M19-551 Systematic Reviews and Meta-Analysis in Public Health and Clinical Medicine
Spring 2021
Fridays, 9:00 am to 12:00 pm
IN SPRING 2021 THIS WILL BE AN ONLINE COURSE

THIS SYLLABUS IS CURRENTLY BEING UPDATED FOR SPRING 2021 AND IS SUBJECT TO CHANGE

INSTRUCTORS
Graham A. Colditz, MD, colditzg@wustl.edu
Carrie Stoll, MSW, MPH, carolyn.stoll@wustl.edu

OFFICE HOURS
Wednesdays, 12-1 pm starting January 27, see Canvas for Zoom link
Or by appointment

ADAPTATIONS FOR FALL 2020
For Spring 2021 we have adapted our class to be entirely virtual. We are prepared to help you meet the learning objectives in this new format.
The key adaptations we have made:
• Synchronous, live Zoom meetings on Friday 9:00-10:30 am Attendance expected
• Although typically the synchronous sessions will only run 9:00-10:30 am please reserve 9:00 AM - 12:00 PM on Feb 5, April 23, and April 30 for special workshop sessions.
• Attendance policy: up to 2 regular Zoom classes (NOT workshops) may be missed without affecting your grade, however you must notify us either before the class or within 24 hours after class. However, we understand the importance of flexibility in this challenging time and if this expectation is becomes difficult for you to fulfill please reach out to the instructor team and we will address it on a case-by-case basis.

PREREQUISITES
Introductory epidemiology and biostatistics 1 (or permission of the course master)

TARGET AUDIENCE
Clinicians interested in conducting research synthesis or meta-analysis to inform practice or policy, clinical training program participants, students enrolled in Genetic Epidemiology Master of Science program, students in MPH addressing application of epidemiologic data to prevention. Prior clinical or community research experience is helpful but not required.

COURSE DESCRIPTION & OBJECTIVES
Introduction to the use of meta-analysis and related methods used to synthesize and evaluate epidemiological and clinical research in public health and clinical medicine. Concepts introduced and illustrated through case studies of public health and medical issues.

Objectives are to learn how to use a variety of formal and informal methods for synthesizing epidemiological information on public health risks, to understand how to use these methods to assess the strength of the
evidence in policy development and clinical contexts, and to appreciate how research synthesis can contribute to rational policy making in controversial areas.

COMPETENCIES
Ability to design research synthesis and meta-analysis
- Define research question
- Define literature search strategy
- Conduct literature search and document the process
- Apply eligibility criteria, data extraction, and data quality scoring
- Develop data analysis plan
- Understand and interpret fixed-effects, random-effects, and meta-regression methods and results
- Recognize heterogeneity and approaches to quantification and reporting of among-study variation

Skills and experience to conduct analysis
- Master data analysis and model fitting in context of meta-analysis
- Quantitatively evaluate publication bias
- Be able to estimate combined results from reports of randomized trials, observational studies, and diagnostic test

Master the core reporting strategies
- Master reporting standards for RCTs and observational data in context of meta-analysis
- Master forest plot, summary tables, and publication bias presentations

Draw inferences from data to inform clinical and public health practices
- Correctly use reasoning for design and methodologies employed
- Present oral and written reports from analyses
- Place inference in context of clinical and public health implications for action and future research

GRADING
Your grade will be based on:
- Class participation (5%)
- Introduction post (1%)
- Topic Workshop: Preliminary topic presentation (10%)
- Library Search Assignment (5%)
- Course pulse survey (1%)
- Analysis HW 1 (7.5%)
- Analysis HW 2 (7.5%)
- Final workshop (15%)
- Final paper (30%)
- Additional small assignments (quizzes, discussion posts, etc) (18%)

Grading Scale
A+: 97-100; A: 93-96; A-: 90-92; B+: 87-89; B: 83-86; B-: 80-82; C+: 77-79; C: 73-76; C-: 70-72

ATTENDANCE AND PARTICIPATION
Attendance to the Zoom sessions is expected, however up to 2 regular Zoom classes (NOT workshops) may be missed without affecting your grade, however you must notify us either before the class or within 24 hours after class. We understand the importance of flexibility in this challenging time and if this expectation becomes difficult for you to fulfill please reach out to the instructor team and we will address it on a case-by-case basis.

We will judge participation across several methods, which allows students to participate in the ways they feel most comfortable. This can include speaking up on Zoom sessions, participating in whiteboard activities on Zoom, and providing peer feedback on discussion board posts and workshop sessions.

**POLICY ON LATE ASSIGNMENTS**
Late assignments will result in a deduction of one grade point (A+ down to A) for each day late (including weekends) unless prior approval is obtained from the instructor or a compelling situation prevents prior approval. Extensions will be given on a case-by-case basis. Please reach out to Carrie (Carolyn.stoll@wustl.edu) if you need an extension.

**READINGS**

Supplemental readings from **Introduction to Meta-Analysis**, Michael Borenstein, Larry V Hedges, Julian PT Higgins, and Hannah R Rothstein, Wiley, 2009, are also given. Additional readings are indicated below and will be available through Canvas.

**Additional Resources**
UK NICE (National Institute for Health and Clinical Excellence) [http://www.nice.org.uk/](http://www.nice.org.uk/)
Berkeley Systematic Reviews Group, [http://www.medepi.net/meta/](http://www.medepi.net/meta/)
PLOS template for systematic review – meta-analysis article preparation [www.plosone.org/static/tpl_plos_meta.doc](http://www.plosone.org/static/tpl_plos_meta.doc)
## CLASS SCHEDULE

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<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topics covered</th>
<th>Assignment Due</th>
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<tbody>
<tr>
<td>1</td>
<td>Jan 22</td>
<td>Introduction</td>
<td>Student introductions</td>
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<tr>
<td>2</td>
<td>Jan 29</td>
<td>Defining the research question and searching the literature (Becker)</td>
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<tr>
<td>3</td>
<td>Feb 5</td>
<td>Topic workshop</td>
<td>Workshop slides</td>
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<tr>
<td>4</td>
<td>Feb 12</td>
<td>Statistical methods: effect sizes, basic meta-analysis calculations</td>
<td>Library search assignment</td>
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<tr>
<td>5</td>
<td>Feb 19</td>
<td>Statistical methods, continued: regression, cumulative meta-analysis</td>
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<tr>
<td>6</td>
<td>Feb 26</td>
<td>Heterogeneity: I², subgroup analysis</td>
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<td>7</td>
<td>Mar 5</td>
<td>Study selection/managing search results</td>
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<td></td>
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<td>Data extraction/assessing risk of bias</td>
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<td>8</td>
<td>Mar 12</td>
<td>Meta-analysis in STATA</td>
<td>Analysis HW 1</td>
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<tr>
<td>9</td>
<td>Mar 19</td>
<td>NO CLASS</td>
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<tr>
<td>10</td>
<td>Mar 26</td>
<td>writing a protocol</td>
<td>Analysis HW 2</td>
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<td>PRISMA/reporting</td>
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<tr>
<td>11</td>
<td>Apr 2</td>
<td>Meta-analysis in STATA</td>
<td>Computer Lab 2</td>
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<tr>
<td>12</td>
<td>Apr 9</td>
<td>Analysis combining individual patient data</td>
<td>Combining diagnostic test results</td>
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<td>Apr 16</td>
<td>Drug safety and adverse events</td>
<td>Network analysis</td>
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<td>14</td>
<td>Apr 23</td>
<td>FINAL WORKSHOP</td>
<td>Workshop slides</td>
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<tr>
<td>15</td>
<td>Apr 30</td>
<td>FINAL WORKSHOP</td>
<td>Workshop slides</td>
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<tr>
<td>16</td>
<td>May 7</td>
<td>steps to get ready to publish; Applying results to policy and practice</td>
<td>Final paper</td>
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## CLASS PUBLICATIONS

Many students go on to publish based on the work they performed in this class. Since 2011, the following publications have been produced by participants in this class:


DROP DATES
You may drop for any reason during the course of the semester. However, you may only receive a partial or no tuition reimbursement depending upon how far into the semester you drop the course. See the MPHS Student Handbook. Late withdrawals will appear on your transcript as a withdrawal.

MPHS Academic Policy Guidelines:
Guidelines regarding MPHS course registration and enrollment, grades, tuition obligation, and academic leave are consolidated in the MPHS Student Handbook. Please review this document.

MPHS Guidelines for Academic and Non-Academic Transgressions:
By registering for this course you have agreed to the terms of the MPHS Academic Integrity Policy, outlined below and in more detail in the MPHS Student Handbook. Please review this policy before submitting your first graded assignment.

Academic Integrity/Plagiarism Policy:
- Academic dishonesty is a serious offense that may lead to probation, suspension, or dismissal from the University. Academic dishonesty includes plagiarism (the use of someone else’s ideas, statements, or approaches without proper citation). Academic dishonesty also includes copying information from another student, submitting work from a previous class for a new grade without prior approval from your instructor, cheating on exams, etc. You are responsible for reviewing WashU’s academic integrity resources to become aware of all the actions that constitute academic dishonesty.
- All instances of academic dishonesty will be reported to the Office of the Registrar for investigation and potential disciplinary action. In addition, the instructor will make an independent decision about the student’s grade on any assignment in question. The MPHS process regarding academic dishonesty is described in the MPHS Student Handbook.

DISABILITY RESOURCES
It is the goal of Washington University to assist students with disabilities in removing the barriers their disabilities may pose and provide support in facing the challenge of pursuing an education at Washington University.

Washington University recognizes and accepts its professional, legal and moral responsibility to avoid discrimination in the acceptance and education of qualified students with disabilities and to provide reasonable accommodations to such students consistent with the principles embodied in the law. These guidelines apply to students seeking admittance as well as to those who become disabled while they are enrolled.

Washington University makes every effort to insure that all qualified applicants and students can participate in and take full advantage of all programs and opportunities offered within the university. Washington University encourages and gives full consideration to all applicants for admission. Washington University does not discriminate in access to its programs and activities on the basis of age, sex, sexual orientation, race, disability, religion, color or national origin.
To learn more about services provided to students with disabilities, initiate the process of formal documentation and/or to arrange for accommodations, please review the Disability Resources for the Med School at the start of the course.

MENTAL HEALTH RESOURCES
Mental Health Services’ professional staff members work with students to resolve personal and interpersonal difficulties, many of which can affect the academic experience. These include conflicts with or worry about friends or family, concerns about eating or drinking patterns, and feelings of anxiety and depression. See: shs.wustl.edu/MentalHealth.

SEXUAL ASSAULT RESOURCES
You can also speak confidentially and learn about available resources by contacting Dr. Gladys Smith, PhD, Sexual Violence Prevention Therapist and Licensed Psychologist at the Medical Campus, (314) 362-2404. Additionally, you can report incidents to the Office of Student Affairs or by contacting WUSM Protective Services 314-362-4357 or your local law enforcement agency.

BIAS RESOURCES
The University has a process through which students and staff who have experienced or witnessed bias, prejudice or discrimination against a student can report their experiences to the University’s Bias Report and Support System (BRSS) team. For details see: diversityinclusion.wustl.edu/brss/.

Office of the Associate Vice Chancellor for Diversity, Equity and Inclusion (DEI)
The DEI Training Team designs, facilitates and leads diversity education programming for faculty, staff and students on a wide range of topics including: creating a climate of respect, the value of diversity and the role of biases in our day-to-day lives. diversity.med.wustl.edu/training/

The Office of Diversity Programs promotes diversity among and prepares medical students to lead in a global society. A priority for the Office of Diversity Programs is to cultivate and foster a supportive campus climate for students of all backgrounds, cultures and identities. mddiversity.wustl.edu/

The Diversity and Inclusion Student Council promotes an inclusive campus environment for all School of Medicine students. sites.wustl.edu/disc/

The Office for International Students and Scholars embraces the university’s mission of welcoming promising students from around the world. wumma.wustl.edu/