

# Infectious Diseases of Bolivia

## Summer 2023

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### COURSE DESCRIPTION

Introduces the basic methods for infectious disease epidemiology and case studies of important disease syndromes and entities in Bolivia. Environmental and social factors and the role they play in disease outbreak will be discussed. Methods include definitions and nomenclature, outbreak investigations, disease surveillance, case-control studies, cohort studies, laboratory diagnosis, molecular epidemiology, dynamics of transmission, and assessment of vaccine field effectiveness.

### COURSE OBJECTIVES

- (1) To introduce students to the concepts of Infectious Disease Epidemiology and the Diseases that plague Bolivia
- (2) To introduce students to the complex issues of climate, SES, and globalization and the affect these have on disease spread
- (3) To help students gain a better appreciation for the historical and experimental basis of our current understanding of Public Health.

### COURSE MATERIALS

- A series of scientific articles and readings that will be provided to the students in digital form and/or in a bound print form.

### Supplementary Materials

In addition to the course materials, students may want to use the following:

- A calculator with square root and logarithmic functions for some of the exercises.

**It is REQUIRED that students read the appropriate material prior to the lecture to get the big picture and again after the lecture to reinforce the details covered during the class period.**

### COURSE EVALUATION

#### Class participation and attendance (20%)

Students are expected to keep up to date with readings, attend classes and fieldtrips, and engage in class discussion of readings and fieldtrips.

Each class will be based on 5 points scale: 5 points-attended, participated beyond expectations (spoke at least 3 times), respectful towards lecturer, material and classmates; 4 points- attended, participated expectedly (spoke at least 2 times), respectful towards lecturer, material and classmates; 3 points- attended, participated standardly (spoke at least once), respectful towards lecturer, material and classmates; 2 points-attended, did not participate, respectful towards lecturer, material and classmates; 1 point-attended or excused absences (each absences will be examined case by case) and/or disrespectful towards lecturer, material and classmates; 0 points-Unexcused absences.

#### Journaling (30%)

Students will keep journal entries that analyze the weekly course materials and cultural encounters. These reflections may be drawn from both courses and should connect their overall experiences in Bolivia with courses' reading materials, lectures, and discussions. Each student will submit TWO 2-3 page (double spaced, Calibri (Body), font 11) analytic journal entries during the course. Due dates are as followed: TBD

#### Final Project Presentation (10%)

Students will give a 10 minute presentation on their final project topic. This presentation should explain the reasons as to why this topic was chosen, what strategies they would implement to control the problem, and how they plan to disseminate the information to the public.

### Final Project (40%)

Students will develop a 5-8 paged (double spaced, Calibri (Body), font 11) Final Project on an infectious public health issue in Bolivia that interests them. This topic can be one that was presented throughout the program or one that they would like to investigate more so after their time spent in Bolivia. The paper will be due exactly two weeks after the program ends.

### Final Grade

Your final grade will be determined by the following (this is approximate and is subject to change):

|                    |         |
|--------------------|---------|
| Journaling         | 150pts  |
| Final presentation | 50 pts  |
| Campaign project   | 200pts  |
| Attendance         | 100 pts |
| <br>               |         |
| Total              | 500 pts |

### GRADE RANGES

|    |                |    |                 |
|----|----------------|----|-----------------|
| A  | 93.00 – 100%   | C  | 73.00 – 76.99%  |
| A- | 90.00 – 92.99% | C- | 70.00 – 72.99%  |
| B+ | 87.00 – 89.99% | D+ | 67.00 – 69.99%  |
| B  | 83.00 – 86.99% | D  | 63.00 – 66.99%  |
| B- | 80.00 – 82.99% | D- | 60.00 – 62.99%  |
| C+ | 77.00 – 79.99% | F  | 59.99 and below |

### ACADEMIC INTEGRITY

Work is to be completed individually. Homework assignments may be discussed with classmates, however each student must write and submit their own, individually written homework assignments. Appropriate citations for work derived from published literature or reliable internet sources (this does not include Wikipedia) must be included in written assignments. Cheating of any kind is unethical and WILL NOT be tolerated, this includes copying from other students or from published book and articles including the internet. Failure to comply will lead to sanctions against the student in accordance with the university policies. These can be found on the UPJ homepage/ Academics page/ Academic Advising page ([www.upj.pitt.edu/3387/](http://www.upj.pitt.edu/3387/)). Sanctions may include a reduction in grade or failure in the course, depending on the severity of the offense.

### Disability Accommodations

If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and the Office of Health & Wellness Services, G10 Student Union, (814) 269-7119(voice)/(814) 269-7186 as early as possible in the term. the Office of Health & Wellness Services will verify your disability and determine reasonable accommodations for this course.

| Class | Topic  | Reading  |
|-------|--|--|
| 1     | The Geographical Context of Bolivia (Andean, Amazonian and Chaco regions)                          | <b>Overview:</b> Understanding the geographical location of Bolivia as well as the vast topography of the country in order to understand the infectious diseases facing the Bolivian communities<br><b>Readings:</b><br>Richards, K.J. (2009). <i>Culture Smart! Bolivia</i> . New York: Kuperard.<br><br>Journal  |
| 2     | Visit a public hospital  | Journal on experience and questions  |
| 3     | Medical Systems in Bolivia (Private vs. Public Care)   | <b>Overview:</b> Understand the current medical system in place for both Public and Private sectors; sanitary problems and public funding<br><br>No reading for this section<br><br>Journal  |
| 4     | Visit a private hospital   | Journal on experience and questions  |
| 5     | Guest Lecture  | How insurance works in Bolivia<br><br>Students will be in small groups after lecture to ask questions<br><br>Journal   |
| 6     | Introduction: Background on Immune functions<br><br>Introduction to Microbes                       | Warrington, R., Watson, W., Kim, H.L. <i>et al.</i> An introduction to immunology and immunopathology. <i>All Asth Clin Immun</i> 7, S1 (2011).<br><a href="https://doi.org/10.1186/1710-1492-7-S1-S1">https://doi.org/10.1186/1710-1492-7-S1-S1</a><br><br>No reading for this section  |
| 7     | Introduction to ecological principles of disease<br><br>Introduction to social issues with disease | Trop. Med. Infect. Dis. 2019, 4(2), 88;<br><a href="https://doi.org/10.3390/tropicalmed4020088">https://doi.org/10.3390/tropicalmed4020088</a><br>Received: 28 May 2019 / Accepted: 30 May 2019 / Published: 31 May 2019<br><br>Buckee, C., Noor, A. & Sattenspiel, L. Thinking clearly about social aspects of infectious disease transmission. <i>Nature</i> 595, 205–213 (2021).<br><a href="https://doi.org/10.1038/s41586-021-03694-x">https://doi.org/10.1038/s41586-021-03694-x</a> |
| 8     | Introduction to Epidemiology<br><br>Summarizing Data<br><br>Measures of Risk                       | Principles of Epidemiology in Public Health Practice pages 1-1 to 1-80<br><br>Principles of Epidemiology in Public Health Practice pages 2-1 to 2-58<br><br>Principles of Epidemiology in Public Health Practice pages 3-1 to 3-50   |
| 9     | Displaying Data  | Principles of Epidemiology in Public Health Practice   |

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|    |   | pages 4-1 to 4-79   |
|    | <b>Problem Based Activities</b>   |   |
| 10 | <b>Guest Lecture</b>  | <p>How hospitals operate in Bolivia</p> <p>Students will be in small groups after lecture to ask questions</p>  |
| 11 | <p><b>Bacterial Infections in Bolivia</b></p> <p><b>Cholera</b></p>                     | <p>Guglielmetti, P., Bartoloni, A., Roselli, M., Gamboa, H., Antunez, D. J., Luzzi, I., Paradisi, F. (1992). Population movements and cholera spread in cordillera province, santa cruz department, bolivia. <i>The Lancet</i>, 340(8811), 113.<br/>doi:<a href="http://dx.doi.org.pitt.idm.oclc.org/10.1016/0140-6736(92)90432-3">http://dx.doi.org.pitt.idm.oclc.org/10.1016/0140-6736(92)90432-3</a></p> <p>Helgegren I, Rauch S, Cossio C, Landaeta G, McConville J (2018) Importance of triggers and veto barriers for the implementation of sanitation in informal peri-urban settlements – The case of Cochabamba, Bolivia. <i>PLOS ONE</i> 13(4): e0193613. <a href="https://doi.org/10.1371/journal.pone.0193613">https://doi.org/10.1371/journal.pone.0193613</a></p> <p>In class activity on spread of Cholera</p> |
| 12 | <p><b>Bacterial Infections in Bolivia</b></p> <p><b>Typhoid</b></p>                     | <p>Simon Dejung; Ivan Fuentes; Gabriela Almanza; Ruth Jarro; Lizeth Navarro; Gina Arias; Evelin Urquieta; Abraham Torrico; Wilma Fenandez; Mercedes Iriarte Christof Birrer; Werner A. Stahel; Martin Wegelin<br/><i>Journal of Water Supply: Research and Technology-Aqua</i> (2007) 56 (4): 245–256.<br/><a href="https://doi.org/10.2166/aqua.2007.058">https://doi.org/10.2166/aqua.2007.058</a></p>  |
| 13 | <b>Field trip to water purification site</b>  | <p>Site TBD</p> <p>Helgegren I, Rauch S, Cossio C, Landaeta G, McConville J (2018) Importance of triggers and veto-barriers for the implementation of sanitation in informal peri-urban settlements – The case of Cochabamba, Bolivia</p>   |
| 14 | <p><b>Viral Infections in Bolivia</b></p> <p><b>Yellow Fever, Zika, Chikungunya</b></p> | <p>Quintero, J., Brochero, H., Manrique-Saide, P. et al. (2014) Ecological, biological and social dimensions of dengue vector breeding in five urban settings of Latin America: a multi-country study</p> <p>Escalera-Antezana JP, Murillo-Garcia D, Gomez C, Unzueta-Quiroga R, Rodriguez-Morales A, (2018) Chikungunya in Bolivia: Domestic imported case series in Cochabamba.</p>   |

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|    |  | Berger, Stephen.(2017) Chikungunya and Zika: Global Status  |
| 15 | Viral Infections in Bolivia<br>Hemorrhagic Fevers          | Delia A. Enria, Francisco Pinheiro,<br>RODENT-BORNE EMERGING VIRAL ZONOSIS: Hemorrhagic Fevers and Hantavirus Infections in South America, Infectious Disease Clinics of North America,<br>Volume 14, Issue 1, 2000, Pages 167-184,<br><br>Montgomery JM, Blair PJ, Carroll DS, Mills JN, Gianella A, Iihoshi N, et al. (2012) <i>Hantavirus Pulmonary Syndrome in Santa Cruz, Bolivia: Outbreak Investigation and Antibody Prevalence Study.</i> |
| 16 | Parasitic Infections in Bolivia<br>Protists<br>Giardia     | Macchioni F, Segundo H, Gabrielli S, et al. Dramatic decrease in prevalence of soil-transmitted helminths and new insights into intestinal protozoa in children living in the Chaco region, Bolivia. <i>Am J Trop Med Hyg.</i> 2015;92(4):794-796. doi:10.4269/ajtmh.14-0039  |
| 17 | Parasitic Infections in Bolivia<br>Protists<br>Chagas      | Joseph William Bastien Chapter 10: <i>Sucking blood or snatching fat Chagas' disease in Bolivia</i><br><br>Salm, A., Gertsch, J. <i>Cultural perception of triatomine bugs and Chagas disease in Bolivia: a cross-sectional field study</i>   |
| 18 | Parasitic Infections in Bolivia<br>Helminths<br>Flatworms  | Asai T, Córdova Vidal C, Strauss W, Ikoma T, Endoh K, Yamamoto M (2016) Effect of Mass Stool Examination and Mass Treatment For Decreasing Intestinal Helminth and Protozoan Infection Rates in Bolivian Children: A CrossSectional Study   |
| 19 | Parasitic Infections in Bolivia<br>Helminths<br>Roundworms | Influence of helminth infections on childhood nutritional status in lowland Bolivia†<br>S. Tanner,W.R. Leonard,T.W. Mcdade,V. Reyes-Garcia,R. Godoy,T. Huanca, First published: 28 April 2009 <a href="https://doi.org/10.1002/ajhb.20944">https://doi.org/10.1002/ajhb.20944</a>   |
| 20 | Final Presentations  |   |