Teenage use of GP care for moderate to severe asthma in Auckland, New Zealand

Stephen Buetow, Deborah Richards, Ed Mitchell, Barry Gribben, Vivienne Adair, Gregor Coster, Makere Hight

Abstract

Objectives. To describe and understand teenagers’ frequency of attendance for General Practitioner (GP) care of moderate to severe asthma in the Auckland region.

Methods. Ten Auckland schools identified 510 children aged 13–14 years with breathing problems, who were invited to complete a screening questionnaire. 271 children participated, of whom 114 had moderate to severe asthma.

Results. 39% of the 114 had made 0–1 GP visit for asthma, and 17% made ≥5 visits. Low attendees (0–1 visit) were disproportionately New Zealand European. High attendees (≥5 visits) tended to be Maori and/or Pacific Islanders. Half of the teenagers attended GP asthma care as often as it wanted, independently of ethnicity; 62% tell their parents when they cannot manage their asthma; and 29% must pay for GP care. Expected attendance was increased for Maori and Pacific students versus others by 77% (p=0002), and by asthma of increased severity (p <0.001). Teenager resistance to accessing GP asthma care reduced expected attendance by 24% (p=0.003).

Conclusions. Maori and Pacific peoples have traditionally faced barriers to accessing GP care, but their more frequent attendance (than New Zealand Europeans) in this case, challenges whether such barriers persist, at least for acute care of moderate to severe asthma.

As children move into their early and middle teenage years, they begin to acquire the ability and permission to help make medical care-seeking decisions. Enhancing the ability of adults to support teenagers is the capacity and willingness of the teenager to recognise a particular health problem or need, and disclose it to an adult.

Problem non-recognition by teenagers may reflect a lack of both functional limitation and sensed danger. Non-disclosure, when there is recognition of health need, may result from believing that continuing functional limitation is inevitable or an expectation that the problem will not be managed as the teenager wants. Negative teenager perceptions of the organisation and delivery of general practitioner (GP) services may help to account, in turn, for teenagers’ under-use of these services. Asthma is a common condition of rising prevalence, which affects teenagers’ health status and can impair development into independent, functional adulthood. In New Zealand (NZ), GPs are responsible for the diagnosis and clinical management of most asthma. Attendance patterns for GP asthma care vary widely in NZ but are poorly understood for teenagers.

This paper focuses on 13–14 year olds with moderate to severe asthma in the Auckland region. It aims to describe and understand from their perspective the frequency with which they access GP asthma care. Reference is made to teenagers’
perspectives on their need for this care; their communication with parents and other guardians; and GP care.

**Methods**

**Sampling**—A sample of 13–14 year olds with moderate to severe asthma was produced in three stages. Stage 1 involved the random selection (in mid-2002) of State secondary schools in Auckland City and Manukau City (south of Auckland City). Schools were ineligible for selection if they had been invited to participate in the concurrent, third phase of the International Study for Asthma and Allergies in Childhood (ISAAC). Participation in our research was sought from 15 schools, first in writing to the school principal and school nurse, and then through a follow-up phone call to both. Site visits to interested schools established a working relationship as well as the roles and responsibilities of each party.

In Stage 2, each participating school used its records to identify all known 13–14 year-olds with breathing problems, and allowed us to speak with this group about breathing, asthma, and our research. The teenagers were invited to obtain from an adult guardian written informed consent to self-complete a short questionnaire at a return visit. They were given a supporting letter from the school principal; a coloured flyer about the project; an information sheet; and a consent form. Our materials were available in English, Maori, Mandarin, Samoan, and Tongan. The teenagers were told that all participants would enter a draw for petrol vouchers. After approximately 2 weeks, a follow-up phone call was made to guardians of the teenagers who had not returned consent forms. In late 2002, we administered the self-complete questionnaire to the teenagers for whom written consent had been received.

Stage 3 identified the teenagers with moderate to severe asthma from responses to the questionnaire (see below).

**Sample size**—Power calculations had been performed for different sample sizes. Without clustering by school, a sample of 107 students with moderate to severe asthma was sufficient to estimate with 95% confidence any item response reported with a prevalence of 75%±8%. For a regression model estimated by maximum likelihood, we planned to allow approximately one parameter for each 10 observations.

**Data collection**—The questionnaire had two parts. Part A focused on the presence and severity of breathing problems during the previous 12 months. For the teenagers reporting ‘wheezing or whistling in the chest’, moderate to severe asthma was defined by reports of at least one of the following: ≥4 wheezing attacks, asthma-associated sleep disturbance on ≥1 night per week, and wheezing severe enough to limit speech to one or two words at a time between breaths. These definitions of asthma and severity of asthma were used by ISAAC. Among other questions was one asking how many GP visits the teenagers had made for their wheezing in the past year. Part B covered issues not discussed at our oral presentation and was required only if the asthma was moderate to severe. The questions covered potential influences on the use of GP care for wheezing. They were developed from published literature and our prior qualitative interviews with families, including some teenagers, on child access to GP care for moderate to severe asthma. The questions were reduced to six variables through additive scales. Two of the variables describe perceived need. Three describe teenager communication and one describes beliefs about GP care. Teenagers were assigned to each of the one or more ethnic groups they specified.

**Data analysis**—Simple descriptive and inferential statistics were produced to explore the dataset for teenagers with moderate to severe asthma. The outcome of primary interest was a count of GP visits for asthma in the year before completion of the questionnaire. A negative binomial regression model (NBRM) was fitted using the software package, Stata to account for this outcome. An intraclass correlation of 0.000 suggested that no variation in GP attendance was attributable to the clustering of students within the same schools.

Ethical approval for the study was obtained from the Auckland Ethics Committee.

**Results**

Ten of the 15 invited schools took part. Their mean decile was 5.1 (s=3.1). Their mean total roll was 1386 students (s=935) with, on average, 12.9% Maori and 22.3%
Pacific Islanders. Of the five other schools, all cited workload as their reason for not participating. Their mean decile was 3.8 (s=3.8) and they averaged 1312 students (s=654) of whom 15.1% and 42.5% (on average) were Maori and Pacific Island students respectively.

Participant schools identified 510 13–14 year-olds as having breathing problems or asthma, of whom 271 (53.1%) returned written consent from a guardian to complete our questionnaire. Of the 85.2% (231/271) students reporting ‘wheezing or whistling in the chest in the last 12 months,’ almost half (114/231) fulfilled the criteria for moderate to severe asthma.

The students’ mean age was 13.5 (s=0.5) with a sex ratio of 40.7 (33 boys and 81 girls). Almost three-quarters (84/114) identified as NZ European. Maori and Pacific teenagers numbered 15.8% (18/114) and 13.6% (15/114) respectively; 22.8% (26/114) identified as Maori and/or Pacific Islander. Fourteen teenagers (12.3%) identified as Asian.

Approximately four in every ten (39/100) of the teenagers had made 0 or 1 visit to a GP for asthma in the year before completing the questionnaire; 17% (17/100) had made ≥5 visits. Low attendees (0 or 1 visit) were disproportionately NZ European, and high attendees (≥5 visits) tended to be Maori and/or Pacific Islanders.

However, no statistically significant differences were detected between the mean numbers of visits reported by Maori and Pacific teenagers (4.5 visits) compared with other teenagers (2.5 visits) (t = -1.673, p > | t | = 0.108), or by the boys (3.9 visits) and girls (2.5 visits) respectively (t = 1.4, p > | t | = 0.189). A statistically significant relationship was found between the number of GP visits for asthma and the severity of moderate to severe asthma (F = 19.6, p > F = 0.000).

Table 1 reports the distribution of responses to statements about need, communication, and GP care. Among key findings was that only half of the teenagers received GP care as often as these teenagers wished. Almost one-third reported having to pay for their GP care. Table 2 summarises findings from the NBRM. Expected attendance was increased for Maori and Pacific students compared with other students, and by asthma of increased severity. No interactions were detected.

Table 1. Frequency of agreement with statements about need, communication and General Practitioner (GP) care among 13–14 year-olds with moderate to severe asthma

<table>
<thead>
<tr>
<th>Variable</th>
<th>Yes (%)</th>
<th>No (%)</th>
<th>Neither Yes nor No (%)</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheeze-related need</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheezing is a problem for me</td>
<td>49.1</td>
<td>15.7</td>
<td>35.2</td>
<td>108</td>
</tr>
<tr>
<td>My wheezing can be controlled</td>
<td>83.3</td>
<td>4.6</td>
<td>12.0</td>
<td>108</td>
</tr>
<tr>
<td>I need help with wheezing</td>
<td>19.4</td>
<td>55.6</td>
<td>25.0</td>
<td>108</td>
</tr>
<tr>
<td>I don’t want to bother parents with my wheeze</td>
<td>15.9</td>
<td>53.3</td>
<td>30.8</td>
<td>107</td>
</tr>
<tr>
<td>Need for GP care of wheeze</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I need GP care for wheeze</td>
<td>52.9</td>
<td>24.0</td>
<td>20.2</td>
<td>104</td>
</tr>
<tr>
<td>I have seen a GP about my wheeze as often as I wanted</td>
<td>49.5</td>
<td>28.0</td>
<td>22.4</td>
<td>107</td>
</tr>
<tr>
<td>Going to GP about wheeze is important to me</td>
<td>36.2</td>
<td>41.9</td>
<td>21.9</td>
<td>105</td>
</tr>
<tr>
<td>I might waste GP’s time with my wheeze</td>
<td>15.4</td>
<td>68.3</td>
<td>16.4</td>
<td>104</td>
</tr>
</tbody>
</table>
Table 2. General Practitioner (GP) visits by 13–14 year olds with moderate to severe asthma: negative binomial regression model (N=92)

<table>
<thead>
<tr>
<th>Independent variable: GP visits</th>
<th>B</th>
<th>z</th>
<th>P &gt;</th>
<th>z</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Need related to wheeze</td>
<td>0.120</td>
<td>1.693</td>
<td>0.091</td>
<td>12.8</td>
<td></td>
</tr>
<tr>
<td>Need for GP care of wheezing</td>
<td>0.225</td>
<td>4.259</td>
<td>0.000</td>
<td>25.2</td>
<td></td>
</tr>
<tr>
<td>Resistance to GP care</td>
<td>-0.277</td>
<td>-2.927</td>
<td>0.003</td>
<td>-24.2</td>
<td></td>
</tr>
<tr>
<td>Direct request for GP care</td>
<td>-0.005</td>
<td>-0.050</td>
<td>0.960</td>
<td>-0.5</td>
<td></td>
</tr>
<tr>
<td>Information telling about wheeze and its management</td>
<td>-0.068</td>
<td>-1.969</td>
<td>0.049</td>
<td>-6.5</td>
<td></td>
</tr>
<tr>
<td>its management</td>
<td>0.014</td>
<td>0.315</td>
<td>0.753</td>
<td>1.4</td>
<td></td>
</tr>
<tr>
<td>GP care</td>
<td>-0.519</td>
<td>0.090</td>
<td>0.090</td>
<td>-40.5</td>
<td></td>
</tr>
<tr>
<td>Asthma duration</td>
<td>0.231</td>
<td>4.054</td>
<td>0.000</td>
<td>26.0</td>
<td></td>
</tr>
<tr>
<td>Asthma severity</td>
<td>0.568</td>
<td>3.080</td>
<td>0.002</td>
<td>76.5</td>
<td></td>
</tr>
<tr>
<td>Maori or Pacific person</td>
<td>-0.704</td>
<td>-3.762</td>
<td>0.000</td>
<td>-50.5</td>
<td></td>
</tr>
<tr>
<td>Girls</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>α</td>
<td>0.17</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pseudo-R²</td>
<td></td>
<td></td>
<td></td>
<td>16.3</td>
<td></td>
</tr>
</tbody>
</table>

Discussion

Auckland 13–14 year-old students with moderate to severe asthma described a variable frequency for accessing GP asthma care. Low attendees were disproportionately NZ European. High attendees tended to be Maori and/or Pacific Islanders (groups that have traditionally experienced barriers to accessing GP care\textsuperscript{12,18–20}. Our survey of the parents of 6–9 year olds with moderate to severe asthma replicated this finding.\textsuperscript{21}
Teenage beliefs influencing this utilisation pattern were identified. About half the sample reported ‘needing’ GP asthma care. A similar proportion receives such care as often as it wants, independently of ethnicity. With only 36% agreeing that this care is ‘important,’ these results indicate an unmet desire for GP asthma care that teenagers consider appropriate rather than necessary.

Most teenagers reported telling their parents when they wheeze (or much less frequently, school staff) and when their inhaler runs out. Only three in every five said they tell their parents when they cannot manage their wheeze themselves, and only half ask to see a GP about their wheeze. This highlights a need to explain to teenagers the circumstances under which growing autonomy does not preclude asking for help.

Almost one in every four teenagers indicated sometimes resisting GP attendance for asthma care. That 29% reported having to pay for their GP care indicates that GP use has frequently depended on the financial resources of teenagers, which presumably are low, and not merely the motivation to attend, which our results suggest is generally also not high.

The NBRM estimated that perceived need for GP asthma care increases the expected number of visits for asthma by 25%. Teenagers’ resistance to this care reduces the expected number of visits by a similar proportion. So too, to a lesser extent, does teenagers telling a guardian about their asthma and its management. However, low attendance could promote information giving-rather than vice versa, and attendance could be reduced less by information-giving per se than unwillingness by teenagers to advocate for attendance requiring dependence on parents. Also, GP care is frequently considered unimportant by teenagers, who may see it to interfere with their ability to minimise differences from peers.

Expected attendance was increased for the Maori and/or Pacific teenagers by 77% and by asthma of increased severity by 26%, given all the values in the model. This challenges the persistence of barriers to Maori and Pacific peoples accessing GP services, at least for acute asthma. None of the six predictors relating to need, communication, and GP care characterised disproportionately the Maori and Pacific teenagers. However, although we asked solely about total visits, our findings could be explained by barriers to these teenagers accessing only routine preventative care. Asthma exacerbations could then have prompted GP visits for acute care, explaining the higher total number of Maori and Pacific visits for asthma.

Other reasons are needed for why almost 40% of the teenagers, who were mainly NZ European, under-used GP care for their moderate to severe asthma. Compared with Maori and Pacific teenagers, they were perhaps more likely to have previously received and redeemed repeat prescriptions for asthma, and to receive acute care out-of-hours from relatively high-cost, community-based Accident and Medical Services.

It is also unclear why boys were more likely than girls to report obtaining GP asthma care. The finding is not due to differences in asthma severity.

Strengths and limitations—Complementing our other quantitative and qualitative research on factors influencing child access to GP care for moderate to severe asthma, this study responds to lack of knowledge regarding how frequently 13–14 year olds attend for GP care of moderate to severe asthma, and why. The high attendance by Maori and Pacific teenagers highlights a need to question whether
barriers to GP attendance persist for this group (at least for acute asthma), compared with NZ Europeans. The study raises the possibility that barriers to accessing preventative care can account for increased total numbers of visits among Maori and Pacific teenagers.

Nevertheless, the findings have limitations. One-third of the schools did not participate, but characteristics of these schools did not differ from those that did. A more major limitation is that the response rate by guardians of children with breathing problems was only 53%, which may limit the generalisability of the findings to all asthmatic teenagers. We do not know how non-participating teenagers differed from the teenage participants. A further limitation is that the final sample size for the teenagers was also small, reflecting difficulty in accessing this group.

Use of a school-wide screening questionnaire was unacceptable to the schools, thus requiring school nurse records to identify asthmatic teenagers. This is unlikely to have produced a large selection bias because nurses were most likely to know the teenagers with moderate to severe asthma. In our companion study, prevalences of moderate to severe asthma among 6–9 year-olds (based on parents’ questionnaire responses) were independent of how schools identified children with breathing problems.

Over-representation of girls in the study most likely reflects our sample, which included two girls-only schools but no boys-only schools. Self-enumeration of GP visits for asthma in the previous year was subject to misclassification. It was not validated against GP claims for patient subsidies because this would have breached participants’ anonymity. GP records of visits could not be checked because of the large number of GPs and the potential for each patient to attend more than one practice. However, self-reports have been shown not to impact systematically on estimates of ethnic differences in health care use, and these differences show the same pattern as reported by the parents of similar 6–9 year-olds. Furthermore, non-systematic misclassification would tend to reduce our ability to find significant associations.

No distinction was made between routine visits and visits for acute care. Exposure time was not measured at the interval level, and use of school records might not have identified some eligible students. Reports of wheezing were not validated against a diagnosis from a doctor, although our focus on moderate to severe asthma most likely minimised this problem. The questions defining moderate to severe asthma came from ISAAC, but we developed our own questions on factors influencing access to GP care in the absence of any standardised and validated tool. Qualitative interviews with teenagers might have yielded different insights and concerns.

**Implications**—There is a need to respond to an unmet preference by teenagers for improved access to GP care of moderate to severe asthma—despite a high level of self-reported attendance for GP asthma care by Maori and Pacific teenagers. Research is needed to test whether or not this utilisation pattern is specifically for acute care of poorly controlled asthma in the face of barriers to accessing routine, preventative care.

If barriers to accessing preventative care persist and increase both acute visits and hence total visits among Maori and Pacific teenagers, this challenges the assumption that access can be defined simply in terms of barriers that must be overcome to obtain healthcare.
A concurrent need exists to understand the widespread under-use of GP care for moderate to severe asthma, especially among NZ European teenagers. In the meantime, health policy should educate teenagers with moderate to severe asthma, and their guardians, on the importance of preventative care for asthma (as part of integrated strategies for addressing known barriers to teenage use of GP services). This would complement previous research highlighting a need to improve knowledge about asthma and its management among parents, teachers and teenagers.12,18–20

Health policy must also respond to concerns that teenagers and guardians express about the acceptability of GP services, while promoting teenage-guardian communication about health issues associated with teenage asthma. An indicator of success will be whether teenagers are taken to a doctor when requested.

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**References:**


