Eurosurveillance
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Eurosurveillance, Volume 8, Issue 4, 22 January 2004

Articles

Citation style for this article: Hovi T, Wassilak S. The importance of maintaining high coverage polio vaccination beyond global eradication of wild type poliomyelitis. Euro Surveill. 2004;8(4):pii=2372. Available online: http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=2372

The importance of maintaining high coverage polio vaccination beyond global eradication of wild type poliomyelitis

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In 1988, the World Health Assembly established the goal of eradication of poliomyelitis by 2000. At the time, there were approximately 350 000 cases in 125 countries. Although the initial goal of the polio eradication initiative (PEI) was not reached by the target date, progress to date has been impressive. Of the 667 provisionally reported cases for 2003 (as of 19 January 2004), 644 occurred in the remaining six endemic countries; the 23 cases in seven other countries were due to imported virus, often with subsequent transmission (http://www.polioeradication.org/vaccines/polioeradication/all/global/casecount.asp).

Wild poliovirus transmission must be interrupted as soon as possible in the remaining endemic countries to avoid any further increase in importation related outbreaks in areas with weak primary healthcare. Encouraging progress in this respect has been recently seen in northern India, but less so in Nigeria and Pakistan, the two other remaining major endemic areas. Financial constraints and incomplete implementation of World Health Organization (WHO) strategies remain the greatest threats to the initiative.

In addition to routine childhood immunisation, high coverage campaigns with the oral poliovirus vaccine (OPV) targeted at children under 5 years of age have been instrumental to the global success of PEI. OPV is easy to administer, and has the dual advantages of being less expensive and providing a better herd immunity than the alternative, the inactivated poliovirus vaccine (IPV). Both vaccines give the vaccinee high protection from paralytic poliomyelitis. It is well known that OPV may very rarely cause a serious complication: vaccine associated paralytic poliomyelitis (VAPP). This may emerge in the vaccinee or in a close contact and is due to functional reverse mutations in the viral genome during replication in the human body. As a result, the attenuated vaccine virus may regain the neurovirulent phenotype. Incidence figures reported for VAPP vary, but one frequently cited is about 1 VAPP case per 500 000 first OPV doses administered, and less than 5% of this risk after the subsequent doses (1).

Supplementary immunization campaigns with OPV and focal house-to-house immunization in the highest transmission areas remain the strategies to vaccinate every child in the remaining endemic and neighbouring countries, in order to reach the goal of PEI. On the other hand, risk of VAPP is the main reason that industrialised countries, which have used OPV in the past and have long been free from endemic poliovirus circulation, are in the process of changing their vaccination schedule. In the 52 countries of the WHO European Region, which was certified free of polio in June 2002, immunisation policies have varied since the introduction of OPV. Some countries have historically used IPV exclusively in routine immunisations (Finland, Iceland, Norway, Sweden, and the Netherlands), whereas others had a policy of universal OPV use but have since changed to use of IPV, some with sequential use of OPV. Currently, 21 countries use IPV exclusively for childhood immunisation (including all European Union member states except for the United Kingdom), eight have a policy of sequential use of IPV followed by OPV (Belarus, Croatia, Hungary, Israel, Latvia, Lithuania, Poland and Ukraine) and the remaining continue to have a policy of exclusive OPV use.

WHO has recently issued a position paper on the use of IPV (2). In developing countries, where immunisation is carried out according to the early infancy schedule (6, 10 and 14 weeks of age; WHO immunisation recommendations for developing countries), IPV given at this time may result in limited seroconversion rates, thus preventing any change in policy.

Countries considering a change to IPV should conduct a thorough evaluation, including the observed risks and potential burden of VAPP, the political and public perception of OPV related adverse events, possible impact on vaccine acceptance, the operational implications of a change (resulting from the need for single dose vaccine supplies, and including refrigerator space implications, etc.), and, in particular, financial implications of IPV use. Exclusive use of IPV in immunisation against poliomyelitis requires the vaccination coverage to be very high, preferably above 95%, to overcome any concern about limited herd immunity,

It is important to note that lowered immunisation coverage may also have serious consequences in countries that use OPV, as was recently demonstrated by outbreaks of poliomyelitis due to circulating vaccine derived polioviruses (VDPV) in Hispaniola, (Dominican Republic and Haiti) (3), the Philippines (4) and Madagascar (5). The picture is complicated by reports of isolation of VDPV strains from sewage in the Palestinian Autonomous Areas (6), in Estonia (7) and in Slovakia (TH

strains from sewage in the Palestinian Autonomous Areas (6), in Estonia (7) and in Slovakia (HH and coworkers, unpublished). Consequently, high coverage of polio vaccination is not only important in the period until the eradication of the wild type polioviruses from human circulation, but for as long as live OPV is in use. WHO has developed a strategic plan for 2004-2008 to achieve and maintain polio eradication that includes the explicit goal of stopping routine immunisation with OPV as soon as possible after certification of global eradication. It also includes continued virological surveillance, provision of global vaccine stockpiles and continuation of a process for secure laboratory containment of wild and vaccine derived poliovirus. The cessation of OPV use could potentially be recommended before 2010.

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