

MMPH6106 Advanced epidemiological methods I

Coordinator: Prof N Leung

Course Description:

The overarching conceptual framework for this course centres on the use of structural causal models to design, analyze and interpret study design commonly used in epidemiology, including observational, instrumental variable, quasi-experimental and experimental study designs. This course will consider how structural causal models, mediation analysis, effect modification, sensitivity analysis and consideration of missing data, can be applied to the pursuit of making valid and transportable causal inferences in epidemiology.

Prerequisite: CMED6200 Introduction to epidemiology
CMED6300 Intermediate epidemiology

Term 2 (Thursday)

Contact person: Ms Huang Xin/ Ms Zhang Junmeng

Date	Time	Lecture Topic	Lecturer	Venue
16 Jan 2025	6:30-9:30 pm	1. Causation and causal inference	Prof N Leung	TBC
23 Jan 2025	6:30-9:30 pm	2. Structural causal models and its application to study design	Prof N Leung	TBC
13 Feb 2025	6:30-9:30 pm	3. Identifying confounders	Prof N Leung	TBC
20 Feb 2025	6:30-9:30 pm	4. Effect measurement modification	Prof N Leung	TBC
27 Feb 2025	6:30-9:30 pm	5. Mediation	Prof N Leung	TBC
06 Mar 2025	6:30-9:30 pm	6. Misclassification	Prof N Leung	TBC
13 Mar 2025	6:30-9:30 pm	7. Instrumental variable analysis	Prof N Leung	TBC
20 Mar 2025	6:30-9:30 pm	8. Missing data	Prof N Leung	TBC
27 Mar 2025	6:30-9:30 pm	9. Alternative epidemiologic study designs and triangulation of evidence in causal inference	Prof N Leung	TBC
03 Apr 2025	6:30-9:30 pm	10. Special topics in epidemiology	Prof N Leung	TBC
17 Apr 2025	6:30-8:30 pm	Final examination	-	TBC

Course Assessment:

Written assignments: 30%
Participation: 20%
Examination: 50%

Recommended Textbooks:

1. Szklo M, Nieto FJ. *Epidemiology: Beyond the Basics*. 3rd ed. Sudbury, MA: Jones and Bartlett Publishers, LLC; 2014.
2. Rothman KJ, Greenland S, Lash TL. *Modern Epidemiology*. 3rd ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2008.
3. Pearl J. *Causality. Models, Reasoning, and Inference*. 2nd edition. New York: Cambridge University Press, 2009. (Optional reading)
4. Burgess S and Thompson SG. *Mendelian randomization: Methods for Using Genetic Variants in Causal Estimation*. Boca Raton: CRC Press, Taylor & Francis Group, LLC, 2015 (Optional reading)

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