

# Original Research Paper

## The common cold: what does the public think and want?

*Bruce Arroll is associate professor, department of general practice, University of Auckland*

*Ngozi Everts is an undergraduate, School of Medicine, University of Auckland*

### ABSTRACT

**Objective:** To assess the public attitudes and knowledge of antibiotic use in the management of upper respiratory tract infections.

**Design:** A randomised cross-sectional survey using a telephone interviewer.

**Setting:** Auckland telephone subscribers.

**Subjects:** A random sample of members of the public with telephone and aged 16 years or older.

**Main outcome measures:** The attitudes and reported behaviour regarding the use of antibiotics for upper respiratory tract infections.

**Results:** Two hundred and eighty two members of the public were approached and 206 agreed to be interviewed. Six were ineligible because of emphysema.

This was a 71 per cent response rate. Forty per cent of the respondents understood that antibiotics were unhelpful in viral infections. Twenty four per cent of respondents would regularly attend a doctor if they experienced an upper respiratory tract infection. However, of those who had ever been to a doctor for an upper respiratory tract infection, 55 per cent wanted antibiotics. Those who understood the benefits of antibiotics in viral infections would be less likely to attend for an upper respiratory tract infection. Only seven per cent would attend another doctor if their own doctor would not give them antibiotics. Almost 50 per cent of respondents thought that antibiotics would be of benefit for coloured nasal discharge.

**Conclusions:** The results suggest that the majority of members of the public do not understand the lack of benefit from antibiotics in upper respiratory tract infections. The high

### Key Points

- Seven per cent of patients would see another doctor if not given antibiotics by their GP
- About a quarter of respondents see a doctor if they have a cold or the flu
- Of those who see a doctor for a cold or the flu, 55 per cent want antibiotics
- Only 7 per cent said they would ask for antibiotics if that is what they wanted
- Forty one per cent of the respondents understood that

proportion of respondents wanting antibiotics is a concern. This work is consistent with overseas research which shows little understanding of the appropriate use of antibiotics. Establishing the baseline level of public knowledge on this topic is the first step in education to lower the use of antibiotics in upper respiratory tract infection.

antibiotics  
work against  
bacterial  
infections  
but not viral  
infections

## INTRODUCTION

There is evidence of high use of antibiotics for viral upper respiratory tract infections (common cold) in spite of doubt about the efficacy of such therapy.<sup>1</sup>

By upper respiratory tract infection we mean the common acute uncomplicated upper respiratory tract infection of the coryzal or influenza type that presents with a fever, runny nose and often with a mild sore throat, headache and cough. In spite of the knowledge that viruses are the causative agent, many patients presenting to their GPs receive antibiotics. In a New Zealand study, computerised records of 100,222 consultations were examined from 17 general practices over one year by McGregor et al (1995).<sup>1</sup> Seventy eight per cent of the patients received antibiotics. About one third of these medications were expensive broad spectrum antibiotics. There is also evidence from other studies that broad spectrum antibiotics are being used instead of narrow spectrum drugs.<sup>2</sup> [Waimedca study personal communication].<sup>3</sup>

It has long been assumed that antibiotics have no place in the treatment of upper respiratory tract infections.<sup>4</sup> There are two published reviews of the topic of antibiotics as a treatment for upper respiratory tract infection. A Cochrane review found no benefit for antibiotics when seven studies were pooled OR = 0.95 (95% CI 0.70-1.28) and there was a significant increase in adverse effects odds ratio OR = 2.72 (95% CI 1.02-7.27).<sup>5</sup> Another review of antibiotics for the treatment of upper respiratory tract infection in children found no benefit from antibiotics OR = 1.01 (95% CI 0.9- 1.13) and no increase in side effects from the antibiotics compared with placebo.<sup>6</sup>

Upper respiratory tract infection (URTI) was the most common reason for a new consultation in general practice and the second most common reason for the

prescribing of an antibiotic in one study (bronchitis was the most common reason).<sup>3</sup> If ineffective, as has been long thought, there is concern that widespread use of antibiotics is not only a poor use of health funds but also a cause of morbidity (from adverse effects) as well as a source of the development of resistant strains.<sup>7,8</sup>

We found a number of articles relating to patient expectation of antibiotics. In one US study of patients attending primary care practices in Kentucky, 72

|                      |                     |          |       |
|----------------------|---------------------|----------|-------|
| Age in years (n=197) | range               | 16 to 94 |       |
|                      | mean                | 46       |       |
|                      | median              | 44       |       |
| Gender (n=200)       | female              | 117      | (59%) |
|                      | male                | 83       | (41%) |
| Ethnicity (n=200)    | European            | 165      | (83%) |
|                      | Māori               | 9        | (4%)  |
|                      | Pacific Island      | 5        | (2%)  |
|                      | Other               | 21       | (10%) |
| Education (n=198)    | 5th form and under  | 68       | (28%) |
|                      | 6th form            | 20       | (10%) |
|                      | 7th form            | 21       | (10%) |
|                      | Apprenticeship      | 5        | (3%)  |
|                      | Technical Institute | 34       | (17%) |
|                      | University          | 60       | (30%) |
| Smoking (n=200)      | yes = 33            | (17%)    |       |
| Family size (n=192)  |                     | was = 62 | (33%) |

| Characteristic            | Yes = n   | (%)   |
|---------------------------|-----------|-------|
| Medical insurance (n=139) | yes = 117 | (50%) |

per cent of patients would seek care with a condition of five days' duration of cough,

sore throat and discoloured nasal discharge.<sup>9</sup> Sixty one per cent of the sample believed that antibiotics were effective for such a condition with a clear nasal discharge, while 79 per cent believed that antibiotics would help with discoloured nasal discharge. In another US-based study, there was little difference in satisfaction between patients who received antibiotics, those receiving advice only and those who received non-prescription medicine.<sup>10</sup>

A UK study examined the effect of giving an "as needed" prescription to patients for the treatment of sore throat.<sup>11</sup> One group was given a prescription for antibiotics, one group got no antibiotic and the third group was asked to come back to the surgery in three days, if not improved, to collect a prescription. The use of antibiotics in these three groups was 99 per cent, 13 per cent and 31 per cent respectively. Patients who received antibiotics were more likely to return for subsequent consultations for sore throat.<sup>12</sup> Prescribing for URTIs can be an uncomfortable area for GPs and perceived patient expectations for treatment seems to be one of the main factors influencing GPs prescribing patterns.<sup>13</sup> One author states that doctors consistently overestimate patients expectations for prescriptions.<sup>14</sup> Our study asked members of the public about symptom treatment, utilisation of health services, the effect of patients expectations on treatment and the level of understanding on the uses of antibiotics in viral respiratory tract infections.

## SUBJECTS AND METHODS

Two hundred and six people from the greater Auckland area were interviewed by telephone. A random sample of telephone numbers was obtained from the Auckland telephone directory by randomising the page number, the column number and the number of private individuals represented per column.

Ethical consent was given by the University of Auckland Ethics Committee, and informed verbal consent was obtained from each subject. Interviews conducted by telephone automatically exclude a sector of the population; however this was the most practical and least invasive method available.

In order to reduce bias we made multiple calls back and varied the time of day at which we called. Participants needed to be aged 16 years or older.

Respondents were asked to participate in our research into "the use of antibiotics for colds and flu". The questions we asked covered the areas of their management of colds/flu, their utilisation of health services, opinions and knowledge about antibiotics and what symptoms they thought would indicate antibiotic use. They were told that the questionnaire would take about 10 minutes and that all their information would remain confidential. No identifying details were kept except their phone number and first name in case we needed to call back to clarify any matters. Results were analysed using *JMP* version 3 for Macintosh computers.<sup>15</sup>

## RESULTS

Two hundred and eighty two members of the public were approached of which 206 agreed to participate. Of these, six had emphysema and were excluded from the analysis. This is a 71 per cent response rate.

Table 1 shows the demographics of the study population. There was a slightly higher number of women who responded to the survey and this may reflect a telephone

interview at home. The number of Maori respondents for Auckland was considerably lower than expected from the population, which would be 10.4 per cent. The same applies to the number of Pacific Island respondents at 2 per cent where 11 per cent would be expected.<sup>16</sup> The proportion of smokers would be expected to be 24 per cent compared with 17 per cent in our survey group. The number of respondents who left school in the 5th form was 29 per cent where it would be expected that 48 per cent of the sample would be in this category.

| TABLE 2: USUAL PRACTICE FOR TREATING UPPER RESPIRATORY TRACT INFECTIONS |        |           |
|---|--------|-----------|
| Usually see a doctor (n=200)  | 49     | (24%)     |
| Try an over the counter medication before going to the doctor (n=200)   | 144    | (72%)     |
| Over the counter medication use (n=210 responses):                      |        |           |
| Analgesic-decongestant  |        | 26        |
| Complementary*  |        | 55*       |
| Analgesic   |        | 45        |
| Cough medication  |        | 37        |
| Vitamin   |        | 19        |
| Antihistamine   |        | 3         |
| Decongestant (topical)  |        | 14        |
| Time since last doctor's visit (in weeks)                               | range  | 0-720     |
|   | mean   | 38        |
|   | median | 12        |
| Went to doctor for last cold/flu (n=197)                                | 39     | (20%)     |
| Ever consulted doctor about a cold or flu (n=196)                       | 122    | (62%)     |
| Weeks since last visit for cold/flu (n=98)                              | range  | 1.5 - 104 |
|   | mean   | 10.7      |
|   | median | 6.4       |
| Symptom-days of cold/flu before consultation (n=32)                     | range  | 1-71      |
|   | mean   | 6         |
|   | median | 4         |
| *complementary means any alternative product or home remedy             |        |           |

Table 2 shows the usual practice of members of the public in treating their own upper respiratory tract infections.

Table 3 shows the reasons for visiting a doctor and the expectations of the respondents. An as-needed prescription is one that is given at the time of consultation with instructions not to fill it unless symptoms have not improved in a few days.

Table 4 shows the perceived benefits and understanding of antibiotics in upper respiratory tract infections and complications. In order to evaluate people's understanding of the function of antibiotics we first asked whether they thought antibiotics cured bacterial infections, and then whether

they cured viral infections. If they answered yes to the first and no to the second we counted them as understanding.

Women were significantly more likely than men ( $p=0.013$ ) to understand that antibiotics are effective for bacterial infections rather than viral infections. However members of the public given antibiotics in the past were no more likely to understand the difference ( $p=0.586$ ). Members of the public were less likely to go to the doctor for URT infections if they understood the benefits of antibiotics (19 per cent versus 29 per cent) but this was not significant ( $p=0.13$ ). Members of the public with university education were more likely to understand the benefits of antibiotics (53 per cent) than those with fifth form education (29 per cent) but this was not statistically significant. Members of the public were significantly more likely to go to a GP for URTI if they had a community services card (34 per cent versus 20 per cent) ( $p=0.046$ ) but less likely to go if they had medical insurance (21 per cent versus 29 per cent) but this was not significant ( $p=0.24$ ).

Members of the public older than 55 years were less likely to go to the doctor for antibiotics, but this was not significant. However, they were almost significantly less likely to be given antibiotics at a previous visit 19/26 (73 per cent) versus 70/78

(90 per cent)  $p=0.052$ . Members of the public who had negative feelings about antibiotics were less likely to report going to a doctor for antibiotics but not less likely to have been given them. When the neutral and negative groups for attitudes towards antibiotics were collapsed in to one group there were 93 per cent of those in the positive group who had been given antibiotics (39/42) and 81 per cent (50/62) in the neutral or negative group who had been given antibiotics ( $p=0.096$ ).

## DISCUSSION

This survey found that the majority of members of the public do not have a good understanding that antibiotics are effective only against bacterial infections. While only a quarter of patients said they usually go to a doctor when they have a cold/flu, 62 per cent said that they had at least once been to a doctor for such conditions. It is hard to know how this translates into the population that actually goes to a doctor and gets antibiotics. The concern by doctors in the literature that patients will be dissatisfied by not getting an antibiotic was not borne out by the mere 7 per cent who said they would see another doctor if not given antibiotics.<sup>17</sup>

TABLE 2: REASONS FOR VISITING A DOCTOR AND EXPECTATIONS OF RESPONDENTS WHO HAD EVER ATTENDED A DOCTOR FOR AN UPPER RESPIRATORY TRACT INFECTION

| Reasons for Visiting a Doctor (n=103 persons -multiple responses possible)                                 |    |        |
|--|----|--------|
| To get an antibiotic   |    | 48     |
| To clarify diagnosis   |    | 78     |
| To relieve symptoms  |    | 59     |
| To get a note for work   |    | 9      |
| Doctor gave antibiotics? (n=104)   | 88 | (85%)  |
| Person collected the prescription from the chemist? (n=88)   | 88 | (95%)  |
| Took some of the course? (n=89)  | 87 | (97%)  |
| Did you want antibiotics? (n=94)   | 52 | (55%)  |
| Were you expecting to get antibiotics? (n=97)  | 63 | (65%)  |
| Did you ask for them specifically? (n=94)  | 7  | (7%)   |
| Doctor asked what you were expecting to be given as treatment for the cold/flu? (n=97)                     | 4  | (4%)   |
| Would you go to another doctor if your own doctor would not give you antibiotics for your cold/flu? (n=86) | 6  | (7%)   |
| Has your doctor ever given you an "as-needed" prescription? (n=89)   | 15 | (16%)* |

\*as-needed prescription means a prescription given at the time of visit only to be filled if symptoms are not improving in a few days

Fifty five per cent of members of the public who had attended a doctor for an upper respiratory tract infection wanted antibiotics and this was a similar percentage that wanted them (65 per cent) in a US- based study.<sup>18</sup> This suggests that the majority of patients who actually attend a doctor with symptoms of an upper respiratory tract infection do want antibiotics. Such similarity in these figures suggests that our study is a valid reflection of what happens in clinical practice.

The strength of this study is that it involved a random selection of the public. A weakness of the study is that it is asking people what they would do rather than actually measuring what they do do. The study sample is more highly educated than the average New Zealand society and contained a lower proportion of smokers and, hence, likely to be a healthier group than average.

In a paper on lower respiratory tract infection patients were asked if they wanted antibiotics, expected antibiotics and asked for antibiotics. The proportions were 72 per cent, 72 per cent and 19 per cent respectively.<sup>19</sup>

In our study there was a similar relative reduction in responses from 55 per cent and 65 per cent to 7 per cent respectively. It was reassuring that 16 per cent of members of the public had received an as-needed prescription as this has been shown to reduce the number of prescriptions used by patients<sup>11</sup>.

The benefit of antibiotics in acute productive cough has been studied in a meta-analysis which found a marginal benefit for antibiotics relative risk 0.85 (95%



CI 0.73-1.00)<sup>20</sup>) Thus it is not unreasonable for the 41 per cent of members of public with morning phlegm and 71 per cent with all day phlegm to think antibiotics would be beneficial.

| TABLE 4: BENEFITS AND UNDERSTANDING OF ANTIBIOTICS IN UPPER RESPIRATORY TRACT INFECTION AND COMPLICATIONS |          |       |
|---|----------|-------|
| Opinions about antibiotics  |          |       |
| helped symptoms (n=84)  | 74       | (88%) |
| shortened the course of flu (n=75)  | 61       | (77%) |
| Feelings about antibiotics for colds/flu? (n=200)   |          |       |
| Positive  | 66       | (33%) |
| Neutral   | 29       | (15%) |
| Negative  | 105      | (53%) |
| Perceived benefit of antibiotics for:   |          |       |
| sinusitis (n=185)   | 93       | (63%) |
| fever (n=185)   | 80       | (43%) |
| to prevent complications for a planned overseas trip (n=192)  | 95       | (49%) |
| dry cough (n=192)   | 23       | (12%) |
| night cough (n=195)   | 26       | (13%) |
| morning phlegm (n=180)  | 80       | (41%) |
| all day phlegm (n=189)  | 135      | (71%) |
| clear phlegm (n=190)  | 46       | (25%) |
| coloured phlegm (n=185)   | 160      | (86%) |
| sore throat (n=194)   | 42       | (22%) |
| tonsillitis (n=180)   | 149      | (83%) |
| runny nose (n=196)  | 10       | (5%)  |
| coloured nasal discharge (n=187)  | 92       | (49%) |
| Understanding of antibiotic efficacy against bacterial vs viral infection                                 |          |       |
| (n=200)   | yes = 81 | (41%) |

While the presence of purulent nasal discharge was seen as a reason for 49 per cent to want antibiotics versus 5 per cent for those with a clear nasal discharge, there is evidence that doctors also see this as a situation requiring antibiotics.<sup>21</sup> There is evidence that antibiotics make no difference to this condition.<sup>22</sup> It may be that doctors educate their patients to want antibiotics for these conditions.

Forty three per cent of members of the public with fever thought that antibiotics would help. There is some evidence for this in the literature in the study by Verheij where patients who felt ill with cough and purulent sputum were more likely to benefit from doxycycline.<sup>23</sup>

It was interesting to note that older members of the public (over 55 years) were less likely to seek attention for antibiotics for upper respiratory tract infection than younger members of the public yet this is an age group that is more likely to benefit from antibiotics.<sup>23</sup>

While 83 per cent of members of the public wanted antibiotics for the treatment of tonsillitis there is debate over whether it makes any difference in terms of symptoms.<sup>24</sup>

While 53 per cent of members of the public wanted antibiotic treatment for sinusitis there are issues over how to best diagnose this condition.<sup>25</sup> A meta-analysis found that antibiotics benefited sinusitis that was confirmed radiologically or by sinus aspiration.<sup>26</sup>

It was reassuring that only 11 per cent and 14 per cent of members of the public requested antibiotics for dry cough and night coughs as there is no evidence that antibiotics help these symptoms and indeed night cough may be more related to bronchospasm.

Our results suggest that the majority of members of the public do not understand the lack of benefit from antibiotics in upper respiratory tract infections. The high proportion of respondents wanting antibiotics is a concern. This work is consistent with overseas research, which shows little understanding of the appropriate use of

antibiotics.

It is encouraging that appropriate knowledge was associated with a decrease in demand. Establishing the baseline level of public knowledge is the first step to lower the use of antibiotics in upper respiratory tract infection.

## References

1. McGregor A, Dovey S, Tilyard M. Antibiotic use in upper respiratory tract infections in New Zealand. *Fam Prac* 1995;12:166-70.
2. McCraig LF, Hughes JM. Trends in antimicrobial prescribing among office based physicians in the United States. *JAMA* 1996;273:214-9.
3. McAvoy B, Davis P, Rayment A, Gribben B. The Waikato Medical Care Survey. *NZ Med J* 1994;107:387-433.
4. Spector SL. The common cold: current therapy and natural history. *J Allergy Clin Immunol* 1995;95:1133-8.
5. Arroll B, Kenealy T. Antibiotics in the common cold. A meta-analysis. In: The Cochrane database of systematic reviews. The Cochrane Library. Issue 1, 1999. Oxford: Update Software.
6. Fahey T, Stocks N, Thomas T. Systematic review of the treatment of upper respiratory tract infection. *Arch Dis Child* 1998;79:225-30.
7. Verkatesum P, Innes JA. Antibiotic resistance in common acute respiratory pathogens. *Thorax* 1995;50:481-3.
8. Arason VA, Kristinsson KG, Sigurdsson JA, Stefansdottir G, Molstad S, Gudmundsson S. Do antimicrobials increase the carriage rate of penicillin resistant pneumococci in children? Cross sectional prevalence study. *BMJ* 1996;313:387-91.
9. Mainous AG, Zoorob RJ, Oler MJ, Haynes DM. Patient knowledge of upper respiratory infections: implications for antibiotic expectations and unnecessary utilization. *J Fam Pract* 1997;45:75-83.
10. Cowan PF. Patient satisfaction with an office visit for the common cold. *J Fam Pract* 1987;24:412-3.
11. Little P, Williamson I, Warner G, Gould C, Gantley M, Kinmouth AL. Open randomised trial of prescribing strategies in managing sore throat. *BMJ* 1997;314:722-7.
12. Little P, Gould C, Williamson I, Warner G, Gantley M, Kinmouth AL. Reattendance and complications in a randomised trial of prescribing strategies for sore throat: the medicalising effect of prescribing antibiotics. *BMJ* 1997;315:350-2.
13. Taylor J. Sore throats and URTIs. *The Practitioner* 1992;236:416-21.
14. Britten N. Patients demands for prescriptions in primary care. *BMJ* 1995;310:1084-5.
15. JMP v3. Statistics for Macintosh SAS Institute. Cary, NC.

16. Statistics NewZealand. New Zealand Official Yearbook. Wellington. GP Print 1998.
17. Butler CC, Rollnick S, Pill R, Maggs-Rapport F, Stott N. Understanding the culture of prescribing: qualitative study of general practitioners and patients' perceptions of antibiotics for sore throats. *BMJ* 1998;317:637-42.
18. Hamm RM, Hicks RJ, Bembien DA. Antibiotics and respiratory infections: are patients more satisfied when expectations are met? *J Fam Pract* 1996;43:56-62.
19. Macfarlane J, Holmes W. Influence of patients' expectations on antibiotic management of acute lower respiratory tract illness in general practice: questionnaire study. *BMJ* 1997;315:1211-4.
20. Fahey T, Stocks N, Thomas T. Quantitative systematic review of randomised controlled trials comparing antibiotic with placebo for acute cough in adults. *BMJ* 1998;316:906-10.
21. Mainous AG, Hueston H, Eberlein C. Colour of respiratory discharge and antibiotic use. *Lancet* 1997;350:1077.
22. Todd JK, Todd N, Damato J, Todd WA. Bacteriology and treatment of purulent nasopharyngitis: a double blind placebo-controlled evaluation. *Ped Infect Dis* 1984;3:226-32.
23. Verheij TJ, J. Hermans, Mulder JD. Effects of doxycycline in patients with acute cough and purulent sputum; a double blind placebo controlled trial. *Br J Gen Pract* 1994;44:400-4.
24. Del Mar C. Managing sore throat: a literature review II. Do antibiotics confer benefit? *Med J Australia* 1992;156:644-9.
25. Williams JW, Simel DL. Does this patient have sinusitis. Diagnosing acute sinusitis by history and physical examination. *JAMA* 1993;270:1242-6.
26. Williams JW, Aguilar C, Makela M, et al. Antimicrobial therapy for acute maxillary sinusitis: a systematic review. In: (forthcoming) The Cochrane database of systematic reviews. The Cochrane Library. Oxford: Update Software. 1999