Public Health Training Camp 2019
Workshop on
"Infectious Disease Modelling, Systematic Review & Meta-Analysis"

Facilitators

Prof Stuart Gilmour (St. Luke's International University, Tokyo, Japan)

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Jenny Jung (Yale University, USA)

Host: Global Public Health Research Foundation

Venue: Uttara (Sector-10), Dhaka

Duration: 3 days (22-24 February 2019)

Time: 10:00-17:00

Registration deadline: **January 31, 2019**

Online Registration Form: https://goo.gl/forms/hbjBgwFqIG5XBtMM2

Contents

Day 1: Systematic Review and Meta-analysis

    a. Overview and search

    b. Overview of systematic reviews

    c. Search strategy and screening

    d. Endnote

    e. Data management and meta-analysis

f. Introduction to meta-analysis

g. Effect measures in meta-analysis

h. Estimators and Standard Errors of effect sizes

i. Heterogeneity

j. Publication bias

k. Data extraction and management use Stata

l. Statistical models in meta-analysis

- Inverse variance weight

- Fixed effect model

- Random effects model

- Inverse variance heterogeneity model

Day 2: Meta-analysis models and methods

a. Meta-regression and sub-group analysis

b. Meta-analysis for continuous and binary outcome variables

c. Meta-analysis use Stata

d. Introduction to infectious disease modeling

e. Types of disease model

f. Mathematical overview

g. Introduction to simulation tools

Day 3: Infectious Disease Modelling

a. Example: HIV in China

b. Simulation: Modeling HIV among injecting drug users

c. Practical exercise: Comparing policy options for an HIV epidemic among injecting drug users

NB: NB: Participants are required to bring a laptop to class, with EndNote, Stata version 11 or more and R and RStudio installed.

Description

Systematic Reviews

Due to the exponentially growing quantity of scientific literature, it is critical to synthesize reliable research for evidence-based decision making. Systematic reviews play a vital role in providing updated and reliable synthesis of established evidence. This three day course covers systematic review, from a fundamental understanding to step-by-step guidance on how to independently conduct a systematic review and meta-analysis. The course covers key topics including: developing a focused question; literature search and screening; data management and extraction; quality assessment of studies; assessment of bias; and handling heterogeneity. The course also presents basic statistical methods such as selection of models for qualitative and quantitative meta-analysis, fixed and random-effects models, subgroup analysis, source of bias, and meta-regression. Participants will have the opportunity to gain practical experience by conducting practical tasks and by the end of the course, they will gain necessary skills to conduct their own high quality systematic review and meta-analysis.

Infectious Disease Modeling

Infectious disease models are an increasingly important component of modern policy-making. They are used for projecting the future path of epidemics, for assessing the pandemic risk of new disease outbreaks such as Ebola virus and SARS, and for comparing the potential benefits of different interventions and disease management policies. This course will introduce these models, show how they differ from classical epidemiological studies, and give students an opportunity to develop a basic mathematical model. The course covers the basic mathematics required for building infectious disease models, introduces different types of disease models with examples, and provides an overview of how to answer policy questions using mathematical modeling. Students will have the opportunity to develop and implement their own mathematical model and to use it to test interventions. Students for this course will need to have a basic understanding of the software package R in order to fully benefit from the practical component of the class.

Learning Objectives

1. Upon successfully completing this course, participants will be able to:
2. Understand the process of conducting systematic reviews and meta-analysis
3. Understand different methods of information and data synthesis based on qualitative and/or quantitative evidence
4. Identify, access, and perform literature search using key sources
5. Develop and use a data extraction form to extract relevant outcomes
6. Identify and consider potential sources of bias and heterogeneity within and between included studies
7. Synthesize results using meta-analysis in Stata both qualitatively and quantitatively
8. Interpret effect size metrics and construct a report to draw relevant conclusions
9. Understand the process of developing and applying a mathematical model
10. Identify the basic components of a mathematical model and assess their validity
11. Distinguish between kinds of disease model, and describe the best model type for a common disease
12. Understand the role of the basic reproduction number in analyzing disease outbreaks and vaccination strategies
13. Develop a simple model and use it to answer a policy question

Course fee

BDT 5,000 for students and BDT 7,000 for professionals and others (including lunch and snacks). Please call to Administrative Officer of GPHRF before making a payment (01797-438889). Course fee is non-refundable.

Contact

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