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RESEARCH: POLIO ERADICATION

SECURING THE LEGACY OF POLIO ERADICATION: ENDGAME CHALLENGES & LESSONS LEARNED

The Global Polio Eradication Initiative (GPEI) is on the verge of a successful conclusion, having reduced the number of wild poliovirus (WPV) cases from 350,000 at its inception in 1988, to 34 in 2016 [1]. However, these achievements remain precarious, and ultimately dependent upon the successful completion of eradication in some of the world's most challenging local conditions. Given that barriers to the GPEI's success are predominantly political rather than technical in nature, the research team at the Global Health Centre (GHC) at the Graduate Institute of Geneva has embarked on a project to better understand the underlying political and financial factors to achieving eradication [2]. Recognizing the critical role that European decision-makers and donors will play in shaping the final stages of polio eradication, this research has focused particularly on European roles in the GPEI's endgame efforts and legacy. Earlier this year, the GHC co-organized and hosted two events in London to discuss the way forward for polio eradication. On April 12, 2016 in collaboration with the All-Party Parliamentary Group on Global Health, the Global Health Centre hosted a parliamentary breakfast on *Polio Eradication: Securing the legacy of the global vaccination initiative* to discuss the following questions:

- How will the final eradication of polio be achieved?
- How can the lessons learned and assets built up during the last three decades of the eradication initiative be conserved and used to help strengthen global health governance and build effective and equitable health systems?

Among the 45 attendees were many parliamentarians, but also representatives from the World Health Organization (WHO), academia, NGOs and the public health sector.

The following day on April 13, 2016, the GHC and the Chatham House Centre on Global Health Security continued the dialogue with a public event, bringing together government representatives, global health experts, academics and leaders from the private sector for a rich discussion on *Polio Eradication: Endgame Challenges, Lessons and Legacy*.

OVERCOMING THE BARRIERS: ACHIEVING AND SUSTAINING ERADICATION

While global polio eradication efforts have led to tremendous achievements in the past several years, the Chair of GPEI Independent Monitoring Board (IMB) , Sir Liam Donaldson, warned that *"celebration would be folly"* as the programme had not yet reached peak performance in remaining endemic countries, and that there was complacency in Nigeria. Several months later, his warnings have proved prudent, as eradication has yet to be achieved in Afghanistan and Pakistan and cases have re-emerged in Nigeria. Key barriers to achieving and sustaining eradication include insufficient political commitment, funding gaps and insecurity in the remaining endemic countries.

Although the GPEI is often viewed as a success story, it has yet to complete its mission. Political and financial commitment to global polio efforts is more important now than ever, in order to ensure that eradication is achieved and the significant investments already made are protected. Michel Zaffran, the Director of Polio Eradication for WHO, emphasized the risk of complacency in Afghanistan and Pakistan, where interruption of WPV has remained elusive, but also throughout the rest of the programme. He highlighted the importance of routine immunization, as well as the need to maintain pressure in order to sustain both Acute Flaccid Paralysis (AFP) and environmental surveillance at necessary levels.

Persistent funding gaps combined with operational challenges have resulted in many missed deadlines by the GPEI. As of April 2016, there was still a need for 1.5 billion dollars in financing for the polio Endgame. A combination of perceived success and donor fatigue risks impeding progress at this crucial time. Representing the Department of International Development (DFID), Jason Lane reiterated the UK's firm commitment to polio eradication, as the third largest donor to the Initiative. Leadership from other European actors in this regard will be equally necessary to completing the task at hand.

THE 'BIG SWITCH': FROM TRIVALENT TO BIVALENT OPV

In recent years as the GPEI has drawn closer to its goal of eliminating WPV, vaccine-derived poliovirus (VDPV) has become a growing challenge. Trivalent oral poliovirus vaccine (tOPV) has been the vaccine of choice for the GPEI because it protects against all three types of WPV (type 1, type 2, and type 3), it is inexpensive and it is easily administered orally (meaning that vaccinators using OPV require relatively little training). One of the disadvantages to OPV is that since it is an attenuated live-virus vaccine, on rare occasions, a weakened poliovirus which is part of OPV can mutate after the vaccine has been administered and regain its ability to cause paralysis, by way of vaccine-associated poliomyelitis paralysis (VAPP) or VDPV. For this reason, eradication will necessitate a global switch from OPV to an alternative vaccine – inactivated polio vaccine or IPV. IPV cannot mutate to cause VAPP or VDPV, however it costs significantly more than OPV and must be delivered via injection. Therefore, although eradication will eventually require a universal switch from OPV to IPV, the urgent need for widespread vaccinations in endemic countries still depends on the use of OPV. Nonetheless, the world made an important stride towards the transition from OPV to IPV when the WHO orchestrated a universal switch from tOPV to bivalent OPV (bOPV) in April 2016. The roll out of bOPV containing only type 1 and type 3 strains of poliovirus was enabled by the fact that wild type 2 poliovirus had been eradicated several years ago. The switch was further encouraged by the fact that 90% of VDPV recorded cases are derived from type 2 viruses; the roll-out of bOPV means that new type 2 VDPVs will not emerge.

The levels of engagement, political commitment, international cooperation and resources that have been invested in making the 'switch' possible are impressive. In terms of both planning and execution, it represents a truly unique feat in global health, both technically and diplomatically, with significant predicted public health benefits [3]. Yet, similar to other achievements of the GPEI, the sustainability of this transition depends on the continued engagement of, and progress made by all stakeholders towards the endgame goal of interrupting the spread of WPV. While the widespread use of bOPV will prevent the emergence of new type 2 VDPV, it also leaves populations vulnerable to existing type 2 VDPVs. It is therefore critical that stakeholders collaborate, not only to ensure that surveillance and response systems are adequately resourced to respond to potential outbreaks, but also to strengthen global efforts to interrupt WPV in remaining endemic countries so that the GPEI can move forward with the complete transition from OPV to IPV.

TOWARDS TRANSITION: VERTICAL TO HORIZONTAL, POLIO WORKFORCE AND CRITICAL HEALTH SERVICES

Beyond the successful conclusion of the GPEI's core mission, there are critical questions surrounding the sun-setting of the Initiative. One of the most pressing concerns is the ownership of polio-related processes and responsibilities once the GPEI's mandate has ended. Transitioning functions from a 'vertical' or disease-specific Initiative such as the GPEI to national and international 'horizontal' health mechanisms requires substantial planning, not only in terms of ensuring that there is sufficient IPV coverage to maintain a polio-free world; but also to ensure that the multitude of critical health 'extras' that the GPEI provides at the community-level are accounted for and continued following the end of the program. Regarding the delivery of health services, Ambassador Carole Lanteri, from the Permanent Mission of the Principality of Monaco to the UN highlighted that the approximately 30,000 polio-funded staff spend a lot of time on other health functions. Careful attention must be paid to if and how these human resources can be maintained through other health projects and systems in different national contexts.

At the technical level, industry representatives Anil Dutta from GlaxoSmithKline and Emmanuel Vidor from Sanofi Pasteur reminded attendees of the complexity of vaccine development and production. One key concern this year has been the global shortage of IPV. In light of the above-mentioned switch to bOPV, this is particularly troubling as IPV is now the only vaccine available which protects against type 2 VDPV. If immunization levels are to be maintained at present and in future, then dialogue on the road ahead needs to be continued to ensure that a sufficient stock of high quality and affordable vaccines is consistently available. In this context, the relatively recent involvement of Gavi, the Vaccine Alliance in polio eradication is critical.

MOVING FORWARD: LESSONS LEARNED, LEGACY AND HEALTH SECURITY

Beyond the global public good of eradication itself, the legacy of the GPEI includes the knowledge and resources gained for global health. Events both a Chatham House and the Parliamentary Breakfast included dialogues on the wealth of knowledge, lessons learned and infrastructure which will potentially comprise the GPEI's legacy, both in terms of transition and resilience. Beyond the necessity to connect the depth of experience behind polio efforts with wider global health initiatives such as health systems strengthening and routine immunization, GPEI experiences can and have already benefitted global health security. Responding to the recent Ebola outbreak in West Africa, for example, polio systems were used to halt outbreaks in Nigeria [4]. Surveillance and containment are not only critical to the success of the GPEI, they are also critical functions in disaster reduction, and disease outbreak response.

Professor Ilona Kickbusch, Director of the GHC, challenged meeting participants to think about what will happen ten years following the eradication of polio. Above all else, the way forward with polio is a question of global health governance, with the central challenge being how to leverage sufficient global political commitment to the GPEI to see eradication through to sustainable completion. As critical actors in global health, European governments have an opportunity to not only contribute to securing this global public good, but also to ensuring that the immense investments already made in polio eradication will continue to contribute to health systems and services in future.

REFERENCES

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