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Waking up to monkeypox

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In the past couple of weeks, the world has discovered monkeypox, an otherwise neglected infection caused by an orthopoxvirus related to the now eradicated smallpox. Monkeypox has been causing regular outbreaks in poorer, neglected communities in Central and West Africa, possibly with increasing frequency and geographic extent.¹

It is frustrating to see the same pattern repeating itself again. Attention is only paid when certain diseases hit high-income countries—exemplifying our collective failure to properly address “epidemic preparedness” and “global health,”—though they are nominally on top of our agenda with the covid-19 pandemic. It also illustrates the double standard applied to how people’s health is valued between wealthy countries and the rest of the world.

Since the disease mostly occurs in remote areas, there is a very large iceberg underneath the small tip that we see and that is recorded, both in terms of the real numbers and the health impact of the disease. Mortality for the cases that come under observation is higher for infections recorded in the Congo basin (11%, including the Central African Republic) than the West-African clade (4%).^{1,2}

Yet, for once when confronted with outbreaks of largely neglected diseases, with monkeypox we have options to treat and prevent the infection. Tecovirimat, a small-molecule antiviral drug, has been registered by the USA Food and Drug Administration (FDA) for smallpox since July 2018, and by the European Medicine Agency (EMA) for treating monkeypox and cowpox since January 2022, all in the absence of clinical efficacy trials.^{3,4} These approvals are based on experimental animal data, and safety and tolerability in healthy volunteers, without clinical trials—a procedure justified for countermeasures against biological threats in the context of health security, when trials are not possible or are very challenging to conduct given accessibility and security issues in the areas where monkeypox occurs. Similarly, there is also an improved smallpox vaccine (live, non-replicating virus) approved by the EMA and FDA, that might also protect against monkeypox.^{5,6} Both the vaccine and the antiviral drug are stockpiled by the United States Department of Health and Human Services (HHS) as part of their Strategic National Stockpile.⁷

We are involved in research studying for the first time the outcomes of treatment of monkeypox with tecovirimat, documenting clinical efficacy and safety of this intervention in communities where it has long been endemic. We hope this may pave the way for its broader use so that those who need it most can benefit. But this will require political will and dedicated financial support to “walk the talk” on epidemic preparedness.

Monkeypox is a typical example of the potentially volatile combination of zoonotic spillover and anthropogenic drivers that constitute most of the epidemic potential in the world. Consider that nearly two-thirds of all pathogens and three-quarters of emerging pathogens are zoonotic, against the geographical distribution of some 5,000 mammals species carrying one or more zoonotic disease.^{8,9}

Gearing up for epidemic preparedness and global health means acting now on the many ongoing outbreaks where and when they occur, not waiting for when they might spill over elsewhere. Providing access to medical innovation to those who can benefit most is not just a matter of health justice and equity, but is also critical for global health security because it is in everyone’s interest to solve a problem before it gets out of hand.

The global attention that is being paid to monkeypox now might mean more investments, which is a good thing. At the same time, we must avoid stigma about where the disease comes from, who gets it, and how. The real culprit of this outbreak is the inveterate neglect of diseases that primarily affect the most impoverished populations, and the global disregard shown towards communities affected by these diseases. Importantly, interventions that prove effective must be made available and be affordable to the monkeypox-endemic low-income countries, and not just be stockpiled for potential use in high-income countries.

Competing interests: We are involved in research studying the outcomes of treatment of monkeypox with tecovirimat (EUP, Registration number: ISRCTN43307947). Institute Pasteur Bangui has received financial support from the drug manufacturer, SIGA.

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- 1 Bunge EM, Hoet B, Chen L, et al. The changing epidemiology of human monkeypox—A potential threat? A systematic review. *PLoS Negl Trop Dis* 2022;16:e0010141. doi: 10.1371/journal.pntd.0010141 pmid: 35148313
- 2 Institut Pasteur de Bangui records.
- 3 FDA approves the first drug with an indication for treatment of smallpox. <https://www.fda.gov/news-events/press-announcements/fda-approves-first-drug-indication-treatment-smallpox>
- 4 Tecovirimat SIGA | European Medicines Agency <https://www.ema.europa.eu/en/medicines/human/EPAR/tecovirimat-siga>
- 5 Imvanex | European Medicines Agency <https://www.ema.europa.eu/en/medicines/human/EPAR/imvanex>
- 6 FDA approves first live, non-replicating vaccine to prevent smallpox and monkeypox <https://www.fda.gov/news-events/press-announcements/fda-approves-first-live-non-replicating-vaccine-prevent-smallpox-and-monkeypox>
- 7 Smallpox Preparedness and Response Updates from FDA <https://www.fda.gov/emergency-preparedness-and-response/mcm-issues/smallpox-preparedness-and-response-updates-fda>
- 8 Taylor LH, Latham SM, Woolhouse ME. Risk factors for human disease emergence. *Philos Trans R Soc Lond B Biol Sci* 2001;356:983-9. doi: 10.1098/rstb.2001.0888 pmid: 11516376
- 9 Han BA, Kramer AM, Drake JM. Global Patterns of Zoonotic Disease in Mammals. *Trends Parasitol* 2016;32:565-77. doi: 10.1016/j.pt.2016.04.007 pmid: 27316904