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BOOK REVIEW

Poliomyelitis in Brazil: from recognition of the disease to the end of transmission

Poliomielite no Brasil: do reconhecimento da doença ao fim da transmissão

Poliomielitis en Brasil: del reconocimiento de la enfermedad al fin de la transmisión

POLIOMIELITE NO BRASIL: DO RECONHECIMENTO DA DOENÇA AO FIM DA TRANSMISSÃO. Risi Junior JB, organizador. Rio de Janeiro: Editora Fiocruz; 2019. 496 p. ISBN 978-85-7541-631-0.

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"*In an historic announcement on World Polio Day, an independent commission of experts concluded that wild poliovirus type 3 (WPV3) has been eradicated worldwide. Following the eradication of smallpox and wild poliovirus type 2, this news represents a historic achievement for humanity*" [1].

The book organized by João Batista Risi Junior is a treatise on poliomyelitis in Brazil, encompassing a long period from the first to the last decades of the 20th century. Organized in nine chapters by collaborators from the fields of Epidemiology, Health Surveillance, Clinical Medicine, History of Health Sciences, Biotechnology, and Social Communication, the book features diverse narrative styles; each section draws on vast documentation to record milestones and fundamental issues that helped structure public health in Brazil starting in the 1970s: the National Immunization Program (PNI); biotechnological development and vaccine production; strides in knowledge on polio's clinical and neurological characteristics; the development of virology techniques implemented in the laboratory network for the identification and genetic typing of the poliovirus; and the development of epidemiological surveillance services, forerunners to the country's current health surveillance system.

The book discusses public health policies in Brazil and the management of public health programs. It also addresses some fundamentals in epidemiology, providing readers with the genesis of some key concepts such as "active surveillance", "door-to-door immunization", and "mopping up".

The interruption of indigenous transmission of the three types of polio (WPV1, WPV2, and WPV3), achieved in most countries in all regions of the world, can be considered a second milestone in the more recent history of public health, following the global eradication of smallpox in 1980. Today, the indigenous transmission of WPV1 is limited to some transmission chains on the border between Afghanistan and Pakistan; these border areas form a scenario of serious armed conflicts that severely impact coverage with monovalent Sabin vaccine (mOPV) against WPV1. The situation of armed confrontation also creates extensive population mobility, contributing to the persistence of transmission chains for the virus [2].

In October 2019, the World Health Organization (WHO) [1] celebrated the worldwide eradication of WPV3 just a few years after certification of the eradication of WPV2 in 2015. The last case of WPV3 had been identified in northern

Nigeria in 2012. The African continent should receive the certificate of polio eradication in 2020. Besides the significance for public health, the eradication of polio has relevant economic implications: since 1988, the world has saved USD 27 billion in health costs [1]. Such facts corroborate the timeliness of the publication organized by Risi Junior, since the success achieved thus far in the global eradication of poliovirus is largely based on the experiences acquired in Brazil's polio control program. Adopted and developed by the Pan American Health Organization (PAHO) in the Americas, the eradication strategies consisted of National Vaccination Days with a strong social mobilization component; active surveillance of acute flaccid paralysis (AFP); and control of outbreaks and virologic surveillance of suspected cases, establishing a vast network of reference laboratories. The eradication process includes virologic surveillance of selected sites to monitor the virus's circulation in the environment. Such strategies have been adjusted and applied successfully in all regions of the world and in other programs to control transmissible diseases, leading to interruption of transmission of the measles and rubella viruses throughout the Americas in the 1990s and 2000s.

The book summarizes several key concepts such as the discussion on the control, elimination, and eradication of diseases, drawing on a vast specialized bibliography. I add references here that I consider seminal in that discussion, namely the publications by P. Yakutiel [3], Professor at Tel Aviv University (Israel), who laid out criteria for eradicating transmissible diseases, summarizing previous work on the issue such as that of Andrews & Langmuir [4] and Cockburn [5,6]. Two decades after Yakutiel "summarized" the concepts and discussions on eradication, the Dahlem Workshop in Germany in 1997 renewed and expanded the criteria for selecting eradicable diseases [7]. By convening experts and scientists in transmissible diseases, the Workshop sought to identify some candidate diseases for control and/or eradication. The book clearly reports this process, with rich references in the various scientific fields involved in polio eradication. In keeping with the concepts of control, elimination, and eradication, the development of the polio eradication program in Brazil in the 1980s was made possible by public health policy decisions in Brazil in the international setting, promoted by PAHO.

This history of polio enlightens readers on the implementation of eradication strategies and their adequacy and timeliness during the process of interrupting indigenous transmission of wild-type poliovirus. The narrative displays the activities' operational dimensions, demanding responses and driving scientific and technological knowledge in various fields such as Molecular Epidemiology, Biotechnology, and Immunology.

In discussing the contributions by polio eradication to health in Brazil, the book provides vivid details on some key positive impacts on the health system, mentioning the *Taylor Report* [8]. The report is the product of an independent commission that analyzed the impacts of the Immunization and Polio Eradication Program in the Americas.

On the issue of social mobilization, an essential factor for achieving and maintaining adequate vaccination coverage (high, or > 95%, and homogeneous), polio eradication inaugurated an unprecedented public-private partnership in public health. The involvement of Rotary International (RI) mobilized hundreds of thousands of civil society volunteers in operations on National Vaccination Days and financial input through the RI PolioPlus Program [9].

The book's final chapter focuses on post-eradication strategies, including the polio virus containment phases in laboratories and the disactivation of production and use of Sabin vaccine (OPV) with live attenuated virus. In a setting in which the wild-type virus has been eradicated, circulation of the Sabin vaccine-derived virus (OPV), which in some situations has the potential to cause paralytic poliomyelitis, becomes the great villain of eradication [10]. Currently, various countries with vaccination coverage rates below the recommended levels are witnessing cases of paralytic polio from circulation of the vaccine-derived virus [1]. Maintenance of high vaccination coverage rates is a fundamental condition for maintaining eradication of the wild-type virus and the vaccine-derived virus until the last transmission chain has been interrupted in the world.

Otherwise, even countries that have obtained the certificate of eradication, such as Brazil, run the risk of seeing the reintroduction of viral transmission, whether the wild type or the vaccine-derived variant.

The implementation of polio eradication and the monitoring and assessment strategies have been the task of various public and private institutions with real-life protagonists, professionals who worked tirelessly and enthusiastically to interrupt indigenous autochthonous poliovirus transmission. In addition to anonymous characters leading the polio eradication efforts in Brazil – and there were thousands – the book pays tribute to health professionals from various national and international partner institutions that participated in the process of polio eradication in Brazil and the world. The Oswaldo Cruz Foundation (Fiocruz), a key protagonist in this process, mobilized its technical units for large-scale training of workers in the healthcare system in immunization and epidemiological surveillance through the PAI/ENSP Working Group, vaccine production (Bio-Manguinhos), and analyses of viral samples with molecular biology methods and techniques (Oswaldo Cruz Institute).

The book is also a tribute to one of the leaders of the Expanded Program on Immunization and Polio Eradication in the Americas, Brazilian public health physician Ciro de Quadros.

When I commented to a friend (himself a public health physician) on the book's release, he replied enthusiastically: "*It's the book of the century!*". Although I believe there are several "books of the century", I share with participants in this adventure the renewed enthusiasm from reading this history of poliomyelitis in Brazil.

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