

**Washington University School of Medicine
Master of Population Health Sciences (M19-5656)
Master of Public Health (S55-4003)**

Fall 2019 Global Burden of Disease: Methods and Applications (3 credits)

Fall 2019 (08/29/19 – 12/12/19)

Thursdays, 1:00 – 4:00 pm

Location: Taylor Avenue Building (TAB) 2nd floor, Richmond Room, Medical Campus

SYLLABUS¹

INSTRUCTOR: Rumi Kato Price, PhD, MPE (pricerk@wustl.edu)

TEACHING ASSISTANT: Nidaa Ekram, MPH (nekram@wustl.edu)

POTENTIAL GUEST LECTURERS (alphabetical listing): ²

Ziyad Al-Aly, MD FASN, Assistant Professor of Medicine and Associate Chief of Staff for Research and Evaluation, VA Saint Louis Health Care System

Peter Benson, PhD, Associate Professor, Department of Anthropology, College of Arts and Science

Anne Glowinski MD MPE, Professor, Department of Psychiatry, School of Medicine

Rupa Patel, MD, MPH, Assistant Professor, Division of Infectious Diseases

Hilary Reno, MD PhD, Assistant Professor, Division of Infectious Diseases

Manan V. Shroff, MBBS, MPH, Research Analytics, School of Medicine

Abigail Smith Zamoarano, MD, Fellow, Division of Gynecologic Oncology, School of Medicine

Bradley Stoner MD PhD, Associate Professor, Department of Anthropology, College of Arts and Science

Adetunji Toriola, MD PhD, Associate Professor, Division of Public Health Sciences, Department of Surgery, School of Medicine

OFFICE HOURS: By appointment, or after each class with an advance request

PREREQUISITES: Equivalent to an introductory epidemiology, a behavioral/social science quantitative method, or a biostatistics course. Prior consultation with Course Master is needed for those who do not meet any prerequisite.

TARGET AUDIENCE: This course is suited for postgraduate scholars, fellows, and medical students, graduate students with interest or experience in global health methodology, and/or global health research experience.

COURSE DESCRIPTION & OBJECTIVES: This transdisciplinary course provides an overview of quantitative and narrative methods and their applications for studying the global burden of diseases. The area topics include three major categories of global burden of diseases, including psychiatric & behavioral disorders, infectious diseases, and non-communicable medical illnesses. Topical areas include maternal and child health, social determinants of health, and environments and health. The course emphasizes causes, consequences of mortality and disability, and comparative risk assessments. Students will learn basic methods used for global

1. Content of this syllabus is subject to change.
2. Guest lectures are subject to availability of lecturers.

health research and major global, regional, and national trends in these areas. They will be able to apply the knowledge of measurements to forecast the global, regional, and national burden of specific diseases, develop needed policy recommendations, and address prevention and intervention strategies targeted to specific nations or regions using a transdisciplinary approach. Students will also learn dimensions of sociocultural, economic, and environmental factors that affect global and regional distributions of major disease categories and how disease burdens are linked to the global economy, policy and environment. The transdisciplinary knowledge and hands-on skills learned from this course will enable students to pursue interests in health research and practice it in the international as well as local arena.

COMPETENCIES:

1. Develop a critical understanding of the concepts and measures used in studies of global burden of diseases.
2. Understand regional and national patterns of global burden of major diseases and their risk factors.
3. Apply measures used in global burden studies to empirical data, field work, or interpretation of results in literature.
4. Apply critical knowledge in global burden studies to disease monitoring, intervention, health promotion, and policy implications in topical areas.
5. Acquire a deeper understanding of transdisciplinary thinking toward illness experiences and global health research.

GRADING: Letter Grade or Pass/Fail with Course Master's Permission

Course activities and student products include lectures, class exercises, discussion and other in-class participation, homework, short reports, and final group presentations. Additional analysis of an empirical dataset can be arranged individually.

Your grade will be based on:

- Class attendance (20%)
- In-class discussion and participation (20%)
- Five short reports (30%)
- Homework and in-class exercises (10%)
- Class presentation (20%)

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. Total of 100 will be converted to letter grades according to the established norm; grades will not be normalized. Pass/Fail is optional but requires advance permission from the Course Master.

ATTENDANCE, PARTICIPATION AND ASSIGNMENTS

1. Attendance is required for all classes. As a courtesy to other students, you are expected to arrive on time, unless permitted by advanced arrangement. Planned absences, for reasons other than acute illness, will need consent in advance by the Course Master, such as religious holidays and career development activities. More than two unexcused absences from class may result in a lowered grade; students who miss more than four classes may be asked to withdraw from the class.
2. In-class conduct: Use of cell phones, texting, emails, and web surfing are prohibited during lectures and student presentations, except for emergencies. This course may be audiotaped for educational purposes
3. Reading materials: If instructed, readings assigned for each class should be read ahead of the class and students should be prepared to discuss the material from readings. Recommended readings are for further exploration, depending on student's interest. Additional references are provided for informational purpose.
4. Homework, in-class exercise products, and short reports will be due upon specified dates, but usually no later than one week after when they are assigned.
5. Final class presentation will be planned and carried out by student groups. The final presentation should be of professional quality, similar to a short presentation at a national or regional professional

meeting. The quality of the presentation will be judged based on how well it meets a majority of the five competency criteria.

POLICY ON LATE ASSIGNMENTS: Late assignments may result in a deduction of one grade point (A+ down to A) for each day they are late unless prior approval is obtained from the instructor or a compelling situation prevents prior approval (i.e. documented health issues or family emergencies).

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.

COURSE SCHEDULE, ASSIGNMENTS & DUE DATES

Required Reading Materials (available in pdf format):

Kleinman A. The Illness Narratives: Suffering, Healing, and the Human Condition. Chapters 1 & 6. Basic Books, 1989.

Hyder, AA, Puvanachandra P, Morrow RH. Measures of health and disease in populations. In Merson MH, Black, RE, Mills AJ (Eds.) Global Health. Diseases, Programs, Systems, and Policies. Third Edition. Jones & Bartlett Learning, 2012 (Chap 1).

World Health Organization. The Global Burden of Disease concept (Chap 3). Available at: http://www.who.int/quantifying_ehimpacts/publications/en/9241546204chap3.pdf.

Lopez AD, Mathers CD, Ezzati M, Jamison DT, Murray CJL (Eds.). Global Burden of Disease and Risk Factors. Washington, DC: Oxford University Press and Word Bank, 2006 (Chap 1).

Keating C. The art of medicine: the genesis of the Global Burden of Disease study. Lancet 2018; 291:2317.

Voigt K, King NB. Disability weights in the global burden of disease 2010 study: two steps forward, one step back? Bull World Health Organ 2014; 92:226-228.

Solberg CT, Norheim OF, Barra M. The disvalue of death in the global burden of disease. J Med Ethics: 2017;0:1-7.

Birn A-E. Philanthrocapitalism, past and present: The Rockefeller Foundation, the Gates Foundation, and the setting(s) of the international/global health agenda. Hypothesis 2014, 12(1):e8.

Advanced further readings (available in pdf):

The Lancet 2012: 380 (December 15) Issue:

1. Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: a systematic analysis for the Global Burden of Disease Study 2010 (pp. 2095-2128).
2. Years lived with disability (YLDs) for 1160 sequelae of 289 diseases and injuries 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010 (pp. 2163-2196).
3. Disability-adjusted life years (DALYs) for 291 diseases and injuries in 21 regions, 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010 (pp. 2197-2223).
4. A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010 (pp. 2224-2260).

Note: Copies of all required readings are available in Canvas. Weekly lecture presentations and useful materials will be made available in Canvas. Materials used for lectures are posted for informational purposes and are not required readings.

Week 1: Thursday, August 29, 2019

Lecture: Introduction to the Global Burden of Disease	Methods and Practices
<ul style="list-style-type: none"> ○ Instructor and student introduction ○ Syllabus review ○ Reading materials ○ Student requirements and products ○ Global Burden of Disease: background ○ Millennium Development Goals (MDG) & Sustainable Development Goals (SDG) 	<ul style="list-style-type: none"> ○ Introductory survey: What GBD means to you? What do you like to achieve? ○ Discussion: Why global health, why global burden of disease? ○ IHME GBD visualization practice ○ MDG & SDG homework instruction

Week 2: Thursday, September 5, 2019

Lecture: Basic Models of Global Burden of Disease	Methods & Practices
<ul style="list-style-type: none"> ○ Major WHO-initiated studies ○ International disease classification systems ○ Basic epidemiological measures ○ The global burden of disease, injuries and risk factors introduction ○ Basic model of global burden of disease 	<ul style="list-style-type: none"> ○ MDG & SDG report ○ Review: Hyder et al. (Chap.1) ○ GBD basic measures discussion: years of life lost (YLL); disability weights; years of life lost due to disability (YLD); disability-adjusted life years (DALY) ○ Short report #1 instruction

Required reading: Hyder, AA, Puvanachandra P, Morrow RH. Measures of health and disease in populations. In Merson MH, Black, RE, Mills AJ (Eds.) Global Health. Diseases, Programs, Systems, and Policies. Third Edition. Jones & Bartlett Learning, 2012 (Chap 1).

Week 3: Thursday, September 12, 2019

Lecture: Illness Experiences	Methods and Practices
<ul style="list-style-type: none"> ○ Disease and illness ○ Illness experiences-student report ○ Medical anthropology 	<ul style="list-style-type: none"> ○ Gapminder introduction and practice ○ Short report #1 discussion ○ Discussion: Kleinman Chap 1 & 6 ○ Short report #2 instruction ○ Group discussion: class project

Required reading: Kleinman A. The Illness Narratives: Suffering, Healing, and the Human Condition. Chapters 1 & 6, Basic Books, 1989.

Week 4: Thursday, September 19, 2019

Lecture: Global Burden of Psychiatric and Addiction Diseases	Methods and Practices
<ul style="list-style-type: none"> ○ Global trends in major psychiatric disorders ○ Selected addiction and substance abuse global trends ○ Global mental health financing ○ Global inequality 	<ul style="list-style-type: none"> ○ In-depth understanding of YLD computations in GBD 2010 study ○ Group discussion: class project ○ Barriers to mental health care

Required reading: Lopez AD, Mathers CD, Ezzati M, Jamison DT, Murray CJL (Eds.). Global Burden of Disease and Risk Factors. Washington, DC: Oxford University Press and Word Bank, 2006 (Chap 1), up to p9.

Recommended reading: Years lived with disability (YLDs) for 1160 sequelae of 289 diseases and injuries 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010 Lancet 2012; 380: 2163-2196.

Week 5: Thursday, September 26, 2019

Lecture: Global Burden of Psychiatric and Addiction Diseases	Methods & Practices
<ul style="list-style-type: none"> o Special topics (e.g., suicide, injury and violence; global child and adolescent psychiatric disorders; refugees' mental health. gun violence) o Global monitoring, prevention, intervention, and health promotion o Stigma o Mental health on our campus 	<ul style="list-style-type: none"> o Review WHO Chap 3; Solberg 2017 o Discussion: stigma; meaning of death from GBD perspective o Other commonly used health metrics: Healthy life years (HeaLY); quality-adjusted years (QUALY) o DisMod-II to DisMod-MR o Short report #2 due o Week 6 computer exercise instruction

Required reading:

World Health Organization. The Global Burden of Disease concept (Chap 3).
 Solberg CT, Norheim OF, Barra M. The disvalue of death in the global burden of disease. J Med Ethics: 2017;0:1-7.

Week 6: Thursday, October 3, 2019

Lecture: Global Burden of Infectious Diseases	Methods and Practice
<ul style="list-style-type: none"> o Introduction to global infectious diseases o AIDS as a paradigm o Recent epidemics (Ebola, Zika) o Other ID topics (e.g., Malaria, neglected tropical disease) 	<ul style="list-style-type: none"> o Class exercise using DisMod II, chronic disease examples o Computations of YLL, YLD, and DALY o Review and discussion: Voigt & King, 2014

Required reading:

World Health Organization. The Global Burden of Disease concept (Chap 3).
 Voigt K, King NB. Disability weights in the global burden of disease 2010 study: two steps forward, one step back? Bull World Health Organ 2014; 92:226-228.

Week 7: Thursday, October 10, 2019

Lecture: Global Burden of Infectious Diseases	Methods and Practices (Price)
<ul style="list-style-type: none"> o Sexually transmitted infections o Global and local STI epidemiology and burden of diseases o Prevention and control 	<ul style="list-style-type: none"> o Comparative risk assessment (CRA) concepts and model o Computation of CRA o CRA group exercises o Group discussion: class project abstract due

Required reading: Lopez AD, Mathers CD, Ezzati M, Jamison DT, Murray CJL (Eds.). Global Burden of Disease and Risk Factors. Washington, DC: Oxford University Press and Word Bank, 2006 (Chap 1), pp.9-10.

Recommended reading: A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010. Lancet 2012; 380; 2224-2260.

Week 8: Thursday, October 17, 2019

Lecture: Maternal and Child Health	Methods and Practices
<ul style="list-style-type: none">○ Infant and maternal mortality and morbidity measures○ Maternal and child health in developing countries	<ul style="list-style-type: none">○ Comparative risk assessment (CRA) concepts and model○ CRA group exercises (cont'd)○ Bayesian regression basis○ Short report #3 instruction

Recommended reading: A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010. Lancet 2012; 380; 2224-2260.

Week 9: Thursday, October 24, 2019

Lecture: Global Burden of Non-communicable Medical Diseases (NCDs)	Methods and Practices
<ul style="list-style-type: none">○ Major chronic diseases in developed countries: adult & geriatric diseases (cancer, obesity, cardiovascular diseases)○ Prevention and intervention studies○ Health promotion in developed countries○ Best buys and obstacles for prevention	<ul style="list-style-type: none">○ CRA risk factor example and practice○ Short report #3 discussion○ Class project outline and content preparation○ Mid-course feedback

Week 10: Thursday, October 31, 2019

Lecture: Risk Factors and Comorbidity of NCDs	Methods and Practices
<ul style="list-style-type: none">○ HPV and cancer prevention○ Barriers to risk factor reduction	<ul style="list-style-type: none">○ Class project outline and content preparation○ Short report #4 instruction○ Tobacco risk factor exercise○ Optional: Halloween costume contest

Week 11: Thursday, November 7, 2019

Lecture: Environments and GBD	Methods and Practices (Price)
<ul style="list-style-type: none">○ Global and national burden of NCD attributable to environmental inequality○ WASH in developing countries○ Gates Foundation WASH challenge	<ul style="list-style-type: none">○ Short report #4 discussion○ Group discussion: class project outline○ Short report #5 instruction

Week 12: Thursday, November 14, 2019

Lecture: Ethics in Global Health Research	Methods and Practices
<ul style="list-style-type: none">○ Is global health neocolonialism?○ Informed consent in international research○ Ethical issues in genetics research○ Responsible conduct as a global citizen	<ul style="list-style-type: none">○ Ethics – case example○ Global citizen as human rights advocates○ Informed consent in international research○ Q&A for group presentation for Week 15○ Class project abstract/outline due

Required reading: Birn A-E. Philanthrocapitalism, past and present: The Rockefeller Foundation, the Gates Foundation, and the setting(s) of the international/global health agenda. Hypothesis 2014, 12(1):e8.

Recommended reading: Pai M. 10 Fixes fro global health consulting malpractice. Global Health NOW.

Available at: https://www.globalhealthnow.org/2019-08/10-fixes-global-health-consulting-malpractice?utm_source=Global+Health+NOW+Main+List&utm_campaign=1a30952616-EMAIL_CAMPAIGN_2019_08_12_03_09&utm_medium=email&utm_term=0_8d0d062dbd-1a30952616-896915

Week 13: Thursday, November 21, 2019 – NO CLASS, Thanksgiving

Week 14: Thursday, November 28, 2019

Student presentations
<ul style="list-style-type: none">o Stigma buster competition presentations & discussionso Short report #5 due

Week 15: Thursday, December 5, 2019

Student presentations
<ul style="list-style-type: none">o Class project presentationso Presentation discussionso Potlucko Course evaluation

Week 16: Thursday, December 12, 2019

Final wrap-up
<ul style="list-style-type: none">o Final class presentation documents dueo Missed assignments makeup timeo Course evaluation

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.

mdiversity.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/

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