Master of Science in Epidemiology and Biostatistics  
( Full-time / Part-time )

Postgraduate Diploma in Epidemiology and Biostatistics / Diploma in Epidemiology / Diploma in Biostatistics  
( Part-time )

Programme Co-Directors:  
Professor Jin-ling TANG & Professor Benny ZEE

Assistant Director for Epidemiology:  
Professor Chen MAO

Assistant Director for Biostatistics:  
Professor Maggie WANG

Health Research in Human Populations, Clinical Research, Evidence-Based Medicine

Background
Modern epidemiology and biostatistics are research methodologies that are used to study practical issues in clinical medicine and public health in human populations. As such, epidemiology and biostatistics have been gaining increasing worldwide prominence as cutting-edge disciplines of medical research. In today’s world, both clinical and non-clinical health professionals must provide evidence-based decisions for patient care, public health interventions and public health policies. The epidemiology and biostatistics courses offered in this programme provide the requisite knowledge and quantitative skills for conducting rigorous scientific studies and for interpreting epidemiological data from such research studies as clinical trials, case-control and cohort studies, and systematic reviews.

Aims and Features
The courses aim to provide comprehensive training in the design, conduct, and analysis of clinical and non-clinical health research and to interpret and use findings from such studies for patient care and policy making. We also teach students how to write professional reports and scientific research papers. Since there is emphasis on clinical epidemiology and interpretation of epidemiological research results, the courses are also particularly popular for those who wish to master critical appraisal skills for evidence-based medicine.

We offer different programmes of study to cater to the varying needs of our students. The Postgraduate Diploma programme teaches the essentials of both epidemiology and biostatistics, whereas the Diploma programme allows more flexibility and only requires attendance in either epidemiology or biostatistics courses. The Master of Science (MSc) programme extends learning to a broader range of topics and involves more in-depth discussions. MSc students are required to conduct an independent research project under supervision of a faculty member and produce a thesis of publishable standard before graduation. Some students’ work has resulted in publications in major medical journals, such as Lancet, Cancer, and Chest.
Teaching Format
English is the medium of instruction. The course content is delivered using a combination of lectures, tutorials, computing sessions, discussions, critical appraisals of literature, and student presentations. An experienced thesis supervisor is assigned to each student, and one-to-one and special small group tutorials can also be offered as needed. Students are provided assistance through all phases of studies including study design, writing grant applications and research protocols, data collection and analysis, and scientific papers writing.

Recognition of the Programmes
The Hong Kong Medical Council recognizes both the Master of Science and Postgraduate Diploma degrees in Epidemiology and Biostatistics as qualifiable qualifications. Continuing Medical Education (CME) credits for non-specialists can also be obtained.

Who Should Apply
- Those planning to conduct applied clinical and health research such as surveys, clinical trials, observational studies, and systematic reviews in order to address practical issues in health care
- Those needing to interpret and apply research findings for evidence-based patient care and health-related decision making
- Those seeking biostatistical proficiency for application to lab-based biomedical research or epidemiological research.

The majority of our past students have been clinicians (including clinical professors, public health professionals, researchers, nurses, physiotherapists, allied health workers, health managers, laboratory technicians, or professionals from the pharmaceutical field.

Who Should Apply
- Those seeking biostatistical proficiency for application to lab-based biomedical research or epidemiological research
- Those needing to interpret and apply research findings for evidence-based patient care and health-related decision making
- Those planning to conduct applied clinical and health research such as surveys, clinical trials, observational studies, and systematic reviews in order to address practical issues in health care

Course Contents

Epidemiology
- Introduction to epidemiology
- Relevance to evidence-based medicine, patient care and decision making

Designs of epidemiological research
- Cross-sectional studies, surveys, ecological studies
- Case control studies, cohort studies
- Clinical trials, systematic reviews and meta-analyses

Research questions that can be answered in epidemiological studies
- Etiology and causes of disease
- Evaluation of diagnostic methods, efficacy and effectiveness
- Investigation of harms and adverse effects
- Health needs and policy evaluation

Making sense of epidemiological data
- Estimation and confidence intervals
- Control of confounding, identification of interaction and dose-response relationship
- Stratified analysis, standardization and multiple regression

Evidence-based medicine
- Critical appraisal skills with respect to different study designs
- Literature search, meta-analysis and systematic review

Major epidemiological concepts
- Validity, biases and confounding
- Quality and grading of evidence
- Causal inference, generalizability and applicability
- Measures of disease frequency & occurrence
- Measures of association

Field work techniques
- Protocol development and sample size planning
- Design and evaluation of measurement and data collection
- Use of routinely collected data in health and disease
- Quality control methods
- Statistical, tabular and graphical presentation of data and report writing skills Other topics
- Infectious diseases epidemiology
- Environmental health and nutritional epidemiology
- Ethical considerations in epidemiological research
- Epidemics, outbreaks and outbreak investigation

Biostatistics
- Introduction to biostatistics
  - Conceptual understanding, application and interpretation on a board range of commonly used statistical methods in medicine and public health research

We discuss modern statistical analysis in depth with diagnostic procedures and model building techniques:
- Analysis of variance and regression
- One and two-way ANOVA
- Simple and multiple regression
- Logistic regression
- Survival data analysis
- Kaplan-Meier estimation, the log-rank test and Cox proportional hazards regression

Advanced logistic regression
- Multinomial logistic model
- Proportional odds model for ordered categorical data
- Conditional logistic model for matched case-control designs

Longitudinal data analysis
-Repeated measures ANOVA and MANOVA
- Generalized linear mixed effect models
- Generalized estimating equations

Analysis of questionnaire data
- Translation and validation of questionnaires
- Exploratory and confirmatory factor analysis
- Structural equation models

Other topics
- Multilevel Modeling
- Poisson & Negative Binomial Regression
- Regression Trees

TeachingFormat: The course content is delivered using a combination of lectures, tutorials, computing sessions, discussions, critical appraisals of literature, and student presentations. An experienced thesis supervisor is assigned to each student, and one-to-one and special small group tutorials can also be offered as needed. Students are provided assistance through all phases of studies including study design, writing grant applications and research protocols, data collection and analysis, and scientific papers writing.

Recognition of the Programmes: The Hong Kong Medical Council recognizes both the Master of Science and Postgraduate Diploma degrees in Epidemiology and Biostatistics as qualifiable qualifications. Continuing Medical Education (CME) credits for non-specialists can also be obtained.

Who Should Apply: Those planning to conduct applied clinical and health research such as surveys, clinical trials, observational studies, and systematic reviews in order to address practical issues in health care. Those needing to interpret and apply research findings for evidence-based patient care and health-related decision making. Those seeking biostatistical proficiency for application to lab-based biomedical research or epidemiological research.

The majority of our past students have been clinicians (including clinical professors, public health professionals, researchers, nurses, physiotherapists, allied health workers, health managers, laboratory technicians, or professionals from the pharmaceutical field.

Courses:

- Introduction to Biostatistics
  - Poisson & Negative Binomial Regression
  - Multilevel Modeling
- Other topics
  - Structural equation models
  - Exploratory and confirmatory factor analysis
  - Translation and validation of questionnaires
- Analysis of questionnaire data
  - Generalized linear mixed effect models
  - Repeated measures ANOVA and MANOVA
  - Proportional odds model for ordered categorical data
  - Multinomial logistic model
- Advanced logistic regression
  - Multinomial logistic model
  - Proportional odds model for ordered categorical data
  - Conditional logistic model for matched case-control designs
- Longitudinal data analysis
  - Repeated measures ANOVA and MANOVA
  - Generalized linear mixed effect models
  - Generalized estimating equations
- Analysis of questionnaire data
  - Translation and validation of questionnaires
  - Exploratory and confirmatory factor analysis
  - Structural equation models
- Other topics
  - Multilevel Modeling
  - Poisson & Negative Binomial Regression
  - Regression Trees

Teaching Format: English is the medium of instruction. The course content is delivered using a combination of lectures, tutorials, computing sessions, discussions, critical appraisals of literature, and student presentations. An experienced thesis supervisor is assigned to each student, and one-to-one and special small group tutorials can also be offered as needed. Students are provided assistance through all phases of studies including study design, writing grant applications and research protocols, data collection and analysis, and scientific papers writing.

Recognition of the Programmes: The Hong Kong Medical Council recognizes both the Master of Science and Postgraduate Diploma degrees in Epidemiology and Biostatistics as qualifiable qualifications. Continuing Medical Education (CME) credits for non-specialists can also be obtained.

Who Should Apply: Those planning to conduct applied clinical and health research such as surveys, clinical trials, observational studies, and systematic reviews in order to address practical issues in health care. Those needing to interpret and apply research findings for evidence-based patient care and health-related decision making. Those seeking biostatistical proficiency for application to lab-based biomedical research or epidemiological research.

The majority of our past students have been clinicians (including clinical professors, public health professionals, researchers, nurses, physiotherapists, allied health workers, health managers, laboratory technicians, or professionals from the pharmaceutical field.

Programme Structure:

<table>
<thead>
<tr>
<th>Course</th>
<th>Dip in Biostatistics</th>
<th>Dip in Epidemiology</th>
<th>PgD 1-Year MSc (Full-time)</th>
<th>2-Year MSc (Part-time)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Courses</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Introduction to Biostatistics</td>
<td>3</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Linear Models</td>
<td>2</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Categorical &amp; Survival Data Analysis</td>
<td>3</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Introduction to Epidemiology</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Epidemiological Study Designs</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analysis of Epidemiological Data</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protocol Development I</td>
<td>1</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Protocol Development II</td>
<td>1</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Topics in Linear Models</td>
<td>2</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Topics in Multivariate Analysis</td>
<td>1.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Application of Epidemiology in Health Care</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selected Topics in Epidemiology</td>
<td></td>
<td>1.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Publishable Research Thesis</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elective Courses</td>
<td>Up to 16 different elective courses for selection</td>
<td>3</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Total Required Credit Units</td>
<td>9</td>
<td>9</td>
<td>18</td>
<td>36</td>
</tr>
</tbody>
</table>

1 To be taken in first year of study for MSc (Part-time) students
2 To be taken in second year of study for MSc (Part-time) students

Career Benefits From Our Programmes: Our programmes have been cited as being greatly instrumental to our students’ career development.

Many graduates have advanced to senior clinical, research, academic and administrative positions after completing our programmes. Some of our graduates have changed to research careers in academic and governmental organizations while others have continued onto doctoral studies.

Selected Publications of Our Past Students:
- Yan Wing Wah (2002), LANCET 2003; 361:1319-1325
- Chang Kwok Chiu (2004), Am J Respir Crit Care Med 2004;170:1124-30
- Ha Ping Yiu Joe (2004), Hepato-gastroenterology 2004; 51(60):1605-8
- Chim Mei Ling (2005), Am J Gastroenterol 2006; 101:1516-23
- Yan Wing Wah (2002), LANCET 2003; 361:1319-1325
- Chang Kwok Chiu (2004), Am J Respir Crit Care Med 2004;170:1124-30
- Ha Ping Yiu Joe (2004), Hepato-gastroenterology 2004; 51(60):1605-8
- Chim Mei Ling (2005), Am J Gastroenterol 2006; 101:1516-23
Sharing of Learning Experience

Dr Jacqueline YAP  
Specialist in Anaesthesia and Pain Medicine, Associate Consultant, Anaesthesia and Operating Services, Alice Ho Miu Ling and North District Hospitals

This postgraduate programme provided a solid theoretical and practical background in epidemiology and biostatistics. Through the expert teaching, guidance, and advice provided by the lecturers and tutors, I gained the knowledge and practical skills necessary in research and data analysis. More importantly, this knowledge can also be applied to my daily clinical practice in medicine.

Dr Wing-wa YAN  
Specialist in Critical Care Medicine, Director and Consultant, Intensive Care Unit, Pamela Youde Nethersole Eastern Hospital

My experience with the Master’s course can be described by two words: ‘practical’ and ‘serious’. The course materials were very practical in the sense that they were relevant to my daily work. Besides covering the basic epidemiological concepts, they also emphasized the application of these concepts in actual clinical papers. The lecturers, tutors, and the coordinator were serious about teaching. All my classmates experienced their wholehearted dedication to the course. Having taught others in my specialty for more than ten years, I enjoyed such care.

Ms Zhenzhen LIANG  
Statistical Programmer, Statistical Programming, PARAXEL International

I found the structure of the courses is reasonable and the objectives are quite clear and definite. More importantly, the postgraduate programme provided theoretical knowledge for my current job, which focuses on the statistical issues of clinical trials. In addition, the great deal of library sources acts as supplement for the lectures. And I have to mention that the professors and tutors help us a lot in our study and thesis.

Dr Kin-Sun TSE  
Associate Consultant, Department of Radiology and Imaging, Queen Elizabeth Hospital

This Postgraduate Diploma course in Epidemiology and Biostatistics has been a precious learning experience! Biostatistics has been a difficult topic in the medical curriculum. This course has equipped me with the key concepts and technical tools in epidemiology and biostatistics. Through different learning modes in this course, namely lectures, small group tutorials, computer workshops, assignments and protocol design, I have put the theories and principles into practice. In the era of evidence-based medicine, this course has laid the foundation for critical appraisals and decision making in daily clinical practice, as well as study design and statistical analysis in research. It also provides the basis for public health-related studies and career development. I have no hesitation in recommending this course to all medical and para-medical colleagues, and those who are interested in this field!

Ms Zhenzhen LIANG  
Statistical Programmer, Statistical Programming, PARAXEL International

I found the structure of the courses is reasonable and the objectives are quite clear and definite. More importantly, the postgraduate programme provided theoretical knowledge for my current job, which focuses on the statistical issues of clinical trials. In addition, the great deal of library sources acts as supplement for the lectures. And I have to mention that the professors and tutors help us a lot in our study and thesis.

Dr William FOO  
Specialist in Clinical Oncology, Director, Radiotherapy and Oncology Centre, Hong Kong Baptist Hospital

Samples and populations; statistics and its interpretation – these were what I learnt 10 years ago, and I still find them immensely useful in reading medical literature. Equipped with this knowledge I was able to explore a whole new world of ‘macro-medicine’, especially in cancer epidemiology. My understanding of epidemiology and statistics were indispensable tools in past years, during my work as the Director of the Hong Kong Cancer Registry.

Prof. Paul Glasziou (left), clinical epidemiologist, Former Director of Oxford Centre for EBM and Editor of Evidence-Based Medicine, gave seminars at the School in 2004

Prof. Olli S Miettinen (right), Prominent Epidemiologist, gave seminars at the School in 2009

Master of Science in Epidemiology and Biostatistics

<table>
<thead>
<tr>
<th>Duration</th>
<th>Mode of Study</th>
<th>Tuition Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year</td>
<td>Full-time</td>
<td>HKD 158,400 (per year)</td>
</tr>
<tr>
<td>2 years</td>
<td>Part-time</td>
<td>HKD 75,600 (per year)</td>
</tr>
</tbody>
</table>

Postgraduate Diploma in Epidemiology and Biostatistics

<table>
<thead>
<tr>
<th>Duration</th>
<th>Mode of Study</th>
<th>Tuition Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 months</td>
<td>Part-time</td>
<td>HKD 75,600</td>
</tr>
</tbody>
</table>

Diploma in Epidemiology or Biostatistics

<table>
<thead>
<tr>
<th>Duration</th>
<th>Mode of Study</th>
<th>Tuition Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 months</td>
<td>Part-time</td>
<td>HKD 37,800</td>
</tr>
</tbody>
</table>

Contact Information

Ms Debbie Leung / Ms Stephanie Wan  
2/F, JC School of Public Health and Primary Care  
Prince of Wales Hospital, Shatin  
New Territories, Hong Kong  
Tel: (852) 2252 8431 / (852) 2252 8418  
Fax: (852) 2145 7489  
E-mail: epibiostat@cuhk.edu.hk

www.clinicalresearch-cuhk.hk