



**Epidemiology & Biostatistics Program**  
**Final Assessment Report &**  
**Implementation Plan**

<b>Faculty / Affiliated University College</b>	Schulich School of Medicine & Dentistry
<b>Degrees Offered</b>	BMSc
<b>Modules Reviewed</b>	Honors Specialization in Epidemiology & Biostatistics Major in Epidemiology & Biostatistics
<b>External Reviewers</b>	Dr. Shanthi Johnson Dean, School of Public Health University of Alberta  Dr. Brenda Wilson Associate Dean, Community Health and Humanities Memorial University of Newfoundland
<b>Internal Reviewers</b>	Dr. Susan Knabe Associate Dean, Undergraduate Faculty of Information and Media Studies
<b>Date of Site Visit</b>	March 7-9, 2022
<b>Evaluation</b>	Good Quality
<b>Approval Dates</b>	SUPR-U: June 29, 2022 ACA: September 7, 2022 Senate (for information only): September 16, 2022
<b>Year of Next Review</b>	Year of next cyclical review: 2029-2030

## **Overview of Western’s Cyclical Review Assessment Reporting Process**

In accordance with Western’s Institutional Quality Assurance Process (IQAP), the Final Assessment Report (FAR) provides a summary of the cyclical review, internal responses and assessment and evaluation of the undergraduate module delivered by the Epidemiology and Biostatistics Program at the Schulich School of Medicine & Dentistry.

This FAR considers the following documents:

- the program’s self-study brief;
- the external reviewers’ report;
- the response from the program; and
- the response from the Dean’s Office.

The FAR identifies the strengths of the program, opportunities for program enhancement and improvement, and details the recommendations of the external reviewers – noting those recommendations to be prioritized for implementation.

The Implementation Plan details the recommendations from the FAR that have been selected for implementation, identifies who is responsible for approving and acting on the recommendations, specifies any action or follow-up that is required, and defines the timeline for completion.

The FAR (including Implementation Plan) is sent for approval through the Senate Undergraduate Program Review Committee (SUPR-U) and ACA, then for information to Senate and to the Ontario Universities’ Council on Quality Assurance. Subsequently, it is publicly accessible on Western’s IQAP website. The FAR is the only document resulting from the undergraduate cyclical review process that is made public; all other documents are confidential to the Program/School/Faculty and SUPR-U.

## **Executive Summary**

The Department of Epidemiology and Biostatistics focused on graduate studies since its creation in 1946. Its first venture into undergraduate studies began in 2000 with an *Introduction to Epidemiology* course. Building on the success of this course a proposal for an Honors Specialization in Epidemiology & Biostatistics was approved in Fall 2013. The first cohort of third-year students were enrolled in 2014 graduating in 2016. This is the first program review since its approval. Currently, this is the only undergraduate program in Epidemiology and Biostatistics in Canada.

The Epidemiology and Biostatistics modules allow students to gain a broad perspective on population-based research and also cross boundaries within individual disciplines (e.g., health services research, health economics) to integrate and apply their knowledge.

In preparation for the review and as part of the program self-study, staff and faculty members of the Department of Epidemiology and Biostatistics; reviewed comments and suggestions from the initial program proposal review; developed specific program-level outcomes and mapped these across the curriculum (along with assessment and instructional practices); and conducted a student survey and focus group.

The external reviewers shared a positive assessment of the Epidemiology and Biostatistics Program. They offer several constructive considerations for further program enhancement and conclude their report with seven recommendations.

### **Strengths and Innovative Features Identified by the Program**

- Interdisciplinary approach including courses in epidemiology, public health, health services research, biostatistics, health economics and the requirement for 1.0 social science courses.
- Weekly seminar series that strengthens student understanding of population based research.
- Fourth-year research projects that offer an opportunity to analyze, interpret and discuss findings from real-world data sets related to topics of research methods in epidemiology, biostatistics, public health, health services research, and health economics.
- Relocating the Department to the PHFM building has created a unique opportunity to foster research convergence of primary care, epidemiology, and public health with the Department of Family Medicine and the Schulich Interfaculty Program in Public Health.
- Active student groups, such as the Undergraduate Student Council in Epidemiology and Biostatistics (USCEB), the Student Ambassador program, and Western's Chapter of the Canadian Society for Epidemiology and Biostatistics (CSEB), who organize professional development and social events.
- Students indicated the following as top program strengths:
  - o small class-sizes
  - o cross-listing of some undergraduate- and graduate-level courses
  - o applicability of the curriculum to careers
  - o the honor's thesis project

### **Concerns and Areas of Improvement Identified by the Program**

- When relocating to the PHFM building from the Kresge Building, undergraduate students lost access to the Kresge K6 Computer Lab.
- Students indicated the following as areas in need of improvement:
  - o need to expand the biostatistics curriculum
  - o potential redundancy of some courses (e.g., Clinical Epidemiology vis-à-vis Foundations of Epidemiology and Clinical Trials)

- need for alignment of the undergraduate- and graduate-level Analytic Epidemiology
- need for greater clarity regarding Honors Thesis requirements
- need to drop social-science requirements

### **Review Process**

As part of the external review, the review committee, comprising two external reviewers and one internal reviewer, were provided with Volume I and II of the self-study brief in advance of the scheduled review and then met virtually (due to pandemic restrictions) over three days with the:

- Acting Vice-Provost (Academic Programs)
- Director, Academic Quality and Enhancement
- Vice-Provost (Academic Planning, Policy and Faculty)
- Vice-Dean, Basic Medical Sciences
- Associate Dean, BMSUE
- Chair, Department of Epidemiology and Biostatistics
- Former and Current Undergraduate Chair, Epidemiology and Biostatistics
- Associate Chief Librarian
- Administrative Staff Members
- Program Faculty Members
- Program Students

Following the virtual site visit, the external reviewers submitted a comprehensive report of their findings which was sent to the Program and Dean for review and response. Formative documents, including Volumes I and II of the Self-Study, the External Report, and the Program and Decanal responses form the basis of this Final Assessment Report (FAR) of the Epidemiology and Biostatistics Program at the Schulich School of Medicine & Dentistry. The FAR is collated and submitted to SUPR-U by the Internal Reviewer with the support of the Office of Academic Quality and Enhancement.

### **Summative Assessment – External Reviewers’ Report**

The external reviewers indicated that program was a “*strong asset to the University and consistent with enhanced academic excellence*” and that they are “*confident that the modules represent rigorous and relevant senior undergraduate training in the discipline.*”

### **Strengths of the Program**

- No other undergraduate program in epidemiology and biostatistics currently exists in Canada, which makes this program innovative in itself.
- Interdisciplinary approach with requirements for health economics and social science courses to complement the core epidemiology and biostatistics curriculum.
- Focus on ensuring familiarity and competence with the most common epidemiological, biostatistics, and economics software packages, which are core 'laboratory' techniques in quantitative disciplines and important for career-readiness.
  - o In particular, students expressed appreciation of learning statistical software and acquiring practical/applicable knowledge and scientific writing skills.
- Excellent program growth since inception and great potential for continued growth.
- The BMSc program has one of the highest entrance averages and acceptance rates in Canada.

### **Areas of Concern or Prospective Improvement**

- Unclear how undergraduate and graduate expectations were differentiated – formalization of a curriculum committee for the undergraduate program would be beneficial.
- Conflicting perspectives regarding supervision capacity and the scope for expanding research project opportunities.
  - o The Honours option may limit program growth because of the number of professors who are available and interested in undergraduate supervision.
- Expansion in the biostatistics curriculum to help meet entrance requirements for graduate specializations in this area.
- Areas of application of epidemiology and biostatistics that could be further explored include social epidemiology, One Health (or ecosystem health), and climate change and adaptation (or planetary health).
- A challenge for the integration and mentorship of undergraduate students is the relocation of the department to their new space remote from both other basic medical science units and from the bulk of undergraduate teaching spaces.
- Need to address issues of equity, diversity and inclusion (EDI) along with indigeneity as part of an academic plan.

**Summary of the Reviewers’ Key Recommendations and Program / Faculty Responses**

The following are the recommendations in the order listed by the external reviewers. Recommendations requiring implementation have been marked with an asterisk (\*).

Reviewers’ Recommendations	Program / Faculty Response
<p>1. Create a formal advisory and governance process for the undergraduate program within the academic unit, potentially in the form of an undergraduate curriculum committee. *</p>	<p><b>Program:</b> An Epidemiology and Biostatistics undergraduate committee will be formed, comprised of the Undergraduate Chair and 3 additional core-faculty members. The committee’s main task will be to ensure coordination of planning and delivery of undergraduate-level courses in Epidemiology and Biostatistics. The undergraduate committee will be meet on a regular basis.</p> <p><b>Faculty:</b> Agreed. The program has grown sufficiently that it warrants a dedicated committee to oversee the undergraduate curriculum.</p>
<p>2. Initiate a process to develop a strategic academic plan, engaging all faculty, students, and other internal and external key stakeholders. *</p>	<p><b>Program:</b> The undergraduate committee will be tasked with developing a strategic academic plan to engage all key stakeholders.</p> <p><b>Faculty:</b> The establishment of a formal undergraduate committee will facilitate this process with the development of a strategic academic plan likely to be one of their first tasks. This process will likely extend beyond just the undergraduate program and incorporate graduate education as well.</p>
<p>3. Examine and address barriers that hinder collaboration across faculties, most specifically with the Faculty of Health Sciences, to ensure optimal program growth. *</p>	<p><b>Program:</b> In addition to the internal discussions within the undergraduate committee, the Program will consult and seek guidance from the BMSUE office on how to best identify and address the barriers and ensure optimal program growth.</p> <p><b>Faculty:</b> The structure of the BMSc program makes this somewhat challenging but there have been initial discussions of joint programs between the School of Health Sciences and the Schulich School of Medicine &amp; Dentistry. Epidemiology and Biostatistics would be a logical connection with the School of Health Studies. Initial discussions can take place in the near future, but any new modules may take a longer time to develop.</p>
<p>4. Work with cross-appointed faculty to leverage the potential for increased engagement of the program across unit and faculty boundaries. *</p>	<p><b>Program:</b> The Program will ensure that cross-appointed faculty members are better informed about the EpiBio BMSc Program. They will be invited to contribute to the program via teaching of courses, presentations at seminars, and supervision of undergraduate-thesis projects.</p>

	<p><b>Faculty:</b> The faculty hopes to better engage clinical departments (the home to many faculty cross appointed to EpiBio) in the summer research programs starting in 2022-23. It is hoped that this will extend to better engagement with undergraduate student research projects with cross-appointed faculty in the future.</p>
<p>5. Review the internship pathway for undergraduates to gain career-relevant experience, focusing on public sector entities and funding partners such as MITACS. Explore internal and external opportunities to enhance undergraduate research opportunities, including building in a provision for undergraduate HQP within external grant applications or utilizing existing internal undergraduate research programs, such as the USRI program. *</p>	<p><b>Program:</b> A committee will be formed that will review the internship pathway and explore internal and external opportunities.</p> <p><b>Faculty:</b> The Science/MedSci internship program is very well established and is starting to grow. The program suggests a new committee will be formed to evaluate the internship pathway which would be great. It may also be something that the new undergraduate committee could tackle. The Faculty suggests that the Program engage with the internship and careers office. It will also be important to promote the internship program during third year courses. In some cases, students aren't aware that these opportunities exist.</p>
<p>6. Consider developing a proposal for a second-year medical statistics course to replace the current compulsory year 2 statistics course, Statistics 2244A/B.</p>	<p><b>Program:</b> The idea of developing a 2nd-year medical statistics to replace Statistics 2244A/B will be discussed with the biostatistical faculty members, the Undergraduate Committee, and with the BMSUE office.</p> <p><b>Faculty:</b> The Faculty somewhat disagrees with this recommendation. A new 2nd year medical statistics course to replace stats 2244A/B in the BMSc curriculum has been considered several times over the years and is somewhat controversial. From one perspective, it seems odd that a department of epidemiology and biostatistics would have to rely on another department to teach statistics when they clearly have the expertise and resources. That said, the BMSc program is complex, and students often switch their module and sometimes even leave the program (for example to the Faculty of Science). It is important that the statistics class allows flexibility for the students to switch modules but also meet the needs of the program. In March of 2022, members from Schulich and the Faculty of Science met to discuss the current offering of Stats2244A/B. The outcome of the meeting was recognition of several recent improvements to Stats2244A/B and that the course was sufficiently covering introduction to statistics. It seems that Stats2244A/B is suitable as an introductory course and the Department of Epidemiology and Biostatistics can build off these concepts in more senior courses.</p>

<p>7. Working in synergy with broader University wide initiatives and with other faculties, the program should proactively develop, implement and lead strategies at all levels to foster a culture of equity, diversity, inclusion and indigeneity including for example, an inclusive admissions policy, curriculum content, and teaching and assessment methods. *</p>	<p><b>Program:</b> EDI is a central value in the department. An EDI committee is already in place, which will be invited to attend UAC meetings and make recommendations and suggestions on how to further promote the culture of equity, diversity, inclusion, and indigeneity in the program.</p> <p><b>Faculty:</b> The Faculty agrees with this recommendation and the program's response. In addition, the BMSc program is working on changes to the Program to include concepts of EDI, decolonization and accessibility.</p>
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**Implementation Plan**

The Implementation Plan provides a summary of the recommendations that require action and/or follow-up. The Program Chair, in consultation with the Dean of the Faculty will be responsible for monitoring the Implementation Plan.

The number of recommendations prioritized for implementation has been reduced as some have been deemed not to move ahead as outlined in the responses above (recommendation #6). As a result, this recommendation will not appear in the implementation table.

Recommendation	Proposed Action and Follow-up	Responsibility	Timeline
<p><b>Recommendation #1</b> Create a formal advisory and governance process for the undergraduate program within the academic unit.</p>	<ul style="list-style-type: none"> <li>- Establish an undergraduate program committee led by the Undergraduate Chair.                             <ul style="list-style-type: none"> <li>o Consider inclusion of staff and student members.</li> </ul> </li> <li>- Outline the committee mandate, meeting calendar and a standing agenda. Consider the following items for the mandate:                             <ul style="list-style-type: none"> <li>o coordinate curriculum planning across undergraduate courses</li> <li>o ensure appropriate alignment of learning expectations at undergraduate and graduate levels</li> <li>o develop and review policies on cross-listing and advanced standing</li> <li>o promote the program in years 1 and 2</li> <li>o increase general student engagement</li> </ul> </li> </ul>	<p>Undergraduate Chair</p>	<p>By December 2022</p>
<p><b>Recommendation #2</b> Develop a strategic academic plan, engaging all faculty, students, and other internal and external key stakeholders.</p>	<ul style="list-style-type: none"> <li>- Develop a strategic academic plan with broad stakeholder engagement                             <ul style="list-style-type: none"> <li>o Consider leveraging this opportunity to form closer links with Family Medicine, the MPH program, and the anticipated new school of public health.</li> </ul> </li> </ul>	<p>Undergraduate Chair Newly formed Undergraduate Committee</p>	<p>By September 2023</p>

<p><b>Recommendation #3</b> Examine and address barriers that hinder collaboration across faculties.</p>	<ul style="list-style-type: none"> <li>- Seek guidance from the BMSUE Office on how to best identify and address any barriers to program growth.</li> <li>- Determine how program growth could be optimized through more robust collaborations within the institution.               <ul style="list-style-type: none"> <li>o In what ways can the Program capitalize on the potential for synergies with faculties outside of Schulich.</li> </ul> </li> </ul>	<p>Undergraduate Chair Newly formed Undergraduate Committee</p>	<p>By September 2023</p>
<p><b>Recommendation #4</b> Work with cross-appointed faculty to leverage the potential for increased engagement of the program across unit and faculty boundaries.</p>	<ul style="list-style-type: none"> <li>- Formally invite cross-appointed faculty members to contribute to the Program via teaching of courses, presentations at seminars, and supervision of undergraduate-thesis projects.</li> <li>- Determine how the summer research programs can be used to better engage cross-appointed members from clinical departments.</li> </ul>	<p>Undergraduate Chair Newly formed Undergraduate Committee</p>	<p>By September 2023</p>
<p><b>Recommendation #5</b> Review the internship pathway for undergraduates to gain career-relevant experience.</p>	<ul style="list-style-type: none"> <li>- Explore internal and external avenues to enhance undergraduate research opportunities.               <ul style="list-style-type: none"> <li>o Leverage the expertise and connections of the Science Career Services Office.</li> </ul> </li> </ul>	<p>Undergraduate Chair Newly formed Undergraduate Committee</p>	<p>By September 2023</p>
<p><b>Recommendation #7</b> Proactively develop, implement and lead strategies at all levels to foster a culture of equity, diversity, inclusion and indigeneity.</p>	<ul style="list-style-type: none"> <li>- Work with the School's EDI Committee to develop and embed EDI strategies into the Program.</li> <li>- Consider adding this topic as a standing item at each Undergraduate Committee meeting.</li> <li>- Share and co-develop EDI best practices with other programs across Schulich and the Faculty of Science.</li> </ul>	<p>Undergraduate Chair Newly formed Undergraduate Committee</p>	<p>By September 2023</p>

**Other Opportunities for Program Enhancement**

- Given the teaching spaces available in the newly configured space, and the relatively small size of many Y3 and Y4 Epi and Biostatistics courses, the department might purposely schedule at least some undergraduate courses in these class or seminar rooms. This would help facilitate additional connections between undergraduate students, graduate students, and faculty members.