Fourth, community alertness and precautionary safety measures and restrictions regarding slaughter settings and meat seller units should be increased, and contact with potentially infected animals, consumption of unpasteurised dairy products, and traditional group food consumption in household or public gatherings should be avoided.

Fifth, the capacity of health professionals and community workers to promptly detect and notify cases of disease in people and syndromic animals should be strengthened, and nomadic and other population-based serological and molecular screening should be applied in the affected villages, neighbouring communities, and across country's borders, in line with WHO's International Health Regulations (2005).

Sixth, access to and use of IVM programmes and other tools should be scaled up to quell mosquito breeding sites, including effective and rational use of insecticide-treated bednets, insect repellent, insecticide vapourisers, and personal protective equipment to prevent mosquito bites outdoors and indoors, wearing of light-coloured long-sleeved clothes, mass disinfection, and decontamination of suspected and stagnant dams and freshwater environments.

Seventh, further operational research in identification and monitoring of fetal malformations, maternal miscarriage, and stillbirths in exposed pregnant women, contact tracing in cases of death, and tracking of nomadic households' slaughters, wildlife management, and trade network mapping are crucial to halt Rift Valley haemorrhagic fever epidemic transmission dynamics.

And finally, investment in the promotion of crucial mobilisation resources for implementation of national and regional one-health surveillance-response approaches and strengthening of operational research and development of new, safe, potent drugs and effective vaccines, are vital, proactive, and resilient long-term solutions to avert the ongoing and future Rift Valley haemorrhagic fever epidemics in Niger and other endemic countries worldwide.

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Sex-specific maps of HIV epidemics in sub-Saharan Africa

Recently the Joint UN Programme on HIV/AIDS (UNAIDS), the President's Emergency Plan For AIDS Relief (PEPFAR), and WHO expressed interest in using geographical targeting strategies when implementing interventions for reducing HIV transmission in sub-Saharan Africa. If geographical targeting is used, a disproportionate amount of the resources that are available for prevention will be allocated to geographical locations where HIV prevalence is substantially higher than average. Mathematical models have shown...
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that using geographical targeting to allocate limited resources would, under certain assumptions, be a cost-effective strategy for controlling HIV epidemics in sub-Saharan Africa. UNAIDS has begun to construct a quantitative framework that can be used to design geographical targeting strategies for sub-Saharan Africa. Specifically, they have constructed HIV epidemic surface prevalence (ESP) maps for many countries in the region. These maps show the proportion of the adult population that is living with HIV infection. However, the ESP maps they have constructed are not sex-specific. Here we show the importance of constructing sex-specific ESP maps. We focus on Lesotho, a country with an HIV epidemic that UNAIDS has identified as a priority for elimination. UNAIDS has previously constructed, using data from the 2010 LDHS, an HIV ESP map for Lesotho. To generate the map they used an adaptive bandwidth kernel density (ABKD) estimation method to spatially smooth and interpolate the geo-referenced HIV-testing data. The ABKD method estimates prevalence, at each geographical location, by constructing smoothing circles. Each circle contains the same number of individuals that were tested for HIV. As a consequence, the circles are small when the population density is high and large when the population density is low. We used the same method as UNAIDS and analysed the same data; however, we constructed two HIV ESP maps. One ESP map shows the geographical variation in HIV prevalence in women and the other in men. We used geo-referenced HIV-testing data from the 2010 LDHS, a nationally representative survey implemented using a two-stage cluster design that sampled 395 cluster locations. Response rates were high: 98% in women and 95% in men. HIV-testing rates were also high: 94% in women and 88% in men. Approximately 7000 individuals, aged between 15 and 49 years, participated in the 2010 LDHS: about 4000 women and 3000 men. Using these data we calculated that at the national-level HIV prevalence is substantially higher in women (27%) than in men (18%). Notably, Heckman-type selection models have been used to rule out selection bias in prevalence estimates based on data from the 2010 LDHS.

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![Figure: HIV epidemic surface prevalence maps for women (A) and men (B) in Lesotho](image)

The colour code shows the proportion of people aged 15-49 years who are infected with HIV.
women and 25% or greater in men. One of these areas is in the interior of the country and encompasses two cities: Roma and Semonkong. The other three areas are very close to the South African border and each area encompasses a city: Maseru (the capital of Lesotho), Maputsoe, and Mohale’s Hoek. Notably, there is an additional area in the interior of the country where HIV prevalence is high in men but not in women; this area is where the Katse dam, one of the largest dams in sub-Saharan Africa, is located.

UNAIDS, PEPFAR, and WHO propose to use ESP maps as health policy tools, but they have chosen to ignore sex. Notably, throughout sub-Saharan Africa, women are at greater risk of acquiring HIV than men.10,11 Furthermore, the burden of disease in every country in sub-Saharan Africa is greater in women than in men. These sex differences in risk, and disease burden, are made apparent by constructing sex-specific ESP maps. A comparison of these maps (as we have shown) can lead to the identification of substantial sex differences in terms of the severity of the epidemic and the location of high prevalence areas. We propose that global health organisations use sex-specific ESP maps as the foundation for designing geographical targeting strategies. Using such an approach would increase the efficiency, and hence the cost-effectiveness, of eliminating HIV in sub-Saharan Africa.

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Human papillomavirus vaccine approval in China: a major step forward but challenges ahead

The bivalent human papillomavirus (HPV) 16/18 vaccine was approved by the China Food and Drug Administration in July, 2016. This was a groundbreaking decision by the Chinese authorities. HPV vaccines, which are recommended by WHO for national immunisation programmes,7 have been marketed in more than 100 countries since 2006. In 2015, there were an estimated 98 900 incident cases of cervical cancer and 30 500 deaths attributed to cervical cancer in China.7 Although mathematical modelling suggests that the burden of HPV infection has been largely averted elsewhere and predicts substantial reduction of related cervical cancer cases in the future, several issues should be considered to ensure the success of HPV vaccine programmes in China.

Financial issues, particularly pricing for HPV vaccines, will be a major consideration for high uptake in China. Current prices for HPV vaccines are US$299–597 in Hong Kong, but with the low-price strategy being adopted by manufacturers, the three doses in China could cost less than $150.3 However, even at this price, the HPV vaccine will still be the most expensive vaccine in China. A national survey in China showed that the uptake of expensive vaccines that are not included in the Chinese Expanded Program on Immunization (EPI), such as pneumococcal vaccines, was low compared...