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EDITORIALS

Malpractice and our responses

A recent high profile case involving the conviction of a medical practitioner for sexual offences in Christchurch has shocked us all. Widespread criticism of the medical profession has occurred in the community. Can we be sure that unacceptable behaviour is rare? How can trust be restored so that patients feel safe and secure? To achieve this outcome, some underlying issues need to be considered.

Perhaps the most important factors in good practice are the doctor's attitude, technique and efficiency in the context of the expectations and insecurities of the patient. Did he or she show appropriate empathy yet necessary detachment? Was there a hint of criticism, excessive palpation or voyeurism?

There is always tension between a person and someone perceived to have authority or power over them. Doctors have an unequal relationship with their patients because of the knowledge base of medicine, the diverse experience which occurs during medical practice, and the fact that they must question and examine patients. Depending on communication skills and attitudes, this difference can be interpreted in an unfavourable light. The doctor needs to alter his or her approach depending on the patient. For example, a seriously ill patient may be totally dependent on the doctor, whilst another with chronic illness may wish to be the dominant decision-maker in the partnership. In all cases, the unequal power relationship renders patients vulnerable and hence there are clear rules to prevent their exploitation.

Loss of trust in doctors has been engendered on several occasions in recent years. These include the National Women's cervical cancer enquiry, and the cervical cancer diagnosis problems in Gisborne. When general distrust results from the publicity surrounding poor performance by individuals or a particular service, it impacts unfavourably on the health service generally and on patient-doctor relationships. The patient feels more anxious and the doctor may become defensive, leading to a change in his or her professional behaviour. Some doctors now do not carry out physical examination with the completeness that they were taught. How many cases of breast cancer, rectal cancer or prostatic cancer are missed because doctors have decided to examine defensively? The threat of litigation in relation to surgery now means that surgeons may not always take the responsibility for risky procedures on behalf of fragile patients to the extent that they did in the past.

It is important that patients understand that there is always an error rate in any medical procedure or investigation. Systems need to be in place to recognise that an inadequate or faulty result has occurred. To achieve reduction in the rate of error, well-trained staff are required and difficult procedures and investigations need to be checked and cross-checked as part of quality control. There is a cost to this. The recent pressures on management to achieve 'profitability' combined with the relatively low percentage of GDP expended on health in New Zealand have meant that some of these activities have not been sufficiently funded to maintain quality. Despite these system issues in creating an environment in which unethical behaviour or error is less possible, there are behaviours and actions which are unacceptable in the relationship between a patient and doctor. These have been defined by medical associations, health authorities and governments everywhere.

There have recently been suggestions and implications that legal actions against culpable doctors have not been properly pursued. Whilst disciplinary bodies may appear to the public to be dilatory, they must act in accord with natural justice. In relation to the recent case involving sexual offences, the President of the Medical Council has stated that the first complaint was received in July 1998 when assessment was begun. It has been claimed in the media that it was media exposure that led to action being taken, but the process had started before that. Hearings were delayed by criminal proceedings. We have been assured that there were no previous complaints to the Medical Council, and Dr Chisholm, in discussing this issue from the viewpoint of the local Disciplinary Committee, states there were no complaints regarding this doctor during the last six years. This lack of complaints may point to a problem with the system.

It has been suggested that the unequal power relationship between the perpetrator and victim renders the victim less likely to be believed, and therefore he or she remains silent. The mechanisms are probably deeper than that. Because of the psychological complexity of the relationship with the doctor, "the patient at the time may not be aware of his or her impaired judgement and inability to make a rational, mature decision" concerning possible sexual intimacy. "This may contribute to considerable feelings of responsibility, guilt and self-blame which may contribute to non-disclosure of the doctor's inappropriate behaviour for some considerable time".[1] We need to make sure that this is not made worse through insufficient safeguards for the complainant to protect his or her confidentiality and relationships with a spouse, family or friends. Do we need to review the mechanisms which exist for the protection of complainants and the process for complaints which become criminal matters?

We need to ensure that sick people can receive help from doctors with the expertise, respect and security they deserve. The doctor needs to be thorough and able to treat patients at high risk, without unwarranted litigation. Cases of malpractice and failure of the health service in recent years need their causes identified. The public, medical practitioners and legislators can then identify the requirements for adequate systems to ensure a health service of high quality in which people can trust.

The Editors

1. Zelas K. Sex and the doctor-patient relationship. NZ Med J 1997; 110: 60-2.

Malpractice

George Chisholm, ***retired General Practitioner, previously Complaints Officer, Canterbury Division, New Zealand Medical Association, Christchurch.***

The recent tragic case of sexual abuse by a doctor inevitably has serious implications for medical practitioners. The media commentators have had a field day, and it is natural for us to react defensively to the issues they have raised. However, it is important we restrain that defensive reaction and seek to explore with open minds, the very deep concerns being expressed.

The issues that seem to be most frequently stated are those of power and the protection of colleagues, "closing the ranks". To these I would add vulnerability and defensive practice.

The issue leads me to reflect on my own experience as a general practitioner for 25 years, an active member of various committees related to our profession, and as Complaints Officer for the Canterbury Division of the NZMA for six years. During this latter period I received many complaints against doctors, but none against the doctor concerned in the recent case. Complaints were mostly about relatively minor matters, but all were treated with respect and usually resolved informally. Some complaints were serious and eventually substantiated. Where appropriate, the complainants were assisted to contact the Disciplinary body. Many of the complainants were women. It is reasonable to assume that many women would be hesitant to contact a male doctor over sexual abuse issues, and with this in mind a second person, a woman practitioner, was also appointed and was freely available. In all instances the concerns of the complainant were paramount and every effort was made to seek a solution satisfactory to that person - even when the evidence against the doctor appeared to lack substance. There was never a question of 'closing the ranks'. One wonders what more we could do?

There is no question that we do have power. It is the power that is inherent in any person with special skills and knowledge. In our case, this is enhanced through the intimate nature of our task. But it was evident to me in the many contacts I had with doctors, that we often don't feel powerful. In fact we frequently feel vulnerable, insecure and misunderstood. These feelings can lead us into defensive reactions. It is important that we acknowledge and accept the power we have, and seek to exercise it with sensitivity and careful judgement. This was, sadly, totally absent in the case referred to above. The doctor concerned must have been very conscious of his power and used it violently, to disempower the women concerned. Our guiding principle must be to honour and respect the patient's autonomy at all times. The exercise of power in emergency and life-threatening situations is another question, but does not preclude this guiding principle.

The aberrant behaviour demonstrated in the recent case is difficult, perhaps impossible to prevent. All we can do is be more sensitive to the possibility.

It is important to bring in as normal practice for all doctors, certain safeguards to prevent even responsible and caring doctors behaving unprofessionally in times of personal stress and trauma, while at the same time creating a climate in which aberrant behaviour has a greater possibility of being detected. These safeguards can have a much wider application than the detection of sexual misconduct. They can impinge on areas of stress or disease, as well as inadequate clinical practice. I briefly mention only two factors.

First, loyalty and caring are not synonymous with doing nothing or just being nice about problems. There have been instances where it has been known that colleagues are not functioning well because of disease, drugs or alcohol, and nothing has been said. I personally was very grateful many years ago, when a practice nurse and a receptionist cared enough to confront me when I was under considerable stress and not coping well due to sickness in the family. Let us be more up front with each other.

Second, is the establishment of the practice of supervision - not by a friendly colleague but by someone specifically qualified for this role, and not necessarily a doctor. This is of course, standard practice in the counselling professions. We doctors, like clergy, find the concept difficult to accept. It is surely time we acknowledged the vulnerability we all face and make supervision mandatory. It is time we recognised the expertise available to us in this regard from other health professions and be prepared to accept their help. Then we will have a much better chance of detecting aberrant behaviour at an early stage.

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The NHS in England is to set up a new, national system for logging all failures, mistakes, and 'near misses' in health care and is to move away from the current 'blame culture', to one that can learn from adverse events; these changes follow recommendations in a major report published last week.

The report suggests that the health service can learn from industry, particularly aviation, about how to learn from incidents and near misses. It acknowledges that the great majority of NHS care is of a very high clinical standard and serious failures are uncommon.

It points out, however, that up to 850 000 adverse healthcare events occur each year in the NHS hospital sector alone. Lack of systematic collection of information is seen as a major block in helping the NHS to improve its management of mistakes.

Susan Mayor. BMJ 2000; 320: 1689.

ORIGINAL ARTICLES

Prevalence of iron deficiency in Auckland high school students

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Abstract

Aims. To determine the frequency of iron deficiency and anaemia in high school students.

Method. The survey was carried out at eight Auckland high schools with a high proportion (≥15%) of Pacific Islands students. All students in Forms 5-7 at these schools were invited to participate, and 1644 students (Pacific Island 765, Asian 350, European 295, Maori 234) had iron assessments (response rate 61%). Iron deficiency was defined as any two (or more) of the following, three: serum ferritin <12 µg/L, iron saturation <14%, or red cell distribution width >14.5%. Anaemia was defined as haemoglobin <120 g/L for females and <130 g/L for males.

Results. Iron deficiency and anaemia were each ten times more common in girls (18.3% and 11.5%, respectively) than boys (1.5% and 1.4%). In females, iron deficiency was two to three times more common in Maori (25.6%), Pacific Islanders (20.9%) and Asians (15.4%) compared with Europeans (8.3%), while anaemia was three to four times more common in Asians (15.9%), Pacific Islanders (12.1%) and Maori (11.2%) compared with Europeans (4.2%). Iron deficiency and anaemia prevalences were inversely associated with aerobic fitness, but not with age or years since menarche.

Conclusion. Prevalences of iron deficiency and anaemia are high in non-European female adolescents in Auckland, for reasons currently unknown.

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Iron deficiency occurs when insufficient iron is absorbed to meet the body's requirements. When prolonged, iron deficiency leads to anaemia. Infants, preschool children, adolescents and women of childbearing age, particularly pregnant women, are at greatest risk.[1] The adverse effects include: impaired immune function, poor cognitive development, fatigue, reduced tolerance to work and decreased aerobic capacity.[1-3]

While iron deficiency is endemic in developing countries, it is also common among disadvantaged communities in developed countries. In New Zealand, clinic-based studies using haematological parameters have found high prevalences of iron deficiency and anaemia among non-European infants.[4-8] However, adolescents are also at increased risk because of the increased iron demands arising during the pubertal growth spurt, especially in young women with menstrual blood loss.

Previous studies of adolescents have mainly used questionnaire assessments of iron intake. National surveys of high school students by the Ministry of Health found that 4.4% of boys and 7.3% of girls in Form 1,[9] and 14.3% of boys and 37% of girls in Forms 3 and 4,[10] had iron intakes less than 70% of the recommended daily intake. The use of single 24-hour recall assessments makes interpretation of their results problematical since the 24-hour recall method underestimates usual dietary intake.[11]

The only adolescent survey to use haematological and biochemical assessments of iron status, in Form 3 and 4 girls in Dunedin and Gisborne, found that 3% had anaemia and 10% had serum ferritin levels <12 µg/L.[12] This may be an underestimate of the true prevalence of iron deficiency because the low response rate (28%) suggests that the survey may have included mainly the 'worried well'. The Dunedin longitudinal survey, which studied age groups either side of adolescence, found that the prevalence of anaemia in predominantly European females (haemoglobin <120 g/L) increased from 3.1% at age 11 to 5.8% at age 21 years.[13] The prevalence of iron deficiency (ferritin <12 µg/L) at age 21 years was 0.2% for men and 6.7% in women, whilst the prevalence of iron deficiency with anaemia was 0% and 2.2% respectively.

We report results from a large multi-ethnic survey that used haematological and biochemical parameters to determine the iron status of adolescent students at high schools in South, Central and West Auckland.

Methods

The current survey of iron status was added to a pre-existing cross-sectional survey of cardiovascular risk factors in Form 5-7 students at ten schools in South, Central and West Auckland. Interviewing of students in the cardiovascular survey took place from May 1997 to September 1998. Its main aim was to compare cardiovascular risk factor levels in Pacific Island and European students. Most of the Pacific Island communities in Auckland live within the above three regions, which have 120 schools with Form 5-7 students. However, 82% of all Pacific Island students at secondary schools in this area attend only 32 schools with a high proportion (≥15%) of Pacific Islands students [Ministry of Education, personal communication]. We randomly selected ten of these schools and invited all Form 5-7 students to participate.

Iron status was assessed in eight of the ten schools surveyed in the cardiovascular risk factor survey (four from South, three from Central, and one from West Auckland). The Ministry of Education socio-economic status (SES) deciles of these schools ranged from 1 to 4 for boys and 1 to 3 for girls. This distribution, towards the low end of the scale (decile 10 being the highest), reflected the sampling strategy of the cardiovascular risk factor survey, which was to recruit from schools with a high proportion of Pacific Island students.

Recruiting was done class by class during form periods. At all schools, once consent was obtained, the survey team saw students on two occasions in groups of ten. On the day before the interview, students were seen briefly and given instructions to fast overnight, a food frequency questionnaire to complete at home that night and a sterile urine container to collect an early morning urine sample.

On the morning of the interview, a 20 mL fasting venous blood sample was collected to measure glucose, serum lipids, iron indices and haemoglobin. Each student also completed a self-administered questionnaire that included: date of birth, ethnicity (self assigned), use of vitamin or mineral supplements, pubertal development using the Tanner Scale,[14] physical activity, smoking and alcohol consumption in the last four weeks. Height and weight were measured (in light clothes with shoes removed) and body mass index (BMI) was calculated (kg/m^2). Aerobic capacity was measured by submaximal estimation of VO_2-max using a Cateye-Ergociser with variable work output.[15]

Serum ferritin was measured by micro-particle enzyme immunoassay (Abbot Laboratories). Iron (transferrin) saturation was derived from serum iron and unsaturated iron binding capacity by a colorimetric method (Boehringer Mannheim). C-reactive protein was measured by nephelometry (Behring Diagnostics). Haemoglobin (using a cyanmethaemoglobin method) and red cell distribution width (RDW which is an index of variation in the size of red cells[2]) were measured on a Technicon H*3.

Definitions were based on those used in the United States National Health and Nutrition Examination Study (NHANES),[16] with the

exception of erythrocyte protoporphrin which was replaced by the red cell distribution width (RDW) test. The erythrocyte protoporphrin test and the RDW are both measures of the iron being used to make red blood cells. Together with the serum iron saturation (which measures transport iron) and serum ferritin (which measures storage iron), measurement of the erythrocyte protophorphrin concentration, or the RDW, allows for quantification of iron status in the three major iron compartments in the body. The erythrocyte protoporphrin test was not readily available in Auckland at the time of the survey. RDW is a sensitive measure of iron deficiency that also differentiates the anaemia of thalassaemia or lead poisoning from that due to iron deficiency.[2,17,18] Iron deficiency was defined as any two or more of the following three: serum ferritin <12 µg/L, iron (transferrin) saturation <14%, or RDW >14.5%. Anaemia was defined as haemoglobin <120 g/L for females and <130 g/L for males.[1] The sensitivity and specificity for anaemia was similar using RDW (sensitivity=79.8%, specificity=91.6%), compared with the other two iron indices, serum ferritin (73.4%, 90.2%) and iron saturation (73.4%, 86.6%).

All statistical analyses were carried out using SAS version 6.10 (Cary, NC). Adjusted relative risks were calculated by the Mantel-Haenszel method for cohort studies. Analysis of covariance was used to calculate adjusted means after excluding 32 boys and 34 girls with an elevated C-reactive protein (>6 mg/L). Serum ferritin was not distributed normally, and the natural logarithm was used in all analyses.

Results

Iron assessments were carried out in 1644 students at the eight schools (response rate 61%). 55% of interviewed students were female. Form 5 students were the largest in number (35.4%), followed by Form 6 (35.0%) and Form 7 (29.0%). The median age was sixteen for both females and males, and age ranged from fourteen to 21 years. Pacific Island was the largest ethnic group (46.5%), followed by Asians (21.3%), Europeans (17.9%), and Maori (14.2%). Mean body mass index (BMI) was 24.9 kg/m^2 for females and 23.5 kg/m^2 for males.

Mean levels of haemoglobin and iron indices, by sex and ethnicity, excluding students with C-reactive protein levels above 6 mg/L are shown in Table 1. Female students had lower levels of haemoglobin, ferritin and iron saturation, and higher RDW, than males of the same ethnic group. Mean haemoglobin was highest in females for Europeans, and in males for Asians. Mean ferritin level did not vary between ethnic groups in females, but was higher for Pacific Islanders and Maori compared with Asian and European among males. In contrast, iron saturation mean levels were highest in Asian and European students for both sexes. The mean RDW was lowest for Europeans in both females and males. The proportion of students with serum ferritin levels <12 µg/L was Maori 29.6%, Pacific 23.4%, Asian 19.5% and European 15.2% in females, and Asian 6.5%, Pacific 2.1%, European 1.3% and Maori 0.9% in males.

Table 1. Age adjusted mean (SE) values for haemoglobin, ferritin, iron saturation and red cell distribution width, by sex and ethnicity for high school students with C-reactive protein levels ≤6 mg/L.

Iron & anaemia status	Ethnic group			
	Maori	Pacific Islands	Asian	European
Females (n)	(121)	(414)	(189)	(138)
Haemoglobin	130.7 (0.9)	130.2 (0.5)	129.6 (0.8)	135.4 (0.9)^{MPA}
Ferritin (TF)	20.9 (1.2)	23.1 (1.1)	23.8 (1.1)	23.8 (1.2)
Iron saturation	19.6 (0.9)	19.0 (0.5)	24.1 (0.7)^{MP}	25.3 (0.9)^{MP}
RDW	14.0 (0.1)	13.8 (0.1)	13.9 (0.1)	13.4 (0.1)^{MPA}
Males (n)	(107)	(311)	(150)	(148)
Haemoglobin	149.3 (0.9)	148.8 (0.5)	153.0 (0.8)^{MPE}	149.4 (0.8)
Ferritin (TF)	53.5 (1.1)^{E}	64.7 (1.1)^{MAE}	47.0 (1.1)	44.3 (1.1)^{M}
Iron saturation	27.1 (1.0)	27.8 (0.6)	32.4 (0.9)^{MP}	31.7 (0.9)^{MP}
RDW	13.5 (0.1)^{AE}	13.4 (0.1)	13.3 (0.1)	13.2 (0.1)

^{M}p<0.05 vs Maori, ^{P}p<0.05 vs Pacific Island, ^{A}p<0.05 vs Asian, ^{E}p<0.05 vs European. (TF) = Tolerance factor = SE x 1.96. RDW = red cell distribution width.

The iron status of survey participants is shown in Table 2. The prevalence of iron deficiency and anaemia in females (18.3% and 11.5% respectively) was about ten times higher than in males (1.5% and 1.4%). Among females, the prevalence of iron deficiency was highest in Maori (25.6%), followed by Pacific Islanders (20.9%), Asians (15.4%) and Europeans (8.3%), despite mean ferritin levels not varying between ethnic groups. This inconsistency might be explained by a bi-modal distribution of log ferritin for Pacific Island, Maori and Asian, compared with European, after removal of three outliers with ferritin greater than 200 mg/L, including those with C-reactive protein levels greater than 6 mg/L (Figure 1). The prevalence of anaemia among females was highest in Asians (15.9%), followed by Pacific Islanders (12.1%), Maori (11.2%) and Europeans (4.2%). Further analyses, including ethnic comparisons, were not undertaken in males because of the small numbers of iron deficient and anaemic cases (n=11 and n=10, respectively).

Table 2. Prevalence of iron deficiency and anaemia by sex and ethnicity in high school students.

Iron & anaemia status	Ethnic group				Total
	Maori	Pacific Islands	Asian	European	
	%	%	%	%	%
Females (n)	(125)	(431)	(195)	(145)	(896)
Iron deficiency & anaemia	10.4	10.0	8.7	3.5	8.7
Iron deficiency only	15.2	10.9	6.7	4.8	9.6
Anaemia only	0.8	2.1	7.2	0.7	2.8
Normal	73.6	77.0	77.4	91.0	78.9
Total iron deficiency	25.6	20.9	15.4	8.3	18.3
Total anaemia	11.2	12.1	15.9	4.2	11.5
Males (n)	(109)	(334)	(155)	(150)	(748)
Iron deficiency & anaemia	0.0	0.6	1.9	0.0	0.7
Iron deficiency only	2.8	0.6	0.0	0.7	0.8
Anaemia only	0.9	0.6	0.7	0.7	0.7
Normal	96.3	98.2	97.4	98.7	97.9
Total iron deficiency	2.8	1.2	1.9	0.7	1.5
Total anaemia	0.9	1.2	2.6	0.7	1.4

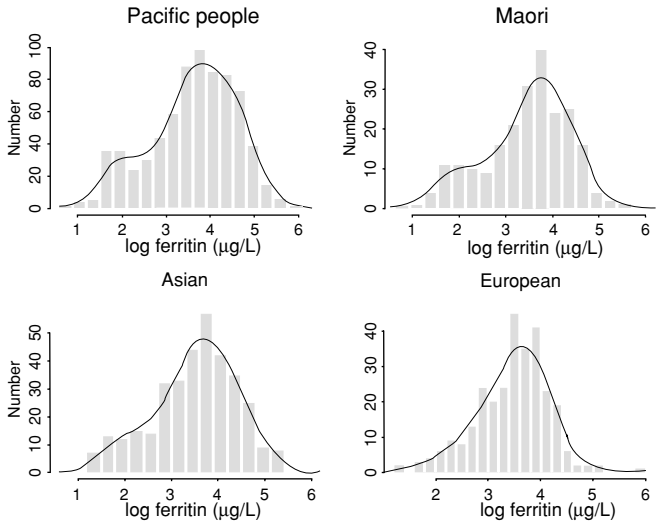

Figure 1. The distributions of the normal log of ferritin level (µg/L) in Auckland high school students by ethnic group (Pacific People, Maori, Asian and European). Students with ferritin levels >200 µg/L and C-reactive protein levels >6 mg/L were excluded.

The relative risks of iron deficiency and anaemia associated with demographic variables in female students are shown in

Table 3. Maori, Pacific Island and Asian students had a two to three fold higher risk of iron deficiency, and a three to four fold higher risk of anaemia, compared with European, after adjusting for age. Students who had low aerobic fitness (physical work capacity <2.00 watts/kg) were more likely to have iron deficiency or anaemia compared with fit students. Age was not associated with the risk of iron deficiency or anaemia. While statistical associations with SES decile of the school were generally not significant, the age- and ethnic-adjusted relative risk (95%CI) of iron deficiency was 0.74 (0.53, 1.03) for decile 1, and 0.44 (0.27, 0.73) for decile 2 compared with decile 3; and the relative risk of anaemia was 0.79 (0.48, 1.28) for decile 1, and 0.63 (0.34, 1.16) for decile 2 compared with decile 3 (no female students were in decile 4). The risks of iron deficiency and anaemia were not associated with years since menarche, body mass index, cigarette smoking, alcohol drinking, or taking vitamin A, C, multivitamin or iron tablets in female students after adjusting for ethnicity (results not shown).

The effect of low response rate on relative risk and prevalence measures associated with ethnicity was examined by repeating these analyses in female students at schools with high response rates (≥70%). The results, although not presented, showed that the relative risks of iron deficiency and anaemia for Maori, Pacific Island and Asian students, compared with European, were slightly, but not statistically significantly higher than those reported for all female students in Table 3.

Discussion

These results describe, for the first time, the use of haematological and biochemical methods to determine the prevalences of iron deficiency and anaemia in a multicultural sample of New Zealand adolescents. Prevalences of iron deficiency and anaemia were higher in girls than boys. Maori females had the highest prevalence of iron deficiency followed by Pacific Island, Asian and European females. Asian females had the highest prevalence of anaemia followed by Pacific Island, Maori and European females. Our finding of ethnic differences in the prevalence of iron deficiency is consistent with recent work in infants and children.[4,8] This study also found that female students with decreased aerobic fitness were more likely to have iron deficiency and anaemia than those who were fit.

The overall response rate of 61%, although less than ideal, was higher than previous surveys of adolescents: 28% in Dunedin and Gisborne[12] and 41% in Australia.[19] Our results are unlikely to be due to selection bias from the low overall response rate since they changed little when analyses were restricted to schools with >70% response rates.

The current survey reports prevalence rates for iron deficiency and anaemia higher than reported in the Dunedin longitudinal survey,[13] Australia[19] and the United States.[16] However, these differences should be interpreted with caution. First, our definition of iron deficiency, based on ferritin, iron saturation and RDW, differed slightly from that in the United States' NHANES study which used erythocyte protoporphyrin instead of RDW,[16] from the Australian national survey which used both ferritin and iron saturation,[19] and from the Dunedin longitudinal survey[13] which used only serum ferritin <12 µg/L. Second, our study recruited students from schools with SES deciles 1 to 4 (10 being the highest), which reflects the sampling strategy for the cardiovascular disease survey of recruiting from schools with a high proportion of Pacific Island students. Our finding, that the relative risk for iron deficiency and anaemia did not vary with school SES decile, is not consistent with previous studies showing that iron deficiency and anaemia are more prevalent in low socioeconomic areas.[7,20] Our comparisons, however, were limited by the narrow SES school decile range.

Our finding that iron deficiency and anaemia were more common in female students with low aerobic fitness confirms overseas studies. Anaemia has long been known to be a cause of tiredness and lethargy. There is considerable evidence that iron deficiency, both with and without anaemia, adversely affects work capacity.[21-24] Intervention studies have shown that iron supplementation improves work capacity in iron deficient people with anaemia[25] and without anaemia.[26] Most of these studies have been in adults. Only limited information on iron status and work capacity is available for adolescents. A cross-sectional survey of eleven to fourteen year old English girls reported decreased physical performance, assessed by the step test, in those with anaemia.[27] An intervention study in the US found that four weeks of iron supplementation increased treadmill endurance times in non-anaemic female high school athletes.[28] Thus, iron deficiency and anaemia appears to be an important cause of decreased physical performance in adolescent girls.

The current analyses have been unable to identify any lifestyle factor that explains the increased risk of iron deficiency and anaemia in non-European female adolescents. The current study did not assess menstrual blood loss, and therefore is not able to excluded this as a factor causing the increased prevalence of iron deficiency and anaemia in non-European adolescent females.

Table 3. Adjusted relative risk of iron deficiency and anaemia associated with age, ethnicity and physical work capacity among female students.

Variable	Iron Deficiency			Anaemia		
	Yes	No	Relative Risk (95%CI)	Yes	No	Relative Risk (95% CI)
Age (years)						
• 14 & 15	49	167	1.00	23	193	1.00
• 16	50	278	0.74 (0.52, 1.05)*	40	288	1.23 (0.76, 2.00)*
• 17	45	180	0.96 (0.66, 1.38)	30	195	1.26 (0.74, 2.13)
• 18-21	21	106	0.81 (0.50, 1.30)	10	117	0.69 (0.32, 1.48)
Ethnicity						
• Maori	33	93	3.12 (1.74, 5.59)*	14	112	2.92 (1.15, 7.43)*
• Pacific Islands	90	340	2.37 (1.40, 3.99)	52	378	3.05 (1.43, 6.53)
• Asian	30	165	1.74 (0.96, 3.15)	31	164	4.20 (1.97, 8.94)
• European	12	133	1.00	6	139	1.00
Physical work capacity (watts/kg)						
• <1.50	61	258	1.34 (0.86, 2.08)†	41	278	2.13 (1.15, 3.96)†
• 1.50-1.99	76	275	1.59 (1.05, 2.39)	47	304	1.95 (1.07, 3.56)
• ≥2.00	24	173	1.00	11	186	1.00

*Adjusted for age or ethnicity as appropriate. †Adjusted for both age and ethnicity.

Other potential factors which require further research, include dietary factors such as low consumption of red meat, frequent drinking of tea, increased calcium consumption and decreased dietary intake of vitamin C.[1]

In conclusion, this survey found that the prevalence of iron deficiency and anaemia was high in adolescent girls, compared with adolescent boys. The prevalence of iron deficiency and anaemia was also high in Maori, Pacific Island and Asian females compared with European females. Further research is required to identify causes of these increased prevalences in non-European females.

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"Wait till it's serious:" health care costs and urban survival strategies of low income groups in Chirstchurch

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Abstract

Aim. To examine the 'survival' strategies adopted by lower income groups seeking to cope with the costs of primary care.
Method. Two surveys, one of the health and health service concerns of clients of an inner city voluntary welfare agency, and another of how 114 general practitioner (GP) surgeries in Christchurch aided patients in financial distress, were conducted in October-December, 1997.
Results. Patients adopted a variety of strategies, both active and passive, with delays in obtaining medications and seeking financial help from GPs being the most common. Although less important, high rates of switching GPs occurred. There was evidence of geographical variation in the strategies adopted by patients and practices as well as of the effects of such strategies given that considerable levels of unmet need remain.
Conclusion. The results suggest that new primary care initiatives are required to meet the health needs of disadvantaged populations.

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Over the last decade, New Zealand, in common with many other countries, has seen a substantial rise in the incidence of poverty.[1] As elsewhere, this can be traced to important restructuring processes, such as the casualisation of the labour market, dismantling of the welfare state, and the rise of new types of households sometimes referred to as the "urban underclass".[2] These related processes have led not only to social exclusion, but also to high levels of social and economic deprivation. A growing body of literature suggests that while poor people experience considerable difficulty in coping with adversity, many nevertheless try to act strategically and are not simply the passive victims of circumstances beyond their control.[3-5]

This paper examines the extent to which lower income groups have responded to the costs of GP consultations and has three objectives; (1) to examine the impact of GP's fees on primary care utilisation by the very poor in Christchurch; (2) to examine the 'survival strategies' of patients in coping with the costs of care and (3), in the light of this, to examine how surgeries assist low income patients and the extent to which such assistance varies according to the socio-economic location of the practice. The paper is motivated by an earlier study[6] which indicated substantial differences in access to care for low income groups in two different areas in Christchurch. While there has recently been increased concern over the impact of poverty on levels of GP use[1,6,7] there has, with few exceptions,[8] been little research on the ways in which either low income patients or their doctors respond to increasing levels of urban distress.

Methods

Two main data sources were used. First, in order to obtain a sample of persons in acute financial distress, a survey of the health and health service concerns of 152 individuals who sought help at the Methodist Church Mission was undertaken over the period of October to December, 1997. Only five people contacted refused to participate. There was no significant

difference in either age or ethnicity between the sample and the Mission's overall clientele.[9] When compared with the 1996 census profiles for Christchurch it is clear that the sample was considerably disadvantaged; 71.3% respondents had incomes of less than $15 000, and 94.4% less than $20 000 (Christchurch 16.0% and 24.0% respectively). Two-thirds (66.2%) indicated that their financial position had recently got worse; 55% had no formal qualifications (Christchurch 32%); 28.1% were of non-European descent (Christchurch 14%); 87% lived in rental housing (Christchurch 25%); 86.8% were on income support (Christchurch 39%) and 92% had a Community Service Card (CSC; New Zealand 53%).[10] In addition, 43.2% rated their health as fair or poor (New Zealand 12.5%)[7] and 59% lived in the most deprived census area units (CAUs; deprivation class, NZDep96≥7; Christchurch 33.4%).

A questionnaire was designed to investigate the coping mechanisms used by patients. First, it addressed variation in the level of GP's fees, and opinions of such fees, using a three point scale similar to that discussed by Fergusson et al.[11] Second, relationships between fee levels, delays in seeking care and impacts on perceived health status were explored. Third, and using the conceptual schema outlined by Strickland and Strickland,[4] respondents were asked about the variety of strategies they had used, both currently and in the past, to cope with the costs of care. Stepwise multiple logistic regression models were used to examine the odds of patients adopting different coping mechanisms and the key predictors of such strategies.

The second data source involved a telephone survey of all 114 GP surgeries in Christchurch. This sought to obtain detailed information on the fees which were 'normally' charged to adult (and child six to fifteen) CSC holders and non-cardholders, and to identify and rank the mechanisms reported as most commonly used by the practice to help low income patients. The survey yielded a response rate of 94.5%, with six practices refusing to divulge such details by phone. These data provided a useful complement to similar questions asked in the survey of low income patients, and provided an independent check of the latter.

Results

Opinions about fees and spatial variations in fee levels. Respondents were asked about the actual fee they currently paid to their GP and, if they had changed providers, what fees they had paid in the past. Over one quarter (27.5%) indicated that they currently paid more than $20, however, the bulk of patients paid either $10-14 (23.9%) or $15-19 (28.9%), with a few paying less than $10 (5.6%) or no fee at all (14.1%). There was a significant relationship between opinions about fees and actual fee levels (χ^2=64.8 p<0.001). Those who had to delay seeking care often were the most dissatisfied with doctors' fees (χ^2=32.8 p<0.001), and were of the opinion that fees were a little or far too high (χ^2=40.4 p<0.001).

Fee levels also varied geographically, being lowest for surgeries located in the most deprived CAUs (NZDep96 7 or more; χ^2=16.4 p<0.01). Here almost half (48.3%) the respondents paid less than $15, compared with only 31.4% of those who attended surgeries in less deprived CAUs (NZDep96 <7), while patients in less deprived areas were more likely to pay $20 or more (33.3%), compared with elsewhere (25.3%). These variations were confirmed by the practice survey (Table 1). Mean fee levels were clearly lower for surgeries located in more deprived CAUs, with significant differences existing for all fee categories. However, the patient survey indicated a substantial proportion of patients attending such surgeries still reported paying fees which they considered higher than reasonable.

Impact of fee levels. Three aspects are considered. First, two-thirds of the respondents (64.5%) indicated that their doctor's fee had caused them to delay 'a lot' or 'sometimes' (χ^2=16.7 p<0.01). Persons charged $20 or more were 5.4 times more likely to delay than those paying the lowest fees ($0-9). Secondly, many (67.7%) respondents indicated that delays in seeing their doctor (χ^2=24.4 p<0.001), or in obtaining their medication (χ^2=10.7 p<0.05) had adversely affected their health, which was more likely to be rated as fair or poor (χ^2=14.0 p<0.001). Persons in the poorest health who had trouble paying fees were less likely (OR=0.4) to have had two or more doctors visits in the preceding three months, compared with those reporting good/excellent health. By contrast, where fees were less of a barrier or never prevented a visit, the odds of a GP visit for those in need increased dramatically (OR=6.4 and 10.8 respectively). Third, relatively high levels of hospitalisation were also experienced by the sample, with 19.7% (n=30) hospitalised over the preceding three months. While levels of hospitalisation were higher amongst those who had delayed the most, the difference was not significant. However, given that hospitalisation results from many causes, those affected were asked whether their admission could have been avoided had they had more regular GP contact. Of those who had delayed a lot, 41.7% indicated that they felt their hospital visit could have been avoided, compared with only 11.1% of those who had delayed sometimes or never at all (χ^2=3.8 p<0.05).

Patient coping strategies. Table 2 indicates the particular coping strategies adopted by people in response to the costs of care. The most common response (70.9%) was to avoid picking up prescriptions, a strategy which was most typical of patients who delayed seeing their GP. Other common strategies were: obtaining help from the doctor (65.3%), going without vital necessities (60.4%), putting others first (49.0%), or adopting 'other' strategies (47.7%), such as using the chemist or natural medicines (71% of this group), using old medicines, swapping medicines with friends, selling assets to pay for care, or attempting to obtain care from the Christchurch Hospital Accident and Emergency Department, or benefits from income support. Less common strategies involved seeking help from friends or family (32.9%), changing GPs (31.8%), or considering an alternative provider (19.0%). These latter options were not preferred, either because of the personal relationship which people had built up with their GP, because of pride, the effects of social isolation, or a need for independence.

In order to examine patient and practice characteristics influencing the choice of coping strategies, stepwise logistic regressions were undertaken for a variety of models combining six different measures of personal and area deprivation (Table 3). Three features are of interest. First,

Table 1. Variations in GP fees in Christchurch by level of area deprivation.

Level of Deprivation		Mean Fee ($)*			
NZDep96	No. of practices	Adult CSC	Adult non-CSC	Child (6-15 years) CSC	Child (6-15 years) non-CSC
Low (<4)	33	19.2 (3.5)	34.3 (3.3)	10.1 (6.2)	14.2 (7.7)
Medium (4-6.9)	50	18.9 (2.2)	34.0 (2.1)	10.1 (3.8)	14.9 (4.5)
High (7 and over)	23	15.8 (6.6)	29.5 (9.9)	6.5 (8.1)	10.9 (9.0)
Christchurch†	106	18.3 (4.1)	33.2 (5.5)	9.3 (5.9)	13.8 (6.9)

*Standard deviations in parentheses. †Data from practice survey.
All area differences in fee distributions were sigificant; adult CSC, adult and child non-CSC (p<0.05), child CSC (p<0.01). CSC=community services card.

Table 2. Odds of patients adopting selected coping strategies in response to GPs fees by level of delay.

Coping strategy	% citing (n)	Extent to which GP fee prevented visit	Odds ratio†	CI	p
No prescription	70.9 (107)	Never	1.0		
		Sometimes	2.4	(1.0, 6.1)	0.05
		A lot	3.6	(1.5, 8.5)	0.01
Financial assistance from GP	65.3 (94)	Never	1.0		
		Sometimes	0.9		ns
		A lot	0.7		ns
Went without vital necessities	60.4 (90)	Never	1.0		
		Sometimes	1.7		ns
		A lot	2.7	(1.2, 5.9)	0.01
Put needs of others first	49.0 (74)	Never	1.0		
		Sometimes	2.4	(1.0, 5.7)	0.05
		A lot	5.9	(2.6, 13.2)	0.001
Other strategies	47.0 (72)	Never	1.0		
		Sometimes	3.0	(2.0, 7.1)	0.01
		A lot	1.9		ns
Obtained help from friends or family	32.9 (48)	Never	1.0		
		Sometimes	0.6		ns
		A lot	0.8		ns
Changed GP	31.8 (47)	Never	1.0		
		Sometimes	1.4		ns
		A lot	3.4	(1.4, 8.4)	0.01
Considered changing GP	19.0 (24)	Never	1.0		
		Sometimes	4.3	(1.0, 18.1)	0.01
		A lot	8.8	(2.3, 33.4)	0.001

*Includes all patients. The overall numbers and proportions in each of the three categories of delay are: never (n=57), sometimes (n=38) and a lot (n=56); or 37.7, 25.2 and 37.1% respectively. †Reference group=never delayed. The odds ratios are unadjusted estimates. Controls for the effects of other coping strategies produced similar results.

Table 3. Individual and area characteristics influencing coping strategies chosen.*

Coping strategy	Predictor		n	Odds ratio†	CI	p
Financial assistance from GP	NZDep96	Low/medium (<7)	57	1.0		
		High (7 & over)	81	0.2	(-0.6, 10.5)	0.01
	Housing conditions	Satisfactory	93	1.0		
		Unsatisfactory	48	4.2	(1.3, 13.2)	0.01
Puts needs of others first	Housing conditions	Satisfactory	97	1.0		
		Unsatisfactory	49	2.1	(1.0, 4.1)	0.05
Changed GP	NZDep96	Low/medium (<7)	57	1.0		
		High (7 & over)	82	2.8	(1.0, 4.1)	0.05
	Health status	Very good/excellent	44	1.0		
		Poor/fair	62	4.1	(1.0, 4.1)	0.05
	Housing conditions	Satisfactory	98	1.0		
		Unsatisfactory	49	4.1	(1.1, 15.7)	0.05
Considered changing GP	Housing conditions	Satisfactory	83	1.0		
		Unsatisfactory	39	4.9	(1.3, 22.8)	0.05

*Includes total sample; only variables p<0.05 are reported. †Adjusted values controlling for the influence of other variables. The total predictor set also included income <$15 000, ethnicity and a measure of the degree of change in personal financial circumstances.

patients who viewed their housing conditions as unsatisfactory were more likely to have received help from their GPs (OR=4.2), to have changed their GPs (OR=4.1), to have considered changing (OR=4.9), or to have delayed seeking care because of the needs of others in the household (OR=2.1). The perception of 'unsatisfactory housing', reflected a broad series of housing concerns with housing costs, overcrowding and substandard living conditions figuring prominently in many responses.

Secondly, patients living in less deprived areas (NZDep96 <7) were more likely to have reported obtaining financial help from their GPs. This finding was unexpected, but could reflect a number of possibilities, including differences in the type of help provided by practices and the effects of high rates of patient mobility. With respect to the former, there was a significant relationship between the types of help made available and the NZDep96 score of the practice (χ^2=12.1 p<0.05). While surgeries in the poorest CAUs were more likely to have discounted fees and, to a lesser extent, to have waived fees completely, they were much less likely to have offered patients the option of deferring payment (Table 4). These findings are also replicated in the patient survey (χ^2=11.3 p<0.05). Patients attending practices in deprived areas

could also have received less help, especially in cases where people often changed their doctors. However, while patient turnover rates were higher in more 'deprived' areas (41.4% had been with their GPs less than two years, compared to only 13.5% in the less deprived areas; χ^2=12,1 p<0.01), differences in the extent of help given to 'newer' and 'older' patients were not significant.

Table 4. Most common strategies cited by practices to help low income patients by NZDep96 of practice domicile (% column totals)*.

	NZDep96		
Practice Strategy	Low Deprivation (<4) %	Medium Deprivation (4-6.9) %	High Deprivation (7 & over) %
Discounting fees	35.9 (28)	35.7 (41)	45.1 (23)
Waiving fees	25.6 (20)	33.9 (39)	33.3 (17)
Deferring payment†	26.9 (21)	23.5 (27)	5.9 (3)
Other strategies‡	11.5 (9)	7.0 (8)	15.7 (8)
Total	100.0 (78)	100.0 (115)	100.0 (51)

*Column totals refer to each strategy as a proportion of the total number of strategies mentioned by practices in each deprivation group; number of practices mentioning common use of the strategy in parentheses.† Account systems, automatic payments. ‡Mainly referral to income support, free medicines etc. χ^2=12.1 (p<0.01).

Third, although not a preferred strategy, many people (31.8%) had changed their GP because of cost, with this reason outweighing all other reasons for change. Those doing so were more likely to have attended surgeries in more deprived areas (OR=2.8), to have been dissatisfied with their housing situation (OR=4.1) and to have been in poorer health (OR=4.1). Rates of change were also related to whether patients had received financial assistance from their GPs. In contrast to patients attending surgeries in less deprived areas (where 15.4% of patients receiving help changed their GPs, compared to 46.2% of those who reported receiving no help; χ^2=5.2 p<0.05), patients in deprived areas were more likely to have changed providers even when their doctor had helped them financially (38.1% versus 46.7%; χ^2=not significant). Thus it would seem that the level or nature of financial assistance provided was not sufficient to aid financially distressed patients in the most deprived CAUs, a trend evident in the fact that the level unmet need was highest in such areas (Table 5).[12]

Table 5. Odds of GP utilisation by perceived health status controlling for area deprivation.*

NZDep96	OR	CI	p
Patient Domicile			
Low/medium deprivation†			
Very good/excellent health	1.0		
Poor/fair health	6.0	(1.5, 24.2)	0.001
High deprivation‡			
Very good/excellent health	1.0		
Poor/fair health	3.0	(1.0, 9.1)	ns
Practice Domicile			
Low/medium deprivation			
Very good/excellent health	1.0		
Poor/fair health	6.5	(1.6, 26.1)	0.001
High deprivation			
Very good/excellent health	1.0		
Poor/fair health	3.1	(1.1, 10.5)	ns

*Those reporting 0-1 and 2 or more visits. †NZDep96 <7. ‡NZDep96≥7.

Discussion

A number of conclusions can be drawn from these findings. First, patients in financial distress did not respond passively to their inability to afford care, and many opted for a variety of proactive strategies. Secondly, while a common response was for people to seek financial help from their GPs, important differences occurred in the form of help provided. Previous research has shown that surgeries provide substantial financial assistance to deprived patients,[13-15] but has ignored spatial variations in the nature of that assistance and its impact on access to care. While it is evident that surgeries located in more deprived areas charged lower fees, it appears that these were not sufficient to prevent high rates of patient mobility or result in a significant reduction in the level of unmet need. Why such area differences should occur is not clear. One possibility is that 'deprived area' practices may seek to minimise financial risk by not offering deferred payment schemes to low income patients, especially when such schemes involve extra administrative costs and the prospect that payments, if deferred, may not be made at all. On the other hand, practices in less deprived areas, because of their more socially mixed clientele, have more financial flexibility in terms of the range of strategies they can use to help patients in financial need. However, discounted fees offered by 'deprived surgeries' may result in fees which are still deemed too high by low income patients, especially when prescription costs are also incurred. Another possibility is that low income patients living in less deprived areas, given their slightly higher levels of education, were more demanding in terms of seeking alternative (deferred) payment options from their GPs. By contrast, those living in the most deprived areas may be more reluctant to seek help especially given evidence that pride or fear of stigma often prevents use of services.[16,17] These contextual influences deserve further examination.

Third, the findings suggest high rates of doctor switching among this low income population, compared with previous studies both in New Zealand[18] and elsewhere.[19,20] Those who switched did so primarily for economic reasons, again in contrast to previous research. However, most studies have focused on rates of change among the population at large,[21] and there has been a distinct lack of research upon the health seeking behaviour of very deprived groups, except in the American context where the dominant tendency has been to use hospital emergency rooms and outpatient departments.

Fourth, the high rates of change have not been without their costs. One reason for the low rates of patient mobility reported in previous research has been the personal relationships that patients develop with their doctors.[22] This was evident in the present research where almost half of those interviewed indicated that they would be (or had been) bothered by having to change their doctors. However, although people were bothered with having to change GPs, especially when their doctor had helped, this did not prevent them from doing so. Thus, while lower fees or some other form of help may have reduced the tendency for patients to change providers, continuing financial problems for this lower income population ultimately outweighed any personal attachments with their GPs.

Finally, the continued presence of high levels of unmet need amongst a largely CSC population indicates that the CSC has been a relatively ineffective mechanism for improving access to care.[1,6] This ineffectiveness can be related in part to the high rates of poverty arising from the lack of affordable housing, a point made by the many respondents who had left the state rental sector for this reason.

In conclusion, this study suggests that problems of access to care remain significant for economically marginalised

people in Christchurch. This is hardly surprising given the recent restructuring of the economy and welfare state, but it is of great consequence to the people attempting to cope in various ways with their financial situation. It is also of consequence to the financially embattled Hospital and Health services throughout the country, given the strong relationship between deprivation and hospital admissions,[23] a relationship which appears to have strengthened during the 1990s.[24] Further research should concentrate on the primary-secondary care interface, and especially on the ways new integrated care and funding arrangements in deprived areas can be targeted to help low income patients.[25] Of course, many elements which affect the health of such populations are not subject to health service intervention, but there is scope for new primary care initiatives, perhaps with area-based forms of positive discrimination along the lines of health priority areas now being established in the United Kingdom.[26] Such strategies, while beyond the scope of the present paper, need further discussion if improvements are to be made in access to care and the health of disadvantaged populations.

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Sudden infant death syndrome among the Auckland Pacific communities 1988-1996: is it increasing?

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Abstract

Aims. To define ethnic origin and verify the diagnosis of sudden infant deaths among Pacific peoples in Auckland 1988-1996, and to elicit socio-economic and demographic characteristics.

Methods. Police (P47) and coroner reports were analysed for an ethnic classification and diagnosis. Postneonatal and sudden infant death syndrome (SIDS) register and New Zealand Information Services data were analysed for additional Pacific cases. Rates of Pacific SIDS in Auckland were calculated. A Pacific SIDS database was developed and families were tracked. Face to face interviews covering the SIDS event were undertaken with selected families. Data were coded, stratified and a thematic approach to analysis was utilised.

Results. There were 52 cases of SIDS and the ethnic origins were: thirteen Samoans, nine Cook Islanders, seven Tongans, fifteen multiple ethnicity, and eight could not be verified. The annual rates of Pacific SIDS varied from less than one (in 1989) to 4.5 (in 1995) per 1000 Pacific live births. 34 cases (65%) could not be contacted and eighteen were traced. Nine in-depth interviews were conducted with caregivers of these cases. All babies had slept in the supine position, seven were breastfed, and five of the mothers were non-smokers. Eight babies slept in the same room with their primary caregiver, with seven sleeping in their own bed. All of the mothers had had continuous access to childcare and support from their families, and seven had had previous children. Grief counselling for partners and children was identified as necessary by almost all the mothers.

Conclusions. This preliminary study concludes that the rate of Pacific SIDS increased in 1995 and remains a serious problem. Ethnic misclassification and under reporting of SIDS cases is apparent among Pacific infants. There is a need to establish a national infant mortality database that collects accurate data incorporating standardised ethnic specific categories. Official routine and data sources also need to incorporate standardised ethnic specific categories. A national prospective study is required to study SIDS in Pacific communities as a basis for effective prevention strategies.

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The New Zealand Cot Death Study (1987-1990) identified the Pacific population as having a lower rate of infant deaths than their Maori and European counterparts.[1] The National Maori Sudden Infant Death Syndrome (SIDS) Prevention Programme has been collecting coroner and police (P47) reports to monitor Maori SIDS cases, and observed a number of non-Maori names.[2] This led to an increased recognition of Pacific infant death from SIDS, the

inadequate systematic collection of SIDS data in Pacific communities, and inaccurate reporting of SIDS cases.[3]

A list of names and addresses of Pacific SIDS cases was identified by the National Maori SIDS Prevention Programme database. This showed an increasing trend of SIDS among Pacific infants during 1988-1996.[3] This finding was questioned, especially because of the widely held belief that SIDS is not a problem among Pacific infants.[4] This paper reports an effort to establish definitively the ethnicity and cause of Pacific infant death. Qualitative research methods were used to examine some of the socio-economic and demographic aspects of these Pacific families.

Methods

The names of Pacific SIDS cases, and the police (P47) and coroner reports were obtained from the National Maori SIDS Prevention Programme. These reports and SIDS cases were cross-referenced to check ethnic origins of the child and each parent, accuracy of contact information, age, address, and place and cause of death. The Postneonatal and SIDS register, which is a National Maori SIDS Prevention Programme register that collects all SIDS deaths (up to two years) and infant deaths (from one month to one year), was examined for additional Pacific names and the ethnicity of both mother and father. This required an awareness of the diversity of Pacific cultures, and the ability to identify Pacific names, it's ethnic origins, and Pacific names with European origins. A database of these Pacific SIDS cases was created to record: the baby's names, gender, date of birth and death, place of death, name of mother and father, ethnic origins of mother and father and baby, address, phone number, file number, and date of registration. Classification of ethnicity in the database was based on the ethnic origin of both mother and father as recorded on these reports.

Fetal and infant deaths data provided by the New Zealand Health Information Services (NZHIS) 1988-1994 were examined for official numbers and rates of Pacific SIDS cases in Auckland.[5-7]

Qualitative data were collected through face to face interviews. The families for interview were selected from the database of Pacific SIDS cases and tracked using contact details on the police (P47 forms) and coroner reports. The P47 is the police death scene report. The coroner's report is a record of the post-mortem. Figure 1 shows the flowchart for tracking families. The telephone directory, the Post Shop, and Housing New Zealand were employed to track telephone numbers and addresses and personal networks and home visits were also employed.

A suitable time for an interview and consent was arranged with the main caregiver. A letter of introduction about the project and SIDS team, and consent form was prepared in English and translated into the Samoan, Tongan, Cook Islands, and Niuean languages. Ethical approval was obtained from the University of Auckland Human Subjects Ethics Committee. The interview consisted of nine key areas. 1) General questions such as age, current work status, number of children, 2) ethnic origin of the parents and grandparents, description of lifestyle practices, 3) infant care practices and support network, 4) the incident, 5) risk factors, breastfeeding and bottle-feeding, sleeping position, and smoking, 6) bedding and bedsharing, 7) housing such as heating and ventilation, 8) grief, and 9) types of SIDS information recollected and needed. In-depth audiotaped interviews of 60-90 minutes were conducted with the SIDS families in their homes. These were held in English and/or Samoan. The interviews were analysed by coding their responses and drawing on common themes.

Results

The original list of Pacific SIDS cases from the National Maori SIDS Prevention Programme contained 69 names. After these were cross-referenced with police and coroner reports, 25 deaths (36%) were found to be due to other causes such as bronchopneumonia, meningitis, and haemophilus infection, and 44 deaths were SIDS cases. The Postneonatal and SIDS Register was analysed and eight additional Pacific cases were found, therefore identifying a total of 52 Pacific SIDS cases from 1988-1996 (Table 1).

Ethnic origin and demographic information (Table 2). There were thirteen (25%) Samoan, nine (17%) Cook Islands, seven (14%) Tongan, fifteen (29%) multiple ethnicity and eight (15%) with no ethnicity or gender information. The multiple ethnicity category contained fifteen cases (29%) of which the mother and/or father came from two or more different ethnic groups eg Samoan/Tongan, and Samoan/Maori/European. There were more males (48%) than females (36.5%).

32 (61.5%) cases died between seven and twenty weeks after birth (Table 3). Most cases occurred in South Auckland (38.5%) and Central Auckland (32.7%), the least occurring in the Northern and Eastern parts (1.9% respectively). The number of SIDS by season were: winter (28.8%), summer (25%), autumn (21.2%) and spring (19.2%).

Tracking SIDS families for interviews. Initial attempts to contact SIDS families was through using the telephone numbers and addresses provided on the police and coroner reports (Figure 1). A total of eighteen families (35%) were ultimately traced, with nine being interviewed while the others declined.

Interviews of Child Carers with SIDS. Nine interviews were conducted with Pacific families in 1997-1998; three from 1996, four from 1995, one from 1991 and one from 1990. The interviews were conducted with seven mothers, one couple, and one mother and grandmother. At the time of the interview, the fathers were working, caring for the children, or had since left the relationship when the baby died.

1) *General.* The mothers' ages ranged from 21 to 42 years, and the fathers from 21 to 39 years. For seven families, the baby that died was not the firstborn. Six of these women had gone on to have more children. The age of the baby at death varied from two weeks to five and a half months, and six of these occurred in the home and three at Middlemore Hospital. The mother's occupations were: caregiver (4), beneficiary (2), employed full-time (2), and doing a training course. The father's occupation were employed full-time (6) and beneficiary (2). The number of people living in the households ranged from four to thirteen people.

Table 1. Number and rate (per 1000 live births) of Pacific SIDS in Auckland 1988-1996.

Year	Total pacific live births	NZHIS number	NZHIS rate	National Maori SIDS prevention programme number	National Maori SIDS prevention programme rate	Pacific SIDS research number	Pacific SIDS research rate
1988	2873	7	2.3	3	1.0	3	1.0
1989	3164	6	1.7	2	0.6	2	0.6
1990	3473	6	1.7	5	1.4	4	1.1
1991	3590	10	2.8	6	1.7	6	1.7
1992	3488	10	2.9	5	1.4	8	2.3
1993	3351	2	0.6	5	1.5	4	1.2
1994	3173	6	2.0	12	3.8	5	1.6
1995	3087	NA*	NA*	19	6.2	14	4.5
1996	3137	NA	NA	12	3.8	6	2.0
Total	29 336	47	14.0	69	21.4	52	16.0

*There was a change in classification of ethnicity in 1995. This is consistent with the concept of ethnic self-identification aimed at providing more detailed statistics and encompass a broader range of ethnic options.[8] NA=not applicable. NZHIS=New Zealand Health Information Service.

Table 2. Number of SIDS cases by ethnicity and gender.

Ethnic Origin	Male	Female	Total
Samoan	7	6	13
Cook Islands	5	4	9
Tongan	6	1	7
Multiple Ethnicity	7	8	15
Unknown	NA	NA	8
Total	25	19	52

NA=not applicable

Table 3. Age at death of SIDS cases.

Months	Number	Frequency (%)
<1-1.5	7	13.5
1.6-3.1	21	40.4
3.2-4.7	11	21.1
4.8-6.3	4	7.7
6.4-7.9	3	5.8
8-9.5	2	3.8
9.6-11.1	1	1.9
Unknown	3	5.8
Total	52	100

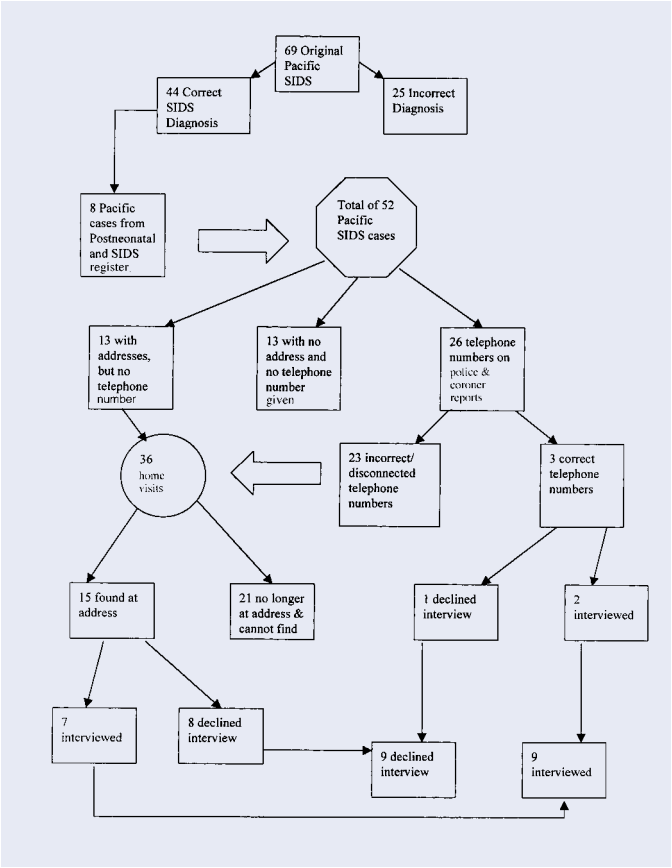

Figure 1. Flowchart to tracking Pacific SIDS families.

2) *Ethnic Origin of Parents.* The mothers were Samoan (5), Samoan/Maori (1), Cook lslands (1), Maori/European (1) and European (1). The fathers were Samoan (5), Samoan/Maori (1), Cook Islands (2) and Tongan (1). The ethnicity of the parents was based on the ethnic group that their parents came from. Those with mixed parents identified their ethnicity according to all the ethnic groups their parents came from. This was used to determine the ethnicity of the baby.

3) *Infantcare.* Childcare and support was received from the parents' mothers, in-laws, families, and from their own children. This was dependent on living arrangements eg living with in-laws, and other considerations, such as whether they had a good relationship with their kinsfolk. Childminding eg bathing, feeding, were the main activities performed by their families. Seven of these women had had previous children and had no cause to change their infant or childcare practices.

4) *Incident.* Seven babies were healthy prior to death. One had been to the doctor and another was awaiting a bowel operation. Four of the mothers had performed activities which were different from their usual; one baby slept with his parents for the first time and was started on solids foods on the day of death; another baby slept unsupervised in the prone position; another baby slept in bed on an adult pillow; and yet another baby had been taken out late that night. The remaining mothers had gone about the usual routine.

5) *Risk Factors.* All nine mothers normally had put their babies to bed on their back or side. Babies were only put on their stomach if they were supervised or could independently hold their heads up. Five mothers were non-smokers, and four were smokers who did not smoke near or around the baby. Three babies slept in a cot, two slept on a single bed, two in a bassinet, and two slept with their caregivers on a double bed. Eight of the babies slept in the same room with their caregivers. Seven were breastfed and two were bottle-fed, and they were fed every three to four hours or on demand.

6) *Bedding and Bedsharing.* The babies had slept on a single/double bed, bassinet or in a cot. These were placed next to the wall to prevent drafts from the window and door. The bedding consisted of a sheet, plastic or underlay covering the mattress, a duvet, blanket or bumper pad, another sheet (optional), a baby pillow, and a duvet or baby blanket/quilt. Woollen blankets were not used because they were considered too heavy, too hot, or caused itchiness. The babies usually slept in a singlet or t-shirt, skivvy (optional), stretch-n-grow or nightie, and nappy. Four babies slept with their mothers, and one with a grandmother, because they had either grown too big for their bassinets, or the caregivers wanted the baby close by.

7) *Housing.* A total of eight families lived in three bedroom houses, and one family of five lived in a two bedroom flat. Six families lived in rented dwellings, and three owned their houses. Ventilation and fresh air for children was considered very important and windows and doors were frequently left open. Houses were vacuumed regularly because baby was crawling on the floor. Oil and fan heaters were used during winter to warm up the house or room. One family preferred to use more blankets and wear warm clothes.

8) *Grief.* None of the nine mothers had any SIDS personnel visit them and the Pacific team was the first time contact had been established about their loss. However, all of the mothers had taken action to work through their grief. Family, church, and peer support were the main sources that they drew on. Children and male partners were identified as needing support and counselling also. Their male partners were a major concern because they had not openly grieved, did not talk about it, and refused to seek professional help. A support group for grieving SIDS parents was viewed positively.

9) *Information.* The level of knowledge about SIDS differed amongst the mothers. Some had heard of SIDS and there was uncertainty and curiosity about its cause and prevention strategies. Television advertisements about Red Nose Day were recollected. Current SIDS information and materials translated into Pacific languages were requested.

Discussion

This research shows 52 Pacific SIDS cases for 1988-1996 in Auckland, which is less than the information provided by

NZHIS. This discrepancy in Pacific cases highlights two important points; the under reporting of SIDS, and the need for a monitoring mechanism. Mounting interest from various sectors led to the inclusion of the 'Pacific Island' group in post-1992 fetal and infant deaths publications. Such an interest in this group suggests formal monitoring of SIDS incidence has been established, particularly when previously identified as having the lowest SIDS rate. This is evidently not the case.

Scrutiny of official sources show inaccurate recording of Pacific names. The correct spelling of Pacific names assists in identifying ethnic origin, ensures appropriate contact and minimises repetition of names on the register. One SIDS case was counted twice because the baby's name was entered under both parents' surnames. Ethnic classification assists the development and implementation of appropriate prevention strategies. A two-day forum on SIDS held with Pacific communities (November 1996) concluded that the collection of reliable Pacific SIDS data and the formulation of guidelines for ethnic specific programmes to Pacific people were essential to addressing the problem of SIDS.[9]

25 cases listed as SIDS were, in fact, not related to SIDS. Causes of death, as determined at post mortem, included bronchopneumonia, meningitis and haemophilus influenza. To improve data accuracy post-mortem, mortality review and a formal register of Pacific infant mortality could be established. This register should incorporate: baby's names, gender, date of birth and death, age at death, place of death, name of mother and father, ethnicity of mother and father and baby, address, and telephone number. A national infant mortality database that includes such information would improve data accuracy for every ethnic group in New Zealand.

Given the lack of data and systematic collection of SIDS in Pacific communities, the task of tracking families proved cumbersome. This study showed a high number of disconnected or incorrect phone numbers (90%) supplied on official reports, and families (40%) that had moved and left no forwarding address. The low number of families that consented to participation (17.3%) in the interview may represent a negativity derived from the SIDS experiences. The validity and representativeness of our findings is affected by insufficient sample size. These data will be useful, however, for developing prevention strategies, and in formulating research questions. The experience in tracking families highlights the barriers to data collection and service delivery to Pacific peoples whom are mobile and difficult to contact.

Undertaking this research with Pacific communities required a level of knowledge about Pacific cultures and protocols, fluency in English and a Pacific language, and access to community networks. The ability to communicate in a Pacific language fostered a rapport that enabled a better dialogue between the researcher and participant. Inherent in this primary medium of communication is a value system that underlies a particular worldview and responses to it.[10] Unnecessary anxiety and mistrust were alleviated, prompting a favourable reception to the project from the outset. The low response rate from the families tracked however, may be an indication of peoples perceived inadequacies of dealing with grief and death. As a study, these preliminary findings show rich data not seen previously, and associated limitations with the study. This offers valuable insights to developing prospective research, both locally and nationally, for assisting in prevention strategies.

Based on this preliminary study, SIDS in the Pacific communities appeared to increase in 1995, and might still be increasing. Routine and official data sources are currently insufficient for reporting accurately and monitoring Pacific infant mortality. A national infant mortality database that incorporates standardised ethnic specific categories is needed. Official routine data sources also need to incorporate standardised ethnic specific categories. From the qualitative phase of this study, the insights gained are useful in developing prevention strategies, and can better assist the design of a national prospective study.

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If you are goint to be ill, the best place to be is France - the country ranked first in an analysis of the world's healthcare systems carried out by the World Health Organisation (WHO).

Among major countries, France was followed by Italy, Spain, Oman, Austria and Japan, with several small countries (including San Marino, Andorra, Malta and Singapore) rated among the top ten healthcare providers.

Despite spending more of its gross domestic product on health than any other country (13.7%), the United States ranked only 37 out of 191 WHO member states; the United Kingdom, which spends just 6% of gross domestic product on health services, came out 18th. France spends 9.8%.

Zosia Kmietowicz. BMJ 2000; 320: 1687.

Hospital admissions among Pacific children in Auckland, 1992-97.

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Abstract

Aims. To describe the reasons for, and rates of, hospital admissions for Pacific children, compared with Maori and 'Other' (non Maori, non Pacific) children in Auckland over the six year period 1992 to 1997.

Method. Analysis was carried out of the New Zealand National Health Information Service database for Auckland domiciled children to show diagnostic codes and hospital admission rates for 0-14 year old children, using the 1996 Census population as the denominator population. Age standardised rates were calculated using the 'Other' group of children as the standard population.

Results. All-cause admission rates were higher among Pacific Children, compared with Maori and 'Other' children. Pacific Children were over-represented in admissions for acute respiratory infections, pneumonia and asthma/chronic obstructive pulmonary diseases, compared with both Maori and 'Other' children.

Conclusion. Pacific children had the highest hospital admission rates, the main reason being preventable respiratory tract conditions. These findings suggest that Pacific children should be a priority group for intervention at various levels. Improvements in socio-economic circumstances, access to early primary health care and community education supported by comprehensive ambulatory paediatric services (particularly with respect to respiratory conditions) need to be implemented urgently. Qualitative research is needed to determine why ethnic differences exist and to identify effective interventions for Pacific children.

NZ Med J 2000; 113: 358-61

The health status of New Zealand children has remained static in recent years, in comparison to that in many developed countries. The infant mortality rate (IMR), generally regarded as a sensible indicator of the socioeconomic conditions in which children live, is 7.2/1000 live births in New Zealand, the fifth highest of 21 OECD countries.[1] The IMR for the Pacific population in New Zealand is 9.5/1000.[2] Pacific peoples are among the fastest growing ethnic groups in New Zealand. The crude birth rate for Pacific people in New Zealand is more than double that for the country as a whole. Approximately 20% of all live births in Auckland are to Pacific women.[3] Pacific children aged one to four years are admitted to hospitals at a rate three times higher than other children. Several studies suggest that Pacific children in New Zealand have morbidity patterns which are typical of developing countries with high prevalence of diseases such as rheumatic fever, acute respiratory infections (ARI), meningitis and tuberculosis.[4] Changing demographic patterns among Pacific populations, together with economic and social reforms of recent years which have lead to a widening gap between the rich and poor, are postulated as reasons for this trend.[5,6] An ineffective health care system is also suggested as a barrier, leading to lower utilisation of primary care services and greater reliance on hospital emergency departments for routine health care by Pacific families.[7,8]

Hospital admissions provide some measure of the prevalence and severity of childhood diseases. Admission rates and their causes reflect socioeconomic circumstances, the level of utilisation of primary health care services and admission policies of tertiary institutions.

This study was undertaken to document admission rates and reasons for hospital admissions among Pacific children in Auckland, compared with children of other ethnic groups. It is part of a systematic analysis of the health status of Pacific children, with the purpose of developing priorities for research and health service provision.

Methods

Records of all admissions to public hospitals in the Northern region, based on Health Funding Authority boundaries, for children aged zero to fourteen years from 1992 to 1997 were obtained from the national morbidity database of the New Zealand Health Information Service (NZHIS).[9]

Northland was excluded because of its small Pacific population. Admissions included all day procedures and those in the perinatal period, but excluded outpatient visits and procedures.

Major diagnoses were coded according to the International Classification of Diseases (ICD9).[10] Ethnicity for numerator and denominator populations was determined by self-identification used in the Statistics New Zealand 1996 Census. The Pacific population included people of Samoan, Tongan, Cook Islands, Niuean or Tokelauan ethnicity, and all children claiming Pacific origin, but excluded children with mixed Pacific and Maori origin who were included in the Maori population. Age standardised rates were calculated using the 1996 Census figures and the 'Other' (non Maori, non Pacific) as the standard. Poisson regression was used to investigate the relationship between the rates of admissions to hospital from 1992 to 1997 for the three ethnic groups. The number of admissions was used as the outcome, with age group, ethnicity and year included in the model as categorical variables. Year was fitted as a categorical variable to allow for the non linearity of the admissions rates over time. The population figures for 1996 were included as an offset variable so that the model was fitted on a rate of admissions for the population basis. The interaction between year and ethnicity was dropped from the model as it was not found to be significant. Thus the model used was:

$$\log(\text{admissions}) = \log(\text{population}) + \text{intercept} + \beta_1\text{age1} + \beta_2\text{age2} + \beta_3\text{age3} + \beta_4\text{year1992} + \beta_5\text{year1993} + \beta_6\text{year1994} + \beta_7\text{year1995} + \beta b_8\text{year1996} + \beta_9\text{year1997}.$$

Results

Population Information. In 1996, the population of Auckland was 1 081 644, of which 117 954 (11%) claimed Pacific origin, 129 111 (12%) were Maori and 834 579 (77%) were of 'Other' (non-Maori, non-Pacific) origin. Children zero to fourteen years numbered 248 433 (23% of the total population), of which 41 997 (17%) were Pacific, 47 463 (19%) were Maori, and 158 973 (64%) were European, Asian and 'Other' children. Table 1 shows the composition and age distribution of the paediatric population by ethnic group in Auckland in the 1996 Census. Pacific children under fourteen years made up 36% of the total population of that ethnic group, compared with 37% within the Maori population and 19% of the 'Other' population.

Table 1. Auckland children by age group and ethnic origin, 1996 Census.

Ethnic Group	Age Group			
	Under 5 Years	5-9 Years	10-14 Years	Total
Maori	18 333	16 086	13 044	47 463
Pacific	16 083	14 391	11 523	41 997
Other	52 221	54 951	51 801	158 973
Total	86 673	85 428	76 368	248 433

Source: 1996 Census.

Hospital Admissions. There were on average 4626 admissions to hospitals annually among Pacific children over the six year period. Average age standardised hospital admission rates over the period were 9843/100 000 for Pacific, 6614/100 000 for Maori and 7836/100 000 for 'Other' children. The Poisson regression analysis found that there was a significant ethnic effect after allowing for age on the rates of admission. (chi-squared (2df) = 390.3 p<0.0001). The Pacific group was used as the reference, and the rates of admission for Pacific children were found to be significantly higher, adjusting for age and time over the six years than the rates for Maori children (chi-squared (ldf) = 11.0 p=0.0009), and 'Other' children (chi-squared (ldf) = 46.5 p<0.0001).

Figure 1 shows the annual age standardised admissions rates. Pacific children had the highest admission rates and Maori, the lowest, but admission trends were similar in the three groups. Admission rates peaked in 1994, followed by a small decline, but have increased again from 1996. Pacific children zero to fourteen years made up 22.5% of all admissions at a time when the group comprised 17% of the paediatric population. This compared with 17% of admissions for Maori from 19% of the population, and 60.5% of admissions for 'Other' children from 64% of the population.

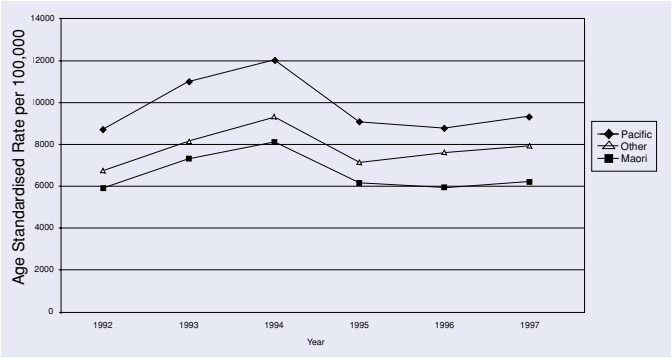

Figure 1. Age standardised admission rates by ethnic group, 1992-97.

Table 2 shows admission rates by ethnic group. The highest admission rates for all three ethnic groups were children under five years of age. Pacific children made up 25% of total admissions for the under five population when they comprised 19% of that age group. Maori made up 17.5% of admissions from 21% of the population, and other children were 57.5% of admissions from 60% of the population. Admission rates were similar in the five to nine and ten to fourteen year age groups in the three ethnic groups.

Table 2. Age specific and age standardised admission rates per 100 000 by ethnic group, 1992-97.

Age group (years)	Pacific	Maori	Other
<5	23 816	14 918	17 103
5-9	3756	2998	3951
10-14	2214	2076	2616
Age standardised	9843	6614	7836

Source: New Zealand Health Information Service.

Table 3 shows leading causes of admission. Each cause is ranked in order by the age standardised rate for each ethnic group. 'Other conditions originating in the perinatal period' was the leading category of admission for all ethnic groups, the highest rate being in Pacific children. This category included ill-defined conditions originating in the perinatal period, such as feeding problems. Pacific children had the highest admission rates for the five selected leading causes. For acute respiratory infections, the admission rate was more than twice that for 'Other' children, and almost twice that of Maori children. The situation with admissions for pneumonia and influenza was even more dramatic with Pacific admission rates almost six times that of 'Other' children, and more than twice that of Maori children. Pacific children made up 52% of all admissions for pneumonia and influenza, 32% for acute respiratory infections and 28% for chronic obstructive pulmonary diseases, the top three respiratory illnesses.

Figure 2 shows the admission trends for children aged under five years for the leading three diagnostic categories of respiratory illnesses. Admission rates for Pacific children were more than twice that for Maori and 'Other' children. There was little improvement in admission rates for respiratory diseases for Pacific children since 1992 while 'Other' children showed a slight improvement. Admission rates among Maori children were higher than 'Other' children, even though their total admission rates were lower overall.

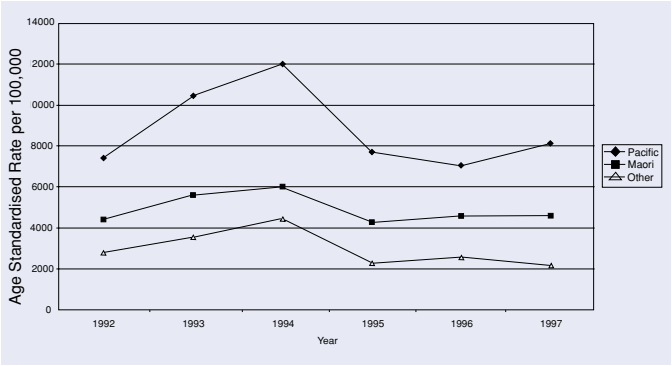

Figure 2. Age standardised admission rates for leading repsiratory conditions by ethnic group for under 5 year olds, 1992-97.

Discussion

Care is required interpreting these data because of the small numbers of Pacific children involved, undercounting and misclassification of Pacific people during data collection.[3] Coding of diagnoses could also vary between hospitals that contribute to the national health information database. Further, 'diagnostic transfer', an important factor in the reported increase in hospital admissions for asthma in Western Australia between 1971 and 1987,[11] might apply. However, deficiencies in data collection methods among Pacific populations suggest that admission rates presented are likely to be conservative estimates.

Hospital admission rates were highest for Pacific and lowest for Maori children, especially in children under five years. The trend is of particular significance because Maori were traditionally regarded as the group with the highest admission rates. Similarities in socio-economic circumstances, demographic patterns and utilisation of primary health care services between Maori and Pacific families suggest that other factors may explain the differences observed in this study. Alternatively, Pacific families may now be more socio-economically worse off than Maori families.

Reasons for discrepant hospital admission between children of various ethnic groups reflect differences in health status, socioeconomic circumstances, levels of knowledge and

Table 3. Age standardised rates (per 100 000 population), proportions and rank for selected leading causes of admission by ethnic group, 1992-97.

Cause	Pacific ASR	%	Rank	Maori ASR	%	Rank	Other ASR	%	Rank
Perinatal conditions*	2881	22	1	1623	14	1	2506	63	1
Acute Respiratory Infections	1416	32	2	844	21	3	643	47	5
Pneumonia & Flu	1079	52	3	468	25	7	142	23	11
COPD	890	28	4	599	21	5	473	51	7
Ear & Mastoid Diseases	911	19	5	850	20	2	827	61	3
Congenital anomalies	632	17	6	550	17	6	736	66	4
Fractures	644	13	7	677	16	4	907	71	2

Source: New Zealand Health Information Service. *Perinatal conditions = conditions originating in the perinatal period. COPD = chronic obstructive pulmonary disease. ASR = age standardised rate.

information in the community, health care seeking behaviour, availability of health care services, and admission policies of various hospitals. Internationally, minority groups show higher hospital admission rates for respiratory and gastro-intestinal infections than the majority culture.[12,13] Aborigines in Australia were admitted nearly three times more than other Australians between 1977 and 1988, and respiratory conditions were consistently much higher in Aborigines of all ages. Studies of zero to two year old children showed that Aboriginal children were admitted more often, stayed longer and were readmitted more often than non-Aboriginal children.[14,15] Similar work in New Zealand in the 1980's demonstrated higher asthma admission rates for Pacific children.[16]

A study in 1985 in Christchurch, showed that asthma and acute respiratory infections were the main reasons for acute admissions to hospital, and gastrointestinal infection was the next biggest category. In that year, admission numbers for each ethnic group were in proportion to their numbers in the population.[17] Our more recent Auckland-based study showed that, while asthma, acute respiratory infections and pneumonia were still the leading reasons for hospital admission, ethnic groups were no longer being admitted in numbers proportional to their representation in the wider population.

The admission rate for pneumonia among Pacific children was six times that of 'Other', and more than twice that of Maori children. Admission rates for pneumonia were consistent with those of a study of hospital admissions for pneumonia at Starship Children's Hospital between 1993 and 1996.[18] The admission rate for Pacific children with chronic obstructive pulmonary diseases (COPD), which included asthma, was twice the rate of 'Other', and one and a half times that of Maori children. Since asthma is not known to be more prevalent or more severe in Maori and Pacific children, this could reflect poor access to effective primary care and/or overuse of hospital services for acute asthma.[19,20]

Our data showed that admission rates among Maori were the lowest of the ethnic groups, although they suffered from similar types of illnesses to Pacific children. Changes in the proportion of Maori people claiming Maori origin is an unlikely explanation. Favourable Maori admission trends may reflect greater efforts by Maori to take charge of their own health and target resources towards health programmes that work for Maori. This is equally unlikely because active Maori involvement in direct health care provision started towards the latter part of the study period and any impact is not expected immediately. Whether the same relatively low admission rate can be achieved for Pacific children is open to question.

The reasons behind the high hospital admission rates among Pacific children are not clear. It is likely to reflect deteriorating socioeconomic circumstances of Pacific families, overcrowding, poor quality housing and inadequate access to primary health care services.[4,21] Other cultural and environmental factors may contribute. A study of asthma hospitalisation rates among inner city urban residents in New York showed that socioeconomic factors such as poor housing conditions, environmental exposure and lack of preventive health care explained differences in hospital admission rates between ethnic groups in that country.[22] Marked socioeconomic and racial disparity in asthma hospitalisation rates among inner-city children was reported to be attributable to greater need, not excess utilisation. Adverse environmental conditions and lower quality primary care were reported as the key contributors to observed differences.[23] A high prevalence of smoking among Pacific men and a high incidence of iron deficiency and adverse dietary habits among Pacific children could also contribute to the poor health of Pacific children.[24,25] Several studies have shown that Pacific people have lower per capita general practice consultation rates than other New Zealanders.[7,26] One study showed that 66% of Pacific people in South Auckland reported postponing visits to the doctors because they could not afford it, compared with 35% of the general population.[27] Pacific people have also been shown to be the least satisfied with primary care interactions.[28]

Further studies are needed to determine why differences exist between ethnic groups, and to identify strategies which may help reduce health disparities. Better understanding of health-seeking behaviour among different ethnic groups, the type of treatment received and referral patterns to secondary care is needed.[29] Policy makers are encouraged to look critically at financial, cultural, social and health system barriers to early primary care if admission rates and trends for Pacific children are to be improved. Efforts intended to improve outcomes may benefit a greater number of children by redirecting resources toward specific populations identified through hospital admission datasets.[30]

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POSITION PAPER

Routine examination of the newborn

Position statement of the Fetus and Newborn Committee of the Paediatric Society of New Zealand

NZ Med J 2000; 113: 361-3

Routine medical examination of the newborn infant is accepted practice. With changes in healthcare delivery, midwifery practice, hospital stay, and the appearance of new technology such as ultrasound, it is time to review current practice. Who should examine the infant and when? What standards should apply? What skills are needed and how are they assessed?

Timing of the routine newborn examination

1. First day examination

A routine newborn examination should be performed within 24 hours of birth.

Ideally this will be performed when mother and infant have recovered from the delivery, but no baby should leave the delivery room without a brief examination to exclude a major abnormality, and to ensure safe cardiorespiratory status. It takes just a moment to check breathing and colour and to sight the face, limbs, back, genitalia and anus. This brief examination does not interfere significantly with the baby's need to be kept warm, or with the dynamic process whereby mother and baby (and the rest of the family) get to know each other. In some units, because of the difficulty of arranging a full examination at any other time, the full routine examination is performed at delivery. In the case of home birth or early discharge, no infant should be left in the sole care of parents without having had a full examination.

2. Second examination later in the first week

A second examination should occur later in the first week. Congenital heart disease may not become apparent until several days of age when the pulmonary pressures fall (revealing a murmur in babies with a ventricular septal defect) or the ductus closes (revealing signs of cyanotic congenital heart disease or coarctation of the aorta). The baby should also be checked for jaundice, skin sepsis and for the condition of the umbilical cord. The full general examination should be repeated, since it has been shown[1] that as many as 0.5% of babies have abnormalities missed on the first examination that are picked up on the second. In the case of early discharge or home birth, the second examination can be coordinated with the Guthrie blood test. The weight should be compared to birthweight to detect possible feeding problems. Any management problems can be discussed at the same time.

It should be stressed that only routine screening examinations are being addressed. The midwife or medical practitioner advising the mother should at all times be willing to check the baby's general condition, as well as colour (for jaundice or cyanosis), umbilical cord and skin (for signs of infection). Despite normal routine examinations, a baby who has any symptoms of poor feeding or poor colour could have congenital heart disease and should have a careful cardiovascular examination. Whenever symptoms supervene, a full clinical assessment by an appropriately experienced clinician should follow.

3. Six week examination

All babies should be examined again at six weeks. This should be a general examination, but with special attention paid to heart, femoral pulse, hips, hearing, eyes, head (including circumference) and signs of hypothyroidism.

Who should perform the routine baby check?

The routine newborn examination should be performed by a health professional who is adequately trained and practiced in newborn examination. The options here are paediatrician, obstetrician, general practitioner, paediatric house staff, obstetric house staff and midwife.[2] The person best suited is the person with the best training and experience. Anyone can be taught the skills, but full competence will only come with continued practice. Some obstetricians, general practitioners and midwives freely admit to a decline in baby examination skills and ask a paediatrician to provide the service. The person providing this service should maintain the knowledge and skills required to advise parents about the implications of abnormal findings, to answer their more general questions and to provide appropriate health education. The training of each professional group needs to be assessed to ensure that there is adequate preclinical and clinical training and assessment, and that practical skills and knowledge are maintained.

The content of the routine screening examination

The routine newborn examination should be a full clinical assessment. The examiner should be aware of the perinatal history and of the relevant family and social history. A full examination of all systems should be performed, preferably

in the presence of the parents. It is beyond the scope of this paper to raise all the possible abnormalities, but it is appropriate to point out that experience is necessary to detect and interpret findings optimally. The following should be examined and documented: general appearance (for dysmorphic features), weight, length and head circumference (measurements and centiles), heart, respiration, colour, palate, abdomen, umbilical cord, genitalia, femoral pulses, hips, limbs, anus, back, head, eyes and ears.

The intention is to pick up:
Any identifiable syndrome such as Down Syndrome.
Other congenital anomalies, especially:

- **congenital heart disease.** This requires a skilled cardiovascular examination, with particular attention to: colour, breathing, cardiac signs and pulses, including the femoral pulses.
- **coarctation of the aorta.** If the femoral pulses are in doubt, arm and leg blood pressures should be checked.
- **congenital cataract.** It should be routine for all babies to be checked with an ophthalmoscope to ensure that there is a normal red reflex. At the same time, any other eye abnormalities such as a coloboma should be identified.
- **anal atresia.** A careful inspection of the anus is essential.
- **genital abnormalities.** It is essential that any form of ambiguous genitalia should be identified and sorted out as soon as possible. This problem requires immediate specialist referral. More common abnormalities, such as undescended testes, are also important.
- **abdominal masses.** A congenital Wilms tumour or hepatoma will present as an abdominal mass. These and other masses, such as a large hydronephrosis or polycystic kidney, may be detected by early routine examination.
- **cleft palate.** This requires examination of the mouth with a good torch and a spatula so that the whole of the palate is visualised.
- **choanal atresia** needs to be checked for if there is unexplained breathing difficulty. If there are excessive oral secretions or frothing, then **oesophageal atresia** should be excluded by passage of a tube into the stomach.
- **congenital dislocation of the hip (CDH).** This comes into a special category, and has been the subject of official recommendations.[3] Detecting a positive Ortolani or Barlow test requires skill and experience. Many services have arranged for one or two orthopaedic surgeons to run a hip check service. This ensures that an optimally trained and experienced person checks the baby. Short of this, the hip check should be performed by someone who has examined many normal and abnormal hips, and who has demonstrated the ability to detect an abnormality. An infant born after breech presentation or with a family history of CDH should be referred for review in accordance with regional arrangements for the surveillance of infants at high risk of this condition.

Other Issues

Hearing assessments. The Health Department has published a list of indications[4] for referral of an infant for a routine Auditory Brain Response (ABR) test. The indications are: family history of congenital deafness; malformation of the cranium or face; severe neonatal jaundice; neonatal meningitis; severe birth asphyxia; evidence of congenital rubella, toxoplasmosis or cytomegalovirus infection and very low birthweight. Any of these indications should be identified by the examiner, and referral made for ABR testing. Hearing screening for all infants would be desirable if an appropriate test were available, but so far there is no generally accepted test. Otoacoustic emissions are the most promising possibility for a routine screening test for hearing.[5] However, this is not routinely available.

Primary Ultrasound screening of hips. Routine ultrasound screening of all babies hips is advocated by some.[6] Ultrasound screening of high risk infants (where there is a breech delivery or family history) is more likely to find acceptance,[7] but further trials are required before national recommendations are made.[8]

Hips - training with Baby Hippy. If someone other than an experienced neonatal hip examiner is responsible for CDH detection, that person should be initially trained using the training model ('Baby Hippy') and then should take every opportunity to upgrade their skill.

Inevitably defects will be missed on some occasions. One study[1] showed that 0.5% of babies had an important finding on a second examination which had clearly been missed on the first. It is easy to examine a baby and find nothing wrong. Skill, experience and good judgment are required if an optimal service is to be provided to the nation's newborns.[9]

Summary of recommendations.

1. All newborns should have at least a brief examination immediately after birth to check breathing and colour, and to sight the face, limbs, back, genitalia and anus.
2. All newborn infants should receive a full clinical assessment within the first 24 hours by a health professional who is adequately trained and practiced in newborn examination. The following should be examined and documented: general appearance (for dysmorphic features), weight, length and head circumference, heart, respiration, colour, palate, abdomen, umbilical cord, genitalia, femoral pulses, hips, limbs, anus, back, head, eyes and ears.
3. No infant should be left in the sole care of parents without having had a full examination.
4. All newborns should have a second examination several days later, with special emphasis on cardiac examination and femoral pulses as well as a general examination.
5. All babies should be examined again at six weeks. This should be a general examination, but with special attention paid to heart, hips, hearing, eyes, head (circumference) and signs of hypothyroidism.
6. As well as the examiner being properly trained to perform the examination, skills should be maintained and audited.
7. Where possible, a neonatal hip examination should be performed by practitioners specifically trained and experienced in the examination of the neonatal hip.
8. The examiner should identify the indications for deafness screening.

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Jenny Corban	Hastings
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VIEWPOINTS

Live donor liver transplantation for adults - should we?

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NZ Med J 2000; 113: 363-4

Live donor liver transplantation (LDLT) was initially developed to overcome a critical shortage in donor organs. It was first used for paediatric patients, where size-matched donor organs are rare, and expanded for adult programmes in those countries where cadaveric transplantation is not feasible, chiefly Japan, where religious beliefs and, until recently, the absence of brain-death legislation prevented cadaveric donation. The need for LDLT in paediatric programmes has largely disappeared since splitting of adult organs became technically feasible and more broadly applied. However, the ongoing shortage of cadaveric organs for adult recipients has led some centers to extend the live donor programme to include adult-to-adult transplantation.[1] To do this requires a considerably larger portion of the donor liver, usually the right lobe which constitutes 50-60% of the total liver volume. Whilst this deficit is quickly rectified by hyperplasia of the remnant, the resection itself is more risky. There is some controversy as to the exact mortality associated with the procedure, but one author (Russell Strong, Brisbane) has recently stated that there have been two donor deaths when right lobes have been taken, with a denominator of around 250 procedures. This would put the risk for a potential donor at around 1%, three times that of a left lateral segment donor, and at least ten times that for a live kidney donor.[2] We wish to record our dismay that reportage of such donor deaths is not mandatory: nevertheless we understand why centres may be reluctant to publicize such catastrophes.

For patients listed with chronic end stage liver disease, the median waiting time in our unit is twelve weeks, which is relatively short in comparison to overseas units - a median of sixteen weeks in UK and over 60 weeks in North America. We are currently able to transplant most chronic patients before they deteriorate irrevocably. At this time it would be difficult to justify live-related liver transplantation for elective cases. This situation could change in the future if the demand for liver transplantation increases in line with most other countries. One situation however, where donor shortage is associated with increased mortality in our programme is in patients with acute liver failure, who are urgently listed for transplantation. Once transplant criteria are met, over 95% of such patients will die from cerebral oedema, multiorgan failure or sepsis, unless emergency transplantation is performed. The window of opportunity during which the patient remains well enough to be transplanted is short - usually between two and five days. Since the New Zealand Liver Transplant Unit was established, seventeen patients have been urgently listed, but seven have died before a donor could be found.

Although the need is greatest in the acute liver failure patient, the ethical issues of LDLT are also greatest in this situation. The short window of time makes identification, evaluation and fully informed consent of the potential donor difficult. The risk of coercion of the potential donor by medical staff and other members of the recipient's family is high. Although the benefits to the recipient are obvious, the associated risks to the donor also need to be carefully considered. Aside from the small, but definite, mortality from the donor operation, the donor may have associated morbidity from pain, scarring and loss of earnings during the recovery period.

On the technical side, one of us (JM) has considerable experience in liver resection surgery, and the outcomes for the patients we have transplanted using full-size cadaveric grafts lead us to believe we could accomplish live donor transplantation for adults from a purely technical perspective. However, the ability to perform such a procedure does not in itself justify its use. The ethical issues surrounding the donor operation are not new; they relate also to live donor kidney transplantation and adult-to-child LDLT.[3] However, the stakes are highest for adult-to-adult LDLT. Furthermore, a stringent donor selection protocol, which is mandatory, can be expected to exclude more than 50% of potential live liver donors on medical or other grounds.[1,4] Nevertheless successful adult-to-adult LDLT has been accomplished for acute liver failure, in units like ours where timely availability of cadaveric livers is a particular problem.[4]

Details of the latest medical innovations are now readily accessible to the public via the internet. The most provocative scenario we face is where the family members of a patient dying of acute liver failure, for whom a liver is not yet available, approach us. Such family members wish to donate a portion of their liver to save the life of this person. Currently we say no. We are most interested in hearing from the medical community of New Zealand on this issue. Our subspecialty is notable for the fact that we have to walk a fine line between timidity and temerity. We wish to know your views before we take our next step along that line.

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Addendum. At a combined meeting of liver transplant centres staff from Australia and New Zealand held on April 11th 2000, in Canberra it was agreed to pursue live-donor liver transplantation for acute liver failure, but not, at this time, for patients with chronic liver disease. This distinction was made because of differences in waiting list mortality rates (40% for acute versus 5-8% for chronic liver disease patients). Subsequent to this meeting, in late April, a young adult patient with acute liver failure received a live-donor transplant in Perth. Both donor and recipient were doing well at the time of writing (18 May 2000).

Implementing the South Auckland Diabetes Plan: barriers and lessons

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NZ Med J 2000; 113: 364-6

In November 1992, the South Auckland Diabetes Plan was launched.[1] Diabetes had hitherto been recognised as a major problem in South Auckland.[2,3] The Plan, an attempt to stimulate local effort to meet the needs clearly defined by the South Auckland Diabetes Survey,[4-6] was developed by a representative committee ('the South Auckland Community Diabetes Planning Group') and distributed to all local general practitioners (GPs) and agencies involved in the delivery of care to diabetes. The South Auckland Diabetes Project (SADP), with its diabetes research team, was established concurrently to address those activities unlikely to be undertaken by either general practice or secondary services.[7] Immediately after the launch of the Plan, the New Zealand health reforms led to the local establishment of five different Independent Practitioner Associations (IPAs), the replacement of most of the existing hospital management and major changes in health promotion activities.

An economic evaluation of the Plan confirmed that its 'net benefits' were 'significantly positive'. An evaluation by the Ministry of Health and the Northern Regional Health Authority in July 1993 supported the implementation of the Plan and funding for the SADP.[9] Plans for the Northern Regional Health Authority in 1996,[10] New Zealand[11] and Otago[12] have been built upon that from South Auckland. At the time of the Plan, a referee of the paper[1] prophetically asked who would ensure implementation of the plan. It is timely to review the extent to which the Plan was implemented, barriers to that process and lessons learnt along the way.

Implementing the South Auckland Diabetes Plan

The Plan defined primary, secondary and tertiary prevention strategies to enhance quality of life issues, and reduce the growth in social and financial costs caused by diabetes. There were 68 recommendations grouped into 38 major recommendations: eight related to patient and community empowerment, nine to access to care, sixteen to improving coordination and standardisation of care and five to diabetes detection. Figure 1 summarises recommendations in the Plan, displaying which components were funded directly (at least in part) and which were implemented.

The South Auckland Health diabetes services established six new community clinics two to three years after the launch of the Plan and transferred a diabetes nurse specialist from the outpatient services to the wards. The former was associated with a reduced default rate (unpublished) and the latter with an improvement in inpatient diabetes care.[13] The changes were unfunded and the delay was due principally to resistance to the move to more community based care by some staff, particularly the additional travelling, and the absence of additional resources required to service the need. Other notable, but funded achievements, were the expansion of podiatric and ophthalmological services in 1995 and 1998 respectively. However, no funding was available for the identified unmet dietetic needs (the inpatient service was in fact reduced) or for other diabetes staff (indeed, the total diabetes nurse specialist complement was also reduced).

Barriers to success: three critical failures

Financial constraints affecting patients and services, personal barriers to self care and the coordination/standardisation of care were revealed as key barriers to success.[14,15] There were three major failures:

1. The failure to increase substantively the dietetic, education and medical time had a major impact on the ability to provide the care required.
2. The failure to address the personal costs of care[16] reduced adherence to glucose monitoring and self-medication.
3. The failure to appoint a South Auckland wide coordinator of lifestyle programmes, provision of clinical care, information flow, a District Diabetes Advisory Group and the response to clinical incidents and complaints. This failure allowed duplication and gaps in care to continue.

The failure to introduce strategies to increase detection of diabetes in the wider community and during pregnancy is a reflection of the lack in population based coordination.

Empowering communities and patients: slow progress

After launching the Plan, the SADP attempted to maintain a representative 'Diabetes Advisory Council'. Attendance was patchy, and the group eventually folded after four years because of lack of authority and a working coordinator. The Mangere Diabetes Integrated Care Pilot Project[17] included the establishment of a Manukau Diabetes Forum, a process initiated with support of the Manukau Counties Health Forum. This faltered due to a lack of funding and a perceived focus on Mangere.

One area of greater success was the development of community diabetes educator courses for Maori and Pacific Islanders. Over 30 individuals passed through the courses run jointly by the Manukau Institute of Technology, South Auckland Health, the SADP and the University of Auckland. Most participants are now in the health workforce (paper submitted). Unfortunately, funding for these courses has been withdrawn by North Health.

Information: partial success

The information aspects of the plan are increasingly being implemented. The SADP with regional health authority and pharmaceutical company support established the Diabetes Care Support Service.[18] The experience gained was a major contribution to the recent Diabetes Health Information Project.[19] The diabetes services in Auckland are now working together to develop diabetes clinical software tailored to the needs of the New Zealand situation. There had been an opportunity to create an integrated electronic diabetes record in primary and specialist care in Mangere, but local issues and privacy considerations delayed full implementation.

Coordination: the big fail

It is clear after six years that a major factor blocking implementation of the diabetes plan is lack of coordination.

	Implemented	Not Implemented
Funded	• Pilot Community based awareness/life style programme (2)[SR] • Evaluate usefulness of targeting high risk groups[SR] • Provide diabetes training to community based nurses[HR] • Distribute targets for care to all GPs[HRP] • Establish district wide diabetes audit (2)[SRP] • Pilot methods to address reasons for default from care[HR] • Build network of Maori/Pacific Island support groups[SR] • Improve accress to podiatry[HR] • Introduce retinal photography[HR] and introduce local retinal photocoagulation service[HR] • Remove $6 tax on glucose test[R] • Improve support for GP based care[M]	• Coordinate an integrated approach to lifestyle(2)[M] • Ensure Universal screening for gestational diabetes
Not Funded	• Develop tailored diabetes education materials[SP] • Increased number Maori and Pacific Island diabetes workers[HS] • Introduce inpatient Diabetes Nurse specialist service[H] • Intregrate South Auckland Diabetes Centre into services[H] • Move diabetes clinics into community (2)[H] • Develop and pilot patient carried notes[SP]	• Distribute patients' charter to all patients • Emphasise need to have one GP and to assure screening (3) • Fund a district diabetes coordinator • Offer all inpatients diabetes education before/after discharge • Provide an out of hours clinic and advisory service (2) • Fund 6 further community educators, 2 diabetes nurses, 2 dietitians, 0.1FTE diabetes specialist • Reduce patient out of pocket expenses • Introduce retinal photography in different sites (part of eye service recommendation) • Provide follow up for people with past GDM/IGT (2) • Pilot/evaluate screening days by GP/diabetes service • Maintain Diabetes Advisory Council (2)

Figure 1. Components of plan by implemention and funding status. Numbers in parentheses indicate the number of recommendations.

Key to providers and funders: (S) = South Auckland Diabetes Project; (H) = South Auckland Health; (R) = North Health; (M) = Mangere Integrated Care Project; (P) = Pharmaceutical industry support. Some components include more than one recommendation. GDM: gestational diabetes mellitus. IGT: impaired glucose tolerance.

The GP audit showed that local GP services were at least as good as those overseas.[20] Similarly, specialist services provided quality education and clinical care to those who attended within the resources available. Inpatient activities were also well ranked in the hospital roundtable (unpublished data). The problem is that activities are not linked, and the gaps of 1992 remain. The failure in coordination has been at two levels: at the level of provider organisations as already discussed, and at the patient level. At the patient level, many diabetic patients experience uncoordinated episodic primary and secondary care. A competitive model does nothing to improve this. Furthermore, coordination takes non-patient contact time, and this has not been specifically funded.

The need for protected staff time has been shown elsewhere.[21] The appointment of clinical care coordinators is associated with an improvement in glycaemic control which can lead to a 60% reduction in complications.[22,23] The role of these individuals is not only to provide clinical care, but also coordinate other components of their care and to observe targets and referral pathways (the standards referred to in the Plan). In the Mangere Project, this patient care coordination role was successfully refined through a joint consultation process,[17] and the job termed 'Diabetes Care Promoter' (DCP). A DCP is a named diabetes clinician (eg GP, diabetes nurse specialist, podiatrist, specialist) who has time reserved for facilitating and coordinating all care delivered by the complete diabetes team. The individual is readily accessible, provides personal support, has health systems expertise and full access to all related health care information and is already involved in the care of the patient. The role had already been successfully introduced into the local Diabetes in Pregnancy services with a domiciliary diabetes midwife, and was associated with reduced admission rates, length of stay and improved glycaemic control (paper submitted). South Auckland Health is about to introduce the role for other patient groups at high risk. The Mangere Project is piloting such a role in general practice.

Primary prevention: time to implement

Although coordination of all involved in lifestyle and awareness programmes has not happened in South Auckland (mainly because of the lack of funding for coordination and the imposition of the more competitive environment), many positive events have occurred. The Agencies for Nutrition Action group is attempting to coordinate projects on a national level. Both the SADP Pacific Islands Church programme and the Ola Fa'autauta Project[24,25] have demonstrated that a structured and modular lifestyle programme can control weight in the Samoan community. A number of lifestyle interventions are underway but these are generally not integrated with the local general practice services nor with each other.

Conclusions

The South Auckland Diabetes Plan was based upon 'hard' local data relating to needs. It was devised by a group representing patients, the providers of care and the high risk groups in the community. Implementation of 20 of 38 recommendations was achieved by a number of enthusiastic individuals through lobbying and other activities. Many key clinical areas remain seriously underfunded; the personal costs of diabetes care and need for patient centred service delivery have not been addressed. We believe that the competitive purchasing model contributed to the difficulties in introducing such a coordinated approach to care. In essence, the Plan has not been implemented to the extent required, and five year follow up data (paper submitted) showed that between 1991/2 and 1996/7, glycaemia and blood pressure control have worsened. We strongly recommend that a needs and geographically defined population based approach to funding be introduced for diabetes care, incorporating specific district and patient coordination services. An outcomes monitoring system permitting national and international benchmarking should be established under the joint control of the key patient and clinician stakeholder organisations. Services provided to prevent diabetes complications need to be free or at minimal cost to the patient at the point of care. The key components of the Plan remain even more valid today than in 1992, and the financial and societal costs of not implementing the plan are increasing rapidly.

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