Re-emerging poliomyelitis – is Australia's surveillance adequate?

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Abstract

In the past two years there has been a resurgence of polio with 21 previously polio-free countries importing wild poliovirus. Wild poliovirus importations into polio-free areas will continue to occur until endemic transmission is interrupted globally. Australia's acute flaccid paralysis (AFP) surveillance falls well short of the target of more than 80 per cent of AFP cases having two adequate stool specimens taken at least 24 hours apart within 14 days of onset for poliovirus examination. As most AFP cases are hospitalised, AFP should be immediately notifiable by hospitals to public health units or state or territory public health authorities to ensure appropriate follow up, including stool specimens. *Commun Dis Intell* 2006;30:275–277.

Keywords: acute flaccid paralysis, surveillance, poliovirus

Poliomyelitis (polio) is a devastating infectious disease that has been controlled for many years but not yet eradicated. In 2003, within 15 years of the World Health Assembly adopting a resolution calling for the global eradication of polio, the number of polio-endemic countries had decreased from 125 to 6 (Afghanistan, Egypt, India, Niger, Nigeria and Pakistan).[1] In 2006 the World Health Organization reclassified Egypt and Niger as no longer endemic as all recent wild poliovirus isolations in these countries have been confirmed by genetic sequencing as importations. However, in the past two years there has been a resurgence of polio with 21 previously polio-free countries importing wild poliovirus type 1 and four countries (Indonesia, Somalia, Sudan, and Yemen) experiencing outbreaks of more than 100 polio cases.[2] In 2005, there were 1,856 confirmed polio cases compared to less than 500 in 2001.[3] The rapid spread of polio from northern Nigeria, where there was a breakdown of polio vaccination during 2003 and 2004, through west and central Africa to the Horn of Africa, the Arabian Peninsula, and Indonesia, sounds a timely warning to all countries that polio has not yet been eradicated and each country should prepare for the possibility of importation of wild poliovirus.[4] With polio on our doorstep, Australia's surveillance system must be strengthened to enable timely identification of possible cases and rapid control.

As polio has a variable incubation period, generally of 7–10 days but ranging from two days to a month, and approximately 99 per cent of infections are asymptomatic or present as non-specific febrile illnesses, travellers may appear well at their point of entry into a country. Clearly the risk for importation is greatest for countries adjacent to polio-endemic countries, however, migration poses a risk for reintroduction of wild poliovirus to all countries. The risk for local transmission after importation will depend primarily on two factors; vaccination coverage in the local community and living conditions, particularly the frequency of faecal contamination of drinking water supply.

Until recently, Australia's risk of importation of wild poliovirus was considered extremely low. Before the large outbreak of polio in Indonesia that followed importation into West Java in March 2005, the last case of wild polio in Australia's neighbourhood was in a young girl in Cambodia in March 1997.[5] Although many Australians, particularly young adventure tourists, travel to polio-endemic countries, most but not all have been vaccinated against polio. Also, Australia welcomes many visitors from polio-endemic countries or countries with recent polio re-introduction, and accepts refugees who are more likely to have been exposed to infected environments and may be inadequately vaccinated against polio. The increasing trend of placing refugees in rural areas, where there is a demand for unskilled and semi-

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skilled labour, juxtaposes with a greater likelihood of faecal contamination and inadequate treatment of domestic water supply. If these communities have inadequate immunisation coverage, then there is a risk of local transmission.

Given the potential for wild poliovirus importation it is necessary to strengthen Australia's polio surveillance. The occurrence of vaccine-derived poliovirus outbreaks in the Philippines (2001) and Indonesia (2005) provides further impetus for ensuring sensitive surveillance for imported cases in Australia.[6] Acute flaccid paralysis (AFP) surveillance is coordinated by the National Polio Reference Laboratory at the Victorian Infectious Diseases Reference Laboratory where all testing of stools for poliovirus is conducted. The Australian Paediatric Surveillance Unit (APSU) has been funded to assist in surveillance of acute flaccid paralysis the classical clinical syndrome associated with polio disease, since March 1995. More than 1,000 paediatricians and child health specialists report monthly to the APSU on more than 10 disease presentations during the previous month. When there is a positive response a more detailed follow-up questionnaire is sent to the reporting doctor and for AFP cases, a 60 day outcome questionnaire is additionally sent for completion when a final diagnosis is not possible from first questionnaire and laboratory test results. This assists in determining the likelihood of polio where stool surveillance was inadequate as residual paralysis more commonly is associated with polio than other causes of AFP.

AFP surveillance for cases of acute onset of flaccid paralysis in one or more limbs or of bulbar paralysis in any child less than 15 years of age proved its value in meeting the World Health Organization (WHO) benchmark rate of detecting at least one non-polio AFP per 100,000 population less than 15 years of age per annum, required for proving the adequacy of polio surveillance.[7] The passive reporting system that existed in Australia prior to 1995 had failed to meet this target necessary for Australia to be included with the rest of the Western Pacific in being declared polio-free.[8] The monthly return rate of surveillance forms to APSU has consistently exceeded 90 per cent. Australia met the WHO detection target in 2000, 2001 and 2004.[9,10] Detection levels have been heterogeneous between states and territories, and although low reference rates may result in some variability due to chance, the fact that certain states have never met the target suggests that their public health surveillance for AFP is sub-optimal.[11,12]

An effective public health response to importation of wild polio virus may be constrained by the delays in reporting through the current surveillance system. Of considerable concern is performance in meeting the second of the WHO indicators for adequate AFP surveillance, namely that more than 80 per cent of AFP cases should have two adequate stool specimens taken at least 24 hours apart and within 14 days of onset for examination by an accredited Global Polio Network laboratory.[13] Between 2000 and 2005 the stool specimen examination rate has ranged nationally between 24 per cent and 40 per cent, and considerably lower if Queensland performance is excluded. The only timely way to rule out polio as the cause of AFP is adequate laboratory examination of stool specimens that are correctly submitted with due consideration of the need for refrigeration to maintain polio virus. Thus, the current low levels of stool submission and delays in reporting pose a public health threat.

It is necessary to supplement current surveillance with a complementary system that will provide rapid confirmation that AFP cases are not due to wild poliovirus importation. It is not surprising, given the dramatic clinical picture, that a high proportion of children with AFP are hospitalised. For example, 96 per cent (137/143) of notified AFP cases between March 1995 and December 1999 were hospitalised.[8] Therefore, hospital-based notification has great potential for rapidly detecting acute AFP presentations and permitting public health follow up to exclude polio. Queensland has already made notification of AFP the responsibility of hospitals and New South Wales is presently considering the same approach.

Wild poliovirus importations from polio-endemic countries into polio-free areas will continue to occur until endemic transmission is interrupted globally. Ensuring sensitive and timely polio surveillance can limit polio transmission subsequent to importation. This requires that all cases of AFP presenting to hospitals be immediately notified to the local public health unit or state or territory public health authority to ensure a rapid appropriate response, including the immediate dispatch of stool specimens to confirm the diagnosis. In states and territories where local public health capacity is limited, it may be appropriate to train hospital infection control nurses as the primary response agents to confirm the clinical case definition, collect and dispatch the necessary stool specimens observing the 'reverse cold chain', and implement appropriate infection control measures.[14]

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