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Monkeypox Virus Disease

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Abstract: ***12th July, India got its first patient detected positive for monkeypox who had travelled to U. A. E. few days back. Monkeypox updated as on July 10, 611 confirmed cases reported in 65 countries. CDC is trying to alert patients who have rash illness consistent with monkeypox regardless whether they have travelled or specific risk factors for monkeypox and gender or sexual orientation. CDC is contact tracing now to identify who may have been in contact with people who have tested positive for monkeypox so they can monitor their health, and also tracking several countries where that don't normally report monkeypox, it is advised to wear PPE Kit (personal protective equipment) for all health care workers. Patient with monkeypox should isolate at home. Vaccination is recommended. Either with ACAM2000 or JYNNEOS to protect them if they have exposed to an orthopoxvirus, this is known as exposure prophylaxis (PrEP). Proper data is not yet available. People is considered fully vaccinated about 2 weeks after their second shot of JYNNEOS and 4 weeks after receiving ACAM2000, Even after vaccination preventive steps are required to be taken***

Keywords: monkeypoxvirus, vaccination, CDC, PPE

1. Introduction

First case age 35yr of mokeypox is detected in India on 12 July 2022, patient had Travelled from UAE to India, one of his friend was found to be positive few days ago, the patients is recuperating well, the Kerala government has informed. First outbreak of monkeypox had occurred in 2003 in western hemisphere, it was referred to pet dogs imported from Ghana and were kept with other rodents. Monkeypox virus was named from where it was originally, isolated and rodents were primary viral reservoir. Zoonoses are infection transmitted from animal to humans, its most re-emerging human pathogen. IT'S found in Africa mostly tropical rainforest regions.

Monkeypox is a viral zoonotic (infection transfer from animals to humans) disease, identified in animals - Rodents, Rope Squirrels, Tree squirrels, Gambian porched rats, Dormice, African Dormouse, sooty Mangabey, Non-Human primates.

Near about 1200 cases from 12 non endemic countries and 82 suspected cases in 32 endemic countries as estimated by world health organisation, on 09 June. The clinical presentation of monkey pox resembles to that of smallpox, a related orthopoxviral infection which was declared eradicated worldwide in 1980. Monkeypox is less contagious than smallpox and causes less severe illness.

Orthopox virus genus	Monkeypox virus
Species	Extinct Africa
Host Reservoir	Rodents
Family	Poxviride
Human Disease	Smallpox like systematic
Natural host of Monkeypox	Not known

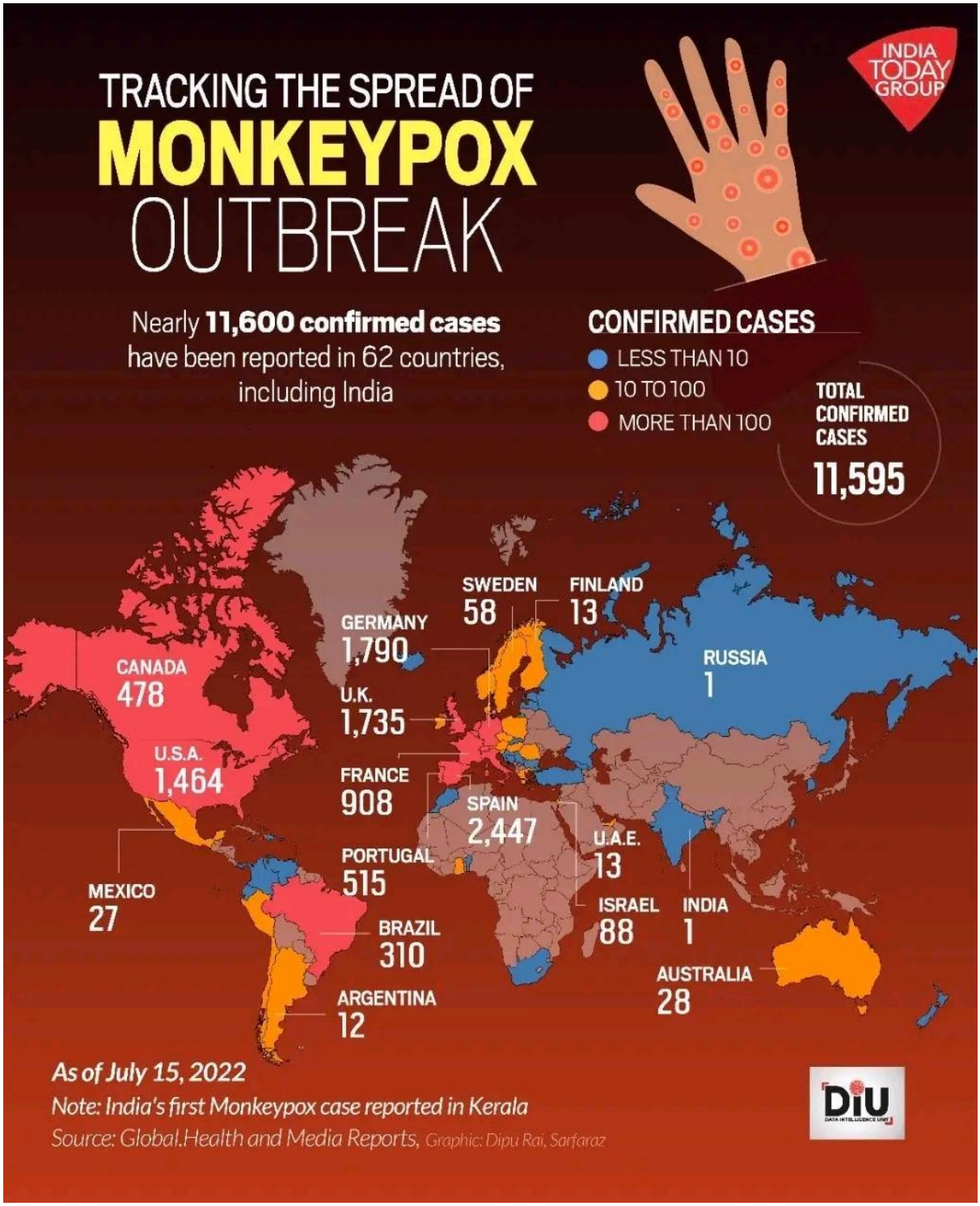
Environmental and Social Factors of Emergence

Deforestation
Civil unrest and poverty
Climate change
Cessation of smallpox vaccination

Monkeypox virus -

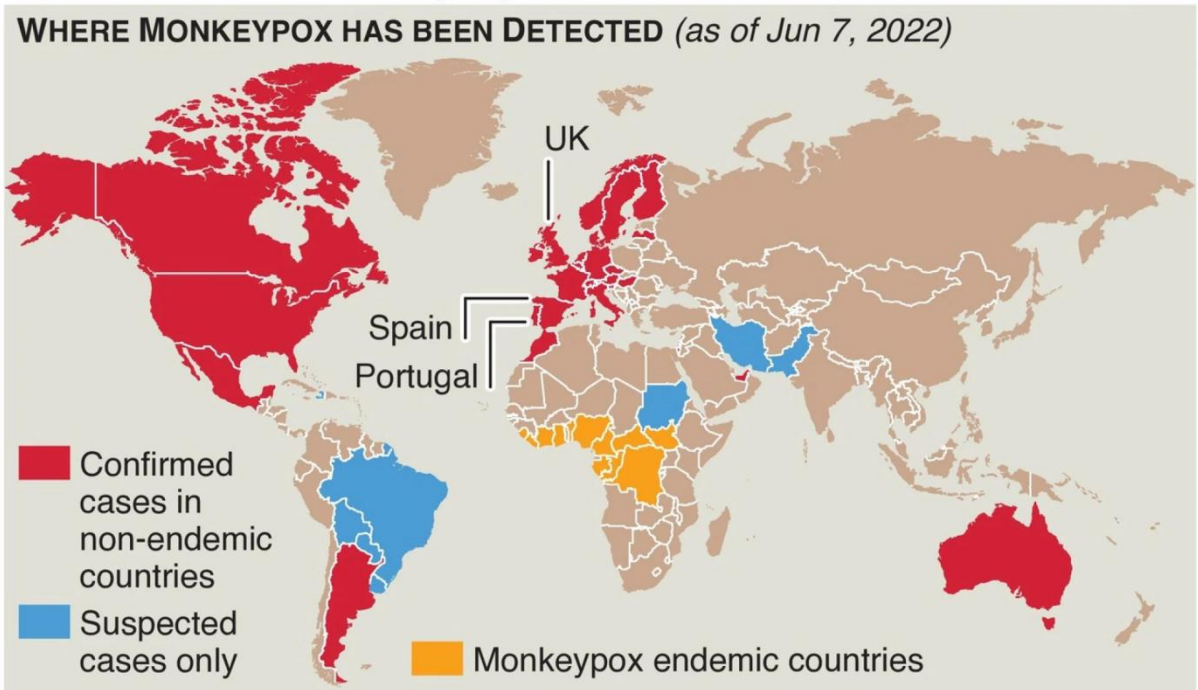
Non Endemic Countries: Australia, Belgium, Canada, Germany, France, Italy, PORTUGAL, Spain, Sweden, U. K., U. S. A.

Endemic Countries: Benin, Cameroon, the Central African, Republic, the Democratic Republic of the Congo, Gabon, Ghana, (identified in animals only), Ivory, Coast, Liberia, Nigeria, the Republic of the Congo, Sierra Leone and South Sudan.



Countries affected by monkeypox

Recent outbreaks of monkeypox – a viral infection typically found in west and central Africa – are occurring in countries that would not normally expect to have the disease



Number of confirmed cases in non-endemic countries

UK	303	U.S.	27	Ireland	6	Norway	2
Spain	198	Italy	25	Sweden	5	Austria	1
Portugal	153	Belgium	17	Slovenia	3	Morocco	1
Canada	81	Switzerland	8	Israel	2	Malta	1
Germany	80	UAE	8	Argentina	2	Mexico	1
France	52	Australia	6	Denmark	2	Hungary	1
Netherlands	40	Czech Rep.	6	Finland	2	Latvia	1

Sources: Global.health, WHO © GRAPHIC NEWS

Monkey pox is usually a self limited disease, with symptoms lasting from 2 to 4 weeks. Monkey pox can be transmitted from animals to humans as well as human to human. The virus enters the body through broken skin, respiratory tract or mucus membranes (eyes, nose, or mouth). Animal to human transmission may occur by bite or scratch, bushmeat preparation (Bushmeat is meat from wildlife species), direct contact with body fluids or lesions material, or indirect contact with lesion material, such as through contaminated bedding. Incubation period is usually 7-14 days but can range from F 5-21 days and the person is usually not contagious during this period.

An infected person may transmit the decision from 1-2 days before appearance of the rash and remain contagious till all the scabs fall off.

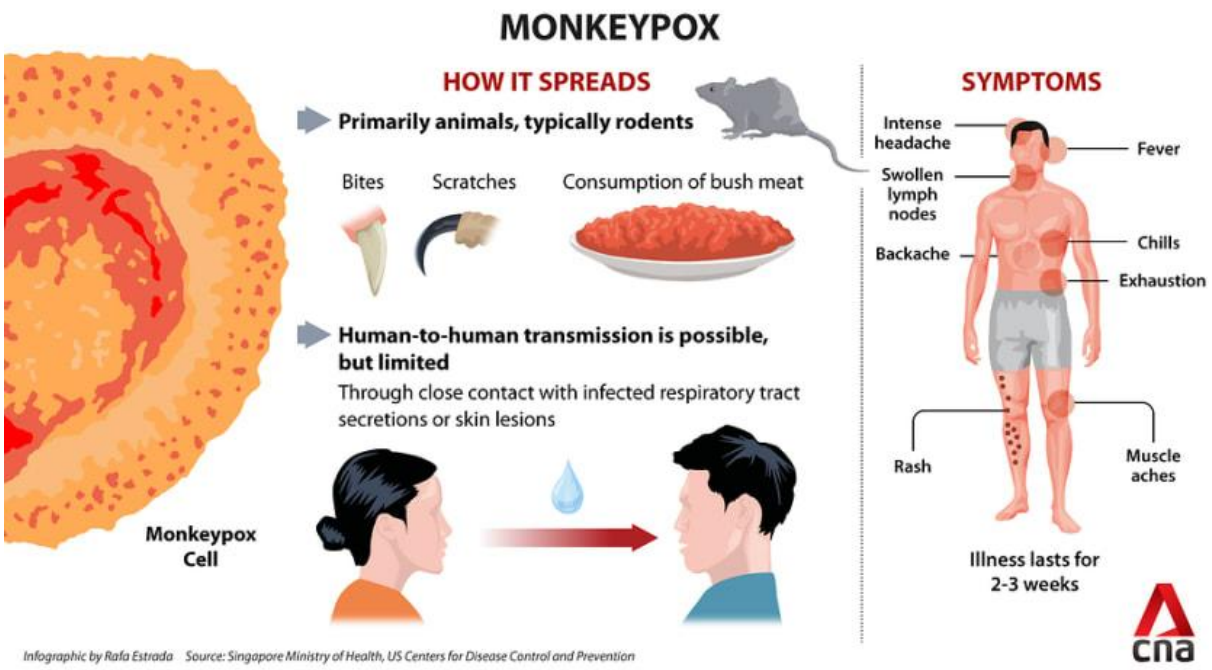
Modes of transmission:
Unprotected contact with
Respiratory droplets
Lesion material
Body fluids
Contaminated materials and surfaces

Virus enters through:-
Respiratory track
Mucous membrane - eyes, mouth
Broken skin (animal bite)

Clinical Features:
Monkeypox virus - Fever, Rash, and lymphadenopathy, 12 days after the exposure, Sorethroat, malaise, fatigue, Virus present in blood is (viremia), at the end of incubation period. small lesions in mouth (enanthem) appear towards the end

Stages:-
Macule-papule-vesicle-pustule-crust

5-12 days	Incubation period
1-4 days	Febrile stage
2-4 weeks	Rash stage
Days to weeks	Recovery



Complications:
Corneal infection and vision loss
Secondary bacterial infection
Abscess and airway obstruction
Pneumonia
Bacterial infection of the blood-sepsis
Inflammation of the brain - Encephalitis miscarriage

Fatality ratio - 10% death

Long term consequences:-
Scarring
Reduced skin pigmentation
Blindness

Asymptomatic infection may occur.

Risk factor for severe illness:-
Children
Immunodeficiency
Invasive rate of infection
Congo basin clade variant.

Differential diagnosis:-

Cowpox
Buffalopox

	monkeypox	chickenpox	measles
Fever	1-3 days before rash	1-2 days before rash	3-5 days before rash
Rash appearance	Lesions often in one stage of development	Lesions often in multiple stages of development	Lesions often in multiple stages of development
Rash development	slow	rapid	rapid
Rash distribution	More dense of face; present on palms and soles	More dense on truck; absent on palm's and sole	Starts on face and spreads, sometimes reaching hands and feet
lymphadenopathy	present	absent	occasional
Death	Up to 10%	rare	Varies widely

Laboratory test:

PCR - Polymerase chain reaction, is the technique most commonly used to confirm monkeypox
Tests conducted on lesions material.

DNA Test: to detect monkeypox and viral clade.

Virus isolation: detect viral particles

Electron microscopy: reveals virus morphology

Antigen detection: it uses an antibody directed against on Orthopoxvirus antigen, proves the presence of an Orthopox virus current infection, done on Lesion test - not monkeypox virus specific

Antibody detection: antigen directed against the antibodies limited diagnostic value proves a reaction of the body to the

virus current or past infection or vaccination done on serum not monkeypox virus specific.

Case definition:

Suspected case:-

Fever >38.3'C, headache, lymphadenopathy, myalgia, distinctive and progressive rash, including on hands and feet

Probable case:

A suspected case with an epidemiology link of a confirmed case or another probable case

Confirmed case:-
Has lab confirmed

Condition	Treatment objective	Treatment and care	Monitoring
Fever	Prevent and treat	External cooling, antipyretic medication	Regular temperature monitoring
Skin function	Prevent and treat secondary bacterial infections	oral or intravenous antibiotics' incision and drainage, advance wound management	Fever, pain, tenderness, erythema, oedema, exudate, warmth
Ex foliation, skin compromise	Avoid Scratching, minimize insensible fluid loss, promote lesion healing	Wash with soap and water or povidone - iodine solution Moist dressings and topical antibiotics e.g. silver sulfadiazine or gentian violets Surgical debridement, skin grafts	Lesion Count / rash burden. Skin turgor in non affected areas, body weight, fluid intake/ output,
Eye infection	Prevent corneal scarring and visual impairment	Vitamin A supplementation Ophthalmic antibiotics/antivirals Oral/ tropical analgesic medications	Repeat examination and vision testing, Slit lamp examination
Mouth and throat sores	Minimize mucosal pain, Encourage Food intake, Promote lesion healing	Oral /topical analgesic medications	Lesion burden Pain scale Food and fluid intake/ output
Vomiting and diarrhoea	Minimize fluid loss Maintain nutrition	Oral or intravenous rehydration Oral or intravenous antiemetic Antidiarrheal medication	Frequency and volume of emesis and diarrhoea, body weight, skin turgor, food and fluid intake / output
Lymphadenopathy	Minimize pain Reduce Swollen lymph nodes	Oral or intravenous analgesic or anti inflammatory medication	Size of lymph nodes Pain or tenderness
Respiratory symptoms or distress	Maintain airways Prevent and treat infections Prevent and manage respiratory distress	Suctioning of nasopharynx and airways, incentive spirometry, chest physiotherapy, bronchodilation, nebulizer treatment, oxygen and ventilation. - BiPAP or CPAP, Intubation and Ventilation	Respiratory Rate and other vital sign'sof distress such as indrawing, shortness of breath, pulse oximetry
sepsis	Hemodynamic stabilization	Oral/ intravenous fluid antibiotics	Pulse Blood pressure Fluid status

System Affected/Syndrome	Treatment Objective	Therapeutic Considerations/Clinical Setting		Follow-up/Monitoring
		Developed	Low-Resource	
Respiratory tract	Maintain patent airways, prevent respiratory infection, atelectasis, and respiratory compromise	Suctioning of the nasopharynx and airways, incentive spirometry, chest physiotherapy, bronchodilation, oral/intravenous antibiotics for prophylaxis/treatment, nebulizer treatments, bronchoscopy, noninvasive ventilation (e.g., BiPAP or CPAP) [1], intubation/ventilation	Suctioning of the nasopharynx and airways, incentive spirometry, chest physiotherapy, bronchodilation, oral/intravenous antibiotics for prophylaxis/treatment	Respiratory rate, pulse oximetry
Sepsis	Hemodynamic stabilization	Oral/intravenous antibiotics, hemodynamic (e.g., intravenous fluid hydration and vasopressors), supplemental oxygen, corticosteroids, insulin	Oral/intravenous antibiotics, intravenous fluid hydration	Hemodynamic monitoring (e.g., pulse rate, blood pressure)
Gastrointestinal/mouth & throat sores	Minimize mucosal pain and disruption of food intake, promote lesion healing	Oral/topical analgesic medications	Oral/topical analgesic medications	Lesion burden, pain scale, food/fluid intake
Gastrointestinal/vomiting, diarrhea	Minimize gastrointestinal fluid losses	Oral/intravenous antiemetic and antidiarrheal medications, oral/intravenous rehydration	Oral/intravenous antiemetic and antidiarrheal medications, oral/intravenous rehydration	Frequency and volume of emesis and diarrhea, body weight, fluid intake/ouput
Fever	Prevent and treat episodes of fever	Antipyretic medications, external cooling	Antipyretic medications, external cooling	Routine temperature monitoring
Exfoliation, skin compromise	Minimize insensible fluid loss, promote lesion healing	Wash with soap and water or dilute water povidone-iodine solution, moisturized dressings, topical antibiotics (e.g., silver sulfadiazine), surgical debridement, skin grafts	Wash with soap and water or dilute water povidone-iodine solution, moisturized dressings, topical antibiotics (e.g., silver sulfadiazine)	Lesion count/rash burden, body weight, fluid intake/ouput
Superinfection skin	Prevention/treatment of secondary bacterial infections, promote lesion healing	Oral/intravenous antibiotics, incision and drainage, advanced wound management (e.g., negative pressure wound therapy)	Oral/intravenous antibiotics, incision and drainage	Fever, pain/tenderness, erythema, edema, exudate, warmth
Inflammation/lymphadenopathy	Minimize pain and decrease size of lymphadenopathy	Oral/intravenous anti-inflammatory/analgesic medications	Oral/intravenous anti-inflammatory/analgesic medications	Size of lymphadenopathy, pain/tenderness
Ocular infection	Prevent corneal scarring and vision impairment	Ophthalmic antibiotics/antivirals and corticosteroids; slit lamp examination	Ophthalmic antibiotics/antivirals and corticosteroids	Vision testing; repeat examination to assess recrudescence

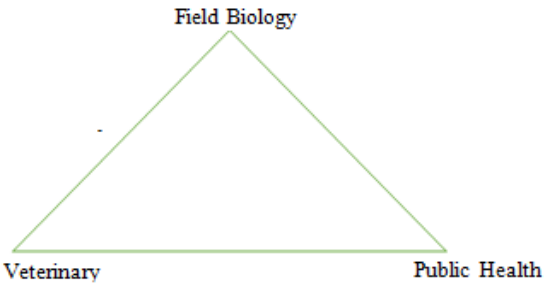
Surveillance:
Mapping person, placed and time
Detailed case investigation
Specimen collection
Primary and co-primary cases
Secondary cases
Epidemic prone disease

Notify health authorities immediately
Notifiable wide WHO International health regulation 2005, when unusual and unexpected

Local risk assessment:-
Core requirement
Heightened control measures
Lab worker must wear PPE KIT
Vaccination for person's working with orthopox virus

2. Conclusion

1) Isolated cases are seen in some part of US, UK, Singapore that means in non-endemic countries suggest Human to Human transmission could be present therefore further study is required whether virus has mutated and its ability to move widely
2) The spread of virus without epidemiology links suggest, Study of virus needs to be conducted
3) Current outbreak is behaving differently than earlier 1970-1980-year, study is requirement
4) DNA of Monkeypox virus is 2000, 000 DNA Letters compared with 30, 000 RNA Letters of SARS CoV-2 IS Required to be studied, to rule out its mutation
5) Moderna is testing potential vaccines in pre-clinical trials for monkey pox virus
6) Maybe in future mass vaccination would be required but at present, public
7) The risk of human disease from animal orthopox virus infection may increase as smallpox immunity wanes in the general population and the popularity of exotic animals as household pets grow
8) Stigmatisind people because of a disease is not good
9) Anyone can get or pass on monkeypox
10) Monkeypox virus a New Pandemic



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