

Certification of polio eradication: process and lessons learned

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Abstract Since the 1988 World Health Assembly resolution to eradicate poliomyelitis, considerable progress has been made towards interrupting the transmission of wild poliovirus globally. A formal process for the certification of polio eradication was established on the basis of experience gained during smallpox eradication. Independent groups of experts were designated at the global, regional, and country levels to conduct the process. The main requirements for the global certification of the eradication of wild poliovirus are the absence of wild poliovirus, isolated from suspect polio cases, healthy individuals, or environmental samples, in all WHO regions for a period of at least three years in the presence of high-quality, certification-standard surveillance and the containment of all wild poliovirus stocks in laboratories. Three WHO regions — the Region of the Americas (1994), Western Pacific Region (2000), and European Region (2002) — have already been certified free of indigenous wild poliovirus. Eradication and certification activities are progressing well in the three endemic regions (African, Eastern Mediterranean, and South-East Asia). Several challenges remain for the certification of polio eradication: the need for even closer coordination of certification activities between WHO regions, the verification of laboratory containment, the development of an appropriate mechanism to verify the absence of circulating vaccine-derived polioviruses in the future, and the maintenance of polio-free status in certified regions until global certification.

Keywords Poliomyelitis/prevention and control/diagnosis; Certification/organization and administration/standards/trends; Poliovirus/growth and development; Paralysis/etiology; Epidemiologic surveillance; Containment of biohazards; World Health Organization (*source: MeSH, NLM*).

Mots clés Poliomyélite antérieure aiguë/prévention et contrôle/diagnostic; Certification/organisation et administration/normes/orientations; Poliovirus humain/croissance et développement; Paralysie/étiologie; Surveillance épidémiologique; Maîtrise risque biologique; Organisation mondiale de la Santé (*source: MeSH, INSERM*).

Palabras clave Poliomiélitis/prevención y control/diagnóstico; Certificación/organización e administración/normas/tendencias; Poliovirus/crecimiento y desarrollo; Parálisis/etiología; Vigilancia epidemiológica; Contención de riesgos biológicos; Organización Mundial de la Salud (*fuentes: DeCS, BIREME*).

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Introduction

Since the 1988 World Health Assembly resolution to eradicate poliomyelitis (1), considerable progress has been made towards interrupting the transmission of wild poliovirus globally. The number of polio-endemic countries worldwide has fallen from over 125 in 1988 to only seven countries in three WHO regions at the end of 2002 (2). A formal process for the certification of polio eradication was established on the basis of experience gained during smallpox eradication. Independent groups of experts were designated at global, regional, and country levels to set criteria and conduct the certification process. Three WHO regions have already been certified free of indigenous wild poliovirus — Region of the Americas (AMR) (1994), (3) Western Pacific Region (WPR) (2000), (4) and European Region (EUR) (2002) (5). Eradication and certification activities are progressing well in

the three remaining endemic WHO regions (African Region (AFR); Eastern Mediterranean Region (EMR); and South-East Asia Region (SEAR)).

The present report describes the development and current status of the process used to certify the eradication of indigenous wild poliovirus, highlights the lessons learned, and outlines the challenges faced in achieving global certification and for the post-certification era.

Basis for the global certification process

The concept of independent external verification and certification of eradication now followed by the polio eradication initiative was initially applied to smallpox eradication (6) — the unprecedented global effort that eradicated the causative agent of a human infectious disease for the first time. To ensure global credibility, an international smallpox certification commission

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of experts was appointed by Dr Halfdan Mahler, then Director-General of WHO. This commission undertook field visits to all previously endemic countries, and after close scrutiny of all available epidemiological data, it certified in December 1979 that smallpox had been eradicated globally (6).

In the light of this success, AMR was the first WHO region to initiate a regional polio eradication initiative in 1985. But, owing to the many inapparent infections (>99% of wild poliovirus infections do not cause paralytic disease) and the relatively non-specific initial clinical picture of paralytic polio, it was clear that surveillance and certification activities would be more challenging than for smallpox eradication.

On the basis of the smallpox experience, an independent International Commission for the Certification of Poliomyelitis Eradication in AMR was appointed by the Director of the Pan-American Health Organization in 1990 to evaluate the progress of the initiative and to certify, if and when it judged appropriate, that transmission of indigenous wild poliovirus had been interrupted in the entire region (7). National Certification Committees (NCCs) were formed in each country to oversee certification procedures nationally and to prepare and submit a final report, claiming polio-free status, to the International Commission. The last known confirmed polio case due to wild virus in AMR occurred in Peru in 1991. Three years later (8), during which high-quality surveillance was maintained in countries that were endemic or recently endemic at the beginning of the initiative, the International Commission certified AMR to be free of indigenous wild poliovirus transmission (9).

The World Health Assembly recognized the progress made in AMR and resolved in 1988 to eradicate polio globally (1), initiating eradication activities in all other WHO regions.

Principles and criteria for global certification

A Global Commission for the Certification of the Eradication of Poliomyelitis (GCC) was appointed by Dr Hiroshi Nakajima, then Director-General of WHO, in 1995 to oversee polio eradication certification activities at the global level. The GCC, at its first meeting, established basic definitions, principles, and criteria upon which certification would be based, and defined the terms of reference and operating procedures of certification bodies at regional and country levels. Regional Certification Commissions (RCCs) were then established and began to function in all other WHO regions: 1995 in EMR, 1996 in EUR and WPR, 1997 in SEAR, and 1998 in AFR. By May 2003, NCCs had been established in all WHO Member States globally except Monaco and San Marino (EUR), Somalia (EMR), and Timor-Leste (SEAR).

Definition of eradication

During its first meeting (10), the GCC defined global polio eradication as “the eradication of all wild polioviruses”, and specified that “the occurrence of clinical cases of poliomyelitis caused by other enteroviruses, including attenuated polio vaccine viruses, does not invalidate the achievement of wild poliovirus eradication”.

Following the detection of an outbreak of paralytic poliomyelitis caused by circulating vaccine-derived poliovirus (cVDPV) on Hispaniola island (11), the GCC re-emphasized that the objective of its work was to certify the eradication of wild poliovirus, including completion of the containment process (12).

The GCC recognized, however, that the full benefits of polio eradication would only be realized in the absence of cVDPV, and requested WHO to develop a separate process for verifying the absence of cVDPV in the post-certification era, after cessation of oral poliovirus vaccine use.

In certifying their region as polio-free, RCCs — first in AMR, then in WPR and EUR — have been careful to limit themselves to certifying the absence of indigenous wild poliovirus, because of the possibility of wild virus importation from remaining endemic regions, and because laboratory containment of wild poliovirus has not yet been completed in any region.

Criteria for certification

The main criteria set by the GCC as prerequisites for global polio-free certification were to show first, the absence of wild poliovirus, isolated from cases of acute flaccid paralysis (AFP) (suspect polio), healthy individuals, or environmental samples, in all WHO regions for a period of at least three years in the presence of high-quality, certification-standard surveillance (10) and second, the containment of all wild poliovirus stocks in laboratories through completion of the requirements of the *WHO global action plan for laboratory containment of wild polioviruses* (13).

Certification-standard surveillance

The GCC stressed the importance of maintaining, especially in all recently and currently endemic countries, the sensitivity of surveillance for AFP cases at levels that enable the detection, rapid reporting, and investigation of any paralytic polio cases. To reach “certification standard”, AFP surveillance systems need to first detect at least one case of non-polio AFP per 100 000 population aged less than 15 years annually; second, collect two adequate stool specimens^a from at least 80% of AFP cases; and third, test all stool specimens for poliovirus at a WHO-accredited laboratory (14).

The GCC defined additional criteria that should also be used when assessing whether or not AFP surveillance quality meets certification standard: first, documentation of the timely receipt of at least 80% of expected routine surveillance reports, including “ZERO” reports, where no AFP cases were seen; second, investigation of 80% of AFP cases within 48 hours of the initial report; third, detailed clinical, epidemiological, and virological investigation, follow-up examination 60 days after onset, and final case classification of all AFP cases by a committee of experts. Although these additional checks are important, surveillance quality will not “fail” if one or two of these are just below the cut-off.

Although the GCC considered AFP surveillance as the “gold standard” for countries that were endemic or recently endemic for poliovirus at the beginning of the eradication initiative in 1988, other surveillance strategies and data have been accepted from countries that have been non-endemic for a long time, with high levels of sanitation and strong health systems. Alternative surveillance strategies and data accepted from such non-endemic countries include combinations of the following: surveillance for “poliomyelitis cases” and for cases of vaccine-associated paralytic poliomyelitis (VAPP); enterovirus surveillance; and/or environmental surveillance for polioviruses.

The GCC determined that, as opposed to smallpox eradication, certification would not occur by country but that only WHO

^a Stool specimens are considered “adequate” (allowing an accredited laboratory to detect poliovirus, if present, with sufficient sensitivity) if two specimens are collected 24 hours apart within 14 days of onset of paralysis, arriving in the laboratory in good condition (with ice present).

regions as a whole would be certified polio-free. Every country and area in the region would need to provide evidence that no indigenous wild poliovirus had been isolated for at least three years, under conditions of certification-standard AFP surveillance.

Laboratory containment of wild poliovirus

In addition to interrupting the transmission of wild poliovirus in human populations, the only natural poliovirus reservoir, polio eradication will not be complete without laboratory containment — minimizing the risk of reintroduction of wild poliovirus into the community from a laboratory.

Beginning in 1997 (15), the GCC supported the development of principles and processes for laboratory containment through international consultation. In 1998, the GCC approved the resulting *WHO global action plan for laboratory containment of wild polioviruses* (13), which comprises three phases: phase 1, laboratory survey and inventory; phase 2, global certification; and phase 3, post-global certification. The containment needs for inactivated polio vaccine production sites are addressed by separately published WHO guidelines (16).

The GCC decided at its third meeting that for regional certification to occur, all countries needed to provide evidence that the activities described in phase 1 of the global containment action plan had been implemented (17). Phase 1 comprised recommendations for the implementation of biosafety level (BSL)-2 polio procedures in enterovirus laboratories, completion of a national inventory of laboratories/facilities holding materials containing or possibly containing wild polioviruses, and establishment of a plan of action for either destroying or moving such materials to a “high containment facility” during phase 2. Global certification will require that phase 2 containment activities, to begin one year after wild poliovirus was last isolated, have been implemented worldwide (destruction of all unneeded wild poliovirus materials, and implementation of appropriate biosafety measures — BSL-2/polio or BSL-3/polio — for all materials retained or transferred to a WHO-designated repository). All RCCs are currently working to fully align certification and containment activities, involving NCCs in the oversight of national containment activities and requiring them to report regularly on progress achieved.

Containment had not been part of eradication and certification activities in AMR, and not all countries in WPR and EUR had fully implemented phase 1 containment activities at

the time of regional certification. Nevertheless, considerable progress has been made, particularly in the certified regions (2). By May 2003, 155 of 207 non-endemic countries globally had established a national containment task force and national containment plans of action. By the end of 2002, 149 WHO Member States had initiated national laboratory surveys. Of those, 79 countries had completed and submitted an inventory of facilities holding wild-virus infectious or potentially infectious materials. The countries comprised 41 of 51 countries in EUR, 33 of 36 in WPR, and 5 of 23 EMR countries. In AMR, laboratory surveys are ongoing in 19 of 48 countries of the region.

Composition and terms of reference of certification groups

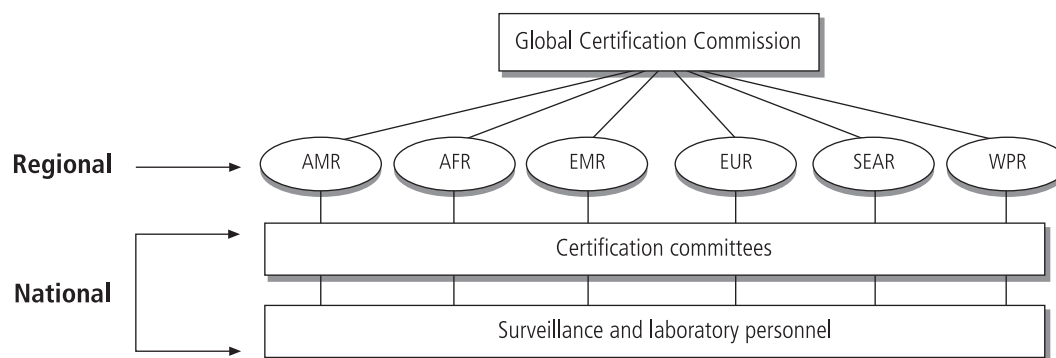
The Director-General of WHO in 1995 charged the GCC with three tasks: first, defining the parameters and processes by which polio eradication will be certified, guiding regions and countries in establishing their data collection processes; second, receiving and reviewing the final reports of RCCs of polio eradication; and third, issuing, if and when appropriate, a final report to the Director-General of WHO certifying that global polio eradication had been achieved.

The GCC has continued to meet annually since 1995 to review progress in regional certification and to provide continued guidance to regions and countries. The GCC closely follows the deliberations of the Global Technical Consultative Group for Polio Eradication (global TCG) — with GCC members attending TCG meetings — to remain abreast of the latest developments in polio eradication globally and of key emerging technical issues bearing on certification and surveillance.

RCCs (Fig. 1) are appointed by the Regional Directors of each WHO region and should include members of the GCC who are from the region (usually the RCC chairperson) as well as representatives of other WHO regions. After a three-year period of freedom from indigenous wild poliovirus transmission under conditions of certification-quality surveillance, and considering all necessary evidence, including the views of NCCs and results of field visits to countries, RCCs have the authority to certify the eradication of indigenous wild poliovirus in the region.

NCCs are responsible for assessing and verifying national documentation on polio-free status, which is collected and provided by the national ministry of health secretariat. NCCs cannot certify polio eradication in their own country, but present their

Fig. 1. Groups involved in certification of polio eradication at global, regional, and country levels



AFR = African Region AMR = Region of the Americas EMR = Eastern Mediterranean Region
 EUR = European Region SEAR = South-East Asia Region WPR = Western Pacific Region

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opinion, with supporting documentation, for assessment by the RCC. The GCC has decided that UN polio partner agencies (WHO; United Nations Children's Fund, UNICEF) will support data collection and verification mechanisms for certification in countries or areas without internationally recognized governments.

The GCC stated that members of both RCCs and NCCs should be independent leading experts in relevant disciplines such as public health, epidemiology, virology, and clinical medicine. Members should have no direct responsibility for polio eradication or immunization programmes in their country or region, act in their personal capacity only, and understand that their scientific reputations will rest on their judgements concerning polio eradication.

The work of the GCC will become increasingly crucial as the polio-free certification of the last WHO region approaches, with global certification following soon thereafter. Following the certification of the last WHO region, the GCC will request final update documentation from all RCCs in order to assess whether freedom from wild virus has indeed been maintained everywhere — and, in turn, whether global eradication has been achieved.

Operating principles and certification process

All RCCs prepared a regional “plan of action” for certification, with a proposed timetable of activities. RCCs have often adopted a phased approach to review epidemiological blocks within the Region, based on the often widely different endemicity status of countries in the Region when the initiative began. For example, the RCCs in both WPR and EUR reviewed non-endemic countries before turning to recently endemic countries. RCCs work through regular annual or semi-annual meetings with selected NCCs, which often also include national polio eradication and/or WHO staff as observers. After an initial phase of briefing newly established NCCs, RCC meetings focus increasingly on a review of selected countries through presentations by the respective NCC chairperson. Initially, these reports are updates on the polio situation in a country, but, once eligible, NCCs are asked to present “final national documentation” claiming polio-free status for consideration by the RCC.

In addition to receiving NCC reports, RCC members, particularly in the EUR and WPR, have conducted visits to selected countries, and used other sources of information (i.e. reports of AFP surveillance reviews, consultant assessments, the UN, and nongovernmental organization team reports from areas not recognized internationally) to broaden their information base about particular countries and areas.

Countries become eligible to present final national documentation after three years have passed without isolating indigenous strains of wild poliovirus in the country, under conditions of certification-standard surveillance. NCCs were established long before the end of a three-year polio-free interval in many countries that were endemic or recently endemic at the beginning of regional eradication efforts. Therefore, the finalization of country documentation on polio-free status in most countries is a multi-year, iterative process, involving repeated dialogue between the NCCs and the RCC.

Although both the RCC and the NCCs were dissolved in AMR after regional certification, most countries that were endemic or recently endemic at the beginning of the regional initiative have maintained sensitive AFP surveillance systems, with many countries continuing to conduct annual national immunization days (NIDs). The GCC has subsequently decided that both RCCs and NCCs should continue to function in regions certified as polio-free until global eradication is declared, in order to oversee

and support continued country activities to maintain polio-free status as well as containment measures. Accordingly, regional and national certification bodies have been maintained in both WPR and EUR.

National documentation

Each RCC, guided by the GCC, prepared standardized modules for the submission of national documentation for certification, to be assembled by national “secretariats” (national immunization programmes), reviewed and verified by NCCs, and eventually presented to RCCs. The national documentation required by RCCs varies depending on regional circumstances. However, key categories of national documentation are:

- country background information (demography, population distribution, high-risk groups, migration patterns, health care systems, etc.);
- structure and responsibilities of national units concerned with polio eradication;
- confirmed polio cases and polio-compatible cases;
- surveillance activities, including AFP surveillance quality;
- information about the polio laboratories serving the country, including documentation of the results of WHO accreditation;
- progress towards laboratory containment;
- a plan of action for handling wild poliovirus importations, including their detection, investigation, and intended response procedures;
- routine and supplementary immunization activities.

The national documentation format used in all regions has included pre-formatted tables, checklists and “yes/ no” questions. This has proved helpful to country teams and NCCs, particularly early on in the certification process.

As certification groups gained more experience, RCCs in WPR and EUR introduced more flexible documentation formats, which required NCCs to provide more of their own assessments and interpretation of the data in narrative format. In all certified regions, final RCC reports were supported by concise “executive summaries”, in which NCCs outlined the main reasons to support their claim of polio-free status.

Experience and current status in certified regions *Region of the Americas*

On 20 August 1994, the Pan-American Health Organization reported that three years had passed since the occurrence of the last case of poliomyelitis associated with wild poliovirus isolation in AMR (7) (Peru, August 1991). Following certification, both the RCC and country-level NCCs were dissolved. There are currently no independent groups monitoring activities to sustain polio-free status at a country or regional level. However, through efforts by countries and monitoring and follow-up by WHO, good-quality AFP surveillance has been maintained in most countries of the region that were endemic or recently endemic at the beginning of the initiative. Laboratory containment had not yet been a certification requirement when AMR was certified. However, country and regional containment activities began in 2001, including the designation of expert groups at regional and country levels.

Western Pacific Region

On 29 October 2000, the RCC, WPR certified that WPR, which comprises 37 countries and territories with an estimated population of 1.6 billion (27% of the world's population), was polio-free (18). The last known polio case associated with

indigenous wild poliovirus occurred in Cambodia in March 1997 in a 15-month-old girl. NCCs, with a sub-regional committee for Pacific Island countries, remain active. The RCC and NCCs continue to conduct regular meetings to help sustain polio-free status in the Region. As at May 2003, phase 1 laboratory containment activities were complete in all countries except Japan and China.

European Region

On 21 June 2002, the RCC, EUR certified the region as polio-free. The last known polio case caused by indigenous wild poliovirus occurred in south-east Turkey in November 1998. EUR comprises 51 countries with an estimated population of 873 million. Importations of wild poliovirus were documented into Bulgaria and Georgia in 2001, but did not delay regional certification, because of the high-quality immunization response and because of strong evidence that the importations had not led to re-established wild poliovirus transmission. At the time of certification, phase 1 laboratory containment activities were completed in 41 of 51 countries, and nearly completed in four other countries.

Current status of endemic regions

Although the first priority for polio eradication teams in endemic regions is to interrupt wild poliovirus transmission, all three regions have made considerable progress in establishing the certification process. NCCs have been established in all EMR countries except Somalia, for which WHO/UNICEF will facilitate certification activities. NCCs in 16 of 22 EMR countries have started to report to the RCC; final national documentation claiming polio-free status has been provisionally accepted from nine countries. Seven countries, including four endemic countries plus Djibouti, Libyan Arab Jamahiriya, and Sudan, have not yet started reporting to the RCC. Phase 1 laboratory containment activities have been completed in five countries and containment activities initiated in 11 others.

In SEAR, Timor-Leste is the only country without an NCC, but certification activities will begin soon. Full national documentation has been reviewed from Sri Lanka and Thailand — both of which have been without wild poliovirus for more than three years, in the presence of certification-standard surveillance. Bangladesh and Nepal will be the next countries to present full national documentation.

Certification activities in AFR began in 1998. The RCC continues to systematically train and orient NCCs in the 46 AFR member states, a number of which were established only recently. The RCC is also beginning to conduct country visits to gather information and to advocate for improvements in surveillance and supplementary immunization. Containment activities have begun in two pilot countries — Cameroon and Uganda — in 2003.

Lessons learned and future challenges

Activities to certify the eradication of wild poliovirus are essential components of the global polio eradication initiative and have been very successful. The fact that no indigenous wild virus has been found post-certification in any of the certified regions, including AMR, for almost 10 years after regional certification, despite continued high-quality AFP surveillance, is evidence of the soundness of the certification strategies.

The main elements of success have been the application, and further development by the GCC and RCCs, of lessons learned from smallpox eradication and polio eradication in AMR, as well as the integration of newly recognized important programme elements, such as wild poliovirus laboratory containment.

Certification activities are possible only through the continued commitment from national governments and ministries of health in all countries, as well as through the support of hundreds of scientists and public health experts donating their time to work together in certification groups. Although passionate about contributing to the overall goal of global eradication, certification group members are fully aware that the optimal way for them to contribute is to work constructively with national and WHO teams, from a strictly neutral, independent, and critical position.

Several challenges for certification remain. Not all NCCs in the remaining endemic regions have attained the high level of expertise needed to critically assess and verify data provided to them by the programme secretariat. RCCs need to work even more closely to scrutinize cross-regional data in areas where polio epidemiological blocks belong to more than one WHO region (e.g. the Horn of Africa). Efficient coordination of certification activities across regions will require regular cross-participation in RCC meetings, and possibly joint meetings. More work is needed to develop appropriate tools for the verification of reported achievements in laboratory containment. The GCC also noted that mechanisms are required in the future to independently verify the absence of circulating vaccine-derived polioviruses. Certified regions, where both sensitive AFP surveillance systems and some supplementary immunization activities need to continue in order to sustain polio-free status, have already had to face the problem of a sudden decrease in interest and support from national governments following regional certification. RCCs and NCCs can play an important role in sustaining the quality of surveillance and maintaining the necessary immunity levels until global certification and beyond. Finally, certification groups need to consider what, if any, additional information will be required to allow eventual global certification once all six WHO regions are certified polio-free and phase 2 laboratory containment is achieved everywhere. ■

Conflicts of interest: none declared.

Résumé

Certification de l'éradication de la poliomyélite : procédure et enseignements

Depuis la résolution de l'Assemblée mondiale de la Santé adoptée en 1988 concernant l'éradication de la poliomyélite, l'interruption de la transmission du poliovirus sauvage a considérablement progressé dans le monde entier. Une procédure formelle de certification a été établie sur la base de l'expérience acquise pour la variole. Des groupes indépendants d'experts ont été désignés aux niveaux mondial, régional et des pays pour mener cette procédure à bien. En matière de certification, les principales exigences sont l'absence constatée du poliovirus sauvage dans

des échantillons prélevés sur des cas suspects, sur des sujets en bonne santé ou dans l'environnement, dans toutes les Régions de l'OMS pendant au moins trois années consécutives moyennant une surveillance de grande qualité répondant aux normes de certification, et le confinement de tous les stocks de poliovirus sauvages en laboratoire. Trois Régions de l'OMS — les Amériques (1994), le Pacifique occidental (2000) et la Région européenne (2002) — ont déjà été certifiées exemptes de poliovirus sauvages autochtones. L'éradication et les activités en vue de la certification

progressent dans les trois Régions d'endémie (Afrique, Méditerranée orientale et Asie du Sud-Est). Il reste plusieurs défis à relever pour parvenir à la certification : renforcer la coordination des activités de certification entre les Régions de

l'OMS, vérifier le confinement des virus en laboratoire, mettre au point un mécanisme pour vérifier à l'avenir que les poliovirus dérivés des souches vaccinales ne circulent pas, maintenir le statut des Régions déjà certifiées jusqu'à la certification mondiale.

Resumen

Certificación de la erradicación de la poliomiélitis:

Desde la resolución adoptada en 1988 por la Asamblea Mundial de la Salud para erradicar la poliomiélitis, los progresos hacia la interrupción de la transmisión del poliovirus salvaje a nivel mundial han sido considerables. Se trazó un proceso formal para certificar la erradicación de la poliomiélitis sobre la base de la experiencia adquirida durante la erradicación de la viruela, y se nombraron grupos independientes de expertos a nivel mundial, regional y de país para dirigir el proceso. Los requisitos principales para la certificación mundial de la erradicación del poliovirus salvaje son la ausencia de este poliovirus en casos sospechosos de poliomiélitis, individuos sanos o muestras ambientales en todas las regiones de la OMS durante un periodo de al menos tres años, la instauración de una vigilancia de alta calidad conforme con los criterios de certificación, y la contención de todas las

proceso y enseñanzas extraídas

reservas de poliovirus salvaje en los laboratorios. Tres Regiones de la OMS - Américas (1994), Pacífico Occidental (2000) y Europa (2002) - ya han sido certificadas como libres del poliovirus salvaje autóctono. La erradicación y las actividades de certificación están progresando satisfactoriamente en las tres regiones endémicas (África, Mediterráneo Oriental y Asia Sudoriental). No obstante, en el camino hacia la certificación de la erradicación quedan todavía algunos obstáculos: la necesidad de una coordinación aún mayor de las actividades de certificación entre las regiones de la OMS, la verificación de la contención en los laboratorios, el desarrollo de un mecanismo apropiado para comprobar la ausencia de poliovirus circulantes de origen vacunal en el futuro, y el mantenimiento de la situación de ausencia de poliomiélitis en las regiones certificadas hasta el momento de la certificación mundial.

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