Course title: Statistics in Policy Analysis and Evaluation
Course #/term: SW 673, Section 003, Fall, 2018
Time and place: Fridays, 9-12, 1636 SSWB
Credit hours: 3
Prerequisites: SW 522, or permission of instructor
Instructor: Andy Grogan-Kaylor
Pronouns: he, his, him
Contact info: Email: agrogan@umich.edu (preferred)
Phone: 734-615-3369
You may usually expect a response within 24 hours
Office: 3846 SSWB
Office hours: TBD

“No physician would consider prescribing strong medications whose impact and potential side-effects have not been properly evaluated. Yet in social development programs, where huge sums can be spent to modify population behaviors, change economic livelihoods, and potentially alter cultures or family structure, no such standard has been adopted.

While it is widely recognized that withholding programs that are known to be beneficial would be unethical, the implicit corollary—that programs of unknown impact should not be widely replicated without proper evaluation—is frequently dismissed.”

— Ruth Levine and William Savedoff (2006) [emphasis added]

Why can’t numbers be beautiful too?

We all talk of beautiful words, art, buildings and they’re not part of the natural world, either. An x in Algebra is no more abstract than an idea in philosophy, just more useful.

But it can’t be use that makes the difference. Keats found beauty in a Grecian urn, surely practical at some time and no one is blind to the beauty of symmetry.

We all get Blake’s awe of the tiger’s stripes. Why not awe at Gaussian curves? Of course, I know there is no great beauty in a single number, in a four or a seven or an eight, but it is the same with the alphabet. Where is the wonder in a b or a k or a t? It is only the combinations, the meanings, the relationships between the letters that make the words and sounds we love.

— And so, why can’t my numbers be beautiful to me? Why the scorn, the doubt in your face? Do you think I am brittle and dusty as old paper? Look again. See the numbers shine in my eyes.

— Eveline Pye
1. Course Statement

a. Course description

This course is designed to introduce students to statistics and statistical methods. It is intended and designed for students who have little or no familiarity with statistics and who may want to learn at a relatively slow pace so that their knowledge base is built on a solid foundation. The course content will integrate the core themes related to multiculturalism and diversity; social justice and social change; promotion, prevention, treatment, and rehabilitation through the data sets and examples that are used to highlight statistical concepts. Students in this course will acquire the skills to comprehend simple statistical reports related to social policy and program evaluation. Students will be able to assess the value and limitations of rates, measures, and statistical estimates. This course will help students develop the ability to use simple quantitative methods to describe real world situations in social work settings and to make ethical inferences and decisions based on the statistical results. Students will learn to choose methods of statistical analysis to improve social policy decisions and service delivery programs. Students will learn to understand and use appropriate language with their statistical analyses to clarify meaning and to explain the inferences that can be appropriately made from specific data. Finally, students will learn to construct basic reports that include meaningful charts, tables, and graphs for various audiences and that provide text that is appropriate for different audiences.

b. Course content

This course focuses on learning the direct application of analytical skills and the ethical reporting of analytical results. Students will review the use simple rates, averages, and other statistics. Students will conduct, interpret, and present statistical analyses to various audiences. Students will receive a brief introduction to the theoretical foundations of descriptive and inferential statistics. Students will practice the appropriate choice of statistics based on available data, the problem to be addressed, and the audience for the analysis. Students will learn the importance of the difference between causality and correlation. Students will learn to interpret, prepare, and report on statistical analyses of problems in policy analysis and evaluation. The course content will integrate the core themes related to multiculturalism and diversity; social justice and social change; promotion, prevention, treatment, and rehabilitation through the data sets and examples that are used to highlight statistical concepts.

c. Course objectives and competencies

Students will be able to: 1. Analyze extant research for its use and abuse of outcomes and measures of social justice, social change, and diversity. (Practice Behaviors 2.SPE, 4.SPE, 5.SPE) 2. Construct rates, means, proportions and other simple statistics and

d. Course design

This course will use lectures, computer lab exercises, applied statistical exercises, case studies, and small group exercises to convey relevant content.

e. Curricular themes

**Theme Relation to Multiculturalism & Diversity**
Students will develop the capacity to identify ways in which gender, race, ethnicity, social class, age and other forms of social stratification and disenfranchisement in the community influence and are affected by the decisions made from statistical analyses and related methodologies.

**Theme Relation to Social Justice**
The ability to assess policies and programs analytically is necessary if the social work profession is to play an important role in shaping the outcome of ongoing program and policy debates to reflect issues in social change and justice. This course provides students with the capacity to understand and influence the role statistical analysis and the interpretation of such analysis play in the formation and implementation of policy, practice and program development.

**Theme Relation to Promotion, Prevention, Treatment & Rehabilitation**
Prevention and promotion activities are difficult to evaluate and therefore raise special challenges in statistical analysis. It is important to expose students to the language of statistics so that they may comprehend useful and appropriate statistical techniques for different problems. In this way they may analyze and evaluate promotion and prevention activities prior to the development, implementation, and analysis of any relevant policy issue or initiative that they encounter in the course of their professional activities.

**Theme Relation to Behavioral and Social Science Research**
Social workers should examine the ways in which social science data is translated into current policy and practice and the consequences (both positive and negative)
which emerge from statistical analyses. This course provides students with the
capacity to understand and influence the role statistical analysis plays in the
formation and implementation of policy, practice and programs.

f. Relationship to social work ethics and values

Ethical standards of research methods (NIH guidelines), social work practice (NASW
Code of Ethics) and evaluation practice (Program Evaluation Standards) will be used
to review issues commonly confronted in the statistical analysis of policy and
evaluation.

2. Class Requirements

a. Text and class materials

There is no textbook for the course. All readings are available in an online reader on
https://canvas.umich.edu/gateway/

Software (you will need to purchase software for this course)

SPSS (available in most campus computer labs and available for a student license for your
laptop from the UM Computer Showcase) (in class exercises will focus on the use of SPSS
although the statistical concepts covered transcend any one statistical software package) Per
SSW policy, all students should have a usable laptop computer.

b. Class schedule

The course schedule is appended to the end of this syllabus. I tend to stick fairly closely to the
schedule listed but communicate updates through e-mail to the class e-mail list. Information
about major aspects of the course, and assignments are also posted on Canvas.

c. Assignments

1) Two data based written products concerning a clinical or policy question of interest.
The intent of these assignments is to create a product that is based on statistical evidence,
yet readable by a lay audience. The intent is that your first product will be a paper that will
be four pages long. I recognize that different questions will lead to different lengths of
papers. Papers up to six pages long are acceptable. Papers over 6 pages long will be
marked down by one full grade per page. The second of these two written products will
build closely upon the first, and may be a short paper, a poster suitable for presentation at
a conference, or an infographic with methodological appendix. The two written products will
be due at different points over the term. Consultation with the professor and other students will be available. Quality of writing, clear formatting, especially of your quantitative results, clarity of presentation, and accuracy of your findings (both in terms of size of effect estimated and statistical significance), will be some of the criteria used in grading.

Presentation of results should have words in tables spelled out, and labels of variables spelled out. Graphs should have nicely formatted axes labels and titles and some attention to color and design. There should be attention to the overall design of each of these products in terms of color, fonts, headings, etc.

Refer to the Student Handbook to make sure that you cite other’s work properly and avoid plagiarism. Plagiarism1—when discovered—will be dealt with severely. Further details of this assignment will be forthcoming and will also appear on the class Web site.

a. **Bivariate Policy or Practice Brief.** How is at least one factor associated with an outcome of interest? This policy brief should include:

i. a review and citation of 5 key pieces of background literature

ii. a bivariate analysis such as a correlation, a cross-tabulation, or bivariate regression

iii. a well-documented2 and nicely formatted graph illustrating some **univariate** aspect of your data related to your research question

iv. a well-documented and nicely formatted graph illustrating some **bivariate** aspect of your data related to your research question

v. a discussion of your findings and their implications. Your discussion of your results should include a discussion of whether or not they are statistically significant and what this implies for your research question, as well as for policy, practice and intervention.

Please note that because of the way our presentation in this course is structured, it is easiest in this brief to relate one categorical variable to another categorical variable or one continuous variable to another continuous variable. **[30% of grade]**

b. **Regression Based Written Product.** How do at least two different factors contribute to a **continuous** outcome of interest? This written product should include:

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1 Please note that for purposes of this course, plagiarism consists of six or more consecutive words, taken from another source without proper attribution. Failure upon my part to detect plagiarism does not imply approval of plagiarism.

2 For purposes of this syllabus, “well-documented” means a graph with a title, clearly labeled axes, and a note indicating the source of the data.
i. a review and citation of 5 key pieces of background literature. 2 of these pieces of literature can be repeated from the prior assignment.

ii. a regression analysis

iii. a well-documented and nicely formatted graph illustrating some \textit{univariate} aspect of your data related to your research question

iv. a well-documented and nicely formatted graph illustrating some \textit{bivariate} or \textit{multivariate} aspect of your data related to your research question

v. a discussion of your findings and their implications. Your discussion of your results should include a discussion of whether or not they are statistically significant and what this implies for your research question, as well as for policy, practice and intervention.

[30\% of grade]

2) \textbf{Group Presentation of a Regression Based Statistical Article}: As the course progresses, there will be an opportunity for you to present the results of a statistically based article, as part of a group. The idea of this exercise is not to get everything right, but rather to dive in and give a good faith effort at presenting the important findings of a regression based academic journal article, in a way that is comprehensible, and makes the importance of the findings clear. If you hear of an article about an interesting, noteworthy, or controversial topic, and would like us to consider it as one of the possible articles for the group assignment, please let me know [20\% of grade].

3) \textbf{Class participation: [20\% of grade]}. You will probably learn more the more you participate. Certainly styles of participation differ across students, but some of your grade will depend upon your participation, attentiveness, and contributions to the class discussion.

4) \textbf{Attendance}. You are expected to attend each class and lab session. If you miss a class session for any reason, please see me to make sure that you are grasping the material. In particular, you will be expected to complete all lab assignments, unless we make other arrangements. Excessive absences, as determined by the instructor, may result in a reduction in grade, or a failing grade, and will be brought to the attention of the student and the faculty advisor by the course instructor.

5) \textbf{Lab Work}. We will spend some time almost every week lab based activities using your laptops. The purpose of the lab is to give you hands on experience with the building blocks of statistically based policy analysis: data handling and regression analysis. You'll use the lab to learn how to do important steps in statistical analysis rather than simply reading statistical analyses or reading about statistical analysis. Most of the learning in lab occurs in the doing of lab. Lab is intended to be a collaborative endeavor where students work with the instructor and with each other. Although, I may sometimes collect your work in lab, I will not grade your lab work, or be able to provide written feedback on your lab work. I am always happy to discuss lab work during lab, during office hours, or over e-mail.

6
A note on work handed in late: Most students turn in work in accordance with class deadlines. In order to be fair to the majority of students, I have developed the following policy: late work will be graded down by half a grade a day unless prior arrangements for an extension have been made with me. I very much understand that extenuating circumstances may arise which make it difficult to turn in work on time. All I am asking you to do is to communicate with me if you need some kind of extension so that we can work out an arrangement that is mutually agreeable.

**Data Sets** (for this project, we are looking, usually, for data at the individual level, regularly arranged in rows and columns)

- I would particularly note the **General Social Survey** and the **National Survey of Children’s Health (2011)** were datasets that many students last year found to be helpful.

- For those interested in cross-national comparisons, the World Bank has many country level indicators that can be easily downloaded into a dataset.


**Grading:**

I will employ the standard grading scheme employed by [http://canvas.umich.edu](http://canvas.umich.edu).

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<thead>
<tr>
<th>Name</th>
<th>Range:</th>
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<tbody>
<tr>
<td>A</td>
<td>100 % to 94.0%</td>
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<tr>
<td>A-</td>
<td>&lt; 94.0 % to 90.0%</td>
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<tr>
<td>B+</td>
<td>&lt; 90.0 % to 87.0%</td>
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<tr>
<td>B</td>
<td>&lt; 87.0 % to 84.0%</td>
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<tr>
<td>B-</td>
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<td>C+</td>
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<td>C</td>
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<td>C-</td>
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<td>D+</td>
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<td>D-</td>
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<td>F</td>
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Cross-cutting criteria for grading: Some amount of your grade will be based upon your attention to matters of design and clarity. For example, the names of indicators or variables should be spelled out, as should the titles and labels for graphs. You should devote some time to thinking about other design elements, like (possibly) the use of a one or two relevant stock photos as well as choices about color palette, line weight, point shape, etc.

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Additional School and University policies, information and resources are available here: https://ssw.umich.edu/standard-policies-information-resources. They include:

- Safety and emergency preparedness
- Mental health and well-being
- Teaching evaluations
- Proper use of names and pronouns
- Accommodations for students with disabilities

If you have a disability or condition that may interfere with your participation in this course, please schedule a private appointment with me as soon as possible to discuss accommodations for your specific needs. This information will be kept strictly confidential. For more information and resources, please contact the Services for Students with Disabilities Office at G664 Haven Hall, (734) 763-3000.

- Religious/spiritual observances
- Military deployment
- Writing skills and expectations
- Academic integrity and plagiarism
<table>
<thead>
<tr>
<th>week</th>
<th>date</th>
<th>topic</th>
<th>readings</th>
<th>assignments</th>
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<tbody>
<tr>
<td>1</td>
<td>9/7/18</td>
<td>Introduction</td>
<td>Gladwell article on going to college. (this article will probably get the most emphasis in our in-class discussion)</td>
<td>one paragraph statement of research question of interest that will guide your work over the semester. (template on Canvas)</td>
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|      |        |                                                                      | *Unfortunately, the readings for this week are probably the heaviest of the semester. However, I really want to start the class with real attention to the idea that there can be quantitative claims that are not well founded, along with treatments and interventions that have null, or even negative, effects. We want the treatments, and interventions, and policies for which we advocate to be beneficial, and in the interests of social justice, and statistics gives us the tools to make those claims. My hope is that you can "listen lightly" to the video and podcast, and skim the article, and come away with some sense of the importance of our work this fall.*  

Ben Goldacre on "Battling Bad Science" (TED Talk)  
Scott Lilienfeld on "Psychological Treatments that Cause Harm" (only skim this article, and really focus on Table 1)  
Freakonomics Podcast on "When Helping Hurts" (on Canvas)  |
| 2    | 9/14/18| Causal theory: what does it mean to say one things causes another?    | Regression and ideas of causality are intimately intertwined. Let's talk about causation before we talk about regression                                                                                                                                           |                                                                                                                                              |
|      |        |                                                                      | *Unfortunately, the readings for this week are probably the heaviest of the semester. However, I really want to start the class with real attention to the idea that there can be quantitative claims that are not well founded, along with treatments and interventions that have null, or even negative, effects. We want the treatments, and interventions, and policies for which we advocate to be beneficial, and in the interests of social justice, and statistics gives us the tools to make those claims. My hope is that you can "listen lightly" to the video and podcast, and skim the article, and come away with some sense of the importance of our work this fall.*  

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<p>|      | 9/21/18| Measures of Central Tendency                                         | Research Methods Knowledge Base on univariate statistics                                                                                                                                                                                                       | form into groups for group presentation assignment                                                                                     |
| 3    | 9/28/18| Testing the Difference Between Two Groups and Statistical Significance | Reading on t-test from Research Methods Knowledge Base                                                                                                                                                                                                      |                                                                                                                                              |
|      |        |                                                                      | Mona Chalabi on &quot;3 Ways to Spot a Bad Statistic&quot; (TED Talk)                                                                                                                                                                                                  |                                                                                                                                              |
|      |        |                                                                      | Grogan-Kaylor t-test simulation @ <a href="https://agroganweb.wordpress.com/statistical-visualizations/">https://agroganweb.wordpress.com/statistical-visualizations/</a>                                                                                                         |                                                                                                                                              |
| 4    | 10/5/18| Bivariate Statistical Procedures Continued: Correlation and Cross-Tabulation | Readings on correlation from Research Methods Knowledge Base                                                                                                                                                                                                  |                                                                                                                                              |</p>
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<th>week</th>
<th>date</th>
<th>topic</th>
<th>readings</th>
<th>assignments</th>
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<tbody>
<tr>
<td>6</td>
<td>10/12/18</td>
<td>Instructor out of Town for Research Meeting</td>
<td>Abela graphic about statistical graphics</td>
<td>TBD</td>
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<td>Yau &quot;7 Basic Rules for Making Charts and Graphs&quot;</td>
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<td>Evergreen data visualization checklist</td>
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<td>7</td>
<td>10/19/18</td>
<td>Lab Day 1</td>
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<td>bivariate statistics paper is due Friday 10/27 at midnight</td>
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<tr>
<td>8</td>
<td>10/26/18</td>
<td>Regression (Understanding a Continuous Outcome with Multiple Predictors)</td>
<td>Grogan-Kaylor tutorial on regression analysis. Scott on &quot;Answering Why Questions Grogan-Kaylor regression demo @ <a href="https://agroganweb.wordpress.com/statistical-visualizations/">https://agroganweb.wordpress.com/statistical-visualizations/</a></td>
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<tr>
<td>9</td>
<td>11/2/18</td>
<td>Regression II</td>
<td>Readings from UCLA-ATS</td>
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<tr>
<td>10</td>
<td>11/9/18</td>
<td>Interpreting a Regression Article</td>
<td>all three of the articles chosen by the instructor or class</td>
<td>group presentations</td>
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<td>11</td>
<td>11/16/18</td>
<td>TBD (possibly second day of presentations)</td>
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<td>12</td>
<td>11/23/18</td>
<td>Thanksgiving</td>
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<tr>
<td>13</td>
<td>11/30/18</td>
<td>Lab Day 2</td>
<td></td>
<td></td>
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<tr>
<td>14</td>
<td>12/7/18</td>
<td>Short &quot;Structured Interactions&quot;</td>
<td></td>
<td>final product e.g. policy brief, infographic with methodological appendix, etc. is due in class today</td>
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