

# WHOOPING COUGH IN THE NORTH COAST REGION

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On March 27, 1992 a case of whooping cough (pertussis) was notified to the North Coast PHU by a general practitioner. Over the subsequent weeks, the PHU was notified of 10 more cases of whooping cough from the same area.

The index case was a 10-year-old girl who attended a primary school of 31 children aged 5-11 years, in a mountainous area about 35 kilometres inland.

PHU staff undertook active surveillance for further cases of whooping cough by contacting GPs, schools and the media in the northern part of the Region. Fifty schools were contacted and informed of the outbreak and asked to be vigilant for further cases. No more cases were identified through this process.

Of the 11 cases, eight were female and three male. Nine cases (aged 5-11 years) attended the school. The other two (both female) were two and four years old and lived close to the school.

The notifying GP was asked for details of immunisation status of cases and laboratory results. Positive serology was notified to the PHU for the first three cases. All further cases were diagnosed on clinical criteria by the attending doctor. The recorded dates of onset were between March 3 and 28.

The immunisation status of the cases was as follows:

- three were fully immunised, having had four doses of triple antigen (TA);
- two were partially immunised;
- one case was immunised, but the completeness of immunisation was unknown, while in another case the immunisation status was completely unknown;
- one case had received homeopathic immunisation; and
- three cases were not immunised.

The school attended by nine of the cases was closed one week before the Easter school holidays in April to prevent further spread of whooping cough among the children and staff.

Information on antibiotic treatment and immunisation for whooping cough was circulated to GPs, community health centres and community groups.

During the outbreak two press releases were made by the North Coast Director of Public Health, in addition to four television interviews, many radio interviews and several local newspaper reports. The objectives were to promote immunisation in the community, and to advise correct treatment for people who contracted whooping cough.

## FURTHER INVESTIGATION

A case-control study was conducted with the aim of determining the efficacy of:

- whooping cough immunisation using TA; and
- homeopathic immunisation for whooping cough.

In addition, the magnitude of whooping cough-related morbidity in the community was assessed, as indicated by the number of days away from school or work. The study sample comprised all teachers, pupils who attended the school and members of their households. Cases were defined as either having been diagnosed with whooping cough or having had a cough lasting 14 days or more during the previous three months. Controls were those individuals who

TABLE 7

REPORTED TYPE OF WHOOPING COUGH IMMUNISATION

Immunisation	Frequency (n)	Per cent
TA injection	46	58
Homeopathic	8	10
None	9	11
Unknown	16	20
Total	79	100

TABLE 8

REPORTED NUMBER OF IMMUNISATION INJECTIONS RECEIVED

Number of injections	Frequency (n)	Per cent
Not stated	37	47
One	6	8
Two	1	1
Three	16	20
Four	16	20
Five	3	4
Total	79	100

did not have an illness consistent with the case definition.

A questionnaire was devised, distributed through the school and collected a week later. Data were analysed with EpiInfo version 5.01, using univariate and bivariate statistical methods (chi square). Permission was granted by the School Education Department Cluster Director for the PHU to investigate the outbreak further.

## RESULTS

Questionnaire data were received from 20 families, covering 79 individuals. One family with children at the school did not participate. Two families supplied information for children, but not adult household members. Overall 95 per cent of families participated in the study. However, because of the anonymity of respondents, it was not possible to determine whether the questionnaire was completed for all members of each household.

The ages of study participants ranged from five months to 70 years (mean age 19 years). Sixty-five per cent of respondents were female. Teachers and children attending the school accounted for 43 per cent of respondents.

Thirty-five survey respondents (44 per cent) had had an illness consistent with the case definition. Sixty-eight per cent of respondents had close contact with someone with whooping cough. Forty-three per cent stated they had taken antibiotics for 10 days or more to prevent whooping cough.

## Immunisation status of survey respondents

The immunisation status of *survey respondents* (cases and controls) is summarised in Tables 7 and 8.

The immunisation status of *cases* identified in the study was as follows:

- 6 per cent were fully immunised (having had four doses of TA);
- 46 per cent were partially immunised (less than four doses of TA);
- 14 per cent were homeopathically immunised;
- 11 per cent were not immunised; and
- 23 per cent had immunisation status unknown.

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## Whooping cough

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### Efficacy of whooping cough vaccine

People fully immunised were five times less likely to contract whooping cough compared with people with other immunisation status (i.e. partially immunised, homeopathically immunised, unimmunised or unknown immunisation status). OR = 0.20; 95%CI 0.03-0.84. This is a statistically lower risk in fully immunised people.

### Efficacy of homeopathic immunisation

The comparison of the efficacy of homeopathic immunisation with no immunisation showed no difference in controlling whooping cough. (OR = 2.08; 95%CI 0.21-22.15). While not statistically significant, the results suggest that TA immunisation is more protective against whooping cough than homeopathic immunisation. (OR = 0.13; 95%CI 0.01-1.18).

### Effect of whooping cough morbidity on the community

During the outbreak, 24 per cent of respondents stayed away from school or work because they had whooping cough and 5 per cent stayed away in order to avoid catching it. The average number of days away from school or work during the outbreak was 3.7.

## DISCUSSION

The Public Health Act 1991 requires medical practitioners, hospital chief executive officers and laboratories to notify cases of whooping cough to the local PHU, but in this study only one-third of cases of whooping cough were notified by a medical practitioner. The other cases were detected by means of the study questionnaire.

The study suggested that TA immunisation was an effective means of protecting people against whooping cough. However, three respondents who were fully immunised

with TA did contract the disease. It is estimated that TA immunisation provides about 80 per cent protection against whooping cough and this protection is known to wane over time<sup>1</sup>. Infants aged under one year (who are most at risk of serious consequences from whooping cough) obtain the highest level of protection from immunisation. Older children and teenagers have an increased risk of acquiring and transmitting disease.

The study results suggested that homeopathic immunisation was no more effective in protecting against whooping cough than no immunisation at all.

Limitations of the validity of the findings were:

- Possible recall bias. Respondents were required to recall events which had occurred at least six weeks previously.
- Self-report of immunisation status. It was not possible to verify self-reported immunisation.
- Power of the study. The sample size was too small to demonstrate possibly significant effects.

## CONCLUSIONS

To minimise the transmission of whooping cough in school-age children, a fifth dose of whooping cough vaccine at the time of the pre-school booster may be warranted<sup>2</sup>. Whooping cough immunisation of adolescents and adults could also be considered with the routine 10-year tetanus and diphtheria boosters.

Evidence from this study suggested homeopathic immunisation was not effective in preventing whooping cough, in contrast to TA.

1. National Health & Medical Research Council. Immunisation Procedures. 4th Edition. Australian Government Publishing Service, Canberra 1991.
2. Australian College of Paediatrics. Report of the immunisation subcommittee on whooping cough immunisation. Policy Statement. *Journal of Paediatric and Child Health* (1991) 27:16-20.

## Public health abstracts

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with considerable skepticism despite its apparent scientific rigour. Only time will tell whether this skepticism is justified.

Valero MV, Amador LR, Galindo G, Figueroa J et al. Vaccination with SPf66, a chemically synthesized vaccine, against *Plasmodium falciparum* malaria in Colombia. *Lancet* 1993; 341:705-710.

### HIGH DIETARY CALCIUM REDUCES THE INCIDENCE OF KIDNEY STONES

Kidney stones are a major cause of morbidity. A high dietary calcium intake has been strongly suspected of raising the risk that a kidney stone will form. However, an enormous study involving more than 45,000 men in the United States has shown that the reverse is the case, that is, a high dietary calcium intake actually decreases the risk of kidney stones. This finding is intriguing and perhaps counter-intuitive. A possible explanation involves the role of the chemical oxalate. Restricted calcium intake increases

the absorption of oxalate in the gut. This is a complex issue which also involves dietary fat which binds with calcium in the gut. Accordingly, the general policy of calcium restriction for patients who have had kidney stones containing calcium should be re-examined.

Curhan GC, Willett WC, Rimm EB and Stampfer MJ. A prospective study of dietary calcium and other nutrients and the risk of symptomatic kidney stones. *New Engl Med J* 1993; 328:833-838.

### ELDERLY DONORS CAN OFFER RENAL TRANSPLANTS

Renal transplantation is the treatment of choice for end-stage renal failure providing a vastly improved quality of life. An Australian group at the Royal Melbourne Hospital has demonstrated that the use of elderly patients, most of whom have died from stroke, is an excellent source of effective renal donors. In this context, there are thought to be more than 1000 patients awaiting renal transplantation, with fewer than 500 being performed each year.

Smith KCG, Martyn BN, Walker RG, Davis SM et al. The potential for elderly donors to increase renal transplantation rates in Australia. *Med J Aust* 1993; 158:588-590.