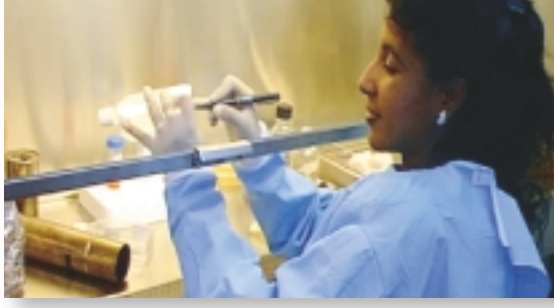
Global Polio Eradication Initiative



WHO/POLIO/02.02; updated January 2002

Containment of wild poliovirus stocks

The purpose

Certifying the world polio-free requires not only stopping the circulation of wild poliovirus in human populations, the only natural reservoir, but also minimizing the risk of an accidental or intentional reintroduction of wild poliovirus into the community from a laboratory or vaccine production site. The *WHO global action plan for laboratory containment of wild polioviruses*[1] aims to locate laboratories worldwide that store wild poliovirus and potentially infectious materials, and ensure that those materials are handled under appropriate biosafety conditions in the post-eradication era. Completion of all pre- and post-eradication containment measures is a prerequisite of global certification of polio eradication.

The recent intentional spread of anthrax and increased media attention to smallpox have raised questions about poliovirus as a potential bioterrorist agent. Poliovirus however is currently a low-level risk relative to agents such as smallpox and anthrax: polio's public health impact and dissemination potential are low while preparedness to detect and control polio is high. Containment, vaccine stockpiling measures, sustained surveillance and polio immunization policy for the post-eradication era will deter the use and limit the impact of poliovirus as a bioterrorist agent in the future.

That the last case of smallpox actually occurred as a result of a laboratory containment failure in Birmingham, England in 1978, one year after global eradication of smallpox, serves as an important reminder of the need for effective containment.

The process

The process of laboratory containment of wild poliovirus was developed through international consultation. Beginning in 1997, a draft action plan was widely distributed for comment, resulting in publication of the *WHO global action plan for laboratory containment of wild polioviruses* in 1998. In 1999, the World Health Assembly unanimously passed resolution WHA52.22, urging all Member States " to begin the process leading to the laboratory containment of wild poliovirus..".

The containment action plan consists of three phases: pre-eradication, post-eradication, and post-global certification. The pre-eradication phase requires that:

1. **National authorities in all countries survey laboratories to identify those with wild poliovirus infectious or potentially infectious materials and encourage destruction of all unneeded materials.**
2. **Laboratories retaining such materials institute enhanced biosafety level-2 (BSL-2/polio) procedures.**
3. **National authorities develop a national inventory of all laboratories with wild poliovirus materials.**
4. **Member States begin planning for implementation of biosafety requirements for the post-eradication phase.**

Laboratories should be requested to conduct a search for all wild poliovirus infectious and potentially infectious materials which include not only viral isolates and clinical specimens from poliomyelitis cases but also faecal samples, throat swabs, or environmental samples that were collected for any reason at a time and place of wild poliovirus circulation and stored in a manner known to preserve poliovirus.

The post-eradication phase begins one year after detection of the last wild poliovirus anywhere in the world. It requires all laboratories possessing wild poliovirus infectious or potentially infectious materials to implement recommended containment procedures (currently enhanced biosafety level-3 or BSL 3/polio) OR transfer such materials to WHO-designated repositories OR render such materials non-infectious, or destroy them, under appropriate conditions.

World Health Organization

1 *WHO global action plan for laboratory containment of wild polioviruses, WHO/V&B/99.32.*

The progress

Although a tremendous logistical challenge, effective laboratory containment is operationally feasible, as progress in the European and Western Pacific regions demonstrates. Worldwide, as of mid-October 2001, authorities in 110 countries had appointed a national task force and started the containment planning process: 2 of 47 Member States in the Americas; 17 of 24 in the Eastern Mediterranean; 48 of 51 in the European Region; 7 of 10 in Southeast Asia; 36 of 36 in the Western Pacific. Seventy countries had already begun compiling exhaustive lists of biomedical facilities to be surveyed, with more than 60 000 laboratories listed. Eleven countries had completed all pre-eradication phase activities and submitted a national inventory of laboratories.

Although it is not possible to guarantee that all laboratories with wild poliovirus infectious materials will be identified, implementation of the global action plan substantially reduces the chance of an accidental reintroduction of wild type poliovirus from a laboratory.

Inactivated poliovirus vaccine (IPV) is produced using large volumes of high concentration, non-attenuated wild poliovirus strains. WHO is working with IPV manufacturers and regulatory authorities to appropriately contain poliovirus strains used in IPV production. Containment guidelines for IPV manufacturers will be published in 2002.

A second, updated edition of the *WHO global action plan for laboratory containment of wild polioviruses*, incorporating lessons learned from two years of experience with implementation of laboratory containment, will be presented to the Global Technical Consultative Group for Poliomyelitis Eradication in April 2002.

The challenges

Implementation of the global action plan – the scale of laboratory containment presents a significant operational challenge requiring commitment from political leaders, diligence from national authorities implementing the action plan and goodwill from laboratories worldwide.

IPV manufacturing sites – IPV production facilities handle large volumes of high concentration, non-attenuated wild poliovirus strains, making appropriate containment especially important and challenging.

For more information on containment, please contact Mr Chris Wolff (WHO/Geneva), Tel.: +41 22 791 4524, email labnet@who.int

Further reading

WHO global action plan for laboratory containment of wild polioviruses, WHO/V&B/99.32.
Guidelines for implementing the pre-eradication phase of the global action plan for laboratory containment of wild polioviruses, WHO/V&B/00.21.
Summary sheet: Poliovirus and bioterrorism.