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Yellow fever outbreaks, vaccine shortages and the Hajj and Olympics: call for global vigilance

The identification in China of 11 non-immunised travellers from west Africa with yellow fever elevated global attention on this vaccine preventable disease that puts about 1 billion people in 46 countries at risk.¹⁻³ Yellow fever is an acute mosquito transmitted viral haemorrhagic disease with a case fatality rate of 15–50% and no cure. On May 19, 2016, WHO declared yellow fever outbreaks a “serious public health concern”.²

The pattern of yellow fever epidemiology is changing with distinct large scale epidemics in Africa, sporadic outbreaks in Latin America, spillover transmission to Asia, and change from a “jungle cycle” where humans are incidental hosts to an “urban cycle” where *Aedes aegypti* bites could sustain transmission among humans.¹⁻³ By mid-July, the west Africa outbreaks alone have led to about 6000 suspected cases leading to 446 deaths.³ These numbers are subject to surveillance, laboratory, and reporting challenges and the actual numbers may vary. In 2015, yellow fever vaccination coverage in 22 affected African countries varied from 45% to 94%, with only 12 countries reaching >80% coverage,³ leading to persistent local transmission and posing a high risk of spread to neighbouring countries with porous borders and weak health systems. By Aug 18, in Angola, the mass vaccination campaign has only reached 31% of the target population.

Of particular relevance in the current yellow fever outbreak is the convergence of three major gatherings this year—the Hajj, the Olympics, and the Paralympics—which attract participants from countries with diverse sociodemographics and levels of health system development. These events are occurring in regions with

either the presence of the yellow fever vector and/or ongoing transmission, as in Latin America, or where the proportion of event participants from the yellow fever risk countries is considerable. For instance, in 2013, 14% of international Hajj pilgrims originated from the 46 yellow fever endemic countries. The proposed fractional dosing of the yellow fever vaccine to one-fifth of the standard dose of 0.5 mL as an interim strategy to address vaccine shortages is both challenging and controversial. It not only requires assuring that the supply of suitable syringes is widely available, it contradicts the WHO International Health Regulation requirement of a single full dose of the vaccine to obtain yellow fever vaccine certification.¹⁻³

Recent mass gatherings have successfully mitigated the transmission of emerging threats (such as the 2009 pH1N1 influenza pandemic, the 2012–15 MERS-CoV outbreak, and the 2014 Ebola outbreak) that posed distinct threats to health security.^{4,5} Although vector control efforts, including those strengthened as a response to Zika virus transmission, may be robust, any shortfalls in yellow fever vaccination and effective vector control in aircrafts and mass gathering venues will enable viraemic vectors or travellers to facilitate the establishment of local transmission. Mass gathering organisers must assure community and individual level availability of vector repellents and encourage and monitor their use routinely. Beyond the mass gathering host countries, where adequate vectors and susceptible human populations are present, vigilance, access to a stockpile of vaccines, and risk communication are critical to minimise and contain sporadic outbreaks.

We declare no competing interests.

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Fair choices in universal health coverage in Thailand

After endorsement of the Sustainable Development Goals in September, 2015, by world leaders for which “leaving no one behind” is top of the agenda, many countries are gearing towards universal health coverage (UHC). In view of the achievement in coverage of 98% of its population and expansion of benefits, Thailand's pioneering public health policies, implemented in 2002, have frequently been used as a showcase.¹ Scientific evidence for success of the Thai UHC is plentiful. 14 years after introduction of UHC, Thailand has had a reduction in infant and child mortality, HIV infections, the effects of diabetes, and workers' sick days, as well as many other health benefits.² Free



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