

Successes and shortcomings of polio eradication : a transmission modeling analysis

Deskripsi Lengkap: <https://lib.fkm.ui.ac.id/detail.jsp?id=102100&lokasi=lokal>

Abstrak

Polio eradication is on the cusp of success, with only a few regions still maintaining transmission. Improving our understanding of why some regions have been successful and others have not will help with both global eradication of polio and development of more effective vaccination strategies for other pathogens. To examine the past 25 years of eradication efforts, we constructed a transmission model for wild poliovirus that incorporates waning immunity (which affects both infection risk and transmissibility of any resulting infection), age-mediated vaccination rates, and transmission of oral polio vaccine. The model produces results consistent with the 4 country categories defined by the Global Polio Eradication Program: elimination with no subsequent outbreaks; elimination with subsequent transient outbreaks; elimination with subsequent outbreaks and transmission detected for more than 12 months; and endemic polio transmission. Analysis of waning immunity rates and oral polio vaccine transmissibility reveals that higher waning immunity rates make eradication more difficult because of increasing numbers of infectious adults, and that higher oral polio vaccine transmission rates make eradication easier as adults become reimmunized. Given these dynamic properties, attention should be given to intervention strategies that complement childhood vaccination. For example, improvement in sanitation can reduce the reproduction number in problematic regions, and adult vaccination can lower adult transmission.