Global Progress Toward Laboratory Containment of Wild Polioviruses—July 2001-August 2002

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Since the World Health Assembly launched the Global Poliomyelitis Eradication Initiative in 1988 (see “Box”), the number of countries in which wild poliovirus is endemic has decreased from 125 to 10 in 2001. Three of the six World Health Organization (WHO) regions (Americas, European, and Western Pacific) have been certified as free of wild poliovirus transmission (CDC, 2002; CDC, 1994; CDC, 2001; CDC, 2002). The Global Commission for the Certification of the Eradication of Poliomyelitis will declare the world polio-free when all regions have documented the absence of wild poliovirus transmission for at least three consecutive years and when laboratories with wild poliovirus-containing materials have implemented appropriate containment conditions (Department of Vaccines and Biologicals, 1999). This report describes preparations for laboratory containment and the creation of a global inventory of laboratories and institutions retaining wild poliovirus and summarizes global progress since July 2001 (CDC, 2001). The data indicate that substantial progress has been made in identifying laboratories with wild poliovirus-containing materials and in conducting national wild poliovirus inventories.

In 1999, the World Health Assembly recommended that all member states “begin the process leading to laboratory containment of wild poliovirus” (World Health Assembly, 1999). As of August 2002, a total of 138 (64%) of 214 countries and areas had appointed national task forces for laboratory containment activities, compared with 110 (51%) in June 2001 (CDC, 2001); 121 (57%) countries and areas were conducting surveys of laboratories, and 76 (36%) had completed surveys and submitted national inventories to regional certification commissions (Figure 1), compared with 11 (5%) in June 2001. These inventories have identified 1,242 laboratories with wild poliovirus materials (Table 1).

Laboratory containment activities are of the highest priority in those regions that have been certified as free of wild poliovirus transmission. In the Americas, laboratory surveys are ongoing in 14 (29%) of the region’s 48 countries. Canada completed a survey of approximately 1,700 institutions in 2001 and is following up with 22 (1%) laboratories that reported holding wild poliovirus-containing materials. In 2002, the United States completed a pilot survey of 306 institutions with 2,951 laboratories, 47 (2%) of which reported retaining wild poliovirus-containing materials; in October 2002, a nationwide survey began of 30,097 clinics, 450 academic institutions, 637 biomedical institutions, 56 state and local health departments, and 12 federal government departments. Completion of the inventory is anticipated in mid-2003.

In 2001, containment activities in the European Region were accelerated in anticipation of the region being certified polio-free in June 2002 (CDC, 2002). Each of the region’s 51 countries has established a national task force, created a plan of action, compiled a list of laboratories, and initiated a national survey, and 41 (80%) countries have submitted national inventories to the European Regional Certification Commission. The 10 (20%) countries that have not yet submitted inventories are highly indus-
Box

International effort to eradicate polio.

The Global Poliomyelitis Eradication Initiative (GPEI) was launched in 1988 by the World Health Assembly following the success of poliomyelitis elimination efforts in the Americas. The goal of GPEI is to protect all children from a debilitating and sometimes fatal disease and the build an infrastructure that can support other disease control efforts. CDC will continue to provide poliovirus vaccine and epidemiologic and laboratory support for this important humanitarian effort.

GPEI is led by the World Health Organization (WHO), Rotary International, the United Nations Children’s Fund (UNICEF), and CDC in partnership with health ministries from WHO member states, donor governments, foundations, the World Bank, the European Union, private-sector donors, other United Nations agencies, and nongovernment organizations. In 2001, approximately 10 million volunteers helped vaccinate 575 million children as part of the final push to interrupt transmission of wild poliovirus worldwide.

Progress though late 2002 confirms that transmission of all three serotypes of wild poliovirus can be interrupted globally. Three WHO regions (Americas, European, and Western Pacific) with a total population of >3 billion persons in 134 countries, territories, and areas have been certified as polio-free (i.e., having no indigenous polio caused by wild viruses). Wild polioviruses are circulating in the lowest number of countries in history, with six countries reporting ongoing polio transmission through October 2002; 90% of all polio cases have been reported from nine of 76 states and provinces in India, Nigeria, and Pakistan. Type II wild poliovirus has not been detected since October 1999.

The challenges to stopping the final chains of wild poliovirus transmission include vaccination of children isolated by conflict, geography, or minority status and ensuring adequate political and financial support to implement eradication strategies fully. Work is ongoing to minimize the risks for inadvertent laboratory release of wild poliovirus and to determine when it will be feasible to end vaccination with oral polio vaccine, which is a major goal of the program. Additional information about GPEI is available at www.polioeradication.org.

trialized Western European nations that face substantial logistical challenges in contacting a large number of biomedical institutions.

In 2001, Germany enacted legislation requiring laboratories with wild poliovirus materials to comply with the survey and with recommended biosafety procedures. Approximately 3,500 institutions were identified and surveyed; the response rate was 100%. The contents of approximately 7,000 deep freezers were reviewed. Wild poliovirus-containing materials were reported in 54 (2%) laboratories, 26 (48%) of them in academic institutions; 30 (56%) laboratories destroyed the materials, and 24 (44%) retained them under the required biosafety conditions.

In the Western Pacific, the first WHO region to begin containment activities, 31 (86%) of 36 countries have submitted national inventories; 69 of 13,178 surveyed laboratories reported stocks of materials containing wild poliovirus. Of the five countries with surveys still in progress, the three countries (Australia, China, and Japan) with the largest numbers of laboratories in the region face logistical challenges similar to those facing countries in Western Europe and North America. The other two countries (the Philippines and Malaysia) also face challenges in identifying correct contact information for many unregistered laboratories.

Laboratory containment activities also are under way in the three regions (African, Eastern Mediterranean, and South East Asian) that have not yet been certified as polio-free. Countries in regions that have not reported polio cases in several years have been encouraged to begin containment activities. Seven African countries have established national task forces, with Cameroon and Uganda serving as pilot countries, and 17 Eastern Mediterranean countries and five South East Asian countries have initiated surveys. Four countries in the Eastern Mediterranean Region have submitted national inventories to the Eastern Mediterranean Region Certification Commission.

**Reported by**: Vaccines and Biologicals Dept, World Health Organization, Geneva, Switzerland. Div of Viral and Rickettsial Diseases, National Center for Infectious Diseases; Global Immunization Div, National Immunization Program, CDC.
Global Progress Toward Laboratory Containment of Wild Polioviruses

Editorial Note

Considerable progress has been made toward completing the global inventory of laboratories and institutions retaining wild poliovirus-containing materials. Countries in all six WHO Regions are implementing laboratory containment activities, and the WHO Global Action Plan for Laboratory Contain-

Figure 1

Countries conducting and reporting completion of national laboratory surveys to identify laboratories with wild poliovirus-containing materials, July 2001-August 2002.

Table 1

Number of countries with national task forces, surveys, and laboratory registries and number of laboratories reporting wild poliovirus-containing materials, by World Health Organization (WHO) region, July 2001-August 2002

<table>
<thead>
<tr>
<th>WHO region</th>
<th>No. countries in region*</th>
<th>No. countries with task force</th>
<th>No. countries surveying laboratories</th>
<th>No. laboratories registered to be surveyed†</th>
<th>No. laboratories surveyed</th>
<th>No. laboratories reporting wild poliovirus-containing materials³</th>
<th>No. countries with national inventory reviewed by commission²</th>
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</thead>
<tbody>
<tr>
<td>Americas**</td>
<td>48</td>
<td>18</td>
<td>14</td>
<td>39,247</td>
<td>2,913</td>
<td>68</td>
<td>0</td>
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<tr>
<td>European**</td>
<td>51</td>
<td>51</td>
<td>50</td>
<td>42,065</td>
<td>35,510</td>
<td>807</td>
<td>41</td>
</tr>
<tr>
<td>Western Pacific**</td>
<td>36</td>
<td>36</td>
<td>36</td>
<td>13,855</td>
<td>13,178</td>
<td>69</td>
<td>31</td>
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<tr>
<td>African†</td>
<td>46</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Eastern Mediterranean†</td>
<td>23</td>
<td>17</td>
<td>16</td>
<td>8,569</td>
<td>6,430</td>
<td>128</td>
<td>4</td>
</tr>
<tr>
<td>South East Asian††</td>
<td>10</td>
<td>9</td>
<td>5</td>
<td>4,920</td>
<td>1,327</td>
<td>170</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>214</td>
<td>138</td>
<td>121</td>
<td>108,656</td>
<td>59,358</td>
<td>1,242</td>
<td>76</td>
</tr>
</tbody>
</table>

* Number of countries and territories.
† Some countries report number of laboratories, and others report institutions with jurisdiction over several laboratories.
‡ Includes materials potentially containing wild poliovirus; data reported but not confirmed.
§ Laboratories identified by the survey as holding wild poliovirus-containing materials.
** Certified polio-free.
†† Polio endemic.
ment has been revised to incorporate the lessons learned from these experiences (World Health Organization, Online). The experience in Germany illustrates the challenges countries with a long history of biomedical research and decentralized health structures face in compiling inventories. The action plan recommends that the number of laboratories with wild poliovirus-containing materials be decreased but allows such materials to be retained by laboratories listed on the national inventory that meet prescribed biosafety conditions, including having basic biosafety level (BSL-2) facilities and practices, limited laboratory access, polio vaccination of personnel, and accurate records of poliovirus materials.

When global wild poliovirus transmission is interrupted, laboratories will be notified that high-containment laboratory (BSL-3/polio) measures are required for all laboratory activities involving known wild poliovirus-containing materials. The same measures are required for all activities involving poliovirus replication in permissive cells or animals using potential wild poliovirus-infectious materials (e.g., fecal, respiratory, and environmental samples collected for any purpose when and where wild poliovirus was known or suspected to be present). For all other activities with potential wild poliovirus-infectious materials, the requirements remain unchanged. Bacteriology and parasitology laboratories may continue to work with potential wild poliovirus-containing materials under BSL-2/polio conditions, which include the use of standard class II biological safety cabinets.

These biosafety recommendations are anticipated to remain in effect as long as current global polio vaccination policies continue. However, the plan recognizes that the consequences of a reintroduction of wild poliovirus from a laboratory will increase after polio vaccination is stopped within a country or region. Containment requirements under this scenario will be reexamined and increased for wild poliovirus and oral poliovirus vaccine materials.

Laboratory containment of wild poliovirus-containing materials is an essential component for the eradication of wild poliovirus. Countries are cooperating successfully to implement laboratory containment activities, and the goal of identifying laboratories with wild poliovirus materials is being achieved. All countries in which polio is not endemic are anticipated to complete a national inventory of laboratories holding wild poliovirus-containing materials by the end of 2003.

References


