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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.

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. The IMR for the Pacific population in New Zealand is 9.5/1000. 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. 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.

Changing demographic patterns among Pacific populations, together with economic and social reforms of recent years, 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. 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.

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.

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). 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). 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:

\[ \text{log(admissions)} = \text{log(population)} + \text{intercept} + \beta_{\text{age1}} + \beta_{\text{age2}} + \beta_{\text{age3}} + \beta_{\text{year1992}} + \beta_{\text{year1993}} + \beta_{\text{year1994}} + \beta_{\text{year1995}} + \beta_{\text{year1996}} + \beta_{\text{year1997}}. \]

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.
Figure 1. Age standardised admission rates by ethnic group, 1992-97. There were on average 4626 hospital admissions for children aged 5-14 years in the three ethnic groups. Admission rates were similar in the five to nine and ten to 14-year age groups in the three ethnic groups. Admission rates for all three ethnic groups were highest for Pacific 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 admission rates presented are likely to be conservative estimates.

Hospita...
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 overdue 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 programs 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.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 Several studies have shown that Pacific people have lower per capita general practice consultation rates than other New Zealanders.25 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.26 Pacific people have also been shown to be the least satisfied with primary care interactions.27

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.28 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.29

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

<table>
<thead>
<tr>
<th>Cause</th>
<th>Pacific ASR</th>
<th>%</th>
<th>Rank</th>
<th>Maori ASR</th>
<th>%</th>
<th>Rank</th>
<th>Other ASR</th>
<th>%</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perinatal conditions*</td>
<td>2581</td>
<td>22</td>
<td>1</td>
<td>1621</td>
<td>14</td>
<td>1</td>
<td>2506</td>
<td>63</td>
<td>1</td>
</tr>
<tr>
<td>Acute Respiratory Infections</td>
<td>1416</td>
<td>32</td>
<td>2</td>
<td>844</td>
<td>21</td>
<td>3</td>
<td>643</td>
<td>47</td>
<td>5</td>
</tr>
<tr>
<td>Pneumonia &amp; Flu</td>
<td>1079</td>
<td>52</td>
<td>3</td>
<td>468</td>
<td>25</td>
<td>7</td>
<td>142</td>
<td>23</td>
<td>11</td>
</tr>
<tr>
<td>COPD</td>
<td>890</td>
<td>28</td>
<td>4</td>
<td>599</td>
<td>21</td>
<td>5</td>
<td>473</td>
<td>51</td>
<td>7</td>
</tr>
<tr>
<td>Ear &amp; Mastoid Diseases</td>
<td>911</td>
<td>19</td>
<td>5</td>
<td>850</td>
<td>20</td>
<td>2</td>
<td>827</td>
<td>61</td>
<td>3</td>
</tr>
<tr>
<td>Congenital anomalies</td>
<td>632</td>
<td>17</td>
<td>6</td>
<td>550</td>
<td>17</td>
<td>6</td>
<td>736</td>
<td>66</td>
<td>4</td>
</tr>
<tr>
<td>Fractures</td>
<td>644</td>
<td>13</td>
<td>7</td>
<td>677</td>
<td>16</td>
<td>4</td>
<td>907</td>
<td>71</td>
<td>2</td>
</tr>
</tbody>
</table>

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

ASR = age standardised rate.