collection and transport, and contracting that out. So the hospital laboratories wouldn't have the set-up costs to enter that market, and then of course they could loss lead. They could simply come in and offer lower prices to*

*the health funding authority for testing, which they could afford to stand through the hospital budget, and put us out of business” (Senior pathologist, 1999).*

The same observations would also apply to large, overseas-owned financing companies. The proposed system seems to be designed to eliminate the smaller, private, pathologist-owned laboratories and all but the largest, most highly specialised hospital laboratories. Such an outcome would achieve system rationalisations with minimal government interference:

*“ ... viewing the hospital and private laboratories as all of one market might be convenient from the health funding authority (HFA)`s ideological viewpoint, but they`re very different in reality..... There are real dangers in setting up private against public in New Zealand in that way. But the HFA and the treasury people clearly don`t care about that, in fact I think they want it, and I think they are quite happy to see private laboratories get squeezed until some of them fall over” (Senior pathologist, 1999).*

The speculations above seem to be borne out by the following statement, which makes it clear that the Health Funding Authority (HFA) favoured further reductions in the numbers of providers, both public and private:

*“ Given our judgement of spare capacity in the primary referred [laboratory] market, tendering could lead to a significant reduction in the number of providers (both HHS and private laboratories) without adverse impact on access” (HFA, 1999, p 25).*

- a trend towards privatisation of the health administrative infrastructure, with professional influence on utilisation policy confined to generalists. This trend is nowhere more obvious than in the action of the HFA, in 1999, in putting laboratory usage guideline development, and referrer education, out to tender. In 1997, Cumming criticised the development of contracting, as a form of external quality control, on accountability-cost grounds:

*“There must be concern at the level of detail that is developing for use in contract arrangements. ...The costs and benefits of alternative mechanisms for promoting accountability and enhancing effectiveness and health outcomes must be considered before the approaches being taken to date become entrenched”* (Cumming, 1997, p36).

It would seem that minimising the costs of accountability, was a dominant guiding principle behind the 1999 laboratory-services strategy position. Hence, the HFA chose to establish an advisory body outside the Ministry, to tender for privately run referrer education, and to favour generalists, who might be expected to give ‘cheaper’ advice in the resulting structure.

- A trend towards the precipitate cementing-in of changes to the ‘point of no return’, with minimal consultation:

*“What worries us at the moment with this latest proposal for pathology, is that it looks almost as if they’re attempting to put in place changes that won’t be reversible, despite any change of government - that they’re trying to pre-empt a change of government”* (Senior pathologist, 1999).

Commentators on reforms to the British NHS have drawn attention to the difficulties of reversing changes that involve an ever-increasing number of vested interests (Keene, 1998). Even the change of government in Britain, in 1997, appears to have had little impact on the momentum towards private involvement in health:

*“Despite the rhetoric about abolition of the internal market, these main components remain in place under the new (British) Labour government and the fund-holding idea so vehemently attacked by Labour is now being generalised to all GPs”* (Enthoven, 2000, p3).

### **On examination**

The shift from central government towards more market-led control has been criticised (Easton, 1997, Pool, 1999) as being experimental, hastily implemented, and lacking in reference to possible social repercussions in the longer term.

In its dealings with laboratory services the 1996-99 National-led government in New Zealand demonstrated the essentially improvised nature of its pro-market strategies. Its first priority was to further reduce the size of government, and several interrelated approaches to achieving that end were pursued with some tenacity. Policy changes seen as 'U-turns': the abandonment of regional-level contract negotiations and of visible contestability, and the devolution of decision-making power to doctors, can be viewed from a longer-term perspective as being consistent with the more-market /less-government goal. If laboratory services are viewed as an indicator of the success of more-market, however, there are several reasons to judge the strategy as being untenable.

Firstly, there are obvious economic weaknesses in the 1999 attempt to revive the internal market. The relatively small size of the country makes the development of monopolies likely and the costs of regulation to counter their power in the market can readily become so high as to negate any cost-efficiency gains from market control. While some elements of the proposed laboratory services strategy, e.g. the longer interval between tendering rounds and the amalgamation of state funding agencies, would reduce the transaction costs of contracting, others would negate that gain, especially as they affect both purchaser and providers. Among these are: the duplicated tendering processes for separate specimen collection and 'test-clusters', the inclusion of public hospital laboratories plus their previously non-contestable, non-schedule tests in tendering rounds, and the separation of all prices into fixed and variable components. Bearing in mind the rapid pace of technological change in the clinical laboratory area, any cost-efficiency gains from the proposed market-led strategy would have

been heavily offset by the increased transaction costs of contracting, thus weakening the main 'benefit' from market-led control.

Disadvantages of market control, other than the economic, also arose in this study. A further 'cost' of regulating to avoid the development of monopolies seems to be instability of ownership of laboratories, as overseas investors, influenced by changing conditions in much larger economies, seek to optimise their profits. Quality of service would also appear to be at risk. The former central Laboratory Services Advisory Committee made up of laboratory professionals (supposedly prone to 'provider capture') became defunct when the RHAs were put in place in 1993. Transcripts from the official Inquiry into the misreporting of cervical smear tests by a Gisborne pathologist make it clear that Midland RHA through the mid-90s relied entirely on the contracting process to ensure external quality control, having no pathology expertise within the organisation country-wide. Contract monitoring was minimal (Mules, 2000). The overt limiting of pathologist participation in laboratory service advisory bodies in 1999, justified as avoiding economic conflict-of-interest was a major side effect of the revived contestable contracting.

A further systemic criticism arising during the Gisborne Cervical Smear Inquiry related to difficulties encountered by would-be programme evaluators, stemming from the market regulation and resulting fragmentation of the national cervical screening service. In combination with heavily restricted (for privacy reasons, Skegg, 2000) and costly (Van de Mark, 2000) research access to the relevant records, this fragmentation provided an accountability cloak for a plethora of privately-controlled laboratory service providers and, perhaps more importantly, for their contracting authorities (Skegg, 2000). Several laboratories, which had reported cervical-screening abnormality rates similar to those of the Gisborne laboratory under investigation, were able to avoid public identification during the Inquiry. The information was deemed to be personal under the Official

Information and Privacy Acts (Ministerial Inquiry, Gisborne, Transcript of Proceedings, May 3<sup>rd</sup>, p 928, 2000).

Neubauer and Pratt (1981), in a critique of standard 'medicalised' approaches to population health promotion in America, have drawn attention to the ease with which government regulatory attempts can be, and frequently are, subverted to serve the interests of both private concerns and secondary 'beneficiaries' of health programmes. Experience in this country with the cervical screening register and related records, provides an example of this subversion, in a system of devolved and fragmented responsibility approaching the extensively privatised American one. The market control exercise, through the contracting mechanism, effectively blurred government culpability for health system failures, as the Gisborne cervical smear Inquiry revealed. Lynch and Markusen (1994) note that this is, for politicians, one of the chief attractions of contracting out politically sensitive government functions.

As a final example of the potential for market-driven controls to attenuate lines of accountability, the only significant attempt by a New Zealand Health Authority to evaluate a budget-holding primary care organisation yielded inconclusive information because quantitative data were not made available by the Aetna-linked organisation concerned (Prime Health), presumably for reasons of commercial sensitivity. The evaluators concluded that the contracting arrangement 'effectively creates a purchaser in competition with the HFA' (Malcolm, Wright and Barnett 1999, p 51). In this context, it should be noted that the similar 'shield' of intellectual property rights enforcement often underpins the strength of trans-national corporations (W. Rosenberg, 1997). These features of a privatised health system in the New Zealand context could run contrary to freedom of information within health services, with negative effects on quality, accountability, equitable access and rational planning.

The market-led approach to control of resources for laboratory services introduced in the 1993 reforms, not only cut across co-operative initiatives already in place, but deflected policy analysts and funding from the difficult, time-consuming (and costly) challenges of governance that confronted this and other services at a time of increasing demand for state supported health care. As Trebilcock (1995, p 30) has pointed out, 'rethinking *how* governments might do their work better is not to be confused with rethinking *what* governments should be working at.' A government unable to accept expert advice for fear of 'conflict of interest' was clearly in no position to make innovative policy.

Lynch and Markusen (1994) critique the notion of the market as a substitute for governance. In particular, they reject the emphasis on 'customers', rather than 'citizens', which market transactions require, as attacking social cohesion on several levels. This study, lends weight to their analysis. Substituting a 'targeted' approach to general medical services (with its associated overtones of stigmatisation) for a universal subsidy, did not, as recent surveys show, lead to access improvements for New Zealanders (Shoen, et al., 2000, World Health Organisation, 2000). Furthermore, reducing responsibility for a national Health Service to a series of highly detailed contracts frustrated attempts at co-ordination within the laboratory disciplines – owing partly to the demands placed on resources by the contracting process and, more fundamentally, to the adversarial nature of competition itself. Finally, failure to plan and co-ordinate pathology services for optimal effectiveness would appear to have been echoed at a higher level in national strategic planning that failed to link interdependent aspects of health, social and economic policy: a failure that the 'funder /purchaser /provider split', as a device to effect an internal market in health, could only exacerbate.

### **In conclusion**

Experience with the relatively invisible laboratory services market-led control 'pilot' carries clear lessons for other publicly funded health services. When the

economic compromises involved in maintaining market resource control are considered, along with risks arising from externalities, the approach seems unlikely to produce an equitable, cost-efficient service in the current New Zealand health care environment. Adding substantially to the more-obviously-unfavourable aspects of this environment, are demographic dynamics favouring the widening income disparities and increasing burden of ill health that are associated typically with market ascendancy in the wider economy.

## ***Part Four: Tracking the Impacts of Change.***

### **Chapter 8: Monitoring policy change affecting community laboratories.**

This chapter examines available quantitative data on the utilisation of community laboratories in order to inform issues of cost-efficiency and access for laboratory testing in the primary health care sector.

The following section outlines all health policy changes of potential importance to community laboratories that were implemented throughout the 1990s.

#### **The changing community laboratory environment through the 1990's**

**Targeting the General Medical Services subsidy:** One of the first changes affecting health care following the newly elected (1990) National (conservative) government's first budget in 1991 was the targeting of what had previously been a universal General Medical Services (GMS) subsidy for general practitioner (GP) consultations (see chapter 2). An increased level of subsidy was provided for low-income patients. At the same time, all patients having personal incomes over a designated level that varied according to number of dependants (Gribben, 1996) would no longer receive a GMS subsidy. Eligibility for the subsidy was conferred by the possession of a plastic Community Services Card, issued by Income Support Services (later Work and Income NZ). As a consequence, about half of all New Zealand adults received no general practice subsidy in 2000 (Davis and Ashton, 2000). Thus, a change introduced to improve access to health

care for the most needy, at the same time, shifted a component of expenditure from state to patient, for the remainder. This was, therefore, one change that might be expected to impact on the utilisation of GPs and, hence, the clinical laboratories and other services for which GPs act as gatekeeper.

**Facilitating laboratory services provider competition:** One early policy initiative was the introduction of contestable tendering for primary sector service contracts from 1993 on. This ‘supply-side’ strategy was aimed at the mean price-per laboratory test, containing it, or driving it down, as rival laboratories strove to optimise cost-efficiency. The detailed early history of this strategy is discussed in Chapter 7 of this thesis. In mid-1999, the two large Auckland companies, MedLab and Diagnostics, amalgamated and were purchased by the large Australian-based company, Sonic Healthcare (HFA, 2000). This occurred in an environment where Auckland hospital laboratories were experiencing severe difficulty in meeting quality standards (New Zealand Herald, 2001). Thus, the amalgamation effectively produced a monopoly of the Auckland primary-referred laboratory testing market, negating anticipated supply-side benefits.

**Facilitating budget-holding by GP groups:** Throughout the second half of the 1990s, New Zealand’s Regional Health Authorities and their centralised health funding authority (HFA) successors developed contracts for independent practitioner associations (IPAs) that allowed them internal control of budgets for laboratory services (and pharmaceutical subsidies) with the aim of optimising the health benefits achieved for their patients overall.

The rate of uptake of budget-holding contracts varied between regions, but was most rapid in the North Health<sup>1</sup> region (Ministry of Health, 1997, 1998). Between June 1994 and June 1995 the proportion of the country’s GPs involved in IPAs had risen from (approximately) seven percent to 30 percent (Ministry of Health, 1997). By late 1998, the proportion had increased to more than 70 percent, and by

late 1999 was estimated at 'near' 80 percent (Malcolm, Wright and Barnett, 1999).

**Payment of the full GMS subsidy for children under six:** Besides the accelerating move to GP laboratory budget holding after mid-1994, a further policy initiative introduced during the time span monitored here was the free child health care scheme (FCHCS). This policy raised the subsidy for general practice consultations for all children aged under-six-years to a level calculated to completely cover the cost of most GP consultations. The universality of the scheme was intended to allow children of both low- and middle-income families to visit a GP free of charge, where previously they might not because of the direct part- or full-charge fee. The FCHCS was implemented in mid-1997 during the term of the National-New Zealand First coalition government. This policy, if it improved access to primary care for the under-six age group, might also be expected to result in increased laboratory referrals for the same age group and a possible change in test mix towards infectious agent identification.

Thus, throughout the 1990s, reforms to the health system attempted to simultaneously address problems of access (targeting, FCHCS) and cost-efficiency (GP budget-holding), while constraining test prices (competitive contracting). (Issues of quality were to be addressed primarily through the contracting mechanism and are examined in Chapter 6.)

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<sup>1</sup> For location of New Zealand Health Authority regions and cities mentioned, refer Appendix 3.

## **A: Trends in costs and utilisation – analysis of Health Benefits**

### **Limited databases.**

#### **Introduction**

This section of the chapter assesses the success of the 1990s primary sector health reforms in constraining both public expenditure on community laboratory services and the demand for laboratory testing.

#### **Test volume and expenditure trends in the lead-up to the 1990s reforms:**

These are summarised in Chapter 3 of this thesis. The 1980s had seen striking developments (Burtis, 1996) in the sophistication, test range and capacity of automated analysers in clinical laboratories, and in the establishment of computerised systems for tracking and reporting results. New Zealand had not, however, experienced the laboratory amalgamations and consequent job losses experienced elsewhere, particularly in the US. Such ‘rationalisations’ probably represented the only real opportunity for economies remaining, once automation and computerisation had been fully exploited.

**Test volume and expenditure trends from mid-1993:** After the health reforms were implemented in 1993 and up to mid-1997, broad trends in community laboratory volumes and expenditures were monitored in the four annual Ministry of Health reports: ‘Purchasing for your Health’ (1995, 1996, 1997, 1998) and, for expenditures only, in the Ministry’s major health expenditure report (2000a). However, for the purpose of evaluating responses to policy, more detail was desirable.

This study and analysis follows trends in community laboratory test volumes and expenditure by year and test grouping from 1993 /1994 to 1999 /2000 and (for the Midland region from July1996) by laboratory and by month. Annual test

volumes and expenditures for the North Health region for 1995/96 and 1996/97 were extrapolated from the nine-month period data obtained. The full annual health-year for which the percentage of budget holding GPs first exceeded 50 percent (Ministry of Health, 1996, 1997 and 1998) was taken as the first year 'post-budget holding'. This was 1996/97 for the North Health and Central regions, and 1997/98 for the Midland and Southern regions and for New Zealand as a whole. Post budget-holding data omit the post-June 1997 contribution from the Pegasus IPA in the Southern region. The implications of this are discussed in the following sections.

### **Analysis**

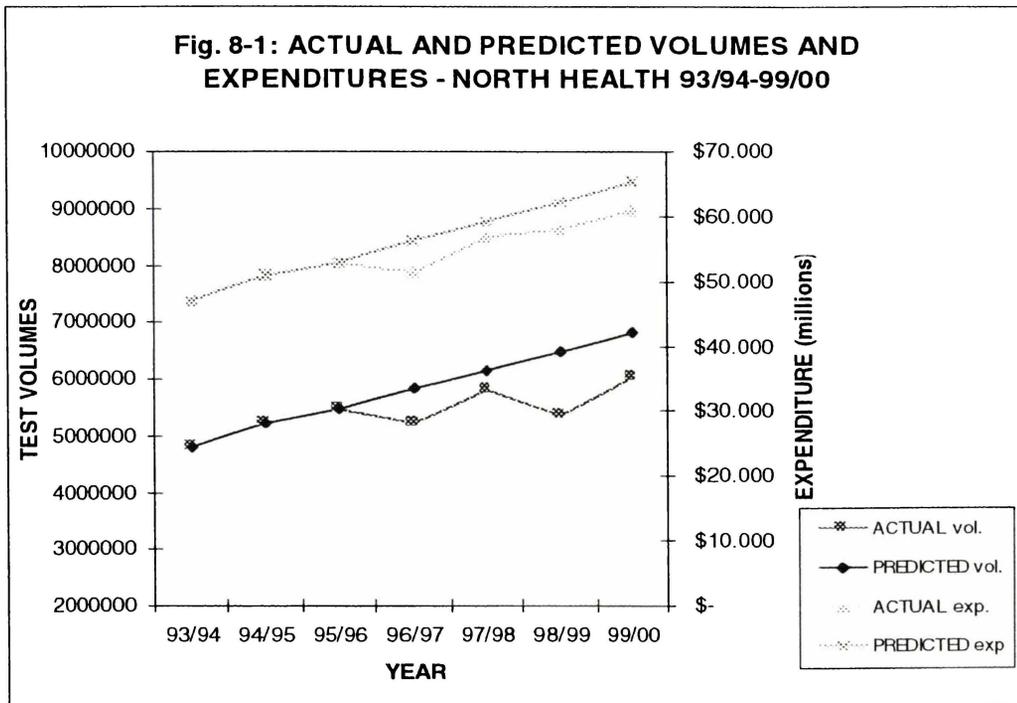
**Trends in volume:** Although test volumes increased overall throughout the period monitored (at a rate of approx. 516,000 additional tests per annum), rates of increase varied by Health Authority region. The North Health region, with a total test volume of 5-6,000,000/annum, did approximately twice as many laboratory tests as each of the remaining three regions. In Table 8-1 year-on-year test volume **changes (percent)** for all four health authority regions and for New Zealand as a whole have been averaged for the pre- and the post- '50 percent GP budget-holding' periods.  $R^2$  values indicate conformity of the data to a straight line over the relevant time period.

**Table 8-1: Year-on-Year % growth in volume pre- and post-budget holding**

	93/94 Volumes	Mean pre- variability	$R^2$	n	99/00 Volumes	Mean post- variability	$R^2$	n	Percent change, mean post- minus mean pre-
<b>Northern</b>	4,793,840	<b>6.72%</b>	0.978	3	6,020,605	<b>2.88%</b>	0.154	4	<b>-3.84%</b>
<b>Midland</b>	2,421,480	<b>4.96%</b>	0.803	4	3,183,311	<b>4.49%</b>	0.945	3	<b>-0.47%</b>
<b>Central</b>	2,520,582	<b>6.14%</b>	0.998	3	3,605,677	<b>6.20%</b>	0.983	4	<b>0.06%</b>
<b>Southern</b>	2,257,521	<b>8.52%</b>	0.921	4	2,647,005	<b>6.27%</b>	0.954	3*	<b>-2.25%</b>
<b>TOTAL</b>	11,993,423	<b>4.77%</b>	0.981	4	15,456,598	<b>4.52%</b>	0.789	3*	<b>-0.26%</b>

\*first post-budget holding % change omitted to correct for loss of Pegasus data

The rate of test volume growth post-budget holding decreased noticeably in the North Health<sup>2</sup> and Southern regions (and, to a much lesser extent, in the country as a whole). Figure 8-1 below illustrates North Health’s departure from its pre-budget-holding volume (and expenditure) trend-lines (as predicted by least-squares linear regression):



The slowing of volume growth in the North Health region (relative to that predicted from the pre-budget holding trend) is shown in Figure 8-2 below, in relation to the region’s increasing percentage of GPs involved in budget-holding contracts. (The line of best fit correlating North Health budget-holding GP numbers with actual test volumes was a third order polynomial, with  $R^2 = 0.9945$ .)

<sup>2</sup> North Health volumes decreased significantly ( $p < 0.001$ ) between 1993/4 and 1996/7 as a proportion of the total volumes for the Midland plus Central Regions. (The Southern region was not included in this calculation owing to the loss of Pegasus data.)

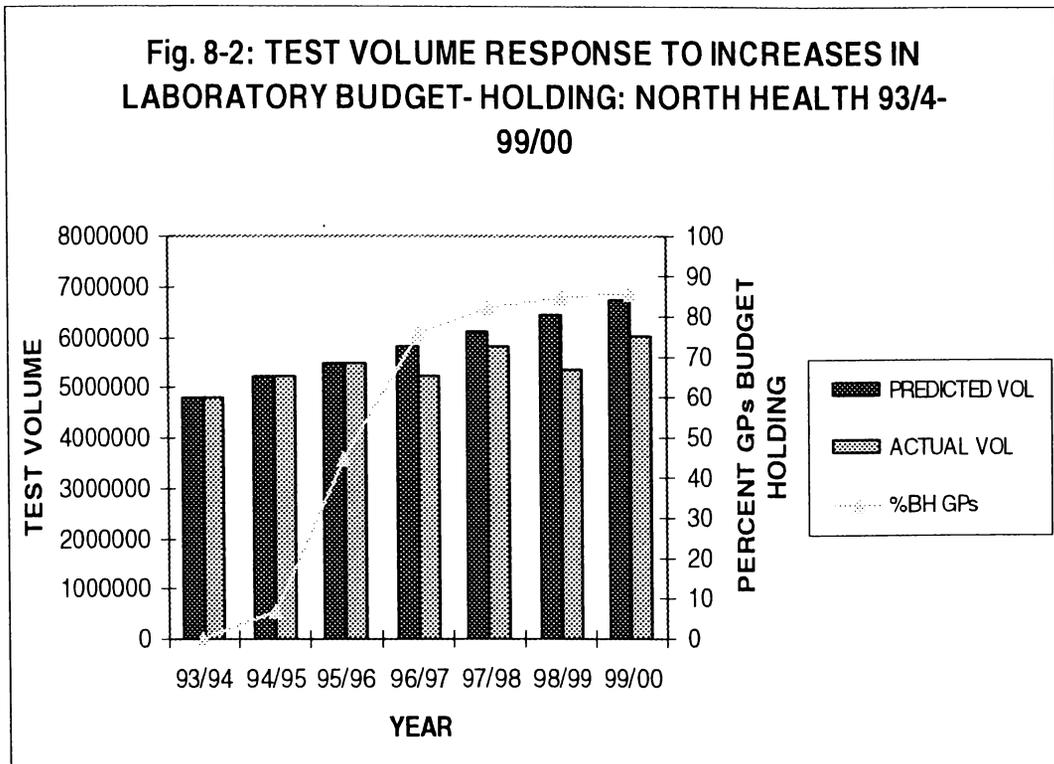
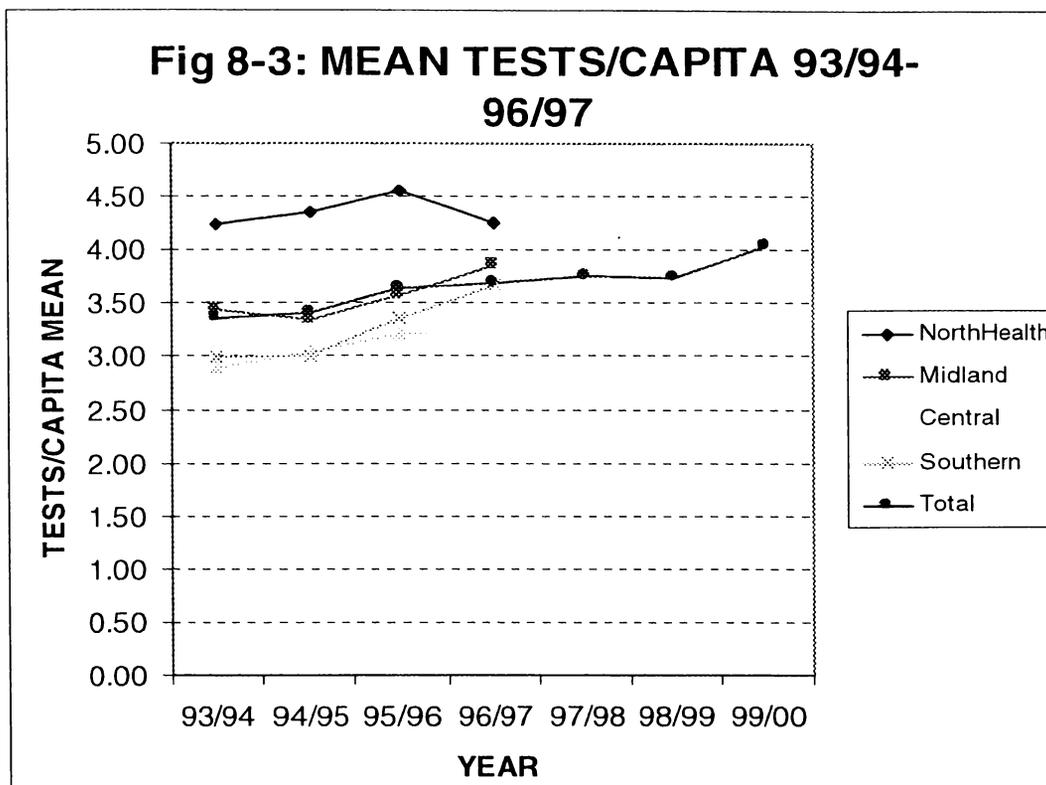


Table 8-1 showed that Midland also experienced a small reduction in the rate of volume growth, post budget holding. Test volume growth throughout the decade was most rapid in the Central and Southern regions. For New Zealand as a whole, the average rate of increase in test volumes throughout the mid-93 to mid-00 time span, year-on-year was 4.66 percent (omitting the 97/98 percent change to account for loss of Pegasus data from mid-1997). From data given by Bedford and Goodwin (1997) it can be calculated that between 1991 and 1996 the annualised percent growth in the New Zealand population was 1.45 percent, i.e. less than a third the rate of test growth.

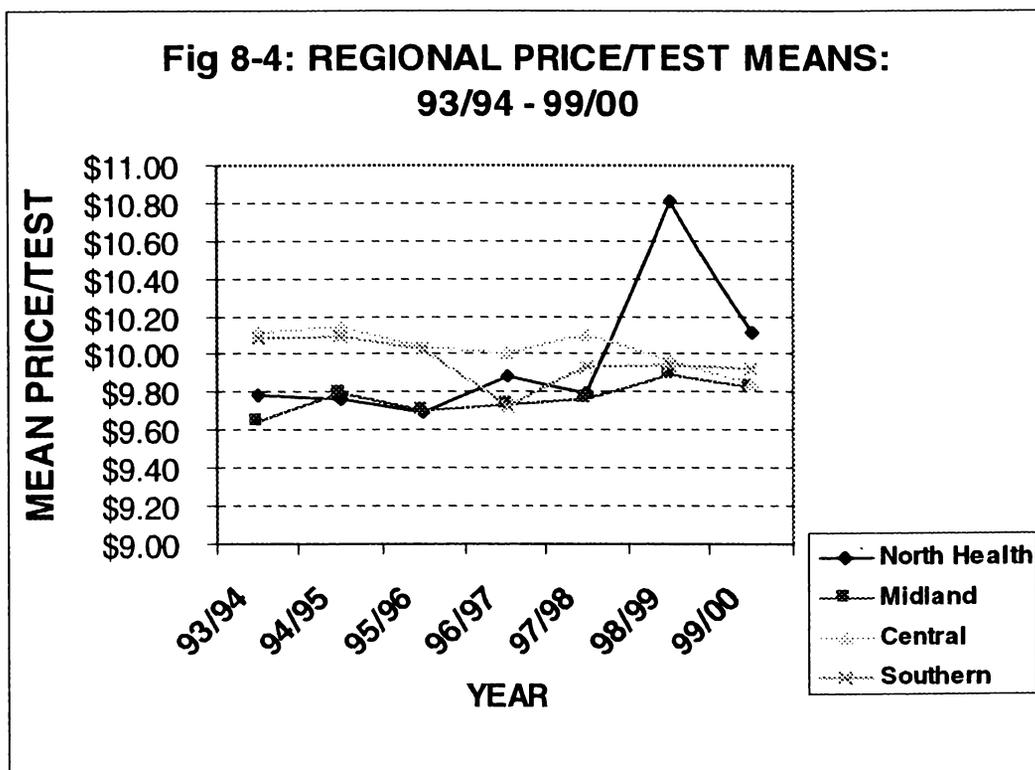
Figure 8-3 (below) shows the mean number of tests per capita per annum over the years following the 1993 reforms:



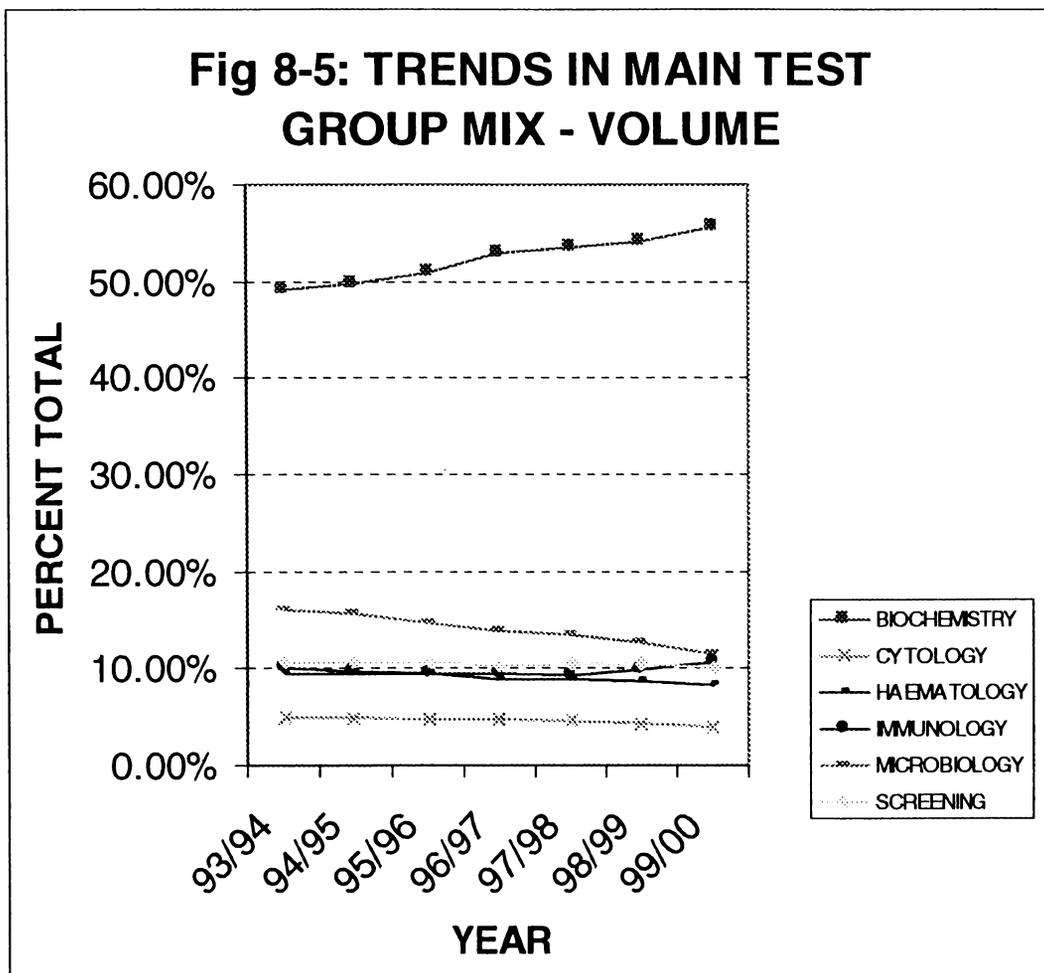
Individual regional population projections are those used by the Ministry (Ministry of Health, 1995, 1996, 1997, 1998) and represent the ‘usually resident’ population (Ministry of Health, 2000a). The mean number of tests per capita increased overall, with the separate regions showing some convergence towards the relatively high North Health level of 4.26 tests per capita by 1996/97. Population projections for New Zealand’s ‘resident’ population (which is larger than the ‘usually resident’ population) up to the 1998/99-year can be derived from data presented in the Ministry of Health’s Expenditure Trends report (MoH, 2000a, p11). These have been used (and extrapolated one further year to obtain a 1999/2000 estimate) in calculating the ‘total’ mean tests per capita for New Zealand in Figure 8-3 above. Although the ‘total’ mean tests per capita appeared to be stabilising by the 96/97 year (at approx. 3.75), increased test volumes for 1999/2000, particularly in the North Health region, indicate a resurgence to more than 4.0 tests per capita in that year.

**Trends in expenditure:** Regional total expenditures on primary referred tests increased throughout the period monitored in close parallel with volumes (see Figure 8-1, for example). However, regions other than North Health experienced much less volume/expenditure volatility in the 'post-budget-holding' years.

Regional mean price per test data (see Figure 8-4) show a convergence towards the narrow band of \$9.82-\$9.92 over the seven years monitored. North Health was an outlier for the last two financial years, however, as its mean price rose initially to \$10.81(1998/99) as a result of individual test price increases, particularly in the cytology grouping (which had increases of nine to 16 percent). The North Health mean price-per-test then fell back to \$10.11 in 1999/2000. Reasons for this volatility are discussed later in the chapter. The overall national trend was upward, but at a rate of slightly less than one cent (\$0.0086) per test per year, but this movement was heavily influenced by the increases negotiated for North Health laboratories in 1998/99.



**Trends in test mix:** Of the six major test groupings, the biochemistry grouping increased in volume from 49.1 percent to 55.6 percent of total test volumes over the 7-year period. Absolute numbers of tests performed in the biochemistry grouping increased by 30.9 percent over the seven-year period. Volume increases for cytology/histology were 5.1 percent, haematology 9.8 percent, immunology 16.0 percent and screening tests 17.3 percent. Numbers of tests performed in the microbiology grouping, however, diminished by 6.3 percent. Overall, test volumes increased 28.9 percent over the period mid-1993 to mid-2000.



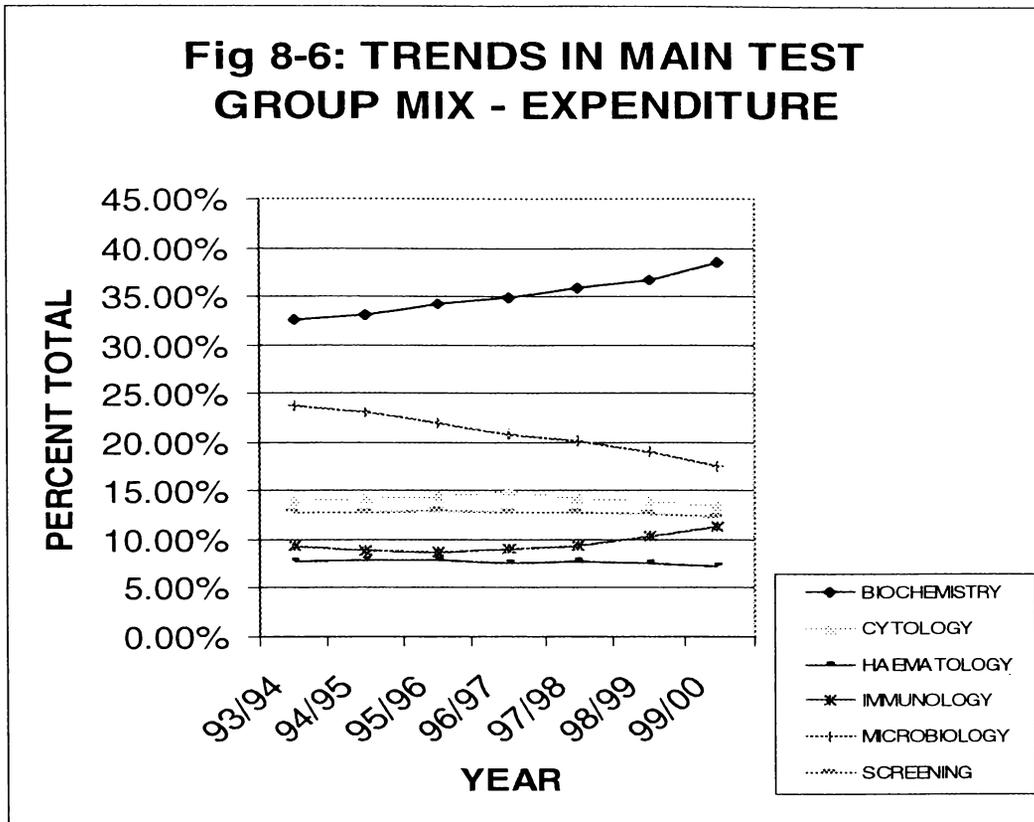
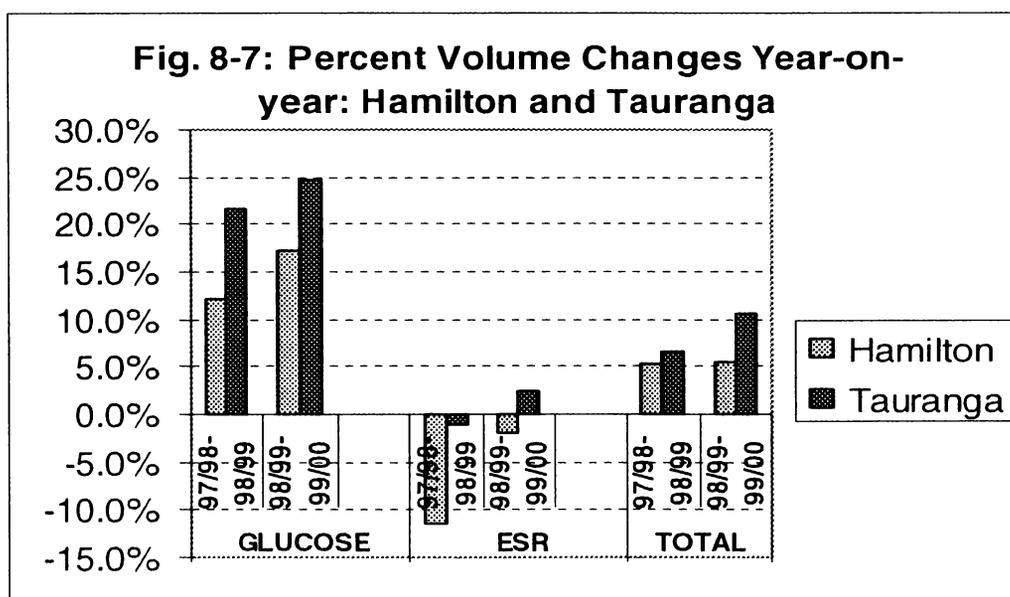


Figure 8-6 shows that expenditures on the major test groupings followed trends similar to those seen for volume. However the relatively low prices of tests in the biochemistry grouping (which are largely automated), and high average prices of the more labour intensive microbiology, cytology, histology and some haematology procedures, meant that contributions from each grouping to the total expenditure were less divergent than their corresponding volume contributions.

On examination of the national volume and expenditure trend data, it can be estimated that most (at least 92 percent) of the annual average increase in laboratory expenditure of approx. \$5.595 million is accounted for by the underlying test volume increases (approx. 516000 per year). The small upward drift in mean price-per-test recorded in Figure 8-6, which is the net of shifts in test mix as well as movements in individual test prices, accounts for the remainder.

**Detailed sub-regional trends:** In the Midland sub-regional data analysis, laboratory location was used as a proxy for patient and practice location. (Linkages to practice data, though possible, were laborious for HBL to perform at the time these data extractions were made). Because the Western Bay of Plenty has had a high proportion of IPAs in risk-holding contract arrangements throughout the three years for which sub-regional data are available, rates of test volume changes were compared for the Tauranga and combined Hamilton laboratories. (I hypothesised that risk-holding practices would show greater restraint in test ordering than non-risk holding practices.)

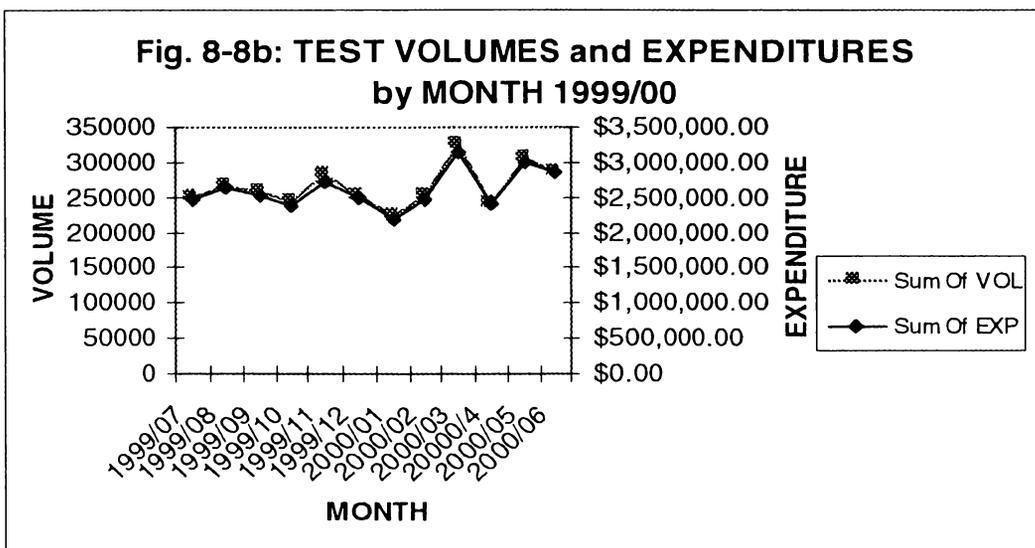
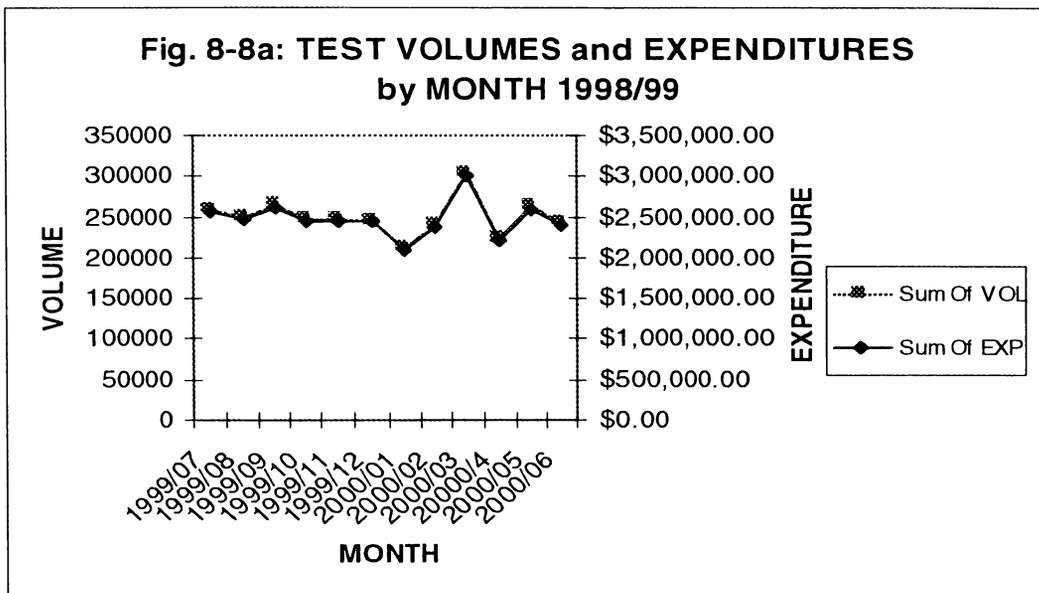
Figure 8-7 illustrates rates of test volume change for the two locations, Hamilton and Tauranga, and for two indicator tests, glucose (biochemistry grouping, \$2.22/test), ESR (haematology grouping, \$7.20/test), as well as for the total test throughputs. Rates of increase were in fact higher (or of decrease lower) for the Tauranga location on both indicator tests.



Population growth rates in Greater Hamilton (including Cambridge and Te Awamutu), and in Tauranga, between the 1991 and the 1996 census can be derived from data given in Bedford and Goodwin (1997). Annualised, these are:

Greater Hamilton, 1.64 percent per annum and Tauranga, 3.41 percent per annum (c.f. New Zealand population growth 1.45; test volume growth 4.66 per annum).

Figures 8-8a and b show seasonal variation in total test volume (by month) for the whole Midland region over the 1998/99 and 1999/00 years. The pattern is similar both years (trough in January, peak in March) for both total test volumes and expenditures. The reproducibility of this pattern lent validity to the repeated 'first quarter only' sampling technique that was employed later in the Hamilton laboratories' 'pick-up' rate studies (see Chapter 9).



## **Discussion**

**Trends in volume:** Test volumes increased throughout the period monitored and, overall, increased more rapidly than population growth (see Figure 8-3). The average rate of increase in test volumes was nevertheless lower than that seen in the 1981-1992 period, and some reduction of the average rate occurred after budget holding became prevalent, particularly in the North Health and Southern regions (which had previously had very high average rates of volume growth). This slowing was, in each case, associated with (though not necessarily caused by) the increasing involvement of GP's in laboratory budget-holding contracts.

It is also possible, however, that the proliferation and more aggressive marketing of laboratory services that accompanied the lead-up to, and introduction of, contestable tendering for primary-referred testing contracts in the early 90's (see Chapter 3), inflated total test throughputs at that time, exaggerating subsequent changes from demand control strategies.

Interestingly, comparisons between Greater Hamilton and Tauranga failed to reveal stronger test volume constraints where GPs were involved in predominantly risk-holding contracts. The relatively high rates of test volume increase seen in Tauranga might reflect its very high population growth (more than twice that of Greater Hamilton) and the fact that much of its population is 'high risk': aged over 60. However, the finding is a reminder that savings made in one area (e.g. pharmaceuticals) may be used in another (e.g. laboratory testing) in any budget holding practice. It might simply mirror variations in what is common local practice.

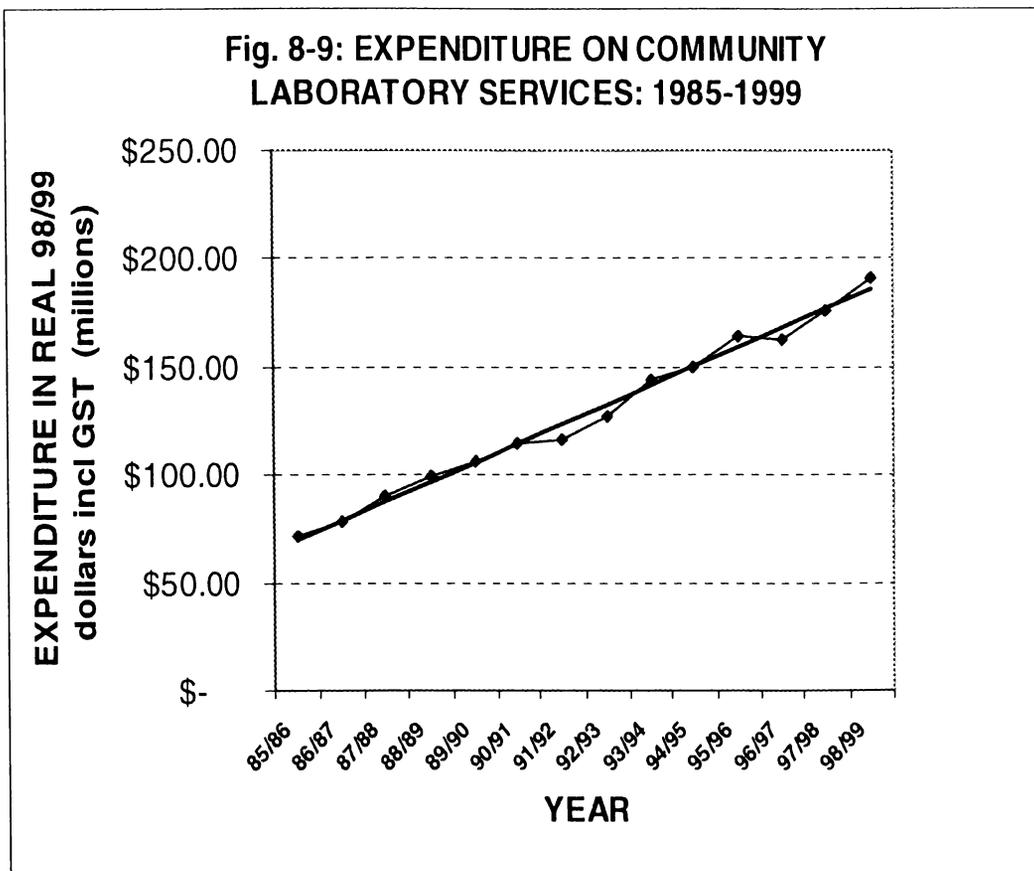
**Trends in expenditure:** The fostering of competition for state contracts throughout the period monitored was designed to drive price reductions, or at least price containment, in the primary-referred testing sector. However, for most of the period monitored, prices remained stable, as is illustrated by close parallels

between volume and expenditure data. Over the last three years monitored, imported laboratory material and instrumentation costs increased owing to deteriorating New Zealand dollar exchange rates. Wage, salary and (especially in Auckland) rental increases would also have inflated laboratory costs over the whole period. The convergence of the four regional means for price-per-test up to the 1998/99 year, however, suggests that very little price competition occurred throughout most of the period. Price containment might have resulted from economies of scale and from technological advances that continued through the nineties: e.g. more sophisticated laboratory information systems, refinements of analysers, and the adoption of automated systems for hormonal, immune system and genetic markers, formerly performed manually.

Support for the theory that scale- and technology-driven economies rather than market discipline contained price increases throughout the period monitored is provided by the changes observed in test group mix. A 31 percent volume increase occurred in biochemistry, almost all of which was automated by the 1990s. The shift from traditional microbiological culture techniques into immuno-diagnostics (also largely automated by the mid-1990s) would have saved further labour costs. In effect, it appears that automated tests increasingly cross-subsidised the more manual, labour and skill-intensive procedures, and the fee-for-test method of state remuneration increasingly obscured the real cost structure of community laboratory testing throughout most of the decade.

The Ministry of Health (2000a) has published data on the trends in total state expenditure on community laboratories in real 1998/99 dollars (inclusive of GST) for the period 1985/86–1998/9, and this has been graphed in Figure 8-9 below, together with the linear (least squares) trend line. Two periods of reduced expenditure growth appear in the graph, both of which coincide with policy changes discussed in this chapter: the introduction of GMS targeting in 1991, and the achievement of the 50 percent budget-holding GP threshold, nationally, by the end of the 1996/97 year. The first expenditure slowdown is explicable as an

outcome of the 15 percent falloff in GP-patient encounter rate in 1991/92 noted by Davis, Gribben, Lay Yee and McAvoy (1994) with the introduction of GMS targeting. The second also appears to have been volume-driven, from evidence presented in this chapter. Both periods were followed by 'catch-up' years involving test price increases (Malcolm, 1993, and Figure 8-4).



In 1998/99, the mean price-per-test in the North Health region rose by 10.3 percent (and test volumes fell – see Figure 8-1). The HFA, as part of its demand control strategy, required current test prices to be printed on the laboratory referral forms supplied to GPs, and this might explain the falloff in test volumes in North Health in 1998/99. As mentioned earlier, patients might have assumed the price was a user charge, and failed to attend for testing. Administrative amalgamation of the two large Auckland laboratories in mid-1999 was followed

by a 6.5 percent mean price-per-test decrease in the region (and corresponding test volume increases), suggesting that the local monopoly achieved had enabled efficiency improvements. There is no evidence, however, that market discipline was a factor in the region's price movements, or in the country as a whole: indeed, a monopoly 'less-market' was now in place.

## **B: Trends in General Practitioner Laboratory Referral Patterns – analysis of RNZCGP Research Unit databases.**

### **Introduction**

**Measures of GP laboratory utilisation:** Several measures of community laboratory utilisation have been monitored over the past three decades. The ‘mean number of laboratory tests per capita’ was considered in the previous section (see Figure 8-3). Although this measure fell in the North Health region between 1995/96 and 1996/97, it appears to have been increasing overall through the 90’s from a national mean of 3.35 tests per capita in 1993/94, to 3.74 tests per capita in 1998/99 (i.e. rates of test volume increase were exceeding population growth rates). Ironically, more than thirty years earlier in 1967/68, the mean number of tests/capita/annum, New Zealand-wide, was 3.84 (Stewart, 1997) i.e. there had been a slight decline over the 26 years prior to the 1993 market efficiency health reforms. This, however, might reflect test definition changes over time (see Chapter 10). The data does not support the burgeoning ‘out-of-control’ public health service discourse of the pro-market policy makers of the 1990s.

The measure: ‘GP consultations per capita’ must be estimated, unless investigators are working from primary data, as some consultations involve no subsidy reimbursements, so are not recorded by HBL (Ministry of Health, 1997). However, two detailed cross-sectional surveys undertaken, twelve years apart, in the Waikato: the ‘CoMedCa’ in 1979-80, and the ‘WaiMedCa’ in 1991-92, showed ‘GP consultations per capita’ to have increased from 3.5 to 4.0 (Davis, Lay-Yee, Finn and Gribben, 1998 a). This increase was attributed to the 50 percent increase in the number of GPs between the two surveys, i.e. to increased availability of GPs.

Data obtained by the Medical Council (NZHIS, 1999) indicated that over the period 1991-97 the number of GPs practising in New Zealand increased by 22.3

percent (an annualised increase of 3.72 percent per annum, i.e. slightly less than the average annual increase in test volumes of 4.66 percent seen in the previous section, but still more than double the rate of population increase). Many of these new GPs would be recently trained and/or overseas trained<sup>3</sup> and might therefore show laboratory referral patterns differing from those of older and/or New Zealand-trained doctors.

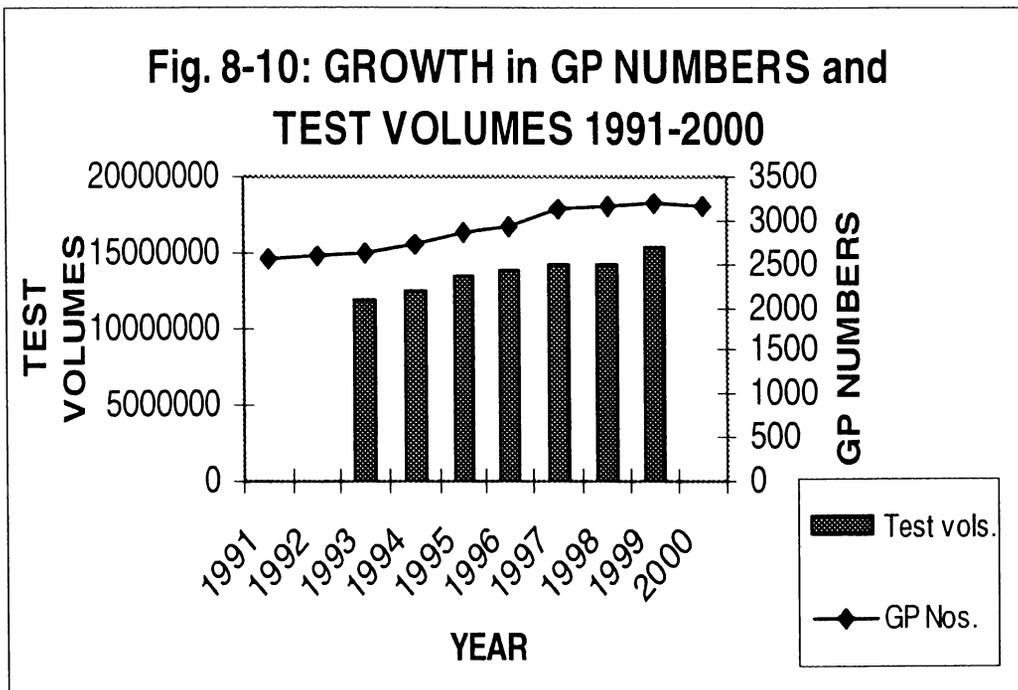


Figure 8-10 shows the growth in GP numbers and test volumes nationally. (The line of best fit between GP numbers and test volumes was a third order polynomial,  $R^2 = 0.9945$ .) As can be seen from this graph, total GP numbers plateau out from 1997. The health-year 1997/98 saw a reduction in test volume growth, suggesting that GP workforce growth could be a factor associated with test volume changes, in addition to GP involvement in laboratory budget holding.

<sup>3</sup> The proportion of doctors working in New Zealand who initially qualified from overseas universities was 33.7 percent in 1998 (<http://www.nzhis.govt.nz/publications/medprac.html>)

Ministry of Health (1998) estimates of the number of GP consultations per capita indicate an increase from the 4.0 measured in the Waikato in 1991-92, to 4.2 GP consultations per capita, by 1996/97 (an annualised increase of 1 percent). Absolute numbers of **subsidised** GP consultations had increased steadily over the 4-year period, especially in the Central and Southern regions, but the figure of 4.2 for total consultations per capita is an estimate only.

A third measure: mean number of tests ordered per laboratory referral, was also monitored by the Ministry through the middle years of the decade. This remained fairly constant at about 3.1 tests per referral until 1996/97 when it fell slightly to 2.9 overall, owing to larger falls in the Northern and Central regions (Ministry of Health, 1998), where GP budget holding was becoming prevalent at that time. (The remaining two regions were slower to adopt the strategy). Continuing growth in test volumes throughout the late 1990's, ahead of population growth, however, suggest that this restraint was not maintained. It is also important to note that changes in the 'fine tuning' of laboratory diagnosis mean that several tests might increasingly be ordered where, once, only one had been available.

Several estimates of the 'proportion of GP encounters utilising laboratory tests or referrals' have been published since the late 60's. Although very wide between-GP variation (0 - 49 percent) was reported in one study (Davis and Lay Yee, 1990), efforts have been made more recently, in association with the introduction of GP budget holding, to reduce between-GP variation in laboratory referrals (Kerr et al., 1996). Mean estimates made over three decades have certainly been much less variable. Stewart (1997) reported that in 1967/68 one patient in 6.2 seen in general practice was referred to a laboratory (16.1 percent). Tilyard, Dovey and Spears (1995) obtained 11.2 percent for consultations in 1990 resulting in a laboratory investigation. The 'WaiMedCa' study in the Waikato in 1991/92 showed 13.2 percent of general practice encounters included pathology tests orders (McAvoy, Davis, Raymont and Gribben, 1994). The estimates of 'encounters utilising laboratory tests' in the study reported here employ a

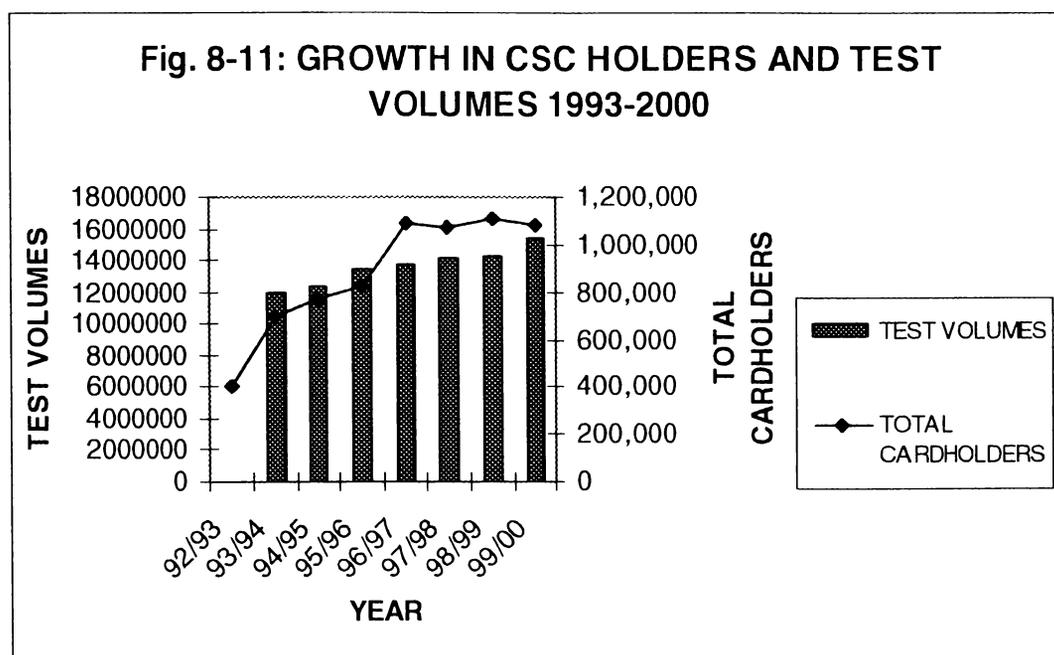
standardised approach and cover a relatively short (four year) time-span (1995/96-98/99). They are used as one measure of the impact of government policy initiatives on GP laboratory referral patterns during this time-span. It is emphasised that factors additional to reform-related changes would also have influenced community laboratory test volumes over the same period, especially population growth, demographics, economic factors, numbers of GPs in practice, and factors improving test availability and diagnostic 'fine-tuning'.

**Social group trends reflected in laboratory utilisation.** Davis, Lay-Yee, Finn and Gribben (1998 b) analysed data from their two Waikato surveys (in 1979-80 and 1991-92) for social group variations in service use and clinical activity. They found a trend towards higher relative rates of medical contact among socially disadvantaged groups (as suggested by ethnicity and/or income) associated with the increase in primary medical care availability. The authors caution that an alternative explanation for the findings might lie with a possible deterioration in health status through the 1980s, differentially affecting the socially disadvantaged. However, there were no discernible social group trends between (or within) surveys for clinical activity, such as laboratory investigations, which continued to be ordered at a similar rate between groups.

The steady increase in numbers of subsidised GP consultations between 1993/94 and 1996/97 reported by the Ministry of Health (1998) could have been augmented by an increase in Community Service Card (CSC) holders qualifying income levels on 1<sup>st</sup> July 1996. Figure 8-11 illustrates the growth in CSC holders alongside growth in test volumes. (Numbers of CSC holders at February – just over midway through the 'health' year - were supplied by the Department of Work and Income.)

The line of best fit correlating total CSC holder numbers with test volumes nationally was a third order polynomial, with  $R^2 = 0.8978$ . Thus, a further factor associated directly with test volumes would appear to be CSC-holder numbers. It

should be remembered that a CSC holder may also use the card for dependants, so that numbers of patients covered by the card could be considerably higher than those indicated in Figure 8-10 as cardholders. It should also be pointed out that not all low-income CSC holders are asset poor (e.g. some pensioners), and others (e.g. some tertiary students) might have access to a relatively high standard of living. There is also evidence that up to 33 percent of New Zealanders entitled to the CSC either do not obtain or do not use it (Crampton, 2001, Gribben, 1996).



**This study:** This study examines the impact on GP laboratory referral patterns, of GMS targeting and the additional policy changes introduced during the 4-year-period from mid-1995 to mid-1999: (a) the Free Child Health Care Scheme (FCHCS) introduced in mid-1997; and (b) general practitioner budget holding, introduced more gradually: 5 percent in mid-1995 to 'near 80 percent' by 1999 (Malcolm, Wright and Barnett, 1999, Ministry of Health, 1997). Data was extracted from the RNZCGP Research Unit databases in Dunedin and analysed, as described in Chapter 5.

## **Results and Discussion**

Table 8-2 presents three populations analysed with respect to gender, income group (as determined by CSC status), GMS subsidy status, and frequency of service need as assessed by High User (HU) Card status. These three populations are: (a) total patients registered with the six practices, (b) total patient encounters and (c) total patient encounters utilising laboratory tests. The 'social group' analyses are given for each of three years: 1995/96, 1997/98 and 1998/99. Percentages are given as well as total counts. Because a particular 'social group' classification was not available for every patient, percentages do not always add up to 100 percent. The GMS subsidy status was almost always known, however, so the encounter rate (encounters per registered patient) calculations were based on this grouping.

**Trends in GP referral rates:** The percentage of general practice encounters utilising laboratory tests in the 'baseline' (1995/6) sample, was **12.4 percent**. This figure is consistent with the 11.35 percent found by Tilyard, Dovey and Spears (1995), who analysed a randomly selected, regionally stratified sample collected in 1990, and also close to the 13.2 percent found in the 'WaiMedCa' study in 1991/92 (McAvoy, Davis, Raymont and Gribben, 1994).

(In the 1990 sample, 8612 consultations were analysed and in 1991/2 a 12,833-encounter sample was analysed: both much less than the over 210,000 patient encounters per year analysed in this study.)

Results for the 1995/96 year also suggest that - if this sample can be compared with the Waikato one - little or no change in the average patient laboratory-referral rate accompanied the GMS targeting regime over the 4-5 years from its inception in mid-1991. On the other hand, after laboratory 'budget holding' was phased in over the period mid 1994-mid 1998 rates of laboratory test volume increases slowed (especially in the Auckland region from 1996/97 on). By 1997/98 the percentage of general practice encounters utilising lab tests had fallen in the same six practices monitored in this study to **9.2 percent**, a fall

of 3.2 percentage points. However, the following year, 1998/99, had a major increase to **11.4 percent**: these year-on-year changes are all statistically significant.

Although the average patient laboratory referral rate appeared little changed by the GMS subsidy targeting regime, the patient encounter rate in 1995/96 (2.55 per registered patient) seems low, compared with the 4.0 visits a year per capita reported for 1991-92 at the start of the targeting regime (Davis, Lay-Yee, Finn and Gribben (1998 a), 3.46 visits a year per capita in 1993/94 (Gribben, 1996), and the Ministry of Health (1998) estimates (4.2 visits a year per capita) for 1996/97. One reason for this might lie in the increasing numbers of GP's in practice throughout the last decade, combined with patient mobility i.e. some patients might be registered with more than one practice. It is also possible, however, that unsubsidised patients might have been encountering their GP much less frequently than they were before the targeting regime was put in place, and the Ministry's (1998) estimates for 1996/97 were biased by expectations based on the known subsidised patient encounter rates.

**Table 8-2:** (a) Summary data on total patients registered (from 'details' table):

	GDR	GDR	GDR	IG	IG	IG	GMS	GMS	GMS	HU	HU	HU
	95/96	97/98	98/99	95/96	97/98	98/99	95/96	97/98	98/99	95/96	97/98	98/99
M/1/A/Y	50233	46898	51294	26105	27308	29410	66277	65387	71792	294	692	1434
F/3/J/N	50262	47092	51137	69985	60747	63824	18151	15614	16793	101085	96569	105420
P							11459	9998	10625			
Y							6858	6723	7304			
SUM	100495	93990	102431	96090	88055	93234	102745	97722	106514	101379	97261	106854
PERCNT	97.6%	95.9%	95.9%	93.4%	89.9%	87.3%	99.8%	99.7%	99.7%	98.5%	99.3%	100.0%
M/1/A/Y	50.0%	49.9%	50.1%	27.2%	31.0%**	31.5%**	64.5%	66.9%**	67.4%**	0.3%	0.7%**	1.3%**
F/3/J/N	50.0%	50.1%	49.9%	72.8%	69.0%**	68.5%**	17.7%	16.0%**	15.8%**	99.7%	99.3%**	98.7%**
P							11.2%	10.2%**	10.0%**			
Y							6.7%	6.9%	6.9%			

**(b) Summary data on total general practice encounters from encounters/details joined table:**

	GDR	GDR	GDR	IG	IG	IG	GMS	GMS	GMS	HU	HU	HU
	95/96	97/98	98/99	95/96	97/98	98/99	95/96	97/98	98/99	95/96	97/98	98/99
M/1/A/Y	101550	87678	84727	120689	121677	111367	150321	129565	123965	5105	4980	9360
F/3/J/N	158225	132710	125084	134355	96547	94265	31473	22705	21672	243681	212942	201503
P							54009	42353	39546			
Y							26031	28636	25580			
SUM	259775	220388	209811	255044	218224	205632	261834	223259	210763	248786	217922	210863
PERCNT	99.2%	98.7%	99.5%	97.4%	97.7%	97.5%	100.0%	100.0%	99.9%	95.0%	97.6%	100.0%
M/1/A/Y	39.1%	39.8%	40.4%**	47.3%	55.8%**	54.2%**	57.4%	58.0%	58.8%**	2.1%	2.3%**	4.4%**
F/3/J/N	60.9%	60.2%	59.6%**	52.7%	44.2%**	45.8%**	12.0%	10.2%**	10.3%**	97.9%	97.7%**	95.6%**
P							20.6%	19.0%**	18.8%**			
Y							9.9%	12.8%**	12.1%**			

**(c) Summary data all encounters utilising lab tests from lab encounters /details joined table:**

	GDR	GDR	GDR	IG	IG	IG	GMS	GMS	GMS	HU	HU	HU
	95/96	97/98	98/99	95/96	97/98	98/99	95/96	97/98	98/99	95/96	97/98	98/99
M/1/A/Y	10155	7097	8152	12408	10818	12311	21941	13891	16944	1001	457	1364
F/3/J/N	21981	13238	15684	18305	9290	11094	2168	1190	1197	30294	19406	22568
P							7087	4206	4786			
Y							1165	1231	1005			
SUM	32136	20334	23836	30712	20109	23405	32362	20519	23932	31295	19862	23932
PERCNT	99.3%	99.1%	99.6%	94.9%	98.0%	97.8%	100.0%	100.0%	100.0%	96.7%	96.8%	100.0%
M/1/A/Y	31.6%	34.9%**	34.2%**	40.4%	53.8%**	52.6%**	67.8%	67.7%	70.8%**	3.2%	2.3%**	5.7%**
F/3/J/N	68.4%	65.1%**	65.8%**	59.6%	46.2%**	47.4%**	6.7%	5.8%**	5.0%**	96.8%	97.7%**	94.3%**
P							21.9%	20.5%	20.0%**			
Y							3.6%	6.0%**	4.2%**			

\*\* significant change from 95/96 baseline ( $p < 0.001$  and confidence interval for the change does not include zero).

PERCNT: percent of total recording relevant information

Social groups: Gender M=male, F=female;

Income group 1 = Community Service Card holders, 3 = non CSC;

GMS subsidy level A = adult, J = age 5-16, P = pensioners, Y = age<5;

Y= High User Card holder, N=Non-High User.

**Factors that might influence test volumes:** Test volumes increased overall throughout the 1990's, independent of referral rates, a trend that, in addition to being common to most OECD countries (Price and Barnes, 1999), also seems predictable as a GP response to continuing technical improvements in laboratory diagnostic 'fine tuning', wider availability of tests, and timely (on-line) reporting of results. The drop in the percentage of GP laboratory referrals between 1995/96 and 1997/98 coincided with reduced rates of test volume increase nationally (see Part A). By mid-1997 the proportion of the country's GP's in budget holding contracts had exceeded the 50 percent point (Ministry of Health, 1998). Thus, one reason for the slowing of test volume increases might have been a falloff in the patient laboratory referral rate, as laboratory budget holding IPAs began to dominate the primary care system. This lower referral rate was not sustained for long, however, as the referral rate had increased again by 1998/99, and test volumes continued to increase nationally throughout the decade (albeit at a reduced rate, especially in the North Health and Southern regions which will be over-represented in this sample).

Between 1995/96 and 1997/98, the practices monitored saw a statistically significant reduction in the GP-patient encounter rate (from 2.55 to 2.28 per registered patient). This reduction in patient encounter rate would also have contributed to a slowing of test volume increase. If these practices did indeed continue to generate increasing test volumes over the time encompassed by the two samples, participating doctors must have been selecting patients more stringently for more extensive testing, i.e. the 'tests ordered per laboratory referral' index must have increased. The period between mid-1995 and mid-1997, however, also saw a rapid increase in GP numbers (see Figure 8-10) so that patients might have been shared between a larger number of GPs and practices, while still remaining on the original registers. The result would be a reduced patient encounter rate as measured in this study. (The same phenomenon is

unlikely to explain the marked income group differential in encounter rate falloff between 1995/96 and 1997/98, discussed later in this section, however.)

The composition of the registered patient populations from which the consultations were drawn changed only slightly throughout the period sampled, the most notable change being an increase in the proportion of Income group 1 (Community Service Card, CSC holders) from 27.2 percent in 1995/96 to 31.0 percent in 1997/98 and 31.5 percent in 1998/99. The threshold for CSC eligibility was raised in mid-1996, and 1997/98 saw a large jump in CSC holder numbers (see Figure 8-10). The proportion of High User Card (HUC) holders also increased significantly over this period, from 0.3 percent to 0.7 percent, and 1.3 percent, of the registered population.

One implication of Malcolm's (1993) analysis of trends in primary care-related services was the suggestion that increasingly excessive laboratory testing was a contributing factor in escalating costs throughout the 1980s. Malcolm (1993) analysed longitudinal trends in New Zealand primary medical care related services and expenditure over the decade 1982/3 to 1992/3. Expenditure growth in real terms had occurred over most of this period, and Malcolm's analysis attributes this primarily to increased utilisation of primary care support services (pharmaceuticals, laboratory and maternity services), rather than to increased general practitioner utilisation. However, Davis, Lay-Yee, Finn and Gribben (1998 a) suggest that increased utilisation of community laboratories through the 1980s was secondary to the increased availability of GPs. Despite these differing interpretations, all authors are agreed that the utilisation rate of primary care services in a given locality is a function of their availability (Malcolm, Wright and Barnett, 1999). Thus, factors that contribute to explaining increasing test volumes, in addition to more selectivity on the part of referring doctors, include population growth, the continuing establishment of new, additional general practices and the mobility of the patient population, as well as changing

economic circumstances, demographics and improvements in test availability and diagnostic 'fine tuning': all features of the 1990s in New Zealand.

**Trends in GP Laboratory Referral patterns:** By comparison with their representation in the registered patient population, females had a high encounter rate, and their encounters utilised lab tests even more than predicted from the encounter rate. This pattern was significantly less marked, however, in 97/98 and 98/99 compared with 95/96. The fall in female laboratory utilisation might reflect parallel changes in birth and fertility rates, which were lower in 1997/98 than in 1995/96, the 'tail-end' of a 'blip' in fertility that peaked in 1990 (Pool, 1999).

Income group 1 (IG 1, low income) was over-represented in the 'encountered' population, and their lab utilisation reflected this. The over-representation of IG 1 in 1997/98 and 1998/99 was even more marked than in 1995/96. By 1998/99, low income-group patients had reached approx. 54 and 53 percent of the encountered and tested populations (c.f. 31.5 percent of the registered population). This over-representation of low-income groups in general practice encounters has been noted before (Gribben, 1996, McAvoy, Davis, Raymont and Gribben, 1994; Ministry of Health, 1998). However, further analysis in this study reveals a statistically significant decline in the encounter rate for this group from 4.62 encounters per registered patient in 1995/96 to 4.46 encounters per registered patient in 1997/98, mirroring the declining overall encounter rate already noted.

GMS group A (adults aged 16 to 64) had fewer GP encounters than expected from their incidence in the registered population, but their encounters were more likely to involve laboratory tests than the encounter rate would predict, especially by 1998/99, when an increase in the proportion of GMS group A undergoing testing, reached statistical significance.

In all three years sampled, the GMS group J ('juniors' aged 5-15 years) GP encounter rate was low, and their encounters were even less likely to involve laboratory tests.

GMS group P (pensioners) continued to be encountered at almost twice the rate expected from their representation in the registered population, and this was reflected in their laboratory test utilisation.

GMS group Y (young children aged under 5 years) also continued, over the 4-year study period, to have GP encounters at almost twice the rate expected from their representation in the registered population, but their laboratory utilisation rates were relatively low. The FCHCS for under six-year-olds initiative was introduced in mid-1997, and statistically significant increases over the 1995/6 encounter-rate for the under-5-years GMS group were detectable by 1997/98 (3.80 to 4.26 encounters per registered patient under-5-years, a 12.1 percent increase). This increase was also reflected in the numbers and proportions undergoing testing, and appears, on the data available, to have been sustained for at least a further year. A national team of researchers was commissioned by the HFA in 1998 to evaluate the FCHCS. They measured an increase in the number of GP consultations by children under-6-years, of between 6 percent and 23 percent depending on data source; and a 4.9 percent increase in the number of laboratory tests performed on the same age-group (HFA, 1998): this despite falling numbers in the under-five age group cohort (Pool, 1999). The HFA commissioned group's comparison, however, was between 1996/97 and 1997/98 (two consecutive years). The increase in GP consultations was mainly by children whose families did **not** hold a CSC (HFA, 1998). A breakdown of children's family CSC status was unfortunately not done for the study reported here.

As others have reported for the year 1996/97 (Ministry of Health, 1998), GP-patient encounter and laboratory utilisation rates were more than 3 times higher for high user card (HUC) holders, compared with their representation in the

registered patient population throughout the study period. Small, but significant, increases over the 1995/96 levels were noted, reflecting similar increases for this group in the registered patient population.

**Possible influences on changing referral patterns:** In the 1991/92 and 1992/93 financial years, a marked decline in the GMS expenditure occurred (Malcolm, 1993). Although this was partly due to cost shifting with the introduction of targeting (requiring non-CSC-holders to pay the total consultation fee), it was also associated with a reported 15 percent decline in general practitioner utilisation at that time affecting all patient groups (Davis, Gribben, Lay Yee and McAvoy, 1994), suggesting that the targeting change, intended to compensate low income groups for their falling standard of living, was less than adequate for this purpose.

In the study reported here, a decline in patient encounter rate between 1995/96 and 1997/98 of 10.6 percent was measured, which affected non-CSC-holders (17.2 percent) much more than CSC holders (3.6 percent). While some of this might be an artefact caused by mobility of the patient population and the continuing expansion of general practice, results suggest that the practices monitored may be seeing reduced utilisation by unsubsidised patients, rather than the improved access for lower income patients intended, when the targeting of GMS subsidy was introduced in 1991. The increase in qualifying-income for the CSC, implemented in mid-1996, may have been inadequate to compensate for continuing financial stress, particularly in the non-CSC-holding population.

Under-utilisation of primary care services by some disadvantaged groups, especially Maori - despite their generally poorer health, has been well documented (Howden-Chapman, 1999; Malcolm, Wright and Barnett, 1999). However, there are suggestions from this study that the targeting of GMS subsidies, intended to improve access for these groups, might have achieved only a relative improvement. In support of this interpretation, studies of changes in

general practice consultation rates between 1989 and 1993 (Davis, Gribben, Lay Yee and McAvoy, 1994) found a negative correlation between increasing user charges and general practice use. Similarly, a study of prescribed versus pharmacy-dispensed medications over 1992 (Gardner, Dovey and Tilyard, 1996) found that increasing user charges correlated negatively with prescribed medication uptake.

There is one group of patients whose proportion in the laboratory-tested population over the period monitored, increasingly exceeded their proportion in the GP-encountered population. This is GMS group A (adults of working age), who will pay more than other groups for their consultations, whether CSC card holders or not (as their GMS subsidy is lower than that for other GMS groups). They are encountered relatively infrequently. Because laboratory testing is universally subsidised, it might be seen by doctors as a means of adding value to a consultation without incurring extra charge to patients perceived as already under financial stress. This would explain the disproportionately high and increasing rates of laboratory testing for the group.

### **General conclusions on factors affecting community laboratories**

Taken together, the analyses of HBL and RNZCGP databases in this chapter point to several important conclusions about the response of community laboratories and GPs to policy changes in the primary health sector over the 1990s, and help explain their success or failure.

**Targeting the General Medical Services subsidy:** While GPs encounter (and test) lower income groups more frequently than other patients, the RNZCGP database suggests that patients visited the doctor less frequently between 1995/96 and 1997/98, particularly those not receiving a GMS subsidy. However, results also indicate that patients who pay the most for consultations whether subsidised or not, i.e. adults of working age, are referred to the laboratory more frequently, and that this trend is increasing. This could be interpreted as an inbuilt

'compensatory' factor in the present income-related, part-charging regime, in that, while all patients must pay some contribution towards both GP visits and prescribed pharmaceuticals, laboratory tests are fully reimbursed by the state and, therefore, seen as 'free' by both patients and GPs. (A completely subsidised primary service would remove the anomaly equally as well as the introduction of targeted part charges for laboratory tests, and would ensure that currently unsubsidised patients do not see cost as a bar to health care.)

**Facilitating laboratory services provider competition:** Although this strategy was aimed at containing, or driving down, laboratory test prices, evidence presented here suggests that this effect was not achieved by the strategy itself. Price containment probably owed more to economies of scale that occurred, not by physical consolidation of community laboratories, but by increased test volumes generated in the primary sector, and especially by greatly increased volumes of automated tests with high marginal returns. Many of these shifts were occurring prior to the policy changes discussed in this chapter.

**Facilitating budget holding by GP groups:** Data presented here demonstrate a slowing of rates of increase in test volumes associated with the increasing prevalence of laboratory budget holding by GP groups through the 1990s. Reductions in the proportion of GP encounters utilising laboratory tests appear to be one factor in this, along with reductions in the GP patient encounter rate, possibly due to the disincentive of full- or part-charging. Countering these factors, would be the prolonged increase in GP numbers exceeding the growth in population over that period, and a possible resurgence, from mid-1997 on, in the mean number of tests ordered per laboratory referral: an index not measured in these studies.

**Payment of the full GMS subsidy for children under six:** The RNZCGP research unit databases provided additional confirmation of improved access to both general practice and laboratory diagnosis following the introduction of the

FCHCS initiative for (slightly younger) children within this age group, and suggest that the improvement in access was maintained at least a further year.

**Drivers of community laboratory test volumes:** It is unlikely, however, that the FCHCS was an important driver of the ever-increasing test volumes seen through the 1990s, owing to the relatively small numbers of 'encounters utilising laboratory tests' seen among the younger age groups.

Results suggest that increasing test volumes were driven by (a) population growth (b) increasing availability of GPs (possibly more recently- and overseas-trained), (c) improved diagnostic 'fine-tuning' and accessibility of laboratory tests, and (d) more subtle factors related to the methods for remunerating community laboratories (no part-charge compared with general medical services and pharmaceuticals; fee-for-test reimbursement independent of volume). Opposing these drivers, to a limited and regionally variable extent, were (a) falls in the GP-patient encounter rate resulting mainly from GMS subsidy targeting, and (b) the GP laboratory budget-holding initiative.

In summary, only the FCHCS introduced by the New Zealand First-National coalition government elected in 1996 appears to have achieved its access goal. There is no evidence from this study that targeting the GMS subsidy improved access for the needy, and the cost containment initiatives examined appear to have been overwhelmed by a range of independent factors, some of which were systemic from the very beginnings of the state's involvement in comprehensive health care in New Zealand.

## Chapter 9: Primary care changes and some measures of outcome.

The studies reported in this chapter assess (a) the effectiveness of new forms of primary sector governance affecting community laboratory utilisation, and (b) the impact of funding policy changes on patient access to primary-level interventions entailing laboratory diagnoses. Outcomes of changes to governance and funding policy are followed through the 1990s, using selected data available in series.

### **The changing environment for General Practice through the 1990s**

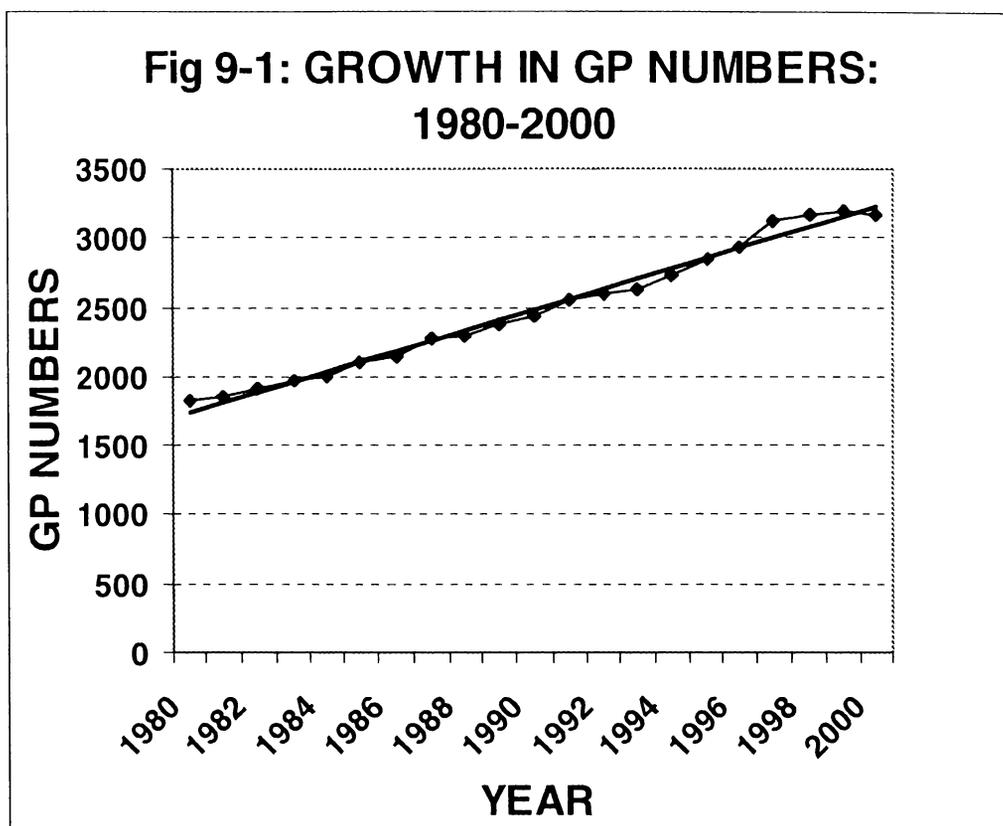
A dominant theme of the influential 1991 'green and white' policy paper, 'Your health & the Public Health' (Upton, 1991), was the need for better integration of state-provided funding streams for primary and secondary health services or, more generally, for private and public health services. New Zealand's primary sector, though substantially government subsidised, is largely privately controlled, as the vast majority of GPs are private practitioners: effectively small businesses. Underlying the 1990s initiatives in primary care, therefore, was the desire of successive post-war governments to gain a measure of control in two key areas: escalating primary care-associated spending, and earlier intervention for those who might otherwise eventually require more expensive secondary- or tertiary-level care (Crampton, 2001, Upton, 1991).

**Integration and demand control:** Although IPA 'budget holding' for secondary services was envisaged in the long term (Upton, 1991), and planned expressly for the large Aetna-linked primary care organisation, Prime Health in Tauranga, only laboratory and pharmaceutical budget holding were implemented extensively during the 1990s (Malcolm, Wright and Barnett, 1999 and 2000). Largely volume-driven expenditure on laboratory services continued to increase through

the 1990s (see Chapter 8). Nevertheless, observers have cited improvements in internal co-ordination, e.g. better information systems, the development of clinical guidelines and improved discrimination in prescribing and referral behaviour, as important achievements of IPAs (Malcolm, Wright and Barnett, 1999).

This ceding of financial control to IPAs, however, has generated concern for both the quality and affordability of primary care. Malcolm, Wright, Seers et al. (2000) pointed to the need to define measures of quality in general practice. As a measure of quality of laboratory utilisation, they suggested 'the ratio between negative and positive laboratory tests'. Crampton (2001) observed that substantial and powerful groups were increasingly dominating a primary sector once made up of small businesses. The scale of the transformation, he warned, carried the likelihood that the contracting process might eventually prove to be an inadequate tool for controlling total primary sector costs.

**Integration and access:** Figure 9-1, below, shows the growth of the national GP workforce from 1980 to 2000, together with the calculated (least squares) trend line, using figures obtained by the Medical Council (NZHIS, 2000). Over the two decades monitored, the GP workforce grew on average at a rate of 74 additional GPs per annum. The period from 1993 to 1997, however, was a time of particularly rapid growth in the GP workforce (122 additional GPs per annum on average). Over the two decades in question, the GP workforce also changed with respect to gender: from 12.6 percent female in 1980, to 36.8 percent female in 2000. Immigration policy had favoured medically and technically qualified candidates for permanent entry into New Zealand up until the formation of the National-New Zealand First coalition government in late 1996. By 1998, 33.7 percent of doctors working in New Zealand had qualified overseas. 2.3 percent classified themselves as Maori (NZHIS, 2000). Overall, this suggests an increasing diversity of backgrounds and training among the GP workforce that might make GPs more accessible to a wider range of New Zealanders.



Several policy initiatives in the early 1990s were directed more specifically at improving access to primary services. An important advantage of the contracting approach to primary care provision was the control over locating new general practices that government funding agencies could now exert. Contracts were framed to limit access to the state general medical services (GMS) subsidy so that new GPs who chose to work in areas already over-supplied would no longer receive it (Crampton, 2001). Thus, new GPs were encouraged to service rural and low socio-economic locations. As part of a government effort to achieve Maori health gains and participation, and to promote Maori-focussed provision, several *iwi* (tribe)-based primary care initiatives were developed, alongside a variety of 'third sector' non-profit organisations, which had been servicing low-income groups since the 1970s. The North Health and Midland RHAs also developed

secondary purchasing and co-ordinating organisations specifically for Maori. None of these new approaches has been systematically evaluated (Crampton, 2001).

Howden-Chapman (1999) has reviewed mounting evidence that the strongest socio-economic determinant of ill health is low income. This may be true even when income is low relative to that of a societal mean, rather than low in absolute terms: a finding that supports redistribution of income as a fundamental health access measure (Howden-Chapman, 1999). Up until 1991, the GMS subsidy had been universal, though demonstrably inadequate for many low income New Zealanders. Income-based targeting of the GMS was introduced in 1991 as a means of improving access to primary care across the country, with the community services card (CSC) as the targeting mechanism (see Chapter 8).

A final policy initiative designed to lift financial barriers to primary care access for all children under the age of 6 years, was the FCHCS introduced in mid-1997. Near-universality characterised the scheme, or as much as could be negotiated in the face of a traditionally conservative GP workforce wary of accepting the status of waged employees (Crampton, 2001).

In summary, although attempts to integrate privately controlled primary care services into the state health system using the contracting mechanism might have achieved improved information flows and more comprehensive coverage, questions still remained about access to primary care, and the overall cost-effectiveness of the primary care governance system.

## **A: General Practitioner laboratory utilisation as an outcome – analysis of trends in Hamilton community laboratory test results.**

### **Introduction**

One objective of the Health Authorities' primary health care IPA budget holding initiative introduced during the mid-1990s, was to improve the quality of laboratory utilisation. 'Percent abnormal/positive', 'case finding', or 'pick-up' rates, have been suggested as potential indicators of quality in primary care (Malcolm, Wright, Seers, et al., 2000), and of GP capacity for 'discrimination' in laboratory use, in response to official control strategies (Sinclair, 1998). Thus, 'percent abnormal' findings could be viewed as an intermediary outcome of policy initiatives like IPA budget holding.

IPA budget holding was introduced more gradually into the Midland region over the years 1994-1999, and the numbers of GPs in laboratory test and pharmaceutical budget holding practices did not exceed 50% until mid-1997 (Ministry of Health, 1996, 1997, 1998). Pre-negotiated GMS funding using a capitation formula was introduced relatively early in the Midland region, though this would not have affected laboratory testing rates, the funding for which was effectively open-ended until budget holding became prevalent. Some Hamilton IPAs, however (those associated with the First Health Network), would have shouldered the risk of going over-budget in return for retaining any budget savings within the IPA, as Midland was the first health authority to negotiate this type of contract (Malcolm, Wright and Barnett, 1999).

### **Analyses**

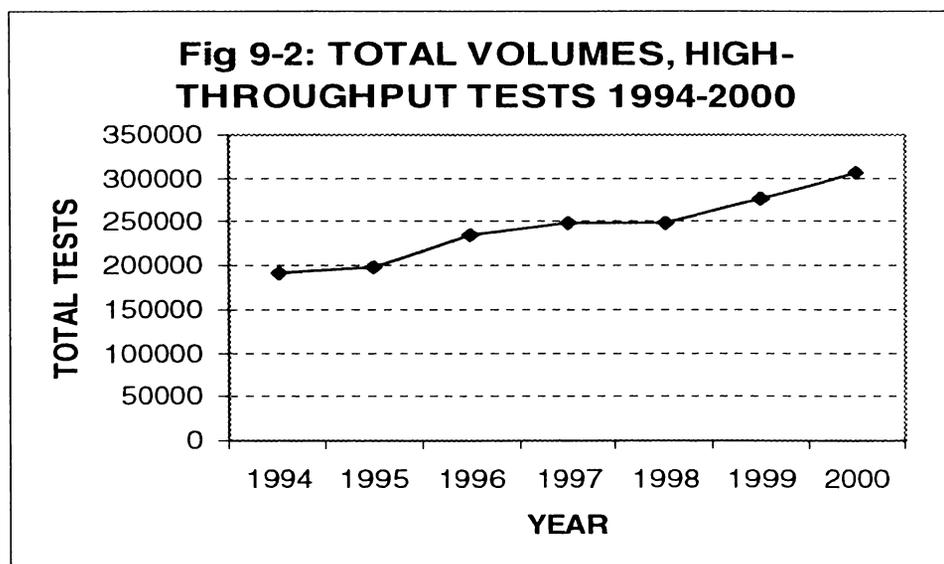
Over the period 1994 to 2000, test volumes for the 10 high-throughput tests monitored in this study increased in total by an average of 19,209 tests, or approx. 7.7 percent per annum (1993 was not included in this calculation, as data

were incomplete for that year). This overall rate of mean annual increase masked a wide variation in increase between the individual tests, however, from 1.3 percent per annum for B12 and ESR, to 17.6 percent per annum for Gluc (see Table 9-1, below).

**Table 9-1: Average annual increase in test volumes for 10 high-throughput tests, Hamilton area 1994-2000.**

	TSH	B12	Ca	Hb	ESR	CRP	HBsAg	Chol	Gluc	GGT
<b>number</b>	3175	950	1291	5039	541	787	252	3289	3518	4821
<b>percent</b>	16.4%	1.3%	4.6%	7.0%	1.3%	16.8%	5.7%	15.4%	17.6%	8.9%

Volumes did not increase in a regular fashion. Some slowing of the rate of increase was often detectable for the individual tests over the years 1996-1998 inclusive, and this shows clearly in the graph of total test volumes versus time (Figure 9-2, below). In the case of ESR, volumes fell slightly most years from 1997 on (as the test was replaced by CRP).



Broadly constant 'percent abnormal' rates were expected, which would be consistent with Cleland's analysis, i.e. the number of diagnoses made using a given test is directly volume-dependant. The results were more complex than

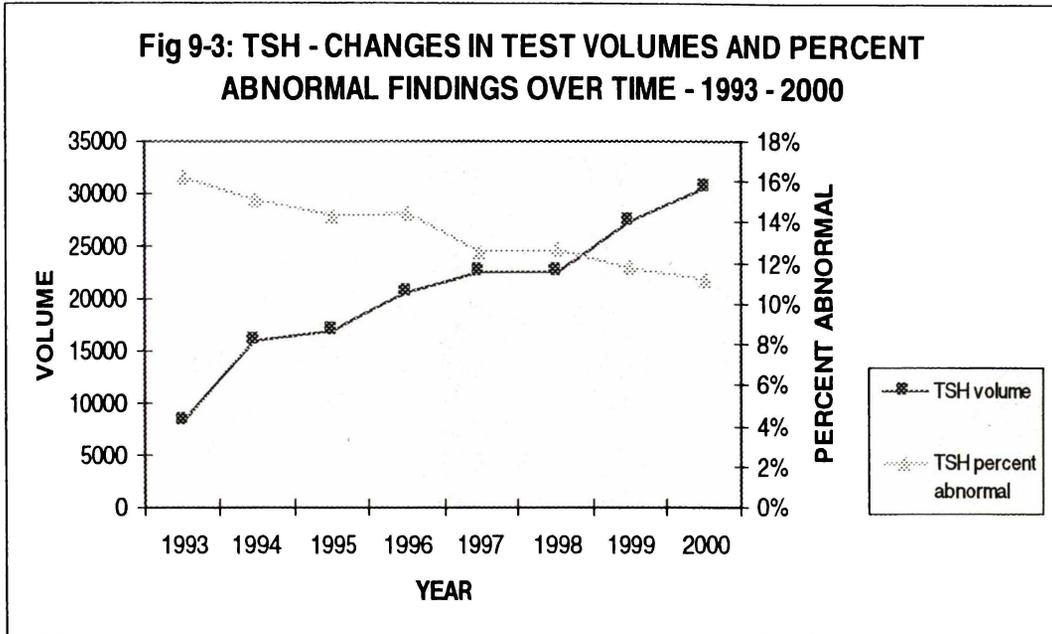
anticipated, however, as can be seen from examination of the ‘percent abnormal’ data listed in Table 9-2:

**Table 9-2: Changes in ‘percent abnormal’ findings over time: ten high-throughput tests.**

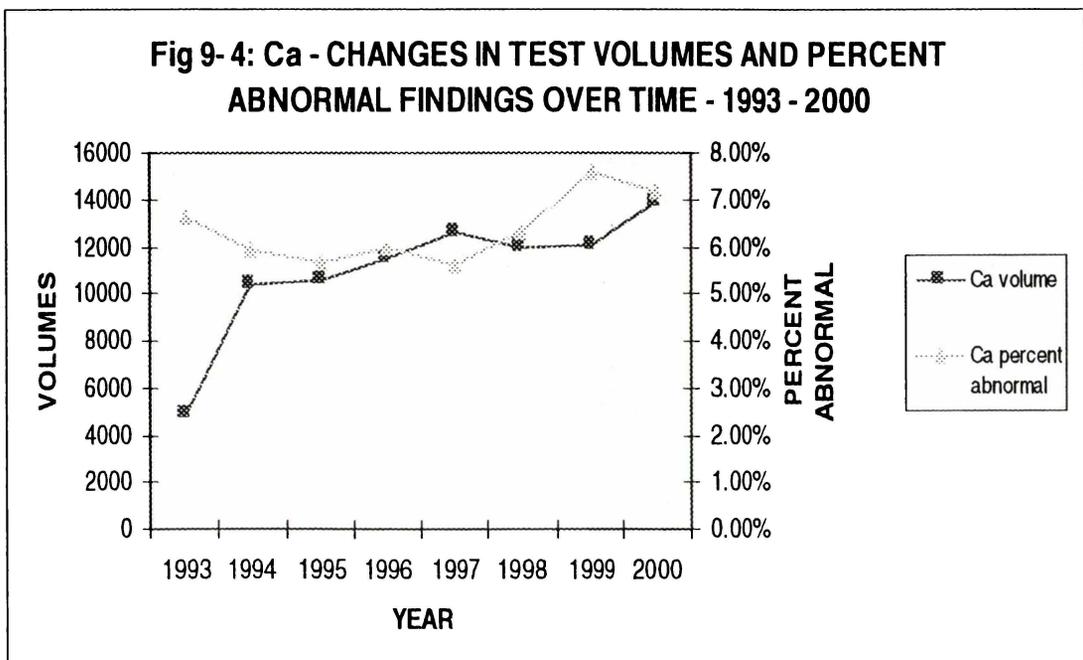
	TSH	B12	Ca	Hb	ESR	CRP	HBsAg	Chol	Gluc	GGT
1993	16.3%	12.4%	6.60%	*	*	19.3%	*	69.9%	33.4%	16.3%
1994	15.1%	12.9%	5.92%	18.0%	15.7%	24.1%	5.4%	67.7%	34.8%	16.1%
1995	14.4%	11.8%	5.65%	18.0%	12.8%	25.3%	4.2%	67.4%	30.3%	16.9%
1996	14.4%	9.8%	5.97%	16.2%	11.4%	21.7%	5.3%	65.9%	32.6%	16.8%
1997	12.6%	6.5%	5.59%	15.6%	12.2%	26.6%	5.6%	68.0%	29.9%	16.5%
1998	12.6%	5.5%	6.29%	17.2%	12.0%	25.7%	5.8%	66.5%	31.1%	16.3%
1999	11.7%	6.2%	7.60%	17.7%	12.2%	23.7%	4.8%	63.1%	27.8%	16.6%
2000	11.2%	5.3%	7.18%	16.9%	12.3%	36.8%	5.6%	61.6%	25.6%	17.6%

(\* = complete data not available).

When both test volumes and the ‘percent abnormal’ tests detected were plotted against time, two broad patterns emerged. For TSH, B12, ESR, Gluc, and Chol, the ‘percent abnormal’ tests detected diminished over time as the test volumes increased. This pattern is illustrated below, for TSH (Figure 9-3). (The slowing of test volume increases between 1996 and 1998 is typical.) Because of the large increases in test volumes that occurred over the period, however, the absolute number of abnormal tests detected did increase despite the fall in their percentage, in all cases except B12 and ESR.



For Ca, Hb, CRP, GGT and HepBSag the 'percent abnormal' detected either remained broadly constant or increased over time, with increasing volumes. This is shown in Figure 9-4, below, for Ca.



The correlations between 'percent abnormal' rates and corresponding test volumes are detailed in Table 9-3:

**Table 9-3: Slopes and correlation coefficients (r) from the least squares regressions of volume versus 'percent abnormal' tests detected – ten high volume tests.**

	TSH	B12	Ca	Hb	ESR	CRP	HBsAg	Chol	Gluc	GGT
<b>Slope</b>	-4079	-1698	46082	-42735	-3209	532.71	2631	-2872	-3083	39216
<b>R<sup>2</sup></b>	0.934	0.197	0.007	0.001	0.335	0.476	0.154	0.860	0.772	0.314
<b>r</b>	-0.966*	-0.444	0.081	-0.032	-0.579	0.690	0.392	-0.927*	-0.879*	0.560
<b>n</b>	8	8	8	7	7	8	7	8	8	8

\*= $p < 0.05$  (significant at the 5% level)

Slopes represent the change in test volume (in the direction indicated by the sign) required to produce a one percent increase in 'percent abnormal' tests detected. Of the ten tests analysed, CRP is the most volume sensitive, i.e. a one percent increase in 'percent abnormal' is produced by a relatively small change (+533 tests-per-year) in volume. Conversely, Ca, Hb and GGT are the least volume sensitive. R<sup>2</sup> is the proportion of variability due to the correlation, rather than to chance. Serum Ca, Hb, and HBsAg 'percent abnormal' rates were not correlated with volumes, i.e. the rates remained broadly constant, despite moderate to steeply increasing volumes. TSH, B12, ESR, Chol and Gluc 'percent abnormal' rates were all inversely correlated with volumes: in the case of TSH, Chol and Gluc the correlation coefficient (r) was significant at the 5 percent level. The serum CRP 'percent abnormal' rate showed moderate- and the GGT weak, direct correlation with test volumes. (The weak GGT correlation might be spurious, owing to the unusually large range of volumes spanned.)

## Discussion

For the group of tests monitored in this study, mean increases in test volumes per annum overall (19209 tests, or approx. 7.7 percent) far exceeded the population growth rate for Greater Hamilton, which was 1.64 percent per annum between

1991 and 1996 (Bedford and Goodwin, 1997), and also the national mean annual growth rate for community laboratory tests of 4.66 percent (see Chapter 8). Some temporary falloff in the rate of test volume growth was detected between 1996 and 1998, consistent with Midland-regional, and national, trends recorded in Chapter 8. This falloff coincided with the increasing prevalence of laboratory budget holding contracts in Midland, which by mid-1997 involved over 50 percent of the region's GPs. The budget-holding initiative, however, even in its 'more commercial' form promoted by Midland Health through the First Health network of IPAs (Malcolm, Wright and Barnett, 1999), appears to have had only a limited and temporary restraining effect on test volumes.

With the exceptions of serum B12 and the ESR, Hamilton area-GPs detected more abnormalities as the decade progressed, in either new or treated patients, using the group of tests monitored in this study. Thus, any reduction in volume would result in fewer actual abnormalities detected by all tests, except B12 and ESR (which is currently being phased out in favour of CRP). These results broadly support Cleland's findings in Auckland (Sinclair, 1998), where test-requesting patterns changed more abruptly.

There was little evidence, however, of improved GP discrimination in test ordering due to the institution of laboratory budget holding by IPAs. The 'percent abnormal' CRP tests detected did improve over the decade but CRP is a relatively new test, with which GPs were gaining experience. Each TSH, Chol and Gluc abnormality detected was costing more in terms of 'negative' test results as the decade progressed i.e. diagnostic efficiency, or 'quality of laboratory utilisation' to use the terminology of Malcolm, Wright, Seers et al. (2000), appeared to be diminishing for these three tests.

Two factors are often cited to counter an interpretation of diagnostic inefficiency. One, is that negative test results can often be diagnostic, since some diagnoses are made by exclusion and, as a consequence, reduced percent abnormal findings do

not necessarily represent falling percentages of diagnoses overall. Another possible explanation for the downward trend in percent abnormalities detected is that certain tests, particularly TSH, Chol and Gluc, are increasingly used in monitoring mode, so that a downward trend in 'percent abnormal' might reflect increasingly successful dietary or other control and, therefore, improved patient management. The changing ethnic mix of patients, and the increasing numbers of younger and overseas-trained GP's practicing in the Hamilton area over the 8 years monitored might also be relevant to the increased inclination of GPs towards liberal use of the laboratory.

For the 'percent abnormal tests detected' to be used as an indicator of quality in laboratory utilisation, a clinical consensus would need to be reached on the 'range of percent abnormal' acceptable for each test. The data reported here, are a starting-point for the analyses needed. Clearly, such a range might be expected to vary according to characteristics of the practice: particularly the ethnic, socio-economic and age compositions of the registered patient base, since these will influence the need for both diagnostic and repeat testing. Also desirable, would be a consensus view on the tests most appropriate for use in therapy monitoring-mode as opposed to initial-diagnostic mode, as confusion of the two is also a potential source of misuse of the laboratory.

In summary, patients who used GP services in greater Hamilton received steadily improving community laboratory surveillance over the 1990s despite considerable changes in general practice, some of which were designed to curtail demand. The next section of the Chapter follows a more direct indicator of outcomes from the primary health care strategy of the 1990s: avoidable hospitalisations.

## **B: Trends in avoidable hospitalisations – analyses of trends in public hospital discharge data.**

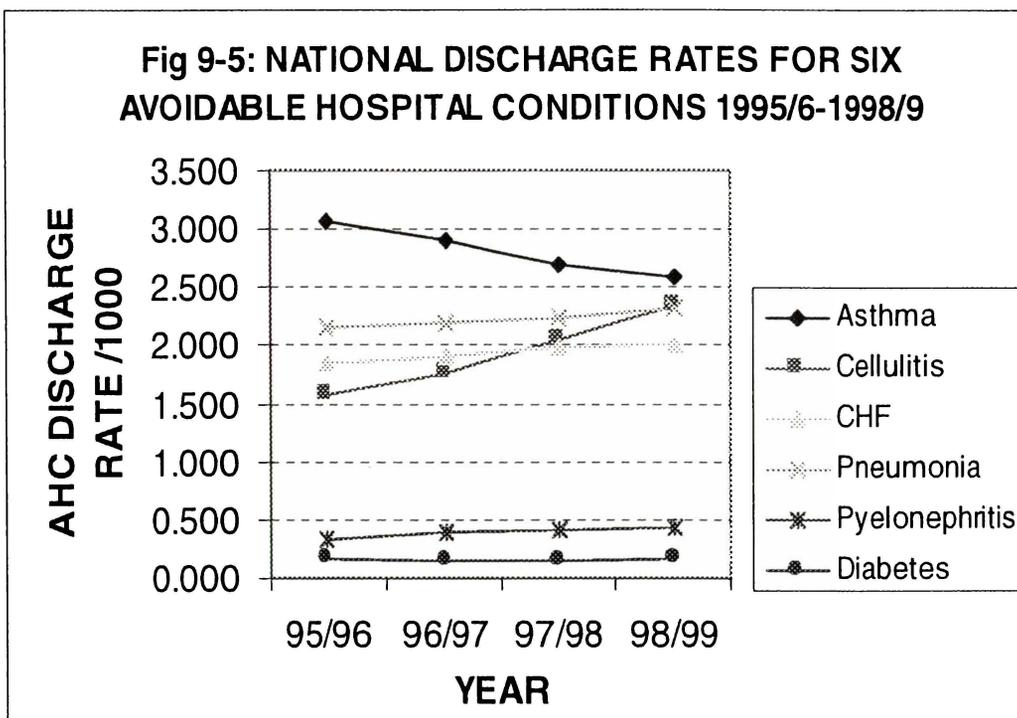
### **Introduction**

In reviewing the effects of GP ‘fund-holding’ in Britain, Gosden and Torgerson (1997) observed that they were dealing with possibly the most evaluated policy in the history of UK health care. The controversial nature of the British fund-holding initiative, and the fact that it was introduced in a quasi-experimental fashion, are two reasons given by these authors for the unusually large number of evaluations. Despite all this activity, they go on to point out that changes in the volume and cost of prescriptions and referrals do not necessarily equate to efficiency changes, if there is no accompanying information about health status. *‘Indeed, substituting prescriptions with referrals could increase costs yet improve patient health status even more, thus representing an increase in efficiency’* (Gosden and Torgerson, 1997, p113).

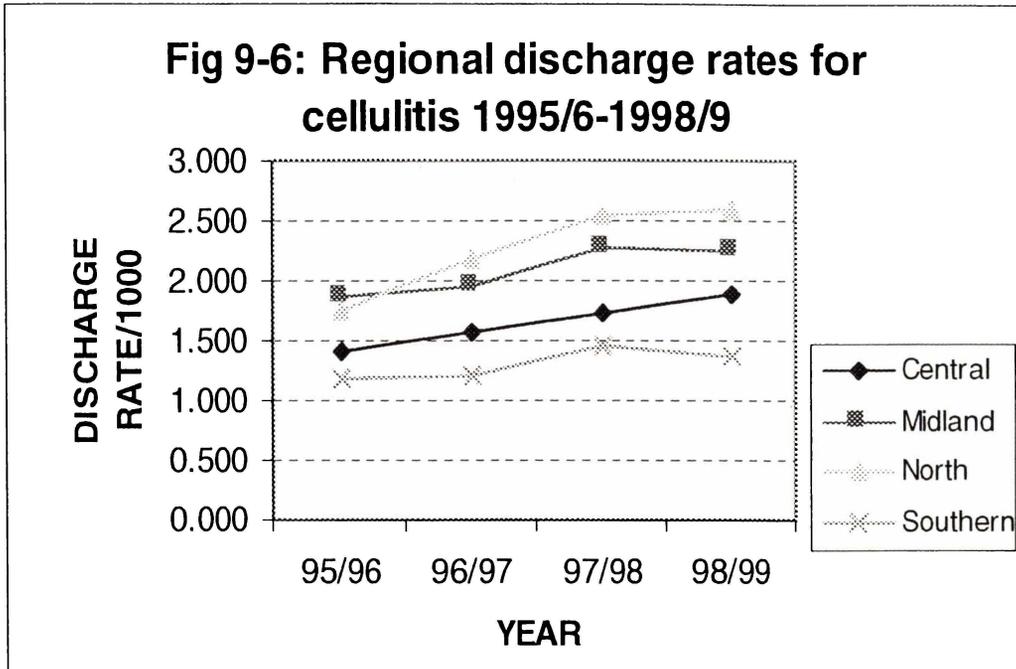
The practical difficulties of measuring health outcomes and efficiency and of designing robust evaluations were acknowledged, however, as ‘challenging’. Malcolm, Wright and Barnett (1999) were more blunt. They considered questions such as ‘has budget holding improved health outcomes?’ to be unanswerable. It is true that individual health outcomes are difficult to link directly with any one element of the total health environment, but limited inferences based on relevant cross-sectional or longitudinal studies have been made, both in New Zealand and elsewhere, in order to inform policy makers (see Chapter 5).

### Analyses

**Trends in selected avoidable hospitalisation public hospital discharge rates through the late 1990s:** Aggregate discharge rates increased nationally for cellulitis, CHF, pneumonia and pyelonephritis, over the four years monitored. Rates for diabetes remained approximately constant. Only those for asthma decreased.

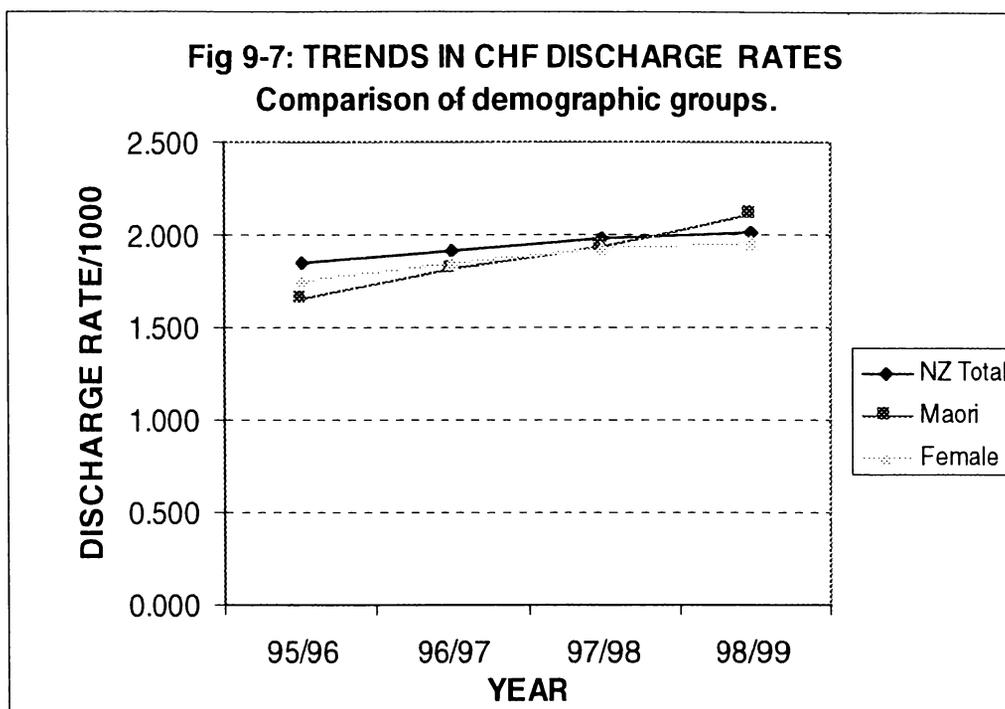


When stratified by health authority region, the crude rates for each AHC followed the same trends as were seen in the aggregate data. This is shown below for cellulitis.



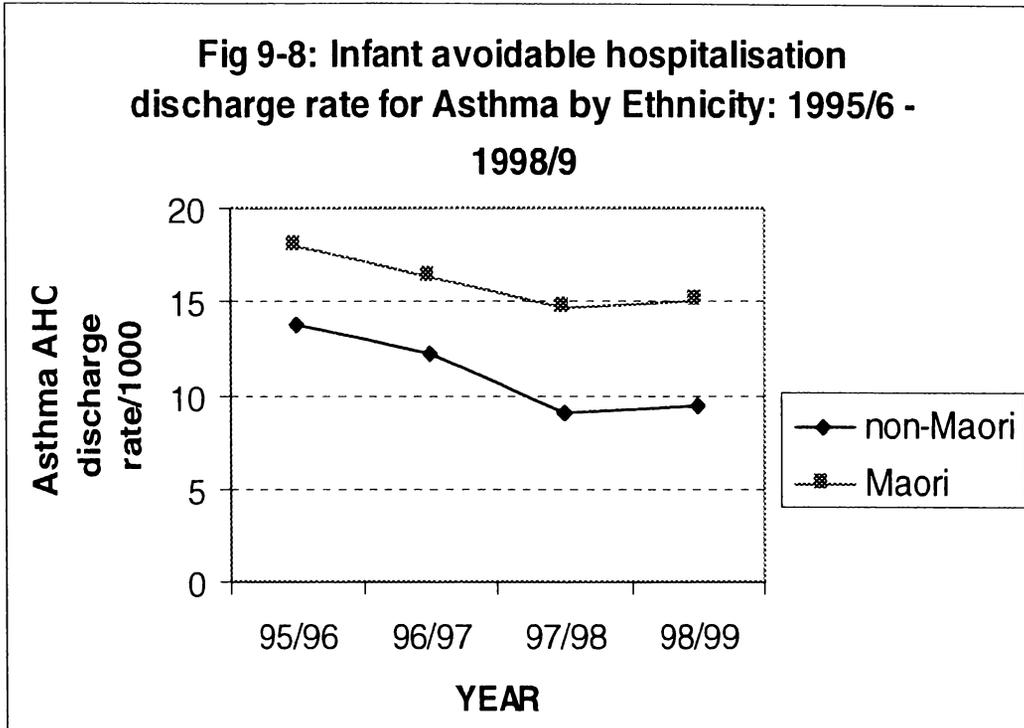
**Comparative trends for selected demographic groups:** Examination of the data after stratification by demographic group, however, in several cases suggested a less favourable trend in AHC discharge rates for Maori and, in one case (CHF) for females, relative to the relevant aggregate national trend. The following graph illustrates a comparison of CHF discharge trends for Maori and females with the national trend.

(Note that AHC discharge rates are calculated per 1000 of the relevant population from which they are drawn i.e. the total, the total female, or the total Maori population, in Figure 9-7 below.) National data were then stratified into Maori/non-Maori, or Male/ Female for Chi squared analysis of changing proportions year-on-year.

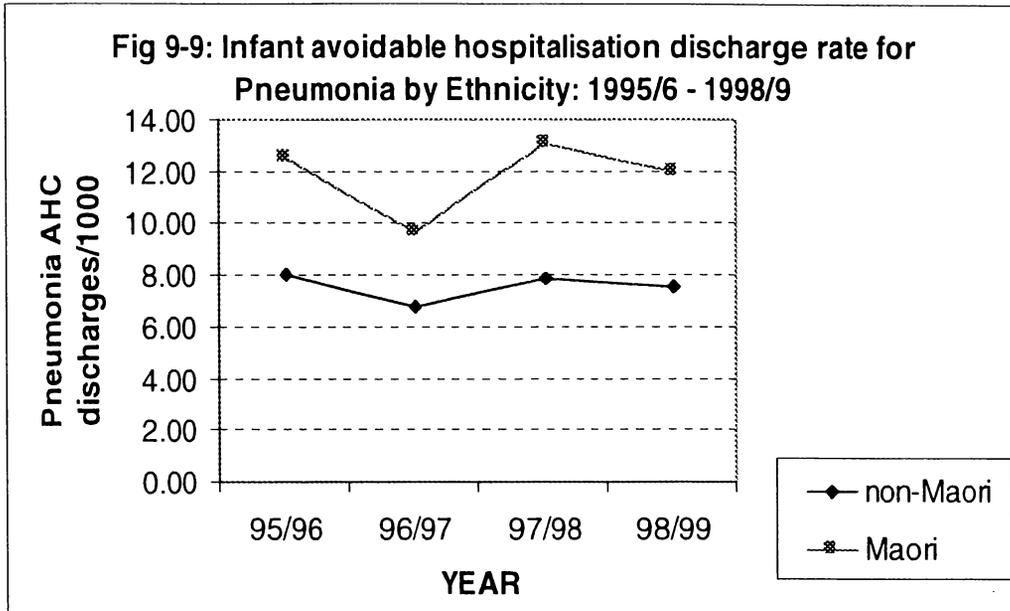


Over the four years monitored the increase seen in the proportion of all Maori CHF avoidable hospitalisations was found to be statistically significant (but that of all females insignificant). An increased proportion of Maori avoidable diabetes hospitalisations was also found to be statistically significant over the same time span.

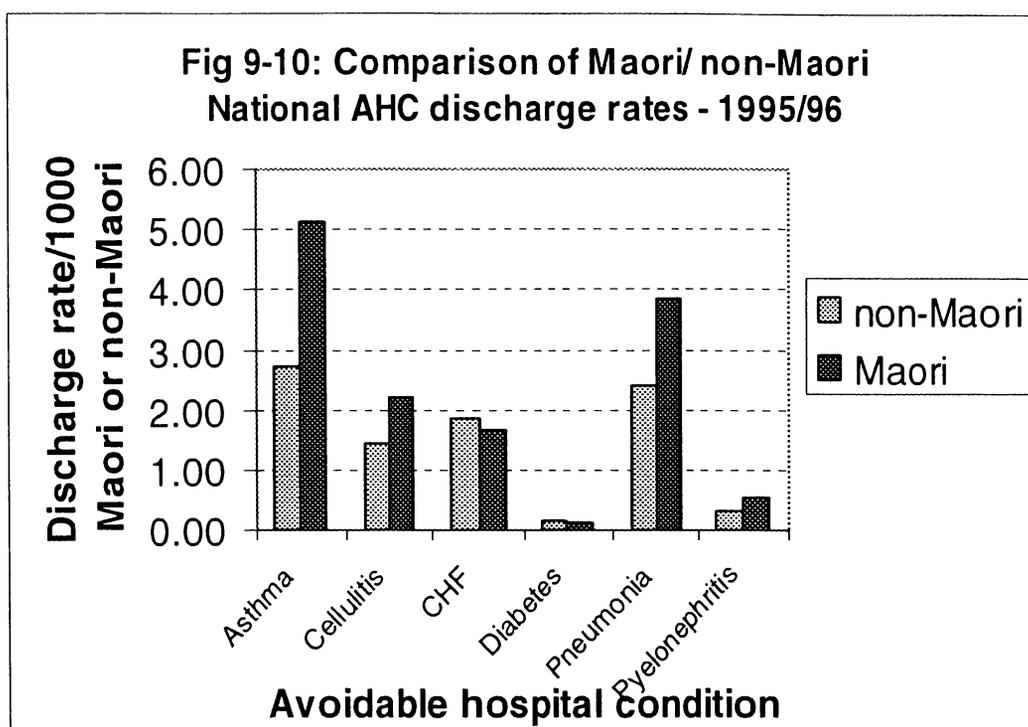
A high proportion of AHC discharges for asthma and pneumonia were for infants in the under five-year age group. Consequently, trends in discharge rates by ethnicity (Maori/ non-Maori) were followed for the under five-years age group separately, in the cases of asthma and pneumonia. The trends are illustrated below in the case of asthma AHC discharges.



It is noticeable that the biggest improvement in asthma avoidable hospitalisation rates was for non-Maori between 1996/97 and 1997/98, i.e. although the Maori avoidable hospitalisation rate fell, it did so to a lesser extent (the **proportion** of Maori infant asthma avoidable hospitalisations was found by Chi-square analysis to have increased significantly). The same findings also applied in the case of pneumonia as the graphical data reflects in Figure 9-9 below, i.e. the **proportion** of Maori infant asthma avoidable hospitalisations was found by Chi-square analysis to have increased significantly between 1996/97 and 1997/98. No other statistically significant trends were found.



**Ethnicity comparisons - national hospitalisation rates for AHCs, 1995/96:** In order to compare Maori with non-Maori avoidable hospitalisation rates, the public hospital AHC discharge rates for 1996 were calculated per 1000 using the relevant New Zealand population from the 1996 census. In Figure 9-10 below, it can be seen that Maori AHC discharge rates for asthma, cellulitis, pneumonia and pyelonephritis are considerably higher than the corresponding non-Maori rates. The situation is reversed, however, in the cases of CHF and diabetes, where non-Maori rates are higher.



**Regional comparisons - directly age standardised morbidity rates and standard morbidity ratios, 1995/6:** Age standardised morbidity rates for the AHCs monitored were calculated by region for the year 1995/96 by directly age standardising against the Maori or non-Maori NZ population from the 1996 census. Direct age standardisation calculates the morbidity rates that would have been found in the relevant ethnic New Zealand population if it had had the morbidity rates observed in the study population. Results are tabulated in Table 9-4 below.

The pattern illustrated for national discharge rates in Figure 9-10 is broadly evident at the North Health, Midland and Central regional level, after correction for differences in age composition. Maori age standardised morbidity rates exceeded those for non-Maori across all AHCs, except CHF (although this exception did not hold for Midland), and diabetes. The Southern region did not

show this pattern, however. With the exception of asthma, Maori age standardised morbidity rates in the Southern region were **lower** than the corresponding non-Maori rates.

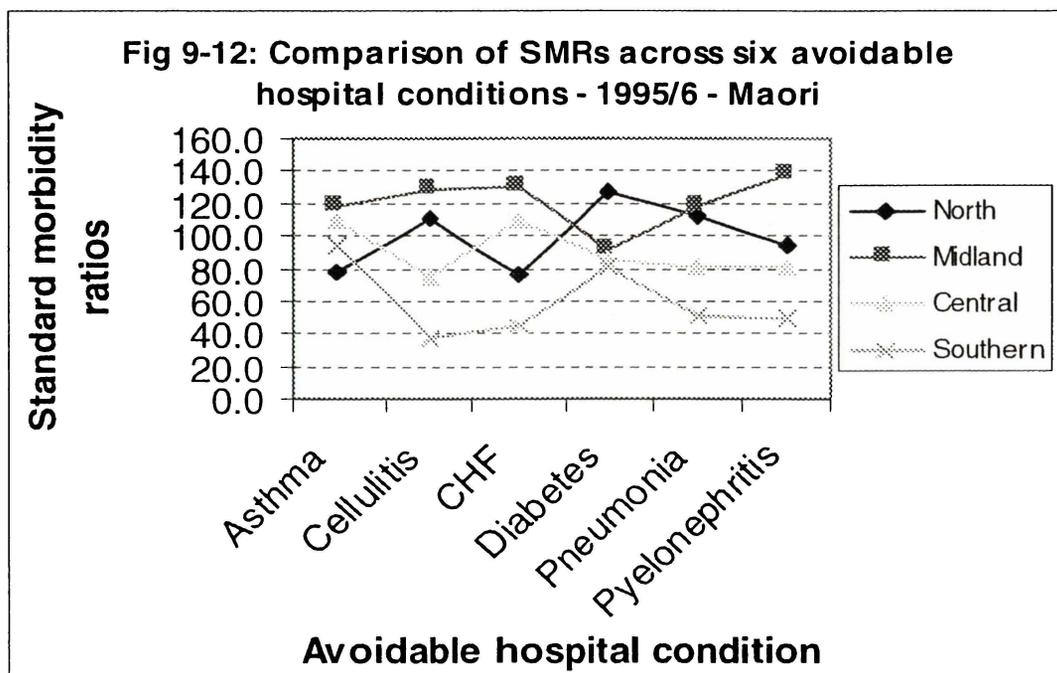
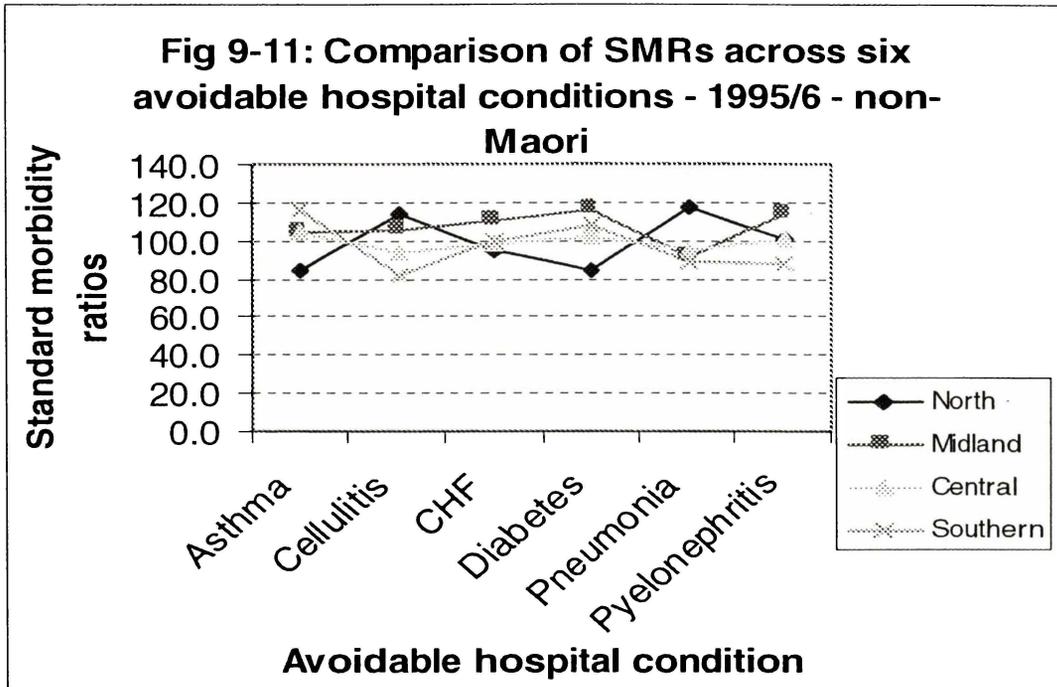
**Table 9-4: Directly age standardised morbidity rates for six avoidable hospital conditions by Health Authority region: 1995/96**

non-Maori						
	Asthma	Cellulitis	CHF	Diabetes	Pneumonia	Pyelonephritis
North	2.28	1.66	1.78	0.14	2.82	0.31
Midland	2.83	1.54	2.06	0.19	2.21	0.35
Central	2.84	1.37	1.85	0.17	2.28	0.31
Southern	3.19	1.18	1.87	0.18	2.15	0.27
Maori						
	Asthma	Cellulitis	CHF	Diabetes	Pneumonia	Pyelonephritis
North	4.02	2.44	1.26	0.14	4.27	0.50
Midland	6.02	2.84	2.15	0.10	4.52	0.74
Central	5.56	1.67	1.81	0.10	3.11	0.43
Southern	4.80	0.84	0.75	0.09	1.95	0.26

Midland had the highest regional non-Maori age standardised morbidity rates for congestive heart failure, diabetes and pyelonephritis AHCs, and also the highest regional Maori age standardised morbidity rates for all avoidable hospital conditions monitored except diabetes.

Standard morbidity ratios (SMRs) were also calculated by region for the year 1995/96 (indirectly age standardising against the Maori or non-Maori NZ population from the 1996 census). Indirect age standardisation calculates the morbidity rates that would have been found in the study population if it had had the same age structure as the relevant ethnic New Zealand population. The SMR then is the ratio of the observed number of avoidable hospitalisations divided by the number expected on the basis of the age-standardised rate. By convention this is expressed as a percentage. Across most AHCs, the Midland region had high SMR's by comparison with the relevant ethnic NZ population, i.e. avoidable hospitalisation rates were usually higher than the corresponding national rates.

The Southern region, by contrast, had extremely low SMR's for its Maori population across most avoidable hospitalisations, i.e. the observed Maori avoidable hospitalisation rates were low compared with the national rates. Figures 9-11 and 9-12 below illustrate these observations.



## **Discussion**

A study by Tilyard and Dovey (1996) compared the fee structures of GPs between 1989 and 1993 (before and after the introduction of GMS targeting in 1991). In the four years between the studies, public funding (including by ACC) of GP consultations had diminished, and both patients and GPs (through the exercise of discretion in charging their fee) were shouldering more of the financial burden of primary care costs. The study revealed a discretionary lowering of fees charged for 44.0 percent of unsubsidised adults in 1993, as against only 3.4 percent in 1989. Similar discretionary 'doctor' subsidies had also increased, though less dramatically, for children and subsidised adult groups. That study is one of several (Davis, Gribben, Lay Yee and McAvoy, 1994, Gardiner, Dovey and Tilyard, 1996) warning of inadequacies in a targeting regime based on the CSC. Furthermore, estimates of the uptake of the CSC indicated that about 33 percent of those eligible had not obtained it (Gribben, 1996). Crampton (2001) reports on a study carried out in 1995 which found that European New Zealanders, if eligible, were significantly more likely than other ethnic groups to have CSCs. (In addition, sixty-four percent of people, who did not know what a CSC was, actually held a current card!) Coster, in supporting cheaper GP visits for all New Zealanders, reported through the news media (Crofskey, 2001) on his own research, which showed that only half of eligible Maori and Pacific Islanders were likely to have a CSC and, as a consequence, those groups were not accessing health care as fully as they could.

American investigators (Weissman, Gatsonis and Epstein, 1992, and Pappas, Hadden, Kozak and Fisher, 1997) used the avoidable hospitalisation rate as an indicator of reduced access to primary care. On this basis, the stable or upward trend for five of the six avoidable hospitalisations monitored over the late 1990s in this study must be seen as indicating a failure of policy initiatives undertaken

earlier in 1990s to achieve their goals of improved service integration, primary care access, and early intervention. In New Zealand, Salmond and Crampton (2000) imply that unexpectedly low overall Maori hospitalisation rates might well indicate poor access to both primary and secondary care. This suggestion makes interpretation of the initially low, but increasing relative rates of CHF and diabetes avoidable hospitalisations seen for Maori in this study, quite complex. One likely explanation is that at the start of the study in 1995/96 many Maori experiencing cardiovascular disease and diabetic symptoms were accessing neither primary nor secondary services. As the 1990s progressed, however, Maori with symptoms of advanced CHF and diabetes were increasingly being encountered by the hospital system. (On this interpretation, failure to access secondary as well as primary services would appear to be especially prevalent among Southern Maori across most AHCs examined.) This, again, would constitute an indictment of primary care strategies during the 1990s. Although the small increase seen in the proportion of women hospitalised for CHF did not reach significance, it might be an indicator of primary care utilisation, and primary service access policies, worth monitoring over time.

Marked improvement in the rate of infant avoidable hospitalisation for asthma between 1996/ 97 and 1997/ 98 confirms findings by the evaluators of the FCHCS (HFA, 1998). Results here, however, suggest that Maori infants experienced the improvement to a relatively lesser degree. The trend for Maori infant pneumonia avoidable hospitalisations between the same two years was also found to be significantly worse than for non-Maori, i.e. the proportion of Maori pneumonia avoidable hospitalisations increased significantly. This suggests that even after removal of the fee barrier to primary care access, further environmental, or other factors unfavourable to health might still remain, particularly for Maori.

This chapter presents an interesting juxtaposition of findings relating to the Midland region. In part A, the community laboratories servicing the Greater

Hamilton area are seen to be performing an escalating number of common diagnostic tests, including those used to monitor diabetes and susceptibility to cardiovascular disease. In part B, the overall avoidable hospitalisation rates for five AHCs, including CHF and diabetes, are seen to be either stable or worsening, and rates generally are relatively high for both Maori and non-Maori in the Midland region as a whole. Taken together, this must mean that despite greatly increased activity (and state expenditure) in the Greater Hamilton primary sector, a substantial, and possibly expanding, section of the Midland community is still not receiving adequate health protection at an early stage in the progression towards life-threatening disease.

## **Conclusions**

Evidence presented in the previous chapter supported the proposition that cost became a major barrier to primary care utilisation through the 1990s, and that increasing test volumes seen by community laboratories possibly reflected the fact that testing was one component of primary care free to the patient. Since most of the work for the last two chapters was completed, the Labour-led coalition elected in late 1999 has signalled long term plans to phase out the CSC, and to work towards a completely free primary care service, building on positive aspects of the system already in place: the acceptance by many GPs of the principles of needs-based capitation, and expansion of the not-for-profit primary care sector, where practitioners are salaried (Ministry of Health, 2001).

Policy changes during the 1990s were not confined to the health sector. Changes in housing, welfare and employment policy from 1984 onwards might well have impacted on population health (National Health Committee, 1998). Similarly, compensatory changes in health policy (such as targeting of GMS subsidies) might have produced trends masking those resulting from laboratory test expenditure containment policy alone.

A further reservation in using percent 'abnormal/positive' test results or avoidable hospitalisations as policy performance measures in the 1990s is the difficulty in holding policy makers accountable for health outcomes where important priority setting roles were delegated to providers (Cumming and Scott, 1998). Funder/purchaser/provider roles overlapped throughout the period, and the practice of sub-contracting (e.g. sub-contracting purchasing power from funding authorities to IPAs) developed rapidly in New Zealand following the 1993 purchaser/provider split. This had the effect of blurring what was initially envisaged as a linear set of contracting arrangements. Such ambiguities must render the links between policy change, laboratory service providers, and outcomes even more tenuous.

Much of this chapter underlines threats to cost-effectiveness in attempting to base a state funded health system on privately controlled primary sector organisations. The more fundamental policy flaw, however, might consist in placing too heavy a reliance on primary care per se, whether privately or publicly controlled, as a first-line defence against ill health. Pool (1999) has drawn attention to the dangers inherent in basing comprehensive health care programmes on current service users as the basic unit, rather than on defined populations. Results on infant avoidable hospitalisations presented here suggest that even after removal of the fee barrier to primary care access, further barriers to the attainment of better health status might remain, particularly for Maori. Malcolm, Wright and Barnett (1999) list some of these as: low expectations, geography, transport, and the day-to-day pressures of coping with disadvantage. All these observations imply a need not only for increased resourcing of population-based health measures, but also for the integration of public health concerns into all aspects of public policy as a matter of high priority.

## Chapter 10: Benchmarking performance in the hospital laboratory environment.

*“Unfortunately efficiency in the health sector is notoriously difficult to measure. For example, the unit cost of procedures and other measures of output change in line with variables such as case mix and the degree of cost shifting to other providers. The relevant data are either not known, or not comparable across organisations or regions and/or over time” (Ashton, 1999, p141).*

This chapter examines some of the issues involved in costing laboratory services, and elucidates the role played by clinical laboratory costing approaches in influencing the cost-control goals of the 1990s health reforms.

### **Performance benchmarking – uses and potential**

In its draft ‘health sector management and services’ portfolio outline, the Health Research Council (HRC, 2001) stressed the need for policy-makers, managers and practitioners to balance quality of care with the cost of services. ‘High quality research is needed’, the draft outline says, ‘to inform decisions on financing and management of services at all levels of the health system’ (Health Research Council, 2001, p1). It pointed out that there is also a need for research to evaluate the benefits and implications of the shift from central decision-making to District Health Board-mediated decision-making that took place with the health re-structuring of 2001. Thus, the research sought in the HRC portfolio outline implies a need for cross-sectional and longitudinal comparisons of both costs and quality within a rigorous framework.

‘Benchmarking’ can be defined as the process of identifying superior performance, determining how that performance is achieved, and incorporating those practices to improve performance (Gordon, Holmes, McGrath and Neil,

1999). Comparative performance measurements have been used for varied purposes. In the US, where provider competition for health funding from a range of private insurers, managed care organisations and Federal Medicare/Medicaid programmes has been a strong motivator, one common application of performance benchmarking procedures is in costing for contract tendering (Venner, 1997, Zinn and Getzen, 1995). In the Australian private laboratory sector, ongoing financial performance evaluation has been advocated as a tool for maximising profits (Pannaccio, 1993). Other common roles for performance benchmarking include the development and continuous improvement of services and products (Campbell and Fowler, 1999, Conyers, Arblaster, McKeon, et al. 1993, Kelley and Street, 1996), and future service planning (Portugal, 1996). In Britain, attempts have been made to use comparative performance measurements to set targets for reducing the unit costs of acute hospitals. This regulatory use of performance benchmarking has parallels with 'yardstick competition', a system devised for improving efficiency in industries that lack competitive pressures (Dawson, Goddard and Street, 2001).

Umiker (1998) has distinguished two types of health service performance benchmarking both of which are helpful for the support of financial, marketing and managed care decisions. One type is operational benchmarking, which compares organisations for their staff productivity and resource use. Most of the examples cited above fall into this category. The second type is clinical benchmarking, which aims to compare clinician practice patterns and case complexity. Clinical benchmarking endeavours to move the measurement emphasis from outputs to outcomes, with the aim of ensuring that best clinical practice is based on evidence (Ellis, 2000). Bissell (1999) gives examples of the critical use of laboratory data to help build an evidence base for benchmarking best clinical practice. In a novel approach towards achieving desired outcomes, Eichler, Auxila and Pollock (2001) describe a USAID initiative in Haiti that uses performance-based payment as the mechanism for remunerating non-governmental organisations. The strategy resulted in markedly improved

performance (as measured by markers such as immunisation coverage), and in the development of improved organisational structures.

The trend towards global competition in health care, first evident in the early 1990s (Smith, 1996), makes comparisons of health care costs between countries more pertinent, especially those between near-neighbours. Comparisons with Australian clinical laboratory performance measures take on a particular interest for twenty-first century New Zealand, given the likely persistence of proposals for sending low-throughput 'specialist' tests to Australia for analysis (see later in this chapter). It is also likely that individual health service performance comparisons will become crucial following the re-decentralization of health decision-making in New Zealand. Central planning of many state funded health services may be limited to the allocation of funding priorities based on available cost-efficiency and cost-effectiveness evidence (Ministry of Health, 2000b, 2001). Much of this evidence base has yet to be built.

### **Clinical laboratory performance measurement – an Australian trial**

While operational performance benchmarking aims to determine the relative cost-efficiency and cost effectiveness of a production process in total (including an element of quality of outcome), quality is usually conceived in terms of customer satisfaction, i.e. it is assumed that the customer is able to judge the technical quality and fitness-for-purpose of the product. In the case of clinical laboratory services, technical quality is, from 2001, monitored by separate compulsory accreditation, registration, and revalidation undertaken by an external body, International Accreditation New Zealand (IANZ). As in clinical support services generally, the primary customer is a clinician, who typically liaises with a specialist pathologist or radiologist colleague to maintain up-to-date links between the relevant technology and medical practice. These safeguards and professional relationships, together with the relative ease of defining the primary good produced, mean that the application of performance benchmarking to

clinical support services should be straightforward, compared with its application to less easily defined health services delivered directly to patients. In practice, as Gordon, Holmes, McGrath and Neil (1999) discovered, even where inputs, processes, outputs and qualities can be quantified, performance measures may be distorted, and the benchmarking process confounded, by a range of factors. Among these are listed 'socio-demographic features of the area serviced; type of client serviced; incentives that exist for the use of funds; and utilisation of infrastructure' (Gordon, et al., 1999, p133). The last two factors listed, in particular, contributed to distortions of performance measures for the laboratory examined later in this chapter.

Although quantification of performance measures is theoretically practicable for clinical laboratories, if valid comparisons are to be made between laboratories, or over time, it is essential that tests be counted in a standardised way, and that the calculation of costs, including indirect costs (overheads), be consistent as far as is possible. In Australia, the pathology 'benchmarking' programme developed during 1996 by the RCPA<sup>4</sup> now includes 37 laboratories, both hospital and private. Gordon et al. (1999) describe the approaches to performance benchmarking in Australian clinical laboratories, developed for the RCPA programme.

The programme designers began with a decision that a 'test' would be the basic counted unit (rather than a 'specimen'), and by defining test nomenclature according to common (Australian) clinical usage. Wherever possible tests usually performed as a group, were included under a single label. All tests were classified within laboratory sub-disciplines or functional sections. Gordon et al. stressed the necessity for estimating the total costs of test result provision, including all the contributing resources, if laboratories operating under different organisational arrangements are to be fairly compared. Hence, costs were based on the 'total avoidable costs' incurred by an organization in providing a laboratory service: a

concept that includes costs not normally considered e.g. costs that, as a result of the laboratory operation, are incurred or saved elsewhere in the organisation (e.g. by increasing or reducing the average length of stay) <sup>5</sup>.

A process of summing all service resources into costs to form a single cost indicator per unit output, while providing a basis for comparison of like activities, cannot capture a quality element of performance, and may not fairly allocate indirect costs unless rules for the allocation have been carefully codified. In the Australian programme, indirect (or overhead) costs were linked to the sub-specialties incurring them within the laboratory and ultimately to each individual test result. A 'clinical costing', bottom-up approach to overheads cost estimation was used where possible, despite its heavy information system requirements, rather than the alternative top-down 'cost modelling' approach. Accrual accounting was employed, i.e. costs were imputed as they were incurred rather than when they were paid. Data were collected monthly, and reported on a test-by-test basis with care taken to preserve the confidentiality of contributing laboratories. The ultimate aim of the project is to determine the factors underlying relative efficiency, both between sites, and over time.

Conyers, Arblaster, McKeon, et al. (1993); Jackson (2001); and Phelan, Tate, Webster and Marshall (1998) have all analysed some of the limitations of the 'top down' cost modelling approach to diagnosis related group (DRG)-based overheads estimation in the Australian context. The reliability of service costs derived using cost modelling is thought to be open to question in Australia, because charges are frequently used as a proxy for costs, mediated through an agreed 'ratio of costs to charges'. This 'retro' approach to estimating overheads was developed in the US, where there had been a long history of cost information acquisition for pricing purposes, perhaps under more optimally functioning

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<sup>4</sup> RCPA Royal College of Pathologists of Australasia.

<sup>5</sup> An example would be in comparing point-of-care and laboratory-based test 'value for money' (Price, 2000). A total avoidable cost approach would endeavour to account for all costs saved and incurred by the entire hospital, as a result of basing the test in the laboratory.

market conditions. Australia (like New Zealand) does not have this history, and use of the information that is available can lead to distortions, particularly in 'smaller' hospitals.

A further consideration is that most refinements to DRG classification systems use 'length of stay' as a proxy for severity and complexity variations, in lieu of accurate cost weightings for the DRG sub-classifications. As lengths of stay decrease, their reliability as a proxy for complexity diminishes (Phelan et al., 1998).

### **New Zealand hospital laboratories in the 1990s**

The 1993 health reforms attempted to control costs and co-ordinate all components of the state health system, including the hospitals, by employing a competitive contracting mechanism. As in the primary sector, however, the only positive outcome from the competitive contracting phase of management in the hospital sector appeared to be more rapid and comprehensive within-service information flows for better-informed decision-making (Ashton, 1998). Even this, probably owed at least as much to advances in information technology as to the stimulus of competition. According to Gauld (2000), gains from competitive contracting in the hospital sector were 'outweighed by a plethora of results that had not been envisaged by policy makers' (p226). Contributing to these, was the dispersed nature of the New Zealand health 'market': there were few competing providers for most hospital services, so that competitive incentives to contain costs were effectively absent for most (Ashton and Press, 1997). Failure to meet business plans was invariably salvaged by government 'bail-outs'. The architects of the reforms had failed to appreciate the parochialism endemic to New Zealand health politics and its consequential political reality for politicians (Gauld, 2000). Le Grand (1999) cites the same political reality as an important reason for failure of the internal market experiment in Britain.

*'...because both central and local politicians were acutely sensitive to the political costs if a local hospital were to close, authorities were often instructed*

*by the central government to bail out trusts in financial difficulties'* (Le Grand, 2000, p 33).

Thus, the internal market for hospital services set up by the 1993 reforms in New Zealand lacked both the competitive incentives and the financial constraints necessary for successful market operation.

This combination of nominally constrained pre-negotiated funding, and near-certain retrospective budget top-ups (usually ear marked for reducing waiting lists) placed New Zealand hospital laboratories in an invidious position. Hospital laboratories found themselves forced to operate under a tightly constrained budget, while the clinicians governing their volume of activity were effectively free to respond to demand. Whether or not clinicians operated under a budget-holding regime with clinical units being billed for their laboratory utilisation, the effect on hospital laboratories appeared to be similar. The following comments endorse this view:

*"Yes we do [have a billing system]. They have to pay for it. Most of the testing comes from registrars and house surgeons anyway. But in the end I think people tend to say - well if we stop doing these tests we're going to save at the end of the month perhaps the cost of three or four X-rays... even some of the specialised laboratory tests are relatively cheap compared with most other investigations"* (Senior Auckland Hospital pathologist, 1999).

*"We have not been able to implement clinically based budget holding due to lack of resource at accounting support level. It has not been possible to move budget to the clinical units and have them manage their demand. We have been left to manage on a historical budget model, which in the last two financial years has been very top down. That is, a budget originally generated in the lab based on previous and predicted expenditure, is submitted to Hospital management. This budget is trimmed arbitrarily with no action plans around the reduced allocation and no sign off by responsible managers. To some extent we have been successful in managing expenditure on salaries through workforce planning, and*

*have helped our budget situation through revenue generation offsetting increased costs” (Health Waikato laboratory manager, 2000).*

As indicated by the last commentator, many hospital laboratories had become dependent on revenue generated largely by work originating in the private (including the primary) sector. The Auckland hospital-based pathologist quoted above was equally critical of hospital managers, and the unreasonable financial constraints they imposed on laboratories. His laboratory, the newly amalgamated and re-located Auckland hospitals laboratory, A+, had been refused formal accreditation in early 2001:

*“What happened at A+ is common to many hospital laboratories. Laboratories are seen as a money earner on the one hand, but also as a service that can be stripped down, because it does not deal directly with patients, and so it is less obvious when the system starts to fail. Failure is also less obvious because the staff work harder and longer to cope with the deficiencies, until they can do no more. None of this work has any benefit to the staff (in terms of productivity rewards), but they are led to believe that if the laboratory doesn't run at a 'profit', then their jobs are at risk, whereas the only two items which are really at risk are the managers' bonus payments and the service to the hospital patients - the latter outcome now having been clearly demonstrated at A+” (Senior pathologist, Auckland Hospital, 2001).*

The speaker draws attention in this passage to the ever-present tension between cost efficiency and quality of service that must be balanced by staff at the workplace who are constantly stressed, additionally, by job insecurity.

While the jobs of staff at a major national tertiary hospital laboratory like A+ are unlikely to be at risk, the situation at secondary hospitals has been more equivocal since the inception of the purchaser/provider split in 1993. Six hospital managements under the financial stress described, contracted out their laboratory workload to the private sector during the mid 1990s. By 2001, five years after inter-hospital competition was officially abandoned, only the laboratory contracts

for Northland Base, North Shore and Taranaki Base Hospitals had been relocated in-house.

The pattern set in the competitive ‘supply-side cost control’ health reform phase of the 1990s might well continue in the new ‘co-operative’, but equally cost-constrained, phase of the early 21<sup>st</sup> century. The following comments, referring to the effects of cost constraint on the Crown Health Enterprises (CHEs) in 1996, appear to be equally as applicable to their Hospital and Health Services (HHS) successors in 2001.

*“Laboratories are not regarded as core business by many of the CHEs, thus they have become potential targets for divestment. Ongoing automation and computer control of laboratory instruments continually erode requirements for technologists, both in terms of the number of FTEs and the skills required..... The old culture of entitlement has been replaced by a new anxiety about job security”* (Senior hospital-based pathologist, 1996).

It might be indicative of long-term directions for hospital laboratories that the 2001 government Budget signalled an intention to shift funding away from hospitals towards preventive care and ‘making visits to GPs cheaper for all’. Primary services, including community laboratories, doctor subsidies and immunisation, were given a relatively small, \$NZ23.5 million boost, as a first step towards the intended shift (Mold, 2001).

### **Public/private laboratory competition in New Zealand**

Clinical laboratory services in New Zealand are all state funded. Privately owned (or community) laboratories, which service the private sector (primary care, private hospitals and specialists), perform a narrow range of generally high-volume tests. Privately owned laboratories are fully reimbursed by the state on a fee-for-test basis, using a pre-negotiated schedule of fees, the ‘primary-referred schedule’, which will include overheads. More recently, with the takeover of the majority of former pathologist-owned laboratories by investor-financed

companies, an adequate contribution towards company profits will also be included as an element within the negotiated schedule price.

Hospital Health Services (HHS) laboratories have traditionally been funded from the global hospital budget through an allocation based retrospectively on past expenditure. They perform a wider range of tests, including specialist tests. Specialist 'non-schedule' tests from the private and primary sector are funded directly by a state health purchasing body or a 'budget-holding' primary care organisation, from a capped budget using pre-negotiated prices that will also include 'overheads' or indirect costs.

The 1990s history of competitive tendering for state funding of laboratory services has been outlined in Chapters 2, 6 and 7. The HFA's revived contestable contracting strategy in 1999 resulted in proposals to include all laboratories in tendering rounds for both primary-referred schedule tests and all non-schedule tests. Thus, the dual funding system would be retained, but both methods of funding (DRG-based and fee-for-test) would be available to all clinical laboratories. The HFA's 1999 strategy document anticipated that competitive tendering would result in fewer laboratory services providers, both hospital and community, but saw this outcome as desirable provided 'sufficient laboratory numbers remain to permit future contestability' (HFA, 1999, p25). There was no recognition that the two types of laboratory might serve separate functions within the publicly funded health system.

For the new Labour-led government, the HFA again recommended contestable contracting for all clinical laboratories, giving the following reasons:

*"...Lack of evidence that prices are correct and some evidence that they are too high... lack of competition in the community laboratory sector over price. Sonic Healthcare, an Australian company, now owns 65-70 percent of the New Zealand community laboratory sector... Regional discrepancies in availability of tests, and standard contract terms and conditions, including quality*

*requirements...Increasing utilisation at a higher level than the increase in funding. Expenditure has increased from \$116 million (1993 /94) to \$172.5 million (1999 /00)”* (HFA, 2000, p.23).

The figures quoted refer to tests funded from the primary-referred schedule only. The cost of tests performed in the hospital sector had been estimated at a further NZ\$180 - 200 million in 1998 /99, the previous year (HFA, 1999). The most compelling argument put before the Commerce Commission in justification for the Sonic Healthcare takeover might well have been the potential for synergies and economies of scale such a move could offer.

By early 2001, a revived Laboratory Services Advisory Committee had been asked by private pathologists to consider extensive revision of the 'primary referred laboratory test schedule' with a view to incorporating many of the specialised tests traditionally performed in hospital laboratories. It appeared unlikely that these specialised tests would, if incorporated into the schedule, be performed in New Zealand. Instead, they would be sent for analysis to the large laboratory owned by Sonic Healthcare in Sydney (personal communication, hospital-based pathologist, 2001). This move by the private laboratories underlines the vulnerability of hospital laboratories dependant on primary sector sourced tests to generate external revenue, maintain standards, and justify their own test repertoire and staffing levels.

### **Are laboratory services cheaper in the private sector?**

Since New Zealand clinical laboratory services are state funded, whether provided publicly or privately, the question as to which sector (or combination of public /private) provides the most cost-efficient service is pertinent, but not easily answered. In the hospital environment, research and training costs are difficult to separate out and quantify. Overheads are high, and their allocation to services highly complex, as the considerable costs of patient 'hotel' accommodation and HHS administration must be shared over all 'treatment' departments. Conversely,

privately owned laboratories, while bearing a smaller burden of overhead costs must return a profit to shareholders.

It is commonly held that transfer of formerly state-owned services to the private sector will generate efficiency gains (Easton, 1997). Profit maximisation is assumed to be the prime motivator of efficiency improvements. Easton argues, however, that managers of corporations in a position of market advantage do not necessarily make maximisation of profit a priority. Instead, having made 'sufficient profits to satisfy shareholders' managers 'then seek other goals, such as higher managerial remuneration, status, technological excellence, and maximum turnover' (Easton, 1997, p34). Such behaviour, as Easton points out, frustrates the ability of the market to send accurate price signals. Easton also suggests that firms with one or a few major shareholders (like those government-owned) might in fact perform better than those with multiple shareholders, because management is more closely supervised. Shareholders based offshore now own the majority of community laboratories in New Zealand, but local pathologists and technologists make the crucial management decisions. Easton's observations would suggest that reliance on private sector contracting to signal a 'correct price' under these circumstances is risky.

A further factor complicating cost-efficiency estimates in the New Zealand clinical laboratory area is the dual system of remuneration, which hinges on where the tests originate. Fee-for-test remuneration for tests originating in the primary- or private- sector (which echoes the fee-for-service state subsidy for GP and GP-referred specialist services) provides a strong incentive for all laboratories to market their services aggressively in the primary- or private-health services sector. With modern automated equipment, higher test volumes should lead to efficiencies of scale. However, the fee-for-test remuneration system precludes the transfer of such economies to the state, whether the tests are performed in the public or the private sector. Just as private sector managers might wish to optimise their own remuneration and conditions, hospital

administrators have an incentive to make a disproportionately large allocation of overhead costs to those hospital departments that can charge-out some of their services (Peeters, Rublee, Just and Joseph, 2000). Furthermore, researchers in the US have demonstrated that in a consolidated market, it is market share that drives hospital pricing behaviour – regardless of whether the hospital is non-profit, publicly traded, or private for-profit (see for example Melnick, Keeler and Zwanziger, 1999). Public hospital managers, it seems, will not necessarily behave more altruistically than those in the private sector, and may be equally as concerned to improve their own remuneration, security or conditions. Consequently, costing estimates for hospital laboratory services that include overheads might be equally as ‘incorrect’ as those for private company-owned laboratories in a position of market dominance. If all clinical laboratory funding is to come from the state pocket, a method for establishing the elusive ‘correct price’ more reliable than market discipline, would seem to be necessary.

### **Health Waikato laboratory: a case study**

In Britain there have been repeated attempts since the early 1990s to issue standardised guidance on how healthcare costs should be estimated (Bowerman and Francis, 1996; Elwood, 1996; Northcott and Llewellyn, 2000). In New Zealand, health-sector costing workgroups known as ‘health technical groups’ were established by the former HFA. ‘Common costing’, ‘common counting’ and ‘common charts of accounts’ originally developed in the US were adapted for New Zealand use, in parallel with a benchmarking procedure for standardising DRG calculations. ‘Common’ guidelines were introduced specifically to enhance the reporting consistency, cost allocation and comparability of public health providers, and ‘to improve the bases for setting prices for services purchased by the funding authorities’ (Brown, Ludbrook and Taumanu, 2001, p19). They had either been adopted, or were being adopted, by most HHS services in New Zealand by late 2000. Underlying the desire of the HFA to standardise the measurement of HHS performance was the breakdown of the former competitive contracting system for achieving price control, and the desire to counter the

potential for inter-hospital collusion to inflate prices (personal communication, former HFA analyst, 2000).

Some of these 'objective' costing methods were implemented in a groundbreaking review commissioned by Waikato Hospital, and undertaken over a six-month period in 2000. The impetus for this initiative was Waikato Hospital's chronically poor performance against budget throughout the 1990s. Thus, the 'Moving Forward Project' (Brown et al., 2001), was designed to compare the overall performance of Waikato hospital against those of three New Zealand hospitals of similar size and service mix, using a series of standardised patient throughput indicators, together with cost-efficiency indicators for the individual treatment and support service departments. These same indicators were also used to follow trends in Waikato Hospital's performance over three consecutive years: 1997/98, 1998/99 and 1999/2000. Since patients within a single DRG classification would have varied treatment and care requirements and, therefore, generate a range of associated costs, each patient counted in the review period was 'weighted' on discharge according to a standard procedure, to produce what was designated as a 'cost-weighted-discharge' as the basic counted unit used in the system. Although the guidelines set out in the 'common counting and costing' methods were used to allocate costs for comparative purposes (and for price setting) they were not used to set budgets for Waikato Hospital's component departments, and this proved a potent source of dissension and low morale, as the authors of the Moving Forward Project Report noted (Brown et al., 2001).

The emphasis of the Moving Forward project was on pinpointing the key factors underlying the relative financial performances of major hospitals like Waikato. It was, therefore, unlikely that the approach used would yield data useful for valid inter-laboratory comparisons of total performance, like those for which the RCPA project, described above, was designed. Nevertheless, the Health Waikato HHS laboratory, which had recently restructured to improve its financial and quality

performance (and to ensure survival), was understandably interested in the comparisons generated.

In due course, the 'Moving Forward' project team was able to report that Waikato Hospital had performed comparatively well on most indicators against its 'benchmarking partners' as did many of its component treatment and support services, including the laboratory. (Detailed comparisons by sub-discipline were undergoing further analysis at the time the Moving Forward Report was published.) On the downside, however, most of the key performance indicators followed retrospectively over the three-year period were no longer showing improvements. In particular, the key cost-efficiency indicator for laboratory performance (the overall mean cost-per-test) had increased 24 percent over the three years (Brown et al., 2001). This result was at odds with the laboratory's own estimate of its mean cost-per-test, which differed markedly in two ways: it was approximately one fifth the cost (so, as a pricing guide, considerably more competitive), and it diminished 1.4 percent over the three years monitored (suggesting improved performance as a result of restructuring).

**Table 10-1: Comparison of laboratory performance measures**

	1997/98	1998/99	1999/2000	% change over 3 years
<b>Project total tests*</b>	1607985	1637126	1671681	4.0%
<b>Laboratory total tests</b>	<b>(4963730)</b>	<b>(5326562)</b>	<b>(5314866)</b>	<b>(7.07)%</b>
<b>Mean staff \$/test*</b>	\$2.54	\$2.41	\$2.45	-3%
<b>Mean non-staff \$/test*</b>	\$1.95	\$2.21	\$2.50	28%
<b>Mean indirect \$/test*</b>	\$1.41	\$2.01	\$2.34	66%
<b>Project mean total \$/test*</b>	\$5.90	\$6.63	\$7.29	24%
<b>Laboratory mean total \$/test</b>	<b>(\$1.44)</b>	<b>(\$1.35)</b>	<b>(\$1.42)</b>	<b>(-1.4%)</b>

\* = complexity adjusted

\$=\$NZ

The above table compares laboratory performance measures estimated by the Moving Forward project with those calculated by the laboratory itself. While the project estimates include corporate overheads and hospital overheads, both allocated using ‘common counting’ and ‘common costing’ guidelines, laboratory estimates account for only those costs, direct and indirect, allocated to the laboratory in the hospital’s General Ledger and these have been offset by revenue generated by the laboratory from external sources.

Because it omits hospital and corporate overheads, the laboratory mean cost-per-test will be invalid for comparing laboratories in different sites, and for pricing purposes. It would, however, be seen as appropriate for internal performance measurement in so-called ‘responsibility accounting’. It captures longitudinal gains in internal efficiency, and although it incorporates no element of service quality, the laboratory, as part of its effectiveness drive, does monitor several quality indicators longitudinally. All performance indicators monitored by the Waikato Hospital laboratory are listed below.

**Table 10-2a: Indicators used to assess aspects of performance quality:**

Turnaround times – within lab

Turnaround times – total

Staff mix FTE technologist/ technician ratio

Internal quality control

External quality control

IANZ registration requirements

Health and safety reports

Client consultations/ responses to requests for assistance

Client surveys or other avenues (e.g. focus groups) to obtain client feedback

Contributions to the literature, presentations

In-service education, conferences, reports

**Table 10-2b: Indicators used to assess financial performance:**

% increase in specimens

Mean cost/test (omitting hospital and weighted overheads)

Mean cost/test (including 'weighted' overheads')

% increase tests

Deviation from budget (Actual/projected)

Staff cost / FTE

Staff cost as % revenue

Stock valueLeave balance (sick and annual)

Operating expenses (consumables, reagents)

Non-DRG-based income generated

Number and proportion of specialist tests (i.e. cytogenetics, virology, immunology)

Overtime as a percentage of total hours

Billable tests/ FTE (technical)

Billable tests/ FTE (total)

Over the three years monitored in this study laboratory records showed marked improvements in several key performance indicators considered significant by laboratory management. Specimen numbers had increased by 13 percent; the percentage of specialised tests by 31 percent; specialised test numbers by 50 percent; and external revenue by 80 percent. The technologist: technician ratio, which had been excessive at 2: 1, had been brought nearer the optimum of 1: 1, and expensive overtime hours had been kept well controlled. These indicators of active management were reflected in the laboratory-measured mean cost-per-test, despite a marked fall in the value of the New Zealand dollar over the time frame followed. In addition, turnaround times had been dramatically reduced. None of these clear gains in efficiency and effectiveness, however, were reflected in the

data produced using the 'common costing-common counting' formulae for the calculation of overheads.

While the laboratory mean cost-per-test has limitations for inter-laboratory comparisons, the 'common costing and counting' formulae also fall well short of the goals of a good laboratory benchmarking system. It is clear from data given in the Moving Forward Project report (Brown et al., 2001: Appendix 6) and Table 10-1 above, that 'tests' are counted differently by the laboratory on the one hand, and by the patient tracking software used for hospital costing on the other. Performance measures for hospitals have been captured for comparative purposes by the 'common formulae' at the expense of meaningful measures of departmental performance. The mean cost-per-test indicator generated by the 'common formulae' will not capture savings made from economies of scale in the laboratory itself. It will have limited usefulness only, for comparing hospital laboratories of closely similar size and workload complexity within New Zealand, and possibly for resource allocation within that cohort. It does, however, appear to be the only official comparative measure of mean laboratory test 'costs' and to the extent that it produces overestimates used in pricing, can only drive all laboratory test prices, both hospital and community, upwards or, at best, maintain them at artificially high levels.

It would be ironic if the long-held objective of successive New Zealand governments to divert health funding away from hospitals and into preventive health care, were being subverted by a performance measuring system that was itself set up to counter potential inter-hospital collusion to optimise their DRG-based income!

### **Are clinical laboratory services cheaper elsewhere?**

Although expenditure on New Zealand community laboratories can be monitored using claims for the laboratory services benefit submitted to the government agency Health Benefits Limited, historically, expenditure on public hospital

laboratories has been difficult to un-bundle from total hospital expenditure. Estimates, however, suggest that the state's expenditure on community laboratories in New Zealand has been at least matched by its expenditure on hospital laboratories over a long period (HFA, 1999, New Zealand Board of Health, 1974). The following table, which is derived from official published data, lists the community laboratories' share of the total health budget through the 1990s. Thus, to obtain an estimate of the overall share of the total health budget consumed by laboratory testing, these percentages should be at least doubled.

**Table 10-3: Laboratory share of Vote Health**

<b>YEAR</b>	<b>% Vote Health</b>	<b>Reference</b>
<b>90/91</b>	2.39%	Upton, 1991
<b>91/92</b>	-	-
<b>92/93</b>	-	-
<b>93/94</b>	2.77%	Ministry of Health, 1995
<b>94/95</b>	2.69%	Ministry of Health, 1996
<b>95/96</b>	2.64%	Ministry of Health, 1997
<b>96/97</b>	2.58%	Ministry of Health, 1998

A conservative estimate is that New Zealand's laboratory services, in total, consumed at least 4.8 percent of the state health budget in 1992/ 93. By comparison, Price and Barnes (1999) report that the British National Health Service (NHS) spent an estimated 3.5 percent of its total expenditure on pathology services in 1992 /3, or 27 percent less than New Zealand.

Almost all Britain's laboratory testing was still being performed by public hospitals in the early 1990s, with only a small rise in privately-controlled laboratory testing by the later 1990s (Price and Barnes, 1999). It must be remembered, however, that the NHS is more comprehensive in its primary sector

coverage. Patient part-charges are not required for general practitioner services, or for pharmaceuticals prescribed to large, targeted patient groups, e.g. pensioners. This would lower the laboratory contribution to total expenditure in the NHS, relative to that in New Zealand, where laboratory services are the only fully state-subsidised component of the primary health sector.

Reasons for relatively high expenditure on testing in New Zealand would include its distance from *in vitro* diagnostics reagent and equipment suppliers, the ill fortunes of the New Zealand dollar, and the low population density of the country, which has led, historically, to its typically sub-optimal pathology service-provider size. Differences in proportionate expenditures reported by Price and Barnes, however, also reflect the difficulties in making valid cost comparisons between countries with widely differing health systems. Similar difficulties would be anticipated when comparing costs between differently funded components of the same national laboratory service, or following an individual laboratory's costs longitudinally through a period of rapid health-political change.

### **Costing hospital laboratory services in a wider context**

Comparisons of costing and pricing experience in New Zealand laboratories with that in the US are instructive. Historically, US hospitals and doctors used the laboratories they controlled as a means of raising revenue, over the almost 40 years during which they received fee-for-test reimbursement. Commentators describe the evolution of the laboratory 'cash cow' role in the following passage:

*"[Hospital] room charges could not be inflated beyond reason.... But... no one knew how much a blood-glucose was worth. As charges for laboratory tests were escalated the actual costs of performing the tests declined rapidly due to better laboratory organisation, higher test volumes and introduction of automation.... Because hospital laboratories were the bellwethers in setting laboratory charges,*

*the field was attractive to large independent laboratories. Physicians in office practice could send specimens to these... and it was common practice to add large mark-ups to the charges and bill the patients for the inflated charges”* (Conn and Snyder, 1997, pp 41-2).

The expansion of ‘managed care’ with the development of Health Maintenance Organisations from the early 1980s, together with the move to DRG-based reimbursement by the US Federal government-funded Medicare programme, precipitated a major change in laboratory status. Laboratories that had formerly been ‘profit centres’, became ‘cost centres’, and were subjected throughout the subsequent 15 years to increasingly stringent cost-containment measures (Kricka, Parsons and Coolen, 1997).

When Waikato hospital moved to DRG-based funding, all support services became ‘cost centres’ competing for resources: a situation that appears to have resulted in the laboratory receiving proportionately less of the DRG workload-based funding allocation over time. The failure of demand-control strategies and the retention of fee-for-service test reimbursement in the private sector, however, would have provided a motive for laboratory unit price inflation, analogous to that which evolved in US hospitals, in what might be seen as the hospital managers’ equivalent of Easton’s managerial collusion: the propensity of managers to place other objectives ahead of profit taking (Easton, 1997) or, in the case of state organisations, ahead of economies in the wider and longer-term public interest.

By 2000, a prominent US laboratory medicine commentator was addressing:

*“...the absurd concept of the ‘billed’ test...This ridiculous concept makes comparisons of productivity between institutions impossible. Indeed, the ‘billed’ test hides increases in productivity because one billed outpatient test may generate as much work as 12 inpatient tests. Successful efforts by hospitals to*

*reduce their inpatient testing, because of non-reimbursability, then mask any increase in revenue-generating outpatient tests”* (Young, 2000, p 740)

How much more absurd, when the inpatient’s test and the ‘billed’ test are funded, as in New Zealand, from the same (public) purse. Here, the ‘billed’ test, rather than being ‘revenue-generating’, merely represents a cross-subsidy between sectors, i.e. unit prices have inflated for no financial gain (in fact, for a net financial loss) to the public health system.

### **Intervening in the laboratory market**

Methods used for allocating overheads (and pricing services) should be reflected in hospital departmental funding allocation methods (as they are in the primary-referred laboratory test schedule) if the system is to be perceived as fair: a point made strongly by the Moving Forward Project team. For most tests, and particularly for automated tests, the cost to the organisation of doing each extra test should fall quite steeply with the total. Ministry of Health officials have contemplated using a formula for reimbursing ‘primary-schedule’ tests that more closely reflects their most efficient cost, by dividing ‘schedule’ test reimbursement fees into agreed fixed and variable (volume dependant) components (HFA, 1999). An important advantage of this approach would be its potential for encouraging rationalisations involving expensive duplicated equipment. In addition, incentives for laboratories to lift volumes and costs to high levels through intensive marketing would be lessened, and funding bodies should gain from the resulting efficiencies. A disadvantage would be the difficulties involved in negotiating and setting up such a system, the possible lengthening of turnaround times associated with laboratory consolidation and, as the HFA strategy team observed, the associated increase in transaction costs that would be passed on as price increases.

In Australia there appear to be multiple models for discouraging the profligate use of laboratory testing. In the following comments, the operation of the fixed and variable reimbursement model is described:

*“Community and private work is Commonwealth reimbursed. Private gets a ‘flagfall’ fee, plus a volume dependent fee. Public gets only the volume dependent*

*fee [no flagfall]. This provides a HUGE advantage to the private sector, which is experiencing significant growth, both in total market share, as well as in relative market share taken from the public sector”* (Australian hospital-based pathologist, 2001).

The implication of this comment is that whereas Australian reimbursement agencies assume hospital laboratories will be allocated a share of the hospital DRG funding equivalent to their actual total fixed costs, that share in practice, as in New Zealand, falls short of what is needed to keep hospital laboratories competitive. It would appear that both countries, whether consciously or inadvertently, are running policies favouring the private sector or, at best, forcing eventual hospital laboratory consolidation.

Another model for curtailing volume-driven laboratory expenditure also used in Australia, is the top-down restriction on GP laboratory utilisation patterns, in combination with much firmer supply-side price controls than are in place in New Zealand.

*“Attempts to curtail this [growth] have been largely targeted at placing micro-caps on particular combinations of tests: if you order A, B and C, you can only be paid for A and B but not C, but if you order A and C without B, you can be paid for both; as well as by a macro-cap: the total national expenditure on pathology is fixed - if utilisation goes up, then fee per test goes down”* (Australian hospital-based pathologist, 2001).

Thus, an Australian laboratory can increase its profits only by increasing its market share within Australia, since the option of expanding the market would entail doing more work for no greater remuneration. This explains why much of the growth seen in Australian private laboratory test volumes has been at the expense of hospital laboratories (and why New Zealand has become an attractive potential market, for both laboratory service providers and investors).

Perhaps the ultimate answer to rising laboratory expenditure and test volumes is the imposition of patient part charges, or co-payments. Again, the Australian experience is instructive:

*“Patients are billed at the discretion of the lab [and usually at the recommendation of the referrer].*

*If they elect to ‘direct bill’ Medicare, a voucher is signed and the patient pays no money: the Govt reimburses 85%. Co-payment is NOT permitted.*

*If they elect to send a physical invoice to the patient, then the patient will receive 85% back from Govt, but must pay the balance.*

*Australia wide, about 80 percent of invoices are direct billed [to Medicare], and this percentage is growing annually. Some path practices only direct bill, but most have some type of premium on the remaining minority of invoices” (Australian hospital-based pathologist, 2001).*

Australian laboratories, it seems, prefer to attract and keep clients, or market share, even at the expense of losing a 15% patient part-charge: an observation that underlines the crucial importance of test throughput as a driver of laboratory efficiency. It would be interesting to see how high the patient part charge could be set before laboratories could no longer afford to waive it. Realistically, however, a part-charge, or certainly one higher than 15 percent, would be unlikely in New Zealand at the time of writing, given current policy directions towards a cheaper primary care service (Mold, 2001).

The Australian experience suggests that there was scope for greater efficiency from economies of scale in Australia, even after the volume-dependence of the financial return was ‘damped down’ by the two-component Medicare remuneration system. These economies might well have been achieved, however, at the expense of hospital laboratory viability.

## **Conclusion**

Hospital DRG-based costing for prospective state funding using recently developed guidelines, results in apparently inflated total costs for New Zealand hospital pathology departments, reinforcing the non-cost-based prices charged to the primary sector. At the same time, the new guidelines mask real hospital

departmental cost structures. It is especially ironic that this should occur at a time when official policy has been explicit about containing the costs of all laboratory services to the primary sector, and reducing the excessive use of expensive hospital-based treatment services.

A further, possibly unforeseen, effect of the guidelines is that unless the same methodology is used in the future to allocate DRG-sourced funding to hospital pathology departments, only the two or three largest hospital laboratories might prove to be viable, given the more favourable reimbursement rules available to community laboratories. New Zealand community laboratory reimbursement rules need to be rationalised: not only to reflect more closely the true cost structure of efficient test provision, but also to align better with reimbursement rules in Australia, now that improvements in technology have made a common market possible.

It has often been argued that the availability of a hospital laboratory on site carries considerably more than monetary value for clinicians and for medical specialists of all kinds, in training. Furthermore, New Zealand's relatively low population density might set practical limits to the efficiencies achievable by the consolidation of laboratories on fewer sites. The introduction of the clinical costing methodology already developed and tested in Australia would facilitate a more rational, evidence-based allocation of state clinical laboratory expenditure across both sectors. Without a valid measure of relative financial performance it is impossible to put a figure on the cost of the present levels of coverage, or to place those levels rationally in a wider scheme of health (and health workforce) priorities.

## ***Part Five: Formulating a Solution***

### **Chapter 11: Weighing up**

This thesis has gathered and analysed evidence testing a hypothesis centred on the impacts of market-style resource control on New Zealand's clinical laboratory services. It was acknowledged, early in the study, that the clinical laboratory system could not be seen in isolation. It impacts pervasively on the health service as a whole, and it holds potential as a convenient pilot service for the trial of radical policies, like the New Public Management style and the privatisation of service provision, in the New Zealand health sector. Thus, in this chapter, arguments directly relevant to the initial hypothesis are analysed, and some implications of the study for the wider goal of health service reform evaluation are presaged. These implications are developed more fully in the succeeding and final chapter.

In common with the 1990s health reforms, New Public Management reform was driven by the conviction that greatly improved cost-efficiency in the public sector was achievable by employing private sector-style market resource controls, facilitated by generic managers. As part of a discussion on the rhetoric surrounding New Public Management reform, Wallis and Dollery (1998) presented a framework of historically recurrent reactionary arguments against such major reform, together with the corresponding progressive arguments, for it.

A summary of this framework, given in Chapter 3 of this thesis, is re-presented below. As an aid to weighing the evidence gathered throughout this thesis I

propose to move through the table row-by-row, selecting the best-supported arguments and recapitulating the evidence for them.

**Table 11-1:** Recurrent arguments used in the NPM debate.

REACTIONARY POSITION	PROGRESSIVE POSITION
<p><u>Jeopardy Thesis</u> The historic achievement of the bureaucratic paradigm in establishing a unified, trustworthy public service may be threatened by the drive to make it more efficient and economical.</p>	<p><u>The Imminent Danger thesis</u> The failure to make the public service more efficient and economical may threaten the future provision of public services in an environment of fiscal austerity.</p>
<p><u>Perversity Thesis</u> Public sector reforms can exacerbate the conditions they set out to remedy e.g. it is possible that the NPM may make the public service less effective, efficient and economical.</p>	<p><u>The Desperate Predicament Thesis</u> Government failure has become so entrenched that it can only be addressed by a radical reconstruction of the public sector regardless of any counterproductive consequences.</p>
<p><u>Futility Thesis</u> Reforms will fail to realise the intentions of the reformers e.g. NPM will have little impact on the craft and coping activities of public organisations.</p>	<p><u>Futility of Resistance Thesis</u> It is futile to resist NPM-style reforms since it is imperative that public organisations adapt to changes in the global environment.</p>

(Wallis and Dollery, 1998.)

### **Jeopardy or imminent danger: A unified public service or an economical one?**

Chapter 6 of this thesis described the transfer of occupational control from pathologists (the only laboratory professionals who had previously enjoyed significant autonomy) to management, through a series of increasingly interventionist strategies, culminating in an extension of ‘provider’ competition. The effect was to progressively exclude pathologists from advisory and decision-making roles on the grounds of ‘conflict of interest’. A striking loss of service cohesiveness resulted and, in the case of several patients whose inaccurate

laboratory reports went unmonitored, tragedy occurred (Duffy, Barratt and Duggan, 2001). Nevertheless, pathology and other clinical laboratory-based professional bodies have continued, throughout the 1990s, to press for mandatory quality audits and, as material presented in the preceding chapter (Chapter 10) affirms, for more valid methods of costing laboratory services.

On the other hand, securing fully state-provided laboratory testing could scarcely be said to be an achievement of the 1990s health reforms. Chapters 7 and 8 on the failure of both market-led and demand control strategies to contain clinical laboratory expenditure, and Chapter 10, describing the contribution of pro-market ideology to maintaining inflated test prices throughout the service, all point to the introduction of co-payments for laboratory tests as a likely future expedient.

### **Perversity or desperate predicament: the relative weights of gain and counter-productivity**

On the question of side effects from the reforms, the bulk of evidence gathered for this thesis again favours the so-called reactionary position: that the 1990s reforms became highly counter-productive, even in their own terms. Thus, the change towards market controls not only destroyed assets of the existing centrally controlled laboratory system (co-operative arrangements between centres and sectors, attractive career structures, a research and development-oriented culture), but greatly increased expenditure on laboratory testing 'with no clearly demonstrable evidence of health gain' (HFA, 1999, p 10).

The increased focus on 'customer satisfaction' fostered by the reforms appears to have been largely interpreted by laboratory managers as a licence to increase market share. This thesis has demonstrated, through multiple approaches, steeply increasing public expenditure on community laboratory testing seen throughout the 1990s (73 percent increase in real terms between 1989 and 1999) was largely

volume driven. A further contribution to the increased expenditure was the proliferation of clinical laboratories that occurred in the early years of the reform decade. This exacerbated an oversupply of providers dating from the pre-reform days of labour-intensive technology and relatively cheap labour (Bassett, 1993). Despite the increasing test volumes, however, there were indications by 2001 that New Zealand laboratories (now using sophisticated automated equipment developed for very large centres of population in Europe and America) could still be operating at well below capacity. Evidence presented in Chapters 7 and 10 suggests that market-led control of the New Zealand laboratory sector neither indicated the most efficient test prices, nor engendered the widespread laboratory amalgamations that have occurred elsewhere in the interests of cost-efficient laboratory testing.

The outcomes of changes to primary care policy examined in Chapter 9 suggest that improved patient surveillance, including increasing use of common diagnostic tests, was largely ineffective in reducing the avoidable hospitalisation rate. An exception: that of asthma avoidable hospitalisations, appeared to be strongly influenced by the Free Child Health Scheme introduced by New Zealand First, a coalition partner with a left-leaning policy mandate elected in 1996.

Thus, as the 'perversity thesis' outlined in Table 11-1 asserts, the net effect of the pro-market health reforms appears to have been an increase in expenditure on laboratory testing, and an exacerbation of both the cost-inefficiency, and the cost-ineffectiveness of the laboratory sector.

### **Futility or futility of resistance: Effectiveness in the global environment**

One of the reasons given by Upton (1991) for introducing an internal market in health was to provide an enhanced working environment for health professionals. While the advantages of overseas investment were not canvassed directly in this context, it is likely that planners saw injections of private and /or overseas funds

as potentially beneficial outcomes of the more open market for health services (see Chapter 7). Possible spin-offs for New Zealand health professionals in the form of ‘stimulus to training, knowledge exchange, the importation of innovative management practices, flexibility, and technology transfer’ (Enderwick, 1997) could ensue, in the new global environment.

The experience recounted in the preceding chapters suggests that the incursion of foreign investment into the laboratory services sector was wholly speculative in the business sense and, in itself, yielded little of value to New Zealand. Early purchases of laboratories throughout the country by the Swiss-based company SGS left the individual laboratories acquired by the company largely independent, so that potential economies of scale from co-operative purchasing, or the centralisation of expensive equipment and services, were never realised. The amalgamation of the two chains of community laboratories formerly owned by SGS and the NZ-based Diagnostics, and their purchase by Sonic Healthcare (Australian based), could, potentially, achieve significant economies of scale in the community laboratory sector (see Chapter 8). However, investigations of costing systems and remuneration rules reported in Chapter 10 have pointed to factors that would counter these economies as outlined below.

Firstly, DRG-based costing systems for allocating costs at service level reinforce inflated non-cost based hospital laboratory test prices, thus undermining the competitiveness of Sonic Healthcare’s major ‘counterweight’ in this country. Secondly, New Zealand’s uncapped and highly volume-dependant remuneration system for primary sector sourced tests makes the country a lucrative target for Australian-based investors, and for Australian-based laboratories, now that technological and transport advances have made a common laboratory market possible. The net effect, could be losses of skilled jobs and training capacity in New Zealand unaccompanied by economies to the public purse: i.e. a lose-lose outcome, and certainly not what the reformers intended.

There have been positive imports of the kind referred to by Enderwick (1997) from Australia and elsewhere but their penetration of the clinical laboratory sector has been largely on the initiative of individuals in professional bodies and educational networks already in existence before the 1990s (see Chapter 6). A report commissioned by the Auckland District Health Board on the troubled Auckland Hospitals' newly combined laboratory, pointed to reduced support for scientific research and development for at least five years, as a major concern of staff (Johnston, 2001). In focussing on customers, it would seem that laboratory management chose to focus, in practice, on their most immediate 'customers', requesting doctors, rather than on their ultimate customers, patients. Thus, the culture of 'customer focus', while providing innovative stimulus of a kind, was given a wholly expedient interpretation by most laboratory managers; again with results unintended by the reformers: dramatically increased test volumes and, in some well-publicised cases, deficient management of total quality.

In summary, the very wide-ranging evidence gathered in this thesis has supported only the 'reactionary' position on market-type control reforms as a route to cost effective clinical laboratories. Furthermore, it would be possible to argue that the decade post-reform has left the service no more effective, while costing the country at least 73 percent more in real terms (if, as seems likely, volume increases in hospital laboratories paralleled those in the privately owned laboratory sector), and that much of this cost increase was directly attributable to the reform ideology. Without informed intervention further increases seemed likely, and just as likely to be shifted on to non-targeted patients, in a health economy at least as constrained as it was in 1990 (Bassett, 1993). This particular radical reform of the health system structure had not served laboratories well and a focal shift was overdue.

### **Lessons from the recent past**

In the lead up to the critical change to a National (conservative) government in 1990 that precipitated the pro-market health reforms, several long-standing weaknesses within the state funded clinical laboratory system could be identified. Some had been present since its inception in 1946. These were listed in Chapter 3 and are re-presented here:

- The dual system of publicly- and privately-controlled laboratory services, both state funded, duplicating expensive equipment, materials, and staff structures;
- Demand for services mediated through other professionals, rather than patient initiated;
- Third party payment;
- Professional incomes /career structures strongly influenced by service volume.

The first and last of these are fundamental design faults: the second and third, are potential threats to service effectiveness, requiring the incorporation of checks and balances in the health system as a whole.

If the analysis in the preceding sections of this chapter reflects an accurate picture of the course of events through the 1990s, then it would seem that the pro-market health reforms of the 1990s not merely failed in their stated objectives, but actually exacerbated the effects of the already existing weaknesses listed. Thus, as Chapter 10 has shown, the dual system of control (and funding) for laboratories conspired to undermine efforts to use the market to contain state expenditure. The emphasis on customer satisfaction, which is central to the proper functioning of a market, led, in the case of clinical laboratories, to a concentration on delivery quality (to doctors, as direct customers) rather than on technical quality: a concept that Levy (1996) interprets as 'patient safety'. (One telling comment that emerged coincidentally from an interview with a hospital laboratory manager was that, following restructuring; the former 'quality control officer' had been re-designated as the 'marketing manager'.) A side effect of this

emphasis on efficient service delivery was burgeoning test volumes: an outcome reinforced by the imbalance between those components of the system, like laboratory testing, that were free to patients, and those requiring co-payment. Inadequate incentives and penalties built into the demand control systems of both sectors meant that demand control was largely ineffective.

Finally, the threat of laboratory service contract loss: always present in a market-controlled system; also meant that professional careers and livelihoods were directly dependent on market share. This is a position considerably more extreme than the fourth statement listed above as a systemic weakness.

That weaknesses already present in the clinical laboratory system were thrown into such strong relief by the introduction of pro-market policies, is perhaps the most telling indictment of structural reform as an instrument for achieving cost effectiveness. In 1996, Dr Lester Levy, then CEO at Middlemore Hospital in Auckland and a King's Fund International Fellow, wrote a critique of the New Zealand pro-market health reforms that focussed on a crucial deficiency: they addressed primarily what he calls the anatomy (the structure) rather than the physiology (how the system works), while ignoring the psychology (or culture) of the healthcare delivery system.

*"...politicians restructure the health system to create a perception of working towards an improved health system, when improving the health system actually requires new ideas about making the system work better which in most cases will be unrelated to structure..... Generally, they [government and politicians] lack a real understanding of the health care delivery system, often exacerbated by health officials with the same deficiency, [but this understanding is necessary] to develop a clear tactical path forward" (Levy, 1996, p4).*

These comments imply a need for health professional leadership in a fundamental redesign exercise, independent of the health system's administrative structure.

Although an express purpose of the reforms had been to align price and performance in health service delivery, and to make issues around both price and performance more transparent, they failed to do this, and in fact ‘clouded and confused’ such issues (Levy, 1996, p7). Levy isolates the chief reason for this is as the differing payment mechanisms between the primary and secondary /tertiary sectors: fee-for-service and capitation. Each, he points out, creates quite different incentives. Their co-existence results in fragmentation, and failure of the two sectors to work together towards a common purpose.

The case of clinical laboratories explored in this thesis, has demonstrated in detail the potential for two co-existing remuneration systems to ‘cloud and confuse’ price and performance issues, particularly where market conditions span both primary and secondary/tertiary sectors. It has become increasingly difficult to ascertain whether or not New Zealand is getting value for money from a service containing such fundamental design faults. As Levy comments, better ways of providing affordable outcomes for patients require a co-operative approach. This will be unlikely to occur spontaneously and extremely difficult to foster, following the divisive imposition of market discipline upon laboratories through the health reforms of the 1990s.

## Chapter 12: Competition, co-operation or control?

I have chosen to introduce the final chapter in this thesis with the following passage because it focuses attention on two key requirements for modern health systems: cost effectiveness, and the pivotal role of expertise. It comes from an address by British health economist, Alan Maynard, in 1994, at the height of the British pro-market health reforms.

*“The current health reforms...create regulated markets at high cost to contain clinical practice and produce more cost effective outcomes. But is this investment demonstrably more efficient than the creation of a new Hippocratic oath obliging clinicians to provide knowledge-based cost effective health care?”* (quoted in Salmond, 1998, p 3).

Feek (1999) has also drawn attention to limitations of the traditional Hippocratic oath that centres upon benefits to individual patients without regard to issues of scarce resources, or wider population needs. As he observes, both the pro-market health reforms, and the new (2000) Labour-led government’s continuing endorsement of population-based funding formulae and integrated care, represent moves away from the traditional focus on individuals. He sees a need for all health professionals to ‘adopt an agenda to improve societal health’ (Feek, 1999, p4). The realization of such an agenda, however, implies the availability of a comprehensive evidence-base for cost-efficient and cost-effective health care practice: i.e. one that covers both its content and its delivery. A government role in promoting and supporting its continuing development would seem to be a fundamental prerequisite for such an evidence-base, together with sufficient public input to ensure the relevance and quality of the evidence gathered. Mistrust of scientific, technical and clinical expertise by government strategists (see Chapter 6), spurious public involvement, with sometimes perverse results (Duffy, Barratt and Duggan, 2001), and fragmentation of the health system with consequent cost escalation (see Chapter 8), all conspired to defeat the progression

of a societal health agenda through the 1990s. Whether the new philosophical (and structural) health environment, introduced by the Labour-led government in 2001, has real potential to foster improved societal health, and how laboratory services policy might best align with that goal in the new environment, are questions for examination in this final chapter.

### **Making health policy: four approaches**

The dominant argument above in suggesting roles for expertise, including health professional stakeholders, the state, and the public in health policy-making, is clearly incompatible with the neo-liberal, pro-market approach to managing the health sector. A more inclusive approach to health sector management and health policy formulation would be accommodated by a combination of three other approaches. These have been analysed and critiqued by Tenbensal and Gauld (2001) and are outlined below.

Advocates of the model of policy making often seen as the ideal: the rationalist model, see health policy-making as an orderly progression. Stages in the process would be: identification of issues, identification of objectives, evidence gathering, some weighing of alternative costs and benefits, followed by a logical policy decision. Tenbensal and Gauld point out that this orderly progression seldom occurs in practice. Objectives cannot be agreed, evidence may be incomplete or ambiguous, and political considerations intrude at all points in the sequence. Examples are provided by the Public Health Commission's ill-fated attempt to introduce evidence-based alcohol policy in New Zealand (Hutt and Howden-Chapman, 1998), and, in Britain, by the fraught attempts at regulating hospital financial performance, using systematically derived benchmarks as a substitute for competitive pressures (Dawson, Goddard and Street, 2001). The rationalist approach to public policy is, however, well regarded almost universally as providing a defensible framework for policy evaluation (Tenbensal and Gauld, 2001).

The stakeholder model of policy making, negotiates a pragmatic path through the often-divergent values of various interest groups and government agencies. An issue encountered particularly in the health sector, is that expertise is often the preserve of groups who are also major stakeholders. Given the resulting knowledge and (therefore) power imbalance between participants, health policy making by 'stakeholder bargaining' has traditionally been dominated by the medically qualified. Consequently, critics see the stakeholder model as either undemocratic and exclusive, or unsustainably expensive, depending on political persuasion.

Participatory policy-making demands that policy processes be 'democratically legitimate' (Tenbensal and Gauld, 2001, p32). This is the model implicitly endorsed by Guba and Lincoln's (1989) 'fourth generation' evaluative framework (outlined in the Chapter 3 of this thesis), which shares with the participatory model, a mistrust of 'objectivity', and of measurable indicators as sole guidelines for sound policy. Participatory policy-making implies an inclusive, interactive, and highly politicised approach to the making and analysis of public policy evaluation. The participatory approach is likely to predominate, in practice, in highly sensitive areas of health policy-making, where Governments fear the loss of electoral support, or where 'policy makers judge that public acceptance and support is crucial' (Tenbensal and Gauld, 2001, p 34). By these criteria, access to health services, including priority setting, imposition of part charges, and closure or relocation of facilities, would all be candidate areas for public consultation and input, and for genuine efforts at consensus building. Formal, fully participatory health policy-making, however, remains an ideal. As was true of market control at the beginning of the 1990s, the cost effectiveness of formal participatory policy-making is untested. Active participation in comprehensive health systems research and evaluation provides a less formal

route to achieving representative public input into policy-making and might prove to be the more cost-effective alternative.

‘Predominantly pragmatic rationality’, with roles for government officials and for stakeholders supposedly wearing their ‘expert’ hats; followed by ‘market rationality’, with its downsides of cost ineffectiveness and fragmentation, have, in turn, dominated health policy-making since the 1960s. Tenbensal and Gauld are critical of complete reliance on any one approach to health policy-making. Multiple criteria, they assert, should guide the formulation and evaluation of health policy. Further to this dimension of flexibility, it would also seem prudent that the criteria for assessment of each policy area be varied according to its needs or status: e.g. relative dependence on expertise; the availability of an evidence-base; suitability for control by competitive pressures; or political sensitivity. In considering clinical laboratory services, evidence presented in this thesis suggests that this is a policy area unsuited to market control and largely invisible to the general public, with heavy dependence on a range of expertise, and an urgent need for enhancement of its cost-effectiveness evidence-base in the New Zealand context.

### **Health system structures: tried and untried**

The different philosophical approaches to health policy-making require different support and purchasing structures in order to facilitate them. Prior to the 1990s health reforms, a vertically integrated and centrally controlled structure supported pragmatic /rationalist policy-making predominant at that time. The principal structural innovation of the 1990s health reforms was the institution of purchasing agencies separate from health providers (public and private), with the aim of constructing an internal market with contracting for health service provision. Mays and Hand (2000) reviewed possible health purchasing options in New Zealand, and possible combinations of local/national and state/private purchasing, in a Treasury policy paper

directed at the then incoming Labour-led government. While they saw merit in the separation of purchaser and provider, they concluded that strict separation of the two roles worked better for some services than for others. The example given by these authors, and also by Ashton and Press (1997), of a health service unsuited to contestable service contracting is that of the public hospitals. Their local monopoly provider status is the principal attribute underlying the public hospitals' unsuitability. As noted elsewhere in this thesis, the Australian-based company, Sonic Healthcare, has near-national monopoly ownership of New Zealand community laboratories. Furthermore, the increasing potential for clinical laboratory services to be provided remote from the patient: even in Australia (thus threatening the viability of specialist hospital laboratories), makes state-purchaser contestable contracting for laboratory services impractical, whether attempted at a local or a national level.

The Labour-led coalition government elected in late 1999 outlined a new structure for New Zealand's publicly funded health system in a strategy document in June 2000 (Ministry of Health, 2000). This would result in abolition of the central Health Funding Authority, and its replacement by twenty-one, majority-elected District Health Boards (DHBs), each responsible for a defined population, and charged with specific health service purchasing, co-ordination, surveillance and public liaison roles formerly undertaken by Funding Authorities. Some contestability in purchasing is implied by the requirements for Boards to manage spending within their annual financial allocation. Policy-making functions of the former Funding Authorities, however, would revert to the Ministry of Health, which has always been responsible for broad issues of funding allocation, national health status monitoring, and all health service regulation and auditing. The new structure thus attempts to balance rationalist and participatory models of decision-making, as well as local and central control of health resources.

The structure adopted by the Labour-led coalition in New Zealand and outlined above, has much in common with the so-called 'third way' in health care reform instituted by Britain's Labour government, newly elected in 1997. The 'third way' has been described and critiqued in detail by Ham (1999), who points out that while Labour's pre-election rhetoric centred on abolition of the internal market in health and its replacement by a more collaborative approach, in practice the critical purchaser /provider split has remained. In this sense, Ham notes:

*"...the Blair government is neither turning the clock back to the centrally planned NHS ..... nor simply keeping faith with market-like mechanisms. Rather, it is adopting a discriminating approach to its inheritance and this lies behind the claims of a third way"* (Ham, 1999, p169).

Specific compromise positions adopted by the Blair government in Britain are also paralleled in New Zealand. In both countries the predominantly centralist shift in policy-making and resource control is offset by increasing autonomy granted, or planned, for primary care organisations. However it should be noted that in New Zealand, primary care organisations have rapidly become large and powerful groupings, still only partially state-funded in most cases (Crampton 2001), making state control over total health resource use in New Zealand considerably more tenuous than it would be in Britain. Similarly, attempts have been made in both countries to achieve centralised planning, while still retaining elements of competition as drivers of efficiency: e.g. strong sanctions against poor local financial management, some contestable contracting, and a process referred to as 'competition by comparison and benchmarking' (Ham, 1999). This is a process still at the early, tentative stages for public hospitals in New Zealand, but its potential for disadvantaging hospital laboratories in a global, market-oriented environment have been explored in this thesis.

Ham posits that the contradictions present in the so-called 'third way', together with the centralising tendencies built into the British National Health Service organisation, will eventually result in an almost complete return to central planning and direction. But absolute philosophical consistency, he also suggests, might no longer be possible in modern, highly complex health systems.

Rodger (2000) has explored failures of both the 'modernist' welfare state, and the 'anti-modernist' or neo-liberal, civil society. He contends that cultural pluralism, political fragmentation, and economic uncertainty in contemporary European societies demand a 'mixed economy of welfare' that includes public, private and not-for-profit welfare provision, if the needs of the disadvantaged are to be fully met: i.e. the 'post-modernist' perspective on welfare would substitute a 'welfare society' for the welfare state. This point seems to align with long-term thinking behind both the Blair government's 'third way' in health system design and the current New Zealand Labour-Alliance coalition government's health strategy.

Ironically, the 1990s pro-market phase of state health resource control in New Zealand generated some persuasive arguments for centralised control and direction as a fundamental requirement for an effective public health system in this country. Blank (1994), for example, argues that countries most successful in achieving comprehensive, low-cost health care coverage, whether service provision is public or private, are those using firm, centralised, supply-side rationing. Centrally controlled systems also create pressures for shifting resources towards preventive and primary care. Such pressures tend not to be present in countries like the US, where fragmentation of the health system makes it difficult to contain the more profitable curative or 'rescue' component of health care (Blank, 1994).

Feek and Carter (1992), also use inter-country comparisons to make a similar case for central control, but go further to support both state funding and provision, i.e. vertical integration, as the most efficient health system option, principally because of its relatively low administrative costs and better capacity for co-ordinating available resources. The following comment has particular resonance for clinical laboratory services, both at the time it was made when the pro-market reforms were about to be implemented and, again, following the decade monitored and explored in this thesis.

*“Rationalisation of current resources with economies of scale, and improvements in administration will free resources for improved patient care. This will achieve at less cost, the aims and aspirations of New Zealanders. Public funding and provision is the least inefficient and most equitable road”* (Feek and Carter, 1992, p296).

In view of these reservations about devolution of health resource control in New Zealand, it is unsurprising to find early critiques of the compromise health system structure adopted by the Labour-led government. As Mays and Hand (2000) point out, the ownership arrangements for public hospitals ‘incur many of the transactions costs of the contestable market, while continuing to provide HHSs with implicit Crown guarantees of their future incomes’ (Mays and Hand, 2000, p3). This situation appears to remain unchanged with the institution of the new DHB structure. Thus, hospital pathology, and other clinical support services, will remain vulnerable to private sector competition for hospital servicing contracts, to the possible detriment of the state funded health system as a whole. A further disadvantage of the DHB model predicted by Mays and Hand is the need to retain contestable contracting, with its associated transaction costs, for those elements of the New Zealand health system under private or ‘third sector’ (not-for-profit) control: e.g. most of the primary sector, community laboratories, disability support services, and some mental health services. Purchaser expertise would be spread more thinly over 21 organisations, and

administration costs increased compared with those of a single central purchaser. Potential exacerbation of recurrent local /central conflict is another problem identified by critics (Mays and Hand, 2000, Creech, 2001).

As with the criteria advocated for assessment of policy, a flexible, case-by-case approach to deciding whether central, regional or local control of resources is appropriate has been advocated.

*“The common sense middle ground positions would accommodate these concerns by recognising that there are services that are best organised nationally (high level surgery), some regionally (mental health services) and some locally (primary and community health care) and some a mix between the three. Developing workable structures to support that pragmatic approach is the real challenge – not swinging between extremes”* (Creech, 2001, p2).

Clinical laboratory services, as demonstrated in this thesis, are unsuited to contestable contracting because of the ease with which monopolies can form and the resulting vulnerability of hospital pathology teaching and research resources. The devolution of responsibility for laboratory services from the central HFA to local DHBs (or even to larger regional groupings) threatens to make resolution of the underlying weaknesses in service design even less likely. Clinical laboratories provide services that are as pervasive, far-reaching in their effects, and as critical to the performance of the whole health system as the state funded pharmaceutical supply. It is almost thirty years since a redesign was attempted (unsuccessfully), and another is long overdue. If a comprehensive, rational health care system is the aim, this can only be achieved from the centre.

### **Health services: design and redesign**

The first of a Nuffield Trust series on reshaping health services in the UK begins with the following comment:

*“The quest for the perfect organisational arrangement has an equivalence in the 15<sup>th</sup> century philosophers’ search for the stone of knowledge: it is fascinating, largely irrelevant, and never, by definition, achievable. It is a diversion of enormous proportions which obscures the necessity to get on with the real job of design and redesign”* (Warner, 1997, p12).

Warner is critical of the ‘innovation gap’ that has opened up because of late recognition of the globalisation of economic activity, the growth of information and other technology, and challenges of the new genetics. Like many other commentators (Berwick, 1997, Feek, 1999, Scally and Donaldson, 1998, Youngson, 1999) he sees a leadership role for health professionals as the key to achieving innovative health services redesign. Feek (1999), who defines policy making as the leadership of change, suggests that clinical leadership should ‘lead change to meet societal needs’. Youngson (1999) looks forward to reform that is a ‘continuous process of self improvement for clinical services, instead of externally imposed change’ (p2). Such reform requires strong, innovative leadership from health professionals focussed on making gains in patient-care within available resources.

Youngson’s paper reviews the evidence for specific measures that would achieve substantial gains provided ‘health professionals lead the charge’ (p6). Among these measures, and with particular relevance for clinical laboratory professionals, is a reduction in inappropriate diagnostic testing. Implementing electronic decision-support systems is another measure listed among opportunities for improving care. Expert systems that work interactively with doctors to assist them with laboratory test selection and result interpretation have been shown to both save on testing costs, and substantially shorten the time required to reach a diagnosis (Smith and McNeely, 1999). A shift to molecular genetic testing is also predicted to change patterns of laboratory testing and clinical practice dramatically (Leonard, 1999). The high cost of automated equipment to perform genetic

analyses is likely to restrict the new technology to only one or, at most, two laboratories in New Zealand. Similarly, automated equipment for cervical smear screening is likely to be installed in only one laboratory, to serve the whole country (personal communication, senior pathologist, 2000). All these technological changes, along with globalisation in health service provision are examples of design influences that will re-shape the supply-side of New Zealand laboratory services. If they are to yield their potential benefits, they must be anticipated, and incorporated - under innovative health professional leadership - into a national, evidence-based, laboratory services redesign plan.

### **Finding ‘the best and least costly solution’**

One positive development for New Zealand clinical laboratories has been the re-establishment, within the new health service structure, of a functional Laboratory Services Advisory Group that includes laboratory professionals from both public and private sectors. It will be essential, if ‘the best and least costly’ solutions are to be found, for the group to have access to reliable information relevant to the cost-effective delivery of laboratory services in this country. Price (2000) has differentiated between two types of evidence-based decision-making in applied laboratory medicine: one supporting the diagnostic process, and one supporting operational issues, including the appropriate utilisation of resources. Investigations and analyses undertaken for this thesis have generated several research themes that would help shape a sound evidence-base for centralised decision-making on operational issues for laboratory services.

One underlying impediment to decision-making is the lack of a valid measure of relative financial performance for clinical laboratories. As has been pointed out elsewhere in this thesis, without this measure it is impossible to make inter-laboratory, inter-sectoral, or international cost-

efficiency comparisons, whether for use as target benchmarks in a post-contestable-market environment, for optimising the laboratory service nationally, or for planning future resource needs. The introduction of the clinical costing methodology already developed and tested in Australia would facilitate a more rational, evidence-based allocation of state clinical laboratory expenditure.

Analyses of test volume data for this thesis could identify only minimal effects of the various demand control strategies tried throughout the 1990s. Electronic decision support systems designed to guide doctors through test ordering and differential diagnosis have the potential to both reduce unnecessary testing and improve the quality of clinical laboratory utilisation. The development and trial of an expert system, particularly in a large teaching hospital setting where the less common tests are performed, might prove to be a constructive route towards achieving the best and least costly solution to clinical laboratory misuse in the long term. It might also provide an alternative to 'market share escalation' for ensuring the hospital pathology department's continued viability.

Further research could exploit the potential of 'percent-positive' rates for common diagnostic tests using demographic groupings (i.e. a more detailed exploration than was attempted in this thesis) in order to provide a basis for quality guidelines in general practice. Implementation of such guidelines, and other initiatives in general practice, could be monitored by appropriate demographic group using the avoidable hospitalisation rates, already monitored up to mid-1999 for this project, as indicators of the overall effectiveness of the rapidly-evolving primary health care system.

### **Some final reflections**

This thesis has brought together multiple reinforcing data strands from a wide range of sources and disciplines to test the initial hypothesis: that market-style

resource control for New Zealand's laboratory service not only failed to meet the wider objectives of policy architects, but exacerbated cost-inefficiencies already endemic to the service design. The wide scope of the study necessitated its containment and direction within several organising structures.

Although the thesis focussed on a component of the New Zealand public health service, the pervasiveness of the diagnostic role undertaken by clinical laboratories made it obligatory to extend both inquiry and analysis into the wider context in which the service operates. Several implications for the research process itself ensued. The initial inquiry generated a great many potential research questions, and the Colton, Frisof and King (1997) 'touchstones' of accessibility, public accountability and quality became invaluable for focussing research effort upon issues of greatest moment. Similarly, as each line of enquiry underwent analysis during the course of the research process myriad explanatory theories and conclusions were generated. Again, the framework of opposed recurrent arguments for and against public sector reform used by Wallis and Dollery (1998) was helpful in drawing attention to explanations and conclusions of direct relevance to the core evaluation in this thesis.

In structuring the research process itself I followed broadly the Guba and Lincoln (1989) 'fourth generation' evaluation framework, which possessed an asset particularly appropriate for my purposes. Intimate knowledge of a topic for research carries both advantages and dangers. On the positive side, considerable time is saved in 'scoping' the project: locating key informants, isolating potential issues, learning the language of debate. The most obvious hazard, and one specifically addressed by the fourth generation framework, is the potential for researcher bias. The framework is primarily a distancing device, providing for the repeated checking and validation of emerging theories against a multitude of inputs, both constructive and reflective. In performing this distancing function, it provided a practicable and, in my judgement, effective safeguard against researcher bias.

The isolation of 'claims, concerns and issues', or phase (i) of the framework, became somewhat prolonged in this thesis, principally because of the volatility of the New Zealand health policy environment through the 1990s. At least four health policy shifts can be traced over this period: three during the course of writing this thesis. As a consequence, the division of phase (i) (the issue defining phase) from phases (ii) and (iii) of the evaluation (the data gathering and reflective phases) was quite arbitrary.

At the outset of the thesis I expressed reservations about my ability to maintain complete fidelity to the fourth generation evaluation ideal within the time and resource constraints of an academic thesis. In retrospect, I feel that such fidelity remains, like fully participatory public policy-making, an ideal. Even a well-resourced team of researchers would, in order to progress, almost certainly need to compromise. This would be especially true in cases where the policy evaluation not only impacts on strongly divergent stakeholder groupings, but echoes through the entire health sector. The compromise suggested as being most likely to both achieve a consensus on assessments of the past, and improve the future cost effectiveness of clinical laboratories, entails centralised conciliation by experts.

It has been the primary aim of this thesis to work towards an evidence base for centralised decision-making on New Zealand's clinical laboratory service and to indicate some important future research directions for its augmentation.

## Appendix 1: Ethics Committee Approvals

### WAIKATO ETHICS COMMITTEE

22 May 1998

Necia France  
Health Development and Policy Programme  
School of Social Sciences  
University of Waikato  
P O Box 3105  
HAMILTON

Dear Ms France

**THE IMPACT OF RECENT HEALTH POLICY REFORMS ON NEW ZEALAND CLINICAL LABORATORY SERVICES: AN EVALUATION WITH POLICY IMPLICATIONS (Our ref: 22/98/517)**

This proposal was considered by the Committee at its meeting on 20 May 1998 and given ethical approval.

Ethical approval is conditional upon the Committee receiving annual progress reports on the study, a final report at the completion of the study, and a copy of any publication. Please notify us if the study is abandoned or the protocol changed in any way.

Best wishes for the success of your study.

Yours sincerely



Rosemary J De Luca  
Chairperson

### Health Funding Authority

### OTAGO ETHICS COMMITTEE

3 November 1998

Rosemary de Luca  
Chairperson  
Waikato Ethics Committee  
PO Box 322  
HAMILTON

Dear Rosemary

**The impact of recent health policy reforms on New Zealand clinical laboratory services: an evaluation with policy implications**

Investigators: Necia France  
Protocol Number: CPD98/24

We have now received a response from the investigators to the queries we raised about the above protocol. This study has now been approved in full.

Approvals granted to protocols are for 12 months. If, after 12 months the study is not completed, it will be necessary to forward to the Committee a brief report on progress made to date and a request for an extension. Please quote the above protocol number in all correspondence relating to this study.

It should be noted that Ethics Committee approval does not imply any resource commitment or administrative facilitation by any healthcare provider within whose facility the research is to be carried out. Where applicable, authority for this must be obtained separately from the appropriate manager within the organisation.

Please advise the Committee on the completion of the study or if, for any reason, you decide not to complete it. On completion of the study a brief report should be forwarded to the Committee.

Yours sincerely



Carol Algie  
Ethics Committee Administrator

cc Neica France, Health Development and Policy Programme Unit of Waikato  
cc Susan Dovey, Associate Director, RNZCGP Research Unit, Otago University

## **Appendix 2: Extraction of data from RNZCGP**

### **Research Unit Databases**

The samples analysed at the RNZCGP Research Unit databases in Dunedin comprised approximately 210,000 encounters generated by the same six large primary care organisations in each of three years: 1995 /96, 1997 /98 and 1998 /99. The data were contained in two large tables for each year. The first, the Details table, contained social and demographic records for all patients encountered by the six practices. Data fields were as follows:

#### **Details Table**

Field Numb	Field Name	Type	Description
1	Patient	A7	Patient ID as used by the software
2	Practice	S	ID of the practice as defined by us
3	NMPI	A7	National Master Patient Index number
4	GDR	A1	Gender: M, F or U(nknown)
5	Reg?	A1	Registered ? Y or N
6	Eth	A2	Ethnicity
7	Ins?	A1	Private Health Insurance ? Y or N
8	MS	A2	Marital Status
9	DOB	D	Date Of Birth
10	IG	A1	Income Group ie. 1 or 3 {CSC}
11	GMS	A1	General Medical Subsidy ie. A, J, P etc.
12	HU?	A1	High User ? Y or N
13	Family	S	Family ID as used by the software
14	GP	A10	Patients Regular GP
15	DPR	D	Date Patient Registered
16	STS	A1	Patient Status, either A(chive or I(ncactive)
17	DLC	D	Date Of Last Consultation

The second, the Consultations table, contained records of all encounters with the six practices for each of the three years monitored. Fields defining each record were as follows:

### Consultations Table

Field Numb	Field Name	Type	Description
1	Patient	A7	Patient ID as used by the software
2	Practice	S	ID of the practice as defined by us
3	CD	D	Date the consultation took place
4	Prov	A30	Name of the provider
5	PC	A10	Problem code
6	PN	A40	Problem Name
7	Notes	A254	Free form text notes

Before using the tables it was necessary to 'clean' the data by updating incomplete records and then eliminating replicated and empty records using standard 'find duplicates', 'find unmatched (unique records)' and 'table update' queries. (In the process of cleaning up the 97/98 data tables, 1904 cases were eliminated from the Details table because all relevant fields were empty, and approx 68000 owing to replication. In addition, 1160 cases were eliminated from the Consultations table because no details corresponding to the consultation number were available in the Details fields. There were 97,986 distinct patients for whom details were available, and 32,635 of these appeared in the Consultations table at least once.)

Three extractions based on character string sequences from the Notes field of the Consultations table were made. These were analysed for social group composition in a joined 'Temporary sample' table (based on each Consultations table extraction and corresponding relevant data from the Details table and joined through the common patient and practice ID fields). The table was obtained using a standard 'make table' query. A further series of queries was made of the three extractions from the Consultations table in order to determine the degree of overlap between extractions, and hence the number of general practice encounters utilising laboratory services.

The character strings used to extract the laboratory related encounters, and the sequence of queries used to define the demographic and social group

characteristics and to correct for overlap between extracts is given below. (Query formats are given in Select Query Language.)

**Query 2 (Q2):** First extraction criterion:

Like "\*bloods\*" Or Like "\*swab\*" Or Like "\* lab \*" Or Like "\*smear\*" Or Like "\*faecal\*" Or Like "\*EMU\*" Or Like "\*Cxs\*" Or Like "\* Mycology\*" Or Like "\*b/test\*" Or Like "\*histology\*" Or Like "\*urinalysis\*" Or Like "\*culture\*" Or Like "\*diagnostics\*" Or Like "\*serology\*" Or Like "\*blood screen\*" Or Like "\*blood group\*" Or Like "\*cells\*" Or Like "\*blood taken\*" Or Like "\*FBC\*" Or Like "\*biochem\*" Or Like "\*cytology\*" Or Like "\* ESR\*" Or Like "\* PSA\*" Or Like "\*protein\*" Or Like "\*elect\*" Or Like "\*folate\*" Or Like "\*preg test\*" Or Like "\*T4\*" Or Like "\* ALT \*" Or Like "\*gluc.\*" Or Like "\* chol \*" Or Like "\*chlamydia\*" Or Like "\* K \*" Or Like "\* LFT\*" Or Like "\*lab.\*" Or Like "\*cholesterol\*" Or Like "\*glucose\*"

**Query 3 (Q3):** ('make table' query)

```
SELECT Query2.NOTES, Query2.PATIENT, Query2.PRACTICE, details.GDR,
details.IG, details.DOB, details.GMS, details.GP, details.HU? INTO [temporary
sample]
```

```
FROM details INNER JOIN Query2 ON (details.PRACTICE =
Query2.PRACTICE) AND (details.PATIENT = Query2.PATIENT);
```

**Query 4 (Q4):** Social or demographic group characteristics, e.g. does patient hold a high user card?

```
SELECT [temporary sample].HU?
```

```
FROM [temporary sample] WHERE ((([temporary sample].HU?)="Y"))
```

**Query 5 (Q5):** Second extraction criterion:

Like "\*rbc\*" Or Like "\*wbc\*" Or Like "\*Campylobacter\*" Or Like "\*Rubella\*" Or Like "\*Sensitivities\*" Or Like "\* ANA \*" Or Like "\*RHEUMATOID F\*" Or Like "\*CRP\*" Or Like "\*Hb \*" Or Like "\*WCC\*" Or Like "\* Na \*" Or Like "\*"

Fe \* " Or Like "\*GGT\*" Or Like "\* AST \*" Or Like "\*liver function\*" Or Like "\*kidney function\*" Or Like "\*enterobact\*" Or Like "\*calcium\*" Or Like "\*transferrin\*" Or Like "\*ferritin\*" Or Like "\*autoantibodies\*" Or Like "\* ANA \*" Or Like "\*PCV\*" Or Like "\*MCV\*" Or Like "\* LH \*" Or Like "\* FSH\*" Or Like "\* alb\*" Or Like "\*medlab\*" Or Like "\*HbsAg\*" Or Like "\*HbsAb\*" Or Like "\* bili \*" Or Like "\* hapto\*" Or Like "\*lipids\*" Or Like "\* Rh \*" Or Like "\*VDRL\*" Or Like "\*haemaglobin\*"

**Subset 1 (Sub1):** Q2's criteria are applied to results of Q5 to determine the number of encounters common to both the first and second extractions.

**Query 6 (Q6):** Third extraction criterion:

Like "\*thyroglobulin\*" Or Like "\* TSH\*" Or Like "\* Hep \*" Or Like "\* IGM \*" Or Like "\* IGG \*" Or Like "\*Coombes\*" Or Like "\*Antibody\*" Or Like "\*Antigen\*" Or Like "\*HCG\*" Or Like "\*Sodium\*" Or Like "\*Potassium\*" Or Like "\*Haematocrit\*" Or Like "\*Hct\*" Or Like "\*Erythrocytes\*" Or Like "\*Thyroid function\*" Or Like "\*campylobacter\*" Or Like "\*candida \*" Or Like "\*sugar\*" Or Like "\* E coli\*" Or Like "\*Paul Bunnel\*" Or Like "\*laboratory\*" Or Like "\*pathlab\*" Or Like "\* iron\*" Or Like "\* TG\*" Or Like "\*salmonella\*" Or Like "\*creatinine\*" Or Like "\* MSU\*" Or Like "\*albumin\*"

**Subset 2 (Sub2):** Q2's criteria are applied to the results of Q6 to determine the number of encounters common to both the first and third extractions.

**Subset 3(Sub3):** Q5's criteria are applied to the results of Q6 to determine the number of encounters common to both the second and third extractions.

**Sub/sub:** Q2's criteria are applied to the results of both Q6 and Q5 to determine the number of encounters common to all three extractions. Therefore:

Number of general practice encounters utilising lab tests\* =

{Q2+[Q5 – Sub1] + [Q6-(Sub2-Subsub)-(Sub3-Subsub)-Subsub]}

= {Q2 + Q5 + Q6 – Sub1 – Sub2 – Sub3 + Subsub} (where the symbols stand for the totals extracted by each query).

Aggregated and disaggregated social and demographic group totals were averaged over the three extractions and then applied to the known number of general practice encounters utilising lab tests (from above\*) to obtain group percentages and totals.

## Appendix 3: New Zealand Health Authority Regions

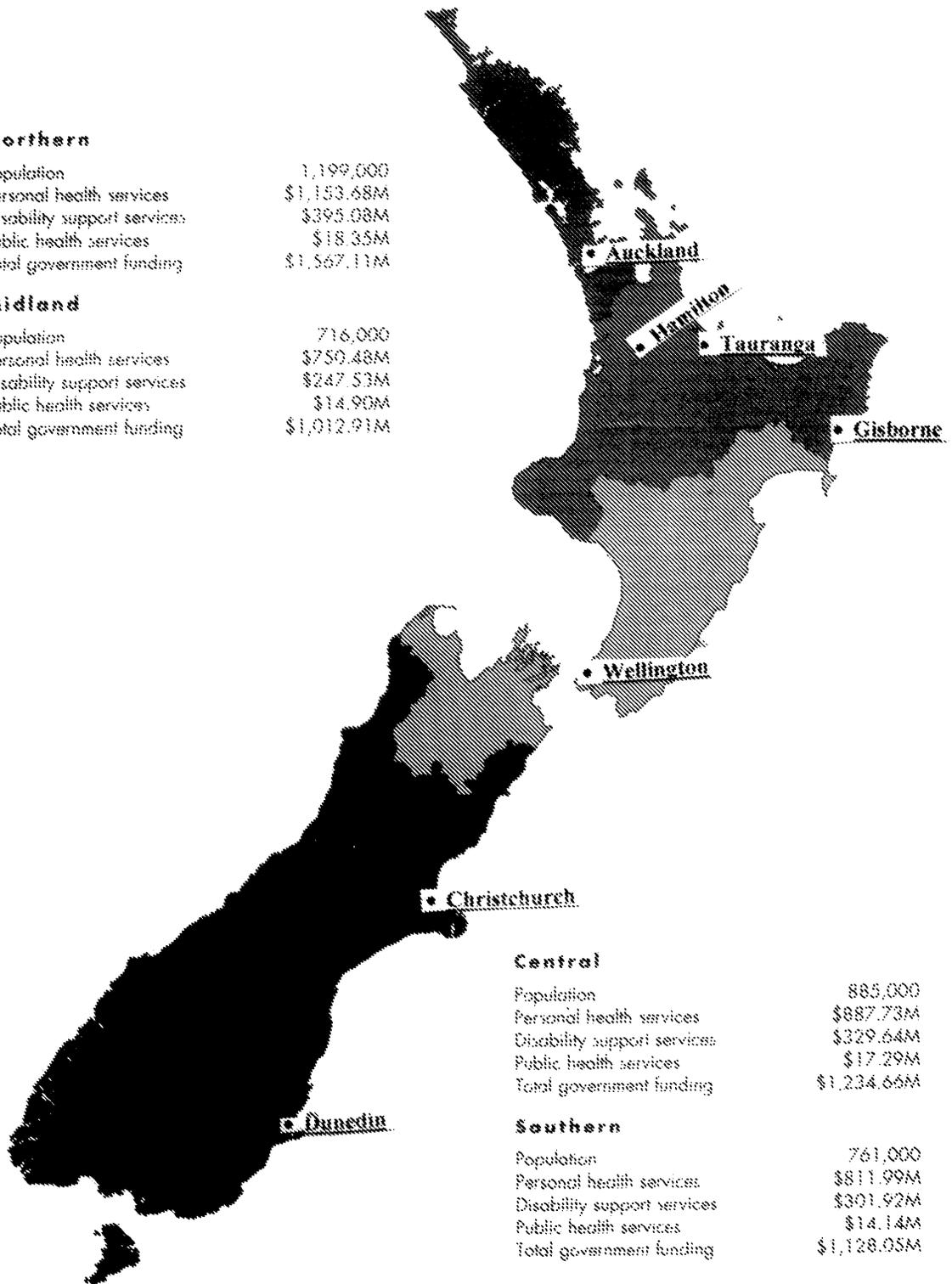
1993 to 1998

### **Northern**

Population	1,199,000
Personal health services	\$1,153.68M
Disability support services	\$395.08M
Public health services	\$18.35M
Total government funding	\$1,567.11M

### **Midland**

Population	716,000
Personal health services	\$750.48M
Disability support services	\$247.53M
Public health services	\$14.90M
Total government funding	\$1,012.91M



### **Central**

Population	885,000
Personal health services	\$887.73M
Disability support services	\$329.64M
Public health services	\$17.29M
Total government funding	\$1,234.66M

### **Southern**

Population	761,000
Personal health services	\$811.99M
Disability support services	\$301.92M
Public health services	\$14.14M
Total government funding	\$1,128.05M

Source: Implementation Group, Ministry of Health

Notes:

1. Population projections for 1995/96 based on medium fertility, mortality, migration and inter-ethnic mobility
2. Funding levels are GST inclusive

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## Abbreviations and Acronyms

AHC: avoidable hospital condition

B12: vitamin B12

Ca: calcium

CHE: Crown Health Enterprise

CHF: congestive heart failure

Chol: cholesterol

CRP: C-reactive protein

CSC: Community Service Card

DRG: diagnosis related group

ESR: erythrocyte sedimentation rate

FCHCS: Free Child Health Care Scheme

GGT: gamma glutamyl transferase

Gluc: glucose

GMS: general medical services

GP: General Practitioner

Hb: haemoglobin

HBL: Health Benefits Limited

HbsAg: hepatitis B surface antigen

HFA: Health Funding Authority

HHS: Hospital and Health Services

ICD-9-CM: 'International Classification of Diseases, Ninth Revision, Clinical Modification'

IPA: Independent Practitioners Association

LSAG: Laboratory Services Advisory Group

NZHIS: New Zealand Health Information Service

RCPA: Royal College of Pathologists of Australasia

RHA: regional health authority