

Making sense of monkeypox death rates

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At the time the World Health Organization declared the global monkeypox outbreak an international emergency, more than 16 000 people across more than 70 countries had been infected with the virus. Only five people had died, and no one outside of Central and West Africa where the disease is endemic.

That suggests a death rate in the current global outbreak of about 0.03%.

Yet, the WHO reports monkeypox death rates around 3%–6% in recent years, and rates as high as 11% historically.

So why haven't we seen higher death tolls?

Mild cases previously under-represented

One factor is huge selection bias in the data on monkeypox prior to 2022, says Isaac Bogoch, an infectious disease physician at the Toronto General Hospital.

Until recently, monkeypox was rarely seen outside of Central and West Africa, where access to care can be very limited.

And most monkeypox infections are mild and resolve without treatment, so many people may not seek care unless they are very ill.

As such, only the sickest people may be represented in case counts, Bogoch explains.

Meanwhile, data collection “will miss the mild cases that never make it to health care.”

Less deadly strain currently circulating

The monkeypox virus driving the current global outbreak likely diverged from the strain that caused an ongoing outbreak in Nigeria, according to research published in *Nature Medicine*.

Both belong to clade 3, a group of strains dominant in West Africa that are considered less deadly than those in Central Africa's clade 1.

Monkeypox outbreaks caused by clade 3 viruses typically have case fatality ratios below 1%, while the fatality rates of clade 1 outbreaks may top 10%, according to the authors of the *Nature Medicine* study.

Different populations affected

Another factor to consider is the different demographics of those infected in the global outbreak versus those in endemic areas.

Outside of Africa, the global outbreak has disproportionately affected young and healthy men who have sex with men from wealthy nations who may be less likely to suffer complications than pregnant women, children,

or immunocompromised people, for example, from poorer endemic regions.

Age is a key risk factor — children under age 10 accounted for all monkeypox deaths in the 1970s to 1990s, and more than one-third of such deaths since then.

Access to care is also important as bacterial superinfection is a leading cause of morbidity and death related to monkeypox, says Sharmistha Mishra, an infectious disease physician who co-leads monkeypox rapid response efforts for the Emerging and Pandemic Infections Consortium in Toronto.

Better access to diagnoses and care also increases the odds that mild cases will be identified and counted, lowering the measured case fatality rates, Mishra says. “We are now broadly identifying and detecting cases, which hopefully will happen with greater resources in endemic regions, too.”

Lauren Vogel, *CMAJ*

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