**AFRICAN INSTITUTE FOR PROJECT MANAGEMENT STUDIES (AIPMS)**

**COURSE NAME: DIPLOMA IN PUBLIC HEALTH (2019/2020)**

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**SUBJECT: CAT 2:**

**(WATER AND SANITATION)**

1. **Why is hand washing an essential aspect in WASH interventions?**

Washing hand is the act of cleaning hands for the purpose of removing soil, dirt and microorganisms from hand using water and soap or wood ash. The main purpose of washing hands is to clean the hands to get rid of pathogens i.e. bacteria, viruses and chemicals that can cause harm or disease.

Hand washing with soap is the single most effective way to help fight the spread of diseases and harmful bacteria and microorganisms such as Campylobacter, Hep A, Shigella, E. coli and salmonella spp. and un-expensive way to prevent diarrheal and acute respiratory infections specially during the time of crisis and disasters . Pneumonia, a major acute respiratory infection is the number one cause of mortality among children under the age of five years old, taking the life of an estimated 1.8 million children per year. Both Diarrheal and Pneumonia put together account for 3.5 million death annually (UNICEF). Putting the practise of hand washing with soap before eating and after using the toilet as a habit can save more lives than any single vaccine or medical intervention, cutting death from diarrhea by almost a half and death from acute respiratory infections by one quarter.

People always get the infection through the faecal-oral route (mouth) which is the common way of transferring microorganism from hand/people to food, this by:

* When people touch their eyes, nose and mouth without realizing it, hence introducing germs into their bodies.
* Germs from unwashed hands may get into foods and drinks when people prepare or during consumption.
* Germs from unwashed hands can be transferred to another objects such as doorknobs, tables and benches, toys or any usable equipment and then transferred to other persons hands.

As handwashing has been identified as one of the most effective way of preventing disease, the practice has to be well communicated to individuals and the community on how and when to wash hands. The following scenarios has been identified and applied for when to washing hands.

* Before eating food
* After using toilet
* Before, during and after food preparation
* Before and after caring for someone who is sick
* Before and after treating a cut or wound
* After changing diapers or cleaning up a child who has used toilet
* After blowing your nose, coughing and sneezing
* After touching an animal, animal feed or animal waste
* After touching garbage.

Promoting good personal hygiene often requires that the community members are mobilized towards this goal and awareness is raised about its importance and how to achieve it. The program has to ensure that for the handwashing to become effective within the community, the following must be in place.

* Water must be available and is easily accessible to the community, making sure that the water is free from contamination.
* Suitable water facilities a tap and a sink must be provided if running water is available and located near places such as toilets and kitchen or eating places.
* If running water is not available a container with a with an approximate capacity of 20 -50 litres be used, by fitting it with a tap and filled with water. This will provide a safe environment for washing hands.

After the successful intervention and implementation of the hand washing program within the community, the following are achieved.

* Infections through the faecal oral route is minimized
* The spread of influenza and other viruses is minimized
* Prevention of infections that causes by diarrheal diseases
* Decreases respiratory infections
* Decrease infant mortality rate at home birth deliveries.

Reference:

* *Personal Hygiene and Handwashing After a Disaster or Emergency - CDC*

**2. What are the main standards in WASH interventions in emergencies?**

The Minimum Standards in Water, Sanitation and Hygiene Promotion are a practical expression of the principles and rights embodied in the Humanitarian Charter. The Humanitarian Charter is concerned with the most basic requirements for sustaining the lives and dignity of those affected by calamity or conflict, as reflected in the body of international human rights, humanitarian and refugee law. Everyone has the right to water. This right is recognized in international legal instruments and provides for sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses. An adequate amount of safe water is necessary to prevent death from dehydration, to reduce the risk of water-related disease and to provide for consumption, cooking, and personal and domestic hygienic requirements.

Water and sanitation are critical determinants for survival in the initial stages of a disaster. People affected by disasters are generally much more susceptible to illness and death from disease, which are related to a large extent to inadequate sanitation, inadequate water supplies and poor hygiene. The most significant of these diseases are diarrheal diseases and infectious diseases transmitted by the faecal-oral route. Other water- and sanitation-related diseases include those carried by vectors associated with solid waste and water.

The main objective of water supply and sanitation programmes in disasters is to reduce the transmission of faecal-oral diseases and exposure to disease-bearing vectors through the promotion of good hygiene practices, the provision of safe drinking water and the reduction of environmental health risks and by establishing the conditions that allow people to live with good health, dignity.

The main minimum WASH standards that necessitates the effective and successful intervention and implementation of WASH programs in emergencies include but not limited to:

1. **Hygiene promotion:**

Hygiene promotion is defined here as the mix between the population‘s knowledge, practice and resources and agency knowledge and resources, which together enable risky hygiene behaviours to be avoided. For effective and successful intervention and implementation of any hygiene promotion program, the following include the following must be taken to consideration.

* **Needs Assessment**: To assess and identify the most hygiene risks of public health importance.
* **Sharing responsibilities**: For Programmes to include an effective mechanism for representative and participatory input from all users, including in the initial design of facilities.
* **Reaching to all sections of the population**. Hygiene promotion activities should reach all groups within the population, and to have equitable access to the resources or facilities needed to continue or achieve the hygiene practices that are promoted.
* **Targeting priority Risks and behaviours**: Hygiene promotion messages and activities should address key behaviours and misconceptions and are targeted for all user groups. Representatives from these groups should participate in planning, training, implementation, monitoring and evaluation of the success of the program.
* **Managing the facilities**: The Users take responsibility for the management and maintenance of facilities as appropriate and different groups contribute equitably

1. **Water Supply:**

Water being one of the standards in WASH programme is essential for life, health and human dignity. In the event of an emergency where there may not be sufficient water available to meet basic needs of the affected individuals or community and there tend to be more challenges. In most cases, the main problems are related to health issues which are caused by poor hygiene through consumption of contaminated water which is a result of insufficient water, in terms of quantity, quality, accessibility, storage and the availability of the safe water facilities. For any quick and successful intervention in any emergency, the following water issues needs to be address.

* **Water Access and quantity**: This ensures that the people affected should have safe and equitable access to a sufficient quantity of water for drinking, cooking and personal and domestic hygiene and making sure that water points are sufficiently close to households to enable use of the minimum water requirement.
* **Water quality:** The Water to be used must be of sufficient quality to be drunk and used for personal and domestic hygiene without causing significant risk to health. Emphasis has to be made that the water used is from a protected water source that is free from any contamination.
* **Water facilities and storage:** The WASH implementing program/partner should ensure that the affected population/People have adequate facilities and supplies to collect, store and use sufficient quantities of water for drinking, cooking and personal hygiene, and to ensure that drinking water remains safe until it is consumed.

1. **Excreta disposal:**

The safe disposal of human excreta creates and is always regarded as the first barrier to excreta-related disease, helping to reduce transmission through direct and indirect routes. Safe excreta disposal is therefore a major priority, and in most disaster, situations should be addressed with as much speed and effort as the provision of safe water supply. The provision of appropriate facilities for defecation is one of a number of emergency responses essential for people‘s dignity, safety, health and well-being. The measures that should be in place to ensure a safe disposal of human excreta will include:

* **Access to toilets:** The affected population/ People should have adequate numbers of toilets, sufficiently close to their dwellings, to allow them rapid, safe and acceptable access at all times of the day and night for easy and safe excreta disposal.
* **Toilets design, construction and use.** Toilets are sited, designed, constructed and to be maintained in such a way as to be comfortable, hygienic and safe to use by any community member including children, old population, the physically and mentally disable people while also taking into consideration privacy as an important aspect specially for women and girls.

1. **Vector control and the environment.**

A vector is an agent capable of transmitting /carrying a disease and these are a major cause of sickness and death in many disaster situations. The vectors include Mosquitoes which are the vector responsible for transmitting malaria, dengue fever and yellow fever among others, House flies which are responsible for most diarrheal diseases, Tse-tse flies which transmit sleeping sickness, black flies that transmits filariasis, bed bug, Tick and many more .

Vector control is one of the major health problems in any emergency program. To ensure a health community or population vector control program have to lay down effective policies and initiatives to control the breeding of the most identified vectors in that surrounding area. Some of the initiatives will include appropriate site selection and shelter provision, appropriate water supply, excreta disposal, solid waste management and drainage, the provision of health services which will include community mobilization and health promotion and education on the use of chemical controls, family and individual protection and the effective protection of food stores.

To make these policies and initiatives effective, the health implementing partner should advocate for health promotion and education on issues such as:

* **Promotion of Individual and family protection:**

The affected community should be made aware of the dangers of the surrounding environment and be given the knowledge and the means to protect themselves from disease and nuisance vectors that are likely to represent a significant risk to their health.

* **Knowledge of physical, environmental and chemical protection measures.**

The numbers of disease vectors that pose a risk to people‘s health and nuisance vectors that pose a risk to people‘s well-being are kept to an acceptable level through the participation of the surrounding community and Chemical vector control measures are carried out in a manner that ensures that staff, the people affected by the disaster and the local environment are adequately protected, and avoids creating resistance to the substances used.

1. **Solid Waste Management:**

Solid waste management present a big challenge in the community specially during an event of a crisis or disaster. The collection, treatment and disposal of solid waste materials has numerous challenges, hence the uncollected and accumulated solid waste and debris left after natural disasters become a public concern. The unsafe/improper disposal of solid waste can create unsanitary conditions and this can lead to a pollution of the environment and lead to outbreaks of vector born diseases spread either by insects or rodents. Solid waste often block drainage channels and leads to environmental health problems associated with stagnant and polluted water which becomes risky to the community.

The task of solid waste management presents a complex challenge that need a variety of administrative, economical political and social activities and policies that must be implemented and monitored, these may include.

* **Proper Collection and disposal of Waste:**

The community must be made aware to have an environment that is acceptably uncontaminated by solid waste, including medical waste, and have the means and measures in place on how to dispose of their domestic waste conveniently and effectively. The community must take responsibility in designing and in implementation of solid waste programs that can clearly spelled out how to collect, separate and dispose of solid waste either by burning or burying and put measure in place in protecting the sites where the waste are disposed.

**f): Drainage:**

Drainage system is one of the requirements to any inhabitants in a geographical area. Drainage place an important role in community settings specially in case of disasters that may be caused by flooding. Good drainage system allows the free flow of surface water that can lead to flooding and prevent accumulation of stagnant water which can encourage vectors breeding and became a potentially risk source of water borne diseases.

At time of crisis or any disaster, drainage system is damage leading to risks associated with contamination of surface water & supplies and the living environment, damage to toilets and sewage system in dwellings, vector breeding and drowning. Rainwater and rising floodwaters can worsen the drainage situation in a settlement and further increase the risk of contamination.

To address drainage system in any emergency, a plan of action need to be in place that can assess the water drainage lay out and waste water disposal in that community This is to be designed and implemented in order to reduce potential health risks to the affected population. The plan should be able to assess:

* **Drainage works;**

Plan needs of action that ensures that affected population have an environment free from contamination in which the health and other risks posed by water contamination /erosion and standing water, including storm water, floodwater, domestic wastewater and wastewater from medical facilities, are minimized. These should be address by making sure that the areas for dwellings and water points are free from contamination, and sanitation facilities are not flooded or eroded, and drainage wastewater do not pollute existing surface or ground water source.

References:

* WHO (2003), *Guidelines for Drinking Water Quality. Third Edition.*Geneva
* House, S and Reed, R (1997), *Emergency Water Sources: Guidelines for Selection and Treatment.* WEDEC, Loughborough University, UK.
* Harvey, PA, Baghri, S and Reed, RA (2002), *Emergency Sanitation, Assessment and Programme Design.* WEDEC, Loughborough University, UK.
* Lacarin, CJ and Reed, RA (1999), *Emergency Vector Control Using Chemicals.* WEDEC, Loughborough, UK

**Question 3:**

**Waste Management is becoming one problem in the emergencies. Why**

Waste management is the collective action used for the collection, transportation, and disposal of garbage, sewage, and other waste products. It encompasses management of all processes and resources used for proper handling of waste materials, from maintenance of waste transport services and dumping facilities to compliance with health codes and environmental regulations.

Waste management is very critical especially during disaster such as flood water, earthquake, hurricane or cycles. During emergency crisis there is a total breakdown in almost all aspect of health-related activities specifically waste management. During the event waste collection, disposal and management are disrupted. In the community or camps of displaced people or refugees where the tragedy occurs, the following events will events will be seen:

• General domestic garbage such as food waste, ash and packaging materials will be dump in open areas.

• Human faeces disposed of in the garbage

• Emergency waste such as plastic water bottles and other packaging materials/supplies will be littering the whole environment

• Rubble resulting from the disaster may block road access, and trap persons.

• Mud and slurry deposited by the natural disaster, and

• Fallen trees and rocks obstructing transport and communication.

* Blockage of drainage system

If the waste management services is not adequately addressed or not appropriately dealt with quickly in a shortest possible time, serious health risks events will develop such as:

* Pools of stagnant rainwater associated with waste collection will propagate the breeding of mosquitoes that transmit malaria, dengue and yellow fever.
* Piles of garbage will attract flies, rates, dogs and other scavengers, and this will to increase cases of diseases such as dysentery and other water borne diseases.
* Heaps of garbage present a fire risk and smoke can also be a health hazard if the burning waste contain items such as plastics or chemicals.
* Breathing difficulties can arise from the fungi that develop on garbage tips.
* Sharp items such as needles and broken bottles/glass present a further hazard to people walking through the area
* Garbage washed by rain can contaminate water supplies.
* Indiscriminate dumping of waste can block water courses causing flooding.
* Spread of waterborne and diarrheal disease will follow immediately.
* The venerable group (children, pregnant mothers and the elderly) will be mostly affected
* Low birth rate
* Cancer cases will be on rise
* Congenital Malformations
* Neurological diseases
* Etc.

References:

* Grandjean P, Landrigan PJ. Developmental neurotoxicity of industrial chemicals. Lancet. 2006; 368:2167–78.
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www.cdc.gov/exposurereport (accessed June 14, 2007); 2005.

* . Goorah, S., Esmyot, M., Boojhawon, R. (2009). The Health Impact of Nonhazardous Solid Waste Disposal in the Community: The case of the Mare Chicose Landfill in Mauritius. Journal of Environment Health, 72(1) 48-54

**Q4:**

**Discuss how environmental health and sanitation affect the nutritional status of the**

**vulnerable groups:**

Chronic exposure to environmental chemicals is an increasing problem globally, adversely affecting the quality of life of large numbers of people. The sheer number of chemicals in use today is overwhelming. In the United States, 80,000 chemicals are registered for commercial use with the Environmental Protection Agency (1). In developed countries, population exposure to chemicals is monitored (2), but in some developing countries chemical use may not be regulated or monitored (3,4). The contribution of most chemicals to neurodevelopmental disorders and subclinical Neurotoxicity in children is unknown (1). This is also true for other health outcomes in children and adults. It is possible that nutritional status and nutrients play a role by modifying the susceptibility to chemical exposures.

Accumulating evidence suggests that the connections among nutritional status, nutrients, and environmental toxicants are not trivial, but the extent of these interactions has not been fully investigated. The symposium on ‘‘Heavy Metal Exposure in Women and Children, the Role of Nutrients’’ considers the implications of nutrient-toxicant interactions for the health of women and children. The overall aim of both the symposium and the proceedings is to encourage nutritionists to consider the importance of environmental exposures to their study populations and their research questions, and also to encourage the involvement of nutritionists in the design of high-quality, rigorous studies of nutritional assessment and interventions in populations exposed to environmental chemicals. . The studies summed up three ways in which nutrition and environmental chemicals are interconnected and interreact ,and this is by:

* first, food may be the vehicle for delivering toxicants and may increase an individual’s exposure and toxicant body burden.
* Second, as a toxicant is absorbed by the human body, it may interact with an individual’s nutritional status to affect the amount of toxicant that is retained and bioavailable to do harm. It is also possible that toxicants may affect nutrient absorption and stores.
* Third, once inside the body, nutrients and nutrient metabolism may also interact with the toxicant in affecting a specific health outcome.

Malnourished individuals, especially women of reproductive age and young children, may be more vulnerable to adverse health effects of chemical exposures. The very nature of children’s growth and development creates windows of vulnerability to both nutritional deficiencies and toxicant exposures (5). A recent article suggests that neurodevelopmental disorders caused by chemical exposures constitute a modern ‘‘silent pandemic’’ (1).With a double burden of nutrient deficiencies and environmental exposures, a substantial portion of the world’s children may never realize their right to optimal health and development.

Women of reproductive age are also vulnerable to nutritional deficiencies. This is especially true during pregnancy, when maternal and fetal growth create high nutrient demands. Environmental exposures in women of reproductive age are especially precarious because women may become sources of exposure to their foetuses and infants through placental exchange and breastmilk. Finally, with a connection between toxicants and chronic diseases, environmental exposures may contribute to the development and course of diseases in adulthood, particularly neurodegenerative diseases (1), beyond the effects of suboptimal nutritional status. Wright and Baccarelli (60), in this symposium,

propose that early life exposures to metals program later adverse outcomes through epigenetic processes

In conclusion, the fraction of disease attributable to environmental (i.e., low-level, nonoccupational) exposures may be small, but 3 considerations speak to the importance of toxicants in affecting health. First, even relatively small risk factors make a notable contribution to disease when a large population is exposed. Second, toxicants are present at all stages of development, potentially accumulating to cause a lifetime of ill health. Third, if chemical exposures interact with poor nutrition, the result maybe high costs to health and well-being of resource-poor individuals and communities who are least able to cope with those costs. Better understanding of the interactions between nutrition

and environmental exposures is needed to guide action from governments and individuals. Future nutrition studies need to consider exposures to environmental pollutants in their study populations and investigate the effects of nutritional interventions as an approach to preventing or reducing toxicity.

**Referencies:**

1. Grandjean P, Landrigan PJ. Developmental neurotoxicity of industrial chemicals. Lancet. 2006; 368:2167–78.
2. CDC. Third national report on human exposure to environmental chemicals. Atlanta: Centres for Disease Control and Prevention; http://www.cdc.gov/exposurereport (accessed June 14, 2007); 2005.
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5. Rice D, Barone S Jr. Critical periods of vulnerability for the developing nervous system: evidence from humans and animal models. Environ Health Perspect. 2000;108: S3:511S–33S.

**QUESTION 5**:

**Assuming you have been appointed to head an organization dealing with health**

**development in your area, describe the critical factors that you will consider in planning**

**for health service in that area:**

Planning health services is complex. It requires a rigorous, evidence-based approach

to improving services to meet the future health needs of the population.Health serviceplanning specifically aims to improve the health status of a given population while safeguarding equity of access as well as responsiveness of the health system to the perceived needs of the community. Health service planning should achieve this goal through the provision of efficient and effective health services, taking into account available resources and the available means and methods of health care.

Thus, health service planning involves the process of aligning existing health service

delivery arrangements with changing patterns of need, to make the most effective use

of available and future resources. It is a future oriented, and usually adopts a longer term (10 years) perspective. This approach supports organisations to be better prepared to address emerging health trends and other factors that are central to contemporary healthcare.

**Assessment needs**:

It is comparative important that an assessment needs be carried out in the perceived population for easy planning, and the assessment will outsource data on the following areas.

**Changing populations and population needs**

Assessing population characteristics (e.g. growth, age groupings, cultural diversity and

socioeconomic status) and anticipated changes in these will guide the most appropriate

service response. Similarly, by identifying population risk factors (e.g. obesity, smoking

and excessive alcohol consumption) that contribute to various health issues, services

can be designed to reduce these risks for targeted population groups.

**Emerging clinical evidence and technologies.**

Understanding and assessing the potential impacts of advances in clinical evidence

and technologies helps inform the way future services need to be organised and

delivered. This includes being aware of changes in the knowledge and understanding

of diseases and disease trends, treatment techniques and service delivery models.

**Projecting future service need**

Understanding future demand for services—influenced by changes in populations,

disease patterns and treatment technologies (all noted above)—is an important

element of health service planning. By assessing how demand may grow or decline,

decisions about future service developments are better informed.

**Prioritising allocation of resources**

Assessing the resources available to invest in health services. Health service assessment

can identify health service resources required to meet health needs. The prioritisation

of health needs and service issues identified through a rigorous health service planning

process will support resources being directed towards the areas of greatest need.

**Improving service efficiency**

Health service assessment explores alternative service options that can optimise service

delivery arrangements to manage increasing demand. Advances in treatment options

and in the delivery of services in a range of settings (e.g. hospital in the home) allow for

substantial flexibility in health service delivery in the future.

**Providing safe and sustainable services**

Health services must be capable of sustaining the provision of high quality care that

continues to meet (or exceed) required minimum standards. Health service planning

considers issues of service viability when planning future services.

**Planning principles:**

Planning for health care services are guided by the following principles which underpin all planning activity, these principles are and not limited to:

* **Planning to improve population health outcomes**—improving the health and

wellbeing of target populations, particularly those of special needs groups.

* **Planning that is person focused**—integrating services across the health sector

(including within and across the public, private, non-government sectors) to facilitate

continuity of care.

* **Planning for service accessibility and affordability-**services to be offered should be assessible to the community and affordable.
* **Planning for quality services**—promoting clinical practice and models of service

delivery consistent with good clinical practice and contemporary policy directions.

* **Planning for safer services**—providing consistently safe and appropriately

supported health services.

* **Planning for sustainable services**—developing, linking and delivering services in

a way that is sustainable and makes efficient and effective use of limited resources.

* **Planning for accessible services**—delivering safe services as close as possible to

where people live (as clinically appropriate).

* **Planning for culturally appropriate services**—considering cultural diversity in

communities and the health needs of specific groups, undertaking consultation

processes that are sensitive to cultural differences

In summary, after vigorous planning, the intended health services that should be provided to the population should :

* be of high quality
* be safe and sustainable
* be affordable and accessible
* be flexible enough to meet changing needs
* health inequalities and inequities that exist between population groups
* address the health need continuum.

The following phases should be followed during the planning process.

* **Scope the planning activity:** Define the planning parameters and manage changes to the scope.
* **Understand the population and service environment:** Scan the policy and service environment and Profile the population and current service delivery system.
* **Identify the health service needs.** Identify the health needs and service needs/issues and develop an approach to categorise needs/issues.
* **Prioritise the health service needs:** Determine the criteria for prioritisation of needs and apply the criteria for prioritisation.
* **Identify the health service directions:** Develop the service directions and measure the success of planning.
* **Develop/analyse service options:** Develop the service options and analyse feasibility and Identify the indicative resource implications.
* **Develop objectives and strategies:** Develop the objectives and strategies understand the impact of service changes

Therefore, the prioritised health service needs will provide the platform for determining the health service directions. This process will be simplified if the needs have been grouped into emerging themes. Using the prioritised health service needs as the foundation for development of service directions should facilitate creation of meaningful directions that accomplish the ultimate aim of planning to improve the health status of a population by align in service delivery arrangements with changing patterns of need.

References:

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Queensland Government; 2013.

* Queensland Health. Policy management policy. Brisbane; Queensland Government; 2013.