Melbourne School of Population and Global Health

Master of Biostatistics

Biostatistics Research Project

POPH90151 (semester-long, 25 points)

POPH90288-Part 1 / POPH90289-Part 2 (year-long, 2 X 12.5 points)

POPH90149 (semester-long, 12.5 points)

Subject Guide 2018

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1. Contact Details

Biostatistics Research Project - Subject Coordinators

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2. Biostatistics Research Project - Learning Objectives

The Biostatistics Research Project is viewed as 'capstone' experience in The University of Melbourne's Master of Biostatistics degree. It provides students with the opportunity to undertake some individual research in a time limited and well supervised context.

The overall aim of the research project is to provide the student with practical experience, usually in workplace settings, in the application of knowledge and skills learnt during the coursework of the Masters course.

As a student enrolled in the Research Project you are expected to:

- undertake a substantial level of independent and self-directed study;
- take responsibility for your learning;
- keep regular contact with your supervisors including regular meetings with them, the agenda for which you set;
- keep a record of meetings, including issues discussed, work required before next meeting, date of next meeting, etc.
- do the work you agreed to do before each meeting and send any material to be discussed during the meetings at least a few days in advance to your supervisors;
- demonstrate willingness to listen to your supervisors and take on board their suggestions; and
- put sufficient amount of work into your project.

3. Identification of suitable research projects

Students may identify topics for their research project(s) in a number of ways.

Students who are currently employed in health research may choose a topic relevant to their job. Other students may be assisted by the subject coordinator to make connections with a researcher who may be in a clinical area, in health services, in biological sciences or in epidemiological research. It will usually be appropriate to identify topics in which there is a co-supervisor with a specific genuine interest in the results of the work, in order to ensure there is strong focus on the application of the work and on communication with non-statistical users of the results.

Projects should be selected to challenge the student and extend their knowledge, consolidating concepts and theories learnt throughout the Master of Biostatistics. The selection of a suitable project topic, tailored to reflect the background of the student (e.g. strong mathematical background, clinical experience), will be reviewed and approved by the subject coordinator by week 2 of semester (*see Assessment*).

A project may include any of the following:-

- primary or secondary analysis of health data and a report describing the work and interpretation of results;
- scientific manuscript for a peer-reviewed journal, with an appendix giving further detail of the statistical methods used;
- design work on a study, e.g. clinical trial or health survey, and a report describing the work;
- evaluation of a data collection, data management or health information system from the perspective of statistical analysis of the data, and a report summarising the findings.

When more than one project is completed, the projects should not all be of the same type and must involve the use of different statistical methods and concepts (e.g. both reports should not involve the analysis of clinical trials).

At least one project should involve complex multivariable analysis of data.

Supervisor(s) – Each student will be assigned a statistically qualified supervisor from The University of Melbourne with whom to discuss the plan for the project(s). Other supervisors may include content experts who are providing the student with data and appropriate substantive knowledge.

Publication of material from a Biostatistics Research Project report:- Students should be aware that there are significant issues that must be considered prior to publication of any material from the project report. These include ownership and confidentiality of the source data and results, recognition of contributions including appropriate co-authorship, protection of copyright, and general approval from the supervisor that the content is fit to publish. Students should therefore engage in discussion with their supervisor prior to the preparation of any manuscripts for publication based on the project report. Adherence to this is of particular importance if a student is

contacted directly by a publisher offering to publish the report in its original form, free of charge, and promising wide dissemination.

4. Important Dates

Students Commencing in Semester 1 2018

Subject	Identification of supervisor & research project topic	Topic Approval	Oral presentation	Research Project Final Report
POPH90151 (semester-long, 25 points)	Nov, 2017 - Feb, 2018	Both projects:- Week 2, Semester 1, 2018	Week 12, semester 1, 2018	Examination period:- Semester 1, 2018
POPH90288 & POPH90289 (year-long, 2 X 12.5 points)	Nov, 2017 - Feb, 2018	Project 1:- Week 2, Semester 1, 2018 Project 2:- Week 2, Semester 2, 2018	Project 1:- Week 12, Semester 1, 2018 Project 2:- Week 12, Semester 2, 2018	Project 1:- Examination period, Semester 1, 2018 Project 2:- Examination period, Semester 2, 2018
POPH90149 (semester-long, 12.5 points)	Nov, 2017 - Feb, 2018	Week 2, Semester 1, 2018	Week 12, semester 1, 2018	Examination period:- Semester 1, 2018

Students Commencing in Semester 2 2018

Subject	Identification of supervisor & research project topic	Topic Approval	Oral presentation	Research Project Final Report
POPH90151 (semester-long, 25 points)	June -July, 2018	Both projects:- Week 2, Semester 2, 2018	Week 11, semester 2, 2018	Examination period:- Semester 2, 2018
POPH90288 & POPH90289 (year-long, 2 X 12.5 points)	June -July, 2018	Project 1:- Week 2, Semester 2, 2018 Project 2:- Week 2, Semester 1, 2019	Project 1:- Week 11, Semester 2, 2018 Project 2:- Week 11, Semester 1, 2019	Project 1:- Examination period, Semester 2, 2018 Project 2:- Examination period, Semester 1, 2019

POPH90149 (semester-long, 12.5 points)	June -July, 2018	Week 2, Semester 2, 2018	Week 11, semester 2, 2018	Examination period:- Semester 2, 2018

5. Assessment

Getting experience in presenting research in written and verbal forms will help you to develop communication skills, which are a vital aspect of a successful career in biostatistics.

There are two main assessments:-

1) An oral presentation of 10 minutes (plus 5 minutes for questions) timetabled during week 11 of the semester. Students enrolled in POPH90151 or POPH90288/POPH90289 will be required to deliver two oral presentations. [20% of total mark] – see Appendix D for guidance on preparing your preparation and for the assessment criteria.
2) A written portfolio of the research (more detail provided below). [80% of total mark]

Written portfolio

Students are required to submit a portfolio of their research, which requires the following content:-

a) Preface – This will contain an outline of the context in which each project was conducted, an outline of the work done and a reflection on the whole learning process.
b) One research project for students enrolled in POPH90149 and two research project reports for students enrolled in POPH90151 or POPH90288/POPH90289 – These reports may relate to different parts of the same study (e.g. design of a clinical trial, data collection, analysis and interpretation) or may comprise completely different projects.

Project approval (not assessed) – Please see Appendix A for the Research Project Approval Form. The form has to be emailed to the subject coordinator and you must cc your proposed supervisor(s) on that email. You are encouraged to submit this form as soon as you finalise your research project topic(s) with your supervisor, and this form can be submitted before the start of semester. A Topic Approval Form should be completed for each research project.

Portfolio of research – See Appendix B for assessment rubric and Appendix C for supervisor's evaluation

Preface – The preface serves as an introduction to the portfolio of work, which may be 1 or 2 research projects. The aim of the preface is to give the reader your perception of what you learned, and how you learned it. You should

discuss your perceived change in knowledge and skills as a result of undertaking the project(s). Other suggested areas for discussion are the relationship of the portfolio work to coursework undertaken, difficulties in determining appropriate analysis methods, useful sources of assistance other than the supervisor, and statistical consulting communication issues. The preface must include a section of reflection on the whole learning process, including issues of communication, team work and ethical considerations.

Research Project Reports

Each project report should comprise:-

- A front section of no more than 2 pages giving:-
    - Project title
    - Location and dates
    - Signed declaration by student (e.g. "I declare this project is evidence of my own work, with direction and assistance provided by my project supervisor(s). This work has not been previously submitted for academic credit.")
- A statement by the main supervisor (~ ½ of a page) – Commenting on the degree of independence of the work, quality of the student's engagement with the project, and how they tackled problems and challenges such as communication issues and timelines.
- Report on the project
    - *Length* - ~ 4000 words per project, excluding tables, figures, table of contents, bibliography and any appendices)
    - *Summary or Abstract* – not to exceed 300 words
    - *Format* – written in English of an acceptable standard, A4 size only, page numbering, double or 1.5 spacing of text, standard easy-to-read fonts (e.g. Times New Roman, Arial) of size 11 or 12 point for text and 9 point for footnote text.
    - *Content* – the report should be readily accessible to a biostatistical reader unfamiliar with the biomedical area of application. When the content area has its own technical terms, these should be defined when they first appear in the text and compiled into a glossary at the front of the report. Similarly, abbreviations should be defined when they first appear in the text and, when non-standard abbreviations are used, a list of abbreviations should appear at the beginning.
    - *Statistical results* – please refer to guidelines available on the website of the Biostatistics Collaboration of Australia (http://www.bca.edu.au/linked%20docs/Student%20resources/BCA%20Presenting%20Statistical%20Information%20Guide.pdf)
    - *References* – see Section 6 below

6. Referencing

Referencing is very important when submitting your work. Referencing acknowledges the sources of information you have used in your research project in a way that identifies their origin. Quotations, facts, data and images, as well as ideas and theories, from both published and unpublished works must be referenced. Referencing must be both complete and consistent before the research report is submitted.

Although there is not a prescribed citations style for research projects in Public Health, the following are the most commonly used in the health and medical fields:

- **Harvard** (http://www.lib.unimelb.edu.au/recite/citations/harvard/generalNotes.html)
- **APA 6th** (http://www.lib.unimelb.edu.au/recite/citations/apa6/generalNotes.html)
- **Vancouver** (http://www.lib.unimelb.edu.au/recite/citations/Vancouver/generalNotes.html)

The University library has excellent guides on correct use of different referencing styles and on managing references. Please see http://www.library.unimelb.edu.au/cite/

We recommend that you use EndNote to manage your references if possible. You can **download the software for free** from the University Library website. The website also has useful guides and tutorials for using EndNote. Please see http://endnote.unimelb.edu.au/home

Appendix A – Project Approval Form

This form must be completed by all students enrolled in the Master of Biostatistics Research Project (POPH90151, POPH90288/POPH90289 and POPH90149) and emailed to Research Project subject coordinator (emilanzi@unimelb.edu.au). Please cc your supervisor/co-supervisor on the email. Please complete this form in consultation with your supervisor.

Note:- For students enrolled in POPH90151 and POPH90288/POPH90289 (25 points total) you will generally need to submit two topic approval forms, one form for each research project. In exceptional cases, you may be approved to complete a single larger project as long as it has sufficient breadth to be equivalent to two separate projects – as evidenced by addressing at least two different types of statistical problem within its scope.

Student information	
Student name and family name:	
Student ID:	
Student email address:	
Supervisor information	
Name of supervisor(s):	Principal (biostatistical) – Co (content-area) -
Principal supervisor email:	
Research Project Information	
Semester / Year starting project	
Semester / Year completing project	
Type of Research Project (for example statistical analysis of data):	
Research question(s) to be addressed:	
Does your research project require ethics approval? If yes, has the ethics approval been obtained? If no, could you please specify the date by ethics approval will	Yes No Yes No

be obtained:	
Does your research project include data analysis? If yes, is your dataset ready for analysis? If no, could you please specify the date by which the dataset will be available for analysis:	Yes No Yes No
Short description of research project, including brief description of aspects requiring Masters-level biostatistical expertise (maximum 200 words)	
Have you discussed with your supervisor(s) how often you are going to meet with them?	
If applicable, have you discussed authorship (publication strategies and recognition of contributions) that should apply to your project with your supervisor(s)? (Please note that publication is not a requirement for MBiostat research projects.)	Yes No
Date when discussed and agreed by supervisor: Signature of the student: Date:	

Appendix B – Assessment of Research Reports

The following assessment rubric is used by examiners to assess the preface and research project(s) report.

1. The examiner should assess the report according to the overall quality of the biostatistical work that was presented and give an initial score according to the following classification:

The quality of the biostatistical work was:	**Mark**
Excellent: demonstrated ability to work with ideas and methods beyond the level expected in MBiostat coursework.	90 (H1: 80+)
Very good: demonstrated capacity at a level similar to high-achieving coursework.	75 (H2: 70-79)
Good: demonstrated a solid understanding and application of methods learned in MBiostat coursework.	67 (H3: 65-69)
Adequate: acceptable work for a biostatistician who would work primarily under supervision.	57 (P: 50-64
Fail: work not demonstrating adequate grasp of essential elements of biostatistics required to work professionally.	45 (F: <50)

2. The examiner will then add or subtract marks from the value assessed above according to the following additional criteria:

Criterion	**Poor**		**Good**		**Extra Mark.**
Presentation/Expression [quality of writing including organisation of report and presentation of data and findings in tables and figures]	-2	-1	0	1	2
Scientific Context [demonstrated understanding of the place of the statistical work in broader context including definition of research questions and literature review]	-2	-1	0	1	2
Collaboration & Professional Issues [communication with collaborators, ethics, professional conduct]	-2	-1	0	1	2
Data Issues [clarity of description of data sources and data cleaning issues etc.]	-2	-1	0	1	2
Bonus Marks (at marker's discretion)			0	1	2

Final result = overall grade (1) + sum of adjustments (2): ☐

Appendix C – Supervisor's Second Evaluation Report

Please note the subject coordinator will send this form to your supervisor and collect it from them. You will not receive the comments and mark from this evaluation report.

MBiostat Research Project
Supervisor's Second Evaluation Report

Supervisor:

Student:

Supervisor's assessment is always difficult because of closeness to the student leading to potential biases – both positive (wanting your student to get a good grade) and negative (knowing the specific weaknesses of a novice researcher). However this report gives the opportunity to assess student's overall performance throughout their research project semester(s), which is not always assessable from their final report. Please feel free to include relevant comments next to the item, or on the reverse of this page. Please bear in mind that your student is a novice researcher and you may need to adjust your expectations to be appropriate to that level of student.

The final mark the students receive for their research portfolio will be the average of the mark they receive for their written report from an external assessor and the mark they receive from this evaluation report.

		Excellent (5)	Above average (4)	Average (3)	Below average (2)	Poor (1)	Not applicable	Comments
Research Skills	Comprehension of the technical / complex details of the content area							
	Knowledge of key background /prior research							
	Clarity of research question / direction							
	Attention to detail / thoroughness							
	Ability to focus on the specifics of the research							
	Independence of thought, whilst considering existing views							
	Level of critical thinking							
Commitment	Appropriate diligence to independent tasks (working independently)							
	Attendance at regular consultations with you							
	Initiation of independent research activities (e.g. literature searching)							
	General attitude							
Interaction with you/ other researchers/ peers	Willingness to listen and take on board suggestions							
	Incorporation of your suggestions in written work							
	Regular discussions with updates on progress							

Additional comments:

Appendix D – Oral Presentation

Audience

Your presentation will be to teaching and research staff of the Melbourne School of Population and Global Health, to your fellow students, and possibly to your other supervisors and interested people from the University or from other institutions.

Presentation Skills

Part of your mark will be based on your presentation skills. This will include: clarity of overheads/slides, how well you speak (acknowledging English may not be your first language) and whether you used your presentation time well to communicate the aims and the results of your research project.

Media

You will need to bring your presentation slides on a flash drive or memory stick to the presentation session. You may be asked to email your presentation slides 24 hours in advance. Please also bring along a pdf copy of your presentation to avoid compatibility issues of PowerPoint presentations prepared on Mac or PC computers.

Duration

You will have 10 minutes for your presentation plus five minutes to answer questions from the audience. You will be kept to this time and therefore should carefully prepare your talk, including doing a rehearsal to ensure you can present within the time limits. As a guide, you should aim for fewer than 10 slides in total. Being concise is important in presenting research and 10 minutes is the standard presentation time at research meetings. An important skill for any student to learn is how to rate the relative importance of information, that is, what has to go in to your presentation and what can be left out. We assess your ability to do this by limiting the time available for your presentation.

Content

At your presentation you should use the following suggested outline (or something similar):

1) The research question (1 slide)
2) The background (2 slides)
3) How you addressed the research question, focussing on the statistical methods (3 slides)
4) The results (2-3 slides)
5) Summary/conclusions/limitations (1-2 slides)

1) RESEARCH QUESTION (1 slide)

This should be the first overhead or slide of your presentation and should clearly state a specific question that you addressed during your research.

2) BACKGROUND (2 slides)

This should convince the audience that you understand the issue (e.g. disease and/or risk factors) that you studied, the gaps in knowledge, and that your project is important. That is, why did you do the study?

You should discuss what is known about the public health issue and what is unknown? How will your proposed study address what is unknown and fill any gaps?

When applicable, it is important to describe findings and methodological problems from any previous similar studies and how your research will differ from previous studies.

3) HOW YOU ADDRESSED THE RESEARCH QUESTION (3 slides)

This should inform the audience as to what you did during your research to complete your project.

If the project involved an analysis of data, you need to describe your data source, clearly define your outcome and exposure of interest and how these were measured and include some statements on how you "cleaned" the data and how it was extracted to your software package.

You should put a primary emphasis on explaining the statistical issues that you addressed in the project, with clear presentation of models and methods of analysis that you used.

4) RESULTS (2-3 slides)

This should inform the audience as to what you found during your research to complete your project.

You need to present a summary of the analysis. This could include tables and figures of results and text, again with a primary focus on statistical issues, e.g. possible effects of decisions taken during the modelling and choice of estimation methods.

5) SUMMARY/LIMITATIONS (1-2 slides)

This slide(s) should summarise in 2 or 3 sentences your overall findings. It should include a conclusion and possibly a recommendation for further research, as well as any limitations – concerning either the data and substantive question or the statistical methods.

Assessment of Presentation

At least two assessors other than your supervisor(s) will assess your presentation. Your final mark will be the average of the mark you receive from these assessors. You will only receive the final mark.

Every effort will be made to send you feedback from the examiners in time so that you may take this into account when completing your written report.

Marking breakdown -

Criteria	Marks allocated
Presentation skills Is the presentation clear in terms of dialog and materials?	20
Background and context Clear research question Clear rationale for choice of research question and justification for research in this area	20
Statistical issues/competence Demonstrated solid understanding of models and statistical methods Clear presentation of the findings Discussion of strengths and limitations of statistical methods/data	40
Conclusions and questions Outline and discussion of main findings Competence in answering questions	20
	100