Course Description and 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, non-communicable medical illnesses. Topical areas include maternal and child health, social determinants of health, environments and health. The course emphasizes causes, consequences of mortality and disability, and comparative risk assessments. Students will learn basic methods used for global health research and major global, regional and national trends in these areas, and will be able to apply the knowledge of measurements to forecast the global, regional, 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 global economy, policy and environment. The transdisciplinary knowledge and hands-on skills learned from this course will enable students to pursue interest in health research and practice 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.

Course Duration: Fall 2016, I and II, August 30 to December 13, 2018

Date and Time: Thursdays, 1 pm – 4 pm

Classroom: Institute for Public Health, TAB Bldg. (Scott & Taylor), Second Fl. Richmond Room

Course Credit: 3 credits

Prerequisites: This course is open to postgraduate scholars, fellows, and graduate students. An equivalent to an introductory epidemiology, a behavioral/social science quantitative method, or a biostatistics course is very helpful. Prior consultation with Course Master is recommended for those who do not meet any prerequisite.

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

1. Content of this syllabus is subject to change.
Administrative Assistant: TBA

Potential Guest Lecturers (alphabetical listing):²
Peter Benson, PhD, Department of Anthropology, College of Arts and Science
Graham Colditz, MD DrPH, Division of Public Health Sciences, Department of Surgery, School of Medicine
Anne Glowinski MD MPE, Department of Psychiatry, School of Medicine
Steve J. Lawrence, MD, Division of Infectious Diseases, Internal Medicine, School of Medicine
Manan V. Shroff, MBBS, MPH, Research Analytics, School of Medicine
Fred Ssewamala, PhD, Brown School of Social Work
Bradley Stoner MD PhD, Department of Anthropology, College of Arts and Science
Adetunji Toriola, MD PhD, Division of Public Health Sciences, Department of Surgery, School of Medicine

Course Activities and Student Products: Lectures, class exercises, discussion and other in-class participation, homeworks, short reports, and final group presentations. Additional analysis of an empirical dataset can be arranged individually.

Course Evaluation: Letter Grade or Pass/Fail with Course Master’s Permission

- 20% Attendance
- 20% In-class discussion and participation
- 10% Homework, in-class exercises
- 30% Short reports
- 20% Class presentation

1. The total point of 100 will be converted to letter grades according to an established norm; grades will not be normalized. Pass/Fail is optional but requires advance permission from the course master.
2. Attendance is required for all classes. Planned absences for reasons other than acute illness need to be excused in advance by the course master. Absences will typically be excused for reasons such as religious holidays, career development activities, or illness. Students who miss more than four classes may be asked to withdraw from the class.
3. Reading materials: Required should be completed prior to appropriate sessions, if instructed. Recommended readings are for further exploration, depending on student’s interest. Additional references are provided for informational purpose.
4. Homework and in-class exercise products and short reports will be due upon specified date, but usually no later than one week after when 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. Use of power point or similar media is highly recommended. The quality of the presentation will be judged based on how well it meets a majority of the five competency criteria.

Class Expectations:

In-class conduct: Use of cell phones, texting and email communications, and web surfing are prohibited during lectures and student presentations, except for emergencies. This course may be audiotaped for educational purposes.

Accommodations based upon sexual assault: The University is committed to offering reasonable academic accommodations to students who are victims of sexual assault. Depending on the specific nature of the allegation, such measures may include but are not limited to: implementation of a no-contact order, course/classroom assignment changes, and other academic support services and accommodations. If you

3. Guest lectures are subject to availability of lecturers.
need to request such accommodations, please direct your request to Kim Webb (kim_webb@wustl.edu),
Director of the Relationship and Sexual Violence Prevention Center. Ms. Webb is a confidential resource;
however, requests for accommodations will be shared with the appropriate University administration and
faculty. The University will maintain confidential any accommodations or protective measures provided to an
individual student so long as it does not impair the ability to provide such measures.

WUSM mental health services: Mental health services are available for full-time students enrolled on the
Medical School campus. Students can self-refer to a counselor (phone: 314-362-2404, Option # 1 or Option #
2); or make an appointment through Student Health Services (SHS), telephone: 314-362-3523, and follow the
prompts. There are also contractual mental health service providers who are available off-campus. More
information regarding this coverage and a list of participating providers are accessible via:
https://wusmhealth.wustl.edu/ and then clicking on Students and scrolling down to Mental Health Information
https://wusmhealth.wustl.edu/students/mental-health-information/

Required Reading Materials (available in pdf format):

Kleinman A. The Illness Narratives: Suffering, Healing, and the Human Condition. Selected chapter(s) Basic

Hyder, AA, Puvanachandra P, Morrow RH. Measures of health and disease in populations. In Merson MH,
&Bartlett Learning, 2012 (Chap 1).

World Health Organization. The Global Burden of Disease concept (Chap 3). Available at:

Lopez AD, Mathers CD, Ezzati M, Jamison DT, Murray CJL (Eds.). Global Burden of Disease and Risk


Solberg CT, Norheim OF, Barra M. The disvalue of death in the global burden of disease. J Med Ethics:

Voigt K, King NB. Disability weights in the global burden of disease 2010 study: two steps forward, one step

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 presentation and useful
materials will be made available in Canvas. Materials used for each week are posted for informational
purposes and are not required readings.
Course Segments:

The didactic lectures are organized to conceptually in six segments.

(1) Introduction to global health and global burden of disease, as well as quantitative and narrative methodologies of GBD.

(2) Practicing measurements of basic GBD concepts and learning global, regional and local GBD trends, both disease specific and combined disease groups.

(3) Introduction to global psychiatric and addiction diseases and trends in burden of diseases, risk factors, and prevention.

(4) Introduction to global, national and local trends and sociocultural factors in the infectious diseases and GBD.

(5) Introduction to non-communicable chronic medical diseases, trends, risk factors, and prevention.

(6) Topical areas including maternal and child health, social determinants of health, environments and health.

Week 1: Thursday, August 30, 2017

<table>
<thead>
<tr>
<th>Lecture: Introduction to the Global Burden of Disease (Price)</th>
<th>Methods and Practices</th>
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<tbody>
<tr>
<td>o Class introduction</td>
<td>o Group discussion and informal reporting: What GBD means to you? What do you like to achieve?</td>
</tr>
<tr>
<td>o Course overview</td>
<td>o Discussion: Why global health, why global burden of disease?</td>
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<tr>
<td>o Historical background for global health and global burden of diseases</td>
<td>o IHME GBD visualization tools</td>
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<tr>
<td>o Millennium Developmental Goals (MDG) and Sustainable Developmental Goals (SDG)</td>
<td>o MDG &amp; SDG homework instruction</td>
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<tr>
<td>o Transdisciplinary perspective on global health research and practice</td>
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<tr>
<td>o Peril of the Amazonas: Case example illustrating the impact of economy, environment, cultures on global health and illness</td>
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Week 2: Thursday, September 6, 2018

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<tr>
<td>o Major WHO-initiated studies</td>
<td>o MDG &amp; SDG report</td>
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<tr>
<td>o The global burden of disease, injuries and risk factors 2020, introduction</td>
<td>o International disease classification systems</td>
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<tr>
<td>o Basic model of global burden of disease</td>
<td>o Basic epidemiological measures</td>
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<td></td>
<td>o GBD basic measures: years of life lost (YLL); disability weights; years of life lost due to disability (YLD); disability-adjusted life years (DALY)</td>
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<td>o DisMod-II to DisMod-MR</td>
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<td>o Short report #1 instructions</td>
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Week 3: Thursday, September 13, 2018

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<thead>
<tr>
<th>Lecture: Illness Experiences (Price, Benson)</th>
<th>Methods and Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>o Disease and illness</td>
<td>o Gapminder introduction and practice</td>
</tr>
<tr>
<td>o Illness experiences-student report</td>
<td>o Short report #1 discussion</td>
</tr>
<tr>
<td>o Cultural Competency</td>
<td>o Group discussion: class project</td>
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<tr>
<td>o Medical anthropology</td>
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Week 4: Thursday, September 20, 2018
### Lecture: Global Burden of Psychiatric and Addiction Diseases (Price)

- Global trends in major psychiatric disorders
- Selected addiction and substance abuse global trends
- Consultation for final presentations

### Methods and Practices

- GBD basic measures: years of life lost (YLL); disability weights; years of life lost due to disability (YLD); disability-adjusted life years (DALY)
- DisMod-II to DisMod-MR
- Group discussion: class project

#### Week 5: Thursday, September 27, 2018

### Lecture: Global Burden of Psychiatric and Addiction Diseases (Glowinski, Price)

- Suicide, injury and violence
- Global monitoring, prevention, intervention, and health promotion
- Stigma
- Mental health on our campus

### Methods & Practices (Price, Shroff)

- Other commonly used health metrics: Healthy life years (HeaLY); quality-adjusted years (QUALY)
- DisMod-II instructions
- Discussion: stigma
- Group discussion: class project progress report
- Short report #2 instructions

#### Week 6: Thursday, October 4, 2018

### Lecture: Global Burden of Infectious Diseases

- Introduction to global infectious diseases
- Tropical infectious diseases
- Malaria
- Critical care development in resource poor countries

### Methods and Practice

- Class exercise using DisMod II, chronic disease examples
- Computations of YLL, YLD, and DALY
- Group discussion: class project

#### Week 7: Thursday, October 11, 2018

### Lecture: Global Burden of Infectious Diseases

- Sexually transmitted infections
- Prevention and control
- Recent epidemics (Ebola, Zika)
- AIDS as a paradigm

### Methods and Practices

- Comparative risk assessment (CRA) concepts and model
- Group discussion: class project

#### Week 8: Thursday, October 18, 2018

### Lecture: Maternal and Child Health (Toriola)

- Infant and maternal mortality and morbidity measures
- Maternal and child health in developing countries

### Methods and Practices (Price, Shroff)

- Comparative risk assessment (CRA) concepts and model
- Computation of CRA
- Bayesian regression basis
- CRA group exercises
- Short report #3 instructions

#### Week 9: Thursday, October 25, 2018

### Lecture: Maternal and Child Health (Ssewamala)

- Sustainable interventions in African countries

### Methods and Practices (Price)

- CRA group exercise presentations
- CRA risk factor examples and practices
- Introduction to other datasets
- Short report #3 discussion
## Week 10: Thursday, November 1, 2018

**Lecture: Global Burden of Non-communicable Medical Diseases (NCDs)**
- Major chronic diseases in developed countries: adult geriatric diseases (cancer, obesity, cardiovascular diseases)
- Prevention and intervention studies of major diseases and eradicating underlying conditions
- Health promotion in developed countries
- Best buys and obstacles for prevention

**Methods and Practices (Price)**
- Class project: abstract presentation
- Short report #4 instructions

## Week 11: Thursday, November 8, 2018

**Lecture: Economic and Social Determinants of Global Health (Price)**
- Health or wealth? A case example from the Amazonas
- WASH

**Methods and Practices (Price)**
- Short report #4 discussion
- Group discussion: class project
- Short report #5 instruction

## Week 12: Thursday, November 15, 2018

**Lecture: Ethical Considerations in Global Health Research**
- Informed consent in international research
- Ethical issues in genetics research
- Responsible conduct as a global citizen
- Ethics of global critical care

**Methods and Practices (Price)**
- Ethics – case example
- Informed consent in international research
- Q&A for group presentation for Week 15-16
- Presentation outline due

## Week 13: Thursday, November 22, 2018 – NO CLASS, Thanksgiving

## Week 14: Thursday, November 29, 2018

**Student presentations**
- Stigma buster competition presentations & discussions

## Week 15: Thursday, December 6, 2018

**Student presentations**
- Class project presentations & discussions

## Week 16: Thursday, December 13, 2018

**Student presentations**
- Class project presentations
- Class discussion
- Final class presentation due
- Missed assignments makeup time
- Course evaluation

Version 5: 08-25-2018