

Laboratory Containment of Wild Poliovirus in South Africa

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LIMPOPO 2006 EPI SYMPOSIUM

BACKGROUND

- In 1988 the WHA, WHO, GCC took an undertaking to eradicate poliomyelitis globally from experience gained during smallpox eradication in 1979.
- In the 18 yrs of the initiative, polio occurrence reduced from 350,000 new cases to 4,000 in 2001 and currently 1,919 new cases
- Increase in number of countries not polio free from 7 in 2003 to 21 in 2006 – Nigeria importation

Cont.

- Three WHO regions have been certified free of indigenous wild poliovirus (wPV) include the Americas- 1994; Western Pacific region- 2000; and European region 2003

Criteria for Eradication

- A show of absence of wild poliovirus from AFP cases suspected with polio or from healthy individuals or environmental samples in all WHO regions for a 3 year period
- Excellent certification surveillance and proven ability to detect, report and respond to cases of imported polio

Cont.

- Containment of all wild poliovirus stocks in laboratories through the completion of the requirements of the WHO global action plan
 - 3 phases
 - Lab survey/inventory
 - Global certification
 - Post global certification

What is wild poliovirus laboratory containment?

The *other half* of poliomyelitis eradication

Certification of Polio Eradication **requires:**



Finding and eradicating wild poliovirus in human populations

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Finding and containing wild poliovirus in laboratories

PURPOSE

- To provide a systematic plan of action to minimize the risk of reintroduction of wild polioviruses from the laboratory to an increasingly non-immune community
why?: (smallpox accident)
(IPV accident)

Objectives

- Identify the number of labs with infectious/potentially infectious polio material and create a National inventory database
- Determine current capacity of labs to handle infectious/potentially infectious mat.
- List all labs which might need to operate under BSL2 in handling such material
- Meet the country's requirements for certification as polio- free

Wild Poliovirus Infectious Materials

- Cell culture isolates, reference strain seeds for inactivated vaccines
- Infected animals or samples from such materials especially PVR transgenic mice
- Derivatives produced in the laboratory that have capsid sequences from wild polioviruses
- Cells persistently infected with poliovirus strains whose capsid sequences are derived from wild poliovirus

Potential infectious material

- Faeces, respiratory secretions and environmental sewage and water samples of unknown origin or collected for any purpose at a time and in geographic area where wild polioviruses or VDPV were suspected to be present, as well as products of such materials in poliovirus, permissive cells or animals, including

cont

- Harvests untested for polioviruses and enteroviruses
- Uncharacterised enterovirus-like cell culture isolates
- Undifferentiated poliovirus isolates

Bio-safety Level 2 (BSL2)

- Operational Procedures
 - Access to lab is restricted
 - All persons entering lab fully immunized
 - All manipulations with open wild poliovirus or potential infectious mat are performed biological safety cabinet/primary containment device

Cont.

- Storage
 - Wild polio material stored in secure areas with limited access
 - Freezers/fridges locked with limited access and clearly marked – containing wild polio materials
 - Freezer inventories current and complete: nature of mat; volume; location in freezer
 - Documentation current on all mat: geographical source and date of collection

Cont.

- Transfer of materials
 - All materials transferred to and from the freezer in leak-proof, unbreakable containers
 - SOPs established and regular training provided

Sectors Targeted

- Types of sectors
 - Health
 - Education
 - Defense
 - Environment
 - Agriculture
 - Science and technology

Institutions

- Biological control agencies
- Biomedical research institution
- Universities
- Culture collections
- Environmental agencies (water/sewage)
- Hospitals/clinics
- Military
- Producers (biologic/vaccines/disinfectants)
- Public health agencies

Laboratories

- Virology
- Bacteriology
- Parasitology
- Gastroenterology
- Pathology
- Genetics
- Medical
- Environmental
- Forensic

Scope Of Activities

- Establishment of database for all relevant labs
- Sensitization
- Develop questionnaire for lab survey and national inventory of wild poliovirus infect materials/pilot
- Send out survey questionnaire

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- Administration of inventory forms
- Collate data from all labs
- Visit labs
- Analyse data and draw up report
- Disseminate report

Monitoring and Evaluation

- Internal Evaluation
- Who guidelines (progress)
- External Evaluation

TIME LINE FOR COMPLETION

ACTIVITY	TIME
1ST Planning meeting	November 2005
Advocacy - Meeting stakeholders	Jan – April 2006
Lab screening (forms sent out)	Feb – March 2006
Completed forms returned	May 2006

TIME LINE

Analysis of results and follow up * non-responders	June - July 2006
Official inventory forms sent out to identified labs Reporting	August-Sept 2006
Presentation to the ARCC	October

Challenges

- **High level political commitment and support essential**
- **Effective task force and dedicated resources**
- **Completion of data base**
- **Compliance**
- **NTF membership very 'thin'**
- **South Africa is a complex and big country**

Cont.

Exact number is not known, but is believed to be in hundreds / thousands

- Correct documentation of ALL labs is critical
- No single body in the country with a register of ALL labs
- **Crucial to obtain support of laboratory/scientific/industrial community**
- **Strengthen relationship between stakeholders and the NTF**
- **Tight Budget**

Conclusion

- Polio risk not hypothetical but real
 - ‘Remember if South Africa has not completed the containment process, it is unnecessarily at increased risk of polio re-introduction from either a research laboratory or a vaccine manufacturing site’ (Global Polio Eradication Initiative 08/05/2006)