A Summer at the CDC: Mumps, Models, and Reviews

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Introduction
• Mumps is a highly infectious viral disease that classically presents as parotitis or swelling of the parotid gland(s)
• The U.S. has seen a 99% reduction in mumps cases following the implementation of a 2-dose Measles-Mumps-Rubella (MMR) vaccine in 1989
• Since 2006, there has been a resurgence of mumps cases and outbreaks
• No comprehensive systematic review or meta-analysis to estimate 2-dose MMR vaccine effectiveness in preventing mumps and mumps complications currently exists
• Few studies have modelled the effect of a third dose of the MMR vaccine in treating mumps

Objective of Internship
The objective of this internship was to conduct research on the effectiveness of the 2nd dose of the MMR vaccine in treating mumps, and to acquire data to model the impact of a 3rd dose of the MMR vaccine in treating mumps.

Work Profile
• Learned how to approach conducting a systematic review
• Created a search query for the CDC librarian that included relevant terms and questions to amass an initial library of articles to screen
• Screened 1323 article titles and abstracts for inclusion to or exclusion from the systematic review
• Provided feedback and consultation to other mumps team members regarding their projects
• Attended weekly team meetings and various calls, such as correspondence with different state departments of health regarding mumps outbreaks in detention facilities
• Consulted several mumps team members about MMR3 data collection and management

Reflection
• Greatly enjoyed the exposure to the day-to-day happenings of the CDC such as:
  • A tri-annual Advisory Committee on Immunization Practices (ACIP) meeting
  • An Ebola outbreak response general briefing meeting
  • A meeting on foodborne outbreaks in the Outbreak Response and Prevention Branch in the Division of Foodborne, Waterborne, and Environmental Diseases

Looking Ahead
• Expecting to publish the results of the systematic review by 2020
• Working with the MMR3 data to model its effectiveness in a university setting

Questions
• What is the reproductive number for mumps in a highly vaccinated university population during an outbreak?
• What is the impact of an MMR3 vaccine campaign on a simulated outbreak model?

Conclusion
The CDC is working diligently to conduct research that would provide timely context to the ongoing mumps related outbreaks occurring in the United States, and it was an honor to contribute to their work.

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