Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

incidence.[11] The UNAIDS-Lancet Commission estimated that HIV/AIDS funding will need to increase from the current $19 billion annually to $36 billion per year.[12] Failure to contain the HIV epidemic now will result in an eventually unmanageable global disease burden; the challenge is to pay now or pay a lot more later.

With the issue of when to start treatment resolved, how best to use pre-exposure antiretroviral prophylaxis (PrEP) and in what formulation rises in importance as an operational question, especially for young African women. WHO recommended PrEP as an additional intervention for groups with an annual HIV incidence of 3% or greater.[10] Experience with preventive treatment in other infectious diseases such as malaria and tuberculosis has been mixed, but PrEP offers potent protection against HIV if adhered to. Science drives formulation of guidelines, yet the benefit of guidelines depends on social and political will to implement them.

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Camels, MERS-CoV, and other emerging infections in east Africa

Although human Middle-East respiratory syndrome coronavirus (MERS-CoV) infection seems to be associated with exposure to animals, including camels, identification of the animal reservoir remains challenging.[1-3] We believe that this gap results from the fact that surveillance systems for diseases in both human beings and animals remain fragmented and fail to take into account the social and ecological contexts within which diseases emerge. Additionally, there is a paucity of data for emerging infectious diseases in animals, especially camels in east Africa. For example, most MERS-CoV cases have been identified in the Arabian Peninsula, in places with robust health care, veterinary care, and disease surveillance. Although preliminary data link some cases of human MERS-CoV to exposure to dromedary camels or their products,[1,2] reliable health records of both human beings and animals cannot confirm a causal relationship. At the same time, many of the camels in the Arabian Peninsula derive from herds in east Africa, where both human and animal health systems, including surveillance, remain inadequate.

To understand the potential reservoirs and prevalence of MERS-CoV, and in the absence of surveillance and clinical data in east Africa, some researchers have tapped into banked animal and human biological specimen repositories as a proxy for baseline data.[3] Findings of retrospective serosurveys done between 1983 to 1997 in east Africa showed that most (up to 81%) camels were exposed or infected as early as 1980.[3] However, these findings do not consider exposure to other viruses or the potential sources of exposure. Indeed, although not recognised until now, MERS-CoV infection seems likely among east African camels, but the lack of surveillance delays its detection.

Further, in human and camel populations, MERS-CoV infections might be masked by other common co-

morbidities. Thus, one of the challenges of surveillance is that syndromic definitions cannot differentiate MERS-CoV from pneumonia, tuberculosis, and other common respiratory infections; MERS-CoV cases might go undetected in human beings and in camels, necessitating confirmatory diagnostics.[4-6]

In addition to MERS, tuberculosis poses another, arguably more economically important, zoonotic disease in camels and other livestock in east Africa. The disease is transmitted from infected animals through bodily fluids, including milk, and might cause up to 10% of the global human tuberculosis burden.[7] Although no population-based studies of tuberculosis in human or camel populations in east Africa specify mycobacterium species, data from small studies suggest that ethnic Somalis' extraordinarily high rates of tuberculosis and extrapulmonary tuberculosis without high prevalence of HIV/AIDS could be related to their exposure to tuberculosis in livestock milks.[8]

Even so, little research or policy work has been done to address these potential sources of spillover and infection. Although tuberculosis interventions in domesticated, non-mobile livestock have proven successful, surveillance and control for camel herds remain restricted because of their mobility and the poverty and disintegration of many local and regional agricultural and health bureaus.[7]

Camels are central to the diets, economies, and cultures of millions of people in east Africa. Camel milk is typically consumed—and strongly preferred—without pasteurisation or other processing, and milk and meat economies are mostly unregulated, informal, and thus outside the purview of governmental and international regulation.[9] More than 65% of the world's camels are raised by ethnic Somalis in Ethiopia, Somaliland, and Somalia,[8] and production has increased exponentially in the past 15 years, including among non-Somali groups in east Africa. Prices for camels have risen as much as ten times[10] and exports from Africa to the Middle East are increasing substantially.[11]

Despite the importance of camels to so many lives and livelihoods, the absence of effective monitoring and sustainable disease reporting systems within and between countries in the region keep proximal populations vulnerable to both anticipated and unexpected disease outbreaks.[12]

In addition to MERS-CoV and tuberculosis, other emerging infectious diseases linked to camels include Rift Valley fever, brucellosis, trypanosomiasis, adenovirus, equine herpes virus, and camelpox. There are gaps in data on each of these, as well as about the association between different zoonotic diseases in increasing risks of comorbidity. Research is necessary to understand if and how MERS-CoV or tuberculosis, for example, might heighten risk of other infections, and vice versa, in both human beings and animals. As preliminary research on emergent zoonoses in camels suggest, infectious diseases and surveillance systems cannot be regarded alone or in isolation from their broader social and ecological environment.

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