

Challenges Facing Healthcare Administration , Public Health, Nurses And Microbiology Team Towards Prevention Of Transmission Of Wild Poliovirus

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Abstract

The Global Commission for the Certification of the Eradication of Poliomyelitis will declare the world free of wild poliovirus transmission when no wild virus has been detected for a minimum of 3 consecutive years, and all laboratories that possess wild poliovirus materials have implemented effective containment measures. These achievements can be attained through the collaborative efforts of healthcare administration, public health, nursing, and microbiology teams in addressing the challenges associated with transmission. The primary obstacles to achieving polio eradication are the lack of robust political backing at the national level, insufficient financial support that hampers the implementation of WHO recommendations, potential issues with the availability of polio vaccine due to inadequate support, and the unsatisfactory rate of progress in polio surveillance.

Keywords: *healthcare administration, public health, nursing, and microbiology teams in addressing the challenges associated with transmission.*

Introduction

The three serotypes of poliovirus are responsible for the viral disease known as poliomyelitis, which can result in permanent paralysis or even death in some severely affected individuals. From about 350000 cases annually in 125 countries in 1988 to 102 cases in two countries in 2020 as of August 19, 2020, the incidence of polio has fallen by 99.99% since the introduction of the Global Polio Eradication Initiative in 1988 with the aim of eradicating wild polioviruses. This decrease has occurred since the beginning of the initiative. It is predicted that around 18 million cases of paralytic polio have been averted since the commencement of the eradication effort in the year 1988. The last case of poliomyelitis caused by indigenous wild poliovirus type 2 (WPV2) was reported in 1999, while wild poliovirus type 3 (WPV3) has not been found since November of 2012. These are the three serotypes of wild poliovirus that have been found worldwide.³⁾ According to the World Health Organization's Global Certification Commission for Poliomyelitis Eradication, WPV2 was declared eliminated in September of 2015, and WPV3 was given the same certification in October of 2019.³⁾ There has been an increase in the transmission of wild poliovirus type 1 (WPV1) since that period [1,2].

In 1988, the World Health Organization (WHO) passed a resolution with the goal of completely eliminating poliomyelitis from the world by the year 2000. In the context of a specific geographical region, eradication refers to the absence of illness in the natural environment as a consequence of deliberate control efforts. There has been a significant amount of work made toward the interruption of the wild poliovirus, and the completion of the eradication process is now within reach. There were ten nations around the world that had endemic transmission of the disease in the beginning of the year 2002. Despite this, there are still obstacles to overcome in the final phase of the polio eradication endeavor [3]. Time is going behind schedule for the program. There are locations that have been recognized as having high transmission, and India is one of them.

Despite the absence of polio in certain regions, wild poliovirus continued to be imported. Some of the assumptions that were made regarding the epidemiological characteristics of poliomyelitis have been discovered to be only partially accurate. There have been cases of paralysis outbreaks that have been linked to the polio vaccination gaining neurovirulence among its recipients. The virus continues to be shed by a number of people even after a relatively short period of time. After the transmission of wild polio virus is halted, there is a projected risk that poliovirus will escape from a laboratory, either accidentally or intentionally. The cessation of vaccination following the global certification of the eradication of poliomyelitis will not be a spontaneous occurrence; rather, it will be deemed subject to the fulfillment of specific requirements [3,4].

Review:

Several microbiological laboratories hold samples that either contain wild type poliovirus or are suspected to contain infectious material. The likelihood of accidental transmission of poliovirus from the laboratory to the community is low but not impossible. There is a sense of danger over the deliberate reintroduction of a substance from a laboratory into the human population. The final instance of smallpox, which took place in Birmingham, England in 1978, was caused by a failure to control the virus in a laboratory setting. A comprehensive strategy for containing Wild Polioviruses in laboratories has been developed and regularly evaluated to address the requirements of eradication efforts in various regions. Following the successful eradication of smallpox, the majority of laboratories disposed of the infectious material. In order to ensure the safety and security of the smallpox virus, all remaining known stocks were brought together in two WHO collaborating sites, one located in the United States and the other in the former Soviet Union [5].

Polio can be transmitted across borders from multiple frontiers. Recommendations for managing cross-border transmission of polio

involve establishing or enhancing collaboration with neighboring countries through existing cross-border forums and structures. This collaboration aims to raise community awareness, exchange information and resources, and develop strategies for identifying eligible children for vaccination or suspected cases of acute flaccid paralysis (AFP) [6]. The certification of the stoppage of wild poliovirus transmission in the WHO African region has been a lengthy and tumultuous process. It was hindered until 2016 by the development of WPV1, mostly caused by ongoing insecurity in northeastern Nigeria, the Lake Chad Basin, and specific areas of Africa. The significance of countries fulfilling the condition of attaining certification-standard surveillance for a minimum duration of 3 years was demonstrated by the necessity to restore Nigeria as a polio-endemic country just 2 years after the most recent identified case of WPV1 infection, and a mere 1 year after it was taken off the roster of polio-endemic countries [7].

The evaluation of country documentation was further reinforced by valuable on-site verification visits, which allowed members of the Africa Regional Commission to assess the level of political and programmatic dedication to polio eradication, the country's ability to carry out necessary certification activities, and to provide recommendations to the highest political authorities on how to address any identified issues. Nevertheless, determining whether there was successful implementation of effective monitoring and increased coverage of regular immunization remained a persistent difficulty. This is due to the fact that accurately assessing the rates of acute flaccid paralysis and immunization coverage relies on having sufficient and reliable data for the population size. Assessing the situation has been exceedingly challenging due to the absence of recent censuses and significant population movement in several regions of sub-Saharan Africa [7].

In 1994, the World Health Organization (WHO) Region of the Americas became the first WHO region to officially confirm that the spread of wild polioviruses originating within the region had been completely stopped. This achievement

demonstrated that eradicating the disease is possible through effective regional leadership, robust international collaborations, well-defined criteria and strategies, and a strong commitment from individual countries to carry out the necessary actions. This accomplishment facilitated the acceleration of efforts to eliminate poliovirus in other parts of the World Health Organization (WHO). Subsequently, the WHO Western Pacific region (2000), European region (2002), and South-East Asia region (2014) were all certified as free from wild poliovirus. The certification of the South-East Asia region has confirmed that it is possible to eliminate wild poliovirus transmission in places with the highest risks. These areas include locations with high population densities, large birth cohorts, high population movement, and inadequate sanitation [8].

Regarding vaccination coverage, based on the 2019 projections from WHO-UNICEF, 17 countries had achieved a coverage of at least 90% for the three-dose bivalent oral poliovirus vaccine types 1 and 3, while 29 countries had achieved a coverage of at least 80%. According to a report, 13 nations have reached a coverage of at least 90% for the inactivated poliovirus vaccine, while 26 countries have obtained a coverage of at least 80% [9].

Regarding the containment of poliovirus, all countries in the region, save for South Africa, do not intend to keep any infectious elements of the virus. Surveys have been conducted in all 47 countries, in accordance with the Global Polio Eradication Initiative Global Action Plan III, to assess laboratories and other facilities. Surveys and eradication of potentially infectious materials have been conducted in all nations, with the exception of the Democratic Republic of the Congo, due to the presence of numerous concurrent emergencies. In 2018, South Africa received a first Certificate of Participation in accordance with the global Containment Certification Scheme [10].

These challenges were addressed through consistent political leadership at regional, national, and subnational government levels, with the Polio Eradication Program being owned by the country. Strong and dedicated national

and international partnerships, along with effective community involvement, were crucial. Additionally, there was a specific focus on enhancing surveillance and routine immunization, as well as the unwavering dedication of healthcare workers. Innovation and resourcefulness also played a significant role [11].

Overcoming these immense hurdles and achieving success is undeniably a remarkable accomplishment. The sacrifices made have been significant; in fact, numerous health-care professionals and volunteers have perished in their efforts to achieve a polio-free Africa. Success is also influenced by continuous occurrences of outbreaks caused by the circulation of vaccine-derived poliovirus type 2, which is a genetic variation of the oral poliovirus vaccine. This version has the ability to cause paralysis that is indistinguishable from the paralysis caused by wild polioviruses. The Global Certification Commission and Africa Regional Commission have voiced their apprehension regarding these outbreaks and have suggested the necessary activities and processes to confirm the eradication of these outbreaks. Nevertheless, the cessation of wild poliovirus transmission in the area will be documented as one of the most notable accomplishments of the continent, showcasing the potential that can be achieved through the dedication and cooperation of healthcare administration, public health, nursing, and microbiology teams [12].

Conclusion:

It seems that the delivery of the oral polio vaccine (OPV) exclusively through routine services does not effectively stop the spread of the wild polio virus in developing nations. In the Americas, there have been no confirmed cases of paralytic poliomyelitis caused by wild poliovirus since August 23, 1991, despite extensive monitoring. This experience has demonstrated the need to administer extra doses of oral polio vaccine (OPV) through large-scale campaigns to all children under the age of five, regardless of their previous immunization status.

Additionally, targeted mop-up operations should be conducted in high-risk areas where the virus has been present recently, focusing on the same age group. High-risk locations were identified based on empirical observations, which were later validated by genetic epidemiology, revealing the existence of many "reservoirs" that facilitated ongoing transmission for several years. While it is not possible to ensure absolute laboratory confinement of polioviruses or any virus, extensive experience suggests that achieving effective containment is both theoretically and operationally achievable. The WHO Regional Office for Europe and other regions is dedicated to eliminating poliomyelitis in Europe, as part of the WHO's global initiative to eradicate polio by the year 2000. In 1993, the European Advisory Group on EPI modified the operational objectives for the regional elimination of polio. These objectives prioritize surveillance, outbreak response, and vaccine coverage. 9 European nations, which continue to record instances of polio, have implemented action plans based on the policies suggested by the World Health Organization (WHO). The WHO Regional Office for Europe has focused its efforts on the following areas: 1. Executing crucial tactics for immunization (such as mopping-up campaigns or national immunization days) in nations that have high-risk regions with ongoing transmission of wild poliovirus. 2. Enhancing monitoring, a crucial strategic element. The primary focus is on monitoring cases of acute flaccid paralysis.

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