

Master of Public Health in Epidemiology Program Handbook 2018/2019

Division of Epidemiology
Dalla Lana School of Public Health
University of Toronto

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*This handbook defines program requirements for the 2018/2019 academic year.
Applicants for admission in 2020 or later should seek the most recent edition of the handbook.

All students are expected to be familiar with the University of Toronto School of Graduate Studies policies and procedures. Additional information can be found on the School of Graduate Studies webpages (sgs.utoronto.ca), as well as the DLSPH Student handbook on the DLSPH website (www.dlsph.utoronto.ca).

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MPH Epidemiology: Program Overview

Program Description

The MPH in Epidemiology provides a solid base in epidemiological methods, an understanding of the breadth of public health and opportunities for applied experiential learning in epidemiologic practice, research and policy.

Full time students will complete the program over 4 to 5 consecutive terms of study (including summer). The program requires mandatory and elective courses, and a required practicum placement (completed after at least two terms of course-work).

The curriculum emphasizes quantitative methods, critical appraisal of evidence, data analysis and interpretation. In contrast to strictly skills-based training, the degree is aimed at developing leaders who will make independent contributions when faced with public health challenges, and direct initiatives in the field. Licensed Physicians completing their Residency in Public Health and Preventative Medicine (PHPM) are often encouraged to also complete the MPH in Epidemiology in order to acquire to full standard of training.

Program Goals

The objective of the program is to provide students with a base of knowledge and skills in epidemiological methods and public health.

Graduates will:

- be able to work as part of a research group or in public health practice;
- be able to describe trends and patterns of disease incidence and prevalence, disease burden, factors affecting health status, and major etiologic and prognostic factors;
- understand the strengths and weaknesses of major methodological and analytical techniques;
- exhibit practical skills, including the ability to develop an epidemiological question, refine the question in light of the literature and community situation, design an appropriate study to answer the question, collect relevant data, analyze these data using commonly available statistical software, and interpret the findings relative to the literature and the community/ organizational context;
- be able to prepare a paper for peer-reviewed publication, and present epidemiological information;
- have knowledge of public health principles to practice; and
- be able to read, critically appraise, and interpret the scientific literature, and discuss the effectiveness of core public health interventions.

Career Opportunities

The program prepares all students to pursue their choice of career in research and/or in applied public health. Many of our graduates have been accepted into PhD programs in Epidemiology and related fields in Canada and internationally. Many of our alumni hold positions as epidemiologists, data analysts and managers in public health units and government departments. We have alumni who are senior managers of research in medical and public health research institutes, and also alumni who work in the private and not-for-profit sectors. Some of our graduates each year enter health professional training such as medicine and nursing and many of those have combined their clinical and public health training to become senior leaders in population health or clinician scientists.

MPH Epidemiology: Admissions Criteria

Minimum Admission Requirements for all MPH fields

MPH students are admitted under the **General Regulations of the School of Graduate Studies (SGS)**. Applicants should refer to SGS web pages for details. www.sgs.utoronto.ca

MPH applicants must also satisfy the **Dalla Lana School's additional admission requirements** which are stated here: <http://www.dlsph.utoronto.ca/students/future-students/admission-requirements/>

Minimum Admission Requirements for MPH Epidemiology field, specifically

The specific admission requirements for the MPH (all fields) are:

- an appropriate bachelor's degree or its equivalent from a recognized university
- at least a **mid-B average** in final year of the degree or in the last 5.0 full course equivalents completed at a senior level
- at least one **undergraduate statistics course** is required for Epidemiology. There is a requirement for a minimum grade (B+ or higher) and content of the qualifying course(s). See below.
- The **Graduate Record Examination (GRE)** is mandatory for all applicants seeking admission to enter the MPH Epidemiology in fall 2018 or later. A GRE General Test score report must be uploaded with the application. (See below and ETS.org for more information).
- Proof of English Language Proficiency is required (see below)

Statistics Content Requirement for Epidemiology

At least one undergraduate statistics course is required for admission to the MPH program in the Epidemiology field. The qualifying statistics course must be completed prior to the application deadline. Applicants must obtain a minimum grade of B+ in this course(s).

The content of the statistics course must include the topics listed below (Box 1). A single term course is enough if the required topics are covered. Two terms of statistics may be needed to cover the required topics. DLSPH does not provide a list of qualifying courses because courses change. When looking for courses, ask if the course will cover all the subjects in our list. See also the section, "Advice for Applicants" later in this program summary.

Box 1. Epidemiology and Health Promotion: Content guidelines for statistics prerequisite.

- Frequency distributions, skewness
- Measures of central tendency: Mean, median, mode
- Levels of measurement: nominal, ordinal, interval
- Measures of variation: Standard deviation, standard score, standard error
- Probability, normal curve
- Sampling, confidence intervals
- Test of significance: Null hypothesis: t-test, one-tail/two-tail tests
- Analyses for proportions and categories (e.g., Chi square))
- Analyses for group means (e.g., t-tests, analysis of variance)
- Correlation
- Regression (linear and/or logistic)

International applicants – qualifying degrees and academic standing

The MPH Epidemiology program follows the admissions regulations of the School of Graduate Studies. Applicants who have not completed a qualifying degree in Canada (regardless of citizenship) must spend time studying the School of Graduate Studies (SGS) website to be sure your prior degree and academic standing meet these criteria. See this website for detailed instruction:

<https://www.sgs.utoronto.ca/prospectivestudents/Pages/International-and-Exchange-Students.aspx>

Requirements for Proof of English Language Proficiency

No applicant will be admitted without evidence of English Language Proficiency (EPT). The MPH Epidemiology program follows the admissions regulations of the School of Graduate Studies (SGS).

Automatic Exemptions: The following applicants do not have to provide direct supporting evidence of EPT in the application.

- A Canadian citizen who studied at a Canadian university where instruction is in English or French
- Any applicant who has obtained a qualifying undergraduate or graduate degree from an institution recognized by the University of Toronto and where the language of instruction and examination is uniformly English.

If either criterion above is satisfied, the application can be submitted without test scores or other proof of EPT. The EPT requirement will be waived, in the online system, when the application is reviewed.

Students who studied outside Canada must consult the School of Graduate Studies website to be sure that separate evidence of EPT can be waived. The SGS website lists those countries and institutions where university instruction in English will be recognized without further documentation. For more information, see:

<https://www.sgs.utoronto.ca/prospectivestudents/Pages/International-and-Exchange-Students.aspx>

The MPH Epidemiology program does not make other exemptions.

If an applicant is required to submit proof of EPT and does not include this with the application, by the application deadline, then the application will be rejected as incomplete and inadmissible.

MPH Epidemiology: Program Requirements, Length and Structure

Full time MPH Epidemiology students complete the program in 4 to 5 consecutive terms of study (see Box 2). The first two terms are dedicated to intensive, skills-based courses. Students will achieve broad knowledge about public health and all the core disciplines which contribute to it. Students should expect a heavy work-load, with extensive reading, plus tutorial exercises and written assignments. Assignments are designed to develop skills relevant to the workplace in both applied public health and research. Epidemiology students acquire skills in descriptive and analytic research, biostatistics, and the critical appraisal and use of research evidence in public health.

The required practicum is usually completed in the summer term of the first year of study. The practicum is an important opportunity to apply skills acquired in the first year, and gain work experience in epidemiologic research and/or applied public health. Epidemiology practicum students must apply their quantitative skills in the analysis and interpretation of data, and contribute to written work. First year students will receive practicum-specific information and professional development throughout the fall term. They typically apply for practicum placements starting in the second term of study (January).

The second year is the chance for students to explore new areas, and/or specialize. Advanced courses may be taken quantitative methods, academic research, or subject areas (e.g., chronic, or infectious disease, mental health or social determinants). Electives are typically within the DLSPH Public Health Sciences Graduate Unit in epidemiology or other fields. Electives outside the Graduate Division are often taken, conditional on availability and approval.

Box 2 MPH Epidemiology Program Requirements. Typical completion; 10 Full Course Equivalents (FCE)

Year 1, Fall Term (September – December)	2.5 to 3.0 FCE*
CHL5004H: Introduction to Public Health Sciences (NB: Begins with full time attendance in first week of fall term) CHL5201H: Biostatistics I CHL5300H: Public Health Policy CHL5401H: Epidemiologic Methods I CHL5426H: Population Perspectives for Epidemiology Elective	
Year 1, Winter Term (January – April)	2.5 to 3.0 FCE
CHL5202H: Biostatistics II CHL5402H: Epidemiologic Methods II CHL5405H: Health Trends and Surveillance CHL5418H: Scientific Overviews in Epidemiology 1 – 2 Electives	
Year 1, Summer Term (May – August)	2.0 FCE
CHL6010Y and CHL6012Y: Required MPH Practicum (16 weeks full time) Students must successfully complete all required first year courses, listed above, before progressing to the practicum. Evolution of a practicum placement into a Capstone Experience may occur during the first practicum. See MPH Epidemiology Practicum Guidelines for more information.	
Year 2, Fall Term (September - December) and Winter Term (January – April)	2.5 to 3.5 FCE
In their second year, students complete diverse combinations of approved graduate credits (regular courses or additional practicum placements) to bring the total number of credits completed to 10.0	
TOTAL	10.0 FCE

Program Competencies and Approach

Our Curriculum, and Program-Specific Competencies

Competencies are action-oriented statements that delineate the essential knowledge, skills, and abilities in the performance of work responsibilities.¹ The Discipline-Specific Core Competencies for DLSPH MPH Program Stream in Epidemiology are presented in Box 3 (following page). These competencies for the MPH in Epidemiology at DLSPH are consistent with Canadian and international competency statements for applied epidemiologists but also include intermediate to advanced research skills. The strong emphasis on research skills reflects the program's history of a merger of a previous professional master's program and the former MSc in Epidemiology focusing on research.

Our curriculum addresses the competencies for applied epidemiologists working in public health and government agencies, as defined by the Association of Public Health Epidemiologists of Ontario² as well as the Applied Epidemiology Competencies for the European Union³. Although DLSPH is not currently seeking accreditation with American Council on Education for Public Health (CEPH), the MPH in epidemiology curriculum covers the MPH competencies for both Epidemiology and Biostatistics as defined for accredited MPH programs.

An important competency statement for epidemiology in public health is the United States Competencies for Applied Epidemiologists in Governmental Public Health Agencies (US Council of State and Territorial Epidemiologists, CSTE, and US Centers for Disease Control; 2008⁴). Following the CSTE classification, our program addresses the applied epidemiology competencies for professional roles described as *Tier 2: Mid-Level Epidemiologist*. In addition, our MPH Epidemiology curriculum addresses more advanced and research-focused competencies for epidemiologists in professional roles defined by CSTE as: *Tier 3b: Senior Epidemiologist, Senior Scientist/Subject Area Expert*.

Competencies Shared with Other Public Health Disciplines

The MPH in Epidemiology is one of five discipline-specific programs offered under the designation of MPH at DLSPH. These fields are: Community Nutrition, Epidemiology, Family and Community Medicine, Health Promotion - Social and Behavioural Health Sciences / Health Promotion, and Occupational and Environmental Health). Each field is as highly specialized as the Epidemiology field, and this makes this DLSPH MPH Program unique in Canada. Each field also takes a multidisciplinary perspective, and each is committed to a shared set of 30 core-competencies organized under the seven headings of the Core Competencies for Public Health in Canada developed by Public Health Agency of Canada⁵. See: <http://www.phac-aspc.gc.ca/ccph-cesp/index-eng.php>. As stated previously, while DLSPH is not currently seeking accreditation, CEPH MPH competencies across public health disciplines have also been considered in the design of cross-cutting program requirements, taken by all MPH students, regardless of their specialization.

¹ Nelson JC, Essien JDK, Loudermilk R, Cohen D. The Public Health Competency Handbook: Optimizing Individual & Organization Performance for the Public's Health. Atlanta, GA: Center for Public Health Practice of the Rollins School of Public Health; 2002.

² Bondy SJ1, Johnson I, Cole DC, Bercovitz K. Identifying core competencies for public health epidemiologists. Can J Public Health. 2008 Jul-Aug;99(4):246-51.

³ Applied Epidemiology Competencies for the European Union. European Centre for Disease Control (ECDC), Stockholm: ECDC, 2008.

http://ecdc.europa.eu/en/publications/Publications/0801_TED_Core_Competencies_for_Public_Health_Epidemiologists.pdf

⁴ Birkhead GS, Davies J, Miner K, Lemmings J, Koo D. Developing Competencies for Applied Epidemiology: From Process to Product. Public Health Reports. 2008;123(Suppl 1):67-118.

⁵ <http://www.phac-aspc.gc.ca/ccph-cesp/index-eng.php>

Box 3**Discipline-Specific Core Competencies for DLSPH MPH Program Stream in Epidemiology**

- A. Understanding the system
 - a. Describe public health and understand public health systems in relation to other health care systems (e.g., international).
 - b. Describe legislation regarding public health privacy and personal health information.
 - c. Demonstrate a broad understanding of content areas such as the social determinants of health, occupational and environmental health, and healthy environments, in general.
- B. Understanding data sources; critical appraisal.
 - a. Identify existing data sources and gaps
 - b. Demonstrate knowledge of available data sources and their applicability.
 - c. Evaluate strengths and weaknesses of available data
 - d. Recognize sources of bias and validity when critically appraising research literature
- C. Databases, technology, surveillance
 - a. Explain the design and implementation of surveillance systems
 - b. Develop and manage databases
 - c. Recognize the uses of technological systems (e.g., GIS) and literature databases (e.g, Medline)
 - d. Operate/employ basic commands within a statistical package (e.g., SAS, SPSS, R, etc.)
 - e. Identify key findings from surveillance data, draw conclusions, identify health threats
 - f. Recognize and utilize evidence-based guidelines for surveillance
- D. Epidemiologic methods
 - a. Describe population health status, determinants, risk factors, health care utilization
 - b. Evaluate health outcomes and understand implications for population health
 - c. Write a draft proposal for a study (which includes a study protocol, data collection instruments, proposed analysis, etc.)
 - d. Conduct risk assessment (with guidance)
 - e. Design basic analysis plan, sampling design, sample size estimation
 - f. Describe the design and implementation of qualitative and quantitative research
 - g. Design and interpret outbreak investigations, including disease clusters
 - h. Prepare reports/publications suitable for peer review
 - i. Apply ethical principles to data collection, management, dissemination
 - j. Differentiate between and evaluate applicability of various study designs
- E. Biostatistics, data analysis
 - a. Use statistical methods to estimate measures of disease occurrence, risk, trends, associations
 - b. Use statistical methods to conduct multivariable hypothesis testing
- F. Public health guidance
 - a. Provide epidemiological input to develop measurable outcomes for public health programs

MPH Epidemiology at DLSPH, compared to other programs

We have compared our program to other MPH and MSc programs in epidemiology, in Canada and internationally, with respect to: stated competencies; the content of required courses; opportunity for hands-on research; and, professional placement experiences. Similar programs tend to be 1.5 to 2.0 years in duration, require multiple, consecutive terms of skills-based courses in epidemiology and biostatistics, have a mandatory breadth of training in public health, and provide a practicum experience. A couple of programs most similar to ours include: the University of Michigan MPH degree in Epidemiology Methods and Applications; and the Columbia University MPH in Epidemiology. These chosen examples are, like ours, highly specialized programs in epidemiology that require advanced courses in epidemiological research methods (i.e., observational research, surveillance, and biostatistics).

The MPH in Epidemiology, at DLSPH, is unlike many MPH Programs, particularly where these are general MPH programs, and one year in length. The DLSPH MPH in Epidemiology is considerably more specialized and focused on quantitative skills used in health surveillance, research and evaluation.

Our program has many of the strengths in common with MSc degrees which emphasize the research supervisor-trainee partnership. Our MPH evolved from our MSc degree, by title, and seeks to achieve all the same objectives. All MPH Epidemiology students have the opportunity to work with research mentors within one or more practicum experience. Many practicum placements encourage students to work on projects that may lead to peer-reviewed publication. MPH Epidemiology students have received the same research scholarships usually held by thesis students, (Canadian Institutes of Health Research and other health research awards). Many graduates have gone on to PhD programs in Canada and internationally. Our program offers advantages over programs which rely heavily on the thesis experience. All our students acquire broad professional skills and all students have access to courses to meet their needs and interests.

What methods of student learning and evaluation can I expect?

Students will experience a mix of learning and assessment techniques, matched to the objectives of the course (e.g. knowledge, synthesis and critique of existing knowledge and evidence, application of skills, and generation of new scientific knowledge). Assessment and evaluation may use: quizzes, exams; graded tutorial assignments; structured reports; independent research essays; presentations; case-studies and problem-based learning. Some courses have large lectures. All courses provide opportunity for discussion, in class or tutorials. Students are expected to be present, participate and respond to questions and challenges during live and online session. Evaluation can include grades for student participation and professional behaviour. Individualized feedback on assignments is built into many courses. Individual mentorship is built into the practicum experience.

All courses are graded as credit/non-credit (CR/NCR) or standard graduate letter grade categories. For graded courses a minimum grade of 'B-' (70%), is required to pass. Graduate students must pass all courses or academic consequences apply up to and including termination of registration. For important information on academic policies and procedures, refer to the DLSPH Student Handbook and website of the School of Graduate Studies. Practicum enrolment involves course enrolment plus approval of the location, supervision, deliverables and financial arrangements. Practicum performance is assessed by the practicum supervisor or preceptor, but the CR/NCR grade is submitted by the Program or Course Director based on evidence that the learning objectives have been met and placement objectives fulfilled.

Part time study

We welcome part time students in the program and will work with individual students to develop a plan of study. Completing the MPH program part-time takes longer. Some students take a reduced course load over a larger number of terms. Others part time students alternate terms of full-time study at DLSPH and terms when they are engaged in work or study activities elsewhere. At present, most core courses are offered once per year, fall or winter term, and weekdays, 9:00am to 5:00pm. Attendance on campus is usually required. However, short-format, inverted, online and other distance-based learning opportunities are a growing component of the DLSPH programs.

Overview of the MPH Epidemiology Practicum

The purpose of the practicum is to enable students to get “hands on” experience and to apply the theory and analytic skills acquired in the academic portion of their degree program. The practicum activities undertaken will depend on the nature of the practicum setting, the needs of the practicum agency/organization, and the student’s learning objectives.

For detailed information including practicum guidelines and forms, see this link:
<http://www.dlsph.utoronto.ca/program/mph-epidemiology/#practica>

Practicum procedures and timeline

All MPH Epidemiology students must complete at least one practicum placement in an applied public health or research setting. The mandatory placement must include an element of quantitative work and contributions to written reports or manuscripts. Full-time students complete their required practicum placement in the first summer, after two terms of required courses. This is a term of real, full time, work experience similar to a short term contract or internship. A 16 week practicum is recommended (2.0 Full time equivalent course credits or FCE); a 12 week (1.5 FCE) practicum is permitted. Many students also complete a second/elective practicum in Winter term of their second year. Students may take a maximum 3.5 FCE across the required and elective practica. Students wanting a thesis-like experience can do this through consecutive practicum placements.

Placements are coordinated by the Practicum Placement & Professional Development Officer (Practicum Officer). Professional development sessions, to prepare students for the practicum and employment, starts right after fall orientation and continues throughout the program. Detailed practicum procedures are presented to registered students by October or November of the first year of study. In January, eligible students are given access to a database of practicum opportunities. Students must apply to positions that interest them. All registered MPH students, in good standing and eligible for the practicum, are guaranteed a placement within the program completion time limit. An opportunities database is available to students for summer and winter terms.

Epidemiology applicants are not required to identify a practicum placement or supervisor, prior to the start of their studies. Most should wait and use the first term in the MPH to explore and consider many possible directions. Applicants wishing to apply for research funds with a specific DLSPH supervisor may approach the faculty member even before applying to the program, but these arrangements are conditional on acceptance into the MPH and approval of the practicum placement.

Students who identify their own practicum opportunity must meet with the Practicum Officer after admission and registration but well before the practicum start date. The university requires affiliation agreements to be in place and these can take months to years to develop. Students who wish to do a second or elective practicum are expected to identify their own placement, with the approval and ongoing support of the Practicum Officer.

Paid Practica and Financial Support

Not all practicum placements can pay students (because of their own resources or policies). Many unpaid placements offer invaluable professional experience. In recent years most MPH Epidemiology practicum students have received some level of stipend or salary. Also in recent years DLSPH has received the Canadian Institutes of Health Research (CIHR) James Rossiter MPH Practicum Awards which provides stipends for unpaid practica. Travel awards have been awarded to many MPH students.

All domestic students should apply for OSAP and bursaries based on financial need wherever applicable. All students should apply for competitive awards. Refer to DLSPH and SGS websites for more information on financial support. Many MPH Epidemiology students have held the same competitive research awards as MSc students and use practicum placements to do independent research.

FAQs about Global Health and International Practicum experiences

Questions about Global Health Practica should be directed to the Office of Global Public Health Education and Training at DLSPH but can be answered during orientation sessions on Global Health Education within DLSPH. Orientation and information sessions will be held during the first months of the fall term for incoming and upper year students.

Students must assume that the required epidemiology practicum (first summer of studies) will be completed in Canada. Work experience in Canada, and references from Canadian employers are both essential post-graduation; whereas travel and international work experience are not necessary core competencies for graduates in epidemiology of public health. DLSPH must ensure that any student placed in any practicum has: the relevant skills and qualifications to fulfil the needs of the hosting agency; and, will uphold the ethical and professional standards of the DLSPH.

Each year, the number of Global Health and international practicum opportunities available to students is growing. Depending on the student's own work experience and academic performance, prior to and during the MPH Epidemiology studies, students may pursue approved practicum placements outside of Canada for the mandatory practicum or by the second, elective practicum. In either case, the placement and placement for the particular student must be approved by the Practicum Placement Office and Program Director, and also by the Office of Global Public Health where that office has a responsibility or relationship with the placement agency or supervisor. Information will be provided to all incoming students, in the fall term, about how to achieve eligibility for an international placement. Students undertaking Global Health placements, internationally or within Canada may be required to complete pre-requisite course work, and will be required to complete professional development and briefings required by the University, prior to departure. For further discussion, and any updates, please refer to the Practicum Guidelines: <http://www.dlsph.utoronto.ca/program/mph-epidemiology/#practica>

Advice to Applicants

What the admissions committee looks for and how this is assessed

Successful applicants to the MPH program in Epidemiology will have evidence of strength in all of the following areas. Students admitted are often exceptional in several of these areas

- Maturity, and relevant professional experience as demonstrated by past training, volunteer and paid work experiences,
- Quantitative skills
- Writing and/or scholarly research experience
- Knowledge of human health and its physical, social and environmental determinants
- Strong communications and interpersonal skills
- A genuine interest in graduate training in the discipline of epidemiology which is well-articulated in the letter of intent, and supported by past choices in training and experiences.

Competitive: We typically have more qualified applicants than we can admit to the program. Applicants who meet the minimum admission criteria may not receive an offer of admission. We cannot pre-review any part of an application or tell applicants in advance if they are qualified or competitive.

Prior education: Applicants are welcomed from the biological and health sciences, quantitative social sciences (e.g., psychology, sociology, economics, anthropology), and from clinical backgrounds.

Health professionals: Health professionals are encouraged to apply. Roughly 10 % of our MPH students have clinical backgrounds already. Many alumni are successful in subsequent applications for clinical training. The MPH does not lead directly to a license to practice medicine, but is often taken in conjunction with post graduate medical training, (particularly residency in Preventive Medicine and Public Health). This combination is strongly recommended to achieve the full breadth of required public health skills including research and surveillance methods, critical appraisal and applied public health practice skills. Health Professionals apply to the MPH separately from other post-graduate training. The letter of intent for the MPH should include the rationale for combined studies and planned timeline including continuing employment, as applicable. The MPH program focuses on population-based research, rather than clinical or laboratory research. People seeking careers in laboratory or clinical research might consider other, excellent, graduate programs within the University or DLSPH Faculty. Health professionals admitted to the MPH complete all the same degree requirements as other students.

Professional (volunteer or paid) experience: Some experience relevant to public health and/or research is a formal requirement but there is no formal definition of minimum amount or nature of experience. All paid and unpaid work experience (even unrelated to public health) should be described in the application CV. Include brief notations for the percent time and duration of positions, training, and progression of responsibility. Teaching and leadership roles in community organizations are relevant. Professionalism is also shown in the application process. Applications that are late, have errors or have missing or late letters of reference will be rejected. Reference letters which describe the applicant's academic performance, professional skills and character, are very important.

Statistics and numeracy: Epidemiology graduates from DLSPH are experts in quantitative research, statistics and analysis. Applicants without the statistics pre-requisite will not be considered. Applicants are reviewed for basic, intermediate or advanced experience in statistics and data analysis.

Writing and communications skills: The program is very demanding in terms of written research essays and scientific reports. Admissions committees look for proof of ability to write throughout the application (including the CV and all letters). Textbooks and reports in epidemiology can be long and complex and require superior reading comprehension skills. Undergraduates, particularly students in sciences and health studies, should take senior course which require library research and written assignments. Senior social sciences and humanities courses are recommended. These develop library and writing skills; they also help students understand important social determinants of health.

Tips regarding the statistics requirement

It is very common for applicants to have questions about the statistics requirements. Here are tips:

- Students who have done poorly in statistics and math may not be competitive for Epidemiology.
- If interested in epidemiology, take lots of statistics before the final year of undergraduate study. You need to know if this kind of work is interesting and satisfying.
- Committees look at all evidence of numeracy in the application, including all grades in quantitative courses, in all years, and GRE numeracy test scores.
- In practice, admissions committees expect to see an A- or better on *first* attempts and most recent courses. Repeating entry-level courses to get the minimum grade is not recommended. Consider taking *more advanced course(s)* and work hard for an A- or better on the first try.
- Applicants must create and upload a Statistics Attachment document (PDF) listing all relevant courses or modules which cover the required content plus grades. Emphasize the most advanced courses. Put the course content description right in the attachment. Web links are often broken.
- The qualifying statistics course(s) must be for credit and from a university recognized by University of Toronto. Grade(s) must appear on transcripts.
- Applicants are responsible for finding course(s) which cover the required content. DLSPH does not provide a list of qualifying courses.
- A one-term statistics course is enough if the required topics are covered. Two terms may be needed to cover the topics, *and* may be seen by the committee as more competitive.
- Additional experience in statistics and data analysis can be described in the CV, and letters.

Graduate Record Examination, deadlines and details

The Graduate Record Examination (GRE) General Test is required for applicants to the MPH Epidemiology. The three test scores (numeracy, verbal reasoning and analytic writing) will all be considered as part of the evidence of qualities we look for, above. The GRE is the most common standardized test for public health, internationally. It is required for masters programs accredited by the American Council on Education in Public Health (CEPH), and a growing number in Canada. It is also required by many PhD programs. DLSPH attracts applicants who also apply to the top schools internationally and have taken the GRE. Canadian students are strongly advised to take the GRE to remain competitive and be able to study at your school of first choice. Even health professionals (e.g., Physicians and Nurses) licensed to practice in Canada are expected to submit the GRE. Minimum score cut-offs have not been set; but any score below the population median ("*%below*" value = 50 or lower) are unlikely to be competitive.

Applicants are responsible for test registration and payment. Applicants must ensure scores are available by the MPH application deadline. Request scores be sent electronically to University of Toronto (Institution Code = 0982). Applicants must also upload a PDF copy of their complete test score report by the application deadline. See www.ETS.org for scheduling and details. Scores are valid for five years.

Other standardized tests, including MCAT, will not be accepted as a substitute for the GRE. Applicants sometimes wish to include other standardized test scores in their applications. If so, these have to be in the same attachment but after the GRE report.

Grade Point Average

The MPH Epidemiology Admissions committee does not pre-calculate GPA and set a cut-off above which applicants are reviewed. Before an offer is made, GPA will be calculated using the method of the U of T School of Graduate Studies (SGS) which requires a Mid-B the average in the most recent 10 senior credits in a qualifying four year undergraduate degree. Additional (upgrading) years are no longer used to achieve the minimum GPA. The SGS minimum standing is no guarantee of admission. While evidence of academic struggle may keep one from being competitive for graduate school, very high grades may not be essential or meaningful. The admissions committee looks for good grades in a relevant and challenging senior courses.