

## Epidemiology in Kenya

IPBH-3500 (3 Credits / 45 hours)

SIT Study Abroad Program:  
**Kenya: Global Health and Human Rights**

Please Note: This syllabus represents a recent semester. Because courses develop and change over time to take advantage of unique learning opportunities, actual course content varies from semester to semester.

### Course Description

The Epidemiology in Kenya seminar examines trends and patterns in the burden of diseases in Kenya and explores the specifics related to epidemiological research conducted in the country by Kenya Medical Research Institute (KEMRI) in conjunction with US Centers for Disease Control and Prevention (CDC) and health practitioners that inform the planning, implementation and evaluation cycle in public health promotion. The course starts by delving into the importance of epidemiology in the context of Kenya, a developing country. Students will describe and apply epidemiological terms using hands-on data to make causal inferences and be able to communicate their findings to both lay and professional audiences.

Further, the course introduces the principles, concepts, and methods of population based epidemiology - the study of patterns and determinants of disease in different populations. Topics include the dynamic behavior of disease, measures of disease incidence, prevalence and effect, uses of rates and proportions and other statistics to assess population health, epidemiologic study designs, and bias in investigating the extent of disease problems and the associations between risk factors and disease outcomes.

Students will learn and apply basic concepts of epidemiology to multiple domains of public health. The course will illustrate how epidemiology can be applied to better understand, characterize, and promote health at community level. The course will engage the students in active and experiential learning through lectures, readings, assignments, team activities, individual projects, case studies, group discussions and educational excursions.

### Learning Outcomes

At the completion of the *Epidemiology in Kenya* course students will be expected to:

- Explain the importance of epidemiology to scientific, ethical, economic and political discussion of health issues;

- Describe a public health problem in terms of person, place, and time;
- Calculate basic epidemiology measures;
- Demonstrate how to derive causal inferences, including how to mitigate bias and the effects of confounding factors;
- Communicate epidemiologic information to lay and professional audiences; and
- Demonstrate the applications of epidemiology to policy development and disease outbreak investigation.

### **Methods of Instruction**

The course is taught in English. Lectures with key personalities in public health are complemented by case studies at Kenya Medical Research Institute (KEMRI) and Centers for Disease Control in Kisumu, case studies of Kisumu City Department of Public Health, Teaching and Referral Hospitals. Students also study research protocols that utilize epidemiologic designs to answer specific research questions.

### **Readings**

Students are responsible for all the required readings, and should be prepared to bring them to bear on discussions in class. The readings will help you place the classes in their context, to challenge and engage lecturers, to generate questions for class discussions and to deepen your knowledge of particular aspects discussed in class.

### **Course Schedule**

#### **Module 1: Overview of epidemiology**

This module introduces students to key concepts in the field of epidemiology and how the field has evolved.

- Definition of Epidemiologic Terms
- History and Philosophy of Epidemiology
- Historic Developments in Epidemiology

#### *Assigned reading*

- Krieger, N. (2014). *Epidemiology and the people's health: Theory and context*. New York, NY: Oxford University Press. [Chapter 1].
- Winkelstein, W. (2000) Interface of epidemiology and history: a commentary on past, present, and future. *Epidemiol Rev.* 22:2–6.
- Vandenbroucke, JP. (2004) *Commentary: The HRT story: vindication of old epidemiological theory*. *Int J Epidemiol* 33:456–457.
- Aschengrau, A. & Seage GR (2013) *Essentials of Epidemiology in Public Health*. Sudbury, Massachusetts: Jones and Bartlett Publishers. [Chapter 1]

#### **Module 2: Application of epidemiology**

The broad applications of epidemiology can be categorized into two focal areas i.e. uses related to health status and health services and the other use related to disease etiology. This module introduces students to Epidemiology at Kenya Medical Research Institute (KEMRI).

- Uses of Epidemiology
- Practical Disease Concepts
- Descriptive Epidemiology I

### Assigned reading

- Morris JN. (1964) Recapitulation; General (final chapter), pp 274-278. In: *Uses of Epidemiology* (second edition). London: E. & S. Livingstone LTD.
- Rose G. (2001) *Sick individuals and sick populations*. Int J Epidemiol 30:427–32
- Forsdahl A. (2002) *Observations throwing light on the high mortality in the county of Finnmark: Is the high mortality today a late effect of very poor living conditions in childhood and adolescence?* Int J Epidemiol 31:302–08
- Stampfer M. (2004) *Commentary: Hormones and heart disease: do trials and observational studies address different questions?* Int J Epidemiol 33:454–55

### Module 3: Epidemiology II: The Kenyan context

This module explores how epidemiological research at KEMRI/CDC and epidemiological research at the Kisumu County Government department of health informs health policy, planning and delivery. Lectures will review select articles from epidemiological work done in Kenya and in the region. Students will work with existing statistical datasets and visit laboratories to obtain experience related to processing and management of data samples from KEMRI/CDC disease surveillance and monitoring systems. Case studies will include HIV/AIDS, malaria, tuberculosis, diarrheal diseases, emerging and re-emerging infectious diseases, maternal and child health, neglected tropical diseases, non-communicable diseases. This module also provides ideas for Independent Study Project (ISP) or internship topic selection.

### Assigned reading

- Kenya AIDS Strategic Framework, 2014/2015-2018/2019
- Malaria Operational Plan FY 2017
- Moore DM, Hogg RS. (2004) *Trends in antenatal human immuno-deficiency virus prevalence in Western Kenya and Eastern Uganda: evidence of differences in health policies?* Int J Epidemiol 33:554–60
- Kenya National Strategy for the prevention and control of non-communicable diseases 2015-2020

### Module 4: Practical Epidemiology I

Epidemiology does not occur in confinement and therefore in this module students will be taken through platforms that evaluate and synthesize epidemiological work in the following sectors/areas of practice: health and demographic surveillance systems, social and behavioral epidemiology, infections and outbreaks investigation, epidemiology and policy.

### Assigned reading

- Kenya Demographic Health Survey, 2014
- Rodgers GB. (2002) *Income and inequality as determinants of mortality: an international cross-section analysis*. Int J Epidemiol 31:533–38
- Leung MW, Yen IH, Minkler M. (2004) *Community based participatory research: a promising approach for increasing epidemiology's relevance in the 21st century*. Int J Epidemiol 33:499–506
- Kark SL. (2003) *The social pathology of syphilis in Africans*. Int J Epidemiol 32:181–86
- Sam Shapiro. (1991) *Epidemiology and Public Policy*. American Journal of Epidemiology, Volume 134, Issue 10, 15 Pages 1057–1061

### Module 5: Practical Epidemiology II

Students observe epidemiology in action in which clinical teams (KEMRI, Teaching and Referral Hospitals, County Governments) use epidemiologic information to make necessary decisions in patient management. Students are also appraised through research protocols that utilize epidemiologic designs to answer specific research questions.

#### Assigned reading

- Leitch I. (2001) *Growth and health*. Int J Epidemiol 30:212–16.
- Kermack WO, McKendrick AG, McKinlay PL. (2001) *Death-rates in Great Britain and Sweden. Some general regularities and their significance*. Int J Epidemiol 30:678–83.
- Davey Smith G, Ebrahim S. (2003) 'Mendelian randomization': can genetic epidemiology contribute to understanding environmental determinants of disease? Int J Epidemiol 32:1–22.
- Berkson J. (2003) *Tests of significance considered as evidence*. Int J Epidemiol 32:687–91.
- Barrett-Connor E. (2004) *Commentary: Observation versus intervention—what's different?* Int J Epidemiol 33:457–59.
- Adcock F. (2004) *Future Work*. Int J Epidemiol 33:468
- Degenhardt L, Hall W, Lynskey N. (2003) *Testing hypotheses about the relationship between cannabis use and psychosis*. Drug Alcohol Depend 71:37–48.

### Module 6: Comparative study of Rwanda's healthcare systems

Rwanda stands out in the East African region for its exceptional gains in rolling back malaria and in implementing a university health insurance system. How has Rwanda made such progress in health promotion, and what lessons do we draw for implementing successful public health programs in tropical settings? Students begin this module by exploring Rwanda's recent history, and then conduct case studies of Rwanda's Universal health insurance scheme, HIV/AIDS and malaria.

#### Assigned Reading

- Twahirwa, Aimable. "Sharing the burden of sickness: mutual health insurance in Rwanda."
- Bulletin of the World Health Organization, Nov. 2008, p. 823
- Epping-Jordan, J E. Pruitt, S. D. R Bengoa, Wagner, E. H. (2004) Improving the quality of health care for chronic conditions. Qual Saf Health Care

### Evaluation and Grading Criteria

#### Assignments

Timely completion of all assignments is expected. Late hand-ins will be penalized. All assignments are evaluated according to organization, analytical quality, in-depth of understanding, argumentation and presentation of evidence. The final grade for the *Epidemiology in Kenya* seminar will be comprised of the following assessments:

**Synthesis Paper 40%:** The synthesis paper offers students an opportunity to explore a topic of their choice relevant to issues of epidemiology in Kenya. The synthesis paper allows students to explore literature that may be useful in developing a more grounded theoretical framework within which to frame their ISP and/or make sense of their ISP experiences. The synthesis paper must be structured along the lines of a standard academic paper – clear introduction, thesis, engaging and rigorous argument, insightful conclusions and recommendations, and consistent referencing. The final synthesis paper will be 8-10 pages (excluding figures and illustrations) and double-spaced, using a 12-point font.

**Mapping project 30%:** Students are required to use a variety of possible mapping strategies in order to better understand the realities of epidemiology in Kenya. Students may utilize existing base maps and

gather primary data that will assist in illuminating issues related to public health and epidemiology in relevant locations. The output of this project is a series of at least three maps that visually represent data drawn from sources including: field observations, semi-structured interviews, and/or community mapping techniques. An oral presentation/discussion of the maps provides students with an opportunity to share results of the project.

**Theory/Practice Reflection Journal 20%:** Students will prepare a two-page analytical journal entry reflecting on the visit(s) included in the excursion. Five journal submissions are required—one for each of the modules presented in the course. Following each academic excursion students should reflect on critical issues observed and knowledge gained. The aim of the reflection will be to connect theory as presented in lectures and practice as experienced during the academic excursions.

**Participation 10%:** Participation in class refers to attendance, punctuality, attentive listening and active engagement in all lectures, discussions, educational excursions and other activities. It also means polite and respectful behavior.

### **Grading Scale:**

The grading scale for all classes is as follows:

94-100% A  
90-93% A-  
87-89% B+  
84-86% B  
80-83% B-  
77-79% C+  
74-76% C  
70-73% C-  
67-69% D+  
64-66% D  
Below 64 F

### **Grading Criteria**

An A grade for an assignment entails superior (not just —very good) performance in terms of structure and organization of assignments, analysis, logical argumentation, consistency, and the provision of factual, numerical and/or historical evidence. In terms of Class Participation, an A grade refers to full attendance, punctuality, attentive listening and active engagement in all academic seminar lectures, discussions, field trips and other activities. It also means polite and respectful behavior. The level, frequency, and quality of student participation will be monitored and taken into account.

All written assignments should be typed and double-spaced. Always remember to back up or keep your work in your email inbox.

**Disability Services:** Students with disabilities are encouraged to contact Disability Services at [disabilityservices@sit.edu](mailto:disabilityservices@sit.edu) for information and support in facilitating an accessible educational experience. Additional information regarding SIT Disability Services, including a link to the online request form, can be found on the Disability Services website at <http://studyabroad.sit.edu/disabilityservices>.