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**Class: W:** 6:00pm- 7:50pm, Room 465, 65 West 11<sup>th</sup> Street Office **Hours:** Wednesdays by appointment

**Accessory website for course:** Blackboard

### **Course Description:**

During the last decade, progress in biotechnology has created a confidence and optimism in Western healthcare. However, most of these breakthroughs have done little to save the lives of 75% of the world's population who continue to die of treatable infectious diseases. Despite new treatments, vaccines, and genomic information about pathogens and their hosts, the access gap between the "haves" and the "have nots" grows wider each day. This course reviews the interplay between infectious diseases, culture, social and economic development, human rights, technology, and conflict using four infectious diseases that have escaped our efforts of elimination: cholera, AIDS, malaria, and tuberculosis. Other pathogens such as those associated with SARs and cervical cancer will be reviewed briefly and serve as representatives of new diseases to come. Students will learn the science and technology of disease prevention, diagnosis, and treatment on a "need to know" basis and connect this knowledge to the regulation and protection of indigenous medical knowledge and resources, the development of synthetic antimicrobials, the move toward more appropriate prevention strategies, and the need for the an essential drugs campaign to prevent epidemics caused by multi-drug resistant pathogens. The readings will be span two major areas of research; determinants of health (biological and social) and responses to health problems (local and international). Because this field is fast-paced, readings and resources will be available on Bb and updated throughout the course.

### **Learning Outcomes:**

- To describe the interplay between host and pathogens using scientific concepts
- To understand how modern biology and new technologies can be applied to health and the environment and the access issues surrounding their application and abuse.
- To demonstrate how socio-economic/political factors influenced disease progression in the past
- To critically read and analyze scientific literature and figures.
- To conduct scientific literature research using the library, electronic databases, and the internet.
- To select the appropriate prevention, diagnostic, and treatment for a particular infectious disease based on a variety of influencing factors ( biology, technology, resources, governance, human rights, and culture)
- To solve situational dilemmas through collaborations involving individuals with expertise in differing areas such as economics, politics, and anthropology.
- To effectively use evidence to develop written and oral statements centered on policy proposals that are appropriate for a variety of contexts

### **Course Expectations**

You must have a current student I.D. and an activated New School computer account by the second week of class. We will use academic electronic databases at Bobst library for research. To help you with these resources I will provide a research tutorial. Since you will be writing analytical papers, you are strongly suggested to complete tutorials and workshops offered by Bobst and Fogelman Library regarding OVID, EBSCO, and Refworks.

**Students with disabilities should** speak with me at the start of class and contact the New School Disabilities office to obtain proper guidance and paperwork if accommodations and/or additional resources are needed. In keeping with the University's policy of providing equal access for students with disabilities, any student requesting accommodations must meet with Student Disability Services. Students will be interviewed and d an academic accommodation notification letter for the student will be drafted to take to each professor. The instructor will review the letter with the students and discuss how to accomplish the accommodations. More information is available through the University's website

<http://www.newschool.edu/studentaffairs/disability/handbookstudents.pdf> at student services.

**Absences from this class can be no more than three, and if a student misses a class, it is his/her responsibility to obtain the information conveyed during that class session**

**The grade for this course will be based on the following for a 100pt total:**

1. **60 points:** Two critical analysis report (~10 pages/1.5 spaced; 4000 words) of a controversial issue that involves infectious diseases and development. Each report will contribute 30 pts of your grade.
2. **30 points.** A simulated public hearing on cholera. Students will role-play a member of the community (scientist, policy maker, or industry specialist) and present a short-range and long-range action plan
  - a. 5pts for a character statement voicing concerns, needs, and contributions
  - b. 10pts for an individual action plan representing that character's stance
  - c. 5 pts for a question directed to a member of your community group
  - d. 10 points for answering questions from other community members (if you have not been posed a question, you can try to address the question posed to another member).
3. **10pts** A final exam that addresses relationships among science, development, and sustainability. Questions given in advance.
4. Any late assignments will drop a half grade per day, including weekends.
5. **Optional:** 10-minute oral presentation of a critical analysis report. Up to 8 pts will be added to the analysis reports point total. This will only occur if there is time during an existing class session that related to your topic.

***Critical Analysis Report***

Sixty percent of your grade will be based on **two** reports which are critical analyses of controversial issues. These papers will take the shape of a focused policy brief that takes a stance and presents a call to action. These papers are not intended to be comprehensive reviews of a disease, organization, or pathogen. Your topic can be disease-specific or concept-specific but should address sustainability for a particular disease or locale. Examples of controversial issues will be presented in class. You must obtain permission to choose a topic of your own.

**First paper can be redrafted for an improved grade.** Each report will be ~7-8 pages 1.5-spaced in length (4000 words) and should include:

- a) An executive summary or abstract
- b) A clear statement of a very focused controversial issue
- c) Background and arguments (with references) for supporting and opposing arguments with the important questions and their implications included.
- d) Data and models presented in charts, figures, and tables
- e) Rationale and assessment supporting one viewpoint or offers a new proposal presented in the third person.
- c) Citations to relevant peer-reviewed literature and a bibliography

***Optional Critical Analysis Report Presentations--8 points will be applied to Analysis Report Total***

You will have the opportunity to present work from one critical analysis report. This oral presentation will allow students to share their research and each presentation will be:

- a) 10 minutes in length and address questions from the audience for 5 minutes.
- b) Accompanied with copies of executive summary, bibliography, and relevant handouts.
- c) All presentations using PowerPoint or images should be emailed to me, yourself, and posted to the Bb by Tuesday night to avoid any compatibility issues. (Mac graphics and images in PowerPoint often are platform specific and you should bring your computer and adaptor)
- d) It is best if the presentation relates to a topic on the syllabus in some manner (comparative, or in depth)

**Please see these Resource documents on the Bb under the left tab titled "Resources"**

- Overview of Analysis Reports- examples, strategies and advice
- Guidelines for Researching, Writing AND Guidelines for Presentations or Talks
- Research Tutorial for conducting literature research using databases and bibliographic software (Refworks) Tip Sheets (titled Refworks tips, Using Write and Cite, and Bibliography and Formatting Paper
- Introduction to the Informed Argument and On Writing Well excerpts
- Examples of past student papers

**Textbooks:**

Books can be purchased at Bluestockings Bookstore, a cooperative bookstore, café and activist center located at 172 Allen Street (one block south of the F train's 2nd avenue stop). Representatives from Bluestockings will attend the first class and bring books for purchase- so please bring cash or credit card. **All readings will be provided to you via a CD. Please check your CD and if there is a corrupt file or missing paper, either locate on your own, or email me and I will reply with attachment.**

**Optional Books:** Please note that there are many reports and articles published by the CDC, WHO, DNDi as well and they are available at no cost online.

**Basch, Paul. 1999.** Textbook of International Health. Oxford University Press. NY, NY. A popular book for courses on international health it will serve as a backdrop.

**Garrett, Laurie.** 1994. The Coming Plague. HarperCollins Ltd. Canada. This text is actually a summary of Garrett's work while she was a fellow at Harvard School of Public Health. The book was on the New York Bestseller list and can be purchased from The Strand Used Bookstore for about \$5.00.

**Farmer, Paul.** Pathologies of Power. University of California Press. pp.402. Farmer challenges governments to view public health as a human right and provides concrete examples from his own work on TB and HIV prevention and treatment. A Few copies will be for sale on the first day of class, approximately \$20.00

**Hawthorne, Fran.** The Merck Druggernaut: The Inside Story of a Pharmaceutical Giant. This book is for the non-scientist and is a very easy read. Even handed presentation of the drug industry and recommended by a previous student.

**Krasner R.** 2003. The Microbial Challenge. ASM Press. This book is a textbook but has chapters on immunology, vaccine development, and important public health partnerships. Serves as a good science reference text but runs about \$90.00 and be ordered from Bluestockings in one week.

**Salyers, A. and Whitt, D.,** 2002. Bacterial Pathogenesis A Molecular Approach. ASM Press, Washington, D. C. Serves as a good science reference text and copies are in my office and the library.

**Hotez, Peter.** 2008. Forgotten People, Forgotten Diseases. The Neglected Tropical Diseases and Their Impact on Global Health and Development. ASM Press. Washington DC. 215. Good overview of the NTDs.

**General and Flexible Outline for Course:** The course will cover the neglected diseases (TB, AIDS, malaria) and the neglected diseases (African sleeping sickness, river blindness, cholera) through your projects.

- Weeks 1-2:** Influential Factors of Public Health: Biology, Structures, and Society
- Week 2:** Research Sessions at the libraries outside of class on your own time and choosing
- Week 3:** Influential Factors of Public Health: Science and Technology
- Week 4:** The Changing Practice of Vaccination: Vaccines, Nutrition, and Interventions
- Week 5:** Genomics, Biodiversity, and Intellectual Property  
**\*Case Studies: HPV, SARS, Flu, Hep C proposal (interactive module) due**
- Week 6:** Science and Technology in DCs: Innovation, Patents, and Sustainability
- Week 7:** Tuberculosis: Introduction  
**\*First Analysis Report Due**
- Week 8:** Spring Break
- Weeks 9:** Tuberculosis: The Indirect Cost to Individuals and Society
- Week 10:** HIV/AIDS: Introduction
- Week 11:** HIV/AIDS/ TB: Standard of Care and the Doha Declaration
- Week 12:** HIV/AIDS: Changing Landscapes are New Technologies Feasible?
- Week 13:** Malaria: Introduction  
**\*Second Analysis Report Due**
- Weeks 14:** Malaria and Benefit Sharing/ Indigenous Knowledge
- Week 15-16:** **Cholera Symposium (interactive 2-week module)**

### **Reading List:**

*The readings listed here are extensive and though I encourage you to read them all, I recognize that triage is often necessary. To help you choose your readings appropriately I have placed an asterisk next to the most essential, provided a synopsis of the readings, and thought questions to guide the reading. The readings should be completed by the date listed.*

### **Week 1 January 28 Overview/comparison of TB, HIV, malaria, water borne diseases, shisto**

How do science and technology play a role in the management of infectious diseases and what role do quasi-judicial declarations play in achieving a standard of health for all.

1. Yoshihara, S. Oct 2008. New UN Document Promotes Controversial Right to Health  
<http://www.lifesitenews.com/ldn/2008/oct/08100912.html> + UN Office of Human Rights excerpts.
2. Juma C. and Yee-Cheong L. March 19, 2005. Reinventing global health: the role of science technology and innovation. *The Lancet* 365: 1105-1107.
3. Anonymous. October 7, 1999. State Department Urged to Take Bold Action to Infuse Science, Technology, and Health Expertise into Foreign Policy Agenda.  
<http://www4.nas.edu/news.nsf/isbn/0309067855?OpenDocument>

### **Week 2 February 4-Influential Factors of PH: Structures and Societal Values**

During this class session, we will cover a good deal of ground. The reference chapters in Basch set the stage by providing history on the methods and international vehicles used to monitor int'l health (~70 pages of text). The special report in the Lancet speaks to the right to health; most of these articles are one-two pages in length, save the research article by Backman et al., which contains excel files as supplements. If you are interested in this subject there are two additional reports, one by Abbott et al. and another by Dujardin that are seminal. The last reading by Plummer provides a lay narrative that gives the problem a very human and cultural face.

### **Questions to Consider**

1. In reviewing the Backman et al, study, pay close attention to the methods used to select indicators, and the process of revising, and whittling them down, into 15 representative groups. Sketch out the protocol steps and sequencing. Are there some indicators that need to be revisited, placed back in the mix? Does the absence of some indicators in the rubric demonstrate a problem or need?
2. In the Backman study, why the heavy emphasis on maternal and child health? Think broadly about this question.
3. Reflect on the Plummer readings after completing the chapters from Basch and consider the social, political, and scientific factors which contribute to the cholera case study presented here.

### **Readings:**

1. \*Hall, P . Sept 27, 2008. The right to health and accountability. *The Lancet*. 372:1150. Letter to the editor refers to Helen Potts report from the office of the UN Special Rapporteur on Right to Health: that outlines the five areas of "teeth" for states obligations.
2. Becker, E. Poor Nations Can Purchase Cheap Drugs Under Accord. *NYTimes*. August 31, 2003

### **Special Report on Right to Health Lancet Dec 13, 2008**

3. \*Anonymous. The right to health: from rhetoric to reality. *The Lancet*. 372(9655): 2001. Editorial. Pillay, N. 2008. Right to health and the Universal Declaration of Human Rights. *The Lancet*. 372(9655): 2005-2006. Overview
4. Frisancho, A., and J. Goulden. 2008. Rights- based approaches to improve the people's health in Peru. *The Lancet* 372(9655):2007-2008. Description of the rights based approach of ForoSalud (similar to Salud of Cuba).

5. Gelahdj, H. and A. Toure. 2008. Gender quality and the right to health. *The Lancet*. 372(9655): 2008-2009. Evidence and numbers to lend to MGD.
6. Sen, A. 2008. Why and how is health a human right? *The Lancet* 372(9655):2010. He brings up the notion: “Why think of health, rather than health care, as a right since health care is under the control of policy making, the actual state of health of the people?”
7. MacDonald, R. 2008. Gunilla Backman: Putting the right to health into practice. 372(9655): 2015. Profile of Backman, her work in international affairs, law, and then finally health services management.
8. \*Backman et al. 2008. Health systems and the right to health: an assessment of 194 countries. *The Lancet*. 372(9655): 2047-2085. The development of 72 indicators to evaluate 194 countries attempts at health for all. Presents six necessary building blocks: health services, health workforce, health information, medical products, financing, and stewardship. Planning must include clear objectives (how to be achieved), timeframes, effective coordination mechanisms, reporting procedures, a detailed budget, financing arrangements (nation and intern'l) assessment arrangements, indicators and benchmarks, and an accountability device.
9. **Optional Narrative:** Plummer, M. February 2, 1999. To Fetch a Pail of Water. *Natural History*: 56-65.
10. \*Basch P. Textbook of International Health 2<sup>nd</sup> Edition, 1999. Oxford University Press. NY, NY. **Read Chapters 1, 3, 4**, Based on your interests, you may choose to return to this text and read selections from the remainder of the list. Chapter 4 is the densest and presents the scaffold for the theoretical and practical approaches to public health. You can rotate the pdf- choose view and the rotate from the pull down menu.
  - a. **Ch.1 Introduction:** Overview of basic outlooks on world and health futures, and brief description of international health. Look closely at “First Quiz” on provocative health questions. (9 pages)
  - b. Ch 2 International Health before 1900: traditional medicine, plague and colonial expansion
  - c. **Ch.3 The Organizations of International Health Since 1900:** History and background on international health organizations since 1900, with good overview of the focus and methods of IH over the four decades that followed WWII. Discusses the roles and functions of the IMF, World Bank, various UN agencies, WHO, USAID, and NGOs in IH. (~ 20 pages )
  - d. **Ch.4 What We Want to Know – Data on Health:** Discussion on how health and illness are defined and measured. ( ~ 35 pages of text- dense)
  - e. Ch. 5 From Data to Information to Decisions- making decisions on health using technology
  - f. Ch.6 The Social Context: Sickness, Illness, and Disease: Discussion on cultural factors that affect behavior and health.
  - g. Ch.7 Health on the Edge: Focuses on relationship between poverty and health. Also discusses children’s health, infant and maternal mortality, and various causes of deaths (of children and adults) in developing countries. Last section looks at cost and sustainability of primary health care programs in poor countries.
  - h. Ch.8 Environment, Development and Health: Examines environment and development as risk factors of disease. Also looks at effects of population growth and urban migration on environment, development and health.
  - i. **Ch 9. International Programs and Projects-** This is al historical overview of the state of intergovernmental public health organizations and NGOs
  - j. **Ch.10 Science and Technology:** Examines issues in technology transfer, such as social, cultural and physical compatibility with local conditions in developing countries.
  - k. **Ch.11 The Cost of Sickness and the Price of Health:** Economic costs of health and illness, with brief discussion on insurance and the “health market.”
  - l. Ch 12 /13 Inventing the Health Sector and Reforming the Health Sector
  - m. **Ch.14 Infectious Diseases, Submerging and Emerging:** Brief overview on disease eradication concepts and several infectious diseases, including smallpox, malaria, and AIDS.
  - n. Chpt 15 The Practice of International Health: Brief overview of informed consent, community partners, and other ethical issues.

### **Week 3 February 11- Influential factors in PH: Science and Technology**

Introduction to basic science of pathogens, diagnosis, tracking, treatment, and prevention. The chapters from Basch provide a surface view of some of the major obstacles in managing infectious diseases, but also provide room for strategies to improve health. Chapter 10 (technology transfer and patents) and Chapter 14 (vaccines and treatment) will be elaborated on in the following weeks, so you can do a skim. The journal and news articles focus on the public-private model of diagnostic/drug/ vaccine development, while the blog by Brody and the article by Light and Warburton question the ethics of publications that support the pharmaceutical's biased claims about the cost of drug development. The Stix piece describes the work of Victoria Hale the founder of One World Health, the first non-profit pharmaceutical company.

#### **Questions:**

1. How are the views of formal and informal medical services shifting today? ( p 335, Basch)
2. Basch comments that policy makers shy away from health due to the murky definitions of outcomes and progress. If you were to respond to these concerns, how might you redefine or expand the definition of outcomes? Think back to the Backman article from last week, and also think about the biology of infection; how does latency pose problems for health outcome accounting?
3. When the PPP model was first proposed, there were many who felt the model was not sustainable. What are your views, and what evidence can you bring to bear to your argument?

#### **Readings:**

1. \* NIH/BSCS and Video Discover. 1999. Pathogens and Control Overview. Emerging and Re-emerging Infectious Diseases 1-6.
2. \*Basch P. Textbook of International Health 2<sup>nd</sup> Edition, 1999.Oxford University Press. NY, NY. **Read Chapters 9, 10, 11, and 14.** Based on your interests, you may choose to return to this text and read selections from the remainder of the list.
3. Anonymous.2005. Foundation. *The Economist* January 26. A description of the sustainability shift in the Gates Foundation funding mechanisms.
4. \*Nwaka, S., and R. Ridley. 2003. Virtual drug discovery and development for neglected diseases through public-private partnerships. *Nature Reviews Drug Discovery*. 2:919-928. Should be viewed in color as it does not transfer well in black and white.
5. \*Moran, M. Sept 2005. A breakthrough in R &D for neglected diseases: New ways to get the drugs we need. *PloS Medicine*. 2 (9): 0828-0832.
6. \* Stix G. May 2004. Making Drugs Not Profits. *Scientific American*.
7. \* Brody, H. The case of the missing journal issues- biased editing of an article about pharma research costs. *Hooked: Ethics, Medicine, and Pharma Blog*. Oct 20, 2008. <http://brodyhooked.blogspot.com/>
8. \* Light and Warburton. Spring2008. Ethical standards for healthcare journal editors: a case report and recommendations. *Health Policy Review*. 9 (1): 58-67

### **Week 4 February 18- The Changing Practice of Eradication and Control: Vaccines, Nutrition and Interventions**

*Videos: Polio Vaccination; Vitamin A Delivery*

We explore infectious disease prevention and the development and use of vaccines in the past and present. The collection as a whole highlights the connection between prevention and nutrition with the advent of edible vaccines and also the shift in vaccine use from prevention to treatment. Garrett provides a much needed reminder of the methods employed for two eradication efforts (small pox and polio), while Hotez suggests a new way forward. The NIH, Okonek, and Damon web excerpts provide the basic science background that is essential for effective public health programming. Ramachandran reviews the work on genetically engineered edible vaccines, and also highlights challenges in the development, marketing, and regulatory arena. Though the

Fernandez- Larsson interview suggests a potential solution in the form of plant delivered vaccines, it is important to consider how cultural attitudes and the dynamics of biology can alter the path of R&D. Perhaps most surprising are the statistics presented in the introduction of the Thanavala article (Arntzen team) regarding the effect of the recombinant protein subunit hepatitis B vaccine, and the return to questions of delivery and access (**for this article skim the text, but take a good look at the figures**). But more hopeful is the following from the Biodesign Institute “The Biodesign Institute projects that 200 acres would produce enough hepatitis B antigen to immunize all the babies in the world, at a cost of \$0.05 per dose, compared with \$0.30, the lowest price of the current vaccine.”— Ariza. *SciAmerican*. 2005. For those interested in nutrition, agrotechnology, and sustainability/climate change, the Enserink, Potrykus, and Serafimov readings center on Golden Rice.

**Questions to consider:**

1. What are the pros and cons of each vaccine type (whole dead, live attenuated, protein subunit, recombinant, DNA, Plant based)? (see Obenek et al).
2. Present an argument for or against a genetically engineered plant designed for vaccine production or delivery—what’s the difference? ( See Fernando-Larsson)
3. What is an adjuvant and why are they used in vaccines?
4. Why were the test patients in the Thanavala et al. article previously immunized with Hep B? Protein subunit vaccine? Why weren’t Hep naïve individuals used in this study?
5. What is the difference between a mucosal antibody (IgA) and a blood antibody (IgG)- does it matter which kind of antibody is produced in response to a vaccination?
6. The Arntzen team discusses the potential for a Hep B vaccine to be therapeutic in those infected with the hepatitis B virus (HBV)- how would this work (Thanavala article)?

**Readings:**

1. \*Garrett L. The Coming Plague. 1994. Farrar, Strauss, and Giroux. NY, NY. Read Chapter 2, "Health Transition," p.30-52 reviews some of the successes and failures of past eradication campaigns and how cultural and political obstacles were handled in each case.
2. \*Hotez P.J. (May/June 2001). Vaccine diplomacy. *Foreign Policy*. 68-69.
3. \*NIH/BSCS and VideoDiscovery. 1999. Prevention, Immunology, and Vaccination. *Emerging and Re-emerging Infectious Diseases*. 1-6
4. \*Okonek and Peteres. Vaccines- How and Why? *Access Excellence*. 1-3.
5. \*Damon et al. 1997. Transgenic Plants: Unit 9. European Initiative for Biotechnology Education. Read pages 6-9 which review how to make a GMO.
6. \*Ramachandran and Sharma. 2007. Edible vaccines: Current status and future. *Indian Journal of Medical Microbiology*. 25(2):93-102.
7. \*Fernandez-Larsson H. Eat Your Corn Flakes-and Get Vaccinated. *AIDS Science*. 2(7). Interview of John Howard by Roberto. Howard, chief scientific officer and founder of [ProdiGene Inc.](http://ProdiGene Inc.), a private company that is developing an edible HIV vaccine using the HIV proteins Gag and gp120. 1-2 <http://aidsscience.org/Articles/aidsscience019.asp> Quite scientific but I will explain why those scientific details matter.
8. \*Thanavala Y. et al. (March 1, 2005). Immunogenicity in humans of an edible vaccine for hepatitis B. *Proceedings of the National Academies of Sciences*. 102(9):3378-3382. This is science research article so it may be tough going, but I am assigning it to be reviewed in class to highlight some of the essential science of vaccine development and particularly the challenges involved in obtaining a vaccine that is “immunogenic and protective” against a specific pathogen. So focus on the introduction and the tables and figures, and skim the remainder of the text (ignore the materials and methods). We will dissect it in class.
9. \***Golden Rice Overview:** Enserink, M. April 25, 2008. Tough lessons from golden rice. *Science* 320(5875):468-471.
10. **Golden Rice Developer:** Potrykus, I. 2001. Golden rice and beyond. *Plant Physiology*, 125 (3):1157-61.

11. **Optional Golden Rice Background:** Serafimov et al. 1997. Biotechnology in the Developing World: Unit 15. European Initiative for Biotechnology Education. Read pages 9-22 which review developing and implementing GMOs using cases studies such Golden Rice for Vitamin A deficiency

## **Week 5 February 25: Genomics, Biodiversity, and Intellectual Property**

**Case Studies Assignment:** During this class session small groups of students will confer on their research on one of the following cases (HPV, Flu, Hep C, SARs) for about 10 minutes. Then a volunteer from each group will present the situation and issue a policy statement regarding prevention or treatment during a five-minute oral presentation. Students should address both scientific and social perspectives as best they can, given their limited understanding of the field. This assignment is designed to help you prepare for your analysis reports and presentations. A few articles will be provided to you in the folder titled Mini- Case Assignments. **Spend ONLY five hours on this entire assignment (reading, research and writing). This assignment is only meant to give you a glimpse of the type of research you will be conducting for your analysis reports... in other words, you will not be able to adequately do justice to any of these topics, but rather see what 5 hours of work will get you.**

1. \*WHO. 2006. "Chapter 5: Fostering Innovation in Developing Countries." *In Public Health: Innovation and Intellectual Property Rights*, 141-169 and 182-188. This report is the product of a commission for Intellectual Property Rights and Public Health (CPIPH) established in 2004. It introduces the ICH, the CBD, and cases such as the STOP TB campaign. Other chapters are also useful and it is accessible in six languages. <http://www.who.int/intellectualproperty/documents/thereport/ENPublicHealthReport.pdf>
2. \*Torreele, E. March 2002. From Louis Pasteur to J. Craig Venter: When Biomedical Scientists Become Bio-Entrepreneurs. *The Crisis of Neglected Diseases: Developing Treatments and Ensuring Access*. MSF and DND. Reviews patenting of genes, proteins, and processes.
3. \*Weatherall, D. 2003. Genomics and global health: Time for a reappraisal. *Science* 302: 597-598.
4. \* Anonymous. June 23, 2001. Special: The Right to Good Ideas: Patents and the Poor. *The Economist*. 359(8227): 21. An article that looks at both sides of the intellectual property argument.
5. FOR BACKGROUND ON GENOMICS AND GENES: Genome News Network. "What is a genome" and "Genome Variations?" This site is VERY basic but provides some background on genome projects should you feel that you need some grounding. The focus of this site is the human genome but the concepts can be extended and apply to microbial genomes as well. The variations found in one species of a pathogen are what lead to the classification of strains. Each strain still belongs to the species, but the genetic variation amongst strains is what gives them their unique properties; antimicrobial resistance, evasion of immunity, degree of virulence. [http://www.genomenewsnetwork.org/resources/whats\\_a\\_genome/Chp1\\_1\\_1.shtml](http://www.genomenewsnetwork.org/resources/whats_a_genome/Chp1_1_1.shtml)

## **Week 6 March 4: Science and Technology in DCs” Innovation, Patents and Sustainability -Topic may change (Abbott)**

All of you will read three papers one by Feinson and two by Trouiller et al. The articles should be read in this sequence. The first two papers by Trouiller et al. are from a New York City Conference hosted by Medicins Sans Frontiers and provide the historical backdrop and review the outcome of the International Conference on Harmonization (ICH) and its effect on clinical trials and drug/vaccine development.

Each of you will also be responsible for responding to one other article(s). These papers introduce the concept of technological inequalities between the North and South. The introductions may be redundant so skim over those and focus on the unique points of each article.

**Everyone Reads**

1. Feinson, S. National Innovation Systems Overview and Country Cases.” Section 1: **30-38 ONLY.**  
**Knowledge Flows and Knowledge Collectives: Understanding the Role of Science and Technology Policies in Development.** Volume 1: Knowledge Flows, Innovation, and Learning in Developing Countries. Columbia University, Center for Science, Policy, and Outcomes. 2003.  
<http://www.cspo.org/home/cspoideas/00001.htm>
2. \*Trouiller P., Salmén R., Myhr K., Folb, P., Weerasuriya K, and Gray A. March 2002. "The Globalisation of Regulatory Requirements, and the Development and Availability of Medicinal Products in Developing Countries: Consideration of Quality, Efficacy and Safety Issues." The Crisis of Neglected Diseases: Developing Treatments and Ensuring Access. MSF and DND: 141-154. This article extends the discussion of the ICH in the context of drug regulatory agencies and international guidelines, and provides a nice history on the FDA.
3. \*Trouiller, Folb, and Weerasuriya. March 2002. "Legal and Regulatory Issues Affecting Drug Development for Neglected Diseases." The Crisis of Neglected Diseases: Developing Treatments and Ensuring Access. MSF and DND: 133-140. This article review the ICH provisions, implications, and issues a call to action for revision of such regulations.

**Assigned to each group**

The following articles all come from Knowledge Flows and Knowledge Collectives: Understanding the Role of Science and Technology Policies in Development. Volume 1: Knowledge Flows, Innovation, and Learning in Developing Countries. Columbia University, Center for Science, Policy, and Outcomes. 2003.  
<http://www.cspo.org/home/cspoideas/00001.htm> Skim the redundant sections and focus on particulars.

4. **Group 1.** Foladori G. “Can PPPs in Health Cope with Social Needs?” *In* Section 3: 83-97.
5. **Group 2** Sampat B. “Recent Changes in Patent Policy and the ‘Privatization’ of Knowledge” *In* Section 2: 39-81
6. **Group 3** Gupta A. “The Role of Knowledge Flows in Bridging North-South Technological Divides.” *In* Section 4: 99-130.
7. **Group 4** Zachary G. “Black Star: Ghana, Information Technology and Development in Africa.” *In* Section 5: 165-186.

**Week 7: March 11: Introduction to Tuberculosis \*\*\*\*\*These Readings will change\*\*\*\*\*  
Student Analysis Report #1 is due**

The readings will provide an overview of the impact of tuberculosis and tools we have to manage the spread of this disease. Please download, print and bring the TB ppt from Bb as 6 slides per handout to class. I will introduce the basics behind the science of the disease, treatment, and diagnostics. We will touch on global partnerships to control this disease, and some of you may choose to analyze one of these programs more specifically for your analysis report. Please read the Cole and Alzari review article carefully and then just skim the corresponding research article by Andries et al.

1. \*Novelli. Apr 8-Apr 14, 2006. BCG vaccination gets a boost. *The Lancet.* 367 (9517):1122 which reviews the corresponding article on a meta-analysis Trunz et al. 1173-1180.—need to update and post this article by Trunz.
2. \*Sachin A. 2005. Multidrug resistance Tuberculosis (MDR-TB) in India: An attempt to link biosocial determinants. *The Journal of Public Health Policy* 26: 96-114.
3. \*Anonymous. Jun 22, 2002. Asia; Joining the DOTs. *The Economist.* 363 (8278): 68,
4. \*Cohen J. 2004. A new drug promises shorter simpler treatment. *Science* 306 (5703): 1872.
5. \*Cole and Alzari. 2005. TB-A new target, a new drug. *Science* 307 (5707): 214-215.

**Optional Reading:**

6. Hall, Stephen. "The Return of Tuberculosis in a New, More Menacing Form" in *HHMI The Race Against the Lethal Microbes: Learning to Outwit the Shifty Bacteria, Viruses, and Parasites that Cause Infectious Diseases*. 1996. p.6-21. This article will highlight the new advances in detection and treatment options.  
**This special publication is best read in color**
7. Andries K. et al. 2005. A diarylquinolone drug active on the ATP synthase of *Mycobacterium Tuberculosis*. *Science* 307 (5707): 223-227. This is a very scientific article so skim and try to get the overall picture of why this is significant.

## **Week 8: Spring Break**

### **Week 9 March 25: *The Indirect Cost of Having Tuberculosis : Individual and Society***

We will extend our conversation to consider the social and ethical perspectives of common approaches taken to control TB. We will pay close attention to the successes and failures of community-based programs and legal mechanisms put in place to enhance patient compliance for treatment. The Wright and Andrews articles highlight the emergence of a new epidemic of HIV/TB and will foreshadow some of the content of the coming weeks on HIV. Collectively the readings review alternative strategies for dealing with the HIV/AIDS epidemic (quarantine, incarceration, HAART) . The scope of these approaches echo those of TB programmes (coercion, quarantine, DOTs). The choice to administer educative or restrictive policies lies at the center of national and international public health discussions. Reflect on the readings and your own experiences and comment on these two very different approaches to public health and consider:

#### **Questions:**

1. Are these two approaches (educative and restrictive) mutually exclusive? If not, which countries have successfully employed both?
2. As is most often the case, one size does not fit all. Therefore where might you be inclined to use restrictive policy? What sorts of characteristics would this nation, the disease, or the people have? Where would it be most useful to approach the epidemic through educative policy?
3. When considering educative policy, draw upon your knowledge in this course of past and present success stories with HIV, TB or other diseases. Describe the cultural, political, scientific, and social factors that contributed to the success
4. It is interesting to consider incarceration from two different perspectives: those who are incarcerated because they do not follow treatment; and those that contract disease as result of incarceration. Farmer reviews the role of incarceration from this latter perspective and the effect this has on the general population. What do you make of the policies?

#### **Readings:**

**These articles specifically address both the science and politics that contribute to antibiotic resistance.**

1. \* "What is Antibiotic Resistance?" <http://people.ku.edu/~jbrown/resistance.htm>
2. \*Wright, A., et al. 2006. Emergence of *Mycobacterium tuberculosis* with Extensive Resistance to Second-Line Drugs -- Worldwide, 2000-2004. (Cover story). *MMWR: Morbidity & Mortality Weekly Report* 55(11): 301-05. <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5511a2.htm>
3. \*Andrews, J. et al. 2007. Multidrug-resistant and extensively drug resistant Tuberculosis: Implications for the HIV epidemic and antiretroviral therapy roll out in South Africa. *Journal Infectious Diseases*. Suppl 3: S482-490
4. \*Farmer, P. 2005. "A Plague on All Our Houses" *In Pathologies of Power*. University of California Press. 115-138. Farmer is both an anthropologist and a physician and he uses his experience to describe the movement of TB from the marginalized population of the poor and incarcerated to the general population.

5. \*Webster P. 2002. Agreement unlocks loan for TB and AIDs treatment in Russia. *Science*. 297: 170. This article extends the conversation to consider culturally different definitions of disease and models for elimination. An important historical footnote.
6. **Optional:** Ashcroft, R.E. 2005. Access to essential medicines: A Hobbesian social contract approach. *Developing World Bioethics* 5(2): 121-41. This is a rather dense social science reading, but for those who are familiar with this model, it is a useful tool for contextualizing the material.

**This next set of articles address policy measures to treat TB and MDR-TB. All are good, but if you only have time, read at least one.**

7. \*Porter, J. D. & Ogden, J. A. 2001. Missed opportunities? Coercion or commitment: policies of prevention. *Annals of the New York Academy of Sciences*. 953: 224-32.
8. \*Moore-Gillon J. 2001. Multidrug-resistance Tuberculosis.: This is the cost. *Annals of the New York Academy of Sciences*. 953: 233-240.
9. \*Farmer, P. 2001. DOTS and DOTS-plus: not the only answer. *Annals of the New York Academy of Sciences*. 953: 165-84. A review of community based programs to reduce the emergence of MDR-TB and to control its spread. The program is evaluated in Haiti and comparisons made to other countries with differing social structures, norms, and avenues for sustainability.

**OPTIONAL: These articles focus on appropriate diagnostics** for TB and HIV and return to the issue of, how inexpensive diagnostics neglect HIV+, women, and children, from morbidity and mortality rates.

10. Kodha and Kabra. 2004. Newer diagnostic modalities for tuberculosis. *The Indian Journal of Pediatrics*. 71 (3):221-227. <http://www.ijppediatricsindia.org/article.asp?issn=0019-5456;year=2004;volume=71;issue=3;spage=221;epage=227;aulast=Lodha>
11. Calandra, B. ,April 1, 2002. The Seeding of Third World Science. *The Scientist*. 16(7);50-51. This article extends the discussion of appropriate technology transfer for the third world and sustainability programs.
12. Walgate R. June 3, 2003. TB diagnostics initiative launched. *The Scientist Daily News*. <http://www.biomedcentral.com/news/20030603/01/>
13. 2004. FIND and Biotech aim for affordable, rapid TB tests. PJB Publications LTD
14. Napier Johnson. August 31, 2001. FastPlaque TB: A New and Timely TB Detection Kit. *Express Healthcare Management Issues* 16 <http://www.expresshealthcaremgmt.com/20010831/hospinews6.htm>
15. Phulpoto M. et al. 2005. Diagnostic yield of Fast Plaque TbTm test for detection of *Mycobacterium* in Tuberculosis Suspects. *Journal of Pakistan Medical Association*. 55 (2): 57-59. <http://jpma.org.pk/jpma/02feb05/PDF/fulltex3.pdf>

## **Week 10 April 1 --Introduction to HIV and the HIV/TB Epidemics**

### **In Class video from Evolution Darwins Dangerous Idea- CCR5 protection**

I will provide the scientific basics of HIV infection and AIDs, treatments currently available, and vaccine initiatives. We will also discuss the new disease that results from dual infections. The Achmat, Bayer, and Garrett references provide historical and current influential factors that heavily influence the HIV epidemic and attempt to review “ lessons learned.” The Quinn, Farmer, Fried/ Kowalski-Morton, and Farmer articles (5-9) address groups that have been traditionally marginalized, while the Cohen and Wax articles (9-12) address cultural differences and perceptions about risk. The CDC report (11) is a summary of the work that has taken place in Uganda and Kenya regarding male circumcision ( based on work coming out in 2003 on high risk populations). The remaining references are topical in nature and provide a look at localized trends over the last decade.

### **Questions:**

1. Achmat and Roberts propose a move from vertical HIV and TB stand alone PH programs to horizontal or combined programs. Given our readings about the emergence of XDR in Tugela Ferry, and the high incidence of primary drug resistant infections, use a critical eye towards this policy. (Also note, how heavy the scientific content is in this policy white paper.)

2. Garrett provides a history of colonialism and globalization and their roles in the combined spread of TB and HIV. Though she wrote this in early 1990s, do you feel that many of the policies hold today or has their been shift?
3. Bayer speaks of HIV exceptionalism in the US, while Achmat's Treatment Action Campaign takes the opposite approach. Why such dissimilar approaches; how does the history of each country, the structure of the public health system, and the profile of the individuals involved in advocacy shape the approach to PH in these two very different environments?
4. Fried and Kowalski- Morton criticize the Global Fund of neglecting sex workers and the LGBT community. What do they propose?

**Readings:**

1. \*To understand the science of HIV infection please view these site and watch the video animations  
<http://www.sumanasinc.com/webcontent/anisamples/microbiology/hiv.html>  
<http://www.pbs.org/wgbh/nova/aids/action.html>  
[http://hopkins-aids.edu/hiv\\_lifecycle/hivcycle\\_txt.html](http://hopkins-aids.edu/hiv_lifecycle/hivcycle_txt.html) -- good for text and understanding treatment
2. Stop Denying the Killer Bug. *The Economist*. 362 (8261)70, Feb 23, 2002. This is a particularly biased article about HIV/AIDS policy in Africa and will be sure to elicit some interesting responses.
3. \*Achmat and Roberts. Steering the Storm. TB and HIV in South Africa A policy paper of the Treatment Action Campaign. June 7, 2005. ( about 15 pages)  
<http://www.tac.org.za/Documents/TBPaperForConference-1.pdf>
4. **Optional:** Garrett L. The Coming Plague. 1994. Farrar, Strauss, and Giroux. NY, NY. 457-527. Read Chapter 14, "Thirdworldization," which reviews the compounded effects of epidemic TB and HIV infections. This is a lengthy chapter so skim it.
5. \*Bayer, Ronald. May 24, 1999. Clinical Progress and the Future of HIV Exceptionalism. *Archives of Internal Medicine*. (10): 1042-49. A review of the historical and current practices used to detect and control the spread of HIV infection as compared to other communicable diseases.
6. \*Quinn and Overbaugh. June 2005. HIV/AIDS in women: An expanding epidemic. *Science* 308: 1582-1583.
7. \*Fried, S. Kowalski- Morton, S. 2008. Sex and the Global Fund: How sex workers, lesbians, gays, bisexuals, transgender people, and men who have sex with men are benefiting from the Global Fund, or not. *Health and Human Rights Journal*. 10 (1): 1-10.
8. \*Farmer, P. Community-Based Approaches to HIV Treatment in Resource Poor Settings *The Lancet* 358 (9279): 404-410, Aug 4, 2001. An excellent article looking at success with the DOTs program and combining that effort with HAART ( Highly Active Antiretroviral Therapy)
9. \*Farmer P. 2005. "Pestilence and Restraint" In Pathologies of Power. University of California Press. 51-90. This chapter describes the detainment of refugees in Gautanomo and rise of HIV in Cuba due to political strife.
10. \*Cohen, J. 2001. Epidemiology. HIV gains foothold in key Asian groups. *Science* **294**, 282-3.
11. \*Cohen J. 2005. Male circumcision thwarts HIV infection. *Science* 309 (5736):860.
12. \*CDC. 2008. Male circumcision and Risk of HIV Transmisison and Other Health Conditions: Implications for the United States . Though this report addresses the US in the title, the content is mostly based on high risk population and randomized studies in Africa ( Uganda and Kenya see ref 7, and 8).
13. \*Wax, Emily. Kenyan Women Reject Sex Cleanser. *The Washington Post*. August 18, 2003, A12.  
<http://stacks.msnbc.com/news/953815.asp>
14. \*Cohen, J. July 28, 2006. The Overlooked Epidemic: Latin America. *Science*: 468-469.
15. Stop Denying the Killer Bug. *The Economist*. 362 (8261)70, Feb 23, 2002. This is a particularly biased article about HIV/AIDS policy in Africa and will be sure to elicit some interesting responses.
16. **Optional:** Schoofs, Mark. AIDS and the Agony of Africa. *The Village Voice*. An eight-part series that begin in November 1999 and reviews the cultural and economic constraints that are specific to Africa.  
[http://www.sahims.net/batchfiles\\_web/aids/05/AIDS%20in%20Africa%20Heartbreak%20and%20Hope2.htm](http://www.sahims.net/batchfiles_web/aids/05/AIDS%20in%20Africa%20Heartbreak%20and%20Hope2.htm)

17. **Optional:** Elwy, A. R., Hart, G. J., Hawkes, S. & Petticrew, M. (2002). Effectiveness of interventions to prevent sexually transmitted infections and human immunodeficiency virus in heterosexual men: a systematic review. *Archives of Internal Medicine* **162**: 1818-30 **Portal only. This is metanalysis of many studies of men in high risk groups- interesting but detailed.**
18. **Optional:** View the video on Sunita Solomon in India from the Global Fund website under “ In the Press halfway down the website and the focus is HIV in India and also the Haiti video on TB, HIV, and Malaria [http://www.theglobalfund.org/en/in\\_action/stories/](http://www.theglobalfund.org/en/in_action/stories/)
19. **Optional:** A special interactive clip including Gideon Mendel’s photos can be accessed here <http://www.guardian.co.uk/aids>

## **Week 11 April 8— Standard of Care: Ethics and Science of Clinical Trials**

### Guidelines, Informed Consent, and Standards that Impede Drug Access and Disease Elimination

If you only have time to read one of these articles, complete #1 by Selgelid. If you happen to be very interested in the pro and con arguments for Standard of Care continue to read the remaining articles in this sequence as many respond to a former article in detail and there is a chronology involved. These articles specifically review informed consent practices and go into great detail regarding the short course AZT trial for pregnant HIV+ women. The Brewer article responds to the Kent article on informed consent and ethics of HIV, TB and malaria trials. The Wendler, letter to the Editor for Wendler, Lie, Schenk, Selgelid, and Ijsselmuiden should be read in this order as they relate to the same trial/topic- this will be our focus. It is of some importance that the seminal article in this series was published by Lurie and Wolfe in 1997 and then picked up for the public in a recent Harpers article in 2006. As reported in the news article by Jack and the viewpoint by Conlan et al. the standard protocol for control arms in clinical trials in LDCs continues to prove challenging. I have also included a more anthropological piece by Paul Farmer from his book, Pathologies of Power.

**Questions: See Questions in the Readings Folder and on Bb titled Standard of Care Notes and Questions and bring these questions to class. They will serve as our discussion points. The class will be broken up into four groups, each of which will address one of the four main sets of questions that accompany these readings.**

1. \*Selgelid, M. 2005. Module 4: Standards of Care and Clinical Trials. *Developing World Bioethics*.5(1): 54-72. This module has an up to date review of the ACTG076 follow up short course AZT trial, and the reasoning both pro and con for conducting such a study. This paper serves as a good example of an analysis report. The entire series of modules was made freely available as part of a larger project because leaders of the South African CIPRA consortium commissioned the Bioethics Division at the Wits University Faculty of Health Sciences to produce such a training programme for their staff. CIPRA is the Comprehensive International Programme of Research on AIDS in South Africa. CIPRA, and therefore the development of the training modules, were funded by the US National Institutes of Health. The module on Informed Consent can serve as a good reference. <http://www.blackwell-synergy.com/toc/dewb/>
2. \*Kent D. et al. (July 14, 2004). Clinical trials in Sub-saharan Africa and established standards of care: A systematic review of HIV, Tuberculosis, and Malaria trials. *JAMA* 292(2):237-242.
3. \*Brewer and Heymann. (July 14, 2004). The long journey to health equity. *JAMA* 292(2):269-271. This is the editorial for the Kent article.
4. \*Wendler D. et al. (June 2004). The standard of care debate: Can research in developing countries be both ethical and responsive to those countries’ health needs. *The American Journal of Public Health* 94(6): 923-928. This article does a great job of sifting and analyzing the data of the controversial short course AZT clinical trial and should be read in conjunction with the Letter to the Editor and the Schuklink and Selgelid articles.

5. \*Wendler D. et al. (Dec 2004). Letters to the Editor about the ‘The standard of care debate: Can research in developing countries be both ethical and responsive to those countries’ health needs?’ *The American Journal of Public Health*. 94 (12): 2048-49.
6. \*Lie, Grady and Wendler. 2004. The standard of care debate: the Declaration of Helsinki versus the international consensus opinion. 30:190-193.
7. \*Schulenk, U. 2004. The standard of care debate: against the myth of an “international consensus opinion.” *Journal of Medical Ethics* 30:194-197. This article counters the notion that smallish groups should dictate international norms.
8. Farmer, P. 2005. “New Malaise” In *Pathologies of Power*. University of California Press. 196-212.
9. \*Anonymous. 2006. Developing country trialists are key for malaria vaccine goals. *The Lancet*. 368(9554): 2185
10. \*Jack, A. Corners are cut in order to bring drugs to Africa. Financial Times. London (UK), 1<sup>st</sup> Edition. Comment and Analysis, Mar 30, 2007: 13.
11. \* Coplan, P. et al. 2004. Regulatory challenges in Microbicide Development. *Science*. 304: 1911-1912.
12. **Optional:** Ijsselmiuden, C. 2005. Ethics and Health Research for Development: An Essential Combination. In *The Global Fund Update on Research for Health*. 142-146. **The last three pages (144-146)** provide a good overview and refer to the role of the FDA in the ICH process and clinical trial guidelines.
13. **Optional:** Angell M. 1997. The ethics of clinical research in the third world. *The New England Journal of Medicine* 337(12): 849-851.
14. **Optional:** Bloom, B. 1998. The highest attainable standard : Ethical issues in AIDs vaccines. *Science*. 279(5348) 186:188.
15. **Optional and Popular.** Farber, C. March 2006. Out of Control. *Harper’s Magazine*. 37-52.
16. **Seminal:** Lurie P, Wolfe SM. 1997. Unethical trials of interventions to reduce perinatal transmission of the human immunodeficiency virus in developing countries. *The New England Journal of Medicine* 337(12) : 853-856.
17. **Seminal Documents:**
  - a. **International Conference on Harmonization Official** document issued by the pharmaceutical industries in Japan, UK, United States, etc.
  - b. **Declaration of Helsinki** issued by the World Medical Association.
  - c. Marshall P. July 2003. Module 3: Public Health Research and Practice in International Settings: Special Ethical Concerns in [Ethics and Public Health: Model Curriculum Online](#). Edited by Jennings, Mastroianni, Kahn and Parker. 85-102. This entire curriculum is made freely available and this module includes some excellent case studies including the short course AZT trial and **sets of questions for discussion**. <http://www.asph.org/document.cfm?page=782>

**Week 12 April 15: New advances in HIV biomedical research: Are they feasible?**

During this class session we will review AIDS research and discuss the probability of advances reaching the developing world. We will extend our conversation to consider the social and ethical perspectives of science education efforts, patent law, and treatment programs in different countries. Topics include, Preprophylactic treatment of HIV+ individuals, the evolution of microbicides, and new combinatoral programs that employ highly sensitive and specific diagnostics that address staging of disease and appropriate interventions. There is quite a range here, so focus on the tagged articles. (9 articles in total)

**Diagnostics → treatment and behaviour change**

1. \*Janssen, R. et al. 2001. The serotstatus approach to fighting the HIV epidemic strategies. *AMJPH*. 91 (7):1019-1024. Though this focuses on the US, it brings up the need to transfer technology to other nations.

2. University of Arizona Biology Website ELISA HIV test <http://www.blc.arizona.edu/aids/>
3. \*Holbrooke and Furman. 2004. A Global Battle's Missing Weapon. *The New York Times* Feb 10:A25. Reviews the necessity of testing in a global context and gives Uganda as case example.
4. \*Steinbrook, R. 2007. HIV in India- The challenges ahead. *NEJM*. 356 (12): 1197-1201.

**Vaccines:**

5. Gaschen, B. *et al.* 2002. Diversity considerations in HIV-1 vaccine selection. *Science* **296**, 2354-60.
6. Cohen, J. 2004. HIV/AIDS in China. Vaccine development with a distinctly Chinese flavor. *Science* **304** (5676):1437.
7. \*Blue, L. March 16, 2009. An New Approach to HIV Vaccine. Time CNN.com <http://www.time.com/time/printout/0,8816,1885659,00.html> with video on Rockefeller site Scheid interview <http://newswire.rockefeller.edu/?page=engine&id=905> . Amy sent this article out earlier in the month, and suggested that we are moving towards packaged antibodies as a vaccine, but in fact the polyclonal antibody discovery will help researchers design multivalent vaccines that stimulate a polyclonal response. This video helps to explain <http://www.thedoctorschannel.com/video/1593.html?specialty=15>

**Microbicides – In March 2009 last reference involves understanding immunity**

8. \*Weber, J. May 2005. The development of vaginal microbicides for the prevention of HIV transmission. *PLoS Medicine*. 2 (5): 392-395.
9. \*(Oct 15, 2004). Topical HIV prevention. *Science* 306 (5695): 369-270. ( **Science students please also read the research article by Lederman et al.** )
10. Lederman et al. Oct 2004. Prevention of vaginal transmission in Rhesus Macaques through inhibition of CCR5. *Science* 306 (5695): 485-487.
11. \* Lagenaur, L. Aug 2005. An anti-HIV microbicide comes alive. *PNAS* 102 (34): 12294-12295. ( **Science students please also read the research article by Rao et al.** )
12. Rao, S. Aug 2005. Toward a live microbial microbicide for HIV: Commensal bacteria secreting an HIV fusion inhibitor peptide. *PNAS*. 102 (34): 11993-11998.
13. \*Katsnelson. A. March 2009. New Hope for HIV Microbicide. The Scientist Blog. <http://www.the-scientist.com/blog/display/55487/>

**Treatment and Drug Resistance (basic science of the infection and disease cycle- genetics and proteins)**

14. \*Cohen. J. 2005. Prevention cocktails: Combining tools to stop HIV's spread. *Science* 309 (5737): 102-105
15. Stanford presents new findings on drug resistance at World AIDS Conference (2002) <http://www.stanfordhospital.com/newsEvents/newsReleases/2002/072002/aidsConference.html>
16. Clarke T. One in ten new HIV cases in Europe is drug-resistant. July 17, 2003 <http://www.nature.com/nsu/030714/030714-8.html>
17. Stephenson, J. April 2002. Researchers Explore New Anti-HIV Agents. *JAMA*. 287(13):1635-1636. A very interesting drug based on the genetics of those who are naturally resistant to HIV infection ( 10% of Caucasians).
18. Stephenson, J. 2002. Scientists Find Some Genes a Bad Omen for Anti-HIV Drug. *JAMA*. 287(13):1637..
19. Stephenson, J. 2002. Researchers identify anti-HIV proteins *JAMA*. 288(16):1969-70. A very comprehensive article that outlines efforts of the Global Fund and other programs seeking resolutions for the drug access gap.
20. McNeil D. Africans Outdo Americans In Following AIDS Therapy. *The New York Times* Sept 3, 2003. <http://www.globalpolicy.org/soecon/develop/aids/2003/0903therapy.htm>
21. Stephenson, J. Cheaper HIV Drugs for Poor Nations Bring a New Challenge *JAMA*. 288(2):151 Jul 10, 2002. A very comprehensive article that outlines efforts of the Global Fund and other programs seeking resolutions for the drug access gap.

**Week 13 April 22 --Introduction to Malaria**

**Video on HIV/Malaria**

I will provide a review of the scientific basics of malaria infection and prevention, the treatment currently available, and vaccine initiatives. We will also discuss the relationship between HIV and malaria in the developing world.

Both of these articles provide the science behind malaria infection and disease. The Webster piece incorporates a bit more about social and political factors that influence spread and progression. Choose one.

1. \*Willis, R. Bloodsucker Rising. *Modern Drug Discovery*. 4 (10):40–42, 44, October 2001.  
<http://pubs.acs.org/subscribe/journals/mdd/v04/i10/html/10willis.html>
2. \*Webster D. Malaria Kills One Child Every 30 Seconds. *Smithsonian* 31(6); 32-44, September 2000.  
Also read these short news pieces for more new technologies for prevention and treatment
3. \*Miluis, S. Better Mosquito. *Science News*. 161(21):324, May 25, 2002. Very short news story on genetically engineered mosquitoes that can no longer serve as the vector for the malaria parasite.
4. \*Seppa, N. Synthetic Protein May Yield Malaria Vaccine. *Science News*. 160(4):54, July 28, 2001.
5. \*Seppa, N. 2001. Malaria Prevention Works in Tanzania. *Science News*. 159: 365.
6. \*Clarke T. Oct 3,2002. Mosquitos minus Malaria. *Nature*. 419: 429.

**Science Students-** read these two science and technology articles. Focus on the introduction and the discussion, the methods will be very scientific and full of scientific jargon so don't get bogged down in the details.

7. Menge D. et al. 2005. Fitness consequences of *Anopheles gambiae* population hybridization. *Malaria Journal*. 4:44 ( about 18 pages –with more science and stats)
8. Wang et al. 2005. Rapid urban malaria appraisal (RUMA)I: Epidemiology of urban malaria in sub-Saharan Africa. *Malaria Journal* 4:40. ( about 30 pages)

**Week 14 April 29- Indigenous Solutions to Malaria and HIV: The challenges of ethnopharmacology**

We will gain some background on the field of non-patentable technologies (NPTs) and review the pitfalls of forging partnerships between the developing world and the developed world.

1. \*Enserink M. January 7, 2004. Source of new hope against malaria is in short supply. *Science* **307** (5706): 33.
2. \*Avasthi, A. 2004. .Plant mimic may be cure for malaria. *New Scientist* 183(2461): 15.
3. \* Goozner, M. December 2006. Beating Malaria. *The Scientist*. 20(12): 16-33.
4. \*Enserink, M. Dec 2008. Signs of drug resistance rattle experts, trigger bold plan. *Science*. 322: 1776
5. \*Balick and Cox.1996. "Biological Conservation and Ethnobotany," in *Plants, Peoples and Culture*. Scientific American Library. This is chapter six (p. 179-208) in a very colorful text that covers the field of ethnopharmacology. A review of efforts to conserve resources and develop partnerships.
6. \*Root-Bernstein. Autumn 1995. The Development and Dissemination of Non-patentable Therapies. *Perspectives in Biology and Medicine*. (38) I: 110-17.
7. \*Shetty P. February 28, 2005. Biodiverse countries call for tighter patent rules. *Sci Dev Net Online*  
<http://www.scidev.net/dossiers/index.cfm?fuseaction=printarticle&dossier=11&type=1&itemtype=1&itemid=1954&language=1>
8. \*Sharma A. March 2004. Global Legislation on Indigenous knowledge. *SciDevNet* :8 pages.  
<http://www.scidev.net/dossiers/index.cfm?fuseaction=policybrief&policy=50&dossier=7>
9. Kling J. 1999. Out of Malaysia. *Modern Drug Discovery*. Nov/Dec, 31-36. A review of a potential new AIDS drug identified through a tech transfer partnership.

10. Parry, R.L. August 2, 2001. Bio-Pirates Raid Trees in the Swamps of Borneo. *The Independent*(UK) <http://forests.org/archive/indomalay/bpraidtr.htm> or <http://www.treff-raum-espaciotime.com/englisch/Articles/biopirates.html>
11. Vidal , J. [Society: Out of Africa: Kenya fights back against British biopirates. John Vidal reports](#) *The Guardian*. Manchester (UK):.13, Sep 8, 2004.
12. Anonymous. 2004. A feverish response. *The Economist* 373(8402):81-82.
13. Shiva V. Biopiracy: The plunder of nature and knowledge. Chapter 1 Piracy and patents and Chapter 2 Can life be made ? Can life be owned.: 1-41.

## **Week 15 May 6**

***Cholera Outbreak Case Study Role Play- Interactive Final Exam Bb- Statements should be posted by May 3<sup>rd</sup> and reviewed by class members and questions should be posted within 24hours and answers prepared for May 5<sup>th</sup> and reviewed for discussion/ symposium in class May 6<sup>th</sup>. Therefore, for May 6<sup>th</sup>, please print your statement, your question posed, and your question that you answered with the answer—making sure to note characters and real names for all parts.***

1. Wachsmuth, Blake and Olsvik, Eds. Vibrio cholerae and Cholera: Molecular to Global Perspectives. 1994. American Society for Microbiology. Washington, DC. Read Chapter 21: The Latin American Epidemic, p. 321-344.
2. The Right to Water, publication #3 in the WHO Human Rights Series <http://www.who.int/hhr/activities/publications/en/>
3. This site is part of a GIS course and has a wealth of information on Cholera in Peru
4. <http://www.valpo.edu/geomet/geo/courses/geo215/lab7.htm> but more recent data can be found at the PAHO site <http://www.paho.org/English/AD/DPC/CD/cholera-1991-2002.xls>
5. Spear, et al. 17 November 2006. Fighting Water-Borne Disease. *Science* 314 (5802):1081-1082. this letter to the editor takes us back to the first day of class with prevention and schistosomiasis in the context of fresh water. Please note that the entire issue of *Science* Aug 26,45 2006 is dedicated to clean water and health.

## **Week 16 May 13**

***You will submit your action plan Monday May 13<sup>th</sup>, and review the Action Plans of members in your Group . On May 13<sup>th</sup> submit your action plan and we will have time in class to deliberate and revise based on the group consensus. In class exam.***

### **Useful Journals**

The *Kennedy Institute of Ethics Journal*, *The Hastings Report*, *Emerging Infectious Diseases*, *JAMA*, *Morbidity and Mortality Weekly Report* ( MMWR free from CDC), *Developing World Bioethics* , *Science*, and the *Journal of Public Health* are all good places to start for getting information. The databases to use are Proquest for Science and Science News, Academic Search Premier for others. You may need to search around. If on the bobst campus you can access full text using Medline database.

### **Useful Web Sites:**(See course web pages for a complete list)

<http://www.theglobalfund.org/en/> The Global Fund for AIDs, TB and Malaria

<http://www.freemedicaljournals.com> \*\*\*\*\* this site has access to full text articles by linking you to the journal publishing sites.

<http://www.hsph.harvard.edu/hcpds/partnerbook/Partnershipsbook.PDF>\*\*\* Public Private Partnerships for Public Health: Online Book. Harvard University Press. April 2002

<http://www.scidev.net>\*\*\*\*\* this site contains great policy briefs and can be searched by region (see map) or by topic

<http://www.blackwell-synergy.com/toc/dewb/> This is a special issue(March 2005) of Developing World Bioethics: a series of research ethics training modules. That were developed because leaders of the South African CIPRA consortium commissioned the Bioethics Division at the Wits University Faculty of Health Sciences to produce such a training programme for their staff. CIPRA is the Comprehensive International Programme of Research on AIDS in South Africa. CIPRA, and therefore the development of the training modules, were funded by the US National Institutes of Health. There are usually strings attached to funding, except this time around the strings were purely beneficial. A corollary of this funding modus is that the modules are available free of charge to you (they are in the public domain) and may be reproduced free of charge for non- commercial purpose

<http://www.neglecteddiseases.org/thedndwg.shtml>\*\*\*\*\*The Working group for Drugs for Neglected Disease case collection of papers on access to essential drugs, with particular focus on developing countries.

<http://www.essentialmedicine.org/docs.html>

The website of The Universities Allied for Essential Medicines campaign which contains a great detailed primer on initiatives and case studies for work in this area ( there is also a shorter paper designed for students, but I think the detailed one is best for grad students)

<http://www.sagepub.co.uk/journals/Details/issue/j0152v42i04.html>

\*\*\*\*\*this is an on-line sample of the 1999 issue from the Journal for the Society of International Development

<http://www.who.int/infectious-disease-report/pages/grfindx.html>

the WHO site of important statistical information presented in graphs

<http://www.brookscole.com> \*\*\*\*\*this site is associated with textbook and has a wealth of resources including flash cards and links to tutorials. Click on resources, biology, and the Immunology Icon and follow the links. Or Choose Health or Microbiology depending on your needs.

#### **Sites for Ethnopharmacological Research**

<http://www.worldbank.org/globallinks/english/environment.html>

World Bank Institute page for videos on Nature's Pharmacy, climate change and access to clean water.

<http://www.cieer.org/archives.html>

The center for international ethnomedicinal education and research

<http://homepage.newschool.edu/~chamanyk/ID%20Web/0412.html> & click on BDCP homepage

<http://www.bioresources.org/> and be sure to visit their conference webpages to get names of people in the field.

Visit <http://homepage.newschool.edu/~chamanyk/ID%20Web/0308.html> for more information on clinical trials

The International Conference on Traditional Medicine in HIV/AIDs and Malaria 2000

<http://www.intercedd.com/events.htm> and click on the link that takes you to the downloadable report from

that conference <http://www.intercedd.com/downloads/bdcp-interceddconf.pdf>

Sunderland T. "Benefit Sharing and the Botanic Garden," *Biological Resources* : Symposium on Benefit Sharing and Botanic Gardens was held after the Convention of Biodiversity's (CBD) Subsidiary Body on Scientific, Technical and Technological Advise (SBSTTA) meeting of the 2-6 September, 1996 in Montreal, Canada 1996.(2003) <<http://www.bioresources.org/pub37.htm> >

<http://www.worldbank.org/globallinks/english/environment.html> Nature's Pharmacy video and images.

Tiger in the Forest <http://research.amnh.org/biodiversity/symposia/tigerintheforest/> The Center for Biodiversity and Conservation's 2003 spring symposium will explore the role of nature-based tourism in biodiversity conservation within mainland Southeast Asia (specifically Cambodia, Lao People's Democratic Republic, Myanmar, Thailand, and Vietnam). The region harbors a significant proportion of the world's rare and endemic plants and animals, including several species new to science.

<http://www.columbia.edu/~ftg1/Francesca%20T.%20Grifo.html>

The Value of Plants, Animals and Microbes to Human Health," held on April 17 and 18, 1998 at the American Museum of Natural History. At this symposium, scientists, environmentalists and policy makers from around the world discussed the link between conserving biodiversity and sustaining human health and well-being.

<http://sciencebulletins.amnh.org/biobulletin/biobulletin/story636.html> and

<http://sciencebulletins.amnh.org/biobulletin/biobulletin/story631.html>

### **Tuberculosis Web Sites**

[TB Drug Resistance](#)

[EthnoMed: Cultural Aspects of TB Screening and Management](#)

[American & Russian Scientists Team Up to Fight Tuberculosis Threat Argonne-Engelhardt Biochip Designed to Improve Diagnosis of Drug-Resistant Disease and Point Researchers toward New Treatment Options](#)

[Molecular Beacons Homepage](#) A site of new diagnostic methods

[PUBLIC HEALTH RESEARCH INSTITUTE](#)

[The Scientist - Stalking Infectious Disease](#)

[Global Tuberculosis Control - WHO Report 2001 - Contents](#)

[InterScience, Inc. - Capabilities - Digital Luminescence Detector](#)

### **Additional Readings on Bioterrorism**

Garrett, Laurie. "Biowar" in *Betrayal of Trust*. Hyperion. NY, NY. p 486-550. 2000. **Hard copy only.**

AAAS (2002). "Spotlight on Bioterrorism" *Science and Technology in Congress*: 3, 7.

<http://www.aaas.org/spp/cstc/stc/stc02/02-02/bio.htm>. This site reviews the current **federal spending for biowarfare** defense.

Cohen, J. and E. Marshall (2001). "Vaccines for Biodefense: A System in Distress." *Science* **294**: 498-501.

**2002** (May 15). <http://www.ph.ucla.edu/epi/bioter/vaccinesfordefense.html>

Black, H. (2001). "Diagnosing Bioterrorism: Applying **New Technologies**." *The Scientist* **15**(15): 8.**2002** (May 15) [http://www.the-scientist.com/yr2001/jul/black\\_p8\\_010723.html](http://www.the-scientist.com/yr2001/jul/black_p8_010723.html)

Willis, R. 2002. Infringement for the Public Good. *Modern Drug Discovery* 5 (5): 41-45.

<http://pubs.acs.org/subscribe/journals/mdd/v05/i05/html/05pap.html>

This is a wonderful education site (McGraw Hill ) on bioterrorism, infectious diseases, and reviews **smallpox, botulism, tularemia, anthrax**, and others. [http://mheducation.com/public\\_service.html](http://mheducation.com/public_service.html)

"Disease and Human Security", Chapter one in *The Global Threat of New and Reemerging Infectious Diseases: Reconciling U.S. National Security and Public Health Policy*

<http://www.rand.org/publications/MR/MR1602/index.html>

Pearson, G. S., M. R. Dando, et al. (2001). *Review Conference Paper No. 4: 'The US Statement at the Fifth Review Conference: Compounding the Error in Rejecting the Composite Protocol'*.

<http://www.brad.ac.uk/acad/sbtwc/>. **2002** (May15) Fifth Review Conference of the Biological Weapons

Convention, Palais des Nations, Geneva, Switzerland. This site carries a collection of papers that deconstruct the U.S. position on the Biological and Chemical Weapons Convention Treaty. There are video clips of policy analysts and their views on the subject and these include Graham S. Pearson, and David Atwood and Jenni Rissanen at <http://www.brad.ac.uk/acad/sbtwc/other/bw-info.htm>. The Jenni Rissanen clip is the most informative:: <http://www.brad.ac.uk/acad/sbtwc/other/video/jenni56k.ram>. Graham S.

Pearson: <http://www.brad.ac.uk/acad/sbtwc/other/video/brightep22.ram> David Atwood:

<http://www.brad.ac.uk/acad/sbtwc/other/video/davida56k.ram>

<http://jama.ama-assn.org/> (use the key words "Working Group on **Civilian Biodefense**" in the search field and six articles on bioterrorism by the Working Group on Civilian Biodefense—addressing **anthrax, smallpox, plague, botulinum toxin, tularemia**, and **viral hemorrhagic fever**—are online and free of charge. Arnon, S. S., R. Schechter, et al. (2001). "Botulinum toxin as a biological weapon: medical and public health management." *JAMA* **285**(8): 1059-70. **2002** (May 15). <http://jama.ama-assn.org/cgi/content/full/285/8/1059> This paper reviews the threat of **botulinum toxin** as a bioweapon and has excellent **figures**. Large-Scale Quarantine Following Biological Terrorism in the United States: Scientific Examination, Logistic and Legal Limits, and Possible Consequences

JAMA 2001 286: 2711-2717.