

# Similarities and Differences between COVID-19 and Monkeypox Virus

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**Abstract:** World Health Organization has announced Corona Virus as a pandemic causing infectant. Similarly, Monkeypox virus also has affected numerous people across the globe after CoV outbreak. The purpose of the study is to analyse about disease's occurrence and how similar and different they are to one another in several aspects. The regional surveillance system noticed an upsurge in monkeypox (MPX) infections in the Democratic Republic of Congo (DRC) October 2013. There is little knowledge of how MPV entered the community and the elements that influence transmission within the homes. There were 68 wild creatures gathered and examined for the orthopoxvirus. Antibodies to two of the three rope squirrels (*Funisciurus* sp.) were positive with rthopoxviruses, but there was no evidence linking rope squirrel intake or preparation to a higher risk. To find risk factors of introduction of MPV transmission in community and homes a case-control and retrospective cohort investigations were carried out and the people who were most usually recognized as the first person infected in the family were male students. Using the same plate or cup as the primary case while sleeping in the same room or bed was another risk factor for contracting MPXV in a family. Eating or preparing wild animals did not pose any substantial risks. The virus causing COVID-19 is SARS-CoV-2 it shares a genome with two bats coronaviruses which are 82% bat-SL-CoVZXC21 and bat-SL-CoVZC45 by more than 89%. The WHO has classified this as a global pandemic and only supportive care is offered to patients as of right now. Presented Review article contains a detailed note on various similarities and differences between both the pandemic viruses.

**Keywords:** Coronavirus, Differences, Monkeypox virus, Pandemic, Similarities.

## I. INTRODUCTION

Viral disease are infections that are caused by viruses. Viral diseases are contagious. Popular means on how virus can spread from one person to another include inhaling the droplets of airborne that are contaminated by viruses, consuming contaminated food or taking contaminated water, having sex with someone who has sexually transmitted virus, indirectly

transmitting viruses from one person to another via virus host like a mosquito and touching surfaces or body fluids that are contaminated by viruses [1].

A person's health and overall health, as well as the sort of viral infections they have, might affect how severe and what symptoms they experience from viral diseases. The most popular viral diseases include common cold and flu which are self-limiting to ones health meaning that the virus causes illness for a time period before resolving itself, while symptom start disappearing the virus is attacked by the body immune system and the sick person recovers [2]. Sometimes viral diseases can bring serious complications like pneumonia, dehydration, acute bronchitis, seizures, cervical cancer and also other secondary bacterial infections, influenza.

## II. MONKEYPOX VIRAL INFECTION

Monkeypox is an illness that was first known in the year 1958 due to pox like diseases that was seen in monkeys but its first case was recorded in 1970 [7]. Before the 2022 outbreak, cases out of Africa were documented by residents of Western and Central Africa, although they were associated with either imported animals or international travel to nations where the illness regularly occurred [3].

Causative agent of monkeypox is monkeypox virus (MPV). The monkeypox virus is an Orthopoxvirus genus (that includes camel pox, cowpox, vaccinia and variola virus) of family poxviridae. So monkeypox is a zoonotic virus which means it can spread from animal to people, from people to other people and from the environment to people [4].



Fig. 1: Monkeypox Diagram

### A. Transmission

Monkeypox can be transmitted among people when one is in close contact with a person having the monkeypox rash and by close contact it means (breathing, talking and singing), skin to skin (touching, anal sex and vaginal sex), by mouth to mouth like kissing and lastly by mouth-skin (kissing of skin or oral sex) [5].

Monkeypox can spread from environment to human by touching of any environment (like clothes, furniture, electronics or surfaces) by an infected person and then the uninfected person touches item the infection may transmit if there is any cutting, lesions or the suddenly touch of eyes, nose, mouth or other mucous membrane it is called *fomite transmission*. Washing of hands after touching contaminated surfaces or objects may assist to stop transmission of this sort. Monkeypox virus can as well spread during or after pregnancy to foetus by birth via body contact from the mother who is affected by monkeypox to the infant.

Monkeypox is also transmitted from animal to human when they come in physical contact with infected animals like non-human primate, terrestrial rodent, antelope, gazelle this can happen through bites, scratches or other activities like hunting, skinning, or trapping. The virus can be transmitted by consuming infected animals that are not cooked properly, by avoiding unprotected contact with animal and cooking meat thoroughly before eating can reduce monkeypox transmission risk [6].

### B. Symptoms

Monkeypox symptoms can either be less severe or serious in such a way one may require care from the health facility, people who have high risk at being infected are children, pregnant mothers and immunocompromised people [7].

Primary symptom of monkeypox is rash appearance that is itchy and painful near genitals that is (penis, testicles, labia, vagina, anus) and body areas like feet, mouth, chest, hands. The rash is seen to go through various stages (macular, papular, vesicular, pustular) before healing.

Other monkeypox symptoms are:

- Swollen lymph nodes
- Chills
- Exhaustion
- Muscle and back aches
- Fever and head ache
- Respiratory symptoms like sore throat, cough and nasal congestion

To some people it may occur all or just few symptoms:

- Some may experience flu like symptoms before rash occurrence.

- Some the rash may be seen first then other symptoms follow.
- And some only experience the rash.

Monkeypox symptoms start to occur within 3 weeks of exposure to the virus, if someone experiences flu-like symptoms first then the rash will develop 1-4 days after some time that is 2-4 weeks symptoms start to heal, all scabs fall off and a fresh layer of skin will then start to form.

### C. Prevention/Protection

- Protect yourself by staying away from unprotected contact with animal that are sick or dead it includes touch or eating the meat that's not thoroughly cooked [8].
- Prevent/reduce meeting with people who have been suspected or confirmed to have the illness, one should always be informed about monkeypox spreading around the area.
- Frequently cleaning and disinfecting commonly touched places in the environment that could have high risk of being contaminated with the virus.
- Isolate oneself in a separate room, open windows for ventilation, use a separate washroom and every after use clean with disinfectant and use alcohol hand sanitizer or soap and lots of water to wash your hands regularly even when you have touched different places, use separate utensils and electronics like phones, do your laundry personally and put everything in a plastic bag before washing the clothes, use soap together with water temperature to be greater than 60 degrees; this is if your living with others and you are infected [9].
- Wear a well fitting mask and cover the rash with a piece of cloth or bandage also avoid touching each other, clean hands often and open the window; this is if you can't avoid being in the same room with others and you are infected.
- If you believe you may have monkeypox, you can help others by obtaining medical assistance and avoiding contact with others until you are examined and tested and if your confirmed with monkeypox then one should completely be separated from other people till each and every lesions and wounds are crushed and fallen off and new skin layer is formed and all sores all over your body have healed this will help to avoid spreading diseases to others [10, 11].

### D. Treatments

Specific treatment for monkeypox is not available instead since the virus causing monkeypox is like that of smallpox then the antiviral drugs that are used to treat smallpox can be used in its treatment [12].

- Tecovirimat (TPOXX) is one of the drugs that is used to treat smallpox but is approved by the FDA to treat

monkeypox to both adults and children. TPOXX is accepted by FDA for curing monkeypox but it is considered as an investigational drug so when given this medication then one is given a consent form to sign to know that it's an investigational drug. This drug is used as an emergency drug for people with severe monkeypox and should not be given to people with mild monkeypox symptoms simply because it may cause resistance of monkeypox virus to the medication, it helps to minimize or prevents serious monkeypox disease that involves the eye, mouth, throat, genitals and anus which gives short term relief like swelling, pain and long-term effects such as scar appearance by reducing a large amount of virus in the body.

- Cidofovir (Vistide) it is used for treating AIDS patients with cytomegalovirus (CMV) it has shown effectiveness in treatment of Orthopoxvirus in in-vitro and animal studies, CDC (Centre for Disease Control and Prevention) has allowed the drug in the treatment of Orthopoxvirus including monkeypox.
- Brincidofovir (CMX001 or Tembexa) is used for treatment of small pox to both adults and children and also neonates its approved by the FDA though there is no effective data for this drug to treat monkeypox patients, the drug was effective against Orthopoxvirus (virus causing monkeypox) in in-vitro and animals studies so CDC is developing an EA-IND to help facilitate the use of the drug in monkeypox treatment [13-16].

During the treatment of monkeypox one should also make efforts to reduce the monkeypox symptoms and also should take medicine that reduce pain example ibuprofen (Advil and Motrin) and acetaminophen (Tylenol) which may assists one to be better.

### E. Vaccine

The vaccines used in monkeypox are:

1. JYNNEOS vaccine
2. ACAM2000 vaccine

#### JYNNEOS Vaccine

This is a live vaccine that is primarily being used in the US due to monkeypox outbreak it is approved for the prevention of both smallpox and monkeypox. It is composed of vaccinia virus which is weakened and cannot copy itself in human cells so cannot spread to other body parts, the virus is related to smallpox and monkeypox [13]. JYNNEOS vaccine is administered in 2 doses the second of which is given 28 days following the first, if one is unable to get the second dose on time then 35 days interval after first dose is also approved and one is considered vaccinated 14 days after the second vaccine. CDC (Centre of Disease Control and Prevention) has recommended getting the full dose that is the 2 doses simply because protection against

MPV for a single dose is not known yet. Its dose is 0.5 mL/ single dose vial [17-20].

#### ACAM2000

This is a vaccine that approved for the prevention against smallpox as well as MPV, it is a single dose and one is considered to be vaccinated 28 days after the dose intake its a substitute of JYNNEOS vaccine; this vaccine is administered by use of multiple pricks on the skin by use of a special needle which causes a sore formation called take which heals after several weeks. ACAM2000 is administered by pricking the surface of the skin in many times normally its on upper side of the arm. A wound named take will appear in the position of the skin that's pricked this is very common. To stop the vaccinia virus from multiplying throughout the body, one should take extra care with their "take".

This vaccine should not be given to people who have weak immune system inconclusive of HIV patients, pregnant or breastfeeding mothers, heart and skin conditions like eczema, psoriasis or ocular diseases treated with steroids [21-22].

### F. Graphical Analysis

Graphical analysis of monkeypox outbreak in 2022.

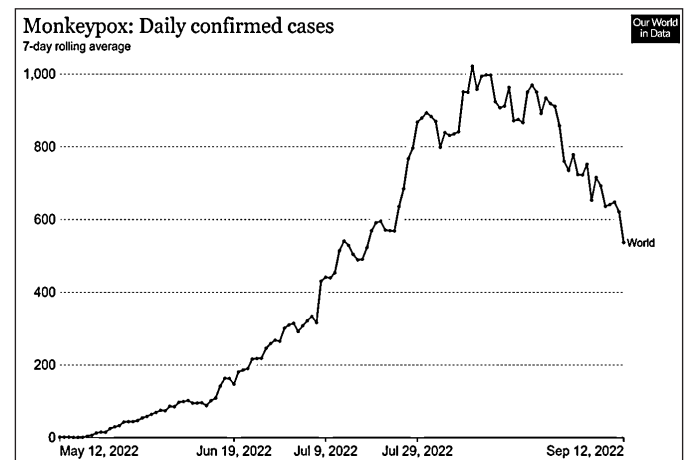


Fig. 2: Graphical Analysis of Monkeypox

## III. COVID-19

SARS-CoV-2 is a causative agent of COVID-19. This infection started during late December in 2019 in Wuhan, China as unknown disease (pneumonia) with a cause that is not known also it infected 9720 people in China where 213 people died and countries other than china it affected 106 people this was until 31<sup>st</sup> January 2020. After some time the agent causing the pneumonia was then discovered to be novel coronavirus (nCoV). The causative virus, severe acute respiratory syndrome coronavirus 2, and the relevant infected disease, coronavirus disease 2019 (COVID-19), were both named by the WHO (SARS-CoV-2) [23].

### A. Symptoms

Most popular are:

- Fever
- Exhaustion
- Dry cough

Other symptoms that may affect patients are:

- Diarrhoea
- Headache
- Nasal Congestion
- Muscle and joint pain
- Diarrhoea
- Chills and dizziness
- Sore throat
- Nausea and vomiting
- Irritability
- Reduced consciousness can cause seizure
- Anxiety
- Chills and dizziness
- Depression and sleep disorders
- Neurological complications like stroke, brain inflammation and nerve damage

Severe symptoms of COVID-19 include:

- Breath shortness
- Confusion
- Loss of appetite
- Pressure in chest and persistent pain
- High temperature of above 38 degrees

### B. Transmission

Individuals in close proximity might spread the corona virus to one another (within 6 feet, or 2 metres). The virus can be transmitted by respiratory droplets of when they infected person breath, sneezing, cough, sings and talking. Infectious particles that travel through the air and are inhaled at a close distance are named as short-range aerosol or short-range airborne transmission and if the particles of infections move straight to the eyes, nose, or mouth of another person nearby it is named as droplet transmission [24].

Since aerosols can stay or travel in the air beyond than conversational distance, or long-range aerosol or long-range airborne transmission, then corona virus can spread in areas that are poorly ventilated and crowded areas when people stay for a long time.

The virus can also be transmitted after one has touched an infected environment or area then touches the eyes, nose or mouth without washing hands or sanitizing them.

Asymptomatic transmission is referred as propagation of the virus from an infected person who is asymptomatic (people who don't show any COVID-19 symptoms). Presymptomatic transmission refers to the propagation of the virus from an individual who is infected but has not yet manifested symptoms.

### C. Prevention

To avoid corona virus, one should take the following precautions:

- Even if the people around you don't seem to be ill, keep your distance and keep at least 1 metre between you and them because some people don't exhibit symptoms.
- Always make sure to wash your hands before putting on the mask mostly when you cannot maintain a physical distance or when you are indoors. Wear a well-fitting three-layer mask.
- Spend more time outside than inside, avoid congested areas, poorly ventilated interior spaces, and lengthy interaction with others.
- To enhance the amount of external air inside when you're inside, open the windows.
- Keep your distance from public surfaces or medical institutions for protection when someone with COVID-19 has touched them. Always wipe surfaces periodically using a normal disinfectant.
- Frequently wash hands using a hand sanitizer that is alcohol based that you keep and use when needed.
- When sneezing or coughing, protect your mouth and nose using a flexed elbow or a tissue, and throw it away immediately after use.
- If you or your kid develops a fever, a cough, or is having trouble breathing, seek medical attention as soon as possible.
- Get vaccinated.

### D. Treatment

If one has COVID-19, there are drugs that can lessen the risk of death from the illness or from hospitalization. When corona symptoms first appear, therapy should begin as soon as possible. Use of some antiviral drugs are aiming for the virus specific parts then prevents its multiplication in the human body as an outcome it prevents the disease propagation, as for monoclonal antibodies they help the immune system to notice and capture the virus effectively so the FDA has approved some antiviral drugs and monoclonal antibodies to be used in treating COVID-19 [25].

#### *Anti-Viral Medications*

- Nirmatrelvir with Ritonavir (Paxlovid)

This is an investigational drug that treats mild to moderate COVID-19, its investigational drug since its still being studied

and its given in times of COVID-19 progression at a very high rate which includes death and hospitalization. It has side effects like allergic reactions, problems of the liver (like loss of appetite, yellowing of skin and jaundice), resistance to HIV medications, diarrhoea, nausea and muscle aches.

Taken by adults and children that are 12 years old and above weighing at least 40 kg. The dose must start very soon that is 5 days after the symptoms have been noticed.

- Remdesivir (Veklury)

This attaches to the virus of RNA that depends on RNA polymerase to retard replication of the virus by putting an end to RNA transcription when it is still too soon so preventing SARS-CoV-2 from spreading to the body. It has effects like nausea, increase level of prothrombin time without a change in the normal ratio, hypersensitivity and elevated transaminase level.

It taken by both adults and children and dose start after 7 days of symptoms occurrence its given in intravenous infusion for 3 days consecutively.

- Molnupiravir (Lagevrio)

It is an investigational drug used to prevent severe and less severe COVID-19 in adults its not authorized for people under 18 years it is used for 5 consecutive days and its ineffective for pregnant mothers. It has side effects like allergic reactions, nausea, vomiting and dizziness.

#### Monoclonal Antibody

- Bebtelovimab

It is an IV injection used by both adults and children having above 12 years old the dose begins 7 days when symptoms begin. This drug fights corona virus infection by blocking the virus from attaching body cells. Its side effects are back pain, chest pain, difficulty in moving, fast or irregular heart beat, headache and itchy skin.

- Sotrovimab

Authorized for emergency use issued by FDA for curing both severe and less severe COVID-19 to both adults and children of above 12 years old who weigh above 40 kg given within 7 days after symptoms are seen for patients that have high risk of COVID progression. Its not given to obese patients, pregnant, diabetes, cardiovascular diseases, sickle cell and cerebral palsy [26].

#### E. Vaccine

There are several COVID-19 vaccines:

- Comirnaty

It's a MRna-Pfizer (R<sub>x</sub>) it requires dilution before administration and after dilution it produces six [30-mcg] doses/vial.

It is used as an active immunization in opposition to SARS-CoV-2 that cause coronavirus illness.

It's of 2 -dose primary series; 0.3 mL (30 mcg) IM x 2 doses administered 3 weeks apart and between dose 1 and 2 stays the suggested interval for those who need quick protection because it increases worry about community transmission or risk of serious infections, those over 65, those who are moderately or severely immunocompromised, and others.

#### Composition

One dose (0.3 mL) is composed of 30 micrograms of tozinameran, a COVID-19 mRNA Vaccine (embedded in lipid nanoparticles). Tozinameran is a single-stranded, 5'-capped messenger RNA (mRNA) produced using a cell-free in vitro transcription from the corresponding DNA templates, encoding the viral spike (S) protein of SARS-CoV-2.

#### Boosting Drug

Administration of Pfizer or Moderna omicron BA.4/BA.5-adapted bivalent COVID-19 vaccine booster for at least 2 months after completing the first vaccine [27].

- Spikevax

MRna-Moderna R<sub>x</sub>, its given for active immunization for preventing COVID-19 that is brought by SARS-CoV-2 to ones with greater than 18 years. It's a 2-dose primary series of 0.5 ml (100 mcg) x 2 doses administered 4 weeks apart. The booster dose is administered either Pfizer or Moderna omicron adapted in the bivalent COVID-19 vaccine booster for 2 months (at least) after completing the first dose.

#### Dose

Primary Dose: 100 mcg/0.5 mL

Booster Dose: 50 mcg/0.25 mL

#### Composition

One dose (0.5 mL) is composed of 50 mg of elasomeran, a COVID-19 mRNA Vaccine that is embedded in lipid nanoparticles. Elasomeran is a single-stranded, 5'-capped messenger RNA (mRNA) that is produced using a cell-free in- vitro transcription from the corresponding DNA templates encoding the viral spike (S) protein of the SARS-CoV-2 virus.

- Johnson & Johnson (Ad26.COV2.S)

It is a viral vector made by Janssen, and it is recommended for use in people over the age of 18 who cannot obtain existing vaccines that are approved by FDA and who need to actively stop coronavirus disease.

#### Composition

It is composed of: recombinant, replication-incompetent adenovirus type 26 expressing the SARS-CoV-2 spike protein, citric acid monohydrate, trisodium citrate dihydrate, ethanol, 2-hydroxypropyl-β-cyclodextrin (HBCD), polysorbate-80, sodium chloride.

Primary Series: 0.5 ml IM as a single dose

Booster Dose: Administer either Pfizer or Moderna omicron BABA.4/BA.5-adapted bivalent COVID-19 vaccine booster not less than 2 months after finalization of the first dose.

- Novavax

**Composition**

5 mcg/0.5 mL of SARS-CoV-2 recombinant spike (rS) protein and 50 mcg Matrix-M adjuvant.

**Dosage**

2-Dose Primary Series: 0.5 mL IM x 2 doses administered 3 weeks apart.

Booster Dose: Administer either Pfizer or Moderna omicron BA.4/BA.5-adapted bivalent COVID-19 vaccine booster at least 2 months after completion of primary vaccination.

For the immunocompromised that is adults over 65 years old and those who require quick defence due to greater worry about spreading in the community, chronic and complicated illness, a shorter gap between doses 1 and 2 (three weeks) is advised.

Due to the low risk of myocarditis linked with mRNA, an interval of 8 weeks which is ideal for individuals under 12 years old, particularly for men in the age of 12-39 years old.

- Covaxin

**Composition**

Coronavirus that is inactivated, Aluminium Hydroxide Gel, TLR 7/8 Agonist, 2-Phenoxyethanol and Phosphate Buffered Saline [NKA1] Covaxin.

**Dosage**

Its given in 2 doses 0.5 ml each dose in 4 weeks apart.

**Contraindication**

The vaccine has a contraindication for people with a history of allergies.

**F. Graphical Analysis**

Graphical presentation of COVID-19 outbreak word wide.

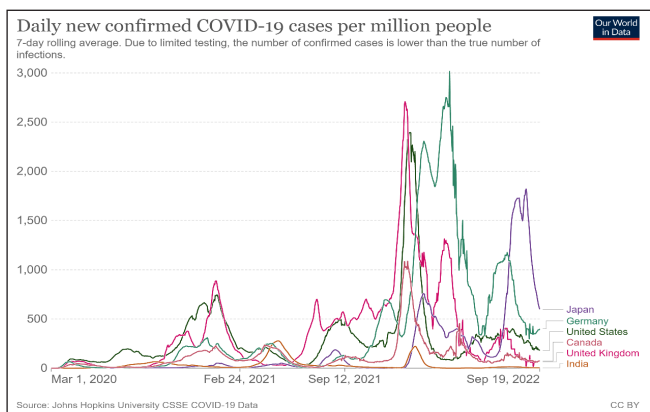


Fig. 3: Graphical Analysis of COVID-19

**IV. DIFFERENCES OF MONKEYPOX AND COVID-19**

- Genome and Structure of the Virus

The corona virus structure is very different to the structure of MPV. SARS-CoV-2 is from family Coronaviridae its structure is similar to all other coronaviruses variants in that it has a small size of 100 nm diameter with a spherical shape having a single stranded RNA virus that is enveloped with spike (S) proteins in which it attaches itself to the host cell using ACE2 enzyme then protein is conveyed to the body and infection begins [28]. MPV from Poxviridae it is long in size (220-450 nm) and its brick or oval in shape composed of double stranded DNA genome that is encapsulate in a core together with the enzymes that are responsible to attack of immune defences of the host. It has surface proteins like the SARS-CoV-2 that enables the entry in the host cell, it uses 11-12 transmembrane proteins which fuse with the host cell that binds to glycosaminoglycans or laminin on surface of the cell.

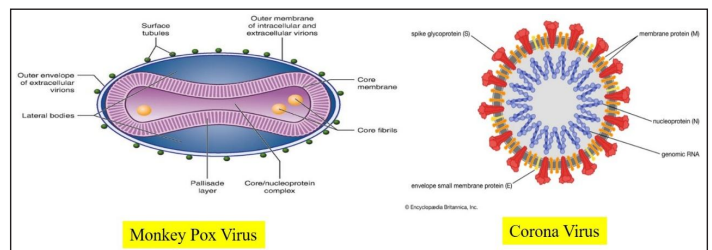


Fig. 4: Structures of MPX and CoV Virus

- Modification and Darwinism

The contrast of genes of SARS-CoV-2 and MPV has played a big role in modification results. The RNA viruses like of coronaviruses can be sloppy replicators, RNA polymerase duplicates the virus genes makes it incompetent to capture and affix replication mistakes. RNA virus of coronavirus doesn't have enzyme (exoribonuclease) for analysing replication errors so slows the possession of the mutations in SARS-CoV-2 but fails to bring it all to the end so mutation progresses randomly and spreads quickly if its helpful to the viral strength. During 2021 the SARS-CoV-2 delta variant took control of the pandemic worldwide while at 2022, omicron was easily spread among people this replaced the delta variant which was the most superior variant as a result omicron spread was escalated [29].

Monkeypox has 2 viral variants; the Congo Basin variant and West African variant (less toxic) has pointed out recent occurrences in nations which was not endemic. Viral DNA example MPV is prohibited to transform as easy as viral RNA, the enzyme used for DNA viral replication (DNA polymerase) are preferred in analysing together with affixing gene mistakes rather than in RNA viral replication (RNA polymerase). Poxviruses gets one to two transformations each year and prof indicates one MPV can get approximately fifty mutations similar to the variants identified in 2018-19, if or how the

genetic interchanges it impacts of monkeypox transmission is still not clear. Mutations do not show the virus's rate of mutation, but it indicates the period it consumed in people (data suggest MPV was going around among people in Africa and Europe for some years prior to cases that began in May 2022. This has helped to differentiate that SARS-CoV-2 virus has mutated several ways that are mainly due to replication mistakes that the population can or cannot fix [30].

- Incubation Period

The vaccine of monkeypox, which was introduced in 2019, can prevent the disease on a person who has been exposed or who is at risk of exposure, such as a caregiver or household contact. The incubation period is relatively long and can last for one to two weeks. Another thing that distinguishes monkeypox from COVID-19, an unique virus that necessitated the development of a new vaccine, is the fact that we already have an efficient vaccine. Because monkeypox and small pox are similar, we are familiar with how to treat it.

- Monkeypox and COVID-19 Reservoirs

The diseases COVID-19 and monkeypox are zoonotic, which means they can be spread from animals to people. Although they are currently insufficient direct evidence to support the transmission chain, SARS-CoV-2 is believed that it has originated from bats and went to other animal like pangolins or minks initially then was transmitted to humans [31]. Initially monkeypox was found in monkeys that were hold on to for investigation in Congo rodents such as squirrels and pouch rats are thought to be the virus keepers. MPV was isolated from wild animals on 2 instances, from rope squirrel and sooty mangabey in Cote d'Ivoire in 2012, and for SARS-CoV-2 further investigation is done for recognition of its start.

- Spread of the Disease

The respiratory virus SARS-CoV-2 is transmitted when an infected person exhales virus droplets and uninfected person inhales the droplets or droplets strike the nose, eyes, mouth or both then a person contracts the disease since SARS-CoV-2 is transmitted by air its difficult to fix since by breathing a person can spread the illness to others. COVID-19 can be transmitted when one don't have the symptoms (asymptomatic) [32]. Unlike COVID-19 which is a respiratory virus monkeypox is not but it can be spread by respiratory secretions. Additionally, it can be transmitted by direct contact with an infected person's monkeypox rash, scabs, or bodily fluids as well as through touching objects and surfaces that they have used while ill. A person's risk of infection is low during activities like putting on clothes at a store since they would need to come into prolonged contact with clothing that has been exposed to monkeypox lesions. Monkeypox is clearly much less transmissible than COVID-19 because MPV continues to spread mainly through nearer prolonged contact. Researchers are still figuring out whether MPV propagates particularly via sexual routes (like semen or vaginal fluids) and if the virus can be conveyed before appearance of symptoms.

- Health Condition Signs and Severity

After being exposed to the SARS-CoV-2, signs of COVID-19, such as fever, chills, sore throat, loss of taste or smell, and headache, begin to appear anywhere between two and fourteen days later. Even though some people experience extended symptoms that last for 3+ months, most people start feel good after some time period. Death may result from COVID-19. Threat of extreme COVID-19 is dependent on a number of serious aspects such as the SARS-CoV-2 variant that caused the illness, a person's span, immunization history, if or not they are immunocompromised.

Monkeypox symptoms may resemble COVID-19 symptoms in the start of the disease (example: fever, headache, and chills) and may take till three weeks to manifest following to meet another MPV patient depending on the individual. Clinically, monkeypox is different from COVID-19 but it is characterized by the appearance of an itchy, painful rash that usually affects the face, extremities, and genitalia. Monkeypox can be severe and even fatal, but the recovery time for most people is between two and four weeks. 5 of the 12 deaths from monkeypox since January 2022, according to the WHO, happened outside of Africa. The MPV strain that causes an infection like COVID-19 influences how severe the sickness is. Age (young children can highly acquire serious illness) and the existence of underlying diseases are other factors that affect monkeypox severity [33-36].

- Diagnosis

Quick antigen assays enable COVID-19 self-testing by individuals at home. There are various Nucleic Acid Amplification Testing (NAAT) options example the Polymerase Chain Reaction (PCR). The procedures, used to identify SARS-CoV-2, entail separating and enhancing the genetic information from patient samples in labs or health care centers (such as drug stores and school hospitals) [37].

Monkeypox can only be diagnosed by one of five commercial labs or the public health laboratory, and only confirmatory testing is done using PCR on pustule fluid or dry crust from scab abrasion. At a point-of-care facility, there aren't any choices for home testing right now. Other diagnostic methods that support the simplicity, accessibility, and diagnostic capabilities of monkeypox testing may be created if outbreaks of the disease spread and case numbers increase.

## V. SIMILARITIES OF MONKEYPOX AND COVID-19

- Both illnesses are zoonotic which means that both are transmitted from animals to people where COVID-19 virus is from bats to human and monkeypox virus is from monkey to human [38].
- Both are viral diseases as they are both caused by virus where monkeypox is caused by monkeypox virus and COVID-19 is caused by SARS-CoV-19 [39].

- Both have some similar symptoms like fever, fatigue, headache, muscle pain, nausea and vomiting [40-41].
- Both illness can be tested in laboratories by PCR assay where monkeypox the rash fluid are tested and COVID-19 is mouth or nostrils secretions.
- They have common ways of prevention like sanitizing and washing hands after touching contaminated or public surfaces, putting on mask, staying in a well ventilated rooms and avoiding crowded places [42-45].

## VI. CONCLUSION

The survey was done by preparation of questionnaire on both diseases and 95% of people from the survey were suffering from COVID-19 but as for monkeypox 1% was obtained in which men were seen to be highly affected by monkeypox compared to women but for COVID-19 the ratio of infection was the same.

Analysis of the survey data that is obtained from several research sources is that COVID-19 pandemic's power and rate of the healing depends in the nation's acquisition of health, humanitarian, and socioeconomic measures since it is still spreading throughout the world on an uncertain trajectory. The intensity of COVID-19 in the world may finally be controlled at a pretty low level if all these initiatives are taken into account.

Analysis of monkeypox from sources is that monkeypox virus became visible in the series of various of dermatologic and systemic clinical findings with simultaneous findings of cases out of places where the disease was originated and according to several sources such as WHO, monkeypox is seen to be decreasing globally as people are taking into consideration all the preventive and health measures.

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