

## Summary of the WHO position paper on pertussis vaccines, 1 October 2010

This position paper, which replaces the corresponding document published in the *Weekly Epidemiological Record* in January 2005, incorporates recent developments and current WHO recommendations in the field of pertussis (whooping cough) immunization. The paper also includes core references and links to a more comprehensive reference list, as well as links to grading tables assessing the quality of scientific evidence for some of its key conclusions.

*Bordetella pertussis* causes about 16 million cases of pertussis and about 195 000 deaths each year, mainly among infants in developing countries. Large-scale vaccination during the 1950s–1960s reduced the incidence of pertussis in industrialized countries by >90%. Worldwide, about 82% of all infants are receiving the primary series of 3 doses of pertussis vaccine, which in 2008 was estimated to avert about 687 000 deaths.

Two types of pertussis vaccines are available: whole-cell (wP) vaccines that are based on entire, killed *B. pertussis* organisms, and acellular (aP) vaccines based on 1 to 5 highly purified, selected components of this agent. wP and aP are usually offered in fixed combination with diphtheria toxoid and tetanus toxoid (DPwP/DTaP), but some combinations include additional vaccines (poliomyelitis, hepatitis B, *Haemophilus influenzae* type b).

Following the primary series, the best wP and aP vaccines show similar efficacy/effectiveness (80–90%) against severe pertussis. Local and systemic reactogenicity is more commonly associated with wP-containing vaccines, but aP and wP-containing vaccines both have an excellent safety record with regard to serious adverse events, including neurological disorders.

The main aim of pertussis vaccination is to reduce the risk of severe pertussis in infancy through  $\geq$  90% coverage worldwide with 3 doses of high quality wP or aP vaccines. All infants, including HIV-positive individuals, should be immunized.

WHO recommends that the first dose be administered at 6 weeks of age, and subsequent doses given 4–8 weeks apart, at 10–14 and 14–18 weeks of age. The last dose of the primary series should be completed by the age of 6 months. Neonatal immunization against pertussis is not currently part of the WHO recommendations.

A booster dose is recommended for children 1–6 years of age, preferably during the second year of life. The booster dose is expected to ensure protection against pertussis for at least 6 years.

The aP-containing vaccines continue to be significantly more expensive than wP-containing vaccines and aP-containing vaccines are unlikely to be currently affordable in most developing countries. In countries where the higher non-serious reactogenicity of wP is an impediment to high vaccination coverage, aP should replace the wP vaccine in the national childhood immunization programme. Interchanging between or within the wP and aP vaccine groups is unlikely to interfere with safety or immunogenicity.

There is currently insufficient evidence to support the addition of vaccine boosters in adolescents and adults, or vaccination of pregnant women and close household contacts, for achieving the primary goal of reducing severe pertussis in infants. However, countries with demonstrable nosocomial transmission of the disease are encouraged to implement pertussis vaccination with emphasis on maternity and paediatric staff, if economically and logistically feasible.

WHO encourages careful epidemiological surveillance of pertussis and surveys comparing age-specific incidences in countries with different vaccine booster policies.