Hull et al. (1) raise important issues regarding the eradication of poliovirus and the ending of polio immunization. Our study (2) provides generally reassuring data on the immunity of the Dutch population. Nonetheless, it also points "weak spots": first, the community of people who refuse vaccination for religious reasons; second, the lower seroprevalence among those persons in the general population born before 1945. Approximately 8 percent of them were negative (titer < 1:8) for antibodies to poliovirus type 1 and approximately 15 percent for antibodies to poliovirus type 2 or 3. Approximately 30 percent lacked antibodies against one of the serotypes. These persons were not immunized during the routine vaccination campaigns and probably also have escaped natural infections. One of the patients in the last outbreak belonged to this group (3). We are currently investigating to what extent these persons are protected by memory immunity or are susceptible to poliovirus infection and are therefore at risk during an outbreak (the "Tiel study"). Although it is too early to draw firm conclusions, our first results indicate that a number of these persons excrete virus upon inoculation with oral polio vaccine (OPV).

We agree with Hull et al. (1) that our data support the lack of widespread transmission of wild polioviruses and vaccine-derived polioviruses (VDPVs). Some cautionary remarks are needed, however. Our serologic method has an unknown sensitivity to detect poliovirus circulation in a population immunized with inactivated polio vaccine (IPV). Hence, we cannot completely rule out small episodes of silently circulating wild polioviruses and VDPVs. Detection of poliovirus-specific immunoglobulin A and of antibodies directed against nonstructural proteins of the virus might enhance the sensitivity of serology for this purpose. Preliminary data in which our poliovirus-specific immunoglobulin A assay was used support the lack of widespread poliovirus circulation (4), but additional work is required to define its sensitivity and specificity. Unfortunately, these serologic methods do not allow discrimination between infection with wild polioviruses and VDPVs and are therefore of no use in countries that use OPV. Furthermore, limited social interaction between the small Orthodox Reformed group and the general population might have limited virus transmission.

Hull et al. (1) are concerned about the long-term supply of vaccine. This matter is indeed very serious; therefore, we would like to call on manufacturers and funding organizations for sustained support in this area, including the development of new approaches to producing vaccines. Because manufacturing IPV under maximum laboratory containment is very expensive, it may be wise to develop IPV from Sabin strains or from viral capsids produced by expression systems such as plants.

Finally, Hull et al. (1) ask for an international consensus on the global strategy for stopping polio immunization. As discussed in Paris, France (1, 4), there are still a number of unresolved issues regarding the "endgame." These issues include the moment and method of stopping immunization (at once or gradually), the risk of transmission of VDPVs, the genetic basis of transmissibility, the risk of recombinant viruses, the risk of long-term immunodeficient virus shedding, the sensitivity of surveillance, and the availability of rapid diagnostics. Countries also largely differ in their per capita annual expenditure on health care and hence in the quality of their public health infrastructure and vaccination coverage. Thus, it is unlikely that such an international consensus will be easy to reach. Vaccination should be stopped only when these questions have been answered satisfactorily and when a sufficient stock of emergency vaccine is available. We therefore recommend not to stop polio immunization too soon but to direct all efforts during the coming years toward bringing routine coverage of polio (and other childhood) immunizations as close to 100 percent as possible.

REFERENCES

