

ENGINEERING STRATEGIES
FOR HANDLING COVID-19 FOR
ENVIRONMENTAL HEALTH
AND ECONOMIC
SUSTAINABILITY IN
ELECTRICAL AND
ELECTRONICS ENGINEERING


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17/ENG04/027

WHAT IS ELECTRICAL AND ELECTRONICS ENGINEERING

- ? Electrical and Electronics Engineering is one of the newer Sub branches of engineering and dates back to late 19th century, it covers everything related to electricity and it is concerned with systems, circuits and devices used in communication, health care instruments and automated control system.



**AN IMAGE OF AN ELECTRICAL AND
ELECTRONICS ENGINEER ON
DUTY**




WHAT IS CORONAVIRUS DISEASE 2019 (COVID-19)?

- Coronavirus disease 2019 (COVID-19) is a respiratory illness that can spread from person to person. The virus that causes COVID-19 is a novel coronavirus that was first identified during an investigation into an outbreak in Wuhan, China.



Coronavirus
COVID-19





WHAT ARE THE SYMPTOMS OF CORONAVIRUS?

- Covid-19 symptoms range from mild to severe. It takes 2-14 days after exposure for the symptoms to develop. These symptoms include; fever, cough, shortness of breath.

It is observed that those with weakened immune systems may develop more serious symptoms, like pneumonia or bronchitis. And so far, most confirmed cases are in adults, but some children have been confirmed infected.

B | COMMON SYMPTOMS AND SIGNS



*Dry (non-productive)
cough*



*Difficulty with
breathing/shortness
of breath*

Fever



Headache



*Tiredness/
weakness*

Symptoms of coronavirus disease



WHAT CAUSES A CORONAVIRUS INFECTION?

- Humans first get a coronavirus from contact with animals. Then it can spread from human to human.
- the COVID-19 virus can spread through a contact with a certain bodily fluid, such as droplets in a cough or by touching something an infected person has touched then touching your hand to your mouth, nose, or eyes.

CAN A CORONAVIRUS BE PREVENTED OR AVOIDED?

- Practices social distancing. Avoid people who are sick or meeting in large groups. Stay home if your sick. Cover your cough with a tissue or cough into your upper sleeve or elbow. Wash your hands often with soap and water for at least 20 seconds especially after going to the bathroom , before eating and after blowing your nose, coughing or sneezing.



A DIAGRAM SHOWING A MEDICAL
PRATICTONER TAKING THE
TEMPERATURE OF AN INDIVIDUAL AS A
SAFETY MEASURE



PREVENTIVE MEASURES OF COVID-19

CORONAVIRUS TREATMENT

- There is currently no vaccine or treatment for COVID-19 symptoms of coronavirus usually go away on their own.





DISINFECTION OF PUBLIC AREAS TO PREVENT
THE SPREAD OF COVID-19



ELECTRICAL AND ELECTRONICS STRATEGIES IN HANDLING COVID-19


- Electrical and Electronics Engineers play a major role in tackling the Covid-19 pandemic, through the following ways;
 1. The development of medical robots.
 2. The manufacturing of ventilators.
 3. The generation of steady electricity in medical centers especially in third generation countries.

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- 4. The manufacturing of 3D-printed respirators.
 - 5. The manufacturing of robots with disinfecting abilities using ultraviolet light.



1. THE DEVELOPMENT OF MEDICAL ROBOTS:

- with the help of Electrical engineers the construction of medical robots is made possible which aids communication as it communicates with patient remotely, saving time and allowing possibly contagious patients to stay confined.

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- With these medical robots, it minimizes human-to-human contacts. Since robots are immune to infection, it becomes a safe method.



A DIAGRAM OF A MEDICAL ROBOT



2. THE MANUFACTURING OF VENTILATORS:

A ventilator (mechanical ventilator) is a life support treatment that helps people breathe when they can't breathe on their own.

MODELS OF VENTILATOR-PATIENT INTERACTION;

Ventilators are powered with energy in the form of either electricity or compressed gas.



A DIAGRAM OF A VENTILATOR

U.S. VENTILATOR PRODUCTION GROWTH

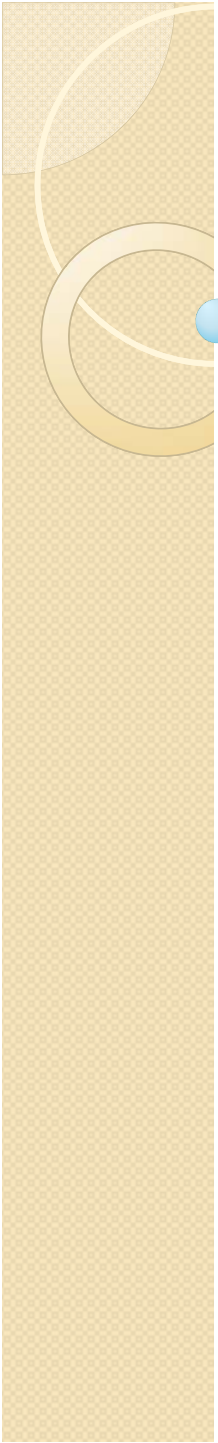


A GRAPH OF U.S. VENTILATOR PRODUCTION GROWTH



3. THE GENERATION OF STEADY ELECTRICITY IN MEDICAL CENTERS ESPECIALLY IN THIRD GENERATION COUNTRIES:

COVID-19 has affected the sourcing and supply chains across the power industry. Most of the Asian suppliers of renewable sector equipment are operating with a reduced load, and the developers in India, south Korea, central Europe and others are witnessing logistical delays.

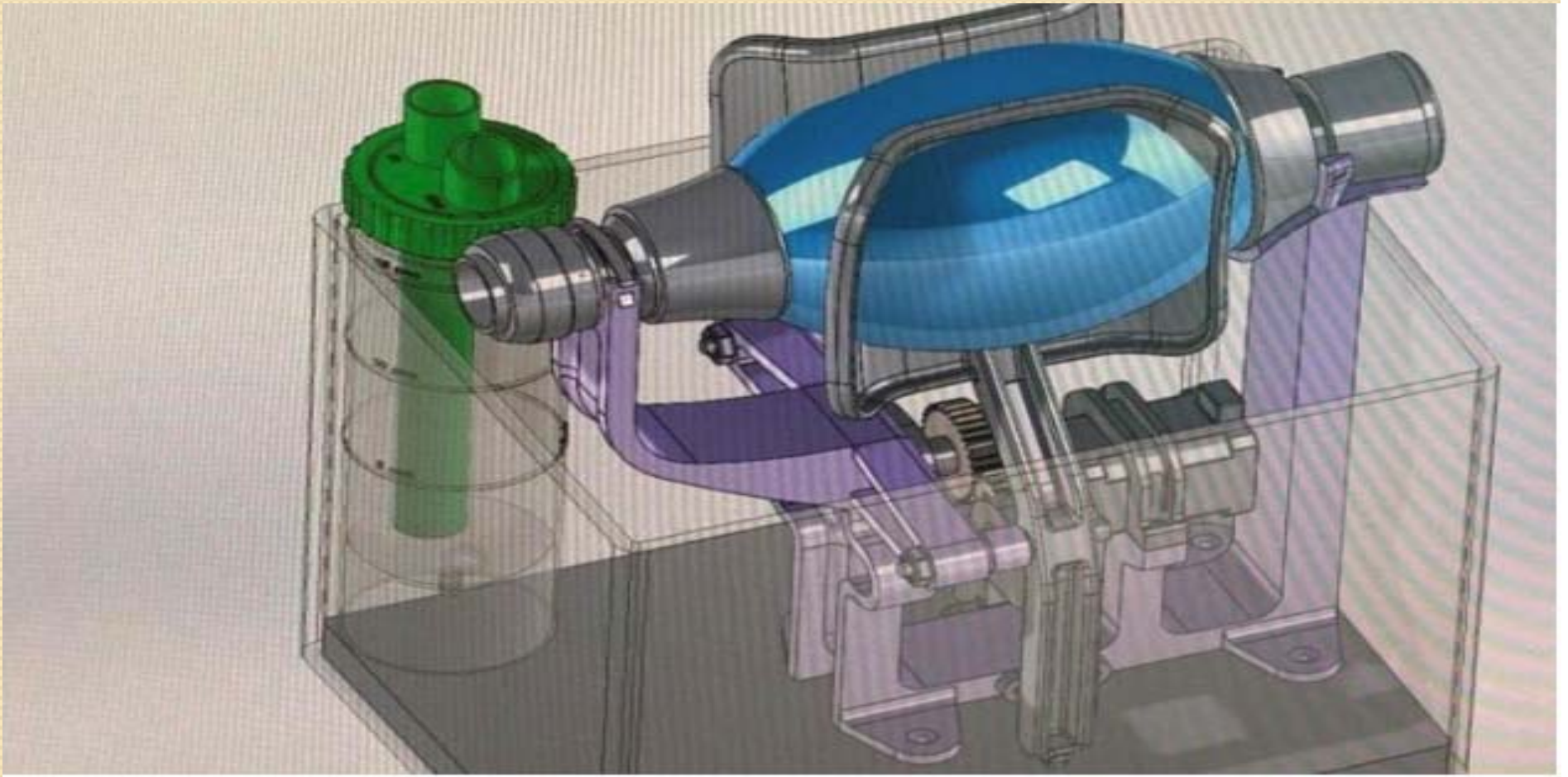


Economic contractions reduce power demand, because every form of economic activity requires electricity, directly or indirectly. And with Electrical Engineers producing consistent power supply they will be no delay in treatment as the medical equipment in use are powered by electricity.

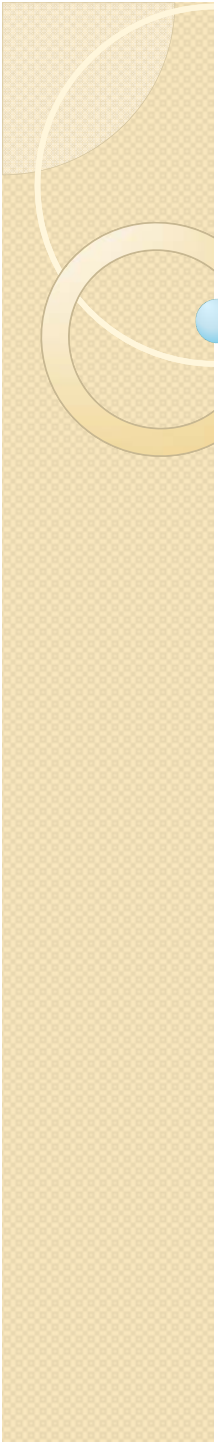
4. THE MANUFACTURING OF 3D-PRINTED RESPIRATORS.

Facing the fact that Hospitals in hard hit such as Italy have been overwhelmed and are running out of space and equipment, including crucial valves for respiratory machines. In response to this shortage a group medical personnel, electrical engineers and investors came up with a 3D-printed respirator.

A 3D printed respirator was manufactured to fight against the shortage of equipment.



A DIAGRAM OF A 3D-PRINTED RESPIRATOR




5. THE MANUFACTURING OF ROBOTS WITH DISINFECTING ABILITIES USING ULTRAVIOLET LIGHT.

It is observed human exposure to ultraviolet light is highly dangerous as it is associated with numerous negative effects such as premature aging of the skin, signs of sun damages(liver spots, wrinkles, leathery skin e.t.c), eye problems.

Solution consist of a self- driving robot platform that is equipped with a ultraviolet (UV) light system. With ultraviolet light, the robot can disinfect and kill disease ,viruses, bacteria and other types of harmful organic Microorganisms in the environment by breaking down their DNA-structure.



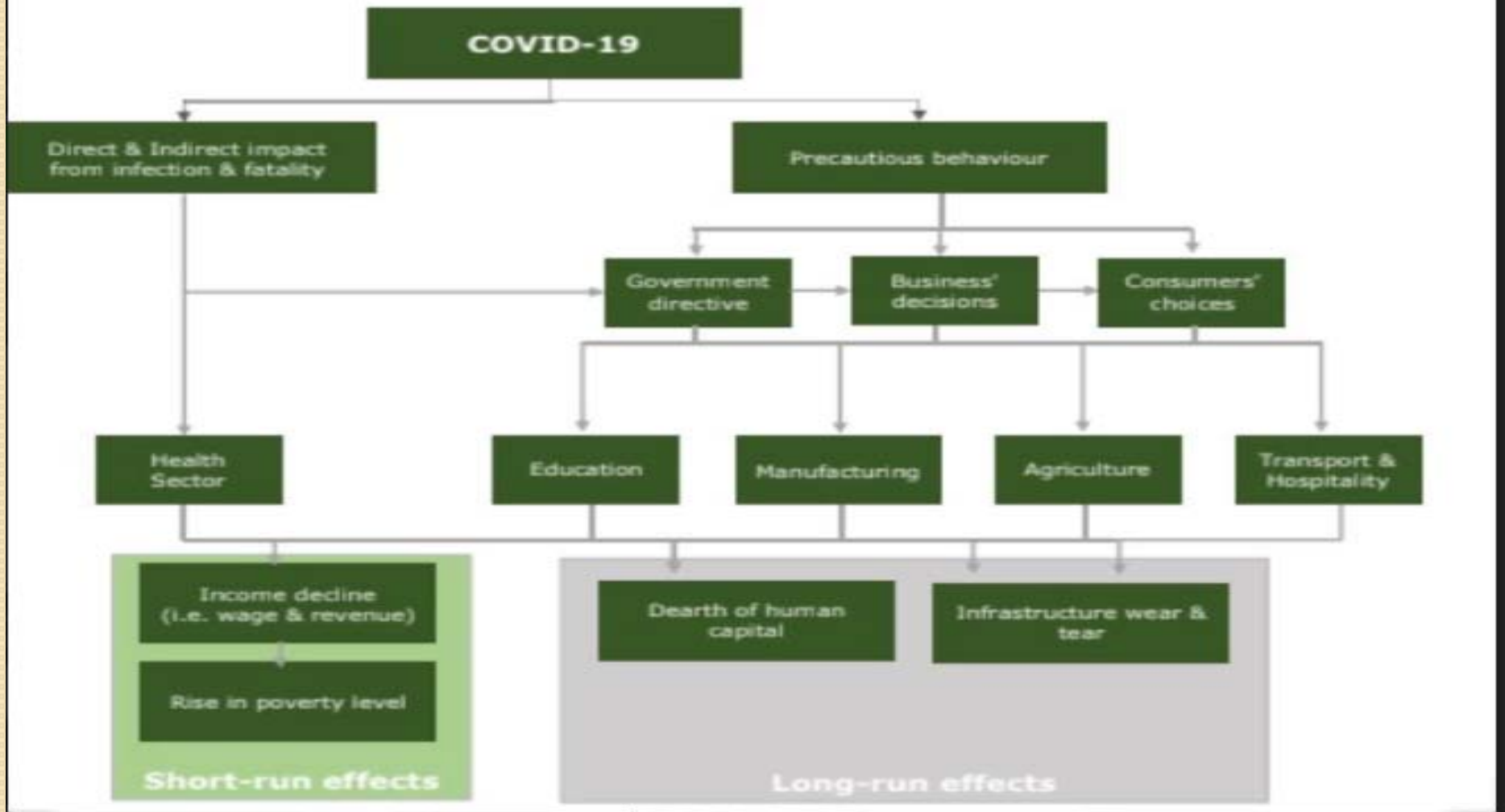
A UVD ROBOT DISINFECTING A MEDICAL WARD



IMPACT OF COVID 19 TO THE ECONOMY AND HOW ELECTRICAL ENGINEERS CAN BE A MAJOR CONTRIBUTOR TO THE SOLUTION (ECONOMIC SUSTAINABILITY)

Before the pandemic, the Nigerian government had been grappling with weak recovery from the 2014 oil price shock, with GDP growth tapering around 2.3 percent in 2019. In February, the IMF revised the 2020 GDP growth rate from 2.5 percent to 2 percent, as a result a of relatively low oil prices and limited fiscal space. But with the assistance of Electrical being able to tackle the Covid-19 pandemic. The economy can be sustained.

Potential economic impact of COVID-19 pandemic on Nigeria's economy



IMPACT OF COVID-19 ON NIGERIAN ECONOMY

A PODCAST
FROM THE
WORLD
ECONOMIC
FORUM

WORLD
ECONOMIC
FORUM

WORLD VS VIRUS

HOW THE WORLD
CAN NAVIGATE THE COVID-19
CORONAVIRUS



STAY HOME.

STAY SAFE.

THANK YOU.