

EMERGING INFECTIOUS DISEASES: ZIKA, EBOLA AND OTHERS

Coordinator: Hannah Shear

This course studies the newly emerged Zika and Ebola viruses as well as other viral, bacterial, and protozoan diseases that have emerged throughout the world in recent times (although some such as AIDS were hidden from view). We study the biology of these infectious agents, when and where they emerged and why they emerged at this juncture in time. We discuss how such infections are identified and how health services can respond. Some questions to be explored are: What are humans doing to promote the spread of these infections? Are we facing another pandemic such as AIDS?

Reading:

Spillover, Animal Infections and the Next Human Pandemic by David Quammen, {WW Norton and Company, 2012, ISBN 978-0-393-06680-7}.

Hannah L. Shear investigated immune responses to malaria, trypanosomiasis, and Pneumocystis at NYU Medical Center and Albert Einstein College of Medicine. She also taught courses on parasitic diseases.

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1. When did the era of emerging, zoonotic infectious diseases begin? What is a zoonosis? (Quammen: pp39-45).
2. What are viruses? How do they differ from bacteria and protists? (Quammen, Ch. VI: "Going Viral" pp. 263-310).
3. Immunity to infection: How to we detect infection and measure responses? Reading to be determined.
4. Zika virus – where did it come from and where is it going?

What do we know about microcephaly? What are the implications for birth control, travel restrictions, financial costs for children with disabilities? Reading to be determined.

- 5.** Ebola virus: The epidemic of 2013-14. What is the aftermath? Drugs, vaccines, tests? (Quammen, pp.54-123 “Thirteen Gorillas” and other reading to be determined).
- 6.** Hendra virus (Quammen, “Pale Horse” pp.13-49,) features of one of the first known spillovers. We will discuss: spillover, reservoir, finding the causative agent, transmission, infectivity, sero-prevalence, morbidity, and amplifiers.
- 7.** SARS CoA - How was infection contained in this outbreak? (Quammen, Ch. IV, “Dinner at the Rat Farm”, pp. 167-207.).
- 8.** Why are bats often the reservoirs of emerging infections? Quammen, Ch. VII, “Celestial Hosts”, pp. 314-381).
- 9.** Malaria, an example of the spillover of a protist. (Quammen, “Everything Comes from Somewhere”, pp. 128-164).
- 10.** Bacterial spillovers: Lyme Disease and others. What are the differences between viruses and bacteria? (Quammen, “The Deer, The Parrot and the Kid Next Door”, pp.238-259) .
- 11.** AIDS: How did HIV emerge? How did it explode? (Quammen, “The Chimp and the River”) pp. 385-489.
- 12.** Summing Up: Quammen, pp, 494-520.