

First Project M470/M570

Choose **one** topic from the list below, work it up and write a brief essay responding to the questions posed. Your answer should be between 3 and 5 type-written, double-spaced pages. If you quote a source, please provide the reference. Be prepared to discuss your work in a 5 to 10 minute presentation to the class. Pictures, overhead projections and PowerPoint presentation will certainly help. Your completed project will be **due on Thursday of week 6**.

If you prepare an outline of your presentation, please provide me with an electronic copy, PDF file preferably, that I can distribute by email to your fellow students.

1. Comment on how the founder population size and degree of genetic homogeneity of Native Americans may have contributed to (or not) any unique susceptibility to disease. Are you aware of any disease, infectious or otherwise, that might occur in higher frequency in Native American populations as compared people of European descent? If so, is there a genetic basis that might explain the increased frequency?
2. Describe how the immune system may contribute to disease and tissue destruction as part of the response to an infection or some antigenic stimulus. Include in your answer the four basic patterns of hypersensitivity, and for one of these give a detailed description with modern examples. Then find at least two historical references from the Americas, written, graphic art, whatever, illustrating some aspect of this process.
3. Describe two different molecular mechanisms by which an otherwise harmless and banal microorganism might be transformed into a pathogenic bug. Then consider hypothetical changes in the environment (vector, reservoir, etc) that might facilitate the emergence of a new infectious disease. How might this factor into the co-evolution of both host and microbe? Find a least one historical description of disease or epidemic that was imported into the Americas in which such changes of the organism can be documented.
4. Take one of the online documents sites we are using as a reference source and explore it. Tell us about where the documents come from, where the originals are found, what time period they cover, who maintains the site and how a search is done. Find a least three references from that site to disease in the Americas, preferably infectious diseases. See if you can trace one of the references backward or forward in time and establish a timeline.
5. Describe the concept of 'herd' immunity, both genetic and acquired. Give at least one example, or hypothetical situation, in which herd immunity could substantially influence the course of an epidemic illness. Find at least one primary reference in the data bases we are using that details an epidemic in which herd immunity (either its presence or absence) played a role in the progression of the illness.