

The global emergence of monkeypox

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Monkeypox is so named because the poxvirus was first identified in 2 outbreaks among cynomolgus monkeys housed at the Statens Serum Institut, Denmark, in 1958.¹ Both outbreaks occurred approximately 2 months after the monkeys arrived by plane from Singapore.¹ However, the natural reservoir of the virus is not monkeys from Asia, but is most likely rodents and other small mammals in West and Central Africa.²

Long regarded as a zoonosis with relatively inefficient human-to-human transmission, multiple small outbreaks of monkeypox had occurred in Africa between 1970 and 2017, largely believed to be due to zoonotic transmission.² Pre-2022, the largest human outbreak outside Africa occurred in 2003 in the US Midwest: 71 people were infected by prairie dogs kept as household pets, which had themselves been infected previously as a result of close contact with rodents from Ghana.³

However, this pattern of almost exclusive zoonotic transmission changed from September 2017, when Nigeria—which prior to that time had reported a grand total of 3 cases—experienced a large and extended outbreak involving mainly young adult men, most of whom had no animal exposure.² Household, nosocomial, intimate, and prison transmissions have been described in reports of the Nigerian epidemic,^{2,4} backed by genomic evidence of human-to-human transmission.⁴ The presence of genital ulcers also featured prominently in these reports,^{2,5} along with tentative suggestions on the possibility of sexual transmission as a novel mode of spread for monkeypox.²

Dr Dimie Ogoana, lead author of these reports, recalled in a recent press interview that his warnings of monkeypox spreading via sexual transmission had been repeatedly ignored.⁶ Indeed, the outbreak in Nigeria was also largely ignored by the global health community until the explosive spread of the virus from May 2022, with more than 36,000 cases and 11 deaths in 89 countries as of 15 August.⁷ Genomic analysis of the monkeypox viruses isolated in 2022 linked them firmly to the Nigerian outbreak that began in 2017.⁸ Singapore has not been spared from this epidemic, with 15 monkeypox cases diagnosed to date—5 imported and 10 local cases, of which 9 were

not linked to any known cases.⁹ The clinical features of these 15 cases are described in this issue of the *Annals*.¹⁰

The World Health Organization (WHO) declared the current outbreak a public health emergency of international concern on 23 July 2022, noting that the majority of cases had occurred in males who had identified themselves as gay, bisexual, or men who have sex with men (GBMSM), with clustering occurring in sexual networks.¹⁰ However, along with other public health practitioners and researchers, WHO also warned against attaching any stigma to or blaming any specific groups for monkeypox, as this would jeopardise public health efforts to contain the virus.¹¹

Monkeypox has spread and established itself through the vulnerability of social and sexual networks, but it is not inherently a GBMSM disease, and transmission is neither limited to this group nor to sexual activities in general. Specifically, stigma against GBMSM and other groups may drive individuals from these stigmatised populations away from health services, undermine prevention messaging among the general public, and therefore impede efforts to control the spread of monkeypox.

Can the global monkeypox epidemic be contained, or must we learn to live with another endemic infectious disease so soon after COVID-19?

Despite its extensive spread to date, there are still strong reasons to believe that the epidemic can be contained. It is certainly not as transmissible as COVID-19, with a reproductive number *R* that exceeds 1 (i.e. the point at which an outbreak will spread exponentially and sustain itself) only in GBMSM sexual networks, while other populations are less vulnerable to monkeypox transmission at current projections.¹² There are also vaccines and drugs designed against smallpox—a closely related virus—that are highly likely to be effective against monkeypox as well, although urgent clinical trials are currently being conducted to verify this. We have also eradicated smallpox—a more transmissible and deadlier disease—in 1980 through a global strategy of detection, isolation and ring vaccination,¹³ the latter which involved vaccinating the close contacts of confirmed cases

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rather than mass public vaccination as in the case of COVID-19.

Because monkeypox also has a prolonged incubation period of 6–13 days, a strategy effective against smallpox might also be successful against this virus. Nonetheless, there are non-trivial challenges in implementing a strategy of detection, isolation and ring vaccination,¹³ even in Singapore. Currently, there are insufficient smallpox vaccines stockpiled in many countries for the purpose of ring vaccination, even though manufacturing is being ramped up. Contact tracing can also be difficult when the predominant mode of spread is via sexual and social networks of GBMSM, in view of the stigmatisation and discrimination experienced by this population in many countries.¹⁴ Effective outreach and communications are therefore critical in educating and reaching people at higher risk, as well as addressing any stigmatisation.

Thankfully, there is no need to reinvent the wheel when it comes to effective communications during an outbreak. The COVID-19 pandemic has highlighted the importance of effective public health and risk communication in optimising public health responses amid a rapidly evolving situation. In this regard, maintaining public trust, developing clear and culturally appropriate messaging that is delivered on the relevant platforms, and engaging community groups are essential in engendering effective responses.¹⁵

One way of ensuring communication of clear, consistent, and culturally appropriate information on monkeypox to the right populations is via a 2-pronged strategy. The first is ensuring that the public has accurate information of monkeypox: that anyone can be infected, and that while it can be sexually transmitted, it should not be labelled as a “sexually transmitted disease”. This ensures that people understand they are potentially at risk even if they are not sexually active, while for those who are sexually active, traditional prevention methods for sexually transmitted diseases will not offer effective protection against monkeypox. The second is ensuring that community stakeholders are directly engaged to tailor such information to specific populations. These community stakeholders may be groups that serve GBMSM at this point in the global outbreak, but perhaps could also be schools or forums for pregnant mothers, in the event that the course of the outbreak subsequently shifts.

Even though the risk of a large monkeypox outbreak remains remote in Singapore, we will never be free of the threat of importation unless the global outbreak also comes to a close. This outbreak again highlights the risk

of rapid infectious disease spread in an interconnected world, and reinforces the need for high-income countries and supranational organisations to support other countries in becoming better prepared against future outbreaks and any major epidemics.

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