

Module C1: Epidemiology and Health Planning

Entry Scenario

The entry scenario addresses a variety of issues and problems associated with the module topic. It may be used at the beginning of the course to stimulate the students to identify their own needs and interests. The results may be utilized by the individual to assess own learning process, or be integrated with class objectives. Feel free to exchange any of those scenarios with others from your participants' context and experiences.

Your government would like a review of the health services for adolescents living in your country or area. You are asked to examine the prevalence of certain health problems in local adolescents aged 10 to 19, specifically the prevalence of teenage pregnancies, teenage drug use, smoking and drinking, and teenage mental health problems. Your report will contribute to a general evaluation of the adequacy of the current health service delivery system.

Teaching note: It is helpful if participants complete homework assignment for Goal II Objective A before the course (Identify sources of national and local data relating to adolescent health).

General Goals for Learners

By completing the module the participant will be able to:

- I. Describe the terminology of epidemiology useful in planning the provision of adolescent health care
- II. Access and analyse available adolescent health data at the national and local levels
- III. Demonstrate proficiency in applying crucial epidemiological data to planning for adolescent health care

Goal I. Describe the terminology of epidemiology useful in planning the provision of adolescent health care

	Training Objectives Key topics to be covered	Educational Methodology	Activities, Issues, and Questions
KNOWLEDGE	A. Demonstrate familiarity with the terms epidemiology and epidemiological data	Handout of definitions (annex)	Students study definitions independently, using websites when internet is available, browsing journals and learning basic definitions.
	B. Provide a definition of research terms useful to the health care provider <ul style="list-style-type: none"> - Descriptive statistics - Measures of frequency (incidence, prevalence) - Language of association (correlations, causal relationships) - Data quality (validity, reliability) 	Handout of definitions Mini-lecture by epidemiologist or health researcher Class discussion	Specialist provides introduction to the application of epidemiological concepts. Discuss the relevance of the “SMART” concept as applied to indicators and objectives (Specific; Measurable; Attainable; Realistic; Time bound) Discuss what kind of data is important to health planning (morbidity, mortality, demographic, etc.) and how it can be used for needs assessment, priority setting, and applying effective interventions. How important are validity and reliability? What is the value of self-reported data?

Goal II.

Access and analyse available adolescent health data at the national and local levels

	Training Objectives Topics to be covered	Educational Methodology	Activities, Issues, and Questions
KNOWLEDGE	<p>A. Identify sources of international, national and local data relating to adolescent health</p> <ul style="list-style-type: none"> - Publicly available data - Data from own practice - Alternate sources 	<p>Homework assignment Use internet if available to identify sources</p> <p>Group discussion of the homework and results</p> <p>Class “brainstorming”</p>	<p><u>Homework assignment for the module:</u> Students locate national and local adolescent health data such as mortality, teenage pregnancies, accidents, physician visits, and survey results.</p> <p>Where were data found, and how reliable are they? What are the barriers to acquiring comprehensive data on this age group? Did students find differing definitions of age cohorts and lack of data comparability? What if no data exist?</p> <p>What kinds of data can one extract from one’s own practice, how, and for what use?</p> <p>Class creates list of possible alternate sources where useful data could be found. (e.g. insurance companies, drug companies)</p> <p>Is there an easy and cheap way to collect new data?</p>

<p>Training Objectives Topics to be covered</p>	<p>Educational Methodology</p>	<p>Activities, Issues, and Questions</p>
<p>B. Improve skill in handling data of practical use to adolescent health care providers</p> <ul style="list-style-type: none"> - Morbidity and mortality data - Service utilization data - Intervention outcome data 	<p>Group discussion: Use data collected for above Objective A or give handout for group work monitored by an epidemiologist</p> <p>Group discussion: Use data collected by participants</p> <p>Interactive lecture</p>	<p>Derive from available data the prevalence of major causes of morbidity and mortality during adolescence. Compare with data from other segments of the population, other geographic regions and other countries. Examine trends over time.</p> <p>Can service utilization rates for adolescents be derived from the available data? How would one assess the ease of access and consumer satisfaction of adolescents with existing services and facilities? What would indicate the need for a special facility/service for adolescents? Discuss how, when, and by whom to evaluate an intervention. List the kind of indicators that can be used in the evaluation of an intervention. What is the meaning of process evaluation, and outcome evaluation? What do we mean by evidence of effectiveness?</p> <p>If there is sufficient time, plan the evaluation of a small scale intervention.</p>

Goal III.

Demonstrate proficiency in applying crucial epidemiological data to health planning for adolescent health care

	Training Objectives Topics to be covered	Educational Methodology	Activities, Issues, and Questions
SKILLS	<p>A. Demonstrate ability to utilize epidemiological data in project selection and planning, with community involvement</p> <ul style="list-style-type: none"> - Selection of key issues - Identification of needs, gaps and deficiencies in service - Identification of subgroups with special needs - Selection of priorities x- identification relevant stakeholders - Plan of action 	<p>Group work with plenary</p> <p>Invite a politician or a local public health official as resource person</p>	<p><u>Case study</u>: You review the results of a survey carried out in 2 schools in your town, and are surprised by the fact that 50% of surveyed adolescents indicate that they have driven while intoxicated at least once. To investigate this finding further, you need to answer several questions:</p> <ul style="list-style-type: none"> - Why are <i>these</i> data extremely important? - What other data would you need to collect? - Where would you collect them? - How much weight should be given to self-reported data? - How would you present the data to have a political/social impact? - How would you organize the development of a prevention plan? - Participants consider: In your work context, who are the key people/institutions who can influence the realization of a project? What is your access to them? - Who should take action on a plan?

<p>Training Objectives Topics to be covered</p>	<p>Educational Methodology</p>	<p>Activities, Issues, and Questions</p>
<p>B. Demonstrate skill in information dissemination</p> <ul style="list-style-type: none"> - Identification of target persons and groups - Methods of dissemination 	<p>Small group work and/or plenary discussion</p>	<p><u>Case study</u>: You are the head of a research team that has recently conducted a national survey on adolescent sexuality. Plan how to disseminate information about the study and the findings. Groups design an approach (such as media interview, conference, journal article) giving consideration to the following points:</p> <ul style="list-style-type: none"> - How to identify those who must be included, and how to solve the problem of trying to include everybody. - What factors influence the choice of dissemination method (e.g. target group, financial constraints)? -How would the priority messages differ for the countries or areas represented by the participants?



Resources

The lancet series is a series of paper published in 2009 & 2012 focusing on adolescent health in the world and which provide - among others - epidemiological data for free (but you have to register)

<http://www.thelancet.com/series/adolescent-health-2012>

Supercourse on Epidemiology and Global Health (University of Pittsburgh)

<http://www.pitt.edu/~super1/>

American Journal of Epidemiology (Free Abstracts)

<http://aje.oupjournals.org/>

US CDC Wonder Online Databases

<http://wonder.cdc.gov/>

Health behavior of school aged children: an international periodic survey on adolescent health behavior in context (European region & Northern America)

<http://www.hbsc.org/publications/international/>

UNICEF 2011: Adolescence: An age of opportunity

[http://www.unicef.org.au/downloads/Publications-\(1\)/SOWC-2011-Full-Report.aspx](http://www.unicef.org.au/downloads/Publications-(1)/SOWC-2011-Full-Report.aspx)

Unicef 2012: Progress for Children: A report card on adolescents (No. 10).

http://www.unicef.org/publications/index_62280.html



WHO / Europe database

<http://www.euro.who.int/en/data-and-evidence>

Data on self-reported use of legal & illegal substances

<http://www.euro.who.int/en/data-and-evidence>

Data on the health of vulnerable adolescents (UNFPA)

http://www.unfpa.org/youth/dhs_adolescent_guides.html

Population council: international data on adolescent health

<http://www.popcouncil.org/topics/youth.asp>

Data on the health of children & adolescents around the world (WHO, 2014)

http://www.who.int/maternal_child_adolescent/epidemiology/en/

Annex 1

Epidemiology defined

- **Epidemiology:** Epidemiology is a scientific discipline that studies the frequency, distribution, and determinants of diseases or health disorders in defined populations. Epidemiologists study conditions of good health, as well as the different factors influencing onset, course, and consequences of diseases and possible methods of prevention.
- **Populations:** One of the most important distinguishing characteristics of epidemiology is that it deals with groups of people rather than with individual patients.
- **Distribution:** Epidemiologists study the distribution of frequencies and patterns of health events within groups in a population. This branch of epidemiology is called *descriptive epidemiology*, which characterizes health events in terms of time, place, and persons.
- **Determinants:** Epidemiologists attempt to search for causes or factors that are associated with increased risk or probability of disease. This branch of epidemiology is called *analytical epidemiology*, which moves from questions of "who," "what," "where," and "when", to ask "how" and "why".
- **Health-related states:** Although infectious diseases were the focus of much of early epidemiological work, this is no longer true. Modern epidemiology is applied to the whole spectrum of health-related events, which includes chronic disease, environmental problems, behavioural problems, and injuries in addition to infectious disease.
- **Evidence based:** Although epidemiology can be used simply as an analytical tool for studying diseases and their determinants, it serves a more active role. Epidemiological data provides the evidence to steer public health decision-making and to aid in developing and evaluating interventions to control and prevent health problems. This is the primary function of *applied epidemiology*.



Annex 2

Glossary of research terminology

Causal Relationship: A relationship established by data that shows that an independent variable, and nothing else, causes a change in a dependent variable.

Cohort: A subsection of a population with a common feature, usually age. For example, all those individuals in the UK born in 1964 form a birth cohort.

Confidence Level: The specific probability of obtaining some result from a sample if it did not exist in the population as a whole, at or below which the relationship will be regarded as “statistically significant”.

Control Group: A group in an experiment that receives no treatment or intervention in order to compare the treated group (the experimental group) against a norm.

Correlation: A common statistical analysis, usually abbreviated as **r** that measures the degree of relationship between pairs of interval variables in a sample. The range of correlation is from -1.00 to zero to +1.00. That two variables are in correlation is not an assumption of cause and effect.

Cross-sectional study: A study based on data collected at a single point in time.

Dependent variable: A variable that receives stimulus and is measured for the effect that stimulus (treatment) has had upon it.

Descriptive statistics: Data collected on an entire population to describe the health status.

Experimental design: Uses both a control group and an experimental group with a means to measure the change that occurs in both groups. A key element in experimental research is that participants in a study are randomly assigned to groups. The research design attempts to control for all confounding variables, or at least



consider their impact, while attempting to determine if the treatment is what truly caused the change. The true experiment is often thought of as the only research method that can adequately measure the cause and effect relationship

Factor Analysis: A multivariate analysis technique used to analyze the interrelationships among a large number of variables and to explain the relationships among variables in terms of their common underlying dimensions

Incidence: A measure of new cases of infection or of another health event having its onset in a population within a specified period of time. It is often expressed as a rate (for example, the incidence of STDs per 1,000 adolescents 13-19years of age during a specified year.)

Independent Variable: A manipulated variable in an experiment or study whose presence or degree determines the change in the dependent variable.

Inferential statistics: Use of statistical methods to *estimate* from a sample of the population what might be happening in the whole population, or to *predict* what might happen in the future.

Longitudinal study: A study taking place over time. If individuals are followed, this is a longitudinal cohort study. If individuals are not followed, but groups (usually age groups) are restudied, this is a longitudinal cross-sectional study.

Mean: The average score within a distribution of scores

Morbidity: State of ill-health produced by a disease.

Mortality rate: The per capita death rate in a population..

Population: The target group under investigation, as in all adolescents who visit health clinics in a certain area. The population is the entire set under consideration, and samples are drawn from populations.

Prevalence: The number of cases of infection, or other health event, which exist at a particular time.

Probability: The chance that a phenomenon has a of occurring randomly. As a statistical measure, it shown as **p** (the "p" factor).



Prospective study: A study in which people are initially enrolled and then followed up at subsequent times.

Random sampling: Process used in research to draw a sample of a population strictly by chance, yielding no regular or discernible pattern beyond chance. Random sample selection is used under the assumption that sufficiently large samples assigned randomly will exhibit a distribution comparable to that of the population from which the sample is drawn.

Rate: The number of events happening divided by the length of time over which they happen.

Reliability: The extent to which a measure, procedure or instrument yields the same result on repeated trials.

Retrospective study : A study in which people are enrolled and then have their history of risks, infections or disease measured.

Sample: The population researched in a particular study. Usually, attempts are made to select a sample population that is considered representative of groups of people to whom results will be generalized or transferred. In studies that use inferential statistics to analyze results or which are designed to be generalizable, sample size is critical--generally the larger the number in the sample, the higher the likelihood of a representative distribution of the population.

Validity: The extent to which a measure, procedure or instrument accurately reflects or assesses the specific concept that the researcher is attempting to measure. A method can be reliable (consistently measuring the same thing) but not valid.

External Validity is the extent to which the results of a measurement of a sample can be accurately applied to the population.