Epidemiology & Biostatistics
Final Assessment Report & Implementation Plan

Faculty / Affiliated University College	Schulich School of Medicine & Dentistry	
Degrees Offered	MSc and PhD	
Date of Last Review	2012-2013	
Approved Fields	Biostatistics Epidemiology	
External Consultants	Anne Leis, PhD University of Saskatchewan	Audrey Laporte, PhD University of Toronto
Internal Reviewer	Jisuo Jin, Associate Dean Faculty of Science	Rachel Wilson, Graduate Student, Physiology and Pharmacology
Date of Site Visit	December 2, 3, 2020	
Date Review Report Received	January 20, 2021	
Date Program/Faculty Response Received	January 27, 2021	
Evaluation	Good Quality	
Approval Dates	**SUPR-G:** February 22, 2021 **SCAPA** (rating approval, and academic program change recommendation): March 3, 2021 **Senate** (FYI for program recommendation, approval for academic program changes): March 12, 2021	
Year of Next Review	Year of next cyclical review- 2027-2028	

Overview of Western's Cyclical Review Assessment Reporting Process

In accordance with Western's Institutional Quality Assurance Process (IQAP), adopted on May 11, 2011, and revised June 22, 2012, this Final Assessment Report provides a summary of the cyclical review, internal responses and assessment and evaluation of the **Epidemiology and Biostatistics** Graduate Programs delivered by the **Schulich School of Medicine and Dentistry.**

This report considers the following documents:

- the program's self-study – Volume 1
- the external consultants' report
- responses to the consultants' report by the Departments and Faculty.

This Final Assessment Report identifies the strengths of the program, opportunities for program enhancement, and prioritizes the recommendations of the external consultants. The Implementation

Plan details the recommendations from the Final Assessment Report that are selected for implementation, identifies who is responsible for approving and acting on the recommendations, any action or follow-up that is required, and the timeline for completion.

The Final Assessment Report and Implementation Plan is sent for approval through SUPR-G and SCAPA, then for information to Senate and the Ontario Universities' Council on Quality Assurance and is made available on a publicly accessible location on Western's IQAP website.

The Final Assessment Report and Implementation Plan is the only document resulting from the Graduate cyclical review process that is made public, all other documents are confidential to the Program/School/Faculty and SUPR-G.

Executive Summary

Overview

Since 1947, the Department of Epidemiology and Biostatistics has offered master's and doctoral degrees in the fields of Epidemiology and Biostatistics with the goal of producing *well-trained graduates of high quality who are immediately competitive for subsequent education or related employment. … The overall objective… is to provide students with the skills needed to effectively apply the methods of modern epidemiology and biostatistics to the scientific study of health and illness in human populations.* Students in the programs come from a wide variety of backgrounds including biological, social and health sciences, health care disciplines, and others.

The Department of Epidemiology and Biostatistics has a complex and diverse faculty consisting of 15 full-time professors;10 Basic Scientists in Clinical Departments; and 35 adjunct members primarily employed in agencies external to the university. The faculty members have substantive expertise and methodological approaches across multiple multidisciplinary areas. Faculty hold significant research funding from granting councils and other peer-adjudicated sources.

The Department has developed a comprehensive set of Learning Outcomes at the program and course levels that align with Western Doctoral Degree Learning Outcomes, complemented by Curricular Mapping, Assessment Matrices, and Program Design Templates.

Strengths/Innovative Features of the Program (as identified in the Program Brief)

- Collaborative Specialization in Musculoskeletal Health Research
- quarter-course elective offerings to provide flexibility and breadth to students to enrich student learning
- collaborative opportunities for students to participate in research and to present at various conferences, locally and nationally
- research proposal/protocols as course requirement
- student involvement in the Epidemiology Community Practicum
- student involvement in Methodology Clinics
- excellent library resources, computing labs, and research laboratories
- exceptional graduate students and high employment rates

- Memorandum of Agreement with select international partners
- weekly summer book club
- comprehensive Professional Development Strategy to ensure graduates are prepared for the employment

Review Process

The Department engages in ongoing and continuous review of its programs and collects data by i) setting up four check-in points with all students during the academic year, in addition to the Annual Review of Student Progress, and ii) hosting regular faculty retreats focusing on research themes of excellence within the department; mapping research activities to identify clusters of expertise; developing/revising Graduate Program Learning Outcomes; and developing methods for supporting and evaluating GDLEs. The Department also collects data from graduates and alumni for feedback about the programs and monitors their employment and publication data on an ongoing basis.

Because of the pandemic, an onsite review was not possible, and the external review occurred online through online (ZOOM) interviews over two days. During the external review, the review committee, comprised of the two external reviewers: *Anne Leis, PhD, University of Saskatchewan and Audrey Laporte, PhD, University of Toronto;* and two internal reviewers *Jisuo Jin, PhD, Associate Dean Faculty of Science and Rachel Wilson, Graduate Student, Physiology and Pharmacology)* were provided with Volumes I and II in advance of their visit and then met with the following over the course of the two days.

- Dr Linda Miller, Vice Provost, School of Graduate & Postdoctoral Studies
- Dr Ruth Martin, Associate Vice Provost, School of Graduate & Postdoctoral Studies
- Dr Margaret McGlynn, Vice Provost, Academic Planning, Policy and Faculty
- Dr John Yoo, Dean, Schulich School of Medicine and Dentistry
- Dr Tom Drysdale, Associate Dean, Schulich School of Medicine and Dentistry
- Dr. Kelly Anderson, Graduate Chair, Department of Epidemiology and Biostatistics
- Dr. Piotr Wilk, Former Graduate Chair, Department of Epidemiology and Biostatistics
- Dr. Saverio Stranges, Department Chair, Department of Epidemiology and Biostatistics
- 16 Graduate Faculty members
- Graduate Students
- Graduate Program Assistants
- Robert Glushko, Associate University Librarian (Collections)

Following the onsite review, the external reviewers submitted a comprehensive report of their findings which was sent to the Graduate Chair and the Dean for review and response.

These formative documents, including Volumes I and II of the Self-Study, the External Report, the program response and the Dean's response, have formed the basis of this summative assessment report, collated and submitted to SGPS and the Senate Graduate Program Review Committee (SUPR-G) by the Internal Reviewer.

Summative Assessment – External Reviewers' Report

> *The review team…was impressed with the overall quality of the graduate program, the faculty and the students. The graduate program in Epidemiology and Biostatistics has a well deserved reputation for excellence. The Masters and doctoral programs in both fields offer a rigorous and comprehensive training experience for students. The curriculum is comprehensive and robust-providing students with a rich training environment. We also noticed an unwavering commitment to excellence and student learning.*
>
> *The program and department have benefited from very able leadership that has continued to adapt to ever evolving funding environments as well as emerging areas in the two fields of study. The faculty complement is comprised of a very talented pool of individuals with the requisite expertise and track record to support the ongoing excellence of the training and research activities of the program. The program attracts high quality applicants and graduates students who are in demand in the labour market and also provides training for the next generation of academics.*

Strengths of the Program

- Open, collegial nature of faculty and the commitment to the ongoing excellence of the programs
- Record of strong continuous leadership
- Strong faculty complement with *superb record of research funding*
- Strong curriculum and training in place
- Excellent resources for program
- Stellar employment record for graduates
- ¼ course electives
- Student publications

Areas of Concern Identified:

- Expanding the Learning Outcomes regarding professional capacity/autonomy for master's students at the end of their program
- demand for expanded training in Clinical Epidemiology

Major Modifications to be approved as part of the cyclical review program

Changes to Biostatistics Field of Study Degree/Course Requirements:

With the discontinuation of the Collaborative Specialization in Biostatistics, incoming students who wish to pursue specialized training in Biostatistics will now be enrolled in the MSc/PhD program, under the Field of Biostatistics. Alongside this change, the Biostatistics faculty reviewed the course requirements for the MSc and PhD degrees and made the following changes:

- **Statistical Sciences 9030B:** listed as required courses list for MSc/PhD, Field of Biostatistics
    - This course was previously an elective option in the Collaborative Biostats Specialization

- **Biostatistics 9681Q** and **Epidemiology 9690R**: listed as elective courses for the MSc/PhD, Field of Biostatistics
    - These courses were previously listed as required courses in the Collaborative Biostats Specialization.

The course requirements by degree level were also revised, as follows:

Previous Course Requirements (under Biostats Collaborative program)	**New Course Requirements (under Biostatistics Field of Study)**
MSc Students: 3.5 credits total 2.0 required, 1.5 elective courses	MSc Students: 3.5 credits total* 2.5 required, 1.0 elective courses
PhD Students: 3.5 credits total 2.0 required, 1.5 elective courses	PhD Students: 4.0 credits total* 2.5 required, 1.5 elective courses

**These revised course requirement weightings align with those for our Epidemiology Field of Study.*

The following are the reviewers' recommendations in order as listed by the external reviewers.

Reviewers' Recommendation Recommendations requiring implementation have been marked with an asterisk (*). The process for implementation can be found in the Implementation Plan below.	**Program/Faculty Response** Please note that in the decanal report, the Dean only commented on #1 and assigns the responsibility for addressing the remaining recommendations to the program.
**While the learning outcomes are well articulated, and follow the Ontario GDLEs, it may also be useful to examine to what extent the program's objectives and learning outcomes map themselves on to the competencies that the Epidemiology and Biostatistics graduates ought to demonstrate by the end of their studies as they enter the job market. Whereas the program excels at developing all required cognitive competencies related to the field, consideration might also be given to diversify the "professional capacity/autonomy" training by more formally targeting emotional intelligence, leadership, relationships and communication skills.*	The need to more clearly articulate the core competencies of training in EpiBio was also identified by our department Graduate Affairs Committee as an important direction for our graduate training. …The current Graduate Chair…will re-initiate this process to further define and map the core competencies that students in EpiBio should demonstrate after graduation, with an aim to complete this process in time for the 2022-2023 academic year.
There is significant demand for biostatistics expertise and a relatively small number of biostatistics faculty who despite their extensive engagement and generosity have had a hard time meeting all the requests for help. This is a common phenomenon which some units have tried to address by establishing a formal Biostatistics Support Service that involves faculty but also engages graduate students in the Biostatistics Program. To ensure smooth operation of consultancy or more in depth services it is beneficial to have a set of guidelines outlining the options for engagement with the requested service. These services are compensated either with authorship on papers which have benefited from the expert contribution of consultancy or biostatistics faculty/students or by being included on grants and allotted research funding within the grant. Often, units which benefit from the provision of these services e.g. Faculty of Medicine, may contribute to a base amount of funding so that these services can be provided on a sustainable basis- since running of a service like this funded by a single department or program may be prohibitive. The monies can be used to provide funding support for graduate students (akin to an RA or TA ship).	The program…has had a Biostatistics Support Service in the past, which unfortunately had to be discontinued due to resource constraints. As commented by the reviewers, we have attempted to reinstate some form of support through our weekly Methodology Clinics, but we have not yet developed the structure and capacity to make this a more formalized service. We are open to considering an expansion of these services should additional resources be made available.

The graduate program in Epidemiology and Biostatistics seems well positioned to take advantage of recent initiatives related to methodological innovation. In particular, the program has significant strength in advanced methods applied to health and health services' data that could perhaps benefit from stronger branding. One example is the Vector-recognized AI Masters Programs, of which there seem to be a couple on the Western University campus (e.g. Masters of Data Analytics) and with which graduate program faculty are already affiliated. It would seem that such an initiative would align well with the existing programming and confer greater recognition of the expertise that resides within the department and graduate program in particular.	Agreed. .,.We have seen an increasing interest among our students for content related to data-analytics and machine learning, and thus far have been working on a case-by-case basis to accommodate the needs of individual students who have interest in this area. …We also offer a summer workshop series to supplement our core curriculum and will regularly hold workshops in this topic area.
There was the sense that there is potentially significant demand for expanded training in Clinical Epidemiology within the Faculty. The graduate program in Epidemiology and Biostatistics includes faculty with the requisite expertise to consider the creation of a more structured clinical epidemiology stream within the graduate program including sub-subspecialty such as health technology assessment, economic evaluation, randomized controlled trials etc.). While this training is already being offered ad-hoc when a clinical research question is at the core of a student's thesis topic, there seems to be a larger demand from clinical departments across the Faculty, and the potential to engage an even larger community of adjunct and cross-appointed faculty to support any additional teaching and supervisory requirements and funding support. The oversight of such stream could be provided jointly.	Agreed. The department is currently working with the Faculty of Health Sciences on a one-year professional Master of Clinical Science in Evidence-Based Health Care. The aim of this new master's program will be to build applied skills in health professionals to base their clinical and health management decisions on valid, reliable, and relevant evidence, determined by sound scientific research and evaluation. We hope to attract clinicians, nurses, and other health professionals by providing a part-time or full-time program (1 year), delivered in a format that is accessible for full-time healthcare professionals, healthcare trainees, and healthcare administrators or policymakers. To support this program, we put in a budget request for a tenure-track position in clinical epidemiology, which has been provisionally approved by the Schulich School of Medicine & Dentistry, and is awaiting final approval.

Implementation Plan

The Implementation Plan provides a summary of the recommendations that require action and/or follow-up. In each case, the Graduate Program Chair and/or the Department Chair/Director, in consultation with SGPS and the Dean of the Schulich School of Medicine and Dentistry is responsible for enacting and monitoring the actions noted in Implementation Plan. The details of progress made will be presented in the Dean's Annual Planning Document.

Recommendation	Proposed Action and Follow-up	Responsibility	Timeline
**While the learning outcomes are well articulated, and follow the Ontario GDLEs, it may also be useful to examine to what extent the program's objectives and learning outcomes map themselves on to the competencies that the Epidemiology and Biostatistics graduates ought to demonstrate by the end of their studies as they enter the job market. Whereas the program excels at developing all required cognitive competencies related to the field, consideration might also be given to diversify the "professional capacity/autonomy" training by more formally targeting emotional intelligence, leadership, relationships and communication skills.*	Department to restart and continue the process of developing LOs for master's students by the end of the program specifically focusing on professional capacity and autonomy	Department Chair and Graduate Chair with Graduate Affairs Committee	Spring 2022

Other Opportunities for Program Improvement and Enhancement

1. *There is significant demand for biostatistics expertise and a relatively small number of biostatistics faculty who despite their extensive engagement and generosity have had a hard time meeting all the requests for help.*

2. *The graduate program in Epidemiology and Biostatistics seems well positioned to take advantage of recent initiatives related to methodological innovation.*

3. *There was the sense that there is potentially significant demand for expanded training in Clinical Epidemiology within the Faculty.*