



Public views and use of antibiotics for the common cold before and after an education campaign in New Zealand

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Abstract

Aims To assess changes in public knowledge, attitudes, and reported behaviour of antibiotic use in the management of the common cold and to compare with results of a 1998 study. The context is a nationwide project to reduce the consumption of antibiotics.

Method Cross-section survey: telephone interviews of random sample of consenting Auckland telephone subscribers aged over 15 years comparing 1998 and 2003 responses.

Results A 55% response rate of eligible participants was recorded. No change was noted between 1998 and 2003 in public awareness that antibiotics are not helpful in treating viral infections (38%). However there was a significant reduction in those attending doctor for the common cold (24% to 15%). In 2003, patients were less likely to receive antibiotic prescription and more likely to receive a delayed prescription.

Conclusions The majority of general public still do not understand that the common cold does not need antibiotic treatment. The advertising campaign may have reduced doctor prescribing hence the reduction in antibiotic use from 1998 to 2003.

The common cold is the most prevalent disease in humans and is generally caused by a rhinovirus.¹ In most cases, antimicrobial agents are not needed. Indeed, there is no role for antibiotics in managing uncomplicated colds²⁻⁴ nor preventing secondary bacterial infection.⁵

The common cold is associated with considerable costs in terms of decreased productivity; time lost from work or school; visits to healthcare providers; and the volume and cost of drugs prescribed.⁶ Despite the lack of effectiveness of antibiotics for treating common cold symptoms (rhinorrhoea, stuffiness, acute cough, sore throat, pharyngitis, and laryngitis), general practitioners (GPs) frequently prescribe antibiotics for patients with such symptoms in response to patients' expectation or doctors' perceptions of these expectations.^{7,8}

However, overuse and misuse of antibiotics for conditions where there is no proven benefit of such therapy contributes to a number of adverse events, as well as to the development of antimicrobial resistance and unnecessary expense to patients and to the healthcare system as a whole.

The New Zealand (NZ) organisation PHARMAC (Pharmaceutical Management Agency responsible for nationwide funding of pharmaceuticals) launched the *Wise Use of Antibiotics* campaign in 1999. This annual campaign aims to reduce antibiotic use by educating the public that antibiotics are ineffective against viruses. The

campaign involves posters in family practice waiting-rooms and pharmacies and leaflets given to patients in pharmacies and primary health care surgeries as well as GP education.⁹

Between 1996 and 2003, PHARMAC reported a reduction in the national antibiotic drug bill from \$NZ36 million to 14.5 million. This resulted from a combination of both decreased volume and price of the antibiotics prescribed. From 1995 to 2002 there also was a national reduction in penicillin resistance among pneumococci from 7% to 3.5% ($p < 0.05$).¹⁰

The aim of our study was to assess change in public attitudes, knowledge, and reported behaviour from 1998 to 2003 regarding antibiotic use as a treatment for common colds and flu.

Methods

The sample were adults aged 16 or over contacted by telephone with their phone numbers randomly selected from the 1998 and subsequently from the 2002 Auckland telephone book. A random sample of telephone numbers was obtained from the telephone directory by randomising the page number, the column number, and the number of private individuals represented per column.

The University of Auckland Ethics Committee gave ethical approval for both phases of the study. Participants were excluded if they had a chronic condition such as chronic obstructive airways disease which necessitated them having antibiotics on hand.

On contacting prospective participants, the telephone-interviewers introduced themselves and asked respondents to participate in 'research into the use of antibiotics for the cold or 'flu (influenza)'. The confidentiality of all information gathered was assured. No identifying details were retained other than the phone numbers in case it was necessary to clarify any matter. To reduce bias, two call-backs were made to respondents not initially available at varying times of the day and week before replacement.

The interview consisted of a pre-prepared questionnaire which covered the areas of personal management of colds/flu, utilisation of health services, knowledge, attitudes, and reported behaviour regarding antibiotic use in the management of the common cold. Respondents also were asked about awareness of the *Wise Use of Antibiotics* campaign. Results from the 1998 and 2003 interviews were compared. Data were entered into a Microsoft Excel spreadsheet and analysed using Stat-Sak and SPSS version 11 with Chi-squared statistical analysis.

Results

In 1998, 282 members of the public were approached of whom 206 agreed to participate. Six were excluded because they had chronic respiratory disease, giving a 72% response rate. 387 members of the public were approached in 2003 and 208 agreed to participate. Of these, 8 were ineligible (2 had chronic respiratory disease, 2 were terminally ill, and 4 had other chronic illness that required them to have antibiotics readily available at all times). The response rate was therefore 55% of eligible participants in 2003.

Table 1 shows the demographics of the members of the public in both 1998 and 2003 surveys. There are no significant differences in the demographic data between 1998 and 2003.

Table 2 shows the attitudes and behaviours reported by patients regarding treatment of the common cold in the 1998 and 2003 surveys. Significantly fewer people reported ever attending a doctor for a common cold in 2003 than in 1998 (45% vs 62%; $p = 0.0006$). The number of people who would usually see a doctor for a common cold decreased from 24% to 15% ($p = 0.026$). However the number who went to a doctor the last time they had a cold remained the same at 20% ($p = 0.86$).

Table 1. Demographics of participants

Variables		1998 N=200	2003 N=200	P value*
Age in years	Range	16–94	17–85	0.97
	Mean	46	49	
	Median	44	47	
Gender	Female	117 (59%)	131 (65.5%)	0.15
	Male	83 (41%)	69 (34.5%)	
Ethnicity	European	165 (83%)	163 (81.5%)	
	Māori	9 (4%)	15 (7.5%)	
	Pacific Island	5 (2%)	3 (1.5%)	
	Others	21 (10%)	13 (6.5%)	
	Not stated	0 (0%)	6 (3%)	
Education	Grade 10	58 (29%)	56 (28%)	
	Grade 11	20 (10%)	27 (13.5%)	
	Grade 12	21 (10%)	4 (2%)	
	Apprenticeship	6 (3%)	3 (1.5%)	
	Technical institution	34 (17%)	46 (23%)	
	College	60 (30%)	64 (32%)	
Smokers		33 (17%)	34 (17%)	1.0
Had medical insurance		117 (58%)	111 (55.5%)	0.61

*Chi-squared and T-tests

Of those patients who had ever been to the doctor for a common cold, the proportion who went specifically seeking antibiotics had risen to 60% from 47% but this did not reach statistical significance ($p=0.064$). Those who had ever visited a doctor for an upper respiratory tract infection (URTI) were less likely to be prescribed antibiotics in 2003 (86% versus 74%; $p=0.049$). There was also a significant increase in the reported giving of “as-needed” prescriptions. An as-needed/delayed prescription is one given at the time of consultation with instructions not to fill it unless symptoms have not improved within a few days.

To evaluate people’s understanding of the function of antibiotics, participants were first asked whether they thought antibiotics cured bacterial infections, and then whether they cured viral infections. If they answered *yes* to the first question and *no* to the second question then they were counted as understanding.

Members of the public had a similar understanding about the function of antibiotics and the nature of the common cold (that it is viral, not bacterial) in 2003 as in 1998 (38% versus 41%; $p=0.9$). However, they were significantly less likely to feel positive about antibiotics in 2003 for the treatment of a cold (16% versus 33%, $p=0.00001$). The perception (that antibiotics were beneficial for fever, dry cough, coloured phlegm/nasal discharge, runny nose, and to prevent complications) significantly reduced from 1998 to 2003. The perceived benefit of antibiotics for tonsillitis increased from 83% to 91% in 2003 ($p=0.014$).

Only 30% of respondents were aware of the national *Wise Use of Antibiotics* campaign; of those who did recall it, 75% were unsure as to where, and in what format, they had seen the information. Posters at the doctors had the highest recall (21% of those who recalled the campaign).

Table 2. Patients' reported behaviour and attitudes

Patient behaviours and attitudes	1998	2003	P value
When patients have a URTI they:			
try an over counter medication before seeing doctor	144/200 (72%)	136/200 (68%)	0.38
have ever consulted doctor about an URTI	122/200 (62%)	90/200 (45%)	0.0006
usually see a doctor	49/200 (24%)	31/200 (15%)	0.024
have been given an "as-needed" prescription at least once	15/200 (7%)	48/200 (24%)	<0.0001
went to doctor for last URTI	39/200 (20%)	41/200 (20%)	0.86
Patients who consulted the doctor with an URTI did so:			
to get an antibiotic	48/103 (46.6%)	50/83 (60%)	0.064
to clarify diagnosis	78/103 (75.7%)	63/81 (77%)	0.74
to relieve symptoms	59/103 (57.2%)	75/83 (90%)	<0.0001
to get a note for work	9/103 (8.7%)	12/83 (14%)	0.22
When the patient consulted the doctor:			
the doctor gave antibiotics	89/104 (86%)	60/81 (74%)	0.049
the patient collected prescription from chemist	88/89 (99%)	59/60 (98%)	0.78
the patient took some of the course	87/89 (98%)	55/59 (93%)	0.17
the patient wanted antibiotics	52/94 (55%)	41/81 (50%)	0.53
the patient expected to get antibiotics	63/97 (65%)	51/81 (63%)	0.78
the patient asked specifically for antibiotics	7/94 (7%)	7/81 (8%)	0.77
the doctor asked what patient expected to be given as treatment for URTI	4/97 (4%)	4/80 (5%)	0.78
the patient would have gone to another doctor if not given antibiotics	6/86 (7%)	9/80 (11%)	0.34
Patients taking antibiotics for URTI believe that antibiotics:			
help symptoms	74/84 (88%)	52/61 (85.2%)	0.62
shorten the course of URTI	61/79 (77%)	49/61 (80.3%)	0.66
Patients perceive that antibiotics are beneficial for:			
sinusitis	93/185 (53%)	106/182 (58.2%)	0.13
fever	80/186 (43%)	52/187 (27.8%)	0.0021
preventing complications for planned overseas trip	95/192 (49%)	26/194 (13.4%)	0.0001
dry cough	23/192 (12%)	10/192 (5.21%)	0.018
night cough	26/195 (13%)	27/192 (14.1%)	0.83
morning phlegm	80/193 (41%)	78/193 (40.4%)	0.84
all day phlegm	135/189 (71%)	128/193 (66.3%)	0.28
clear phlegm	45/180 (25%)	39/197 (19.8%)	0.23
coloured phlegm	160/185 (86%)	148/197 (75.1%)	<0.0001
sore throat	42/194 (22%)	48/196 (24.5%)	0.51
tonsillitis	149/180 (83%)	178/195 (91.3%)	0.014
runny nose	10/196 (5%)	3/197 (1.52%)	0.047
coloured nasal discharge	92/187 (49%)	71/197 (36%)	0.009
Patients understand antibiotic efficacy against bacterial vs viral infection	81/200 (41%)	76/200 (38%)	0.6
Patients feelings about antibiotics for URTI are:			
Positive	66/200 (33%)	33/199 (16%)	<0.0001
Neutral	29/200 (15%)	63/199 (31%)	0.00015
Negative	105/200 (53%)	103/199 (52%)	0.88

URTI=upper respiratory tract infection.

Discussion

This survey found no change since 1998 in the percentage of the general public with a sound understanding that antibiotics are not effective in the treatment of viral infections. There was, however, a reduction in those wanting antibiotics for specific symptoms, and a reduction in positive feelings towards antibiotics. There was also a reduction of 12% in patients getting antibiotics. It is reassuring that doctors are using more "as-needed" prescriptions (24% versus 7%). There was also a decrease (from 62% to 45%) in the proportion of people who had ever consulted a doctor about a cold or flu.

These findings may suggest that people are aware that they should not be using antibiotics to treat the cold or flu, even if they do not know the reason. This assessment is supported by the number of respondents who feel positive about antibiotic use for common colds falling dramatically from 33% in 1998 to 16% in this study. If this assessment is correct then it may form a base from which to launch further and better education programmes into the wise use of antibiotics. However of those who had seen a GP, the proportion wanting antibiotics had increased. Some of this may be due to a residue of patients “keen” on antibiotics for common colds still consulting GPs.

Another 1998 NZ study found that the general public had poor understanding regarding the lack of benefit of antibiotic treatment for the common cold and influenza (flu).¹¹ Only 40% understood that antibiotics were unhelpful in viral infections and as such would be of no use in treatment.

A US study evaluated patient contribution in antibiotic use across nine countries (UK, France, Belgium, Turkey, Italy, Morocco, Colombia, Spain, and Thailand).¹² All had some degree of antibiotic misuse in the community. Some patients exaggerated symptoms to get a prescription for antibiotics, while others exerted pressure on doctors for a prescription. Keeping leftover medication for future use and illegal sale of antibiotics directly from the pharmacy was observed in all nine countries. The authors concluded that the lack of knowledge in patients regarding antibiotic use and the consequences of misuse made education a major priority in the primary care setting.

An UK study examined the effect of giving an “as needed” antibiotic prescription for sore throat management.¹³ Three groups of patients were compared: one group was given a prescription for antibiotics, one received no prescription for antibiotics, and the third group was asked to come back to the practice in 3 days if not improved, to collect a prescription. The use of antibiotics in these three groups was 99%, 13%, and 31% respectively. Another study done by these authors found that it was more likely for patients who received antibiotics previously to return for subsequent consultations for sore throat, suggesting that giving antibiotics encourages patients to return with subsequent illness.¹⁴

The reasons for visiting a doctor for the common cold show that patients need re-education about antibiotics usage. This suggests that the majority of patients who actually attend a doctor with symptoms of a cold do want antibiotics. There was a general trend toward diminished perceived benefits of antibiotics for various symptoms. On the other hand, for conditions such as pharyngitis, tonsillitis, and sinusitis, patients had an increase in perceived antibiotic benefits. From existing literature, it is controversial whether antibiotics play a role in reducing symptoms of tonsillitis¹⁵ and purulent nasal discharge.^{16, 17}

Comparing our results to a US study,¹⁸ only 54% knew that a virus is the usual cause of the common cold and 46% believed that antibiotics kill viruses while 17% were not sure whether antibiotics kill viruses. Our findings were more encouraging when compared to Swiss research of 5379 interviewees across nine countries showing that antibiotics were still perceived as strong efficient drugs against viral illness.¹² Interviewees believed that most respiratory infections require antibiotic treatment and 11% of them had to exaggerate their symptoms to get an antibiotic prescription from

their doctor. About one patient in four saved part of their antibiotic course for future use.

Some commentators reflect that despite the excessive amounts of antibiotics used, relatively minor attempts have been made to reduce unnecessary or even improper use.⁷ This emphasises the importance of reinforcement of education to both the public and GPs.

A study in the Netherlands found that fewer patients than doctors endorsed the self-limiting character of cough, sore throat, and earache (mean 3.1, 3.4 and 2.9 versus 4.1, 4.1 and 3.7). In addition, far more patients than doctors rated antibiotics as necessary for cough and sore throat (mean 2.7 and 2.9 versus 1.7 and 1.7) and believed that antibiotics speed recovery (mean 3.7 versus 2.0).¹⁹

Educational material and prescribing feedback to physicians has been shown to reduce their antibiotic prescribing.²⁰⁻²² To a limited degree patient education has been demonstrated to limit antibiotic use for viral illness in some studies,²³ but many patients still seek antibiotics despite public education programmes.²⁴

The strength of our study is that it reports on a random selection of the public and compares two time periods between which there was a campaign to reduce antibiotic use. We are not aware of any other study to do this in the international literature. The response rate was 72% in 1998 and 55% in 2003 which is acceptable for this type of study. There is no reason to indicate that non-responders introduce a bias in the results in any particular direction.

There is the possibility that the group who has seen a doctor for a respiratory illness are a residue wanting antibiotics. This may not be the case as the number of respondents who went to the doctor for their last cold and flu remained constant at 20%. A limitation of this study is that it relies on asking people what they do, rather than measuring what they do.

In conclusion, the results show that in 2003 the majority of the general public believe that antibiotics are useful in the treatment of the common cold, and that this belief has not changed since 1998. However, the *Wise Use of Antibiotics* campaign may have been successful in its goals since there appears to be a reduction in patients seeking attention for common colds and a reduction in the number of people receiving antibiotics from GPs. The campaign appears to have been less successful in increasing public knowledge. The change in GP behaviour may be the major factor in the reduction in antibiotic use from 1996 to 2003.

There are no conflicts of interest in this study.

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