

From inner Congo to WHO Geneva: a bottom up journey in the governance for vaccines and immunization

Jean-Marie Okwo-Bele

Public Health Consultant

Early days in the Democratic Republic of Congo (DRC)

I grew up in Bandundu, what was then a small town in Western DRC, where my father worked as a primary school principal and my mother had stopped teaching to focus on the chores at home. My parents and teachers always encouraged me to be among the top students at the Catholic priesthood school I attended. There was not much entertainment around, which meant we had quality time for school work and for reading, mostly books by French-speaking authors. From the age of 13, I spent most school holidays learning to type blindly on my dad's typewriter. This proved a smart investment as I had no difficulties years later to quickly familiarize myself with the first personal computers we received at the Ministry of Health (MOH) in 1984.

Toward the end of high school, my father began to lose his sight due to tardiness in accessing treatment for his glaucoma. I saw him struggle and helped him through all of the required paperwork. The idea of studying medicine came to mind when he became blind at the age of 44. Although my high school core courses were Latin and Philosophy, against all odds, I was admitted to what was at the time the only medical school in the country. While my hard work and strong performance in high school paved the way for my medical studies, I, of course, had to work very hard as an undergraduate biomedical sciences student to fill my knowledge gaps in physics, math, and chemistry.

Soon after finishing medical school in 1981, I worked as a medical officer at an MOH project in charge of combating childhood communicable diseases. This opportunity serendipitously emerged after a brief encounter with the program's Director, Dr Ruti Kalisa and Prof J.J. Muyembe, who was my mentor and Dean at the medical school (Prof Muyembe is currently Director of the National Institute of Biomedical Research in the DRC and co-discoverer of the Ebola virus). Informed that I had just obtained my medical degree, Dr Kalisa handed me two reports (One was the World Health Organization's (WHO) summary of the successful smallpox eradication program and the second was the report of a just completed review of the DRC immunization program) and suggested that we meet later that week to discuss them. At the end of our second meeting, he convinced me that I should join his expanding project team, which dealt with immunization, diarrhea diseases, and malaria control programs.

I was initially tasked with co-leading special field epidemiological research to determine the prevalence and the severity of monkeypox virus infection in humans. This activity was recommended by WHO given the close resemblance between smallpox and monkeypox. We surveyed thousands of people and collected blood specimens from nearly 3000 persons without smallpox vaccination scars, mostly children. The data generated confirmed that the monkeypox virus was not a threat to smallpox eradication.¹ Moreover, the project helped to initiate field surveillance of Ebola virus which was discovered a few years earlier 500 km away. Working with experienced consultants such as David Heymann and Isao Arita, I had acquired the first-hand experience in setting up surveillance for infectious diseases, which proved very useful when in 1995 I was asked to join D. Heymann and J.J. Muyembe for the control of an Ebola outbreak that occurred in the DRC city of Kikwit. It also provided an important opportunity for me to practice my English.

In the following years, I worked on the roll-out of immunization services in a country as vast as all of Western Europe, but with very poor transportation and health infrastructure. I was later responsible for the overall DRC immunization program design, in addition to focusing on monitoring and evaluation. The training of district teams was a central strategic element in addition to the provision of critical logistics for routine health-facility based and outreach immunization sessions. Together, these efforts led to steady improvements of nationwide immunization coverage.

In 1988, reports of repeated outbreaks and high measles incidence in the under-9 months old in Kinshasa caught our attention. With a US CDC colleague, Dr F. Cutts, we designed improvement measures, which included the implementation of special survey techniques to identify pockets of low coverage and a house-to-house approach for the motivation of communities to seek vaccination. In addition, given high measles incidence in the under-9 months, I led a technical committee decision that recommended a vaccine policy switch from the use of Schwartz measles vaccine at age 9 months to medium titer of Edmonston Zagreb vaccine at age 6 months. The project's impact was noticeable with measles coverage reaching nearly 90% and a substantial drop of measles incidence. But it was difficult to confirm whether the impact of vaccination of younger children over and above the achievement of high coverage was due to the new vaccine.²

Exciting but challenging assignments in the African region

After spearheading immunization efforts in DRC, I later joined the small Immunization team of the WHO African regional office in Brazzaville, Republic of Congo in the early 1990s where the playing field greatly expanded. I focused on the analysis of scarce country data, drawing regional summaries. Countries were expected to sustain the immunization coverage gains already made and the region was due to launch the polio eradication campaign. My bosses at the regional office and R. Henderson at the Headquarters in Geneva agreed quickly that I should take over the leadership of the regional program. A working trip to South Africa in 1995 marked a turning point for the regional program. Following my briefing on polio eradication and my request for South Africa to launch its eradication campaign, Dr D. Zouma, then Health Minister and the provincial health ministers preferred to add measles control, given the severe outbreaks observed in the country. In the years that follow, six other southern African countries did the same, which amplified the impact of the interventions, resulting in the elimination of polio and the lowest measles incidence ever reached in the sub-region.³ Clearly, the combination of effective technical guidance to implement proven strategies with strong political and financial support could lead to amazing successes in Southern Africa, as was observed in other regions, and particularly in the Americas during their efforts for the elimination of polio and measles.

We then turned to face the challenges of implementing polio campaigns in the remaining countries of Africa, knowing that many of them had overwhelming difficulties to carry out earlier vaccination campaigns promoted by UNICEF for reaching universal coverage in 1990. As such, we chose Tanzania to demonstrate the feasibility of repeated yearly nationwide polio campaigns. We were very pleased to get this right, thanks to the technical support including from the Pan American Health Office staff, and the personal involvement of the country top leadership. Massive financial and technical support then came in from various polio eradication donors and by year 5, our yearly spending was increased tenfold (reaching almost US\$90 m) and we had more than 1000 WHO program staff across Africa.

Beyond polio campaigns, we adapted and rolled out stringent requirements of case-based, laboratory-based and nationwide polio surveillance in each country. Each suspect case has to be investigated, with two samples of stools collected and sent to the national reference lab and with follow up visit at 60 days. Only smallpox surveillance was anywhere close to this herculean task and we made this happen in spite of the tremendous disturbances of the civil war that erupted in Congo-Brazzaville, forcing my regional team to be evacuated and work in disperse temporary offices in Geneva, Abidjan, Nairobi, and Harare.

By 2003, some eight years after launching the polio eradication campaign in Africa, only two countries (out of 47) remained polio-endemic; the regional immunization coverage was improving and several countries had introduced the new pentavalent vaccines and other available under-used vaccines

such as Yellow Fever vaccine. From our perspectives, at least four factors were in place that we felt were most important for the sustainability of national immunization programs: simple program design; continuous performance measurement; additional staff capacity and funding. In addition, we benefited from the support of the African Union Heads of State and the high-level advocacy campaign to “kick polio out of Africa” led by the late President Nelson Mandela.⁴

Later, the polio campaign experience helped me to lead the design of a phased approach for the roll-out of the conjugate vaccine against Meningitis A, targeted to control epidemics in the Africa meningitis belt from 2012. We ensured the full adhesion of countries through the signing of Yaounde Declaration in which they committed to fast-track introduction of the new vaccine, strengthen surveillance and improve information sharing to enhance the region’s response to epidemic meningitis. The high turnout of people during vaccination campaigns was a clear indication that meningitis was very much feared by everyone.

Moving on to the global level

My focus shifted from regional to a global level where I worked first with UNICEF in New York and then at the WHO in Geneva. I was appointed Director of the WHO immunization and vaccines department in 2004 at the time when the recently appointed Director General, JW Lee, was implementing substantial organizational changes, notably the shifting of resources away from HQ to benefit the decentralized regional and country offices. We were quick at completing the task in my department, thanks to my previous management experience at the WHO regional office of Africa and the professionalism of my collaborators and staff. In some other departments, this turned out to be a difficult experience, leading to the first-ever work stoppage at the WHO Headquarters.

On the technical front, one of the initial tasks in hand was to lead the development of a global immunization strategy, requested by Dr JW Lee and Mr Kul Gautam, UNICEF Deputy Executive Director. Indeed, although the impact of immunization was remarkable worldwide (drastic reduction of polio incidence; 1.5 million deaths averted in children), the global level immunization landscape was marked by multiple voices, diverse interests, and confusing governance. The emergence of several well-funded partnerships such as the GAVI Alliance, the Global Polio Eradication Initiative, the Measles–Rubella Initiative, and others brought in financial resources mainly for the achievement of ambitious disease elimination/eradication goals and accelerated the introduction of multiple new vaccines, while basic routine immunization suffered in many countries. The roles and responsibilities of organizations involved in global immunization became unclear, to the point that we had to stand to maintain the WHO convening and technical leadership roles. In 2005, we carved out a strategy that framed the case for vaccines as an intervention with immense potential to accelerate the achievement of childhood mortality reduction, one of the Millennium Development Goals adopted by the United Nations in 2000.

Coverage expansion to reach the never vaccinated with existing vaccines and the addition of new vaccines would reduce, respectively, 1.4 million deaths and 1.1 million deaths each year. The ensuing joint WHO-UNICEF Global Immunization Vision and Strategy (GIVS) for 2006–2015 became the first ever global immunization framework and was endorsed by the World Health Assembly and the UNICEF Executive Board the following year.⁵

With the understanding that most countries follow the precepts promulgated by the WHO, there was a need to reinforce some of the WHO normative processes that are critical to governance and worldwide vaccine implementation. First, I entrusted my esteemed colleague Philippe Duclos with the dedicated task of enhancing the role of our Strategic Group of Experts (SAGE) for the review of evidence and advice on policies. Then, we optimized the roles of the WHO Expert Committee on Biological Standardization, established to set norms and standards in view of the selection and “pre-qualification” of vaccines to be procured internationally and the Global Advisory Committee on Vaccine Safety, which provides independent assessment on the safety of vaccine products for policy decisions. Finally, we updated the terms of reference of the regional and national immunization advisory mechanisms, given their additional roles in guiding and facilitating the adoption and the roll-out of new vaccines.

In 2010, in Davos, Bill and Melinda Gates launched the Decade of Vaccines as the call to action to intensify Research & Development, advocate at the highest level for resource mobilization and expand efforts to communicate the benefits of vaccines. Dr M. Chan, the WHO DG at that time, convened a broader interagency group to re-shape the global immunization strategy. The main tenets of which were accelerated implementation harnessing the availability of new vaccine products, the strengths of new partners and new funding, and the need to tap into innovations and research. While I had to overcome fierce resistance within WHO (my colleagues felt that the existing GIVS was still valid), the new strategy – the Global Vaccine Action Plan⁶ – came into force in 2011. Its implementation progress was assessed on an annual basis, leading to an independent, fact-based report of the SAGE for the World Health Assembly.

I think the impact of these processes has been remarkable for all national immunization programs, including those in high-income countries. Over the years, SAGE has become extremely valuable and well respected, playing a critical leadership role for global immunization. WHO policy recommendations brought tremendous guidance for countries and their partners, including Gavi. Major innovations are fully integrated in the program, including the life-course approach to immunization (HPV vaccination being a catalyst), research for game-changing vaccines (HIV, new TB, universal flu and malaria vaccines), incremental improvements of newer vaccines (rotavirus, pneumococcal conjugate vaccines in particular), simplification of vaccine delivery approaches and improvements in tracking systems. However, important challenges remain. Most notably, that the technical and financial support for implementation is too much focused on the countries eligible for Gavi support, leaving out numerous countries in the low middle-

income range that are lagging behind their immunization targets.

Looking ahead ...

I retired from WHO in November 2017, feeling very much privileged to have met and worked with so many great leaders and colleagues in advancing the rollout and the impact of vaccines worldwide.

While proud of the excellent progress made, there remains substantial work to reach everyone, everywhere with life-saving vaccines. This will require relentless focus to address the major bottlenecks, building from the excellent know-how that is observed across all the stakeholders and sectors. I consider the management capacity as a critical factor of immunization program success and sustainability.

In the future, I chose to work on upstream vaccine research and production and to learn more about the challenges and opportunities that could contribute to sustainable solutions for an affordable supply of vaccines for the benefits of all people in Africa.

My career journey thus far is well reflected in the following quote by Elisabeth Eaves in “Wanderlust: A Love Affair with Five Continents” (2011): “The best kind of travel – the kind I wanted to experience – involves a particular state of mind, in which one is not merely open to the occurrence of the unexpected, but to deep involvement in the unexpected, indeed, open to the possibility of having one’s life changed forever by a chance encounter”.

Disclosure of potential conflicts of interest

No potential conflicts of interest were disclosed.

Notes on contributor



About Jean-Marie Okwo-Bele: Dr. Okwo-Bele is public health consultant and former Director of WHO Department of vaccines and immunization (2004-17). He was Chief of the UNICEF global immunization unit (2002-4), Regional Advisor and Head of the WHO regional vaccine and immunization programme in Africa (1989-2002) and National Manager for the DR Congo Immunization Programme (1984-9). He received training in medicine from University of Kinshasa (1981) and in public health from Johns Hopkins

University (1986). Author of >30 articles and book chapters, Dr. Okwo-Bele led the national immunization program in DRC and coordinated the launch and management of polio eradication and other vaccine programs in Africa and Southeast Asia. He worked with GAVI on the roll-out of Hib, hepatitis B and other vaccines, and helped strengthen WHO vaccine policy recommendations at global level. Dr. Okwo-Bele received Rotary Paul Harris Fellow recognition for advancing polio eradication in Africa.

References

1. Fenner Frank, Henderson, Donald A, Arita, Isao, Jezek, Zdenek, Ladnyi, Ivan Danilovich, et al. Smallpox and its eradication. WHO; 1988. p. 1292–1309.

2. Cutts FT, Othepa O, Vernon AA, Nyandu B, Markowitz LE, Deforest A, Wilkins K, Okwo B. Measles control in Kinshasa, Zaire improved with high coverage and use of medium titre Edmonston Zagreb vaccine at age 6 months. *Int J Epidemiol.* 1994 Jun;23(3):624–31. doi:[10.1093/ije/23.3.624](https://doi.org/10.1093/ije/23.3.624).
3. Biellik R, Madema S, Taole A, Kutsulukuta A, Allies E, Eggers R, Ngcobo N, Nxumalo M, Shearley A, Mabuzane E, et al. First 5 years of measles elimination in southern Africa: 1996–2000. *Lancet.* 2002;359(9317):1564–68. doi:[10.1016/S0140-6736\(02\)08517-3](https://doi.org/10.1016/S0140-6736(02)08517-3).
4. Okwo-Bele J-M, Lobanov A, Biellik RJ, Birmingham ME, Pierre L, Tomori O, Barakamfitye D. Overview of poliomyelitis in the African region and current regional plan of action. *J Infect Dis.* 1997;175(2 SUPPL):S10–S15. doi:[10.1093/infdis/175.Supplement_1.S10](https://doi.org/10.1093/infdis/175.Supplement_1.S10).
5. Bilous J, Eggers R, Gasse F, Jarrett S, Lydon P, Magan A, Okwo-Bele J-M, Salama P, Vandelaer J, Villeneuve P, et al. A new global immunisation vision and strategy. *Lancet.* 2006;367(9521):1464–66. doi:[10.1016/S0140-6736\(06\)68625-X](https://doi.org/10.1016/S0140-6736(06)68625-X).
6. Cherian T, Okwo-Bele J-M. The decade of vaccines global vaccine action plan: shaping immunization programmes in the current decade. *Expert Rev Vaccines.* 2014;13(5):573–75. doi:[10.1586/14760584.2014.897618](https://doi.org/10.1586/14760584.2014.897618).