

WWS 571c  
Topics in Development: Challenges of Infection, Burden and Control  
Syllabus

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Infectious diseases are major contributors to the global burden of illness in terms of morbidity and mortality. Over the past few decades and in spite of earlier achievements in controlling few major infections, new challenges are undermining the global effort by the emergence and re-emergence of new pathogens, development of resistance in microbes and their vectors and the intentional use of microorganisms to cause harm. Furthermore, policies and tools for prevention and control are not keeping pace with expanded threats.

**Objectives:**

In order to appreciate the global challenge of infectious disease, this course has three objectives. First, it explores the biological and epidemiological fundamentals of human-microbes interaction including dynamics of transmission of infectious agents in human populations. This knowledge will then be used to examine the impact of different disease control strategies on interruption of transmission and reduction of burden of illness. The second objective is to examine several model infectious diseases as case studies for policies impacting their endemicity, burden of illness and efforts to prevent and limit their spread. These will include examples of viral infections such as Poliomyelitis and HIV/AIDS, bacterial pathogens such as pneumococci and tuberculosis and parasites such as malaria and neglected tropical diseases. The third objective is to examine the role of several international organizations, partnerships and philanthropy in developing policies and implementing programs for control of global infection.

**Readings:**

The purpose of the required reading list is to expose students to a selective range of studies and reviews used to explore the challenge of global infection and strategies for their control. The course is intended to facilitate students appreciation of biological and epidemiological findings and how they are used to develop and implement control policies for infectious disease. Emphasis will be placed on critical examination of the impact of these plans. The format of the class will combine lecture presentation and

discussion. It is essential therefore, that students come to class having completed the readings assigned for each week. Additional reading may be distributed in class.

The following topics and readings are designed to cover the three objectives of the course.

Date	Week	Topics	Papers
9/17	1	<ul style="list-style-type: none"> <li>• Introduction and plan of course <ul style="list-style-type: none"> <li>➤ Objectives:</li> <li>➤ Content</li> <li>➤ Assignments</li> </ul> </li> <li>• Challenges of Global Infection</li> <li>• Infectious history <ul style="list-style-type: none"> <li>➤ Germ Theory</li> <li>➤ War metaphor</li> <li>➤ A new ecological understanding</li> <li>➤ Origin of human pathogens</li> </ul> </li> <li>• Impact of evolution on humans and microbes</li> </ul>	<p>Lopez, A.D., <i>et al</i> (2006) Global and regional burden of disease and risk factors, 2001: systematic analysis of population health data. <i>Lancet</i> <b>367</b>: 1747-1757.</p> <p>Lopez, A.D., Mathers C.D. (2006) Measuring the global burden of disease and epidemiological transitions: 2002-2030. <i>Ann. Trop. Med. Parasitol.</i> <b>100</b>:481-99.</p> <p>Jones, K.E., <i>et al</i> (2008) Global trends in emerging infectious diseases. <i>Nature</i> <b>451</b>:990-994.</p> <p>Lederberg J. (2000) Infectious history. <i>Science</i> <b>288</b>:287-293.</p> <p>Wolfe ND, Dunavan CP and Diamond J. (2007) Origins of major human infectious diseases. <i>Nature</i> <b>477</b>: 279-283.</p>
9/24	2	<p>Human-microbe interplay</p> <ul style="list-style-type: none"> <li>• Epidemiology and dynamics <ul style="list-style-type: none"> <li>➤ Phenomena in populations</li> <li>➤ Transmission dynamics</li> <li>➤ <math>R_0</math></li> </ul> </li> <li>• Immunology <ul style="list-style-type: none"> <li>➤ Innate and adaptive</li> </ul> </li> </ul>	<p>Real L.A., Biek R. (2007) Infectious Disease Modeling and Dynamics of Transmission. <i>CTMI</i> <b>315</b>:33-49.</p> <p>Breban R, Vardavas R, and Blower S. (2007) Theory versus data: How to calculate <math>R_0</math>? <i>PLoS ONE</i> <b>2</b>: e282.</p> <p>Kawai T &amp; Akira S. (2006). Innate immune recognition of viral infection. <i>Nat Immunol.</i> <b>7</b>: 131-137.</p> <p>Alberts, B. <i>et al</i> (2007) Chapter 25 The Adaptive Immune System pp1539-1600. <i>In Molecular Biology of the Cell, Fifth Edition</i>, Garland Science Press.</p> <p>Sirugo G., <i>et al</i>(2008) Genetic studies of African populations: an overview on disease susceptibility and response to vaccines and therapeutics. <i>Hum. Genet.</i> <b>123</b>:557-598.</p>

		<ul style="list-style-type: none"> <li>➤ Recognition</li> <li>➤ Effector mechanisms</li> <li>• Genetics <ul style="list-style-type: none"> <li>➤ Variability in microbes</li> <li>➤ Host susceptibility</li> <li>➤ Impact</li> </ul> </li> </ul>	
10/1	3	<p>Challenges of Infection</p> <ul style="list-style-type: none"> <li>• Emergence and reemergence <ul style="list-style-type: none"> <li>➤ Etiology/risk factors</li> <li>➤ Responses</li> </ul> </li> <li>• Resistance <ul style="list-style-type: none"> <li>➤ Naturally occurring</li> <li>➤ Antimicrobials</li> <li>➤ Antivectors</li> </ul> </li> <li>• Intent to harm <ul style="list-style-type: none"> <li>➤ Bioterrorism</li> <li>➤ Dual use research</li> </ul> </li> </ul>	<p>Weiss RA &amp; McMichael AJ. (2004). Social and environmental risk factors in the emergence of infectious diseases. <i>Nat Med.</i> <b>10</b>: s70-s76.</p> <p>Dethlefsen L., McFall-Nagai M., Reman D. A. (2007) An ecological and evolutionary perspective on human-microbe mutualism and disease. <i>Nature</i> <b>449</b>:811-818.</p> <p>Levy SB &amp; Marshall B. (2004) Antibacterial resistance worldwide: causes, challenges and responses. <i>Nat Med Supp.</i> <b>10</b>: S122-128.</p> <p>Dantas G. et al (2008) Bacteria subsisting on antibiotics. <i>Science</i> <b>320</b>:100-103.</p> <p>Nauen, R. (2007) Insecticide resistance in disease vectors of public health importance. <i>Pest Management Science</i> <b>63</b>:628-633.</p> <p>Elder BD, Dukic VM, and Dwyer G. (2006). Uncertainty in predictions of disease spread and public health responses to bioterrorism and emerging diseases. <i>PNAS</i> <b>103</b>: 15693-15697.</p> <p>National Research Council (2004) Biotechnology Research in the Age of Terrorism. Executive Summary. <i>The National Academies Press</i>, Washington D.C. pp 1-14.</p> <p>Moran G. J., Talan D. A., Abrahamian F. M. (2008) Biological terrorism. <i>Infect. Dis. Clin. North Am.</i> <b>22</b>:148-87.</p>
10/8	4	<p>Control/Prevention of infectious disease</p> <ul style="list-style-type: none"> <li>• Multiplicity of approaches <ul style="list-style-type: none"> <li>➤ Development</li> <li>➤ Sanitation</li> <li>➤ Antimicrobials</li> <li>➤ Vaccines</li> </ul> </li> </ul>	<p>Achievements in Public Health, 1900-1999:Control of Infectious Diseases. <i>MMWR</i> <b>48</b>:621-629.</p> <p>Andre F. E. <i>et al</i> (2008) Vaccination greatly reduces disease, disability, death and inequity worldwide. <i>Bulletin of the World Health Organization</i> <b>86</b>:140-146</p> <p>Roush S.W. (2008) Historical Comparisons of Morbidity and Mortality for Vaccine-Preventable Diseases in the United States. <i>JAMA</i> <b>298</b>:2155-2163.</p> <p>Plotkin S.A. (2005) Vaccines: past, present and future. <i>Nature Medicine</i> <b>11</b>:suppl s5-s11.</p> <p>Kimman T.G., <i>et al.</i> (2006) Developing a vaccination evaluation model to support evidence-</p>

		<ul style="list-style-type: none"> <li>• Veterinary Health</li> <li>• vaccination</li> </ul>	<p>based decision making on national immunization programs. <i>Vaccine</i> <b>24</b>:4769-4778.</p> <p>Rodier G., <i>et al</i> (2007) Global Public Health Security. <i>Emerging Infectious Diseases</i> <b>13</b>:1447-1452.</p> <p>French N. P., Gemmell N. J., Buddle B. M. (2007) Advances in biosecurity to 2010 and beyond: towards integrated detection analysis and response to exotic pest invasions. <i>N. Z. Vet. J.</i> <b>55</b>:255-263.</p>
10/15	5	<p>Case Studies I</p> <ul style="list-style-type: none"> <li>➤ Success with smallpox <ul style="list-style-type: none"> <li>• Biological and clinical features</li> <li>• Properties of vaccine</li> <li>• Global Campaign</li> </ul> </li> <li>➤ Struggle with Polio <ul style="list-style-type: none"> <li>• Biological and clinical features</li> <li>• Trivalent and monovalent vaccines</li> <li>• The case of Nigeria and India</li> <li>• Is eradication feasible?</li> </ul> </li> </ul>	<p>Henderson DA, <i>et al.</i> (1999) Smallpox as a biological weapon: medical and public health management. <i>JAMA.</i> <b>281</b>: 2127-2137.</p> <p>Henderson DA. (1999) Lessons from the eradication campaigns. <i>Vaccine</i> <b>17</b>:s53-s55.</p> <p>Ferguson N. M., <i>et al</i> (2003) Planning for smallpox outbreaks. <i>Nature</i> <b>425</b>:681-685.</p> <p>Centers for Disease Control and Prevention (CDC). (2007) Household transmission of vaccinia virus from contact with a military smallpox vaccinee--Illinois and Indiana, 2007. <i>MMWR</i> <b>56</b>: 478-481.</p> <p>Racaniello VR. (2006) One hundred years of poliovirus pathogenesis. <i>Virology.</i> <b>344</b>: 9-16.</p> <p>Progress Toward Interruption of Wild Poliovirus Transmission – Worldwide, January 2007 – April 2008. (2008) <i>MMWR</i> <b>57</b>:489-494.</p> <p>Paul Y. (2007) Role of genetic factors in polio eradication: New challenge for policy makers. <i>Vaccine</i> <b>25</b>:8365-8371.</p> <p>Rey M., Girard M. P. (2008) The global eradication of poliomyelitis: Progress and problems. <i>Comparative Immunology, Microbiology &amp; Infectious Diseases</i> <b>31</b>:317-325.</p> <p>Thompson K. M., <i>et al</i> (2008) The Risks, Costs, and Benefits of Possible Future Global Policies for Managing Polioviruses. <i>Am. J. Pub. Health</i> <b>98</b>:1322-1330.</p>
10/22	6	<p>Case Studies II</p> <ul style="list-style-type: none"> <li>• Mixed Success “Measles” <ul style="list-style-type: none"> <li>➤ Biological and Clinical features</li> <li>➤ Vaccination in developed countries</li> <li>➤ Vaccination in Latin America</li> </ul> </li> </ul>	<p>Moss WJ, Griffin DE. (2006) Global measles elimination. <i>Nat Rev Microbiol.</i> <b>4</b>: 900-908.</p> <p>Acharya A, <i>et al.</i> (2002) Cost-effectiveness of measles elimination in Latin America and the Caribbean: a prospective analysis. <i>Vaccine.</i> <b>20</b>: 3332-3341.</p> <p>Otten M, <i>et al.</i> (2005) Public-health impact of accelerated measles control in the WHO African Region 2000-03. <i>Lancet.</i> <b>366</b>: 832-839.</p> <p>Palese P. (2004) Influenza: old and new threats. <i>Nat Med.</i> <b>10</b>: S82-87.</p> <p>Vardavas R., Breban R., and Blower S. (2007) Can Influenza Epidemics Be Prevented by Voluntary Vaccination? <i>PLoS Computational Biology</i> <b>3</b>:796-802.</p> <p>Davey V. J., <i>et al</i> (2008) Effective, Robust Design of Community Mitigation for Pandemic</p>

		<ul style="list-style-type: none"> <li>➤ A global campaign?</li> <li>• Mixed Success “Influenza”</li> <li>➤ Biological &amp; Clinical features</li> <li>➤ Vaccine for seasonal flu</li> <li>➤ Threat of Pandemics</li> </ul>	<p>Influenza: A Systematic Examination of Proposed US Guidance. <i>PLoS One</i> <b>3</b>:1-14.</p> <p>McLeod M., <i>et al</i> (2008) Border control measures in the influenza pandemic plans of six South Pacific nations: a critical review. <i>N. S. Med. J.</i> <b>121</b>:62-72.</p> <p>Miller M. A., <i>et al</i> (2008) Prioritization of Influenza Pandemic Vaccination to Minimize Years of Life Lost. <i>IID</i> <b>198</b>:305-311.</p> <p>Ehrlich H. J., <i>et al</i> (2008) A Clinical Trial of a Whole-Virus H5N1 Vaccine Derived from Cell Culture. <i>N. Engl. J. Med.</i> <b>358</b>:2573-2584.</p>
11/5	7	<p>Case Studies III</p> <p>The major unresolved Challenges</p> <p>Malaria</p> <ul style="list-style-type: none"> <li>• Biology and burden</li> <li>• Control strategies</li> <li>• Limitations <ul style="list-style-type: none"> <li>➤ Confused objectives</li> <li>➤ Antimalarial resistance</li> <li>➤ Insecticide resistance</li> </ul> </li> <li>• ? Vaccines</li> </ul> <p>TB</p> <ul style="list-style-type: none"> <li>• Biology and burden</li> <li>• Control Strategies <ul style="list-style-type: none"> <li>➤ Historical</li> <li>➤ Current: Drugs BCG</li> <li>➤ Implementation: DOTS</li> </ul> </li> <li>• Drug resistance</li> </ul>	<p>Greenwood B. M., <i>et al</i> (2008) Malaria: progress perils and prospects for eradication. <i>The Journal of Clinical Investigation</i> <b>118</b>:1266-1276.</p> <p>Roca-Feltre A., Carneiro I, Armstrong Schellenberg J. R. (2008) Estimates of the burden of malaria morbidity in Africa in children under the age of 5 years. <i>Trop. Med. Int. Health</i> <b>13</b>:771-783.</p> <p>White N. J. (2008) Qinghaosu (Artemisinin): The Price of Success. <i>Science</i> <b>320</b>:330-334.</p> <p>Langhorne J., <i>et al</i> (2008) Immunity to malaria: more questions than answers. <i>Nature Immunology</i> <b>9</b>:725-732.</p> <p>Walther B., Walther M. (2007) What does it take to control Malaria? <i>Ann. Trop. Med. Parasitol.</i> <b>101</b>:657-672.</p> <p>Dye C., <i>et al</i> (2008) Measuring tuberculosis burden, trends, and the impact of control programmes. <i>The Lancet</i> <b>8</b>:233-243.</p> <p>Young D. B., <i>et al</i> (2008) Confronting the scientific obstacles to global control of tuberculosis. <i>The Journal of Clinical Investigation</i> <b>118</b>:1255-1265.</p> <p>Hoft D. F. (2008) Tuberculosis vaccine development: goals, immunological design, and evaluation. <i>The Lancet</i> <b>372</b>:164-175.</p> <p>Floyd K., Pantoja A. (2008) Financial resources required for tuberculosis control to achieve global targets set for 2015. <i>Bulletin of the World Health Organization</i> <b>86</b>:568-576.</p>

		<ul style="list-style-type: none"> <li>• ? Vaccines</li> </ul>	
11/12	8	<p>Case Studies IV Neglected Tropical Diseases</p> <ul style="list-style-type: none"> <li>• Worms: Schistosome, Hook worms etc.</li> <li>• Protozoa: leishmania, Trypanosoma</li> <li>• Bacteria: Chlamydia</li> </ul> <p>Control Strategies</p> <ul style="list-style-type: none"> <li>• Historical: Drugs &amp; Environment</li> <li>• Current: Drugs, Drugs!!</li> <li>• ? Vaccines</li> <li>• A comprehensive approach is needed</li> </ul>	<p>Mathers C. D., Ezzati M., Lopez A. D. (2007) Measuring the Burden of Neglected Tropical Diseases: The Global Burden of Disease Framework. <i>PLoS Neglected Tropical Diseases</i> <b>1</b>:1-15.</p> <p>Hotez P., <i>et al</i> (2007) Recent progress in integrated Neglected Tropical Diseases Control. <i>Trends in Parasitology</i> <b>23</b>:511-514.</p> <p>Hotez P. J., <i>et al</i> (2008) Helminth infections: the great neglected tropical diseases. <i>The Journal of Clinical Investigation</i> <b>118</b>:1311-1321.</p> <p>Singer B. H., Caldas de Castro M. (2007) Bridges to sustainable tropical health. <i>PNAS</i> <b>104</b>:16038-16043.</p>
11/19	9	<p>Case Studies V HIV/AIDS</p> <ul style="list-style-type: none"> <li>• Biology of human and animal immunodeficiency viruses</li> <li>• Host-pathogen relationship</li> <li>• Antiretroviral therapy <ul style="list-style-type: none"> <li>➤ Discovery</li> <li>➤ Policy</li> </ul> </li> </ul>	<p>Heeney J. L., Dalgies A. G., Weiss R. A. (2006) Origins of HIV and the evolution of resistance to AIDS. <i>Science</i> <b>313</b>:462-466.</p> <p>Piot P. (2006) AIDS: from crisis management to sustained strategic response. <i>The Lancet</i> <b>368</b>:526-530.</p> <p>Walker B. D., Burton D. R. (2008) Toward an AIDS Vaccine. <i>Science</i> <b>320</b>:760-764.</p> <p>Fauci, A. S., <i>et al</i> (2008) HIV vaccine research: the way forward. <i>Science</i> <b>321</b>:530-532</p> <p>Wools-Kaloustain K, Kimaiyo S, Diero L. <i>et al.</i> (2006) Viability and effectiveness of large scale HIV treatment initiatives in Sub-Saharan Africa: experience from Western Kenya. <i>AIDS</i> <b>20</b>:41-48.</p> <p>Gruskin S., Tarantola D. (2008) Universal Access to HIV prevention, treatment and care: assessing the inclusion of human rights in international and national strategic plans. <i>AIDS</i> <b>22</b>:Suppl 2:s123-32.</p>

		<ul style="list-style-type: none"> <li>➤ PEPFAR</li> <li>• Opportunistic infections/TB</li> <li>• Vaccine research</li> <li>• Prevention Policies</li> </ul>	<p>Russell S, <i>et al.</i> (2007) Coming back from the dead: living with HIV as a chronic condition in rural Africa. <i>Health Policy and Planning</i> pp.1-4.</p> <p>Charles M, Pape JW. (2006) Tuberculosis and HIV: Implications in the developing world. <i>Curr HIV/AIDS Rep.</i> <b>3</b>: 139-144.</p>
11/26	10	<p>Case Studies VI The big killers of children</p> <ul style="list-style-type: none"> <li>• Pneumonia <ul style="list-style-type: none"> <li>➤ Etiology and biological features</li> <li>➤ Burden of illness</li> <li>➤ Management</li> <li>➤ ? vaccines</li> </ul> </li> <li>• Diarrhea <ul style="list-style-type: none"> <li>➤ Etiology</li> <li>➤ Burden of illness</li> <li>➤ Management <ul style="list-style-type: none"> <li>▪ Water sanitation</li> <li>▪ Oral rehydration</li> <li>▪ ? vaccines</li> </ul> </li> </ul> </li> </ul>	<p>Mulholland K. (2007) Perspectives on the burden of pneumonia in children. <i>Vaccine.</i> <b>25</b>: 2394-2397.</p> <p>Chiang WC, <i>et al</i> (2007) Epidemiology, clinical characteristics and antimicrobial resistance patterns of community-acquired pneumonia in 1702 hospitalized children in Singapore. <i>Respirology.</i> <b>12</b>: 254-261.</p> <p>Roth D. E., <i>et al</i> (2008) Acute lower respiratory infections in childhood: opportunities for reducing the global burden through nutritional interventions. <i>Bulletin of the World Health Organization</i> <b>86</b>:356-364.</p> <p>Graham S. M., <i>et al</i> (2008) Challenges to improving case management of childhood pneumonia at health facilities in resource-limited settings. <i>Bulletin of the World Health Organization</i> <b>86</b>:349-355.</p> <p>Scott J. A. G., <i>et al</i> (2008) Pneumonia research to reduce childhood mortality in the developing world. <i>The Journal of Clinical Investigation</i> <b>118</b>:1291-1300.</p> <p>Petri Jr W. A., <i>et al</i> (2008) Enteric infections, diarrhea, and their impact on function and development. <i>The Journal of Clinical Investigation</i> <b>118</b>:1277-1290.</p> <p>Keusch G. T. <i>et al</i> (2006) Diarrheal Disease. <i>In Disease Control Priorities in Developing Countries.</i> D. T. Jamison <i>et al</i> (eds) <i>Oxford University Press</i>, New York, NY 371-388.</p> <p>Cunliffe N., Nakagomi O. (2007) Introduction of rotavirus vaccines in developing countries: remaining challenges. <i>Ann. Trop. Paediatr.</i> <b>27</b>:157-167.</p>
12/3	11	<p>The Global Response to Challenges of Infectious Diseases</p> <ul style="list-style-type: none"> <li>- Millennium Development Goals</li> <li>- International</li> </ul>	<p>Downs T. J. and Larson H. J. (2007) Achieving Millenium Development Goals for health: Building understanding, trust and capacity to respond. <i>Health Policy</i> <b>83</b>:144-161.</p> <p>Cohen J. (2006) The New World of Global Health. <i>Science</i> <b>311</b>:162-167.</p> <p>Bland J, Clements J. (1998) Protecting the world's children: the story of WHO's immunization programme. <i>World Health Forum.</i> <b>19</b>: 162-173.</p> <p>Cutts FT (1998) Advances and challenges for the expanded progression on Immunization.</p>

		<p>organizations WHO UNICEF</p> <ul style="list-style-type: none"> <li>- New Partnerships</li> <li>    GAVI Alliance</li> <li>    Global Fund for HIV, TB and Malaria</li> <li>- Global Philanthropy</li> </ul>	<p><i>British Med. Bul.</i> <b>54</b>:445-461.</p> <p>Baker M. G. and Fidler D. P. (2006) Global public health surveillance under new international health regulations. <i>Emerg. Infect. Dis.</i> <b>12</b>:1058-1065.</p> <p>UNICEF's Role in Global Immunization.</p> <p>Global Immunization Vision and Strategy 2006-2015. <a href="http://who.int/vaccines-document/docsPDF/GIVS_final_EN.pdf">http://who.int/vaccines-document/docsPDF/GIVS_final_EN.pdf</a>.</p> <p>GAVI Alliance Strategy (2007-2010) accessed at <a href="http://www.gavialliance.org/vision/strategy/index.php">http://www.gavialliance.org/vision/strategy/index.php</a> on 8/8/08.</p> <p>Lu C, <i>et al</i> (2006) Effect of the Global Alliance for Vaccines and Immunisation on diphtheria, tetanus, and pertussis vaccine coverage: an independent assessment. <i>Lancet.</i> <b>368</b>: 1088-1095.</p> <p>Radelet S, Siddiqi B. (2007) Global Fund grant programmes: an analysis of evaluation scores. <i>Lancet.</i> <b>369</b>: 1807-1813.</p> <p>Galárraga O., Bertozzi S. M. (2008) Stakeholders' opinions and expectations of the Global Fund and their potential economic implications. <i>AIDS</i> <b>22</b>:Suppl 1:s7-s15.</p> <p>Litzow J.M. and Bauchener H. (2006) The grand challenges of the Gates Foundation: what impact on global child health. <i>J. R. Soc. Med.</i> <b>99</b>:171-174.</p>
12/10	12	<p>Challenges in Global Infectious Diseases: Scientific knowledge</p> <ul style="list-style-type: none"> <li>• The microbiome</li> <li>• Discovery and introduction of new tools <ul style="list-style-type: none"> <li>➤ Antimicrobials</li> <li>➤ Vaccines</li> <li>➤ Sustainability</li> </ul> </li> <li>• A global architecture</li> </ul>	<p>Turnbaugh P. J. <i>et al</i> (2007) The human microbiome project. <i>Nature</i> <b>449</b>:804-810.</p> <p>Molyneux D. H. (2008) Combating the "other diseases" of MDG 6: changing the paradigm to achieve equity and poverty reduction? <i>Trans. Royal Soc. Trop. Med. Hyg.</i> <b>102</b>:509-519.</p> <p>WHO (2008) Meeting of the Immunization Strategic Advisory Group of Experts, April 2008 Conclusions and recommendations.</p> <p>Weekly epidemiological record. (2008) <i>World Health Organization</i> <b>83</b>:193-208.</p> <p>Ezzati M. <i>et al</i> (2005) Environmental risks in the developing world: exposure indicators for evaluating interventions, programmes and policies. <i>J. Epidemiol Community Health</i> <b>59</b>:15-22.</p> <p>Singer B. H., Ryff C. D. (2007) Neglected Tropical Diseases, Neglected Data Sources and Neglected Issues. <i>PLoS Neglected Tropical Diseases</i> <b>1</b>:e104,1-3.</p> <p>WHO (2007), World Health Report: Global public health security in the 21<sup>st</sup> century:</p>

**Requirements:**

Students are expected to attend classes regularly and engage actively in class discussions, having reviewed carefully the assigned readings.

In addition, each student will be required to prepare the following.

1. Presentation to class: 30 minutes in length (20 minutes for presentation and 10 minutes for class responses). Examination of a specific public health issue related to one of the infectious diseases selected for case studies in class in weeks 5-10. **Students should discuss and decide on a topic with the instructor prior to October 10, 2008.**
2. Policy memo. Typed 2-3 pages, double spaced. Memo to the Minister/Secretary of health of a country of your choice that identifies an **EMERGING** public health issue that needs immediate attention. Explain why this should be considered a problem (and not just its normal endemic prevalence), provide concrete evidence to justify your concerns and outline one or two approaches for solving or minimizing its impact. **This memo is due on November 7<sup>th</sup>, 2008 by 5 pm.**
3. Final research paper: Chose a pressing public health problem related to challenges of infectious diseases in developed or developing countries. The spectrum of choices may include endemic, emerging or re-emerging infections, consequence of interventions such as antibiotic resistance or specific settings for the use of microbes for bioterrorism. It also may include responses to infectious disease prevention or control plans. You have two options for your research paper:
  1. Examine a specific public health issue with significant impact on a particular population e.g. age group, gender etc. Provide a detailed examination of evidence, quality of data, scientific information and gaps in evidence.
  2. Propose a plan to address a specific public health problem in a developed or developing country. Provide evidence for the importance of the public health problem, what sectors of population is affected and how to measure the impact of anticipated results.
4. Please review criteria for evaluation of policy memo and final research paper to guide your written presentation.

**One page proposal for final research paper should be submitted to Instructor electronically by November 15<sup>th</sup> 2008 at 5 pm. Final research paper should be 12-15 pages double spaced and submitted electronically to Instructor by December 12<sup>th</sup> 2008 at 5 pm.**

Course Grading:

1. Class Participation (20%). Students are expected to come to class prepared to discuss readings and participate in a dialogue to present ideas effectively and to reach closure on subjects debated.
2. Class presentation (20%)
3. Policy Memo (20%)
4. Final Research Paper (40%)

Grading Rubrics:

Criteria for Evaluating class oral presentation

<b>A</b>	<ul style="list-style-type: none"> <li>• Clearly identifies purpose of presentation</li> <li>• Clearly presents methods used for data collection</li> <li>• Clearly demonstrates the analytical methods used in presentation</li> <li>• Comments on strength and weakness of approach used</li> <li>• Identifies policy implications of results</li> <li>• Stays within the 20 minute time allocation for presentation</li> </ul>
<b>B</b>	<ul style="list-style-type: none"> <li>• Identifies purpose of presentation</li> <li>• Shows weakness in presentation of methods, data collection and/or analyses</li> <li>• Comments on the analytical methods used, but does not identify strengths and weaknesses</li> <li>• Comments on the policy implications</li> </ul>
<b>C</b>	<ul style="list-style-type: none"> <li>• Identifies purpose of presentation</li> <li>• Presentation of components are unclear</li> <li>• Describes results but relationship to hypotheses is not clear</li> <li>• Comments on the analytical methods are superficial or unclear</li> <li>• Critique of relationship between evidence and policy is weak.</li> </ul>
<b>D</b>	<ul style="list-style-type: none"> <li>• Shows effort to complete assignment but presentation and critique are unclear in all respects including policy implications</li> </ul>
<b>F</b>	<ul style="list-style-type: none"> <li>• Shows no effort to complete assignment</li> </ul>

Policy Memo

<b>A</b>	<ul style="list-style-type: none"> <li>• Clearly identifies an emerging public health challenge (problem) in one country.</li> <li>• Provides concrete evidence about the likely effects of leaving the problem</li> </ul>
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	<p>unsolved.</p> <ul style="list-style-type: none"> <li>• Provides concrete recommendations for solving the problem and why it was chosen.</li> <li>• Is organized and written logically and clearly.</li> </ul>
<b>B</b>	<ul style="list-style-type: none"> <li>• Satisfies the basic requirements of the paper.</li> <li>• Argumentation about the importance of solving the problem is not clear.</li> <li>• Contains writing and organization errors.</li> </ul>
<b>C</b>	<ul style="list-style-type: none"> <li>• Identifies an emerging public health challenge but demonstrates unsatisfactory logic in explaining its importance in the country.</li> <li>• Uses insufficient evidence to support argument.</li> </ul>
<b>D</b>	<ul style="list-style-type: none"> <li>• Shows effort to complete assignment but fails to clearly identify an emerging public health challenge or provide evidence.</li> </ul>
<b>F</b>	<ul style="list-style-type: none"> <li>• Fails to address basic requirements.</li> </ul>

#### Final Research Paper

<b>A</b>	<ul style="list-style-type: none"> <li>• Documents a specific public health problem or a public health plan in a specific country with reference to at least 3 original sources</li> <li>• Reviews literature on possible solutions to this problem; include at least 5 original references and critique of each</li> <li>• Formulates specific policy recommendations</li> <li>• Executive summary is concise and communicates recommendations clearly</li> <li>• Demonstrates originality of thought</li> <li>• Is well organized and clearly written.</li> </ul>
<b>B</b>	<ul style="list-style-type: none"> <li>• Satisfies the basic requirements of the assignment</li> <li>• Use of original sources is less than required</li> <li>• Includes some gaps in evidence used to support arguments and policy recommendations</li> <li>• Executive summary is not concise</li> <li>• Write up shows few errors</li> </ul>
<b>C</b>	<ul style="list-style-type: none"> <li>• Shows serious effort to identify problem but relies on secondary rather than primary sources</li> <li>• Provides weak evidence to support recommendations and arguments</li> </ul>

	<ul style="list-style-type: none"> <li>• Executive summary vague or missing</li> <li>• Contains substantial organizational or writing errors</li> </ul>
<b>D</b>	• Shows effort to complete assignment but is seriously deficient in exploring literature, argument or recommendation
<b>F</b>	• Fails to meet basic requirements of assignment

### Summary Schedule and Grading

- 1. Class participation: be prepared to discuss reading assignment at all scheduled classes. 20% of final grade.**
- 2. Class oral presentation, weeks 5-10, 20 minutes presentation, 10 minutes discussion. 20% of final grade.**
- 3. Policy memo (2-3 pages). Due November 7<sup>th</sup>, 2008. 20% of final grade.**
- 4. Research paper (12-15 pages). One page proposal due November 15<sup>th</sup>, 2008. Full research paper due December 12<sup>th</sup>, 2008. 40% of final grade.**