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"Different Pandemic Diseases found till date"

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ABSTRACT :-

The Pandemic has a long history, but the term of "pandemic" is still not been defined by many medical texts. There have been many significant pandemics recorded in human history, and the pandemic related crises have caused enormous negative impacts on health, economies, and even national security in the world.

This article will explore the literature for the concept and history of pandemics; summarises the key features of a pandemics, and discusses the negative impacts on health, economy, social and global security of pandemics and disease outbreaks**.**

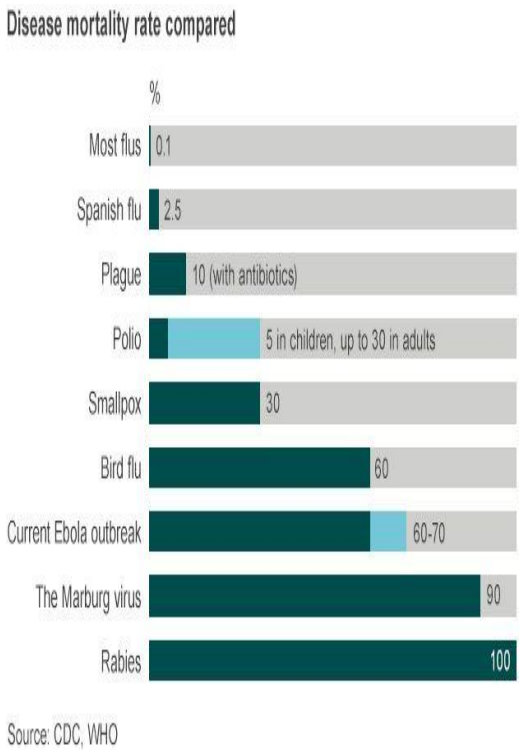

Fig 1 : Mortality rate

KEY WORDS : Pandemic, Epidemic, Mortality, Contagiousness, Immunoflurocense Widespread , Malignant, Hemorrhagic, Blackpox, Antiretroviral, Etiology

INTRODUCTION :-

Pandemics are for the most part disease outbreaks that become widespread as a result of the spread of human- to-human infection. There have been many significant disease outbreaks and pandemics recorded in history, including Spanish Flu, Hong Kong Flu, SARS, H7N9, Ebola, Zika (WHO, 2011b) (Rewar, Mirdha, &Rewar, 2015) (Maurice, 2016). The term "pandemic" has not been defined by many medical texts, but there are some key features of a pandemic, including wide geographic extension, disease movement, novelty, severity, high attack rates and explosiveness, minimal population immunity, infectiousness and contagiousness, which help us to understand the concept better, if we examine similarities and differences among them. The pandemic related crises have been associated with enormous negative impacts on health, economy, society and security of national and global communities. As well, they have caused significant political and social disruption.

Role of WHO in Pandemic :

1) Helping countries to prepare and respond :

a. Preparedness and Response Plan, which identifies the major actions countries need to take, and the resources needed to carry them out.

b. The plan, which is updated as fresh information and data improve WHO's understanding of the characteristics of the virus and how to respond, acts as a guide for developing country-specific plans.

c. The health agency's six regional offices, and 150 country offices, work closely with governments around the world to prepare their health systems for the ravages of COVID-19, and to respond effectively when cases arrive and begin to mount.

d. With partners, WHO set up the COVID-19 Solidarity Response Fund, to ensure patients get the care they need, and frontline workers get essential supplies and information; and to accelerate research and development of a vaccine and treatments for all who need them.

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f. With donations from governments, the private sector and individuals, more than $800 million has been pledged or received for the response so far.

2) Providing accurate information, busting dangerous myths :

a. The internet is awash with information about the pandemic, some of it useful, some of it false or misleading. In the midst of this "infodemic", WHO is producing accurate, useful guidance that can help save lives.

b. This includes around 50 pieces of technical advice for the public, health workers and countries, with evidence-based guidance on every element of the response, and exploding dangerous myths.

c. The health agency benefits from the expertise of a global network of health professionals and scientists, including epidemiologists, clinicians and virologists, to ensure that the response is as comprehensive, authoritative and representative as possible.

d. To ensure information is correct and helpful, WHO set up a team to give everyone access to timely, accurate and easy-to-understand advice, from trusted sources. In addition, daily situation reports and press briefings, as well as briefings with governments, are keeping the world informed about the latest data, information and evidence.

e. Many social media and tech companies are working closely with WHO to aid the flow of reliable information, including Instagram, Linkedin and TikTok; and chatbots on the Whatsapp and Viber platforms have garnered millions of followers, sending out timely updates and reports.

3) Ensuring vital supplies reach frontline health workers :

a. Personal protective equipment is essential to ensure health professionals are able to save lives, including their own. So far, WHO has shipped more than two million items of personal protective equipment to 133 countries, and is preparing to ship another two million items in the coming weeks. More than a million diagnostic tests have been dispatched to 126 countries, in all regions, and more are being sourced.

b. However, far more is needed, and WHO is working with the International Chamber of Commerce, the World Economic Forum, and others in the private sector, to ramp up the production and distribution of essential medical supplies.

c. On 8 April, WHO launched a "UN COVID-19 Supply Chain Task Force", which aims to dramatically increase the supply of essential protective equipment where it is needed.

4) Training and mobilizing health workers :

a. WHO is aiming to train millions of health workers, via its OpenWHO platform. Thanks to this online tool, life-saving knowledge is being transferred to frontline personnel by the Organization, and its key partners.

b. Users take part in a worldwide, social learning network, based on interactive, online courses and materials covering a variety of subjects. OpenWHO also serves as a forum for the rapid sharing of public health expertise, and in-depth discussion and feedback on key issues. So far, more than 1.2 million people have enrolled in 43 languages.

c. Countries are also being supported by experts, deployed around the world by the WHO's Global Outbreak Alert and Response Network (GOARN). During outbreaks, the network ensures that the right technical expertise and skills are on the ground where and when they are needed most.

d. Emergency Medical Teams are also an important part of the global health workforce. These teams are highly trained, and self-sufficient, and are sent to places identified as disaster or emergency zones.

5) The search for a vaccine :

a. Laboratories in many countries are already conducting tests that, it is hoped, will eventually lead to a vaccine. In an attempt to corral these efforts, WHO brought together 400 of the world's leading researchers in February, to identify research priorities.

b. The agency launched a "Solidarity Trial", an international clinical trial, involving 90 countries, to help find effective treatment. The aim is to rapidly discover whether any existing drugs can slow the progression of the disease, or improve survival.

c. To better understand the virus, WHO has developed research protocols that are being used in more than 40 countries, in a coordinated way, and some 130 scientists, funders and manufacturers from around the world have signed a statement committing to work with WHO to speed the development of a vaccine against COVID-19.

The DefinitionPandemic :-

The word "Pandemic" comes from theoriginates from the Greek pan meaning "all" and demos "the people "., and The word is commonly taken to refer to a widespread epidemic of contagious disease throughout the whole of The word "Pandemic" comes from theoriginates from the Greek pan meaning "all" and demos "the people "., and The word is commonly taken to refer

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to a widespread epidemic of contagious disease throughout the whole of

"A pandemic is the worldwide spread of a new disease"

A pandemic is defined as "an epidemic occurring worldwide, or over a very wide area, crossing international boundaries and usually affecting a large number of people".

The classical definition includes nothing about population immunity, virology or diseasseverity.By this definition, pandemics can be said to occur annually in each of the temperate southern and northern hemispheres, given that seasonal epidemics cross international boundaries and affect a large number of people. However, seasonal epidemics are not considered pandemics.

Risks of Pandemic diseases :-

- Pandemics have occurred throughout history and appear to be increasing in frequency, particularly because of the increasing emergence of viral disease from animals.
- Pandemic risk is driven by the combined effects of spark risk (where a pandemic is likely to arise) and spread risk (how likely it is to diffuse broadly through human populations).
- Some geographic regions with high spark risk, including Central and West Africa, lag behind the rest of the globe in pandemic preparedness.
- Probabilistic modeling and analytical tools such as exceedance probability (EP) curves are valuable for assessing pandemic risk and estimating the potential burden of pandemics.
- Influenza is the most likely pathogen to cause a severe pandemic. EP analysis indicates that in any given year, a 1 percent probability exists of an influenza pandemic that causes nearly 6 million pneumonia and influenza deaths or more globally.

Impacts of Pandemic diseases :-

- Pandemics can cause significant, widespread increases in morbidity and mortality and have disproportionately higher mortality impacts on LMICs.
- Pandemics can cause economic damage through multiple channels, including short-term fiscal shocks and longer-term negative shocks to economic growth.
- Individual behavioral changes, such as fear-induced aversion to workplaces and other public gathering places, are a primary cause of negative shocks to economic growth during pandemics.
- Some pandemic mitigation measures can cause significant social and economic disruption.
- In countries with weak institutions and legacies of political instability, pandemics can increase political stresses and tensions. In these contexts, outbreak response measures such as quarantines have sparked violence and tension between states and citizens.

Pathogen adaption and pandemic risks :-

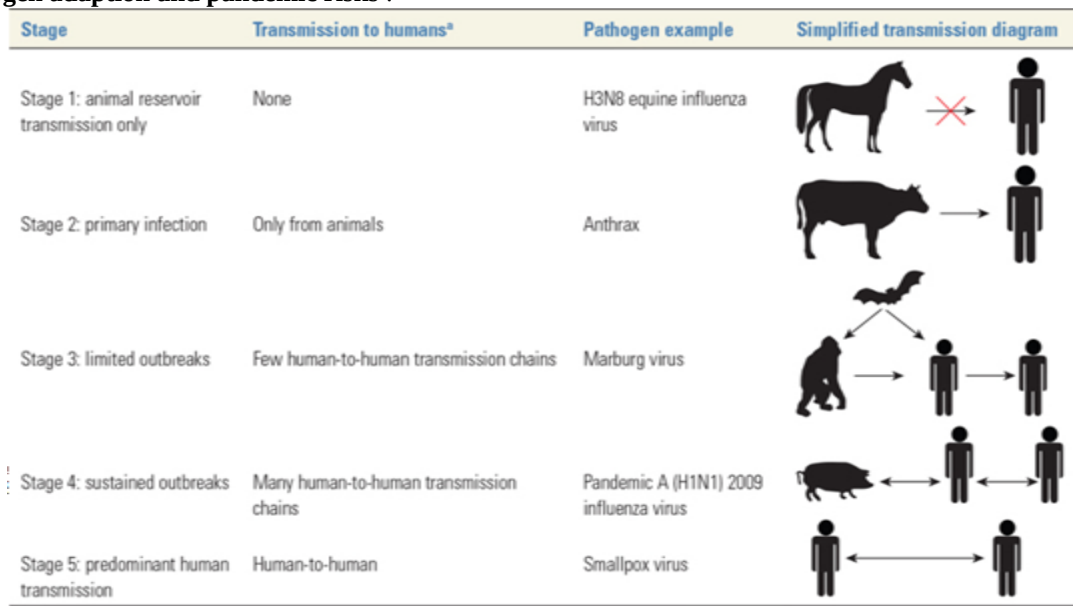

Fig 2 : Pathogen adaption and pandemic risks

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Examples of Pandemic Preparedness and Response Activities, by Time Period :-

Prepandemic period (before a pandemic starts) :

- Stockpile building
- Continuity planning
- Public health workforce training
- Simulation exercises
- Risk transfer mechanism set-up

Situational awareness[a]

Spark period (as a pandemic starts) :

- Initial outbreak detection
- Pathogen characterization or laboratory confirmation
- Risk communication and community engagement
- Animal disease control

Spread period (after a pandemic starts) :

- Global pandemic declaration
- Risk communications
- Contact tracing, quarantine, and isolation
- Social distancing
- Stockpile deployment

Effects of Pandemic on health:-

Pandemics can cause significant, widespread increases in morbidity and mortality and have disproportionately higher mortality impacts on Low and middle-income countries .

Pandemics can cause economic damage through multiple channels, including short-term fiscal shocks and longer-term negative shocks to economic growth.

Pandemic disease by year :

Influenza Pandemic	1847 – 1848
Cholera Pandemic	1826
Spanish flu Pandemic	1918 – 1919
Smallpox Pandemic	1980
Ebola Pandemic	1976
HIV/AIDS Pandemic	1981 to present
Covid-19 Pandemic	2019

DIFFERENT PANDEMIC DISEASES :-

1 .INFLUENZA PANDMIC :

Year:(1847-1848)

Influenza viruses, which are part of the **Orthomyxoviridae** family of viruses, cause the flu-

Four types of the virus exist: A and B, which are responsible for seasonal flu epidemics in people; C, which is relatively rare, causes a mild respiratory illness, and is not thought to cause epidemics; and D, which primarily infects cattle and isn't known to affect people

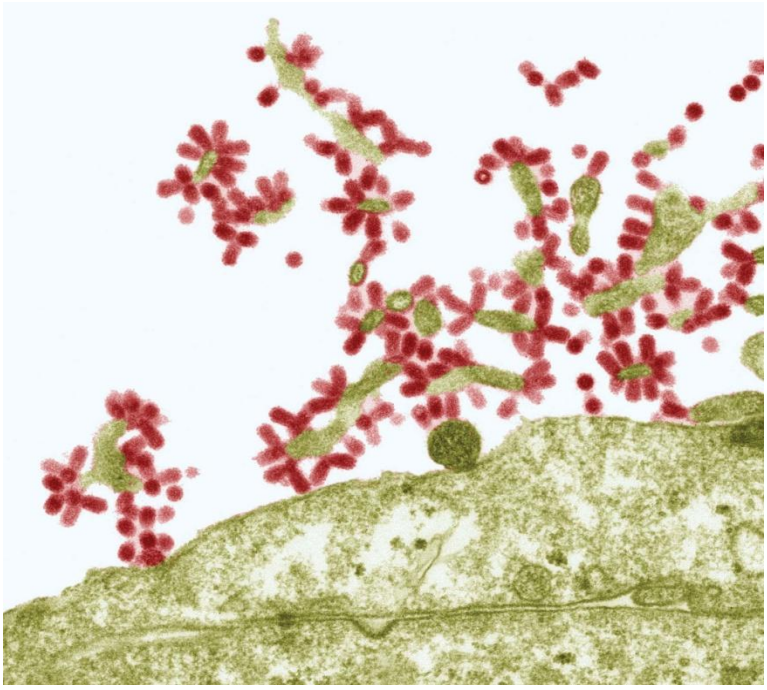

Fig 3 :-influenza virus.

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SWINE FLU :

The **2009 swine flu pandemic** was an influenza pandemic that lasted about 19 months, from January 2009 to August 2010, and was the second of two pandemics involving H1N1 influenza virus (the first being the 1918–1920 Spanish flu pandemic). First described in April 2009, the virus appeared to be a new strain of H1N1 that resulted from a previous triple reassortment of bird, swine, and human flu viruses and that further combined with a Eurasian pig flu virus,[1] leading to the term "swine flu".

Some studies estimated that the actual number of cases including asymptomatic and mild cases could be 700 million to 1.4 billion people—or 11 to 21 percent of the global population of 6.8 billion at the time. The lower value of 700 million is more than the 500 million people estimated to have been infected by the Spanish flu pandemic. However, the Spanish flu infected a much higher proportion of the world population at the time, with the Spanish flu infecting an estimated 500 million people, which was roughly equivalent to a third of the world population at the time of the pandemic.

The number of lab-confirmed deaths reported to the World Health Organization (WHO) is 18,449, though the 2009 H1N1 flu pandemic is estimated to have actually caused about 284,000 (range from 150,000 to 575,000) deaths. A follow-up study done in September 2010 showed that the risk of serious illness resulting from the 2009 H1N1 flu was no higher than that of the yearly seasonal flu.For comparison, the WHO estimates that 250,000 to 500,000 people die of seasonal flu annually.

Diagnosis of swine flu :

Confirmed diagnosis of pandemic H1N1 flu requires testing of a nasopharyngeal, nasal, or oropharyngeal tissue swab from the patient. Real-time RT-PCR is the recommended test as others are unable to differentiate between pandemic H1N1 and regular seasonal flu.However, most people with flu symptoms do not need a test for pandemic H1N1 flu specifically, because the test results usually do not affect the recommended course of treatment.

The U.S. CDC recommend testing only for people who are hospitalized with suspected flu, pregnant women, and people with weakened immune systems. For the mere diagnosis of influenza and not pandemic H1N1 flu specifically, more widely available tests include rapid influenza diagnostic tests (RIDT), which yield results in about 30 minutes, and direct and indirect immune ofluorescence assays (DFA and IFA), which take 2–4 hours.

Due to the high rate of RIDT false negatives, the CDC advises that patients with illnesses compatible with novel influenza A (H1N1) virus infection but with negative RIDT results should be treated empirically based on the level of clinical suspicion, underlying medical conditions, severity of illness, and risk for complications, and if a more definitive determination of infection with influenza virus is required, testing with rRT-PCR or virus isolation should be performed.

The use of RIDTs has been questioned by researcher Paul Schreckenberger of the Loyola University. Health System, who suggests that rapid tests may actually pose a dangerous public health risk. Nikki Shindo of the WHO has expressed regret at reports of treatment being delayed by waiting for H1N1 test results and suggests, "[D]octors should not wait for the laboratory confirmation but make diagnosis based on clinical and epidemiological backgrounds and start treatment early."

On 22 June 2010, the CDC announced a new test called the "CDC Influenza 2009 A (H1N1)pdm Real-Time RT-PCR Panel (IVD)". It uses a molecular biology technique to detect influenza A viruses and specifically the 2009 H1N1 virus. The new test will replace the previous real-time RT-PCR diagnostic test used during the 2009 H1N1 pandemic, which received an emergency use authorization from the U.S. Food and Drug Administration in April 2009. Tests results are available in four hours and are 96% accurate.

Transmission :

Spread of the **H1N1 virus** is thought to occur in the same way that seasonal flu spreads. Flu viruses are spread mainly from person to person through coughing or sneezing by people with influenza. Sometimes people may become infected by touching something—such as a surface or object—with flu viruses on it and then touching their face .

Vaccines :

By 19 November 2009, doses of vaccine had been administered in over 16 countries. A 2009 review by the U.S. National Institutes of Health

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(NIH) concluded that the 2009 H1N1 vaccine has a safety profile similar to that of seasonal vaccine.

Sign and Symptoms:-

1).Common symptoms :

- Fever
- Aching muscles
- Chills and sweats
- Headache
- Dry, persistent cough
- Shortness of breath
- Tiredness and weakness
- Runny or stuffy nose
- Sore throat
- Eye pain
- Vomiting and diarrhea, but this is more common in children than adults

2). Chronic symptomps:

- Difficulty breathing or shortness of breath
- Chest pain
- Ongoing dizziness
- Seizures
- Worsening of existing medical conditions
- Severe weakness or muscle pain

TREATMENTS:-

***For common symptoms:**

Everyone need nothing more than rest and plenty of fluids to treat the flu.

***For severe symptomps:**

Drugs that used for treatment are:

1. **oseltamivir (Tamiflu), -** (oral medication)
2. **zanamivir (Relenza), -** (inhale using inhalers)
3. **peramivir (Rapivab) or baloxavir (Xofluza**).

2 .CHOLERA PANDEMIC :

Year – (1826)

It is caused by eating food or drinking water contaminated with a bacterium called **Vibrio cholerae** .

The World Health Organization reports that there are **1.3** million to **4** million cases each year.

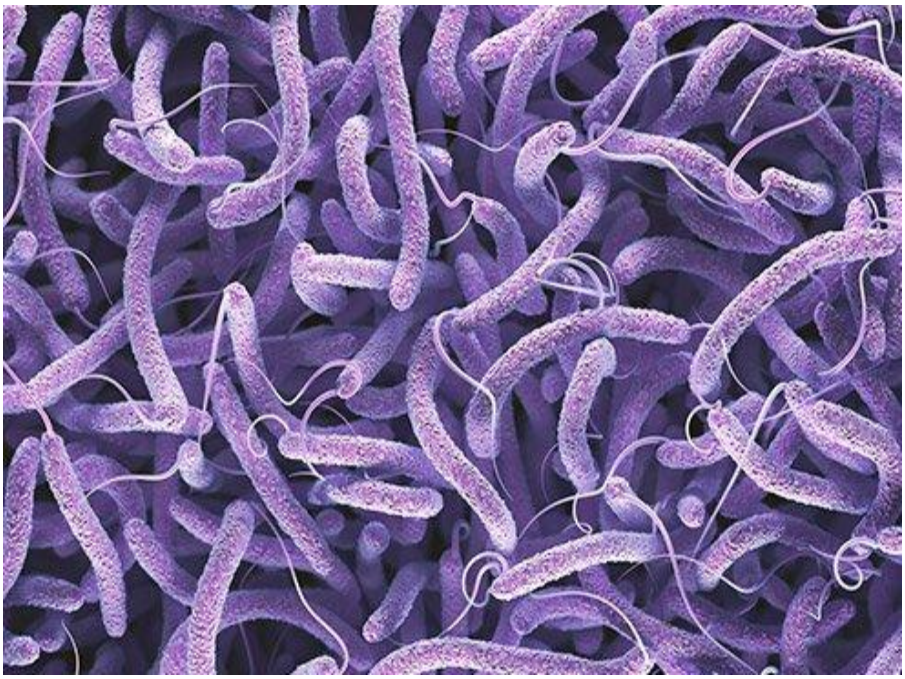

Fig 4 :Vibrio cholerae.

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Steps in the evolution of the seventh pandemic Vibrio cholerae :

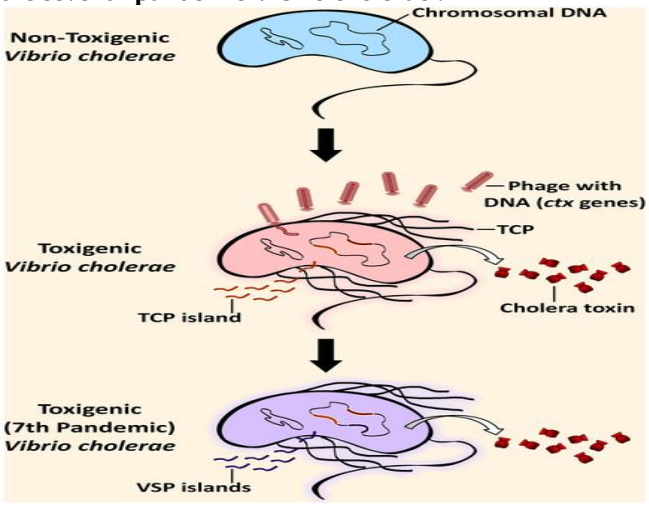

Fig 5: Evalution pf Vibrio cholerae

Signs and symptoms :

1 . Vomiting

2 . Dehydration

3 . Diarrhea

4 .Symptomps of dehydration includes :

- Rapid heart rate
- Loss of skin elasticity (the ability to return to original position quickly if pinched)
- Dry mucous membranes, including the inside of the mouththroat, nose, and eyelids
- Low bloodpressure
- Thirst
- Muscle cramps

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Fig 6: Muscle cramps

TREATMENTS:

1. Rehydration Therapy :

Cholera can cause dehydration, which can be deadly if not properly treated. With timely rehydration therapy, more than 99% of cholera patients will survive. That's why rehydration is the most important treatment for cholera.

Rehydration therapy for patients with cholera can include

- adequate volumes of a solution of oral rehydration salts,
- intravenous (IV) fluids when necessary, and
- electrolytes.

Fig 7: Image of ors solution and electrolyte

2. Antibiotic treatment :

Antibiotic(s) of choice	Alternative(s)
Doxycycline Adults: 300 mg once *or* **Tetracycline** Children: 12.5 mg/kg Adults: 500 mg 4 times a day x 3 days	**Erythromycin** Children: 12.5 mg/kg Adults: 250 mg 4 times a day x 3 days

All doses shown are for oral administration. If drugs are not available in liquid form for use in young children, it may be necessary to use tablets and estimate the doses reported in this table. The first dose should be given as soon as vomiting stops, which is usually 4-6 hours after starting rehydration therapy.

Table 4. WHO guideline of antimicrobial treatment of cholera

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Fig 8: Images of antibiotic

3 . SPANISH FLU PANDEMIC :

Year – (1918-1919)

Spanish flu caused by an **H1N1 virus** with genes of avian origin. It spread worldwide during **1918-1919.**

It lasting from February 1918 to April 1920, it **infected500 million** peoples that is about one third of world population at the time, in four successive waves. The **death** roll is about **17 to 100 million** peoples.

Fig 9 : H1N1 virus

Signs and symptoms :

1. Typical flu symptoms of sore throat, headache, and fever, especially during the **first** wave.
2. During the **second** wave the disease was much more serious, often complicated by **bacterial pneumonia,** which was often the cause of death. This more serious type would cause **heliotrope cyanosis** to develop, whereby the skin would first develop two mahogany spots over the cheekbones which would then over a few hours spread to color the entire face blue, followed by black coloration first in the extremities and then further spreading to the limbs and the torso. After this, death would follow within hours or days due to the lungs being filled with fluids.
3. Other signs and symptoms reported included spontaneous mouth and nosebleeds, miscarriages for pregnant women, a peculiar smell, teeth, and hair falling, delirium,dizziness, insomnia, loss of hearing or smell, blurred vision, and impaired color vision.

TREATMENTS :

When the Spanish flu hit, doctors and scientist wee unsure what caused it or how to treat it. Unlike

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today there were **no effective vaccines**oe antivirals, drugs that treat flu.

***There are **four FDA-approved influenza antiviral drugs** recommended by CDC for use against recenty circulating influenza viruses.

1.Rapivab (peramivir) **2.Relenza** (zenamivir)
3.Tamiflu (oseltamivir phosphate)
4.Xofluza(baloxavirmarboxil)

Fig 10: Rapivab injection

4 . SMALL POX :
Year- (1980)

Smallpox was an infectious disease caused by one of two virus variants, **Variola major** and **Variola minor**. The last naturally occurring case was diagnosed in October 1977, and the World Health Organization (WHO) certified the global eradication of the disease in 1980. The risk of death after contracting the disease was about 30%, with higher rates among babies. Often those who survived had extensive scarring of their skin, and some were left blind.

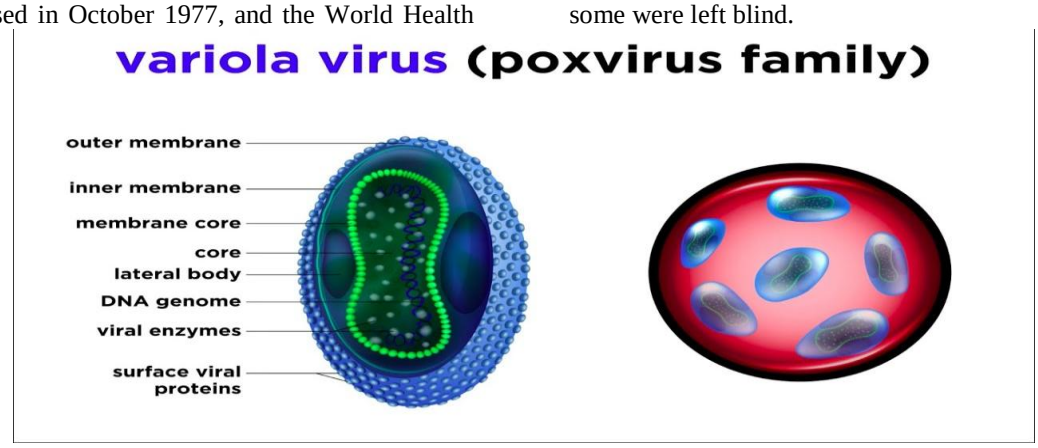

Fig 11 :Variola virus (poxvirux family)

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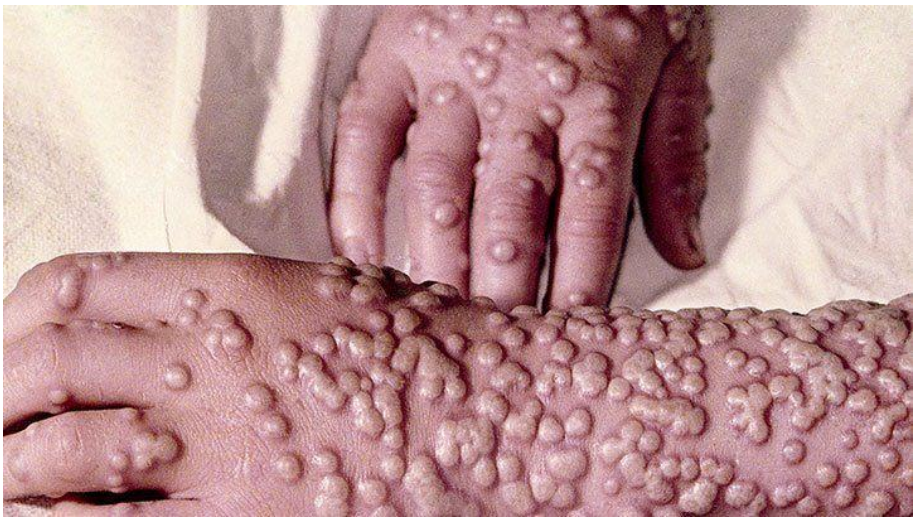

Fig 12: Smallpox effect on body

Signs and symptoms :

1 . Ordinary symptoms :

Ninety percent or more of smallpox cases among unvaccinated persons were of the ordinary type. In this form of the disease, by the second day of the rash the macules had become raised papulesBy the third or fourth day, the papules had filled with an opalescent fluid to become vesicles This fluid became opaque and turbid within 24–48 hours, resulting in pustules.

By the sixth or seventh day, all the skin lesions had become pustules. Between seven and ten days the pustules had matured and reached their maximum size. The pustules were sharply raised, typically round, tense, and firm to the touch

The pustules were deeply embedded in the dermis, giving them the feel of a small bead in the skin. Fluid slowly leaked from the pustules, and by the end of the second week, the pustules had deflated and began to dry up, forming crusts or scabs. By day 16–20 scabs had formed over all of the lesions, which had started to flake off, leaving depigmented scars.

Ordinary smallpox generally produced a discrete rash, in which the pustules stood out on the skin separately. The distribution of the rash was most dense on the face, denser on the extremities than on the trunk, and denser on the distal parts of the extremities than on the proximal. The palms of the hands and soles of the feet were involved in most cases. Sometimes, the blisters merged into sheets, forming a confluent rash, which began to detach the outer layers of skin from the underlying flesh. Patients with confluent smallpox often remained ill even after scabs had formed over all the lesions. In one case series, the case-fatality rate in confluent smallpox was 62 percent.

2.Modified symptoms :

Referring to the character of the eruption and the rapidity of its development, modified smallpox occurred mostly in previously vaccinated people. It is rare in unvaccinated people, with 1–2% of cases being modified compared to around 25% in vaccinated people. In this form, the prodromal illness still occurred but may have been less severe than in the ordinary type. There was usually no fever during the evolution of the rash. The skin lesions tended to be fewer and evolved more quickly, were more superficial, and may not have shown the uniform characteristic of more typical smallpox Modified smallpox was rarely, if ever, fatal. This form of variola major was more easily confused with chickenpox**.**

3.Malignant symptoms :

In malignant-type smallpox (also called**flatsmallpox**) the lesions remained almost flush with the skin at the time when raised vesicles would have formed in the ordinary type. It is unknown why some people developed this type. Historically, it accounted for 5–10 percent of cases, and most (72 percent) were children. Malignant smallpox was accompanied by a severe prodromalphase that lasted 3–4 days, prolonged high fever, and severe symptoms of viremia. The prodromal symptoms continued even after the onset of rash. The rash on the mucous membranes was extensive.

Skin lesions matured slowly, were typically

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confluent or semi-confluent, and by the seventh or eighth day they were flat and appeared to be buried in the skin. Unlike ordinary-type smallpox, the vesicles contained little fluid, were soft and velvety to the touch, and may have contained hemorrhages. Malignant smallpox was nearly always fatal. Often, a day or two before death, the lesions turned ashen gray, which, along with abdominal distension, was a bad prognostic sign. If the person recovered, the lesions gradually faded and did not form scars or scabs.

4.Hemorrhagic symptoms :

Hemorrhagicsmallpox is a severe form accompanied by extensive bleeding into the skin, mucous membranes, gastrointestinal tract, and viscera. This form develops in approximately **2** percent of infections and occurs mostly in adults. Pustules do not typically form in hemorrhagic smallpox. Instead, bleeding occurs under the skin, making it look charred and black, hence this form of the disease is also referred to as **variolanigra** or "**black pox**." **Hemorrhagicsmallpox** has very rarely been caused by **Variolaminor**.While bleeding may occur in mild cases and not affect outcomes, hemorrhagic smallpox is typically fatal.

TREATMENTS :

Antiviral Drugs :

In July 2018, the FDA approved tecovirimat (TPOXX) for treatment of smallpox. In laboratory tests, tecovirimat has been shown to stop the growth of the virus that causes smallpox and to be effective in treating animals that had diseases similar to smallpox.

Antiviral Drugs for the Treatment of Smallpox Disease :

Drug	FDA approved for smallpox treatment?	Available through IND protocol for smallpox treatment?	Available in Strategic National Stockpile?
Tecovirimat	Yes	Not applicable	Yes
Cidofovir	No	Yes	Yes
Brincidofovir	No	No	No

Fig 13 : Cidofovir Injection

5 . EBOLA PANDMIC :

Year- 1976

Discovery of ebola is in **1976,** but in year **2014-2016** there is an outbreak of ebola virus inWest Africa began in a rural setting of southeastern Guinea, spread to urban areas and across borders within weeks, and became a global epidemic within months.

Ebola, also known as **Ebola virus disease** (**EVD**) or **Ebola hemorrhagic fever** (**EHF**), is a viral hemorrhagic fever of humans and other primates caused by ebolaviruses, Signs and symptoms typically start between two days and three weeks after contracting the virus with a fever, sore throat, muscular pain, and headaches. Vomiting, diarrhoea and rash usuall y follow, along with decreased function of

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the liver and kidneys. At this time, some people begin to bleed both internally and externally.The disease has a high risk of death, killing 25% to 90% of those infected, with an average of about 50%. This is often due to low blood pressure from fluid loss, and typically follows six to 16 days after symptoms appears.

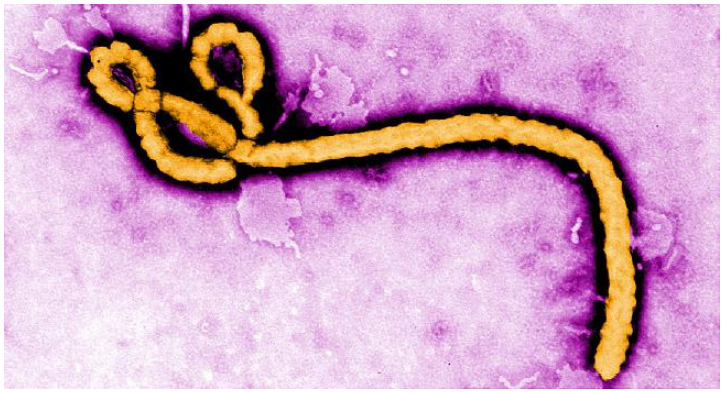

Fig 14 : Ebola virus

Signs and symptomps :

1. Onset

The length of time between exposure to the virus and the development of symptoms (incubation period) is between two and 21 days, and usually between four and ten days. However, recent estimates based on mathematical models predict that around 5% of cases may take longer than 21 days to develop.

Symptoms usually begin with a sudden influenza-like stage characterised by feeling tired, fever, weakness, decreased appetite, muscular pain, joint pain, headache, and sore throat. The fever is usually higher than 38.3 °C (101 °F). This is often followed by nausea, vomiting, diarrhoea, abdominal pain, and sometimes hiccups. The combination of severe vomiting and diarrhoea often leads to severe dehydration .Next, shortness of breath and chest pain may occur, along with swelling, headaches, and confusion. In about half of the cases, the skin may develop a maculopapular rash, a flat red area covered with small bumps, five to seven days after symptoms begin.

2. Bleeding

In some cases, internal and external bleeding may occur. This typically begins five to seven days after the first symptoms. All infected people show some decreased blood clotting. Bleeding from mucous membranes or from sites of needle punctures has been reported in 40–50% of cases This may cause vomiting blood, coughing up of blood, or blood in stool.

Bleeding into the skin may create petechiae,
purpura, ecchymoses or haematomas , Bleeding into the whites of the eyes may also occur. Heavy bleeding is uncommon; if it occurs, it is usually in the gastrointestinal tract.

3. Recovery and death

Recovery may begin between seven and 14 days after first symptoms. Death, if it occurs, follows typically six to sixteen days from first symptoms and is often due to low blood pressure from fluid loss. In general, bleeding often indicates a worse outcome, and blood loss may result in death. People are often in a coma near the end of life.

TREATMENTS :

As of **July 2015,no medication** has been proven safe and effective for treating Ebola.

By the time the **Ebola virus epidemic** in **West Africa began** in 2013, there were at least nine different candidate treatments. Several trials were conducted in late 2014, and early 2015, but some were abandoned due to lack of efficacy or lack of people to study.

As of August 2019, two experimental treatments known as REGN-EB3 and mAb114 were found to be 90% effective.

6 . HIV/AIDSPANDEMIC :

Year – (1981 to Present)

Acquired immunodeficiency syndrome (**AIDS**) is a chronic, potentially life-threatening condition caused by **the human**

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immunodeficiency virus (HIV). By damaging your immune system, **HIV** interferes with your body's ability to fight infection and disease.

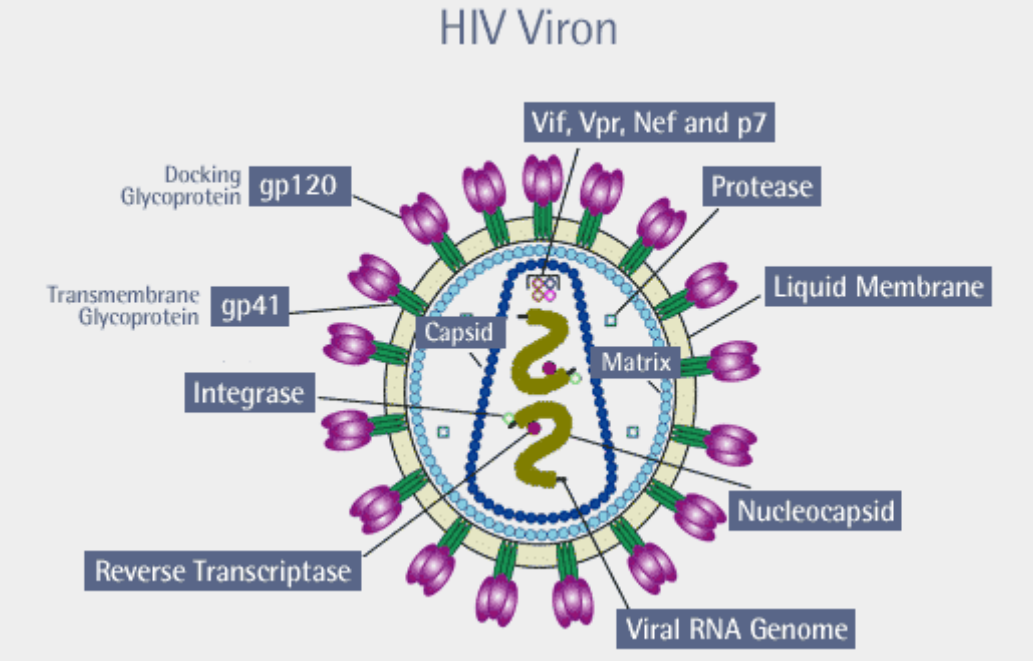

Fig 15 : HIV virus structure

Signs and symptoms :

1. Primary infection (Acute HIV)

Some people infected by HIV develop a flu-like illness within two to four weeks after the virus enters the body. This illness, known as primary (acute) HIV infection, may last for a few weeks. Possible signs and symptoms include:

- Fever
- Headache
- Muscle aches and joint pain
- Rash
- Sore throat and painful mouth sores
- Swollen lymph glands, mainly on the neck
- Diarrhea
- Weight loss
- Cough
- Night sweats

2. Clinical latent infection (Chronic HIV)

In this stage of infection, HIV is still present in the body and in white blood cells. However, many people may not have any symptoms or infections during this time.

This stage can last for many years if you're not receiving antiretroviral therapy (ART). Some people develop more severe disease much sooner

3. Symptomatic HIV infection

As the virus continues to multiply and destroy your immune cells — the cells in your body that help fight off germs — you may develop mild infections or chronic signs and symptoms such as;

- Fever
- Fatigue
- Swollen lymph nodes — often one of the first signs of HIV infection
- Diarrhea
- Weight loss
- Oral yeast infection (thrush)

4 .Progression to AIDS

When AIDS occurs, your immune system has been severely damaged. You'll be more likely to develop opportunistic infections or opportunistic cancers — diseases that wouldn't usually cause illness in a person with a healthy immune system.

The signs and symptoms of some of these infections may include:

- Sweats
- Chills
- Recurring fever
- Chronic diarrhea
- Swollen lymph glands

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- Persistent white spots or unusual lesions on your tongue or in your mouth
- Persistent, unexplained fatigue
- Weakness
- Weight loss
- Skin rashes or bumps.

TREATMENTS :

1 .HIV medications :

These antiretroviral medications are grouped into six classes:

- nucleoside reverse transcriptase inhibitors (NRTIs)
- non-nucleoside reverse transcriptase inhibitors (NNRTIs)
- protease inhibitors
- fusion inhibitors
- CCR5 antagonists, also known as entry inhibitors
- integrase strand transfer inhibitors.

2 . HIV prevention :

Although many researchers are working to develop one, there's currently **no vaccine available to prevent the transmission of HIV**. However, taking certain steps can help prevent the transmission of HIV.

7 . COVID-19 PANDEMIC :

Year – 2019

The COVID-19 pandemic, also known as the coronavirus pandemic, is an ongoing pandemic of coronavirus disease 2019 (COVID-19) caused by the transmission of **severe acuterespiratory syndrome coronavirus 2 (SARS-CoV-2),** which was first identified in **December 2019** in **Wuhan**, China.

The outbreak was **declared** a Public Health Emergency of International Concern in January 2020, and **a pandemic inMarch 2020**.

As of **14 January 2021**, more than **92.3 million** cases have been confirmed, with more than **1.97 million** deaths attributed to COVID-19.

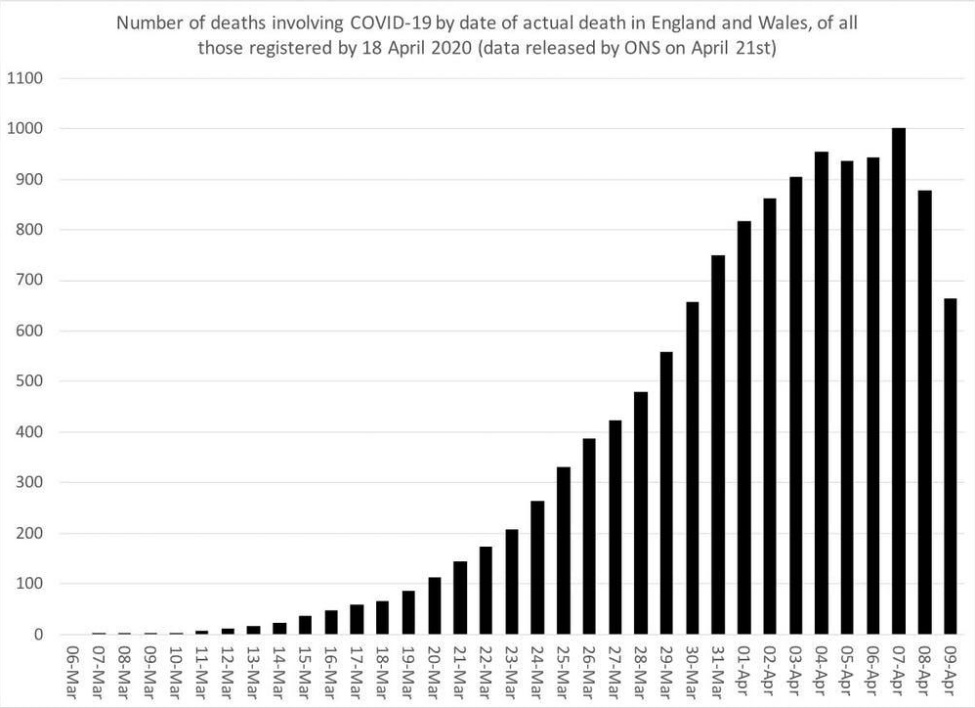

Fig 16: Mortality graph

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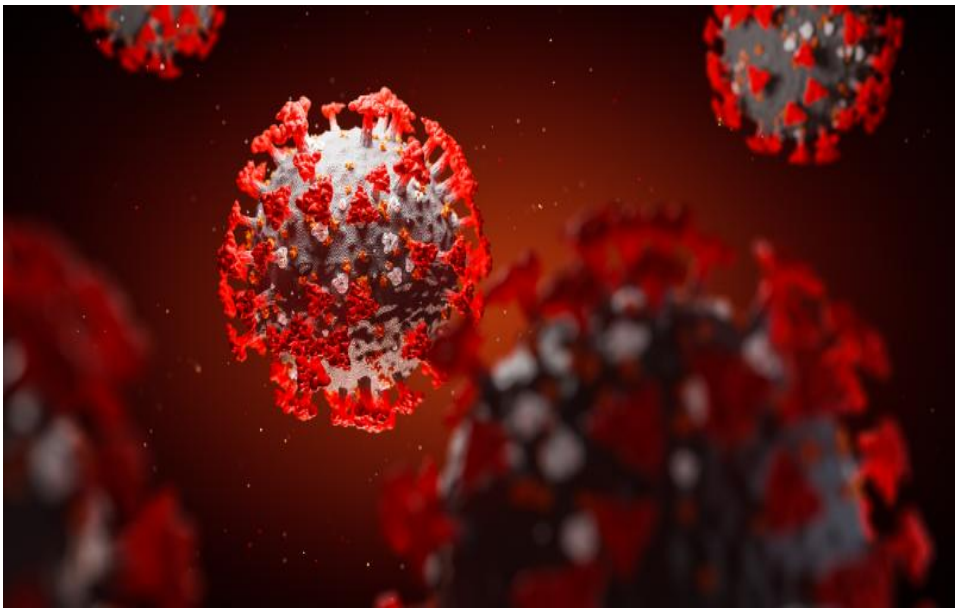

Fig 17 : Corona virus

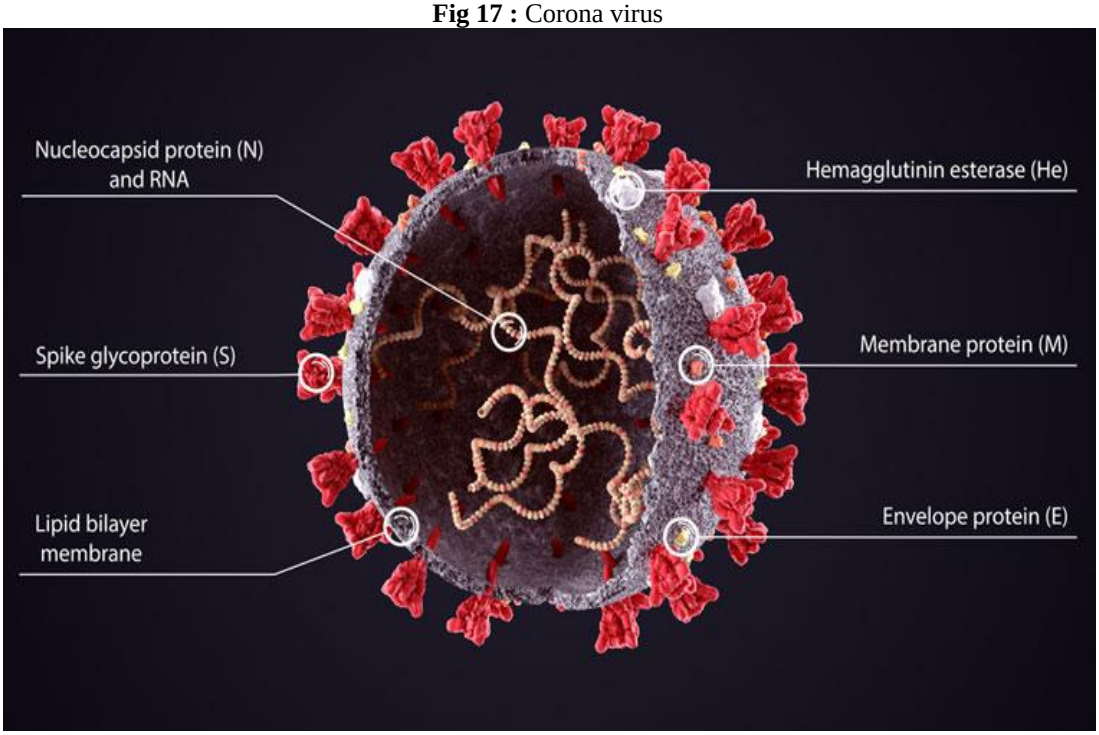

Fig 18 : Structure of Corona virus

Signs and symptoms :

Symptoms of COVID-19 are variable, ranging from mild symptoms to severe illness.

1. Common symptoms:

Headache, loss of smell and taste, nasal congestion and rhinorrhea, cough, muscle pain, sore throat, fever and breathing difficulties. People with the same infection may have different symptoms, and their symptoms may change over time. In people without prior ears, nose, and throat disorders, loss of taste combined with loss of smell is associated with COVID-19 with a **specificity of 95%.**

2. Mild to moderate symptoms:

Most people (81%) develop mild to moderate symptoms up to mild pneumonia, while 14% develop severe symptoms dyspnea, hypoxia, or more than 50% lung involvement on imaging.

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3 .Critical symptoms
5% of patients suffer critical symptoms respiratory failure, shock, or multiorgan dysfunction.

*** Dignosis of covid-19 :**
a. Rapid antigen test
b. RT-PCR test

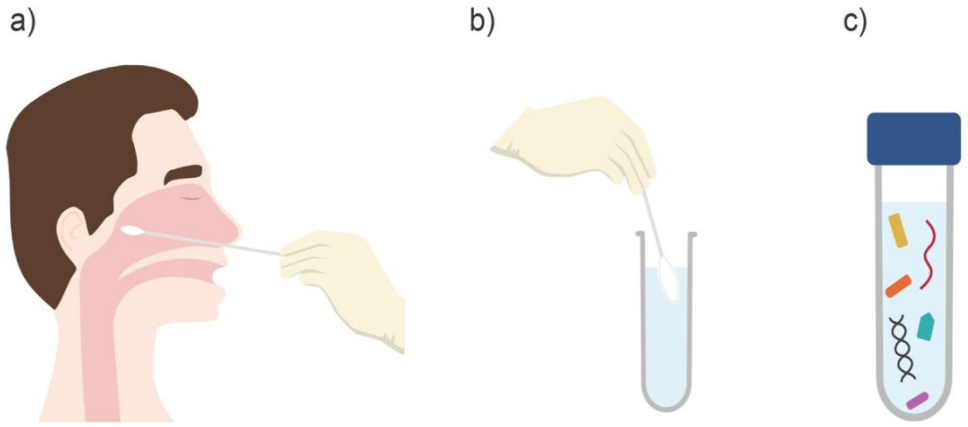

Fig 20: Rapid antigen test

Fig 21 : RT-PCR test

TREATMENTS :
Tablets and injection :
1 .Tocilizumab (immunosupressant)
2 .Itolizumab
3 .Cipremi
4 .Fabiflu
5 .Covifor (injectable 100mg injection)

VACCINES (Provisional
1. Pfizer-BioNTech COVID-19 vaccine
2 .Moderna's COVID-19 vaccine
3 .Covishield vaccine by Serum institute of India
4 .Covaxin developed by Bharat Biotech

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Fig 19: Covishield Vaccine

CONCLUSION :

The substantial burden posed by chronic diseases of likely infectious etiology demands global attention and action. Evidence continues to mount implicating microorganisms as important etiologic agents of chronic diseases that contribute substantially to morbidity and mortality. However, the identification and confirmation of infectious causes of chronic diseases is complicated by several problems, including frequent multifactor causation for many of these diseases and differences in the environmental background and genetic composition of different populations. Recently developed molecular and immunological techniques offer new approaches to addressing the technical barriers.

However, improved coordination among basic and clinical scientists, pathologists, and epidemiologists also will be critical to progress. Standardization of case definitions and analytical assays combined with sound epidemiologic design will help, as will the development of broad, new strategies for creating carefully pedigreed specimen collections and disease registries. Although the task is daunting, taking the practical and pragmatic pathways described above could clarify many of the uncertain relationships between infectious agents and chronic diseases.

REFERENCES :

[1]. World Health Organization (WHO). Natural ventilation for infection control in health care settings. Geneva: WHO; 2009. (http://whqlibdoc.who.int/publications/2009/9789241547857_eng.pdf)
[2]. Essential of Medical Pharmacology by KD. Tripathi of pharmacoloy 7th edition
[3]. A Textbook of Clinical Pharmacology and Therapeutics by Timothy.Gk.Mant, Albert Ferro
[4]. Mayhall CG. Hospital epidemiology and infection control. Philadelphia: Lippincott Williams & Wilkins; 2004.
[5]. Wenzel RP. Prevention and control of nosocomial infections. Philadelphia: Lippincott Williams & Wilkins; 2003.
[6]. World Health Organization (WHO). International health regulations (2005). Geneva: WHO; 2006. (http://www.who.int/csr/ihr/en)
[7]. Centers for Disease Control and Prevention (CDC).Guidelines for preventing the transmission of Mycobacterium tuberculosis in health-care settings,2005. Morbidity and Mortality Weekl
[8]. www.googlescholer.com