

UNIT REPORT

**Biostatistics (MS) - 01.Reviewer's Report - Academic Data**

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# Biostatistics (MS)

## MS Biostat Program Mission

**Mission:**

The MS program in biostatistics strongly aligns with and advances the missions of the Department of Biostatistics, the College of Public Health and Health Professions (PHHP), and the University of Florida. It provides students with a robust theoretical foundation and prepares them for advanced education and research in biostatistics, addressing a growing need for skilled biostatisticians in the field. The program's emphasis on applications of statistics to public health and medical sciences fosters collaboration and innovation, supporting PHHP's goal of preparing graduates for impactful careers in public health. Additionally, the emphasis on practical skills and application aligns with the university's commitment to excellence in education and research, furthering its mission of shaping a better future for Florida and beyond.

**Program Type and Level:** Masters (includes all masters level degrees)

**Start:** 07/01/2022

**End:** 06/30/2023

**Program:** Biostatistics (MS)

**Program CIP:** 26.1102

**Site Information:** Online & Residential

**If Other Site:** :

**Responsible Roles:** George Hack (hackg@ufl.edu)

## PG 1 Careers in biostatistics

**Goal:** The program will effectively prepare students for careers in biostatistics.

**Program:** Biostatistics (MS)

**Evaluation Method:**

PG 1 was evaluated through the percentage of MS students graduating during the reporting period who have found jobs or further schooling. If students were successful in either of these two pursuits, we considered them to be prepared through our program. Additionally, we measured the percent attrition out of all enrolled MS students during the reporting period. Data used to evaluate PG 1 was collected through our Survey for Post Graduate Employment Data Collection in Qualtrics.

**Results:**

Campus Program:

Total Enrolled 2022-2023	Left Program	Attrition Rate	Graduated	Responses	Response Rate	Job	Further Schooling	% Job or Schooling
18	0	0%	11	3	27.27%	1	2	100.0%

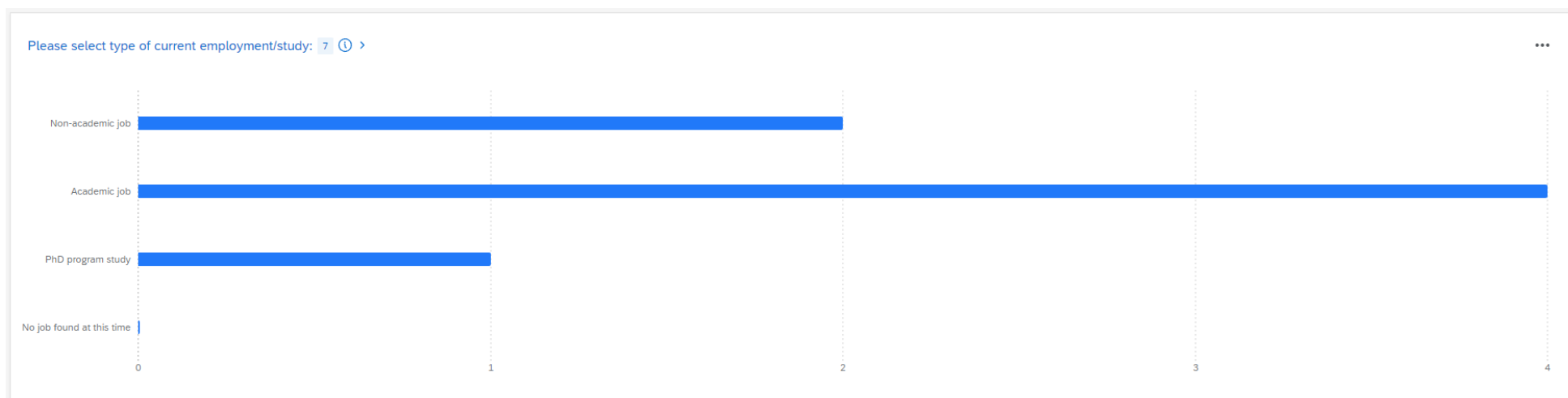
Online Program:

Total Enrolled 2022-2023	Left Program	Attrition Rate	Graduated	Responses	Response Rate	Job	Further Schooling	% Job or Schooling
51	1	1.96%	15	6	40.0%	5	1	100.0%

Note: 2 of our graduating MS students were admitted into our PhD program in F23 and did not respond to our Qualtrics survey. Their data is reflected in the table but not in the screenshot from Qualtrics.

According to our results, graduates in both the online and residential MS programs were successful in finding jobs or pursuing further schooling. The online program had a slightly higher attrition rate than the residential program, but with only 1 student leaving the program, this was not considered a practically significant difference at this time.

The survey supported the evaluation method, but the response rate was low.



(Screenshot from Qualtrics report for survey question about post-graduate employment/schooling)

### SLO 1 Knowledge

**Outcome:** Communicate the underpinning of biostatistics concepts and methods.

**SLO Area (select one):** Knowledge (Grad)

**Assessment Methods Checklist:** Capstone

**Assessment Method Narrative:**

SLO 1 was assessed through the MS Capstone project. All MS in Biostatistics students were required to complete a capstone project to demonstrate their ability to communicate the underpinnings of biostatistics concepts and methods through a written report. Students had two options for the report (attached below). In both cases, the report included sections that required students to communicate biostatistics concepts and methods (e.g., introduction/background, critique, methods), which related directly to SLO 1. Other sections of the report required students to apply biostatistics methods to analyze and interpret data (e.g., results, discussion/conclusions, simulation). Students submitted a plan, outline, draft, and final paper to their MS faculty advisor through a capstone Canvas page. The submissions were each processed through Turnitin and reviewed by the MS faculty advisor for satisfactory completion before a final decision was reached by the faculty advisor. An MS Final Exam Form was signed by the MS faculty advisor to act as documented evidence that the student satisfactorily completed their capstone project.

## PROJECT OVERVIEW

All MS in Biostatistics students are required to complete a capstone project to demonstrate mastery of the program. While every project will involve different goals and activities, each one presents multiple opportunities for students to expand on one or more of the MS core competencies. Students will typically begin working on their project at the beginning of the semester they wish to graduate, however, it may be started in the penultimate semester with the permission of their faculty advisor. The capstone project involves writing a paper and submitting it to your faculty advisor for feedback and approval. There are two options for the paper:

1. Read a paper from the statistical literature (e.g., the Journal of Statistics in Medicine) and submit a written report that summarizes the article and critiques the methodology used in the paper. Additionally, you will apply the methodology used in the paper to real or simulated data and include your process in the report. Any code used in the process should be attached as an appendix to your document.
2. Complete a data analysis that uses one or more of the methods you learned about in the program to answer a research question. Submit a written report that summarizes the goals of the project, the data source, the methods used, the results of the analysis, and the conclusions of the project.

The statistical methods you should be aiming to use/find should be at least on par with methods that you learned about in your MS program. Ideally, the method will be an extension of one of these methods in some way (e.g., a special case). If choosing option 1, your simulation should go beyond a simple reproduction of the paper.

**SLO Not Assessed This Year:**

**Threshold of Acceptability:** 90

**How many students did you assess for this outcome?:** 27

**How many students met the outcome?:** 27

**What percentage of students met the outcome?:** 100

**Does this meet your threshold of acceptability?:** Yes

**Results:**

Assessment	Program	Students Assessed	Students Met Outcome	Percent Met Outcome
SLO 1	Campus	11	11	100%
SLO 1	Online	16	16	100%
	<b>Total</b>	<b>27</b>	<b>27</b>	<b>100%</b>

All of the MS students who were assessed for SLO 1 during the reporting period met the outcome, with no differences in success rates

between online and residential programs. Our students did an excellent job with their capstone projects during the reporting period.

## SLO 2 Skills

**Outcome:** Apply biostatistical concepts and methods, interpret and communicate results.

**SLO Area (select one):** Skills (Grad)

**Assessment Methods Checklist:** Capstone

### Assessment Method Narrative:

SLO 2 was assessed through the MS Capstone project. All MS in Biostatistics students were required to complete a capstone project to demonstrate their ability to communicate the underpinnings of biostatistics concepts and methods through a written report. Students had two options for the report (attached in Assessment Method Narrative for SLO 1). In both cases, the report included sections that required students to communicate biostatistics concepts and methods (e.g., introduction/background, critique, methods). Other sections of the report required students to apply biostatistics methods to analyze and interpret data (e.g., results, discussion/conclusions, simulation), that directly related to SLO 2. Students submitted a plan, outline, draft, and final paper to their MS faculty advisor through a capstone Canvas page. The submissions were each processed through Turnitin and reviewed by the MS faculty advisor for satisfactory completion before a final decision was reached by the faculty advisor. An MS Final Exam Form was signed by the MS faculty advisor to act as documented evidence that the student satisfactorily completed their capstone project.

### SLO Not Assessed This Year:

**Threshold of Acceptability:** 90

**How many students did you assess for this outcome?:** 27

**How many students met the outcome?:** 27

**What percentage of students met the outcome?:** 100

**Does this meet your threshold of acceptability?:** Yes

### Results:

Assessment	Program	Students Assessed	Students Met Outcome	Percent Met Outcome
SLO 2	Campus	11	11	100%
SLO 2	Online	16	16	100%
	<b>Total</b>	<b>27</b>	<b>27</b>	<b>100%</b>

All of the MS students who were assessed for SLO 2 during the reporting period met the outcome, with no differences in success rates between online and residential programs. Our students did an excellent job with their capstone projects during the reporting period.

## SLO 3 Professional Behavior

**Outcome:** Display ethical behaviors, cultural sensitivity, teamwork, conduct and communications.

**SLO Area (select one):** Professional Behavior (Grad)

**Assessment Methods Checklist:** Project(s)

### Assessment Method Narrative:

SLO 3 was assessed during the Biostatistical Consulting course that was required for all MS students. In particular, students worked on a semester-long, group project that involved presentations, discussions, peer reviews, and a written report. This project was graded in multiple phases (study plan presentation, results presentation, and final report), and to pass the assignment, students needed to display ethical behaviors, cultural sensitivity, teamwork, conduct, and communication.

### SLO Not Assessed This Year:

**Threshold of Acceptability:** 90

**How many students did you assess for this outcome?:** 28

**How many students met the outcome?:** 28

**What percentage of students met the outcome?:** 100

**Does this meet your threshold of acceptability?:** Yes

### Results:

Campus Program:

Students Assessed	Students Met Outcome	Success Rate	Average Grade
SLO 3	9	100%	92%

Online Program:

Students Assessed	Students Met Outcome	Success Rate	Average Grade
SLO 3	19	100%	100%

100% of MS students who were assessed for SLO 3 received a passing grade on the project. The online students tended to have slightly higher grades than students in the residential program. This could be due to differences in instructors/graders for the different sections of the course. The differences in grades were not large enough to be concerning at this time.

### Programmatic Use of Results

**Improvement Types Checklist:** Modified one or more SLO assessment methods.

Revised one or more existing Program Goals.

**Use of Results for Improvement Narrative - Required:**

- Results were reviewed by the Director of Graduate Studies and the MS Online program director.
- We decided that a detailed rubric for the MS capstone project needs to be created. Elements of the capstone project were used in the evaluation of SLO 1 and SLO 2, however, a more detailed rubric would allow for a more informative evaluation. For example, a rubric will ensure that the evaluation of capstone projects is more uniform across all student committees. Additionally, a more detailed rubric would include elements that focus on sections of the report associated with biostatistics concepts and others that focus on methods and application.
  - The department curriculum committee will meet in the 2023 academic year to discuss and implement changes to the rubric.
- We decided that a detailed rubric for the consulting project used to evaluate SLO 3 needs to be created. SLO 3 covers multiple facets of professional behavior and the rubrics for assessing these facets need to address them explicitly.
  - The department curriculum committee will meet with the instructors of the course that assigns the consulting project in the 2023 academic year to discuss and implement changes to the rubric.
- We decided to review our Program Goal (PG 1) to determine if it reflects the current goals of our MS program. The department curriculum committee will meet in the 2023 academic year to review PG 1 and will submit a change request, if necessary.

**Program Results Not Reported This Year:**

**Program Results Reporting Complete:** true

### MS Biostatistics AAP Detail

**Providing Department:** Biostatistics (MS)

**Assessment Cycle:**

**Analysis and Interpretation:** May - June

**Program Modifications Completed By:** August 31

**Dissemination Completed By:** September 30

Year	16-17	17-18	18-19	19-20	20-21	21-22	22-23	
<b>SLOs</b>								
<b>Content Knowledge</b>								
<b>SLO #1</b> Communicate the underpinning of biostatistics concepts and methods.	X	X	X	X	X	X	X	
<b>Skills</b>								
<b>SLO #2</b> Apply biostatistical concepts and methods, interpret results, communicate.	X	X	X	X	X	X	X	
<b>Professional Behavior</b>								
<b>SLO #3</b> Display ethical behaviors, cultural sensitivity, teamwork, conduct and communications.	X	X	X	X	X	X	X	

**SLO Assessment Rubric:**

**PHC6063 Biostatistical Consulting Project Rubric (SLO 3)**

The project report and presentation were evaluated in terms of the following criteria: Significant, Innovation, Approach, and Effective Presentation. For example,

- **Significance:** Does the project address an important problem or critical barrier to progress in the field or have the ability to improve knowledge, technical capability or clinical practice
- **Innovation:** Does the presenter employ novel theoretical concepts, approaches, or methodologies?
- **Approach:** Does the research strategy present a well-reasoned overall approach, methodology, and analysis to accomplish the aims? Are the study endpoints clearly and specifically defined, and do they complement the study objectives? Is the proposed statistical

analysis appropriately and sufficiently defined for the primary and secondary endpoints? Is the power/sample size calculation adequately described and reproducible? Are there adequate data collection and data management plans?

The co-instructors independently scored each project component and averaged the two scores. If there was a large disparity, a discussion would follow to agree on a score.

Attached Files

**Assessment Oversight:**

Name	Department Affiliation	Email Address	Phone Number
Steven Foti	Biostatistics	fotisj@ufl.edu	352-294-5922

**Methods and Procedures - Undergraduate and All Certificate Programs:**

**Curriculum Map - Undergraduate Degree Programs:**

**Research :**

Our MS in Biostatistics is not a research degree. However, students are exposed to biostatistical research in some of their coursework (e.g., PHC6063 Biostatistical Consulting, PHC6020 Clinical Trials Analysis, and PHC6791 Data Visualization in the Health Sciences), and also through their culminating experience. They are exposed to collaborative research with investigators in other disciplines as part of their consulting course.

**SLO Measures - Graduate and Professional Programs:**

**Direct Assessments**

- Assessment metrics were agreed upon by the entire faculty.
- The Knowledge SLO was measured by the student’s performance on the MS culminating experience. This was a written report either critiquing an article from the statistical research literature or describing an active research experience in which the student participated. Each student worked with his/her advisor to choose an article, digest it, and report on it. Usually, the student simulated data (or used data from their research experience) and applied the new statistical method. The grading scheme was pass or fail.
- The Skills SLO was measured by the student’s performance on the MS culminating experience. This was a written report either critiquing an article from the statistical research literature or describing an active research experience in which the student participated in. Each student worked together with his/her advisor to choose an article, digest it, and report on it. Usually, the student simulated data (or used data from their research experience) and applied the new statistical method. The grading scheme was pass or fail.
- The Professional Behavior SLO was measured by the student’s performance on a semester-long project in their Biostatistical Consulting course (rubric provided in SLO Assessment Rubric section above). The project was completed in groups and involved presentations and a written report.

**Indirect Assessments**

- We indirectly assessed students' perception of their learning objectives through exit surveys that asked if they felt prepared for the workforce and other general questions about their experiences in our MS program.

**Assessment Timeline - Graduate and Professional Programs:**

Assessment SLOs	Assessment 1
Knowledge	
#1	Capstone Project (final semester)
Skills	
#2	Capstone Project (final semester)
Professional Behavior	
#3	Consulting Course (final spring semester)