

# Ahead of the WHO emergency deliberations, the World Health Network declares monkeypox a pandemic

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In a lead-up to the World Health Organization's (WHO) emergency meeting on Thursday to decide on whether the current global outbreak of the monkeypox virus should be declared a Public Health Emergency of International Concern (PHEIC), the World Health Network (WHN), an independent international collaboration of scientists and concerned citizens, said on Wednesday, June 22, 2022, that the monkeypox outbreak conformed to the definition of a pandemic.

The statement reads, "The World Health Network (WHN) today announced that they are declaring the current monkeypox outbreak a pandemic given that there are now 3,417 confirmed monkeypox cases reported across 58 countries, and the outbreak is rapidly expanding across multiple continents."

They explained that without a concerted global action, the outbreak would continue and move into vulnerable populations such as children, expecting mothers and the immunocompromised. They warned that all people 40 and under who have never previously been immunized against smallpox remain extremely vulnerable to monkeypox, and that spillage into animals such as rodents and domesticated pets would potentially make the pathogen endemic in a broad geographic region with significant long-term consequences.

The WHN declaration states, "Even with death rates much lower than smallpox, unless actions are taken to stop the ongoing spread—actions that can be practically implemented—millions of people will die, and many more will become blind and disabled." So far, only one death in Brazil has been attributed to monkeypox.

As of June 24, there have been 4,118 confirmed or suspected cases spanning at least 65 countries and territories. Yesterday, 461 more cases were added to the growing total. The seven-day rolling average of new infections has grown to 280 per day and is climbing. Taiwan, Singapore, and South Korea are the latest countries in Asia that have confirmed cases. Other non-endemic countries recently reporting monkeypox cases include South Africa, Croatia, Bulgaria, Colombia, and Gibraltar.

**Figure 1: Seven-day average and cumulative cases of monkeypox infections. Source @antonio\_caramia gave the WSWs permission to use these figures. Please follow**

**the hyperlink to the website.**

The case in Singapore involved a British Airways flight attendant who had attended several establishments on his layovers in mid-June. On June 20, he developed flu-like symptoms and pathognomonic skin rashes, prompting him to seek medical attention. Singapore's ministry of health told the press that the man was being treated at the National Centre for Infectious Diseases, 13 close contacts had been identified, and tracing was ongoing.

The South Korean citizen who reported to the Korean CDC had just returned from Germany, where cases have been up-trending recently. He was symptomatic on his return flight with headaches, fever, sore throat, fatigue, and skin lesions. Another case is also being investigated.

On Thursday, Health Minister for South Africa, Joe Phaahla, reported that they had confirmed a case of monkeypox in a 30-year-old man from Johannesburg without travel history, meaning it was community-acquired and the extent of infections remains unknown. The health minister assured the press that contact tracing was underway.

With more than 900 cases, Britain leads all other countries in the sheer number of cases. According to the UK Health Security Agency, cases soared by more than 40 percent in less than one week. Europe remains the epicenter of the monkeypox outbreak, with Germany surpassing Spain and Portugal. However, in North America, Canada has seen 267 cases and the United States 173.

**Figure 2: Cumulative monkeypox cases across Europe as of June 24, 2022. Source: @antonio\_caramia**

Professor Yaneer Bar-Yam, Ph.D., President of New England Complex System Institute and co-founder of WHN, stated emphatically, "There is no justification to wait for the monkeypox pandemic to grow further. The best time to act is now. By taking immediate action, we can control the outbreak with the least effort and prevent consequences from becoming worse. The actions needed now only require clear public communication about symptoms, widely available testing, and contact tracing with very few quarantines. Any delay only makes the effort harder and the consequences more severe."

Dr. Eric Feigl-Ding, Ph.D., Epidemiologist and Health Economist, and co-founder of WHN, added, “The WHO needs to urgently declare its own Public Health Emergency of International Concern (PHEIC)—the lessons of not declaring a PHEIC immediately in early January 2020 should be remembered as a history lesson of what acting late on an epidemic can mean for the world.”

The WHO’s Director-General, Dr. Tedros Adhanom Ghebreyesus, has previously acknowledged that the disease is more widespread than the official numbers suggest. At the emergency committee meeting on Thursday, he reaffirmed this fact stating, “Person-to-person transmission is ongoing and is likely underestimated.” His statement implies that public health officials lack a clear comprehension of where these cases arise and how widespread they are.

Public health officials have been focused on tracing cases among men who have sex with men. The UK Health Security Agency noted that the monkeypox virus appears to be a threat “in the sexual networks of gay, bisexual and other men who have sex with men.”

David Heymann, a professor of infectious disease epidemiology at the London School of Hygiene and Tropical Medicine present at the WHO emergency conference, told the *Washington Post*, “We’re beginning to understand how widespread it really is. We know it’s widespread in certain populations, and we need to know whether it’s spreading in other populations as well.” Evidence is mounting that there are multiple routes of transmission that also include airborne routes, although it does not spread easily between people and requires close contact.

**Figure 3: Monkeypox cases by date and country as of June 24, 2022. Source @antonio\_caramia.**

Genetic sequencing data places the origin of the outbreak back a few years. Trevor Bedford, an evolutionary biologist at the Fred Hutchinson Cancer Research center in Seattle, told the *New York Times* that “genomic patterns would suggest this occurred around 2018,” when the virus potentially became better at spreading from person to person.

Anthropologist and Assistant Professor Sagan Friant at Pennsylvania State University, who has been studying the zoonotic interactions of monkeypox in Nigeria, said in May during an interview with WPSU public media for Central Pennsylvania, “Many of the export cases that we’ve seen in the past have had one or few or zero subsequent cases due to human-to-human contact. But now as we’re seeing these multiple cases [in] multiple parts of the globe, you’re seeing sustained human-to-human transmission that is very unexpected and something that we’re keeping an eye on.”

She also explained that the zoonotic interaction between humans and animals goes both ways. Spilling the monkeypox virus from humans back into animals such as rodents in countries outside of previously non-endemic regions would mean that the virus could find a permanent niche throughout

the globe, threatening new outbreaks repeatedly.

Genomic analysis of recent cases has surprised virologists. Monkeypox is a large double-stranded DNA virus with very efficient error correction mechanisms during replication. It acquires approximately one or two mutations yearly compared to the 20 to 30 mutations for RNA viruses. However, the current monkeypox virus has gained almost 50 mutations compared to the 2018 version, meaning it should have taken the monkeypox virus several decades to acquire these many changes to its DNA.

Scientists are zeroing in on a family of enzymes called APOBEC3 based on their analysis of recent cases and the specific type of mutations associated with this enzyme. The enzymes are part of anti-viral defense systems that animals, including humans, possess that induce mutations in the virus when they encounter it.

Richard Neher, a computational evolutionary biologist at the University of Basel, speaking with *STAT News*, explained that “the idea behind such a sabotage scheme is that if you trigger enough mutations, certainly some of them will be deleterious. The virus won’t be able to replicate, and what will be left is just a dead piece of DNA. It’d be like rearranging the letters on your enemy’s typewriter so they can’t get a clear message out.” However, the process is not foolproof, and mutations that incur an advantage may be passed to the next generation.

Dr. Bedford said that while mice carry only one version of the APOBEC3 enzyme, humans possess seven. The implication is that the rapid accumulation of mutations may be a product of the monkeypox virus having shifted to spreading through people rather than from rodents to humans. Neher admitted, “We don’t have a good enough understanding of how this virus interacts with the host [people], or what these individual mutations could do.”

As urbanization, deforestation, and climate change have radically altered the natural habitats of animals and the pathogens that have colonized them, the jump into human hosts becomes ever more inevitable unless efforts are immediately undertaken to study and address this compelling question. Virologist Dr. Michael Malim at King’s College London, who discovered APOBEC3 in 2002, told the *Times*, “These spillovers from other species, and what that means and what the trajectory is—it’s very unpredictable. And it’s occurring more and more.”



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