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Date 08.10.2024 General Science and Ability

Q1(a) Describe different causes and preventions of 'Polio'.

Polio, or poliomyelitis is a viral disease that primarily affect children and can lead to paralysis.

II. Causes of Polio:

1. Poliovirus Transmission:

The poliovirus spreads through direct contact with infected fecal matter or contaminated water and food.

"Poliovirus is highly contagious and spreads predominantly through the fecal-oral route, particularly in areas with poor sanitation and hygiene"

(World Health Organization)

2. Poor Sanitation:

Poor sanitation leads to the spread of diseases like polio by contaminating water and food with harmful viruses. Without clean water and proper waste disposal, infections can easily spread in communities.

3. Lack of Vaccination:

Lack of vaccination leaves people unprotected from diseases like polio. Without vaccines, the virus can spread quickly causing outbreaks.

"Polio can only be prevented through vaccination. A lack of immunization allows the virus to spread unchecked,

threatening children's health globally"

(UNICEF)

4. Crowded Living Conditions:

Crowded living conditions make it easier for diseases like polio to spread from person to person.

Close contact increases the chances of transmitting the virus.

5. Weakened Immune System:

A weakened immune system makes it harder for the body to fight off infections like polio.

People with low immunity are more likely to get seriously ill from the virus.

"A weakened immune system makes it harder for the body to clear the poliovirus, increasing the risk of prolonged infections"

(Johns Hopkins Medicine
Report)

III. Preventions of Polio:

1. Vaccination:

Vaccination protects individuals from diseases like Polio by building immunity against the virus. It helps to prevent outbreaks and keeps communities safe.

"Immunization against Polio is crucial for the health of children and communities"
(CDC)

2. Improved Sanitation:

Improved sanitation helps to prevent the spread of diseases like Polio by ensuring clean water and proper waste disposal. When communities practice good hygiene, the risk of infection decreases significantly.

3. Public Health Campaigns:

Public health campaigns raise awareness about the importance of vaccination and hygiene in preventing Polio. These initiatives mobilize communities to participate in immunization drives and adopt healthier practices.

"Public health campaigns are vital for educating communities about Polio prevention and the importance of vaccination."

(World Health Organization)
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4. Hand Hygiene:

Hand hygiene is crucial for preventing the spread of diseases like polio by reducing the transmission of germs. Regular handwashing with soap and clean water can significantly lower the risk of infection.

“Hand washing is a simple yet effective way to prevent infection, especially in vulnerable population.”

(Dr. David S. Fedson)

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Q1. (b) Define the term 'Bio-fuel'. How is it helpful to promote clean energy?

Definition of Bio-fuel:

Bio-fuel refers to any type of fuel that is derived from biomass, which includes organic materials such as plants, agricultural residues and animal waste.

Bio-fuels are typically produced through processes like fermentation, anaerobic digestion and transesterification.

I. How Bio-fuels Promote Clean Energy:

1. Renewable Energy Source:

Bio-fuels are derived from renewable resources, making them a sustainable alternative to fossil fuels. As long as biomass is replenished, bio-fuels can provide a continuous energy supply.

Renewable energy sources, including biofuels, are essential for a sustainable future and for combating climate change.

(United Nations)

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2. Reduced Greenhouse Gas Emissions :

When burned, bio-fuels generally produce lower level of greenhouse gases compared to fossil fuels. This reduction helps to mitigate climate change by decreasing the carbon footprint.

According to the U.S Department of Agriculture (USDA) biofuels can reduce greenhouse gas emissions by up to 86% compared to gasoline, depending on the feedstocks and production methods used."

3. Waste Utilization :

Bio-fuels can be produced from agricultural and organic waste, reducing landfill waste and promoting a circular economy. This utilization of waste helps to minimize environmental pollution.

"Waste-to-energy technologies provide a dual benefit: managing waste and producing clean energy"

(Food and Agriculture Organization
(FAO))

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4. Energy Security:

The production of bio-fuels can enhance energy security by diversifying the energy supply and reducing dependence on imported fossil fuels. This shift can stabilize local economies and create jobs in the renewable energy sector.

5. Support for Rural Development:

The cultivation of energy crops for bio-fuel production can stimulate rural economies by providing farmers with new income sources and creating jobs in processing and distribution.

"Sustainable bio-energy initiatives can drive rural development, providing both energy access and economic opportunities"

(United Nations Development Programme) (UNDP)

