

MICR 418: Emerging Infectious Diseases I

Emerging infectious pathogens are predators that exploit changes in human biology, behavior, and the environment to overcome public health measures and host defenses. Domestic examples include Zika, Ebola, influenza, dengue, and West Nile virus. Hospital-acquired infections, usually multidrug resistant, take the lives of over 90,000 Americans annually. Vaccine-preventable diseases reemerge in populations at both ends of the wealth spectrum, such as tetanus or rabies among the world's poorest children, measles or mumps among conscientious objectionists. In South America, dengue fever, schistosomiasis, leishmaniasis, and persistent childhood diarrhea feature prominently. In Sub-Saharan Africa, co-infections and drug resistance increasingly frustrate the struggle against malaria, tuberculosis, salmonellosis, and HIV/AIDS. In East Asia, the recent origin of novel influenza viruses, SARS, and pan-resistant gonorrhea meets a particularly interesting nexus of economic transformation, societal upheaval, and government policy. Additional complications include an arising pandemic of hepatitis C, promiscuous drug-resistant genetic elements, rolling waves of HIV, the unfolding effects of climate change, and, of course, the specter of biological weapons. The class will survey a wide range of pathogens whose emergence relates to contemporary human, microbiological, and environmental factors and will examine how microbes have overcome medical marvels that took 150 years to develop. Common themes will be developed from almost 50 examples of today's emerging infectious diseases. The course will explore the spectacular opportunities for research science to liberate humanity from existing infectious diseases and prepare for the next emergence.

Learning Objectives

- Understand where, how, and why infectious diseases emerge
- Discuss over 50 emerging infections in the context of U.S. and global health
- Get to know the impact of infectious disease and disease control on human genetics, behavior, and society
- Explore how infectious disease molds human science, art, and society
- Gain insight into important new opportunities in infectious disease

Credits: 2

Class Type: Graduate Course

Prerequisites:

Interest in the interface of science and medicine, and, for credit students, willingness to make one class presentation on an emerging infectious disease chosen from a list.

Program: Immunology and Microbiology