

PERSPECTIVE



Elimination round

We must push harder to eliminate diseases, for everyone's benefit, say **Andrew Artenstein** and **Gregory Poland**.

Epidemic infectious diseases kill millions each year and cause a massive burden of morbidity in developing countries. These maladies contribute to social upheaval, political turmoil and economic chaos, which threaten country-specific, regional and even global security.

Many of these infections are preventable. Some vaccine-preventable infectious diseases, such as polio, measles and rubella, are subject to aggressive intervention strategies; polio, for example, is targeted for global eradication. So far, only one disease — smallpox — has been globally eradicated. However, sustained vaccination programmes have eliminated several epidemic diseases in developed countries.

The elimination of a disease from a defined geographic region or its worldwide eradication requires sustained global engagement and massive resource investment — a bigger commitment than most developing countries can make and more than the governments of many wealthy nations are willing to provide. Yet the potential rewards are substantial: not just saving lives but keeping people healthy and creating a more stable and secure world.

The regional elimination of polio, part of the campaign to eradicate the disease, illustrates the importance of global engagement and the risks of letting our guard down (see 'The eradication endgame', page 14). According to the World Health Organization (WHO), this ongoing vaccination and surveillance effort, which started in 1988, has involved more than 20 million volunteers working in 125 countries to vaccinate 2.5 billion children at a cost so far of US\$9.5 billion. It has reduced the incidence of polio by more than 99% and eliminated endemic transmission in all but three countries¹. However, the difficulties associated with the campaign are illustrated by the recent outbreak of wild-type polio in China; the virus was imported more than a decade after the country was certified polio-free². Eliminating polio from its last remaining pockets is difficult. It requires ongoing, worldwide vigilance that calls for resources, political will and the focused, sustained commitment of both wealthy and developing nations — because as long as polioviruses circulate anywhere in the world, we all face the threat of disease re-emergence.

A NEW MODEL

Recently, a new campaign has started to eliminate another important, epidemic infectious disease — group A meningococcal meningitis — from the 'meningitis belt' of sub-Saharan Africa. This crippling infection of the central nervous system occurs in devastating, seasonal and cyclic epidemics in sub-Saharan Africa, affecting hundreds of thousands of people, predominantly children and young adults, and killing nearly one in ten infected individuals. Epidemic meningococcal A has been targeted for elimination by the Meningitis Vaccine Project (MVP), a consortium organized through a partnership between the WHO and the non-profit organization PATH, with start-up funding from the Bill & Melinda Gates Foundation³.

The MVP represents a model for regional disease elimination efforts

in two respects. From the outset, its leaders were advised by stakeholder African nations that to achieve the goal of vaccinating more than 300 million people within 15 years, a vaccine would need to be not only safe and effective but also very cheap. Large pharmaceutical companies showed little interest in the sub-Saharan market. Therefore, the MVP established creative alliances with vaccine companies that were outside 'big pharma' and that recognized both the humanitarian benefits and the rewards of positive public exposure³. The result was MenAfriVac, a novel, safe, cheap and effective meningococcal conjugate vaccine specifically designed for the at-risk African population⁴.

But vaccine development was only the first innovation; the second was MVP's massive, coordinated educational and communication efforts, aimed at engendering extraordinary levels of support among local populations. Between 2010 and 2012, the MVP vaccinated more

than 100 million people in 10 African countries. As a result, the number of infections during the 2013 epidemic meningitis season was the lowest in that region for a decade⁵.

INTERNATIONAL EFFORTS SUCH AS THE MVP HAVE SHOWN WHAT MIGHT BE ACHIEVED

PUSHING FOR THE FINISH LINE

The MVP has shown that it may be possible to eliminate meningococcal meningitis in sub-Saharan Africa. It has so far taken a monumental effort

over 15 years involving thousands of people and hundreds of millions of dollars from the international community and African nations. And even more is required to finish the job: the WHO has estimated that another US\$475 million will be needed to deploy MenAfriVac to all meningitis belt countries, and ongoing resources required to sustain disease elimination through surveillance and vaccination.

Epidemic infections that are suitable targets for elimination occur primarily in developing parts of the world where wars, political instability, economic hardship and the lack of infrastructure and trained personnel impede vaccine delivery. The massive investment of people, vaccines, equipment and diagnostics required is daunting but attainable. International efforts such as the MVP have shown what might be achieved. The time is ripe for the developed world to commit to eliminating as many epidemic infectious diseases as possible; the global community will reap the benefits for years to come. ■

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