# Pox and Puff: What's Alike?

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The sound-alike of "Pox" and "Puff" made me imagined of the story of the dragon in "Puff, the magic dragon" song, especially in the last paragraph that stated, "Without his lifelong friend, Puff could not be brave. So Puff, that mighty dragon, sadly slipped into his cave"[1]

"Slipped into his cave" appeared to be the respite of pox (typically smallpox) in human history, which persisted for more than 3,000 years before it was declared eradicated in October 1979, and was officially endorsed by the 33rd World Health Assembly on May 8, 1980, courtesy of WHO (World Health Organization).[2] And one day, it seemed to be emerging from the cave again with its new form-- MONKEYPOX.

## Monkeypox: Its History and Emergence

According to Centers of Disease Control and Prevention (CDC),[3] monkeypox is a rare disease caused by infection with the monkeypox virus. Monkeypox virus is part of the same family of viruses as variola virus, the virus that causes smallpox. **Monkeypox symptoms are similar to smallpox symptoms, but milder,** and monkeypox is rarely fatal. Monkeypox is not related to chickenpox.

Monkeypox was discovered in 1958 when two outbreaks of a pox-like disease occurred in colonies of monkeys kept for research. Despite being named "monkeypox," the source of the disease remains unknown. However, African rodents and non-human primates (like monkeys) might harbor the virus and infect people.

The first human case of monkeypox was recorded in 1970. Prior to the 2022 outbreak, monkeypox had been reported in people in several central and western African countries. Previously, almost all monkeypox cases in people outside of Africa were linked to international travel to countries where the disease commonly occurs or through imported animals. These cases occurred on multiple continents.

The chaotic outbreak news of monkeypox spread like a tsunami wave throughout the world. The WHO has activated its highest alert level for the growing monkeypox outbreak, declaring the virus a public health emergency of international concern since July 23, 2022.[4] Fortunately, this disease is milder than the highly contagious smallpox, but the report showed that since 1 January through 7 August 2022, there have been 27,814 laboratory confirmed cases of monkeypox and 11 deaths have been reported to WHO from 89 countries/territories/areas.[5]

## Signs and Symptoms[6]

- A new, maculo-papular rash that develops into vesicles and then pustules. Lesions may be deep-seated, firm, well-circumscribed and umbilicated. The rash may:
  - Appear anywhere on the body, including palms, soles and anogenital region
  - Be localized to a specific body site or diffuse - Be the only symptom people experience
  - Be painful, painless, or itchy
- Fever, headache, malaise, chills, and lymphadenopathy may occur.
- Patients may present with anorectal pain, rectal bleeding, or tenesmus in association with visible perianal skin lesions and proctitis.

## The Risks[6]

- Traveled to a **country** with recent monkeypox cases, one that's experienced prior outbreaks.
- Had close or intimate contact with someone with a similar rash or confirmed monkeypox infection.
- Had close or intimate contact with someone in a social network experiencing monkeypox infection.

Most U.S. cases have been among gay, bisexual, and other men who have sex with men; many of whom had anonymous sex with someone they met on dating apps or sex with multiple partners at commercial sex venues or events where anonymous sex is common.

## Treatment[7]

- There are no treatments specifically for monkeypox virus infections. However, monkeypox and smallpox viruses are genetically similar, which means that antiviral drugs and vaccines developed to protect against smallpox may be used to prevent and treat monkeypox virus infections.

• Antivirals, such as tecovirimat (TPOXX), may be recommended for people who are more likely to get severely ill, like patients with weakened immune systems.

• Most people with monkeypox recover fully within 2 to 4 weeks without the need for medical treatment.

## Vaccination[8]

• The **JYNNEOS vaccine** is approved for prevention of smallpox and monkeypox. It is the primary vaccine being used during this outbreak in the U.S. The ACAM2000 vaccine is an alternative to JYNNEOS. It is also approved to help protect against smallpox and monkeypox.

## How does each country fight with the Monkeypox?

As a result of the lessons learned from COVID-19, and because of the different geographical locations, politics, cultures, and other factors, each country nowadays has developed their own guidelines for management of monkeypox disease. For example, the Ministry of Health and Family Welfare, Government of India, has issued their own guidelines.[9] In addition, the Thai Government's Department of Disease Control, Ministry of Public Health has also declared their own guidelines from previous experiences and of course, taking into account some various environmental factors.[10] We must closely observe and track the situation from the WHO surveillance and develop our tool to be ready for any pandemic events.

## What will come up?

According to Sagan Friant, an anthropologist at Pennsylvania State University in the United States, as quoted by BBC online,[11] "For a long time, scientists thought that diseases in primates were the most threatening to humans because of our close similarity genetically, and that's true. But we're realising that infectious diseases from rodents and bats are of increasing importance when we're thinking about spill-over of new diseases into human populations."

Infections that pass from animals to humans are known as zoonotic diseases. Some of these also have the ability to pass from human to human once they make the jump across species.

In that respect, monkeypox has some similarities to COVID-19. But it's been around a lot longer than the coronavirus behind the recent pandemic.

Multiple factors have influenced the causes of diseases. One important factor is the climate change, and as a result, we can observe changes in the distribution of many

diseases. We can anticipate seeing more changes as the idea of humans encroaching on animal habitat, specifically with regard to zoonosis.[12]

Evidences suggest that, because of climate change and other factors, we will encounter more and different infectious diseases in different places and each disease has its own transmission cycle, mode of transmission and we will begin to see fairly significant changes in infectious disease incidents and numbers of cases.

No one knows what will happen next, therefore we should respect the power of nature and prepare for the next scenario that will challenge human beings again and again. It is similar to awaken Puff to come out of the cave again.

**Figure 1.** Puff the magic dragon: pop-up book[1]

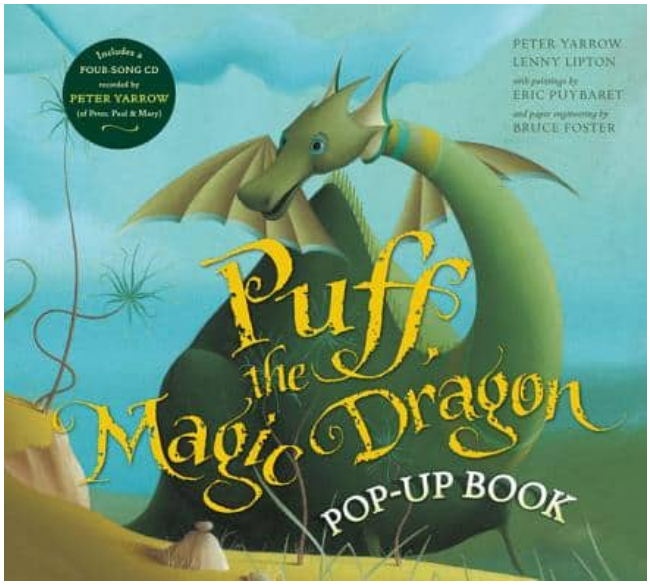



**Table 1.** Number of cumulative confirmed monkeypox cases and deaths reported to WHO, by WHO Region, from 1 January 2022 to 7 August 17:00 CEST[5]

| WHO Region | Confirmed cases | Deaths |
|---|---|---|
| African Region | 375 | 7 |
| Region of the Americas | 10,815 | 1 |
| Eastern Mediterranean Region | 31 | 0 |
| European Region | 16,495 | 2 |
| South-East Asia Region | 13 | 1 |
| Western Pacific Region | 85 | 0 |
| **Cumulative** | 27,814 | 11 |

**Figure 2.** Visual examples of monkeypox rash[13]


**Figure 3.** Visual examples of monkeypox rash[13]

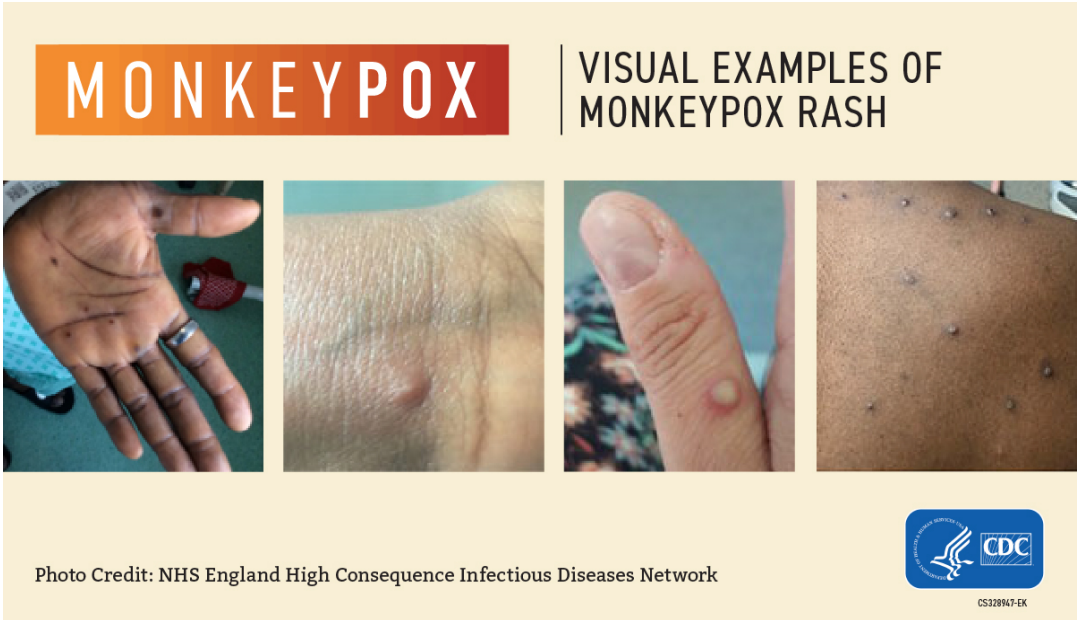
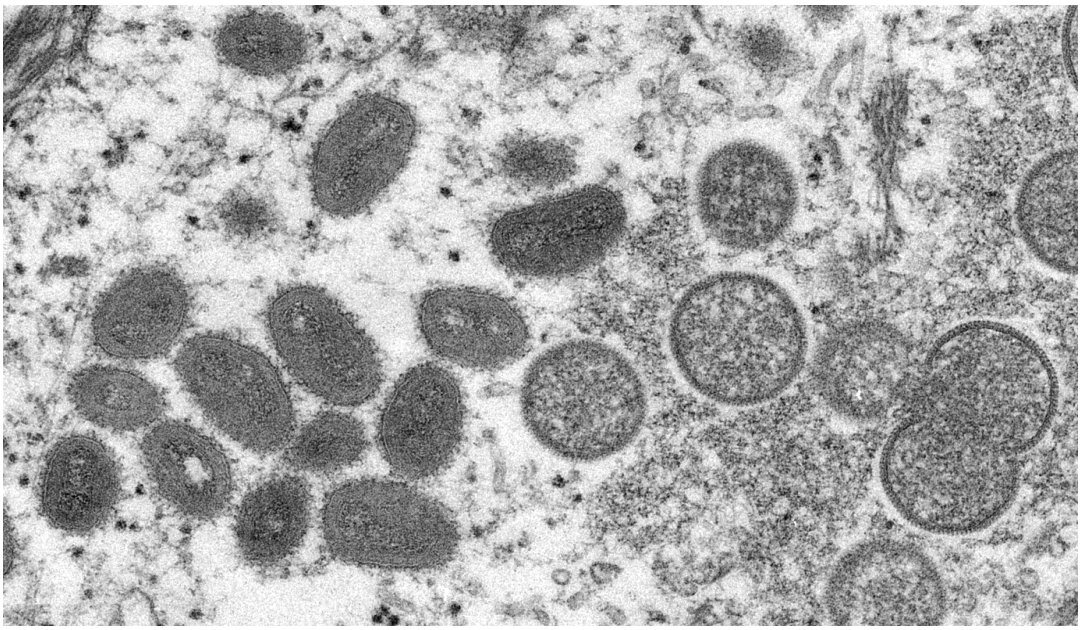


**Figure 4.** Monkeypox virus particles[14]



This electron microscopic (EM) image depicted monkeypox virus particles, obtained from a clinical sample associated with the 2003 prairie dog outbreak. It was a thin section image from a human skin sample. On the left were mature, oval-shaped virus particles, and on the right were the crescents, and spherical particles of immature virions. Credit's: CDC/ Cynthia S. Goldsmith[14]

## References

1. Educatepark. Puff the magic dragon. [Internet]. [cited 2022 August 23]. Available from: https://www.educatepark.com/แปลเพลง/แปลเพลง-puff-magic-dragon-peter-paul-mary/.
2. Centers for Disease Control and Prevention. History of smallpox. [Internet]. [cited 2022 August 23]. Available from: https://www.cdc.gov/smallpox/history/history.html.
3. Centers for Disease Control and Prevention. About Monkeypox. [Internet]. [cited 2022 August 23]. Available from: https://www.cdc.gov/poxvirus/monkeypox/about/index.html.
4. CNBC. WHO declares rapidly spreading monkeypox outbreak a global health emergency. [Internet]. [cited 2022 August 23]. Available from: https://www.cnbc.com/2022/07/23/who-declares-spreading-monkeypox-outbreak-a-global-health-emergency.html.
5. World Health Organization. Multi-country outbreak of monkeypox. [Internet]. [cited 2022 August 23]. Available from: https://www.who.int/docs/default-source/coronaviruse/situation-reports/20220810_monkeypox_external_sitrep.pdf?sfvrsn=ccb541dc_5&download=true.

6. Centers for Disease Control and Prevention. Monkeypox: what to do if you suspect monkeypox. [Internet]. [cited 2022 August 23]. Available from: https://www.cdc.gov/poxvirus/monkeypox/pdf/mpx-clinician-what-to-do.pdf.
7. Centers for Disease Control and Prevention. Monkeypox: treatment. [Internet]. [cited 2022 August 23]. Available from: https://www.cdc.gov/poxvirus/monkeypox/if-sick/treatment.html.
8. Centers for Disease Control and Prevention. Monkeypox: vaccines. [Internet]. [cited 2022 August 23]. Available from: https://www.cdc.gov/poxvirus/monkeypox/vaccines/index.html.
9. Ministry of Health and Family Welfare, Government of India. Guidelines for management of monkeypox disease. [Internet]. [cited 2022 August 23]. Available from: https://main.mohfw.gov.in/sites/default/files/Guidelines%20for%20Management%20of%20Monkeypox%20Disease.pdf.
10. Department of Medical Services, Ministry of Public Health. Guidelines for diagnosis, treatment and prevention of monkeypox infection. [Internet]. [cited 2022 August 23]. Available from: https://r8way.moph.go.th/r8wayadmin/page/uploads_file/20220804025429.pdf.
11. BBC. What is monkeypox and why is it spreading? [Internet]. [cited 2022 August 23]. Available from: https://www.bbc.com/future/article/20220801-what-is-monkeypox-and-why-is-it-spreading.
12. Cardona M. How climate change can cause viruses like monkeypox. [cited 2022 August 23]. Available from: https://www.star-telegram.com/news/nation-world/article264566446.html.
13. Centers for Disease Control and Prevention. Monkeypox: graphics. [cited 2022 August 23]. Available from: https://www.cdc.gov/poxvirus/monkeypox/resources/graphics.html.
14. Centers for Disease Control and Prevention. Public health image library: details. [cited 2022 August 23]. Available from: https://phil.cdc.gov/details.aspx?pid=22664.