



# Careers in Epidemiology & Biostatistics

## *Preparing for the Job Market*

*CSEB Webinar*

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Waterloo

# Talking Points

- About Us
- What are Epidemiology and Biostatistics?
- Education & Training
- Employment Trajectories
- Preparing for the Job Market
- Applying to Graduate School
- Academic, Public, Not-for-profit, and Private Sector Careers
- The Canadian Society for Epidemiology & Biostatistics (CSEB)
- CSEB 2016

# Poll - Who are you?

- Undergraduate student
- Graduate student – Masters, PhD
- Junior – newly graduated, <5 years experience
- Mid-level – 5 to 10 years experience
- Senior – 10+ years experience



■ Education ■ Employment ■ Volunteering

BHSc @  
McMaster  
University

Summer  
Research  
Assistantship –  
Institute of  
Population  
Health @  
University of  
Ottawa

PhD in  
Population  
Health @  
University of  
Ottawa

Chair of CSEB  
Student  
Conference in  
Ottawa &  
CSEB-UO  
founder  
  
CSEB Board  
of Directors

Planning & Evaluation  
Consultant, LGL  
District Health Unit  
  
Senior Research  
Associate, then  
Associate Director,  
Health Economics @  
Conference Board of  
Canada



Summer Research  
Assistantship – Not-for-  
Profit Sector,  
Reproductive Health

MSc in Community  
Health &  
Epidemiology @  
Queen's University

Started FSWEP &  
Term Contracts @  
Public Health  
Agency of Canada

Part-Time Professor  
in ISHS @ University  
of Ottawa  
  
Senior Research  
Associate @ Elizabeth  
Bruyère Research  
Institute (contract)

Thy Dinh



■ Education ■ Employment ■ Volunteering

MSc,  
Epidemiology and  
Biostatistics,  
McGill University

Research  
Associate,  
MS Pharmaccess

PhD,  
Epidemiology  
and  
Biostatistics,  
McGill  
University

CSEB,  
Communications  
Committee  
(chair) and  
Membership  
Committee,  
Executive  
Committee, VP  
IJPC-SE

Associate Professor,  
SPHHS, University of  
Waterloo

1997-2000

1999-2005

2002-05

2000-2005

2005-08

2008-14

2014-

Research Assistant,  
Ctr for Clin Epi and  
Community Studies,  
JGH

Postdoc and  
Research Associate,  
CE&B, McMaster  
University

Assistant Professor  
(2008-2013) and  
Associate Professor  
(2013-2014), CE&B,  
McMaster University

Mark Oremus

# Epidemiologist

- “an investigator who studies the occurrence of disease or other health-related conditions or events in defined populations...may study disease in populations of animals and plants, as well as among human populations” (Last, 2001)
- Profile of the “epidemiologist” has changed overtime given the many areas of specialization and application
- Some core competencies framed by a common knowledge –base and skill-set (may vary depending on field e.g. public health, health services and policy, HRM, biostatistics, etc.)

# Fields of Study & Application

Aboriginal Health Epidemiology

Aging

Bayesian Statistics

Biostatistics (general)

Cancer Epidemiology

Cardiovascular Epidemiology

Chronic disease/Non-communicable diseases

Clinical Epidemiology

Epidemiologic Methods

Global Health

Health and Social Policy

Health Economics

Health Informatics

Health Services Research

Health Technology Assessment

Infectious Diseases

Mental Health

Meta-analysis / Systematic Reviews

Molecular and Genetic Epidemiology

Neurological Disorders

Nutritional Epidemiology

Occupational and Environmental Health

Pharmacoepidemiology

Population and Public Health / Preventive Medicine

Reproductive, Perinatal and Child Health

Respiratory Epidemiology

Social and Behavioural Epidemiology

Women's Health

**And many more.....**

# Education & Training

- A minimum **Master's Degree** in a program including, but not exclusive to, Epidemiology, Community Health, Biostatistics, Health Sciences, Public Health.
- Basic core competencies in Epidemiology/Biostatistics, however not standardized across Canada.
- **Competencies** : action-oriented statements that delineate the essential knowledge, skills, and abilities in the performance of work responsibilities. Are describable and observable.

# Occupation: Epidemiologist

Level	Examples of Functional Responsibility	Educational/ Experiential Criteria
<p>Entry-level or basic epidemiologist Approximate salary range: \$35-\$45K</p>	<p>Simple data collection, analysis, and reporting in support of epidemiologic investigations, surveillance, research, or policy analysis.</p>	<ul style="list-style-type: none"> <li>• New Master's degree graduate with minimal experience but from a Master's program with a focus on epidemiology and/or analysis and assessment</li> </ul>
<p>Tier 2 – Mid-level epidemiologist Approximate salary range: \$55-\$70K</p>	<p>Simple and more complex data collection, analysis, and interpretation. Can work independently; or supervise a unit or serve as a project leader or coordinator.</p>	<ul style="list-style-type: none"> <li>• Master's degree with a focus in epidemiology with 2 or more years' work experience in epidemiology; or</li> <li>• Doctoral level epidemiologist</li> </ul>
<p>Tier 3– Senior-level epidemiologist Approximate salary range: \$70K -\$100K</p>	<p>Supervisor and/or manager, director of a major research initiative, project, or section; or Senior scientist/subject area expert in an epidemiologic focus area.</p>	<ul style="list-style-type: none"> <li>• Master's degree with a focus in epidemiology &amp; <math>\geq 4</math> years' work experience in epidemiology; or</li> <li>• Doctoral-level degree in epidemiology supplemented with <math>\geq 2</math> years' work experience at a Tier 2</li> </ul>

# Occupation: Biostatistician

Level	Examples of Functional Responsibility	Educational/ Experiential Criteria
<p>Masters –level biostatistician</p> <p>Approximate salary range: \$45K to \$90K</p>	<p>Carries out complex data analysis, often works as part of a team, may occasionally supervise an analysis team in a large research centre or industrial setting (after 5+ years of work experience)</p>	<ul style="list-style-type: none"> <li>• Master’s degree with a focus in statistics with application in the health sciences with 2 or more years’ work experience in epidemiology/biostatistics; or</li> </ul>
<p>Senior-level biostatistician</p> <p>Approximate salary range: \$75K - \$100K+</p>	<p>Senior scientist, consulted for projects involving complex statistical methods, can work as part of team or independently, can manage a team of biostatisticians/analysts</p>	<ul style="list-style-type: none"> <li>• Master’s degree with a focus in statistics /biostatistics and <math>\geq 5</math> years’ work experience in health sciences; or</li> <li>• Doctoral-level degree in statistics or epidemiology with specialization in biostatistics, supplemented with <math>\geq 4</math> years’ work experience</li> </ul>

# The Type of Career You Want

- Identify what area interests you and look at job postings to get an idea of the entrance requirements (minimum degree, previous experience required [fresh out of school or 'X' number of years of experience])
- Simply Google 'epidemiology job Canada' or 'biostatistics job Canada' to get an idea of the types of jobs that are available
- Not all jobs are advertised
  - Word of mouth
  - Employer already has someone in mind

# Getting in the Door

- Networking helps – plant ‘seeds’
  - Tell people you are looking for work
  - Do a good job in your volunteer work or COOPs
    - Employers remember good workers
  - Send tailored applications to prospective employers
    - If a CRO is looking for a data analyst with experience in big data, and you just analyzed a 20,000-person dataset for your MSc in biostats, then apply for the job
  - Generic job inquiries often do not work
    - Faculty delete blanket e-mails sent to every prof in the department
    - Companies usually throw out unsolicited CVs

# Plan Ahead

- Ask yourself whether you would like to work in industry, government, or academia
- Look at the job advertisements to understand where you need to develop your CV
  - Do you need work experience?
  - Do you need to get a publication?
  - Do you need to know a certain software package?
    - SAS software is a must for industry or government

# Plan Ahead

- Do you need to take epi or stats courses?
  - Those film and philosophy courses are useless if you want to get into epi or biostats
- What program should you take in graduate school?
  - To get a job in epi or biostats today, you will almost certainly need a Master's degree
  - PhDs are needed for academia, but are not as essential for industry or government
    - Some industry or government jobs do ask for PhDs (check the job advertisements!)

# Graduate School

- Choose your program well
  - Do not apply to an MSc in epidemiology if you want to study public health (yes, there is a difference)
    - MSc – Epi: often thesis-based and research oriented
    - MPH: often course-based with practicums or COOPs, designed for people who wish to work in a public health department
  - You can get a job in public health with an MSc, or work in academia with an MPH, but applying to a grad program with the wrong focus could lead to a rejection letter (you do not ‘fit’ the program)

# Graduate School

- Tailor your letter of intent to the purpose of the program
  - E.g., McMaster's HRM MSc program is designed for people who want to work in research
    - Tell readers at the outset that you are applying to the HRM program because you want to pursue a career as an independent researcher and the HRM MSc is a means to help you achieve your career objective
    - Describe your previous research experience (paid, COOP, volunteer)
      - Be specific about what you did, e.g., data entry or analysis, screening articles for a systematic review, etc.

# Graduate School

- Highlight relevant courses in your letter
  - If you are applying to an MSc in epi, or an MPH, draw the readers' attention to any epi or stats courses that you completed as an undergrad
  - If you are applying to an MSc in biostats, you probably have a math/stats background, but you can still highlight any health-related courses that you took at undergrad

# Graduate School

- Avoid storytelling in your letter
  - “When I was 10 years old, my uncle’s best friend’s sister got sick and I was touched by how the doctors used medical research to treat the disease. After that, I decided to become a researcher.”
  - A sure way to loose the reader’s attention quickly!
- Come clean and explain big gaps in the CV or poor grades (do not make excuses or blame everyone but yourself!)

# Graduate School

- Grades versus experience
  - Many graduate programs in epi and biostats look at applicants' overall dossiers, not just their grades
  - Students with B+ or A- averages can get into grad school, but experience is the key
  - Get research experience before you apply to grad school
    - Paid student RAships
    - Volunteer in a professor's research unit
    - COOPs
    - Independent studies, honour's theses

# Graduate School

- Some professors ‘try out’ undergraduate students and offer the good ones a placement in their research units as MSc students
  - Many departments will admit students based on a potential supervisor’s recommendation
- Having a supervisor lined up is not essential to getting into grad school, but it helps!
  - Approach potential supervisors carefully, especially if they do not know you
    - Pick profs with shared interests
    - Send tailored e-mails with specific examples of how your experience meshes with a prof’s research program
    - Do not just say that you read some of the prof’s papers and you are interested in her/his work (we know you did not read our papers)
    - Spell our names right and get our universities correct
    - Get your letter proofread!

# Graduate School

- Letters of reference
  - Most letters say good things about applicants and therefore do not make or break an application
  - Really good letters can sway an admission decision in an applicant's favour
  - Get letters from profs whom you know well and whom you have worked with in the past
    - More likely to get a good letter from them
    - They can comment on your research ability and work habits (this is what admissions committees really want to know)

# Graduate School

- Letters of reference
  - Letters from profs whom you know only because they taught you in a course are of limited value!
  - Profs usually cannot get to know students well enough in classroom settings to write the kind of letter that can make a difference on a grad school application
  - The situation is amplified when an 'anonymous' student in a class of 300 asks for a letter
  - Most profs have generic reference letters for these kinds of requests (cut and paste letters)
  - Admissions committees know this and give limited value to these kinds of letters
  - Get work experience with profs to get good references!
  - Do the work and do it well because word of mouth goes a long way

# Academic Careers

- MSc – Epidemiology
  - Research assistant or study/project coordinator
  - Work for one or more profs on their research projects
  - Task-oriented, nitty-gritty work, some management responsibility for senior coordinators
  - Dependent on research budgets
- MPH
  - As above, but often linked to researchers who do public health-oriented research
- MSc – Biostatistics
  - Data analyst
  - Works for one or more profs on their research projects
  - Good analysts are in high demand
  - In large research centres, such a person could oversee a group of analysts

# Academic Careers

- PhD – Epidemiology or Biostatistics
  - Faculty member
    - Apply for grants to run your own research studies
    - Work as a co-investigator on other profs' studies
    - Teach and supervise students
    - Service (university committees, professional organizations, etc.)
  - RAs/coordinators/analysts
    - Some PhDs do not become faculty members, but instead work as RAs/coordinators/analysts
    - Many IMGs also do these jobs

# Academic Careers

- Postdoctoral fellowships
  - Only useful if you get a PhD and want to work as a faculty member
  - PDFs are usually offered by individual faculty members who typically have large research programs and lots of funding
  - You work for the faculty member on one or more projects, but you are given the chance to start developing your own research program
  - A good PDF supervisor will treat you as an equal and give you a chance to publish
  - The supervisor might give you a chance to teach part or all of their courses (applicants for faculty positions, even entry level, will have to demonstrate some teaching experience)
  - Good supervisors will help you network and help you kick-start your career
  - Most PDFs last for 1 to 2 years
  - Some fellows cannot find faculty positions after their postdocs, so they jump from postdoc to postdoc (3-4 postdocs is sadly common)
  - Avoid being a serial postdoc!

# Public Sector Careers

- Federal government
  - Departments: Public Health Agency of Canada, Health Canada, National Defence
- Provincial government
  - Ministry of Health, Public Health, agencies e.g. Cancer, Health Quality
- Regional health
  - Local health integration network (Ontario), health authorities
- Public health (municipal) – mostly Masters degree level
  - Public health units

# Public Sector Careers

- Educational requirements – mostly Masters level; senior scientists have PhDs
- Internships and practicum placements (mostly unpaid)
- Paid student work programs e.g. Federal Student Work Experience Program, Field Epidemiology Program
- Application process: competitions; skills and previous work experience assessed (essential qualifications)
- Strong references from professors and employers

# Not-for-profit Sector Careers

- Type of sub-industries:
  - Health care delivery institutions e.g. hospitals, clinics/centres
  - Health charities, societies, and associations e.g. CMA, Can Diabetes Association,
  - Research institutes e.g. CIHI, EBRI, OHRI
  - Think tanks (Private, NFP) e.g. the Conference Board of Canada, C.D. Howe, IRPP, Fraser Institute, CCPA
- Qualifications:
  - mix of Masters and PhD-level education (leadership positions)
  - Previous work experience a must
  - Working in teams and strong communication skills essential
  - Business mindset (think tanks)
  - Strong references from employers
- Check for internships

# Private Industry Careers

- Types of sub-industries:
  - Pharmaceuticals e.g. Pfizer, GSK, Merck, Johnson & Johnson
  - Technology e.g. Medtronic, Janssen (J&J)
  - Consultancy e.g. IMS Health
- Qualifications:
  - mix of Masters and PhD-level education
  - Previous work experience a must
  - Working in teams and strong communication skills essential
  - Business mindset
  - Strong references from employers
- Check for internships



# Job Search

- [www.cseb.ca/career-opportunities/](http://www.cseb.ca/career-opportunities/)
- [www.cseb.ca/job\\_search/](http://www.cseb.ca/job_search/)
- <http://www.epimonitor.net/JobBank.htm>
- Get on jobs notifications lists e.g. CIHI, OPHE bulletin, CSEB membership list



# The Canadian Society for Epidemiology & Biostatistics

## About CSEB

- Canadian organization of professionals, founded in 1990, for the purpose of fostering epidemiological and biostatistical research and practice in Canada.
- Facilitates networking among epidemiologists and biostatisticians across Canada.
- Promotes the professions of epidemiology and biostatistics at all levels of government, academia and industry, and engages with counterparts in the USA and internationally.
- Assists faculties and schools of medicine and public health to improve training
- Bridges both the research, practice, and policy aspects of our disciplines through close collaboration with other groups
  - Public Health Agency of Canada (PHAC)
  - Association of Public Health Epidemiologists in Ontario (APHEO)
  - Saskatchewan Epidemiology Association (SEA)
  - Statistical Society of Canada (SSC)
  - Canadian Association of Veterinary Epidemiology and Preventive Medicine (CAVEPM)
  - International Joint Policy Committee – Societies of Epidemiology



# 2016 CSEB Student Conference

*Patterns of Health: A Population Perspective*

## **THE UNIVERSITY OF MANITOBA, WINNIPEG**

- Wednesday, June 8th to Friday, June 10th.
- Will be partnering with the Canadian Student Health Research Forum (CSHRF).
- June 8-10: CSEB unique events (workshops, student posters and presentations, dinner) on June 8th and June 10th.
- June 9: joining CSHRF conference for their symposium (theme will be Epidemiology/Biostatistics).
- Student Travel Awards will be made available (CIHR & CSEB).
- For more info: contact [csebwpg2016@gmail.com](mailto:csebwpg2016@gmail.com) or visit <http://umanitoba.ca/outreach/conferences/cseb2016/>



# For More Information

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