

THIS WEEK

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Viral complacency

The first outbreak of yellow fever in Angola in almost 30 years illustrates the danger of a short attention span when confronting epidemic threats.

The World Health Organization (WHO) last week declared that the Ebola epidemic in West Africa no longer represents an international public-health emergency. But as experts also warned last week, there must be no let-up in improving readiness for the next Ebola outbreak — including the nightmare prospect of an epidemic in the megacities of Africa.

An expert panel of researchers convened by the London-based Wellcome Trust and the Center for Infectious Disease Research and Policy at the University of Minnesota, Minneapolis, warned in particular that support for Ebola vaccine research must not be allowed to slip. Although a successful experimental Ebola vaccine has been developed, much work remains to be done if safe and effective vaccines are to be ready in sufficient amounts to quickly nip future outbreaks in the bud.

“As Ebola infection rates come under control it’s a huge concern that complacency sets in, attention moves to more immediate threats, and Ebola vaccine development is left half-finished,” cautioned Jeremy Farrar, director of the Wellcome. Too often in the past, the world has stumbled from epidemic to epidemic, failing to learn the lessons of the last. Emergency responses to the latest threat capture headlines, research and political attention. But too often this attention quickly fades.

Yellow fever, a virus that kills many of those it infects, is just one example of the failure to sustain control efforts. The virus is spread by *Aedes aegypti*, a mosquito adapted to live in urban areas. An ongoing yellow-fever outbreak in Angola, the first for nearly 30 years, began in December and has since spread within the country, infecting at least 490 people and killing 198. It now threatens the wider region.

Yet mass vaccination and intensive mosquito-control programmes largely eliminated this vaccine-preventable mosquito-borne disease by the 1940s. In South America, where the disease was widespread, the mosquito vector was virtually wiped off the map by the 1970s. But the success of mosquito control led to complacency and scale-back.

As a result, *A. aegypti* is now present across more of the continent than before control began. It is similarly resurgent in tropical and subtropical regions worldwide, resulting in sporadic outbreaks of yellow fever in at-risk countries. Moreover, the mosquito’s comeback has fuelled large urban outbreaks of dengue, chikungunya and now Zika viruses, with at least tens of millions of people infected.

There’s a long list of other *Aedes*-borne viruses that are currently restricted to animal reservoirs in the wild. But some of these, including potentially deadly ones, will inevitably establish themselves in cities with *Aedes* mosquitoes. Given rampant urbanization throughout the tropics and subtropics, dense human and *Aedes* populations are ticking time bombs. The failure to sustain *Aedes* control illustrates the need for long-term persistence to curb epidemic threats.

The Angola outbreak has already depleted an international emergency stockpile of 6 million doses of vaccine, leaving authorities scrambling to obtain extra vaccine from national immunization programmes. The WHO and other international agencies launched the

Yellow Fever Initiative in 2006 to reboot yellow-fever mass-vaccination programmes and routine vaccination in the highest-risk African countries. But vaccine stocks are still insufficient, and vaccine coverage in many African countries too low, leaving many vulnerable. The problem, says one official associated with the initiative, is that yellow fever is a “forgotten disease”, which makes it difficult to attract sustained political interest and funding.

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Following the Ebola epidemic in West Africa, a slew of commissions and reports laid out a broad consensus on what needs to be done for a more proactive and sustained preparedness against epidemic threats. These measures include reinforcing public-health systems, surveillance and diagnostic capacities, and training health workers to identify and respond early to disease outbreaks. Weaknesses in these areas have been

identified as factors that allowed what was a small Ebola outbreak to spiral out of control.

Monitoring viruses in the wild, and a better understanding of how factors such as deforestation, and the hunting and consumption of bushmeat, influence spillover of animal viruses into humans, is key. So, too, is the pre-emptive development of drugs and vaccines against known potential epidemic threats.

The Ebola epidemic has prompted vigorous discussion on all these points, on what shape or form any new global initiatives should take, and where the required multibillion-dollar investment will come from. The big risk is that as the Ebola epidemic fades from memory, the sustained political commitment and funding required will not materialize, and business as usual will resume. That must not be allowed to happen. ■

Safety in neutrons

To boost nuclear security, research reactors must eliminate highly enriched uranium.

Working with the United States, Japan has removed all of the highly enriched uranium (HEU) and the separated plutonium from one of its nuclear reactor facilities, to minimize the risk of theft and use by terrorists. The two countries have now pledged to convert a second research reactor to use safer, low-enriched uranium. These are among the latest in a series of accomplishments that have stemmed from US President Barack Obama’s biennial Nuclear