

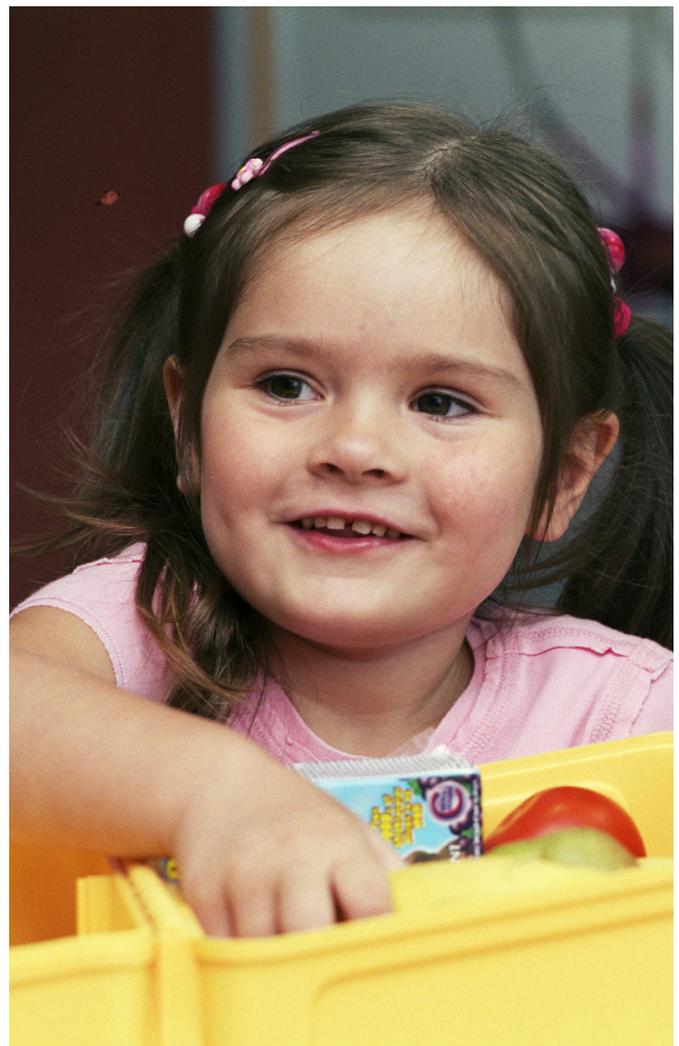
## Whooping cough infection common in school aged children with stubborn coughs

This NIHR-funded study found that almost a fifth of children aged five to 15 years who visited their GP with persistent cough showed signs of recent whooping cough infection, despite having a booster vaccination before school age. These data, from 22 GP practices in Thames Valley UK, describe the duration of vaccine-induced immunity and the burden of disease in adolescents. This may inform policy discussion about the potential need for a national adolescent whooping cough booster programme in the UK.

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*The most serious cases of pertussis (whooping cough) are in very young infants, before they are old enough to be immunised. Because protection given by the vaccine weakens with time, adults and older siblings who have been vaccinated can still catch the disease themselves and could pass it on to vulnerable young infants. The UK has recently become the first country to introduce pertussis vaccination in pregnancy to provide protection to the newborn, through antibodies which cross the placenta, and thereby to have a major impact on the disease in these most vulnerable infants. The study by Wang and colleagues shows the ongoing transmission of pertussis amongst school age children which provides new knowledge to guide the development of pertussis vaccine policy and makes the case for intervention to further reduce the burden of pertussis amongst children and thus to improve child health.* ”

**- Professor Andrew J Pollard,  
Professor of Paediatric Infection and  
Immunity & Director of the Oxford Vaccine  
Group, University of Oxford**



## WHY WAS THIS STUDY NEEDED?

Whooping cough (pertussis) is one of the most common vaccine preventable diseases causing almost 300,000 childhood deaths a year worldwide. Primary vaccine coverage in the UK has been more than 90% since the vaccine was introduced in 1992. A pre-school booster vaccination, introduced in 2001, has achieved about 80% coverage. The effectiveness of vaccine fades over time and UK incidence of whooping cough in older children and adults has been increasing since 2011. A national outbreak was declared in the UK in April 2012.

In the last decade a number of other countries, including Australia, Canada, France, Germany and the US, have introduced an adolescent booster vaccination. In January 2012 the UK Joint Committee on Vaccination and Immunisation (JCVI) reviewed the need for an adolescent booster vaccination and concluded that further research was needed to estimate the burden of disease in the UK. The current study estimated the prevalence and clinical severity of whooping cough in school age children who went to their GP with a persistent cough.

## WHAT DID THIS STUDY DO?

This prospective cohort study recruited 279 children aged 5 to 15 years between November 2010 and December 2012 who presented with persistent cough in 22 general practices in the Thames Valley, England. Of these, 261 had received whooping cough vaccinations, but there was variation in whether they had also received the preschool booster or other combinations of vaccine. Recent whooping cough infection was diagnosed using laboratory tests. The authors used a reliable approach as they recruited children to the study without healthcare providers knowing if they had confirmed whooping cough or not.

## WHAT DID IT FIND?

- A fifth of all children with persistent coughing had evidence of recent whooping cough infection, whether they were fully vaccinated or not.
- Whooping cough was more than three times as common in children who had received the pre-school booster seven or more years ago than in children who had received the booster vaccination less than seven years ago.

## WHAT DOES CURRENT GUIDANCE SAY ON THIS ISSUE?

Current 2015 Public Health England guidance states that the objective of the childhood immunisation programme is to provide a minimum of four doses of a pertussis-containing vaccine. The primary course of whooping cough vaccination consists of three doses of a pertussis-containing product. It is recommended for all infants from two months up to ten years of age. The fourth dose should be given as part of the pre-school booster, at three years and four months of age or soon after.

Currently, routine immunisation against whooping cough is not recommended for those aged ten years and over, except for pregnant women or as part of outbreak control.

## WHAT ARE THE IMPLICATIONS?

Whooping cough remains a significant cause of persistent cough among school children in the UK even after the implementation of the preschool booster vaccination and despite high levels of coverage. Burden of illness studies such as this informs cost-effectiveness calculations and will be important in discussions about an adolescent whooping cough booster vaccination policy in the UK.

Only children attending Thames Valley GP practices were studied. This relatively small sample may not be representative of the range of vaccine experiences of children across the UK as a whole.

If an adolescent booster vaccination were to be recommended in the UK it would likely be administered at 14 years of age, at the same time as routine meningitis C, tetanus, diphtheria, and inactivated polio adolescent booster vaccinations.

## DEFINITIONS

Whooping cough booster vaccinations during adolescence were provided in Australia, Canada, France, Germany, and the United States as a result of increased incidence of whooping cough in adolescents. Any booster programme would aim through herd immunity to not only reduce the incidence of whooping cough in adolescence, but by reducing the rates of illness in family members also protect pre-vaccinated infants. The US booster vaccination (Tdap) has only been partially effective in preventing the admission of infants to hospital due to whooping cough, although since introduction there has been a decrease in the ratio of the incidence of whooping cough in adolescents compared with other age groups.

## CITATION

- Wang K, Fry NK, Campbell H. Whooping cough in school age children presenting with persistent cough in UK primary care after introduction of the preschool pertussis booster vaccination: prospective cohort study. *BMJ*. 2014;348:g3668.

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