DIPLOMA IN PUBLIC HEALTH

PUNLIC HEALTH DATA AND SURVEILLANCE-ASSIGNMENT -FOUR (4)

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COLLEDGE:

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1. **Define Data. Why is it paramount to for Public health professional to take?**

**Comprehensive individual data?**

**Data** is distinct pieces of information, usually formatted in a special way. ... Since the mid-1900s, people have used the word **data** to **mean** computer information that is transmitted or stored. Strictly speaking, **data** is the plural of datum, a single piece of information.

In our current situation in health information system, it is advisable to use very accurate data as the means of storing information for a specifics purpose and tracking of health performance. Health professionals to comprehensive individual data for the following number of reasons listed below.

**Health** research is vital to improving human **health** and **health** care. ... But it is **important** to stress that privacy also has value at the societal level, because it permits complex activities, including research and public **health** activities to be carried out in ways that protect **individuals**' dignity.

The fundamental principles of fair information practice articulated in the report have since been amplified and adopted in various forms at the international, federal, and state levels ([Gelman, 2008](https://www.ncbi.nlm.nih.gov/books/NBK9579/)). The fair information practices endorsed by the Organisation for Economic Co-operation and Development (OECD), which have been widely cited, include the following principles ([OECD, 1980](https://www.ncbi.nlm.nih.gov/books/NBK9579/)):

* *Collection Limitation*

There should be limits to the collection of personal data, and any such data should be obtained by lawful and fair means and, where appropriate, with the knowledge or consent of the data subject.

* *Data Quality*

Personal data should be relevant to the purposes for which they are to be used and to the extent necessary for those purposes, should be accurate, complete, and kept updated.

* *Purpose Specification*

The purposes for which personal data are collected should be specified not later than at the time of data collection, and the subsequent use limited to the fulfillment of those purposes or such others as are not incompatible with those purposes, and as are specified on each occasion of change of purpose.

* *Use Limitation*

Personal data should not be disclosed, made available or otherwise used for purposes other than those specified in accordance with [the Purpose Specification] except:

* 1. with the consent of the data subject; or
  2. By the authority of law.
* [*Security*](https://www.ncbi.nlm.nih.gov/books/n/nap12458/gloss_part/def-item/gl35/) *Safeguards*

Personal data should be protected by reasonable security safeguards against such risks as loss or unauthorized access, destruction, use, modification, or disclosure of data.

* *Openness*

There should be a general policy of openness about developments, practices, and policies with respect to personal data. Means should be readily available of establishing the existence and nature of personal data, and the main purposes of their use, as well as the identity and usual residence of the data controller.

* *Individual Participation*

An individual should have the right to know whether a data controller has data relating to him/her, to obtain a copy of the data within a reasonable time in a form that is intelligible to him/her, to obtain a reason if the request for access is denied, to challenge such a denial, to challenge data relating to him/her, and, if the challenge is successful, to have the data erased, rectified, completed, or amended.

* *Accountability*

A data controller should be accountable for complying with measures, which give effect to the principles stated above.

These principles have been adopted at the federal and state levels to varying degrees. The United States has taken a sector-driven approach toward adopting the principles of fair information practices, with the federal and state governments promulgating statutes and regulations that apply only to specific classes of record keepers or categories of records

2. **Identify six institutions or organizations that provide health services in a country or**

**State and briefly discuss the roles played each of them.**

Health humanitarian organizations in south Sudan played a very huge role in building the health strategies of rural and local communities at the grassroots levels across different states among different communities country wide, below is the listed of the best humanitarian organizations giving health care services to our community.

**Doctors with Africa- CUAMM.**

*Overview of Cuamm.*

Doctors With Africa-Cuamm is an international humanitarian organization based in Italy that is dedicated in giving health services to vulnerable communities in Africa and globally, Cuamm has been operating in south Sudan since 1992 giving health care services to areas of no accessibility to health services, cuamm works in partnership with south Sudan Ministry of health in giving health promotion activities at the grassroots level across the county, cuamm is aimed at improving the following health sector in

**Primary health Care or units**:Primary health care is a whole-of-society approach to **health** and well-being centered on the needs and preferences of individuals, families and communities. It addresses the broader determinants of **health** and focuses on the comprehensive and interrelated aspects of physical, mental and social **health** and wellbeing. Under this health strategy, cuamm is giving health care services at the Payam and district level with in the targeted communities. In PHC, cuamm did the following roles.

* Training lactating mothers on the importance of exclusive breastfeeding up to the period of 6 months.
* Employing Community Health workers that are well trained in giving diagnosis of various diseases that resulted into dead and did serious treatment upon cases detected.
* It is also ensuring that health services reach every house hold through integrated community cased management in which CHW works at home level household to house tracking pneumonia, malaria and Diarrhea to ease a quick response upon the surveillance conducted.
* Teaching community on health education, the important of vaccine for Children, ANC for pregnant mothers and to other targeted ages.

**Population Services International (PSI)**

**Overview of PSI and what they do**

Population Services International PSI is a global health organization dedicated to improving the health of people in the developing world by focusing on serious challenges like a lack of family planning, HIV/AIDS, barriers to maternal health, and the greatest threats to children under five, including malaria, diarrhea, pneumonia and malnutrition. A hallmark of PSI is a commitment to the principle that health services and products are most effective when they are accompanied by robust communications and distribution efforts that help ensure wide acceptance and proper use. In each of its platforms, PSI works in partnership with local governments, ministries of health and local organizations – creating health solutions that are built to last.

**The Carter Centre (TCC)**

*Overview of TCC*

The Carter Center, in partnership with Emory University, is guided by a fundamental commitment to human rights and the alleviation of human suffering. It seeks to prevent and resolve conflicts, enhance freedom and democracy, and improve health.

*What they do***.**

The carter centre is an international nongovernmental organization that is aimed to improves the living status of communities that are unable to resist against dangerous and epidemic factors of diseases among themselves, TCC took part in Guinea Worm Eradication program in south Sudan for over 20 years

* The Center emphasizes action and measurable results. Based on careful research and analysis, it is prepared to take timely action on important and pressing issues.
* The Center seeks to break new ground and not duplicate the effective efforts of others.
* The Center addresses difficult problems in difficult situations and recognizes the possibility of failure as an acceptable risk.
* The Center is nonpartisan, actively seeks complementary partnerships and works collaboratively with other organizations from the highest levels of government to local communities.
* The Center believes that people can improve their own lives when provided with the necessary skills, knowledge, and access to resources.
* Works at house to house levels tracking Guinea work cases across all the communities of the country.
* Carter centre play a very strategic role in south Sudan Guinea Work program by employing over 1000 Community Health Workers (CHW) at every village to assure and ensure that communities are free from such factor.

**UNAIDs**

*Overview of UNAIDs*

UNAIDS is leading the global effort to end AIDS as a public health threat by 2030 as part of the Sustainable Development Goals. Since the first cases of HIV were reported more than 35 years ago, 78 million people have become infected with HIV and 35 million have died from AIDS-related illnesses. Since it started operations in 1996, UNAIDS has led and inspired global, regional, national and local leadership, innovation and partnership to ultimately consign HIV to history. UNAIDS is a problem-solver. It places people living with HIV and people affected by the virus at the decision-making table and at the centre of designing, delivering and monitoring the AIDS response. It charts paths for countries and communities to get on the Fast-Track to ending AIDS and is a bold advocate for addressing the legal and policy barriers to the AIDS response.

**What they do.**

*HIV/AIDs prevention*

No single prevention method or approach can stop the HIV epidemic on its own. Several methods and interventions have proved highly effective in reducing the risk of, and protecting against, HIV infection, including male and female condoms, the use of antiretroviral medicines as pre-exposure prophylaxis (PrEP), voluntary male medical circumcision (VMMC), behavior change interventions to reduce the number of sexual partners, the use of clean needles and syringes, opiate substitution therapy (e.g. methadone) and the treatment of people living with HIV to reduce viral load and prevent onward transmission.

Despite the availability of this widening array of effective HIV prevention tools and methods and a massive scale-up of HIV treatment in recent years, new infections among adults globally have not decreased sufficiently. The 2016 United Nations Political Declaration on Ending AIDS target is to reduce new HIV infections to fewer than 500 000 by 2020, from more than 1.8 million in 2016.

**International Commission for Red Cross (ICRC)**

*Overview if ICRC*

The ICRC, established in 1863, works worldwide to provide humanitarian help for people affected by conflict and armed violence and to promote the laws that protect victims of war. An independent and neutral organization, its mandate stems essentially from the Geneva Conventions of 1949. Based in Geneva, Switzerland, it employs some 12,000 people in 80 countries; it is financed mainly by voluntary donations from governments and from national Red Cross and Red Crescent societies.

**What they do**

An overview of the ICRC’s health programmes on the ground and the principles underpinning them. Treating and caring for the wounded and sick in armed conflict, other major violence and natural disasters has always been bound up with our history, identity, values and reputation.

**United nations Children Education fund-UNICEF**

*Overview of UNICEF*

Today, thousands of children will die from diseases that are easy to prevent. Thousands more will die because they don’t have the food they need to live and grow. And yet more will experience unspeakable violence.

Millions of children are in danger, every day.

UNICEF keeps children safe by providing vaccines against deadly diseases, distributing mosquito nets and by promoting safe hygiene in communities around the world. We are the world’s largest supplier of emergency life-saving food for children. And we campaign tirelessly to end violence against children. UNICEF therefore very a great goal in funding against malnutrition among vulnerable communities, lt also fight against dangerous diseases to children aged 0-5 years old, UNICEF put much hand in providing vaccines necessary for diseases prevention.

* 1. **Discuss the principles of Public health in the concept of health systems management**.

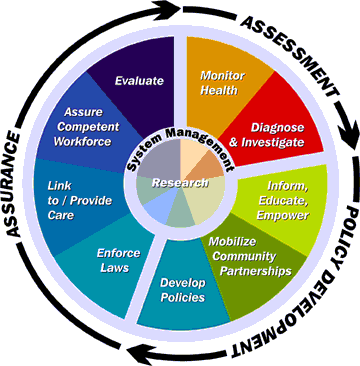
Public health principles refer to the role play of public health professionals in assessing community needs and interventions for promoting public and community health at various areas.

The following are the basic public health principles in the concept of health systems management.

The ten (10) Essential Public Health Services describe the public health activities that all communities should undertake:

1. Monitor health status to identify and solve community health problems
2. Diagnose and investigate health problems and health hazards in the community
3. Inform, educate, and empower people about health issues
4. Mobilize community partnerships and action to identify and solve health problems
5. Develop policies and plans that support individual and community health efforts
6. Enforce laws and regulations that protect health and ensure safety
7. Link people to needed personal health services and assure the provision of health care when otherwise unavailable
8. Assure competent public and personal health care workforce
9. Evaluate effectiveness, accessibility, and quality of personal and population-based health services
10. Research for new insights and innovative solutions to health problems

The picture below summaries more about public health principles, the strategies below is used in giving right services to the target communities.



4. **Give merits and demerits of Public Health Surveillance**

Public health surveillance: **Public health surveillance** (also **epidemiological surveillance**, **clinical surveillance** or **syndromic surveillance**) is, according to the [World Health Organization](https://en.wikipedia.org/wiki/World_Health_Organization) (WHO), "the continuous, systematic collection, analysis and interpretation of health-related data needed for the planning, implementation, and evaluation of [public health](https://en.wikipedia.org/wiki/Public_health) practice."[[1]](https://en.wikipedia.org/wiki/Public_health_surveillance#cite_note-WHO-1) Public health surveillance may be used to "serve as an early warning system for impending public health emergencies; document the impact of an intervention, or track progress towards specified goals; and monitor and clarify the [epidemiology](https://en.wikipedia.org/wiki/Epidemiology) of health problems, to allow priorities to be set and to inform [public health policy](https://en.wikipedia.org/wiki/Public_health_policy) and strategies."[[1]](https://en.wikipedia.org/wiki/Public_health_surveillance#cite_note-WHO-1)

Health surveillance allows for early identification of ill health and helps identify any corrective action needed. Health surveillance is required by [Section 22 of the Safety, Health and Welfare at Work Act, 2005](http://www.irishstatutebook.ie/2005/en/act/pub/0010/sec0022.html) if a risk assessment identifies that employees are exposed to noise or vibration, solvents, fumes, dusts, biological agents and other substances hazardous to health. Regulation 63 of the Safety, Health and Welfare at Work (Quarries) Regulations, 2008 require that the Health Surveillance is made available before persons are assigned to particular work activities in the quarry where a Risk Assessment identifies Health Surveillance is required. The Quarry industry traditionally has issues with noise, dust and musco-skeletal disorders.

Health Surveillance techniques should be used to establish a baseline as part of a pre-employment medical. The employer should identify if a potential employee has existing conditions such as asthma or dermatitis that could be aggravated by their potential work activities such as contact with sensitizers or has an identifiable pre-existing level of hearing loss or r Health surveillance is a system of ongoing health checks. These health checks may be required by law for employees who are exposed to noise or vibration, ionizing radiation, solvents, fumes, dusts, biological agents and other substances hazardous to health, or work in compressed air. espiratory problem.

Health surveillance is important for:

* detecting ill-health effects at an early stage, so employers can introduce better controls to prevent them getting worse
* providing data to help employers evaluate health risks
* enabling employees to raise concerns about how work affects their health
* highlighting lapses in workplace control measures, therefore providing invaluable feedback to the risk assessment
* providing an opportunity to reinforce training and education of employees (eg on the impact of health effects and the use of protective equipment)
* Risk assessment should be used to identify any need for health surveillance.  Health surveillance should not be a substitute for undertaking a risk assessment or using effective controls
* Health surveillance can sometimes be used to help identify where more needs to be done to control risks and where early signs of work-related ill health are detected, employers should take action to prevent further harm and protect employees.

In the other hand, at my own country of residence Health surveillance has got a lot of challenges at its operation at the community levels and district in the targeted location in particular places. The following are the demerits of public health surveillance.

* *Human* Resource, in the health program where public or health surveillance is concerned, therefore, there must be enough human resource that involves well trained technical staffs response for tracking various diseases at various localities.
* *Finance*. When carrying out health surveillance it is sometimes very hard to fulfilled all the promised activities, qualified staffs responsible for surveillance need to be hired at high amount form good performance.
* *Mobility*: any organization or a company that might be responsible for survey must have good transport means to rich hard to reach areas that not are accessible by cars or plane but by bicycles and motor cycles. It is meanwhile recommended that mobility is the factors that limited surveillance.
* *Tools*; disease surveillance is aimed not to be very easy, therefore, some living organisms termed as micro organism may live in human body but cannot be seen with our human eyes, there are some tools that used to indentify this organism in the body and without such tools effective surveillance will not run.
* *Networks or internet*. There are geographical location that might be targeted by GPS with use of good internet service, surveillance need a good wireless network or other network for GPS working
* *Others*. Because conducting surveillance for a health problem consumes time and resources, taking care in selecting health problems for surveillance is critical. In certain countries, selection is based on criteria developed for prioritizing diseases, review of available morbidity and mortality data, knowledge of diseases and their geographic and temporal patterns, and impressions of public and political concerns, sometimes augmented with surveys of the general public or non health-associated government officials.

**5. as a newly employed health research manager, briefly explain what types of**

**Epidemiological studies you would think of in order to describe the association between**

**The occurrence of disease and factors that influence the occurrence**.

Epidemiology is the study of the distribution of diseases and other health-related conditions in populations, and the application of this study to control health problems. The purpose of epidemiology is to understand what risk factors are associated with a specific disease, and how disease can be prevented in groups of individuals; due to the observational nature of epidemiology, it cannot provide answers to what caused a disease to a specific individual. Epidemiologic studies can be used for many reasons, commonly to estimate the frequency of a disease and find associations suggesting potential causes of a disease. To achieve these goals, measures of disease (incidence) or death (mortality) are made within population groups. Epidemiology is fundamentally multidisciplinary and it uses knowledge from biology, sociology, statistics, and other fields.

The four types of epidemiologic studies commonly used in radiation research are *cluster*, *ecologic*, *case-control*, and *cohort* studies. An additional approach for estimating risk in radiation research—although strictly not an epidemiologic study—is risk-projection models. These models are used to predict excess cancer risks by combining population dose estimates with existing risk coefficients to transfer risks across populations with different baseline rates. This type of modeling approach is not new; one of the earliest examples of its use was by the U.S. Federal Council Report, where 0 to 2000 leukemia deaths in the United States attributed to exposures to fallout from above-ground nuclear testing up to 1961 were estimated ([Federal Radiation Council, 1962](https://www.ncbi.nlm.nih.gov/books/NBK201995/)). As discussed in a comprehensive review (Berrington de González et al., 2011), recent applications of the risk-projection modeling have increased partly because of the publication of user-friendly risk estimates for U.S. populations in the BEIR VII report ([NRC, 2005](https://www.ncbi.nlm.nih.gov/books/NBK201995/)) and the increasing acceptance of the limitations of epidemiologic studies of low-dose radiation exposures, mainly owing to their limited statistical power.

The study designs described in this chapter can provide clues for potential associations between cancer and living near a nuclear facility. The first thing that the epidemiologist questions is whether any observed association is real, or if it is due to bias, confounding, or simply due to chance. “Bias”[1](https://www.ncbi.nlm.nih.gov/books/NBK201995/) is a general term related to error in the measurement of a factor and can arise from a variety of sources such as the method of selection of cases and controls, or exposed and unexposed (selection bias), or due to the inaccurate information regarding either the disease or exposure status of the study participants (information bias). On the other hand, confounding refers specifically to the existence of some third variable, the “confounder,” that alters the degree of association between the exposure and the disease of interest. Confounding is a potential issue with all epidemiologic studies discussed here

### Cluster Studies

A *cancer cluster* is an aggregation of a relatively unexpected high number of cases. Clustering can be “spatial,” when the disease in question has a higher incidence rate in some places than in others, or “temporal,” when the incidence rate is higher at a specific time compared to other times. A disease cluster can also be “spatiotemporal.” Testing involves comparing the observed number of cases with the number expected, based on the size and age composition of the population.

The scientific reason to examine disease clusters is to learn about the causes of the cluster and, by extension, gain insight toward the causes of disease. Epidemiologists and public health workers recognize the value of historic examples of cancer cluster examination which contributed to the recognition of human carcinogens in those situations. Typically, exposure was high, prolonged, and well defined. In contrast, most cluster reports involve exposures that are low and poorly defined, and the cases involved are a mix of unrelated, relatively common cancers. For these reasons there is skepticism regarding the scientific value of the investigation of reported clusters (Neutra, 1990; [Rothman, 1990](https://www.ncbi.nlm.nih.gov/books/NBK201995/)).

In a rather provocative summary of the reasons why—with a few exceptions—there is little scientific or public health purpose to investigate individual disease clusters, [Rothman (1990](https://www.ncbi.nlm.nih.gov/books/NBK201995/)) explains that the boundaries of the space and time that encompass the cluster should be clearly defined before examination of the cluster and should not be defined after the fact to capture a population that has experienced the high disease rate. This interpretation has been described as the “Texas sharpshooter’s” procedure in which the shooter first fires his shots randomly at the side of the barn and then draws a bull’s eye around each of the bullet holes. This kind of process tends to produce clusters of causally unrelated cases of no etiologic interest. As noted by [Rothman (1990](https://www.ncbi.nlm.nih.gov/books/NBK201995/)), assigning statistical significance to a reported cluster requires clear definitions of the populations, regions, and/ or time periods under consideration, often a challenging undertaking

### Ecologic Studies

An *ecologic study* (sometimes referred to as a *geographic study* or *correlation study*) evaluates the relationship between an exposure and a disease in some aggregate group of individuals, but not specific individuals, such as those living in a country, a county, a community, or a neighborhood. This is in contrast to case-control and cohort studies where the unit of analysis is the individual. In an ecologic study, average measures of exposure and disease frequency are obtained for each aggregate, and the analyses focus on determining whether or not the aggregates with high levels of exposure also display high disease rates. For example, in a study that uses counties as the unit of analysis, the data of interest are average values of exposure and aggregate counts of disease by county. However, the individuals who actually develop cancer in a county may be more or less exposed than the county average, so the association across county populations may not accurately reflect the association for the individuals who develop cancer. This issue is referred to as *ecologic fallacy* or *ecologic bias* and is the main limitation associated with ecologic studies. The magnitude of the ecologic bias is not measurable; therefore, conclusions need to be stated carefully and results interpreted with caution.

One of the causes of ecologic fallacy is that average levels of potential confounding variables across the geographic units may be subject to considerable measurement error, so trying to adjust for the geographically estimated confounding variables fails to control for confounding. This was illustrated in a study of the association of average county radon levels with lung cancer rates, with an attempt to characterize smoking levels by county ([Cohen, 1995](https://www.ncbi.nlm.nih.gov/books/NBK201995/), [1997](https://www.ncbi.nlm.nih.gov/books/NBK201995/)). The radon–lung cancer ecologic correlations were in the negative direction, whereas a series of studies using estimated individuals’ radon exposure have shown positive associations ([Darby et al., 2005](https://www.ncbi.nlm.nih.gov/books/NBK201995/)). This poor control for confounding is important mainly for potential variables that have strong association with the target disease (e.g., smoking and lung cancer) and is of lesser concern for weak confounding variables. However, when expected effects of exposure are themselves quite weak, then good control for confounding variables becomes especially important.

### Case-Control Studies

The aim of a *case-control study* is to determine whether the frequency of exposure to several possible risk factors is higher in the group of people with the disease of interest (cases) than in the group without the disease (controls). The proportion of cases with and without an exposure suspected to be linked with the disease is compared to the proportion of controls with and without the relevant exposure. If a certain exposure is associated with or causes a disease, then a higher proportion of past exposure among cases is expected compared to the proportion of past exposure among the controls. If the difference cannot be explained by chance, an association between the disease and the characteristic may be inferred.

Cases can be selected from hospitals, registries, or other relevant sources. However, cases based on hospitals may be a biased sample; for example, those cases seen at referral hospitals may represent more serious or unusual cases. Therefore, population-based case ascertainment is the preferred study design. This may be possible through a cancer registry if the registry can provide complete information on diagnoses of cases. Control selection requires equal thought and consideration, because the controls must come from the same population base as the cases; subtle differences in the way cases and controls are selected may lead to selection bias. The major point is that the controls have to reflect the population from which the cases arose. For general-population case-control studies, various methods are used to identify controls for study.

### Cohort Studies

In a *cohort study*, the investigator typically selects a group of exposed and a group of unexposed individuals and follows both groups over time to determine disease occurrence in relation to the exposure. In the radiation epidemiology field, when individual exposures or doses are available, cohort studies typically examine gradients of exposure rather than just un-exposed and exposed groups. The data necessary for assessing disease diagnosis can be obtained either directly by periodic examinations of individuals or by obtaining data from disease registrations, hospital records, and death certificates. For rare diseases or those that take a long time to become evident, such as cancer, the investigator needs to start with a large number of exposed and unexposed individuals and follow them for a long period of time. Study participants may be lost to follow up in a cohort study because they do not wish to take part in the study, because they cannot be located, or because they have died. Minimizing these losses is crucial because they reduce the number of participants being followed. Also, participants that are lost to follow-up may differ in characteristics from those that remain enrolled in the study. When reporting the study design, it is important to note the percentage of and any available demographic information on subjects that are lost.

A cohort study is considered to be a more scientifically rigorous study design compared to case-control, ecologic, or cluster studies. This is because cohort studies measure potential exposures before the disease has occurred and therefore can demonstrate that they may have caused the disease. Because cohort studies most often look forward to the future, they are also referred to as *prospective studies*. However, a cohort study can also be retrospective if both exposures and outcomes have already occurred and accurate historical data are available when the study begins. Studies on radiation effects are often jointly retrospective and prospective; exposures occurred mainly in the past and disease ascertainment includes both past and prospective follow-up.

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