**African Centre for Project Management,**

**Nairobi- Kenya**

**Course: Post Graduate Diploma in Public Health**

***Course Unit: Public Health Final Exam***

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1. *List the types of people who are most vulnerable to waterborne diseases. Explain your answers why and how to overcome the diseases*

Safe drinking water/potable water is water that does not contain harmful or potentially harmful substances (Microorganisms and chemicals) and does not present any risk to human health.

Waterborne diseases are caused by people ingesting water contaminated by human or animal faeces containing pathogens. Such diseases can also be caused by food that has been prepared using water contaminated with these pathogens.

This water borne diseases are caused only when the infectious agent enters the human body. Waterborne diseases include most of the enteric(related to the intestine) and diarrheal diseases caused by;

* Bacteria such as *Vibrio cholerae*, *Campylobacter jejuni*, *Shigella* species and *Salmonella typhi*,
* Viruses such as Rotavirus, Hepatitis A and E viruses.
* Protozoa such as *Entamoeba histolytica*, *Giardia lamblia,* and *Cryptosporidium*, while the
* Helminths which are warms include *Ascaris lumbricoides, Dracunculus medinensis and Trichuris trichiura.*

Unsafe water is a cause of bad health for people of all age groups, however, some groups of people who are at greater risk include;

* Infants and young children,
* Older people and
* The immunosuppressed People who are incapacitated by diseases such as HIV/AIDS.

These categories of people have their immunities low and they can easily be attached by the pathogens present in water causing them diseases.

Waterborne diseases can be prevented by the following ways;

* Proper waste disposal such as flashing toilets after use and covering Latrine holes.
* Proper personal hygiene including washing hands after visiting the toilet and washing hands before touching, preparing or eating food.
* Proper food safety precaution such as washing all fruits and salads with safe and clean water before eating them.
* Proper treatment of drinking water and drinking only treated or boiled water.

1. *Suppose that inhabitants of a village obtain water from a spring. What advice would you give to the users about the prevention of contaminants entering the spring?*

Springs are natural groundwater outflows. Spring water is defined as natural water that gets collected from underground sources. To prevent a spring from contamination it means we need to protect the spring from contaminants and the following will be the step by step advice for the users;

* Cut back or dig back to the eye of the spring until clear clean water comes out. Where there may be many eyes it is advisable to choose one that has the best output or to build a point where all the eyes can collect their outputs. Ensure the water is drained away from the eye during digging.
* Make a concrete foundation out of cement, sand and gravels for the spring box which will protect the spring from contamination with running water.
* Construct the protection box using stones or bricks with a thickness wall of about 10cm and plaster the wall to prevent dirty water from contaminating the spring and set/attach a large diameter pipe into the wall at a lower level to the eye of the spring to deliver the water.
* Then construct wing walls to prevent water from seeping into the spring.
* Fill the area between the eye of the spring and the back wall of the box with gravel.
* Create a concrete apron and drain should be constructed where the water is delivered. The drain should lead into a water course as there is usually too much water for a soak away.
* Install a lid on the box either with a concrete or a metallic cover/lid to seal the spring.
* Fence the spring area to keep animals away as they are potential sources of contamination.
* Plant vegetation cover around the spring and maintain the vegetation.
* Ensure the surrounding is clean.

1. *The following are pollution sources. Give two specific pollutants for each source.*
2. *A residential area:*

The examples of pollutants in residential areas include

* Food remains
* Human waste
* Construction debris
* Food and drinks containers

1. *A metal plating plant:*

In a metal plating the pollutants are;

* Sound pollution
* Metal debris or remains
* Metal particles in the air such as lead

1. *Agricultural activities:*

In the Agricultural activities the pollutants are chemical pollutants such as

* Fertilizers and
* pesticides

1. *An uncontrolled landfill site:*

In an uncontrolled land fill, the pollutants include;

* Plastic Bags
* Plastic containers such as water and soda containers
* Decomposing organic matter

1. *Urban surface water run-off*

In Urban surface water runoff, the pollutants are;

* Washing detergents
* Household detergents
* Human wastes

1. *Explain 5 reasons why emergencies can put people at greater risk of waterborne disease*

During emergencies such as floods, people are exposed to greater risk of waterborne diseases such as cholera. This is due to the following reasons;

During floods, infrastructure such as of water and sewage are left damaged. These damaged infrastructures will lead to contamination of drinking water with human wastes from the sewages causing waterborne diseases including cholera and others.

In emergencies including floods, populations are displaced, this will mean lack of toilet facilities leading to open defecation. This open defecation will lead to the faeces washed by rains and the flood itself into water bodies which are used to provide for water for drinking, cooking and washing. This leads to a greater risk of waterborne diseases.

People displaced with emergencies such as floods and wars always have no access to adequate safe drinking water. This means they will drink unsafe water that may be contaminated leading to waterborne diseases.

Lack of resources for water treatment also leads to a high risk of waterborne diseases during emergencies as people affected with emergencies will always have to escape from the emergencies with limited lifesaving items.

During emergencies, there is usually displacement leading to overcrowding. This overcrowding means the population will outweigh/ overwhelm the available resources including food, water and health services. This overcrowding and lack of food will lead to poor nutrition and lower levels of immunity. This leads to outbreaks of waterborne diseases as the sick will not get enough desired treatment.

1. *In your own words, what is your understanding of public health and what are its key elements?*

Public health is defined as the art and science of preventing disease, prolonging life and promoting health through the organized efforts and informed choices of society, organizations, public and private, communities and individuals to attain a better health for the whole public.

The key elements of Public health include;

* Monitoring and identification of community/ public health problems
* Inform and educate the public (Health education).
* Develop policies and plans that support individual and community health efforts.
* Law enforcement and regulations to protect health and ensure safety such as putting on seat belts.
* Evaluate effectiveness, accessibility, and quality of personal and population-based health services.
* Conducting research on emerging health issues and innovative solutions to solve health problems.
* Identifying and solving public health problems.
* Ensure competent health service workforce through training of health service providers and preparedness for emergencies.
* Linking the public to needed personal health needs
* Evaluate the health of the public and the interventions in use.

1. *Discuss how environmental health and sanitation affect the nutritional status of the vulnerable groups*

Environmental health is a Public health discipline addressing human [health and disease](https://www.sciencedirect.com/topics/earth-and-planetary-sciences/health-and-disease) and the factors in the environment that can potentially affect health. It comprises those aspects of human health, including quality of life, that are determined by physical, chemical, biological, social and psychosocial factors in the environment. It is all the physical, chemical, and biological factors external to a person, and all the related behaviors.

Environmental health and sanitation affect Nutritional status of the vulnerable groups in the following ways;

Culture and beliefs such as those that do not allow women to eat liver or even chicken as seen in other cultures can affect the nutrition status of the women.

In other tribes, the men are allowed to eat first then the women and children will eat the left overs from the old men. This means that the children and women who are vulnerable will have little food intake leading to malnutrition of these groups.

Agriculture does well I a fertile land. Where the land is infertile it means there will be poor yield of the crops leading to malnutrition of the poor community who depend solely on agriculture compared to the rich who can then buy food from the market.

Disasters such as man-made disasters including civil wars and natural disasters such as floods affect nutritional status in that during wars farming is affected and people have little or no food to eat leading to malnutrition where as floods also can wash away farmlands leading to poor yield and thence malnutrition.

Educational status of people also has an effect on nutritional status of the individuals and their dependents. The educated will know what needs to be done to children and pregnant mothers in terms of feeding as compared to the uneducated. This means that educated women and her dependents will have better nutritional status compared the uneducated.

Poor waste disposal contaminates the environment leading to spread of diseases such as infestation with hookworms and round warms. These warms are main cause of anaemia in children and the pregnant and lactating mothers. Safe waste disposal reduces cases of infection with these warms and therefor malnutrition.

Lack of access to organic foods leads to populations feeding on junk foods. This leads to over nutrition also another malnutrition experienced by the rich and people living in the developed places where organic foods are hard to get.

Poor health policies are also another cause of malnutrition. Policies such as fortification of foods and fluoridation of water for consumption are key in ensuring nutritionally healthy populations. Where the policies do not look into these, the population will be exposed to poor nutrition leading to malnutrition of the population. Other policies such as examination and inspection of imported food staff is another way of ensuring the health of people in regard to nutrition.

1. *Paul, a resident in the outskirts of your town, consults you about building a latrine in the compound of his house. He is an open-minded man who is keen to improve life for his family. He has a wife and three young children, and his elderly mother also lives with them. He doesn’t have a tap in his house and gets water from a nearby well. The area has heavy soil and the rock below is impermeable.*

*A). Which types of latrine are possible choices for him?*

The type of Latrine I will advise him to construct will be a Ventilated Improved Pit (VIP) Latrine,

*b). Which types of latrine would you recommend, and why?*

The type of Latrine I will recommend him to construct will be a Ventilated Improved Pit (VIP) Latrine because it is cheap and can easily be emptied.

*c). What other advice would you give him about the location, design and construction of the latrine?*

I will advise him to construct the latrine downward from the point of the water source to ensure the waste doesn’t contaminate the water well.

The latrine should also be constructed far from the living house and kitchen as well as the water well. Minimum of 20 meters.

1. *Explain five ways in which urbanization creates challenges for effective sanitation and solid waste management.*

Urbanization is the increase in the number of people living in cities and towns. It also includes the turning of a remote village into a town with increased number of people and economic activities. Urbanization creates challenges for effective sanitation and solid waste in the following ways,

When the population of a particular area increases, it means the large population will over crown and over use the available resources such as water and waste systems. This will affect the effective management and supply of safe water to the residents of the urban area.

Where the population is big, there is a huge output of wastes such as solid wastes and human wastes. This means urbanization will lead to increased waste out put which is expensive to manage.

Urbanization means more people, and this leads to overcrowding which is a main source of disease spread from one person to another. Diseases such as Tuberculosis spread easily in over crowded areas unlike in the villages where populations are sparse.

In urban areas unlike in the villages, there is a problem of air pollution due to burning of fuels such as cars used for transportation and in industries. This affects the well being of the populations in the urban areas causing sickness.

*9. How do good sanitation and waste management practices bring a positive effect to urban inhabitants? Give examples for effects on:*

1. *health*

Proper waste management and good sanitation means few people will fall ill. Proper waste management means people will not be exposed to faeco-oral diseases such as Typhoid hence a healthy population.

Good sanitation and waste management ensures people are healthy by drinking safe water while disposing off their wastes to reduce disease occurrence.

1. *education*

When sanitation and waste management is not properly managed, people will fall ill contracting diseases caused due to poor sanitation and waste management. This affects education in that, when some one is sick them person can not concentrate in class leading to poor performances.

Sicknesses caused due to poor sanitation and waste management will keep school going children away from school as they nurse themselves from the diseases. This time off will mean poor learning hence poor educational performances.

Some diseases such as Hookworm are a result of poor sanitation and waste management. This is a major cause of malnutrition in school going children and malnutrition affects the mental capacity of the individual meaning, malnourished children perform poorly in school than the normal children.

Therefore, good sanitation and waste management means better educational outcomes.

1. *economic conditions*

As mentioned above, when people become sick due to poor sanitation and waste management, the productivity of the person is reduced due to either time off from work due to sickness or low energy. This will affect economic performances of the individual.

Treatment of illnesses due to poor sanitation and waste management will lead to spending affecting the finances of the individual and the government.

Proper sanitation and waste management means investment in this sector. This will have an effect in the economic condition of individuals or public. For example, to have a better sanitation and waste management you need to invest in safe water such as drilling boreholes and building VIP latrines, this will affect the finances of the individual or community.

Therefore, good sanitation and proper waste management means better economic outcomes for both the individual and the government as little will be spent on treatment and enough time is put on productive activities that will yield better economic outcomes.

1. *the environment*

Sanitation and waste disposal ensure a safer environment. Poor sanitation and waste disposal will pollute the environment such as pollution with plastic bags and plastic water bottles. These leads to infertility of the soil hence poor crop yield and thus malnutrition. Poor environmental sanitation leads to contamination of the water bodies which affects the fauna in the water body such as fish. This in turn also affects the health of the population.

Good sanitation and proper waste management will ensure a fertile environment for agriculture and clean and safe water bodies for the fauna to grow leading to better nutrition and a healthy population.

*10). List and briefly describe the measures by which the success or otherwise of a public–private partnership providing water supply services can be assessed.*

A Public-private partnership (PPP) isa long-term contract between a private party and a government agency for providing a public asset or service, in which the private party bears significant risk and management responsibility of the project such as provision of safe drinking water for the people of Jubek State by CRS a nongovernmental organization.

The success or failure of PPP providing safe water supply can be assessed as follows;

**Measuring the output**

Outputs are products and services delivered by a project. When a project is aimed to deliver water to a total population of say 5000 inhabitants of an area, it will be better to see how many people the water project has reached to see if indeed the project has reached its desired target.

**Measuring the outcome**

Outcomes are results received outside the project. This allows for adjustments in the projects to meet the goal of the project. For example, when diarrheal diseases have been measured at 20% before the project and during the project implementation another the cases drop even for those not covered by the project then the success or failure of the project can be measured.

**Measuring the phases with schedule**

PPP can also be measured by the looking at the speed of the project by looking at the phases of the project while looking at the schedule.

**Effectiveness**

This relates to whether the project is effective and within its schedule and budget.

**Beneficiary**

This also looks at whether the project benefited the intended beneficiaries or not and when it benefited the beneficiaries.

**Future outcome**

The other measure is whether the PPP has an outcome that can be felt in the future.

NB: ALL QUESTIONS CARRY 10 MARKS

BEST OF LUCK!!