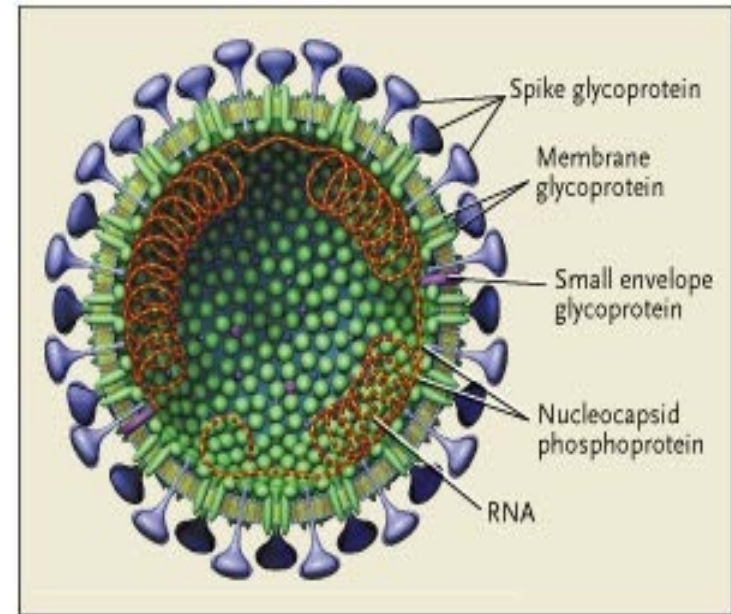


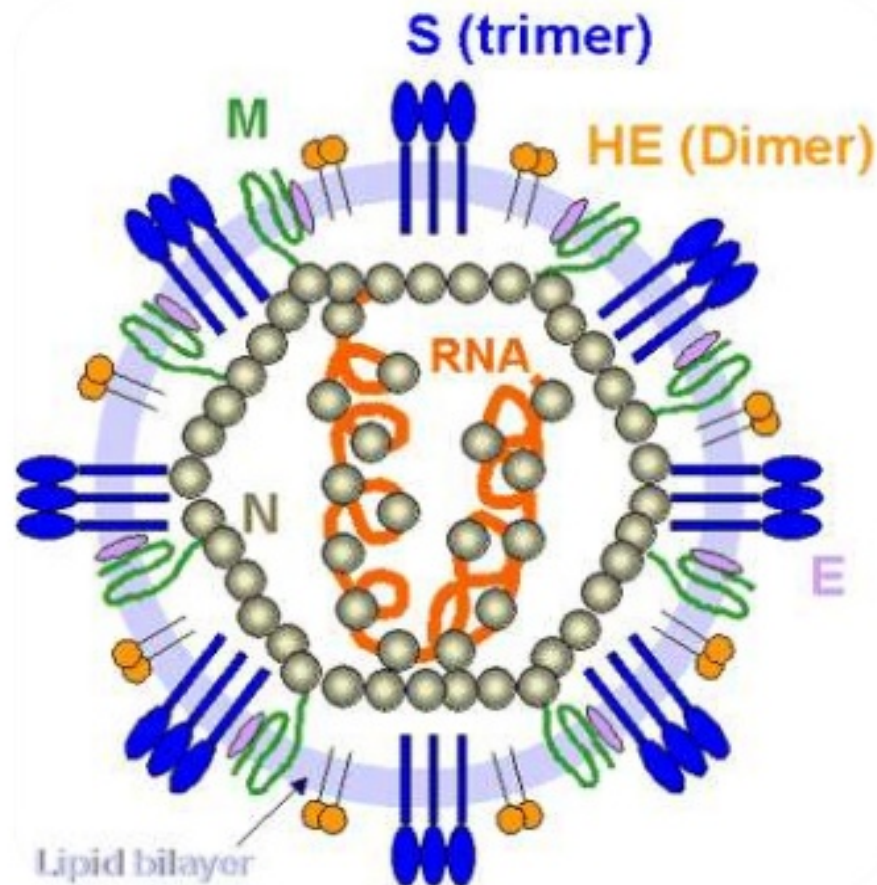
SARS Coronavirus

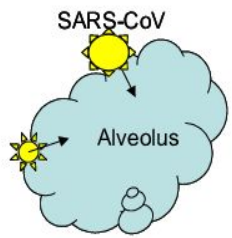
- SARS coronavirus is a positive and single stranded RNA virus belonging to a family of enveloped coronaviruses. Its genome is about 29.7kb, which is one of the largest among RNA viruses. SARS is similar to other coronaviruses in that its genome expression starts with translation of two large ORFs 1a and 1b, which are two polyproteins.



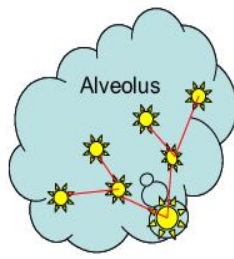
SARS belongs to Corona virus

- Coronaviruses are positive-strand, enveloped RNA viruses that are important pathogens of mammals and birds. This group of viruses cause enteric or respiratory tract infections in a variety of animals including humans, livestock and

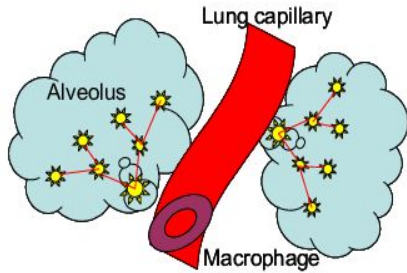




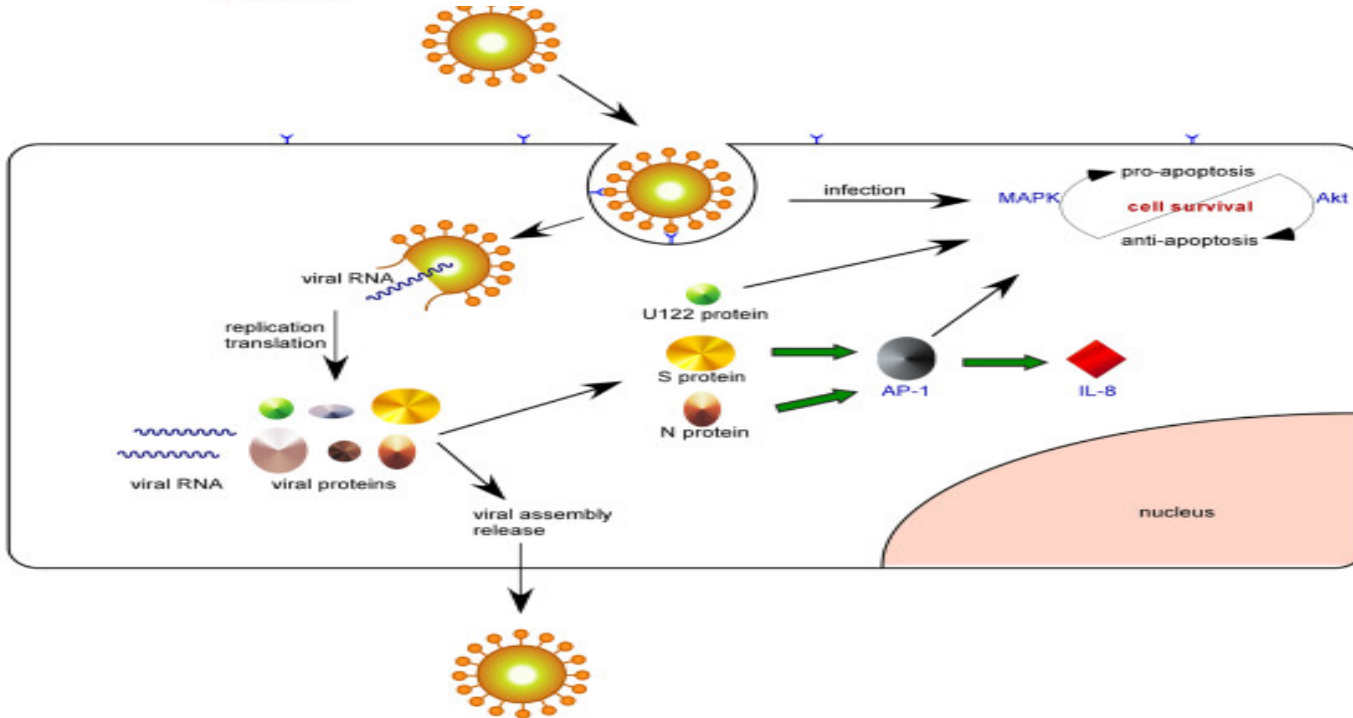
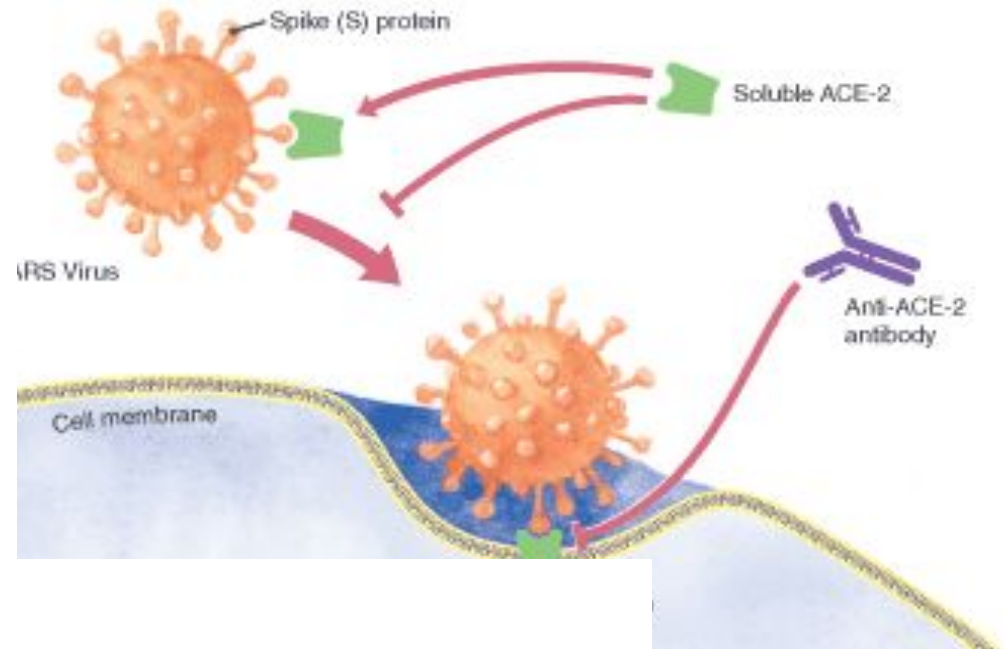
(a) Interstitial infiltration.



(b) Duplication.



(c) Macrophage increment.



What is SARS?

- Definition:
 - “Severe acute respiratory syndrome (SARS) is a viral respiratory illness caused by a coronavirus, called SARS-associated coronavirus (SARS-CoV).”
- Symptoms:
 - high fever ($> 100.4^{\circ}\text{F} / 38.0^{\circ}\text{C}$) at outset with
 - headache, overall feeling of discomfort, & body aches
 - some experience mild respiratory symptoms, diarrhea, & dry cough.
 - most develop pneumonia.

Source: US Center for Disease Control and Prevention SARS Factsheet

Symptoms & Signs

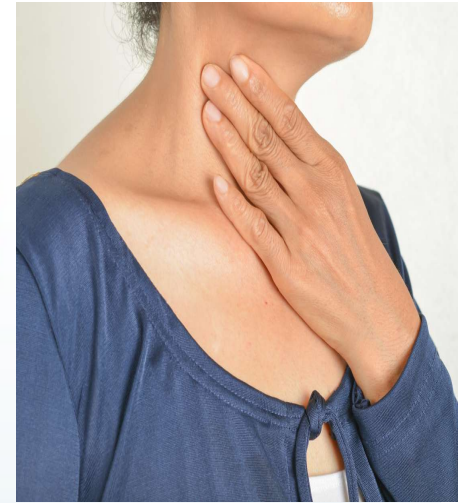
- ❖ Usually begins with a sudden onset of a high fever Greater than 100.4 degrees
- ❖ Headache, overall discomfort, body/muscle aches, chills, shivering, sore throat, runny nose
- ❖ 10%-20% of patients get diarrhea
- ❖ Dry cough, breathing difficulties (after 2-7 days), Oxygen levels in the blood are low
- ❖ Most patients will develop pneumonia (3-4 days) Traveled recently to a SARS-affected area and been in close contact with someone diagnosed with SARS.
- ❖ May not be infectious until symptoms begin to appear, usually 2-7 days, can be up to 10 days. (Incubation Period)



Upper Respiratory Tract Infections (URTI)

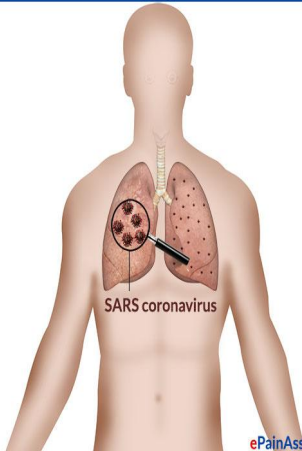
Homeopathic Way Of Treating It!

Symptoms & Signs

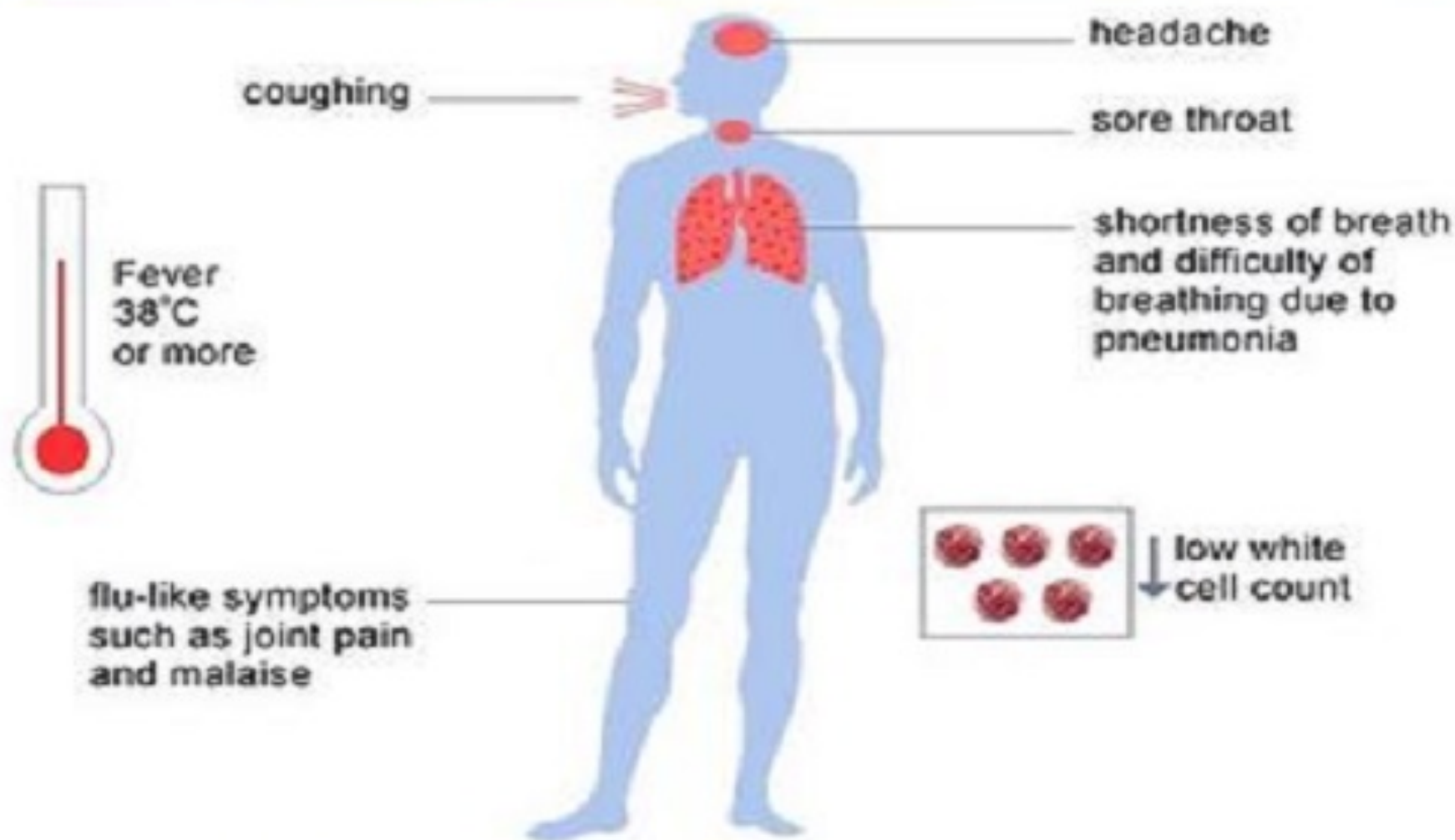


- ❖ Acute
 - ✓ Sudden onset of a high fever
- ❖ Can be lethal for severe cases
 - ✓ 10.9% average death rate in the most severe cases
- ❖ Not lethal for mildly affected people
 - ✓ With time, relief of symptoms, and no complications
- ❖ Difficult to make an accurate prognosis because there is no cure
 - ✓ Based on statistics of SARS patients with similar symptoms and conditions

Severe Acute Respiratory Syndrome



Symptoms of Sudden Acute Respiratory Syndrome (SARS)



Symptoms appear 3-7 days after exposure

Sars virus: Tell-tale signs...

SIGNS AND SYMPTOMS

Incubation period:
two to 10 days.

First main symptoms

- High fever of more than 38 deg C
- Muscle aches

Other symptoms

- Dry cough
- Headache
- Muscular stiffness
- Loss of appetite
- Malaise (extreme tiredness)
- Confusion
- Rash
- Diarrhoea

Late stage symptoms

- Shortness of breath or breathing difficulties;
- Changes in chest X-rays indicative of pneumonia.

Final stage

- **Pneumonia (inflammation of the lungs) triggers off lung failure. The lung is no longer able to exchange the air breathed in into oxygen for the blood.**
- **The patient dies.**

SCIENTISTS and doctors around the world have made breakthroughs over the last two months in the war against severe acute respiratory syndrome.

Much more is known about the dreaded virus since The New Paper's first info-graphics ran on Mar 27.

Here are the latest findings:

THE VIRUS

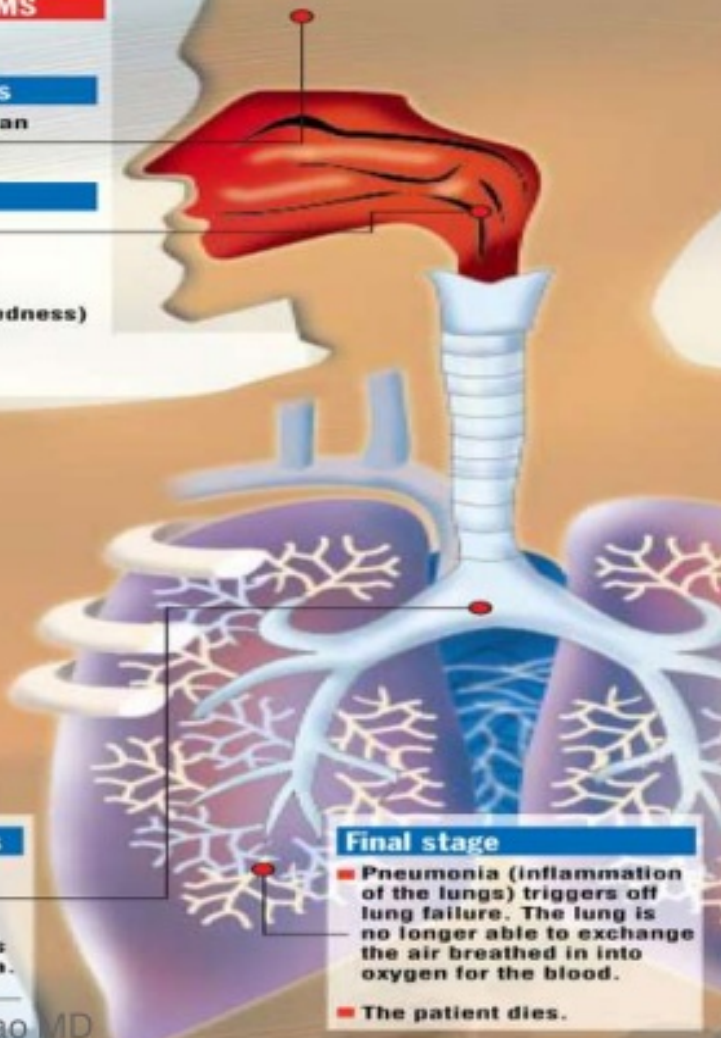
- Can be excreted in large amounts by infected people in their stool and urine. This raises the distinct possibility that less than vigorous hygiene - particularly a lack of hand-washing - can lead to its spread on surfaces in the home and elsewhere;
- Can survive for at least 24 hours on a plastic surface at room temperature;
- Can live for up to four days in human waste;
- Viable indefinitely at 0 degrees;
- Is killed by disinfectants such as bleach, ethanol, phenol, formaldehyde and paraformaldehyde.

STILL UNKNOWN

- The amount of virus needed to infect a person;
- Whether a discharged Sars patient is still capable of excreting the virus and for how long.

DO'S AND DON'TS

- Wash your hands often, especially after touching surfaces.
- Avoid touching your face in general.
- The body is not sterile and the virus can enter the respiratory system through the nose, mouth and eyes.
- Do not spit in public places. If you must, do it in the toilet where it can be flushed down the toilet or sink.
- If you have a fever of 38 deg C, see a doctor straight away.
- Always see the same doctor, do not doctor hop.
- And wear a mask on the way to see the doctor.
- Always cough and sneeze into a tissue or handkerchief.
- Take your temperature at least twice a day.
- Adults have a fever when their temperature is 37.7 deg C and above (ear temperature), 37.3 deg C and above (mouth) and 37 deg C and above (armpit).
- Children have a fever when their temperature is 37.9 deg C and above (ear), 37.6 deg C and above (mouth) and 37.3 deg C and above (armpit).
- Do not self-medicate if you are going to visit a doctor, because it may interfere with his diagnosis and treatment of your illness.

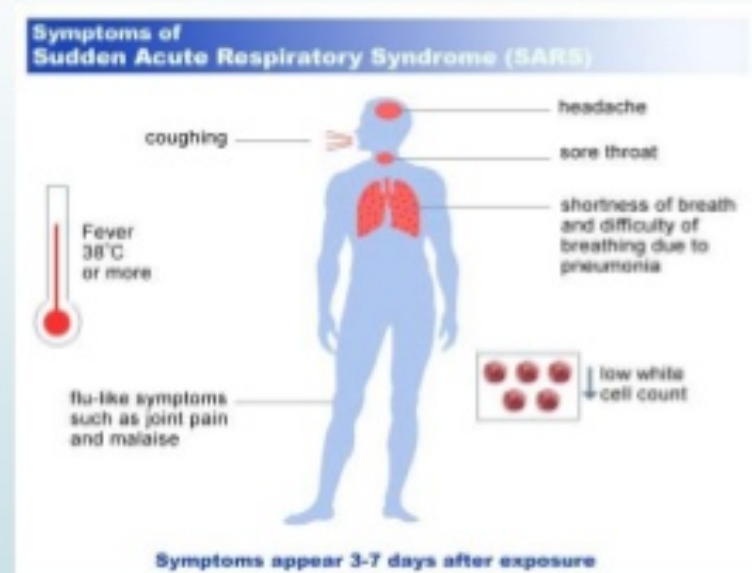


Transmission mode

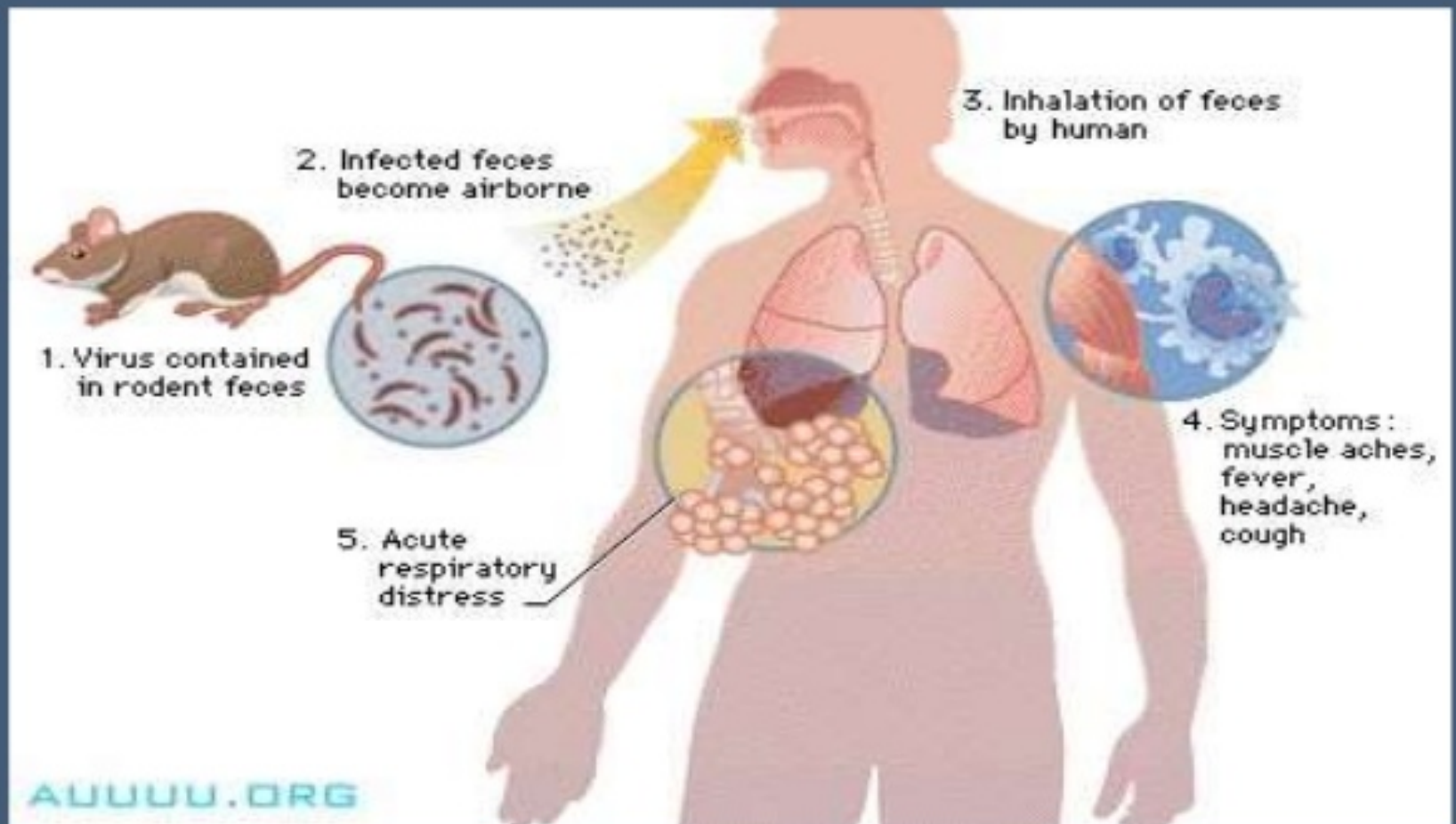
Pathogenesis

Transmitted Through:

- ✓ Close contact with an infected person.
- ✓ Contaminated air and surfaces.
- ✓ If a person touches a contaminated surface and then touches their eyes, mouth or nose.



- Mode of transmission- through cough and sneezes.
 - close person to person contact.





Diagnosis

Doctor will ask questions (about traveling), perform a physical exam and tests.

- ❖ **PCR test**

Polymerase Chain Reaction Test - an essential test that detects the genetic material of the SARS virus in specimens of a patient's blood, stool, or nasal secretions

- ❖ **Serologic Testing**

Laboratory test that searches for antibodies (substances made by the body's immune system to fight a specific infection) to the SARS virus in the patient's blood

- ❖ **Viral Culture**

A small sample of the patient's tissue or fluid that may be infected is placed in a container along with cells in which the SARS virus can grow and if the SARS virus grows in the culture, it will cause changes in the cells that can be seen under a microscope

CDC guidelines for Confirmatory testing

- Positive RT-PCR test results should be confirmed in a reference laboratory. Confirmatory testing is particularly important in areas with a low prevalence of SARS-CoV disease, where the positive predictive value of the assay is likely to be quite low. CDC will conduct confirmatory testing during the early phases of an outbreak.



Treatment

- No uniform treatment for SARS-CoV
- Can easily be confused with other lung related illnesses so patients are usually given:
 - ✓ Broad-spectrum antibiotics
 - ✓ Antiviral agents
 - ✓ Immunomodulatory therapy
 - ✓ Supportive care
- Requires intensive care and observation.

Prevention

- ❖ Good hand hygiene.
- ❖ Pay attention to what surfaces you touch.
- ❖ Infected must remember to effectively cover their mouths when they sneeze or cough.
- ❖ Surgical masks.
- ❖ Gloves.



Isolation and Quarantine the best options

- SARS needs to be regarded as a particularly serious threat for several reasons. The disease has no vaccine and no treatment, forcing health authorities to resort to control tools dating back to the earliest days of empirical microbiology: isolation and quarantine



All are concerned to Prevent the Spread of SARS

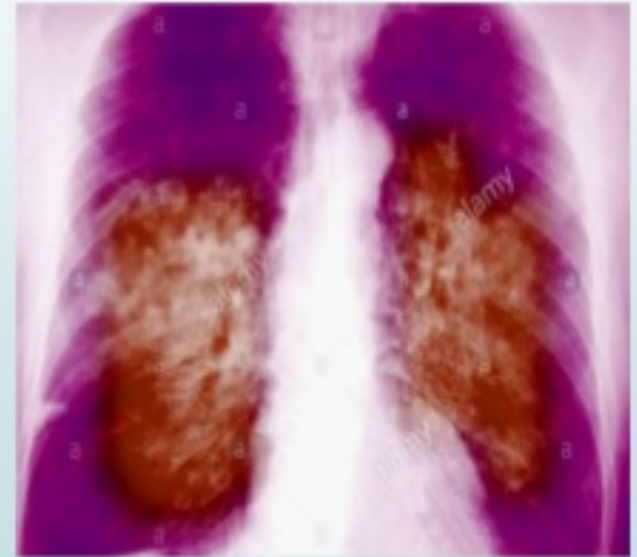


X-ray of SARS Patient

Initial Stage

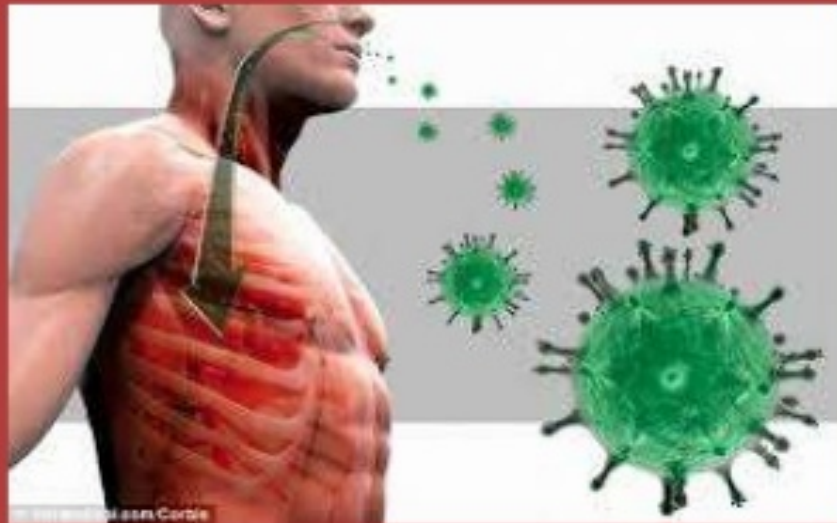


Fatal Stage



INFECTIOUSNESS OF SARS

- Factors affecting infectiousness are
 - Viral load of the secretion from index patient
 - Aerosol-generation procedures
 - Distance of the index patient



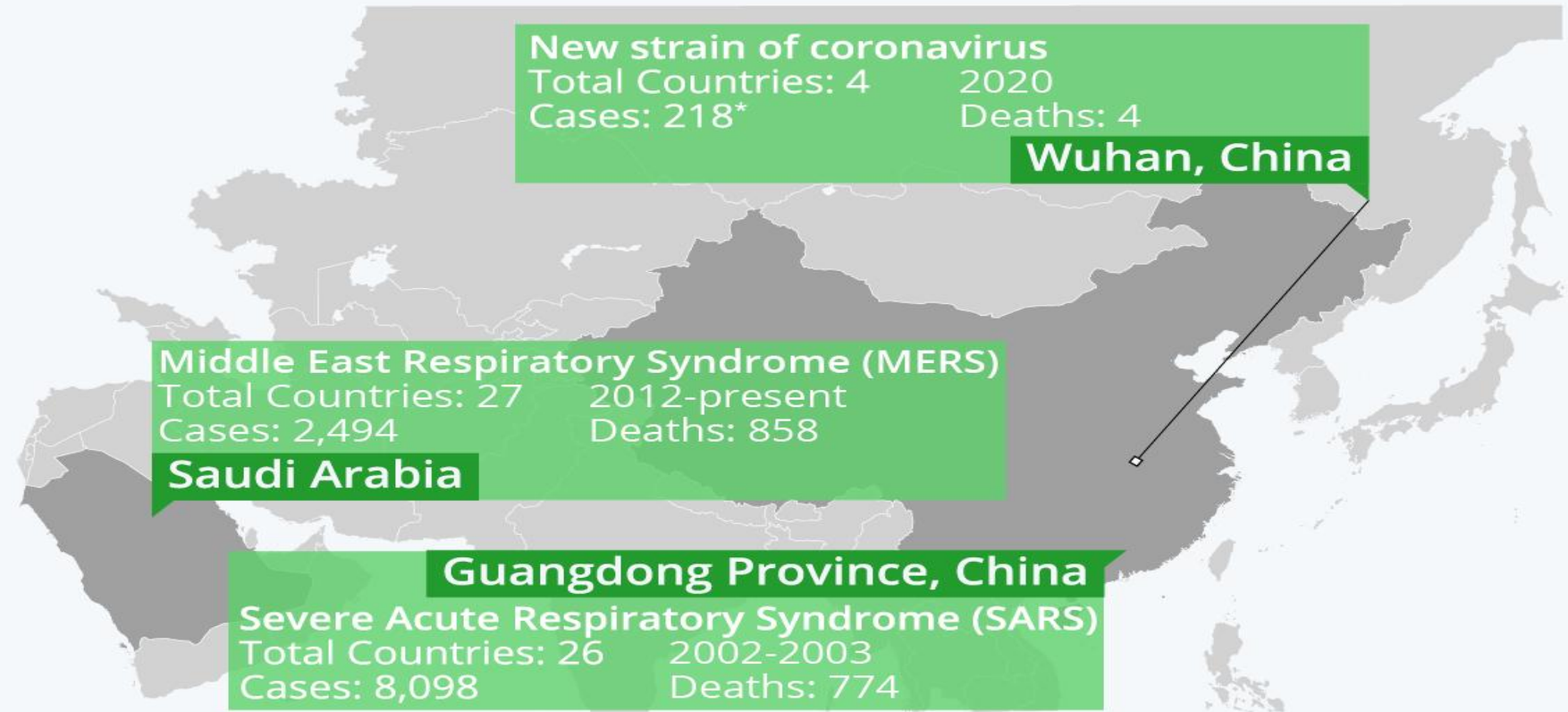
What Is the Outlook for SARS?

- Researchers are currently working on a vaccine for SARS, but there have been no human trials for any potential vaccine. Because there's no confirmed treatment or cure for SARS, it's important to take as many preventive measures as possible.

- Here are some of the best ways to prevent transmission of SARS if you're in close contact with someone who's been diagnosed with the disease:
- Wash your hands frequently.
- Wear disposable gloves if touching any infected bodily fluids.
- Wear a surgical mask when in the same room with a person with SARS.
- Disinfect surfaces that may have been contaminated with the virus.
- Wash all personal items, including bedding and utensils, used by a person with SARS.
- Moreover, follow all of the above steps for at least 10 days after the symptoms of SARS have gone away. Keep children home from school if they develop a fever or any breathing problems after coming in contact with someone with SARS.

New Coronavirus Strain Found in China

Selected data on human coronavirus outbreaks in Asia



* Not all have been confirmed as coronavirus in a laboratory

Sources: World Health Organization, Centers for Disease Control and Prevention, BBC

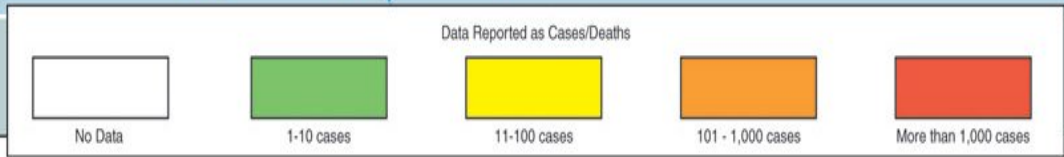


Figure 4
Cumulative Number of Reported Probable SARS Cases/Deaths (1 November 2002 to 8 July 2003)

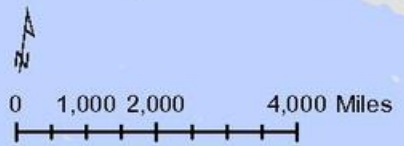
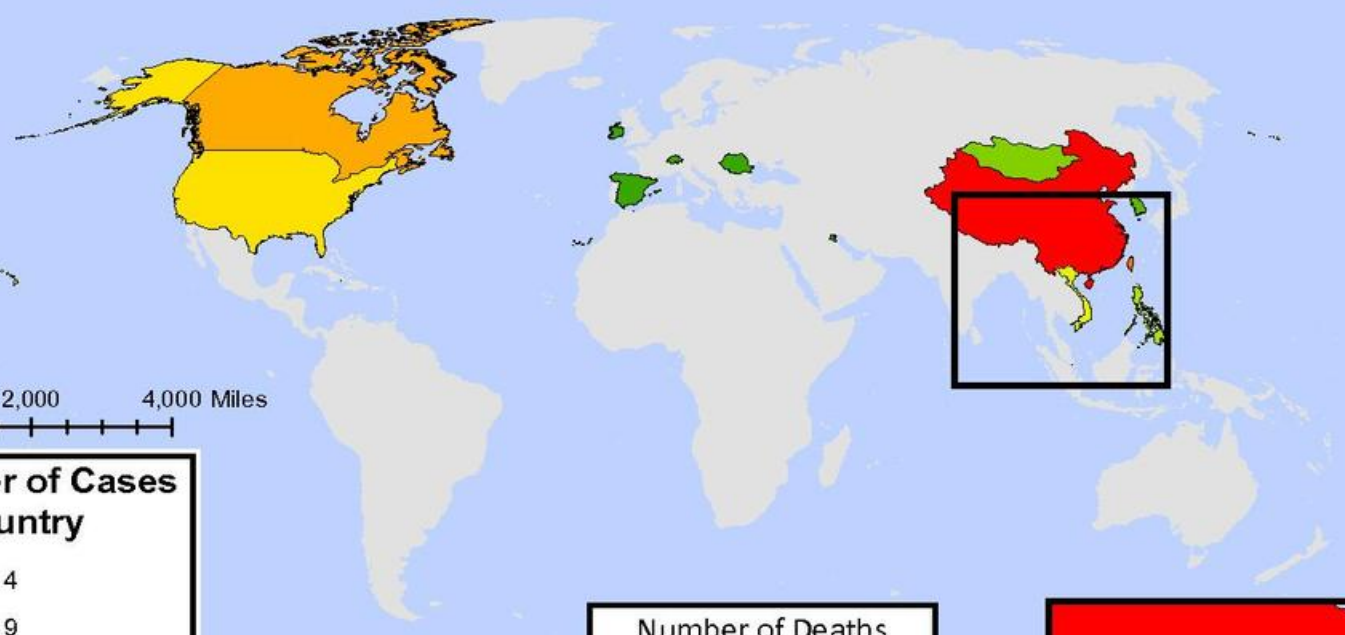


Source: World Health Organization

Boundary representation is not necessarily authoritative.



SARS CASES AND DEATHS



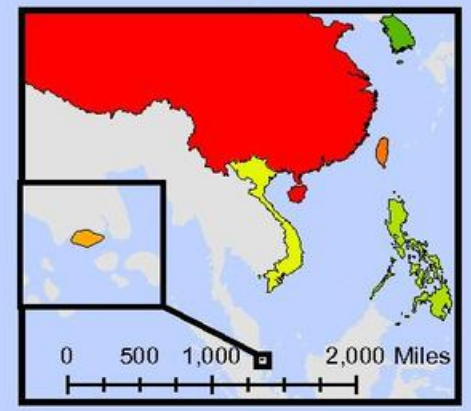
Number of Cases per Country

| |
|-------------|
| 1 - 4 |
| 5 - 9 |
| 10 - 13 |
| 13 - 16 |
| 17 - 63 |
| 64 - 71 |
| 72 - 251 |
| 252 - 346 |
| 347 - 1755 |
| 1756 - 5328 |

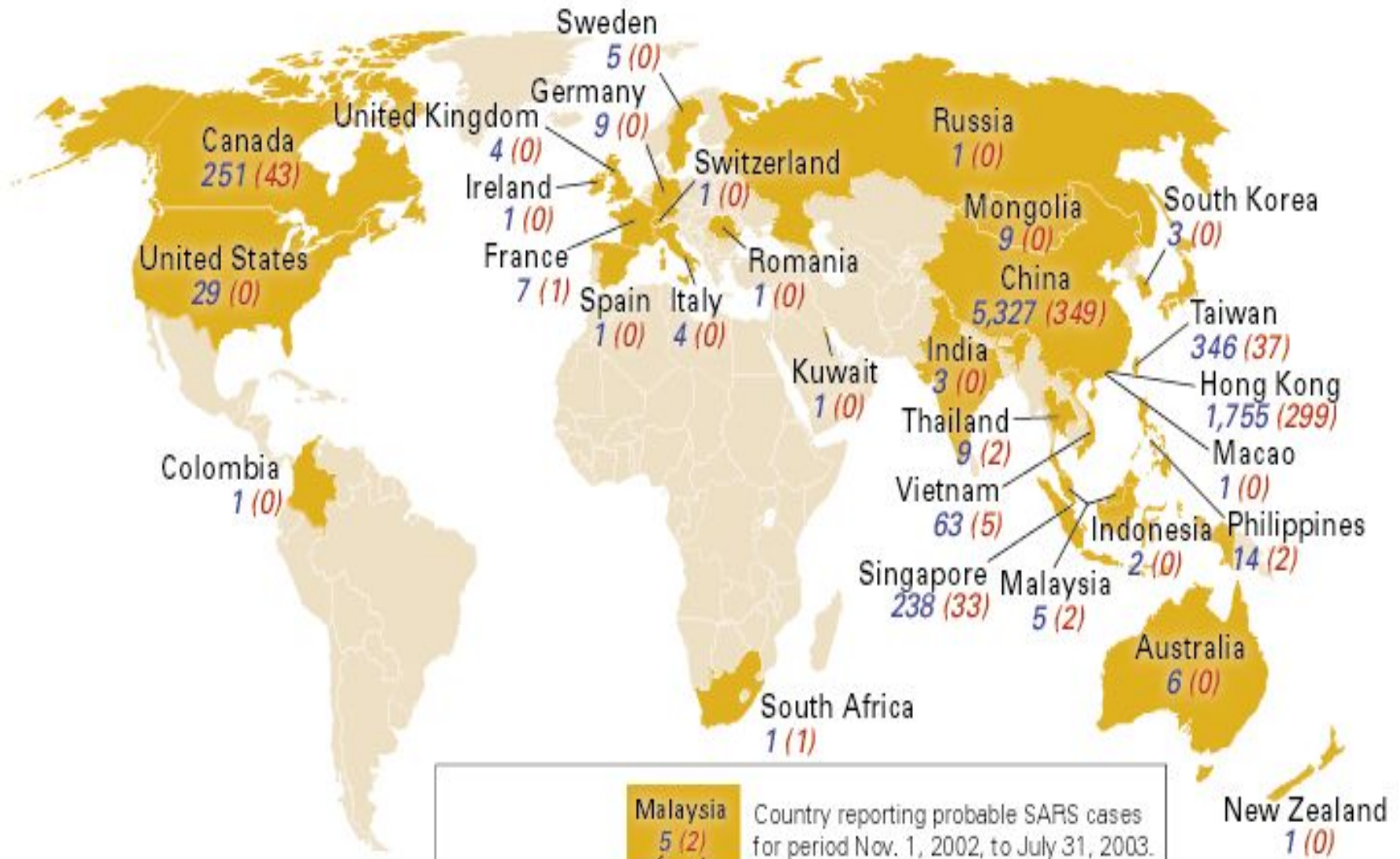
Pauline Strickland
 April 3, 2012
 Robinson Projection
 Source: WHO [13]

Number of Deaths

| | |
|---------------|-----|
| Canada | 44 |
| China | 349 |
| Hong Kong | 299 |
| Taiwan | 37 |
| Philippines | 2 |
| Singapore | 33 |
| United States | 4 |
| Vietnam | 5 |



SARS EPIDEMIC, 2002–2003



Malaysia
5 (2)

Country reporting probable SARS cases for period Nov. 1, 2002, to July 31, 2003.

Number of cases Number of deaths

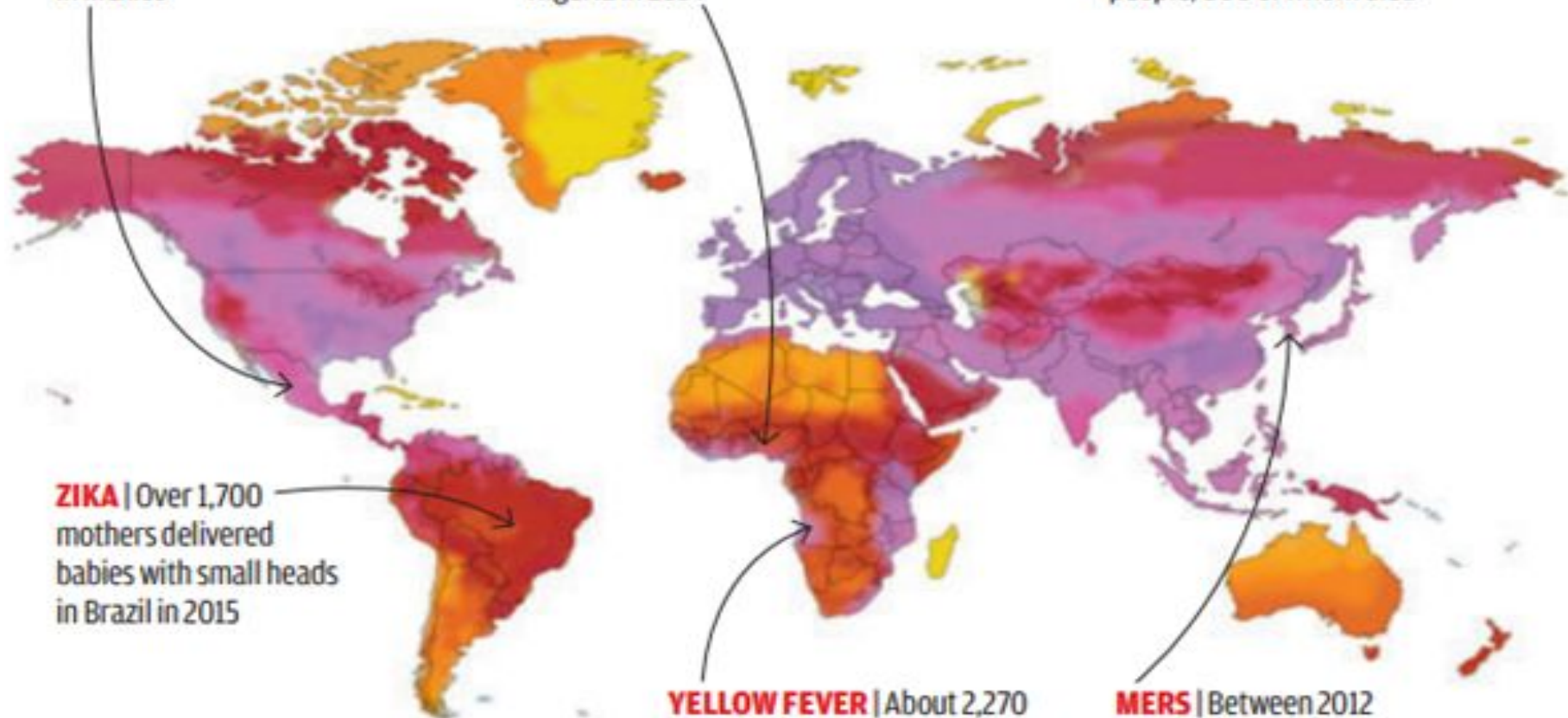
Outbreak nations

Zoonotic diseases are periodically striking various parts of the globe

SWINE FLU | In 2009, over 1,550 cases of influenza were reported in Mexico

EBOLA | About 12,000 people were killed by the Ebola hemorrhagic fever in Sierra Leone, Liberia and Nigeria in 2014

SARS | In 2002, SARS was reported in 37 countries, which infected about 8,000 people, 800 of whom died



ZIKA | Over 1,700 mothers delivered babies with small heads in Brazil in 2015

YELLOW FEVER | About 2,270 cases, including 293 deaths, due to yellow fever were reported in Angola in 2015

MERS | Between 2012 and 2015, about 580 deaths due to MERS were reported in South Korea

Snaps



THANKING YOU