

OLLI Cinema



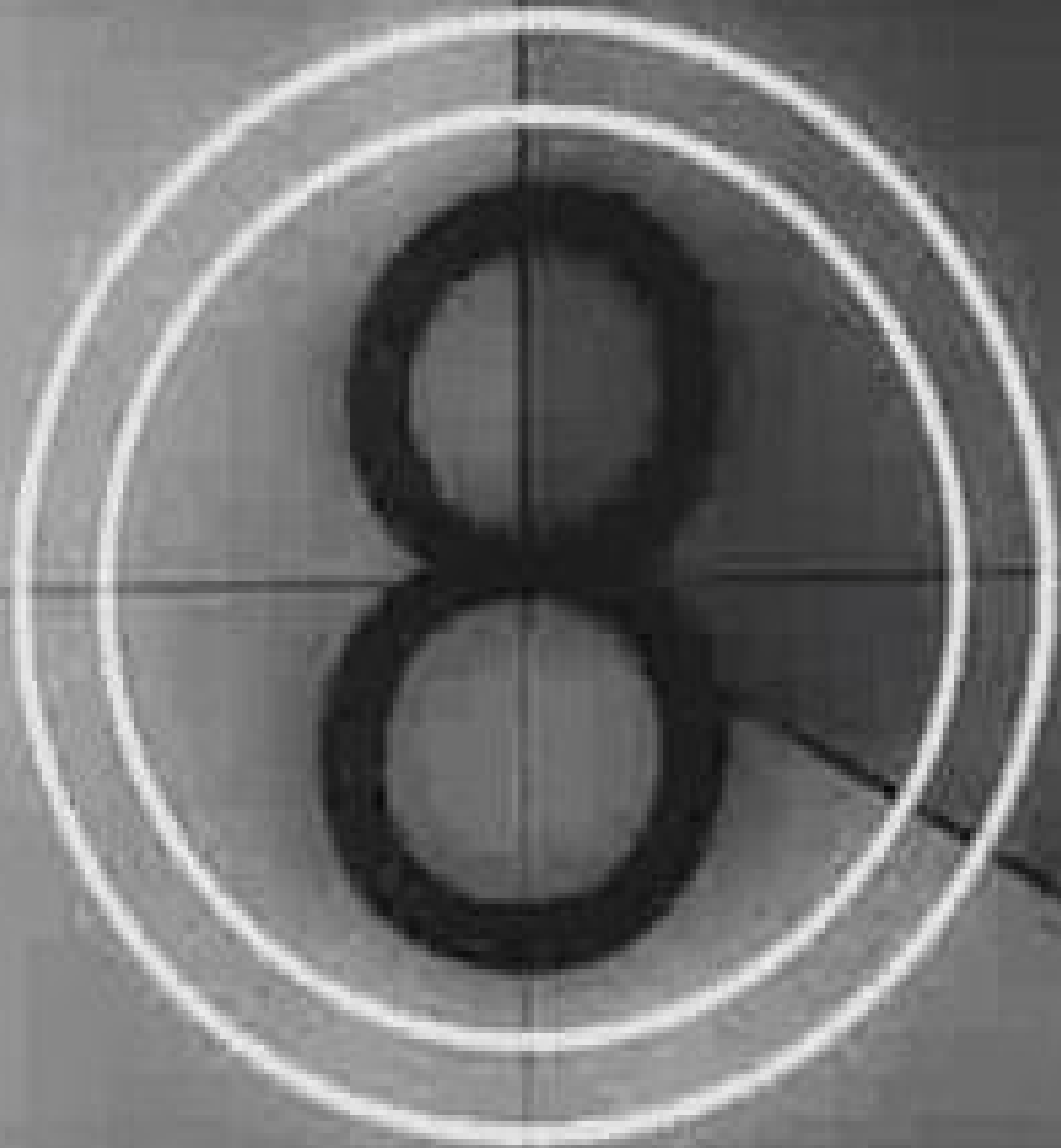
Visit our concessions.

Please take your seats.

Mute your devices.

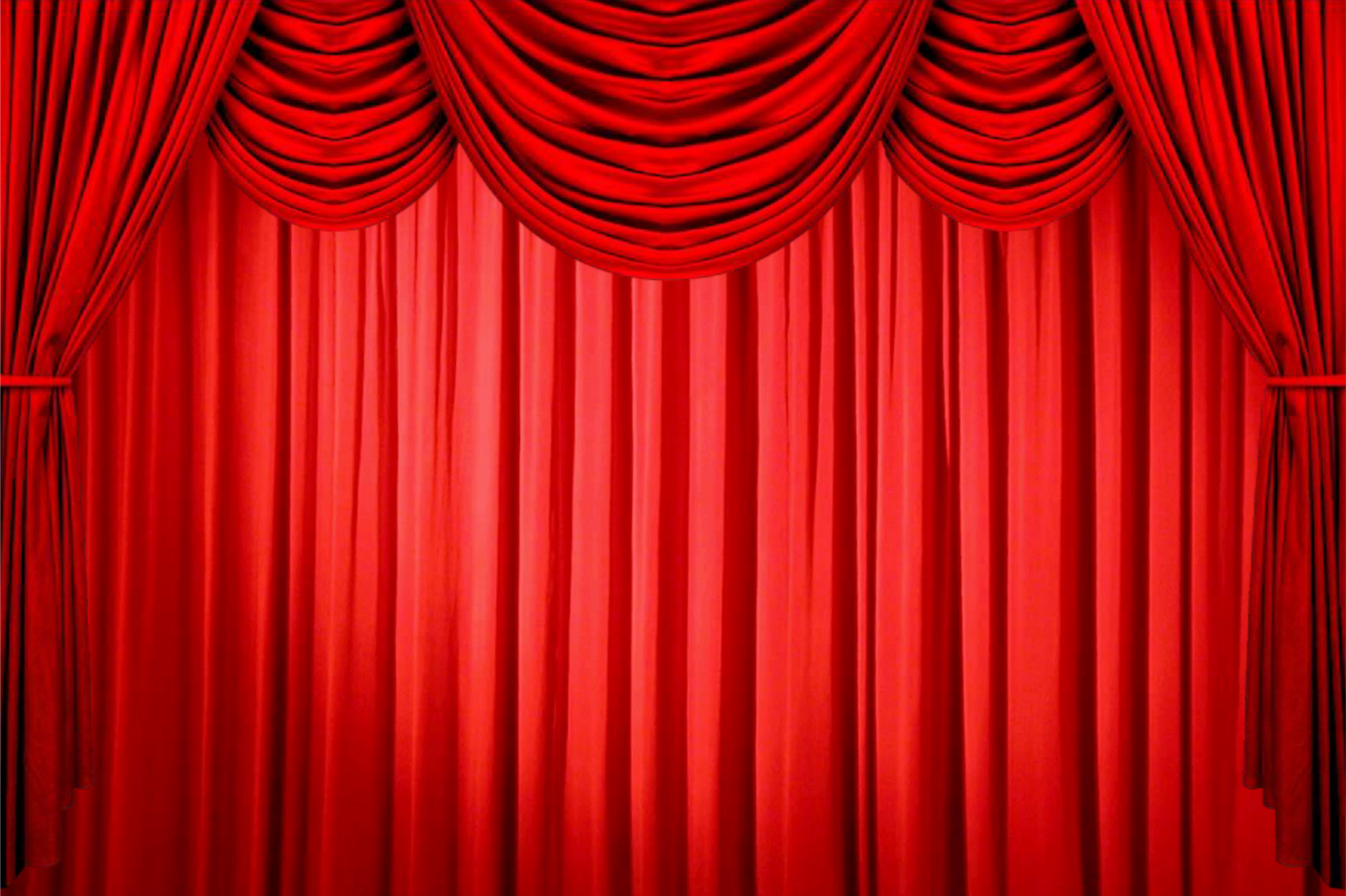
Show will start soon.





A stage with red curtains and a blue star containing the text "Welcome ! Good Afternoon". The star is centered on the stage floor, which is lit with a yellow spotlight. The curtains are drawn back, revealing the stage.

Welcome !
Good
Afternoon





In Full Color:

Red plague (Smallpox)

Yellow plague (Yellow fever)

White Plague (Tuberculosis)

Blue plague (Bubonic plague)

Purple plague (Spanish flu)

Black plague (Pneumonic plague)

Starring:



Rattus rattus

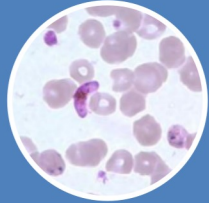


Xenopsylla cheopis



Yersinia pestis

Co-Starring: (As themselves)



**Plasmodium
falciparum**
Malaria



**Aedes
aegypti**
Yellow Fever



**Vibrio
cholerae**
Cholera



Guest Appearances:



**Rickettsia
prowasekii**

Typhus



**Treponema
pallidum**

Syphilis

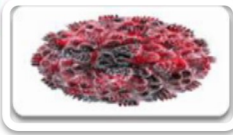


**Neisseria
meningitidis**

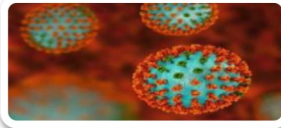
Meningitis B



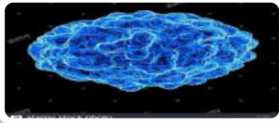
Supported by Viral Billions



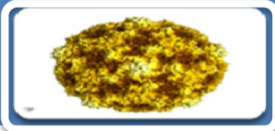
HIV/AIDS



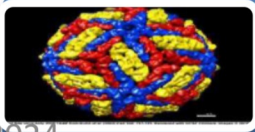
Influenza



Smallpox



Yellow Fever

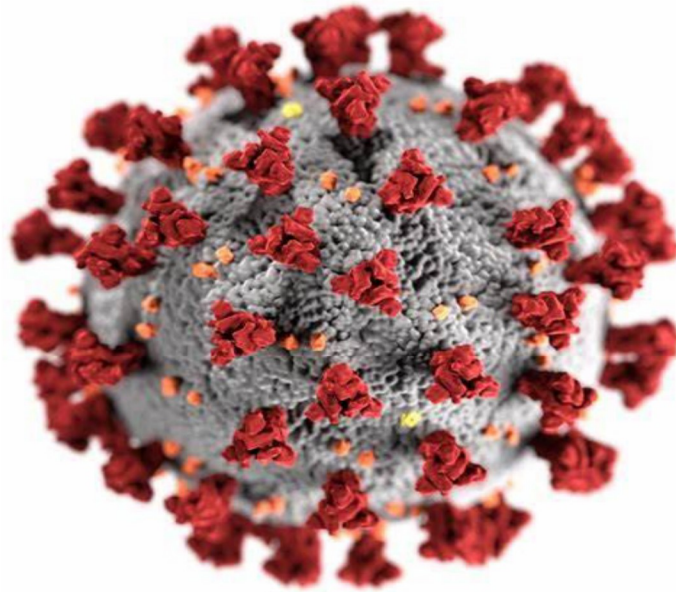


Ebola, Zika, Dengue, Chikungunya

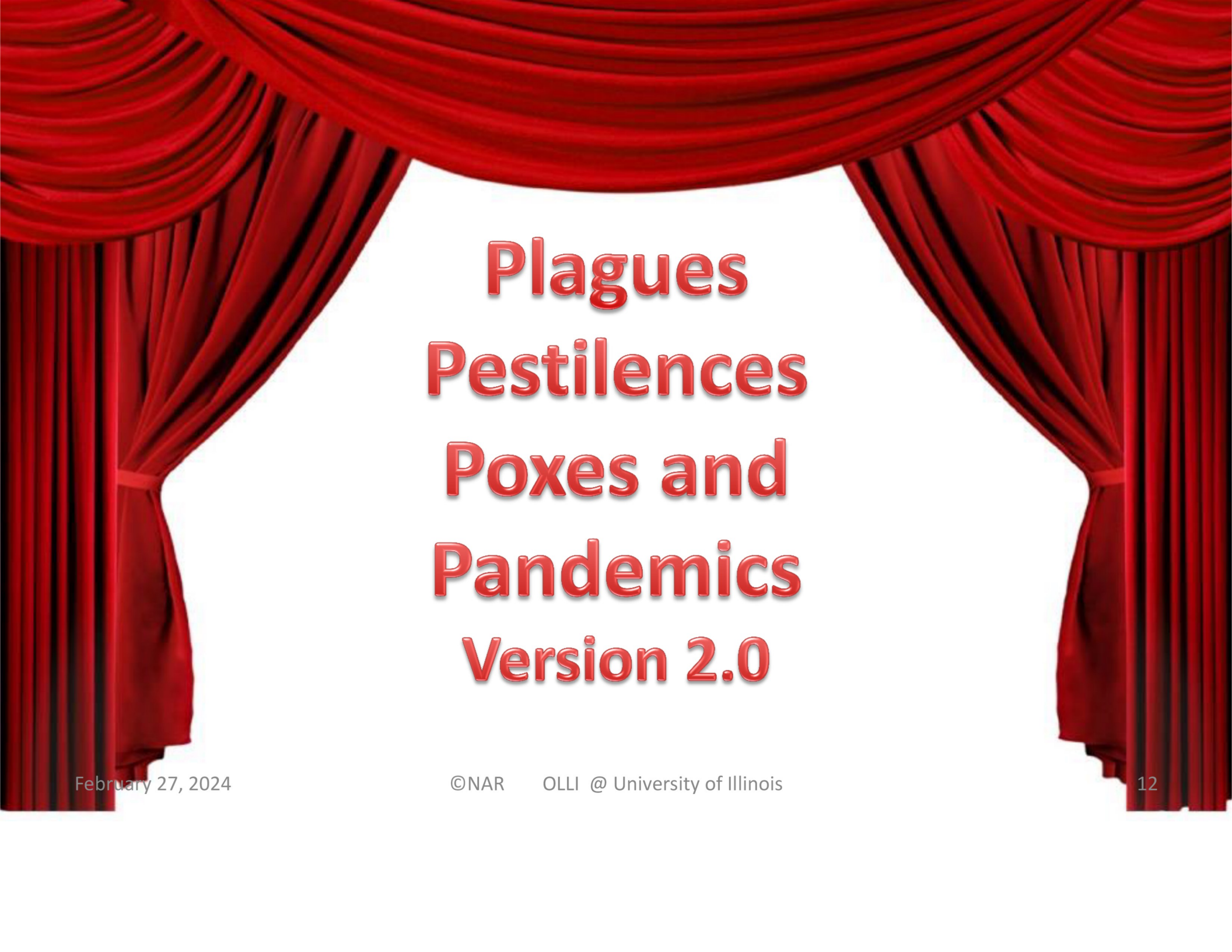
February 27, 2024

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Featuring:



CORONA virus as COVID-19



**Plagues
Pestilences
Poxes and
Pandemics
Version 2.0**

February 27, 2024

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Plagues, Pestilences, Poxes and Pandemics Version 2.0

Overview through History, Geography, and Time

Néstor A. Ramírez, MD, MPH

Purpose and Plan of this Program's Presentations

Provide a peripatetic, panoramic perusal of the particulars of past, present and potential plagues, pestilences, poxes and pandemics that produce pervasive panic and persistently put the permanence of people on this planet at prolonged peril, plus presenting possible positive principles of prevention.

Disclosures

- I regret that I have no financial conflicts of interest.
- I do not work for OLLI or the University of Illinois
- If a graphic is not in the public domain, I will give an attribution, when available.

In the interest of full disclosure, when I was 12, I removed from my pillow the

Under Penalty of Law this Tag NOT to be Removed!

The pillowtag police hasn't caught up with me yet!

February 27, 2024

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Disclosures

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Course Overview

Spring 2024 Semester

- **Session 1 February 27th : Definitions, Biblical Plagues.**
- Session 2 March 5th : The PLAGUE through time, new theories.
- Session 3 March 12th : Cholera, Yellow Fever, Malaria, Polio, etc.
- Session 4 March 19th : The Columbian Exchange.
- Session 5 March 26th : 20th Century Pandemics, past & current.
- Session 6 April 2nd : HIV/AIDS, new treatments.
- Session 7 April 9th : 20th and 21st Century Viruses.
- Session 8 April 16th : Crystal ball into the future?

Session 1: FEBRUARY 27th, 2024

Definitions and Clarification of Terms

Primitive Conception of Causes of Disease

Plagues and Pestilences in the Bible:

Old & New Testaments

DEFINITION of TERMS

Definitions

- Mostly Greek roots.
- Definitions are descriptive.
- Some include others.
- Classification is done by health offices.

Greek Roots

- *Demos*: people or population
- *Endo*: inside, within
- *Epi*: upon, above
- *Pan*: all, every

Endemic

- A disease or condition regularly found among a particular population or in a certain geographic area.
- Implies that the disease is consistently and continually present in that area or population.
- The number of people with the condition is usually stable throughout time.

Outbreak

- Sudden increase in occurrences of a disease in a particular time and place.
- Small and localized group or an entire continent.
- Four linked cases of a *rare* infectious disease may be considered an outbreak.

Epidemic

- *Sudden and rapid* spread of disease to a large number of people in a population, community or region within a short period of time.
- Used for infectious diseases, and for diseases or health conditions with an environmental origin.
- Also used for the prevalence of smoking, vaping, opioids, etc.

Epidemics

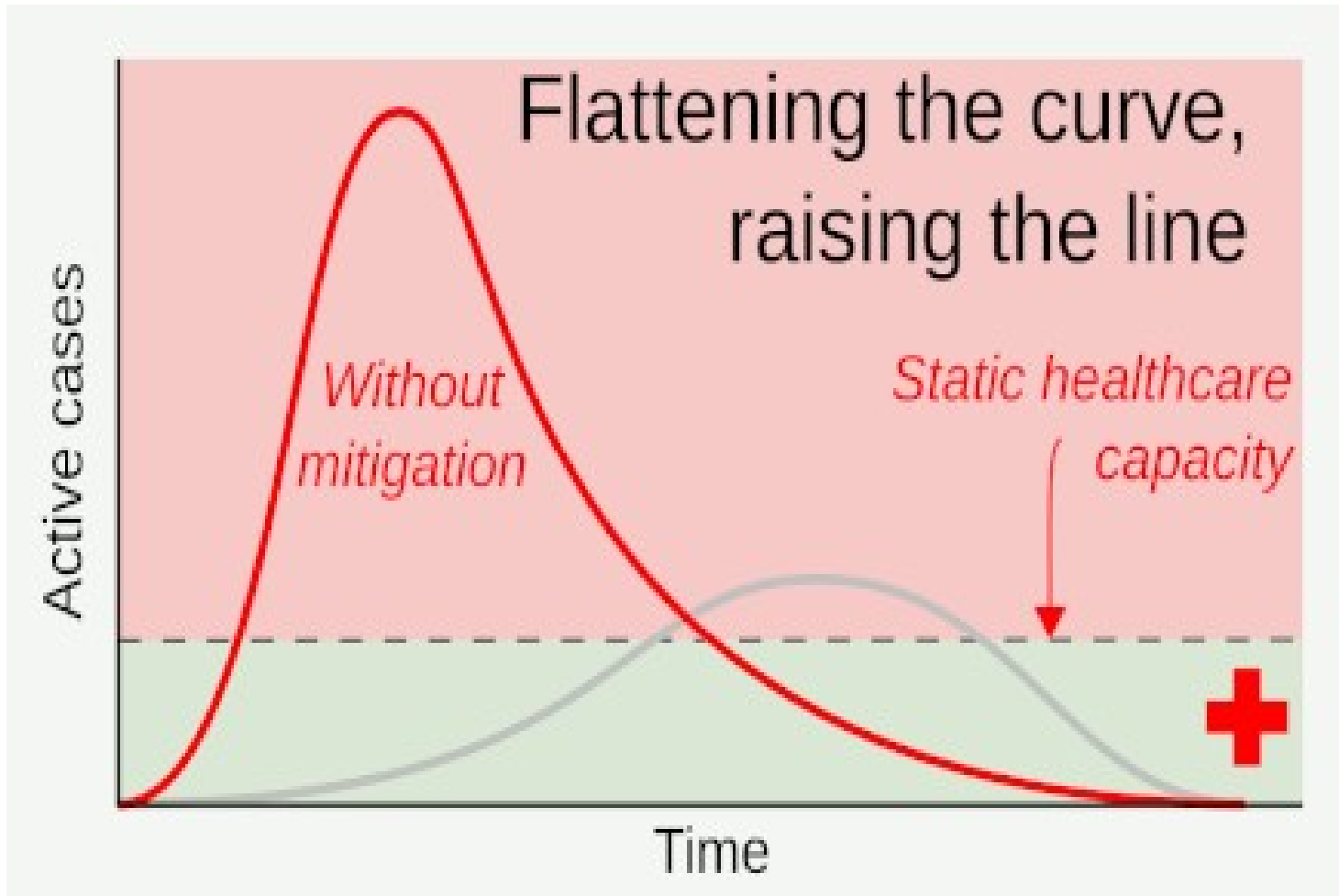
Opioid, Smoking

- They are not infectious diseases, but they can be considered epidemics because of their widespread and significant implications on public health.
- Use of the term in this context is not erroneous, but is rather a way to draw attention to the severity of the issue and the need for action to address it.

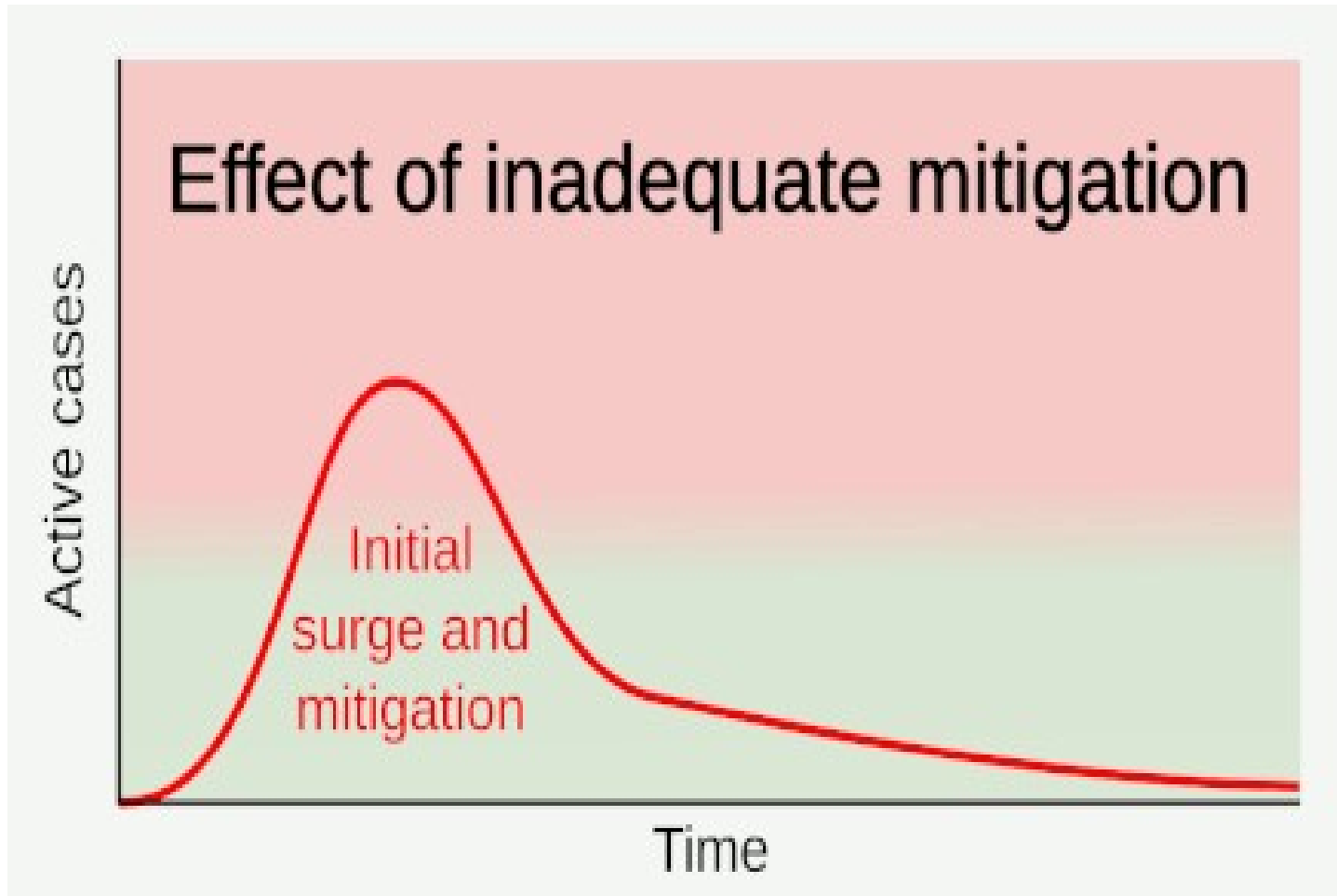
Pandemic

- An epidemic that crosses international boundaries, usually affecting people on a worldwide scale.
- Near-global disease outbreaks when multiple countries across the world are infected.
- Term refers to **extent** of illness not **speed** of spread.

Flattening the curve



Inadequate Mitigation



Zoonosis

(plural zoonoses)

- Infectious disease caused by an agent (virus, bacteria, prion or parasite) that has jumped from animal to human.
- First infected human transmits the infectious agent to at least one other human, who then infects others.
- Of 1,415 human pathogens, **61%** are zoonotic.

Zoonosis

- Diseases that routinely involve animal to human transmission, such as rabies, are considered *direct zoonoses*.
- In *direct zoonosis* the disease is transmitted from animals to humans through media such as air (influenza) or through bites and saliva (rabies).

Zoonosis

- In *indirect zoonosis* transmission occurs via an intermediate species (vector), which carries the disease pathogen without getting sick.
- When humans infect animals, it is called *reverse zoonosis, zooanthroponosis, or anthroponosis*.

Pox

- A disease whose major presenting symptom is eruptive pustules on the skin, such as small-pox, chicken-pox, monkey-pox or cow-pox, all of which can leave pockmarks.
- If the kind of pox was not specified, in history the "great pox" (syphilis) is what was meant.

Plague

- A disastrous evil or affliction (*Calamity*).
- A destructively numerous influx or multiplication of a noxious animal or insect (*Infestation*).
- An epidemic disease causing a high rate of mortality (*Pestilence*).

Pestilence

- A pernicious, evil and malignant influence or agent.
- A highly contagious, infectious, virulent, devastating and deadly epidemic disease.

Concepts of Disease

- Conceived as a divine punishment for wrongdoing.
- Retribution upon humans for offending the gods.
- Needed sacrifices, offerings, repayment, penance.
- Show of gods' power over humans' weakness.

Concepts of Disease

- People had no concept of transmission or contagion.
- They thought a disease could only be transferred if there was a visible stigma, like leprosy or smallpox.
- Treatments were based on appeasing the gods.
- Prayers, herbs, chants and sacrifices were common.

Questions? 1



Plagues in the Bible

Old Testament:

Plague of the Philistines (Ashdod)

Plagues of Egypt

Leprosy

New Testament:

7 Final plagues of
the Book of Revelation

Plague of Ashdod

Samuel Book 1, Chapters 4-6

- Philistines defeated the Israelites in battle at Shiloh.
- Stole the Ark of the Covenant, took it to Ashdod.
- Put it beside their god Dagon in his temple.

Plague of Ashdod

(Plague of the Philistines)



- The next day, the statue of Dagon was found face down with its head and hands cut off, but the Ark was intact.
- After defeating their god, Jehovah sent a plague to punish the Philistines.
- Struck them with lumps and tumors around their groins, and they died of that disease.



The Plague of Ashdod
Nicolas Poussin ~1629

also known as

***The Miracle of the Ark
in the Temple of Dagon***

The Louvre, 58 X 78 in.

February 27, 2024





Plague of Ashdod

Latin Vulgate Old Testament

1 Kings (1 Samuel) V: 6, 9, 12

“And while they were carrying the Ark about, the hand of the Lord came upon them with an exceeding great slaughter, and he smote the men of every city.”

Latin Vulgate Old Testament

1 Kings (1 Samuel) V: 6, 9, 12

- “The hand of the Lord was heavy upon Ashdod, and he destroyed them, and afflicted them with *emerods*, and the Gethites consulted together, and made themselves seats of skins,
- and in the villages and fields there came forth a multitude of mice (rats?), and there was confusion and a great mortality in the city.”

February 27, 2024

“Emerods”

- In 1 Samuel, 5 the NIV states the Philistines were afflicted with tumors.
- In 1 Samuel, 9 the Septuagint versions expand: “He afflicted the people, both young and old with an outbreak of tumors in the groin.”
- The New World Translation (NWT) calls them “piles”.

Different words, same problem?

Various translated Bible texts state that Philistines were smitten with:

- growths in the groin (Septuagint)
- hemorrhoids (Hebrew Bible)
- buttocks (Septuagint)
- behinds (Vulgate)
- emerods (KJV)*
- swellings (Korem Jerusalem Bible)

Plague of Ashdod

Latin Vulgate Old Testament

1 Kings (1 Samuel) VI: 5

“And the men that did not die were afflicted with the *emerods* in their secret parts, and the cry of every city went up to heaven.”

Plague of Ashdod

Latin Vulgate Old Testament

1 Kings (1 Samuel) VI: 5

- “You shall make the likeness of your *emerods*, and the likeness of the mice that have destroyed the land.
- You shall make 5 golden *emerods*, and 5 golden mice; for the same plague hath been upon you all, and upon your lords.”

“quinque anos aureos facietis et quinque mures aureos”



Current Scholarly Thought

- No agreement on whether the Plague of the Philistines was:
 - bubonic plague
 - dysentery
 - hemorrhoids
 - tularemia (new theory)
- Most scholars believe that the stories:
 - are mainly about the Ark and its power over pagan gods
 - are not about the disease or its description
 - are not completely historical

There is nothing to be gained by continued argument over the identity of an epidemic whose biblical account is not founded on a discrete historical tradition, but is composed of various details given to illustrate an overarching religious theme and not to describe any particular historical event.

Lawrence I. Conrad 1984

THE BIBLICAL PLAGUES OF EGYPT

BOOK OF EXODUS CHAPTERS 7-12

Inflicted on Egypt by the God of Israel to force Pharaoh to free the Israelites from slavery.

Issues of Contention

10 Plagues of Egypt

Did they really happen?

When did they happen?

Where did they happen?

How long did they last?

Who was the Pharaoh?

Why is there no Egyptian historical record?

1st Hebrew description was ~500 years after

What caused them?

The First Plague



Nile water
turned to blood

The Second Plague



Plague of Frogs

The Third Plague



Plague of Gnats and Lice

The Fourth Plague



Plague of Flies

Fifth Plague



Death of
Livestock

Sixth Plague



Sores in
Humans
and Animals

Seventh Plague



Hail of Fire

Eighth Plague



Hordes of
Locusts

Ninth Plague



Darkness
for 3 days

Tenth Plague



Death of
Firstborns

The 10 Plagues of Egypt

Exodus Chapters 7-12

1. Nile turns bloody, fouls drinking water, kills fish, big stink.
2. Frogs leave the Nile, invade Egyptian homes, die, big stink.
3. Annoying small insects swarm.
4. Annoying large insects swarm.
5. A disease kills livestock in pasture, big stink.
6. Boils afflict beasts and humans.
7. Thunderstorm with lightning and hailstones destroys crops.
8. Swarms of locusts obliterate remaining crops.
9. Palpable darkness obscures all light.
10. Firstborn Egyptians and firstborn animals die, while Israelites and their livestock live.

Interpretations of the Biblical 10 Plagues

- **Theological:** explores alternative translations of the original Hebrew and Aramaic texts and also secondary biblical interpretations.
- **Scientific:** science writers
 - give explanations for one plague, a subset , or all 10 of them
 - propose Procrustean theories to identify a single common factor or condition (meteorology, climate change, infections).
- **Supernatural & Quasi-scientific:** Plagues caused by Divine retribution on Egypt from the God of Israel.

Theories

Plagues of Egypt

- Microbiologist: Siro Trevisanato
- Epidemiologist: John Marr
- Naturalist: Greta Hort
- Paleoclimatologist: Augusto Mangini
- Rabbi: Yonatan Neril



Scientific



Theological

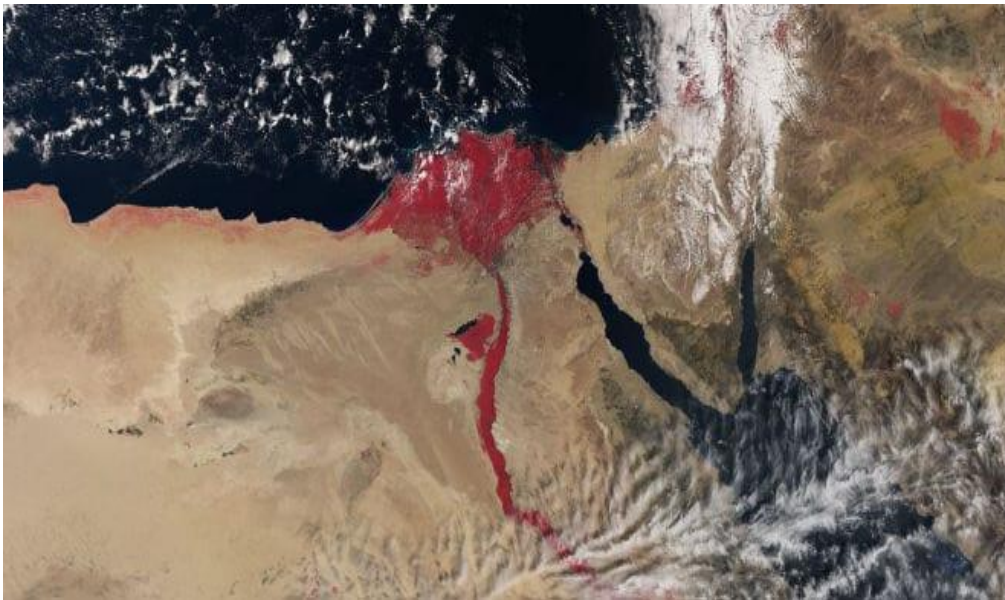
Scientific Explanation

10 Biblical Plagues

- The plagues were the result of the Minoan volcanic eruption on the island of Santorini (Thera) around 1624-1596 BCE.
- Winds would have carried the volcanic ash during the summer, and the toxic acids and the mineral cinnabar could have turned the river a blood-like red color, and slow, sludgy Nile flow caused the bacterium *Oscillatoria rubescens* to flourish. **(1)**

Red Waters

The Nile River



Harmful Algal Bloom (HAB)

European Space Agency 2016

Hungarian Countryside



Red mud sludge, Hungary 2009

Scientific Explanation

10 Biblical Plagues

- The accumulated acidity in the water killed fish and caused frogs to leap out in the search for clean water. **(2)**
- The grass would have been contaminated, poisoning the animals that ate it. **(5)**
- Insects would have burrowed eggs in the bodies of dead animals which generated larvae and adult insects. **(3 & 4)**

Scientific Explanation

10 Biblical Plagues

- Volcanic ash affected the weather, with acid rain landing on people's skin and causing boils. **(6 & 7)**
- Humidity from the rain and hail would have created optimal conditions for locusts to thrive. **(8)**
- Volcanic eruptions or a solar eclipse could also explain the several days of darkness. **(9)**

Scientific Explanation

10 Biblical Plagues

First-born children could have been sacrificed out of desperation, in the hopes that such a meaningful sacrifice would lead their gods to stop punishing them. **(10)**

Other Theories

- Euhemerism is the branch of literary and historical analysis which seeks to ascribe historical origins and derivations to remarkable mythical events.
- Myths (stories) derive from reality (history).
- All the plagues were caused by an ENSO (**El Niño Southern Oscillation**), an interannual recurrent climate variability pattern across the equatorial Pacific Ocean.

Volcanic Eruption, Santorini Island (1620-1600 BCE)

Winds carried the volcanic ash (with cinnabar) to Egypt and turned the Nile red. (1)

Toxic acids in the ash killed fish and made water undrinkable. (1)

Acidity in the water caused frogs to leap out in search for clean water. (2)

Insects lay eggs in bodies of dead animals and humans, generate more insects. (3 & 4)

Volcanic ash in the atmosphere caused acid rain and produced boils on people's skin. (6)

Contaminated grass poisoned the animals that ate it. (5)

Humidity from the rain and subsequent hail created optimal conditions for locusts. (7 & 8)

Volcanic eruptions explain the several days of darkness. (9)

Red Algae Theory

Sequential catastrophes

Red algae sucked oxygen out of Egypt's Nile, and turned the water red.

1

Corrupted water killed the fish.

1

Frogs leaped out looking for food, and died.

2

Pests like flies gnats, lice, and locusts proliferated and feasted on corpses.

3, 4, 8

"Lice": carry 2 diseases that cause livestock deaths: African horse sickness & Bluetongue.

5

Boils on humans caused by *glanders*, an airborne bacterial disease spread by flies or tainted meat.

6

Darkness coincidentally caused by a thunderstorm and sandstorm.

7, 9

Moldy crops produce airborne toxins that explain widespread childhood death.

10

Plagues directed at gods of Egypt

Plague	Egyptian god	Significance
1 Nile water to blood	Osiris, Hapi	Nile was lifeblood of Egypt
2 Frogs	Heqt (frog goddess)	Fertility to families & crops
3 Lice	Seb or Geb (earth god)	Even lice come from earth
4 Flies	Hatchit (marshes), Khepri	Flies come from marshes
5 Pestilence on animals	Apis (bull god), Hathor	Strength & victory in war
6 Boils	Sakhmet (fights disease) Isis	Power to stop epidemics
7 Hail of fire	Nut and Osiris (sky & crops)	Crop damaged from the sky
8 Locusts (grasshoppers)	Khepri, Seth	Peace and the afterlife
9 Three-day darkness	Ra (god of the sun)	Direct attack on the sungod
10 Death of firstborn	Pharaoh	Attack on the mangod

Plagues Aimed Egypt's gods

Against the gods of the Nile

Water turned to blood: **Hapi**, **Osiris**, gods of the Nile (1)

Frogs : **Heket**, goddess of fertility and childbirth (2)

Against the gods of the land

Gnats or lice: **Geb (Seb)**, god of the earth (3)

Flies: **Khepri**, god of creation (4)

Livestock disease: **Hathor**, goddess of love and protection (5)

Boils: **Sekhmet**, goddess of disease and healing (6)

Against the gods of the sky

Hail of fire: **Nut**, goddess of the sky (7)

Locusts: **Nepri**, god of grain (8)

3-day Darkness: **Ra**, the sun god (9)

Death of the firstborn: **Osiris**, the god of the dead (10)

Other Old Testament Plagues

Numbers, 16

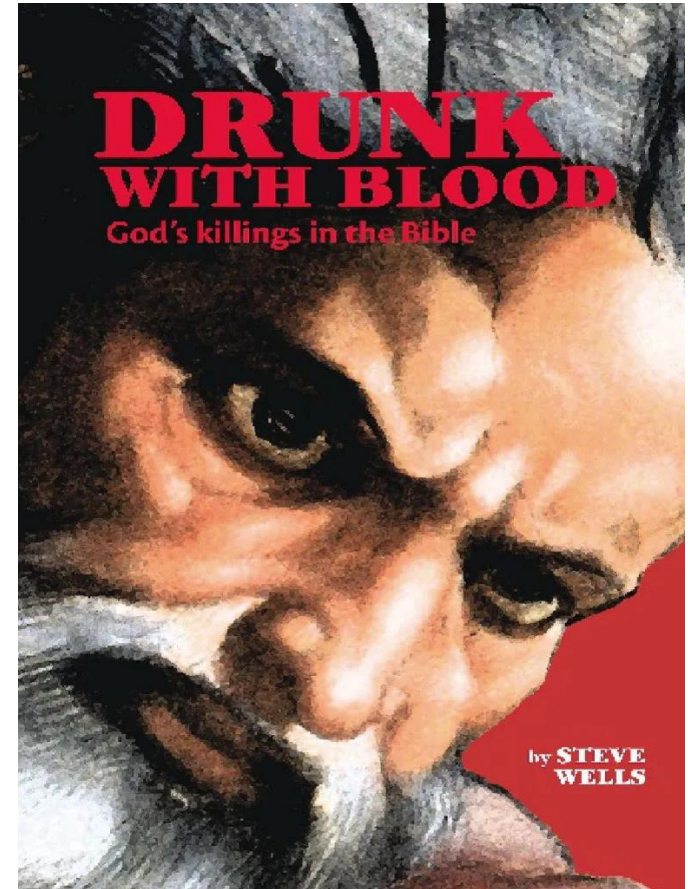
- God punished the Israelites in the wilderness for rebelling against Moses and Aaron.
- 250 killed by the ground splitting apart when God struck Ko'hath, Dathan, Abiram and their followers.
- 14,700 killed by Jehovah's plague.

Other Old Testament Plagues

2 Samuel, 24

- Jehovah punished David for his sinful pride in counting his troops.
- David was given the choice of:
 - 7 years of famine
 - 3 months of fleeing from his enemies
 - 3 days of pestilence
- He chose the 3 days, and God sent a pestilence (Angel of Death) that killed 70,000 persons.

God's Killings in the OT

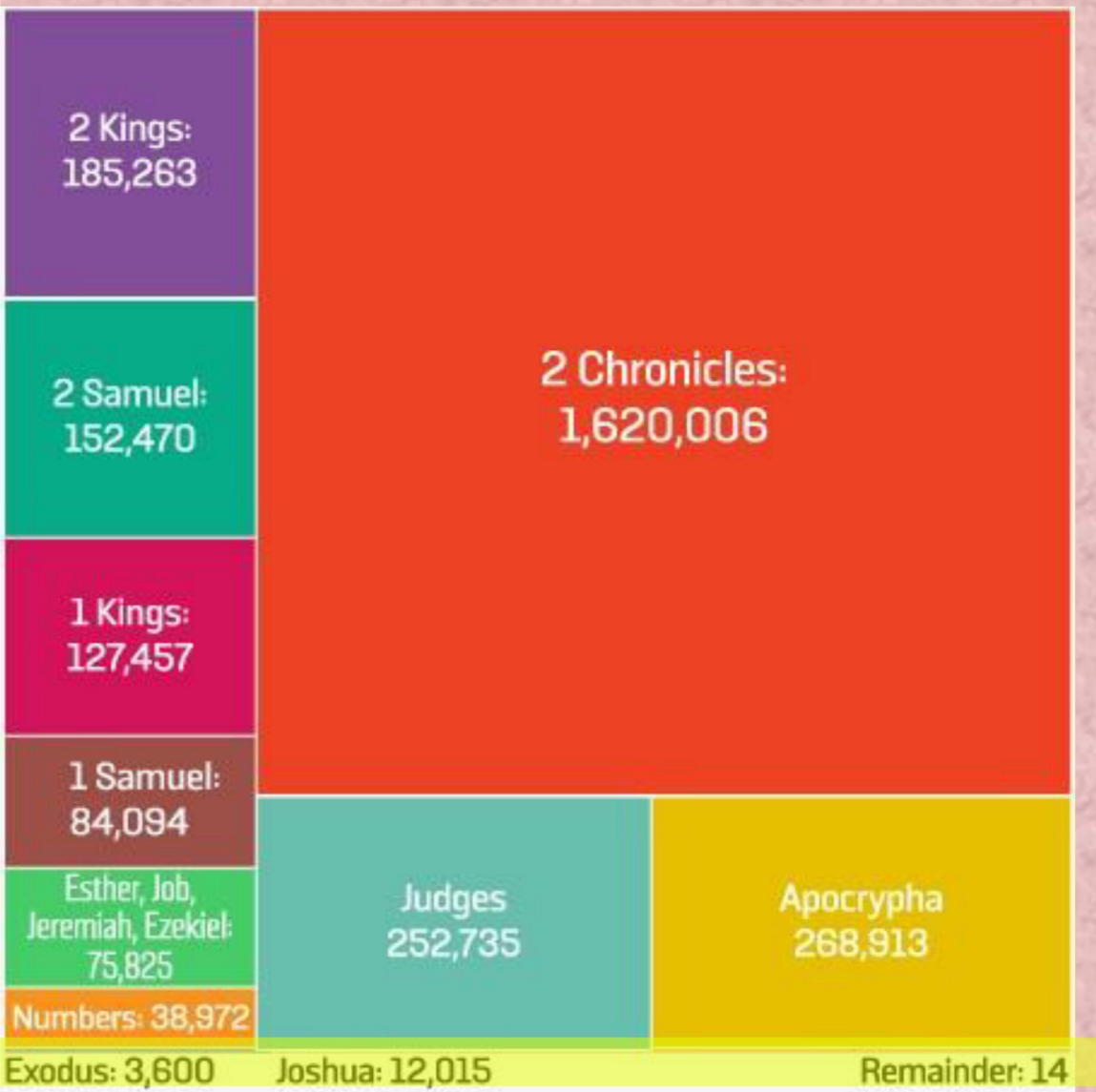


“Biblical” Proportions

- Pertaining to a natural disaster or other cataclysmic event so immense that it brings to mind biblical accounts of horrific catastrophes.
- Pertaining to a thing or occurrence having vast upheavals in size, extent, or consequences.

“Biblical Proportions” God’s Killings in the Old Testament

- About 2.8 million people.
- Plagues, floods, earthquakes, fires, walls, animals, other humans, and the Angel of God.
- Ethiopians, Egyptians, Syrians, Canaanites, Philistines, Israelites, etc.



Reznik, Sieradzki, Markovitz 2015, based on “*Drunk with Blood, God’s killings in the Bible*”, 2013 by Steve Wells

Questions? 2



LEPROSY

February 27, 2024

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Leprosy

Is

- chronic infectious disease
- transmissible but not easily contagious
- debilitating and deforming
- repulsive or scary appearance
- **Treatable**

Isn't

- biblical curse
- punishment for evil behavior
- inherited
- untreatable / incurable
- extremely contagious
- rotting away of face or extremities

Leprosy

- Also known as Hansen's disease (HD).
- Infection by *Mycobacterium leprae*.
- Infected person may remain asymptomatic for 5 to 20 years.
- Infection can lead to damage of the nerves, skin, respiratory tract, and eyes.

Leprosy

- ~95% of people with *M. leprae* contact **don't** develop disease.
- Does not spread during pregnancy to baby.
- Does not spread through sexual contact.
- More common among people living in poverty.

Leprosy

- Nerve damage results in a loss of feeling pain.
- May lose extremities from repeated injuries or infection.
- Physical and neurological damage may be irreversible.
- May present with diffuse granulomatous skin lesions: macules, nodules, or papules.

Hansen's Disease Damage

Lesions of Leprosy



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Lazarettos

EXTREME ISOLATION

Why Leprosariums?

15th to 19th Century Europeans were terrified of contracting leprosy in their outlying empires.

Medical & intellectual elites were inspired by the ignorant & superstitious Middle Ages.

The answer, to them, obviously, lay in **compulsory mass isolation.**

Lazarettos

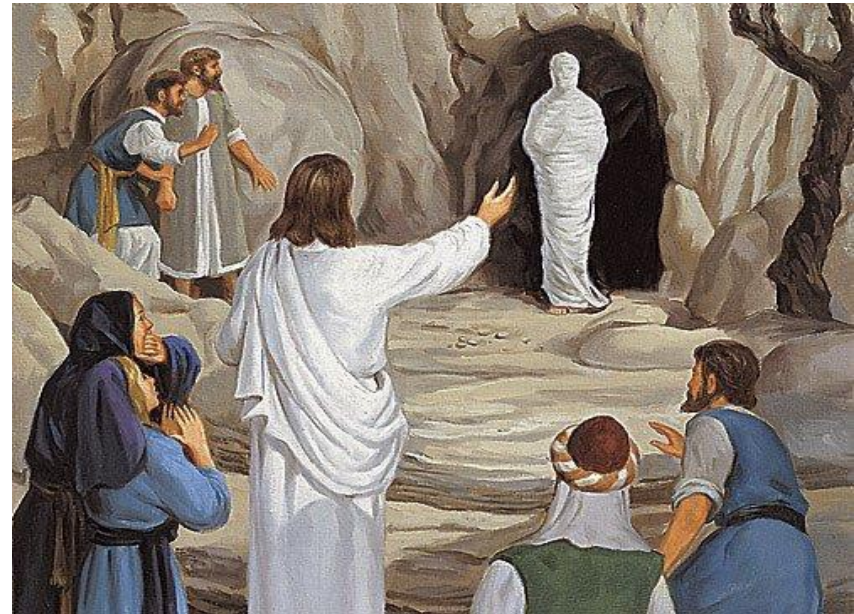
- A lazaretto or lazaret was a quarantine station for sea travelers.
- Used for quarantine of cholera, plague, yellow fever or other diseases.
- A leper colony administered by a Christian religious order was often called a lazaret house.

Lazarettos

- Called leprosariums when used for leprosy.
- Located in distant areas or remote islands.
- Usually run by religious orders or pious groups.
- Frequently had own currency, to be used **ONLY** inside the leprosariums.

Lazarus and the Gospels

- Name is Latinized from the Aramaic “Eleazar”.
- Lazarus of Bethany, brother of Mary & Martha.
- Was resuscitated by Jesus (John 11:11-44).



Lazarus and the Gospels

- Lazarus in Luke (16:19–31) was a beggar whose sores the dogs licked.
- Inspired the Order of St. Lazarus.
- NOT Lazarus of Bethany.



The Order of Saint Lazarus



- In the Crusades an army made up of diseased men, who fought fiercely and formidably despite their ailments.
- They had many former Templars in their ranks, but their battles were catastrophic and many Lazarites died.

The Order of Saint Lazarus

- By 13th Century, Templars with leprosy were made to switch to the Order of St. Lazarus.
- In 1291, with the other four military Orders, the Lazarites fought bravely to protect Acre.
- All the military members of the Order of Saint Lazarus in Acre were killed defending the city.

The Order of Saint Lazarus ⁽³⁾

- 1250: Had >300 leprosaria throughout Europe.
- 1253: Started to recruit non-leprous knights.
- 1265: Pope Clement IV put all lepers in Christendom under the control of the Order.

Carville Leprosarium



All persons diagnosed with Hansen's disease in the U.S. were required by law to be quarantined and treated.

Leprosarium Warning Signs



Leprosarium Warning Signs



The New Testament

Apocalypse

- Apocalypse (*ἀποκάλυψις*), Greek word meaning ***revelation***, an unveiling or unfolding of things not previously known and which could only be known by this unveiling.
- Apocalyptic literature details the authors' visions of the end times as revealed by an angel or other heavenly messenger.

The Revelation of St. John the Divine

- The last book of the NT is a prophetic revelation of a cataclysm with universal or widespread destruction or disaster.
- The imagery of the Four Horsemen of the Apocalypse is associated with the end of the world in a catastrophic manner.

Seven Last Plagues in Revelation

The end-time prophetic events in the book of Revelation will occur before and at the time of Christ's return to earth and are outlined by:

- seven seals (the 1st 4 are also called the 4 Horsemen)
- seven trumpet plagues
- seven last plagues: golden bowls full of the God's wrath to be poured upon the earth

4 Horsemen

- **White:** Pestilence
- **Red:** War
- **Black:** Famine
- **Ashen:** Death & Hades

*“Authority was given to him over the four parts of the earth, to kill with sword and with **famine** and with **pestilence** and by the wild beasts of the earth.”*



Seven Last Plagues in Revelation

- **First** plague: painful sores upon those who had “the mark of the beast and those who worshiped his image”.
- **Second** plague: the sea will become blood and cause all life in it to die, destroying a major food source for millions of people.
- **Third** plague: the rivers and springs of water will become blood, destroying fresh water fish, further impacting the food supply for millions of people.
- **Fourth** plague: the sun will become so hot as to “scorch men with fire”.

Seven Last Plagues in Revelation

- **Fifth** plague: darkness, pains and sores.
- **Sixth** plague: the Euphrates River will dry up and allow the armies of “the kings of the earth and of the whole world” to assemble at Armageddon and then advance toward Jerusalem for a final battle against Jesus Christ.
- **Seventh** plague: “noises and thunderings and lightnings” and “such a mighty and great earthquake as had not occurred since men were on the earth”.

Shakespearian Curses

- “A pox upon him.” (All's Well That Ends Well)
- “Boils and plagues plaster you o'er, that you may be abhorr'd.” (*Coriolanus*)
- “Thou art a boil, a plague sore, an embossed carbuncle.” (*King Lear*)
- “A pox o’ your throat, you bawling, blasphemous, incharitable dog!” (*The Tempest*)
- “A plague o’ these pickled herring”. (*Twelfth Night*)

Final Questions?



Recap of Session 1

- Epidemiologic definitions.
- Primitive conceptions of diseases.
- Plagues in the Bible: Old Testament.
- Plagues in the Bible: New Testament.

Next Week

March 5, 2024

- Session 1 February 27th : Definitions, Biblical Plagues.
- **Session 2 March 5th : The PLAGUE through time, new theories.**
- Session 3 March 12th : Cholera, Yellow Fever, Malaria, Polio, etc.
- Session 4 March 19th : The Columbian Exchange.
- Session 5 March 26th : 20th Century Pandemics, past & current.
- Session 6 April 2nd : HIV/AIDS, new treatments.
- Session 7 April 9th : 20th and 21st Century Viruses.
- Session 8 April 16th : Crystal ball into the future?

