

The Corona Virus Disease 2019 (Covid-19) Pandemic Appears as a Result of Human Beings not Friendly to the Environment

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ABSTRACT

The number of new deadly infectious diseases in the world, including Covid-19, has quadrupled in the last 60 years. For example, HIV is known to have originated from chimpanzees, the Ebola outbreak was related to hunting habits or the use of several species of bats that carried the virus, SARS (Severe Acute Respiratory Syndrome) was transmitted from mongooses to humans, while MERS (Middle East Respiratory Syndrome) was transmitted from humped camels and Bird flu (H5N1), also known as avian influenza, is a viral infection originating from wild birds (chickens) that can attack not only birds, but also humans and other animals. All of the events mentioned above have awakened humanity to exploit natural resources. responsibly so as not to cause the emergence of new diseases such as the corona virus 2019 disease 2019 (covid-2019).

INTRODUCTION

The Covid-19 pandemic has spread in 34 provinces, in 373 regencies/ cities in Indonesia. It has infected 14,265 people and caused 991 people to die. [1]. Covid-19 has caused world economic growth to experience a very sharp decline, causing layoffs and unemployment to increase, crime rates to increase and population incomes to decrease. All countries including Indonesia are experiencing uncertainty when the Covid-19 pandemic will end. WHO and paras Experts in the medical world continue to struggle to reduce the rate of increase in the number of people who are sick with Covid-19 and find a vaccine. All countries in the world, including Indonesia, are implementing strategies to fight Covid-19, including: total lockdown and large-scale social restrictions (PSBB) with varying durations. , but to this day its success has not been successful in most countries in the world.

IMPLEMENTATION AND METHODS

The activity was carried out in the form of lectures and questions and answers with radio broadcast listeners via sms and telephone. This activity was carried out by six speakers who were teaching staff of the Environmental Engineering Study Program, Faculty of Engineering, Solo Christian University of Technology, namely Elvis Umbu Lolo, MT, Yonathan Suryo Pambudi, ST., M.Si, Dra. Cicik Sudaryantiningasih M.Si , Richardus Indra Gunawan S.TP., M.Sc, Agerippa Yanuranda Krismani S.T., M.Sc, Widiyanto, S.T M.T. This activity was carried out by six speakers with assignments as follows: the speakers in this activity were Elvis Umbu Lolo, MT, Dra. Cicik Sudaryantiningasih M.Si, and Richardus Indra Gunawan S.TP., M.Sc. Yonathan Suryo Pambudi, ST., M.Sc. Agerippa Yanuranda Krismani S.T., M.Sc, and Widiyanto, S.T M.T whose job is to find or find themes to be used in broadcasts and then together with broadcasters, present and provide explanations about papers or themes that have been prepared in radio broadcasts and also answer questions related to the things presented.



Figure 1. Community Service Activities through live Onair on Radio Immanuel Solo

RESULTS AND DISCUSSION

Viruses are microscopic (super small) PARTICLES that are spread all over the world and tend to be parasitic. Almost all ecosystems in the world contain viruses and are considered to be the most numerous organisms on planet earth. Viruses can infect living things, ranging from humans, animals, plants, fungi, and even bacteria. This virus infection has many fatal consequences for the creatures it infects. Viruses also cannot replicate (multiply themselves) without riding another organism. For this reason, viruses are classified as parasitic or harmful organisms.

2. Characteristics of Viruses

Viruses are often debated over their status as living things because they cannot carry out their biological functions freely. Because of this characteristic, viruses are always associated with certain diseases, whether in humans (eg influenza and HIV viruses), animals (eg bird flu virus), or plants (eg tobacco mosaic virus). Then what are the characteristics possessed by the virus? Here are some of them:

1. Only has one type of nucleic acid which is covered by a capsid or protein coat. This nucleic acid is DNA or RNA.
2. Very small size, between 25 – 300 nm. For 1 nm is equal to 10^{-9} m.
3. The body of the virus is not in the form of a cell. So the virus does not have a cell nucleus, plasma membrane, and cytoplasm.
4. Viruses can only live and reproduce in living cells or are also known as obligate intracellular parasites.
5. Virus is a creature metaorganism. A metaorganism is a transitional form between inanimate matter or having properties that can be crystallized and living things or can reproduce.
6. Viruses have several body forms. The body shape of the virus is spherical, rod, T-shape, and cylindrical.

3. Virus Body Structure

In general, the body structure of a virus consists of a nucleic acid and a capsid. In addition, the virus also has an additional structure. This nucleic acid consists of DNA or deoxyribo nucleid acid or RNA or ribonucleid acid. In general, the body structure of the virus consists of 4 main parts, namely the head, body contents, tail and capsid.

1. **Virus Head Structure** Viruses have a head containing DNA or RNA which is the genetic material for life. The contents of this head are protected by a capsid, which is a protein sheath composed of protein. The shape of the capsid is highly dependent on the type of virus. Viral capsids can be spherical, polyhedral, helical, or some other more complex shape. The capsid is composed of many capsomeres or protein sub-units. The capsid is a layer in the form of a series of capsomeres in the body of the virus that functions as a wrapping for DNA or RNA. The function of this capsid is to form a body and protect the virus from external environmental conditions.

2. Virus body contents or commonly called virions, are genetic material in the form of a type of nucleic acid (DNA or RNA). The type of nucleic acid possessed by the virus will affect the body shape of the virus. Viruses with RNA in their bodies are usually cubic, spherical, or polyhedral in shape, for example in viruses that cause polyomyelitis, influenza viruses, and viral infections of the mouth and nails.
3. The tail is part of the body structure of the virus which functions as a tool to attach itself to the host cell. The tail attached to the head generally consists of several plugged tubes filled with fine threads and fibers.

4. Virus Reproduction

Viruses reproduce by replicating or multiplying themselves in the host cell. The energy and materials for viral protein synthesis come from the host cell. This virus carries nucleic acids which carry genetic information by making all the virus-forming macromolecules in the host cell so that the new virus that is formed has the same properties as the parent virus. Based on the stages of the viral life cycle, it can be divided into the lytic cycle and the lysogenic cycle. In the following, the two types of virus life cycle will be described, especially viruses that infect bacteria or phages.

a. Cleavage Phase

In that connected state, the Viral DNA is inactive, which is known as a prophage. Because the viral DNA becomes one with the bacterial DNA, if the bacterial DNA replicates, the prophage also replicates. For example, if the bacteria will divide themselves. Bacterial DNA will copy itself with a replication process. Thus the prophage is also copied, two bacterial cells are formed as a result of division and in each bacterial daughter cell there is an identical prophage. And so on until the bacterial division process takes place repeatedly so that each bacterial cell formed contains prophage, thus the number of prophage follows the number of bacterial cells it hosts.

b. Synthesis Phase

For one reason or another, for example due to radiation or the influence of certain chemicals, the prophage suddenly becomes active, the prophage separates from the bacterial DNA, then destroys the bacterial DNA, then the viral DNA synthesizes, namely synthesizing proteins to be used as capsids for viruses. new and also replicate DNA so that the DNA Virus becomes a lot.

c. Assembly phase.

The capsid is assembled into a complete viral capsid which functions as a viral envelope. The virus capsid that is formed reaches 100-200 new capsids, then the DNA replication results enter it to form new viruses.

d. The lytic phase

After the new viruses are formed, bacterial cell lysis occurs (the description is the same as lytic). The viruses that are formed scatter out of the bacterial cells to attack the new bacteria. In the next cycle, viruses can undergo lytic or lysogenic cycles, and so on.

The number of new deadly infectious diseases in the world has quadrupled in the last 60 years. Scientific publications state that 60 percent of Emerging Infectious Disease (EID) or new infectious diseases originate from animals and 70 percent of EID originate from wild animals[2]. For example, HIV is known to have originated from chimpanzees, the Ebola outbreak was related to hunting habits or the use of several species of bats that carried the virus, SARS (Severe Acute Respiratory Syndrome) was transmitted from mongooses to humans, while MERS (Middle East Respiratory Syndrome) was transmitted from humped camels and Bird flu (H5N1), also known as avian influenza, is a viral infection originating from wild birds (chickens) that can attack not only birds, but also humans and other animals.[3]



Figure 2. Covid-19 virus
(Source: Kompas.com)

e. Coronavirus COVID-19

According to the WHO website, the corona virus is a large family of viruses that can cause disease in animals or humans.

Coronavirus is a collection of viruses that can infect the respiratory system. In most cases, this virus only causes mild respiratory infections, such as the flu. However, this virus can also cause severe respiratory infections, such as lung infections (pneumonia). In humans, corona is known to cause respiratory infections ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). Corona virus infection is called COVID-19 (Corona Virus Disease 2019) and was first discovered in the city of Wuhan, China at the end of December 2019. This virus spread very quickly and has spread to almost all countries, including Indonesia, in just a few months.

6. Symptoms of Corona Virus (COVID-19)

Early symptoms of Corona virus infection or COVID-19 can resemble flu symptoms, namely fever, runny nose, dry cough, sore throat, and headache. After that, the symptoms can disappear and heal or even get worse. Patients with severe symptoms can experience high fever, cough with phlegm and even bleeding, shortness of breath and chest pain. These symptoms appear when the body reacts against the Corona virus.

2. Why Viruses Cause Infectious and Deadly Diseases.

Ecosystem damage is associated with a significant increase in the number of infectious diseases. Complete and natural ecosystems provide protection for humans because the flora and fauna within these ecosystems compete naturally in the food cycle without having to interact with humans as the top of the food chain. New infectious diseases are often caused by damage to natural ecosystems and changes in human activities. Ecosystem imbalance causes a break in the food cycle without predators. The main example is damage to the ecosystem of bats which are known as the source of many viruses [4]. Destroying bat habitat in primary forests has an impact on the spread of disease, due to the massive distribution of bats with a large number of species. The research results prove that the SARS and MERS viruses, Covid-19 also originate from bats.



Figure 3 Bats as virus transmission animals

Source: Kompas.com

Damage to natural ecosystems is caused by, among others:

1. Deforestation (illegal logging of forests to get wood, rattan, and get land for farming,
2. Changes in the agricultural industry by using various pesticides, fungicides and herbicides by using organic fertilizers, natural pesticides,
3. Degradation of flora and fauna functions in primary forest, and
4. Trade in endangered species protected by law for conservation.



Figure 4: Illegal logging of forests in Indonesia

Source: Liputan 6.com

In addition to the problem of damage to natural ecosystems of flora and fauna, other human activities that can cause deadly new diseases recently are depletion of the ozone layer due to air pollution which will cause global warming.[6] Global warming will cause the melting of eternal ice in the north pole and south pole, so that dangerous viruses that have been hidden for millions of years will emerge and undergo evolution and mutation. These viruses will cause new deadly diseases that attack humans. Global warming also causes the human immune system to weaken so that it is susceptible to disease.



Figure 5. Air pollution at power plants in Indonesia

Source: Batam.news

3. What should be done to prevent Covid 19?

What must be done so that new viruses no longer appear and cause new deadly diseases is:

Stop the rate of deforestation or logging of natural forests and protection forests by:

- a. Carry out strict supervision through air and ground patrols,
- b. Permits for forest concession rights (HPH) are terminated, moratorium or conditions are tightened,
- c. Mining business permits have been discontinued or conditions have been tightened.

- d. Closing domestic and foreign wildlife markets (pangolins, bats, snakes, tiger skins, elephant ivory, rhinoceros and others) by working with Customs and Excise, Angkasa Pura and PELINDO in tightening entry and exit gates at airports and ports sea.
- e. Stop or reduce the consumption of wild animals by taking a persuasive approach and law enforcement
- f. The large-scale agricultural industry tries to use organic fertilizers and natural pesticides,
- g. Replacing fossil fuels with biofuels, gas fuels, geothermal, solar energy/solar cells, biofuels, water in the form of (hydropower/PLTA), and wind to reduce the depletion of the ozone layer so as to prevent global warming.

4. Positive Impact of the Virus

The term virus has the connotation of something that is deadly, but this bad reputation does not apply universally because viruses are not always harmful. There are several viruses that are beneficial to human life, here are some of them:

A. Health

Some viruses that play a role in the health sector as cancer prevention and body health control are as follows:

1. Viruses play a role in the manufacture of some vaccines. Such as polio vaccine, measles, smallpox, cancer, and others. The content contained in the benefits of the vaccine is a virus that is dead or weakened and causes fever for the person who is injected with the vaccine. Then, the immune system will record it and form antibodies in the body. So if these diseases come to attack, the body's immune system prevents them from entering.
2. Some viruses play a role in controlling some cancer cells which will be killed by using the cell-killing effects of viruses directly, rather than using the immune system.
3. Make antitoxin. This antitoxin is formed by combining viral DNA and beneficial genes. Then, viral DNA connects human DNA with bacterial DNA. Thus, bacterial cells contain human genes that can produce antitoxins.
4. Ingredients for making insulin. A cancer-causing virus is grafted with insulin-producing genes into bacteria. Thus, the bacteria can multiply and produce insulin.
5. Gene therapy by changing the gene that causes infection into a gene that cures
6. Bacteriophages has succeeded in curing typhus in chickens and dysentery. In 1921, bacteriophages were used to fight the Staphylococcus virus that attacks the skin. Its working system is to stick to the pathogenic bacteria and infect it until the bacteria die.

B. Agriculture Field

The benefits of viruses in agriculture can be seen from the use of biological organisms in controlling damage by pests or what is commonly called biological control. This activity is already widely used in agricultural systems, here are some of them:

1. Insect pest control via Baculoviruses, or a group of viruses that can infect insects and other arthropods. Baculoviruse implanted in agricultural crop genes. Then the insect larvae eat the plant. The virus then infects the cells and grows in the larvae's body and over time damages the body's tissues.
2. Integrated Pest Management. The application of IPM relies on biological agents. Thus, reducing the use of pesticides which can cause environmental pollution.

C. Field of Science

Science development. Viruses have been used extensively in molecular and cellular studies to manipulate and understand the functions of cells. In addition, viruses can also be used for genetic research, such as DNA replication, transcription, RNA formation, protein formation, basic DNA for body resistance.

CONCLUSIONS AND RECOMMENDATIONS

Covid 19 makes people aware that in meeting their needs, they must be friendly with nature and take enough from nature. For the government, it must prioritize the principle of sustainable development, so that later it can bequeath natural resources that can meet the needs of today's life, but also for future generations.

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