HNRS 225 Science and Technology in New York

Lecture *: Value of Vaccines for Society: We (yes me, too) have all grown up in a time when most people have been vaccinated against a series of devastating childhood diseases. In America, we are likely never to have seen a child with whooping cough, measles, polio and even now chicken pox. However, these diseases once devastated parents and had significant impact on the growth and development of nations. In this lesson we will explore the symptoms of a set of devastating diseases that once plagued children, the process of developing and deploying a vaccine, the consequence of not vaccinating and the current state of vaccinations in the US and abroad. As a part of this module you will work in groups to identify key information needed to understand the value of vaccines, work with that data to generate useful visual representations of this data and share your findings with the class.

This will likely take 2 or 3 class periods (1:15 hours per period).

By the end of this lesson you will be able to:

Vaccination Measurable Learning Objectives:

- identify 4 childhood diseases for which vaccines are currently available
- list the symptoms of each disease
- explain how vaccines are developed in a research laboratory
- explain how vaccines work in our bodies to generate immunity
- explain the importance of population vaccinations to protect the community

Assessment: formative assessment as participation components of for this unit and summative in the form of the final project for this unit in addition to final exam questions covering this key material.

In addition, you will develop skills to be able to:

BIG Dream Learning Goals:

- evaluate scientific resources for data acquisition
- demonstrate effective visual communication skills
- identify relevant numerical data sources and extract numerical data from data tables

- utilize these data to generate graphs that effectively visually represent the data (bivariate line or bar graphs)
- gain comfort and confidence in mathematical skills utilize quantitative data and QR to make informed health decisions based on mindful risk/benefit assessments

Pre-class preparation (warm up): Due 2 hours prior to class on BB. Bring a copy to class.

Grading: Formative assessment. Graded on a scale of 0-3. (This grading system is used for each pre-class assignment and it primarily given for participation. A grade of 0 is given if nothing is submitted. A grade of 1 is given if students provide partial answers (either answering only some of the questions or part of each question). A grade of 2 is given if students provide complete but minimal answers for most of the questions while a grade of 3 is provided to students who present clear and well thought out answers.)

1) Watch the following 7-minute movie:

http://www.youtube.com/watch?v=55wOg9fe_Ms

In a maximum of half a page, answer the following questions and post them under assignments on BB:

2) Describe the cause and symptoms of whooping cough.

3) What is the death rate (virulence) of whooping cough? In other words, how likely would you have died if you had whooping cough and it was untreated? Cite your sources and show any calculations. (Students are familiar with the CDC and WHO website)

4) In two or three sentences, using your own words, what is the social value of vaccination programs? Consult the WHO if you need additional information.

5) Identify 2 questions about childhood disease or vaccines that you would like to learn more about in this course.

Instructor Preparation:

The instructor will read and consider the pre-class submissions. If needed, the instructor will develop a simple class activity to address any misconceptions or confusion identified in the pre-class assignment.

In Class:

If no class redirection is required, students will gather together in their **Rainbow Teams**.

Discuss their responses to the pre-class assignment (formative assessment- participation grade only)

Group member assignments: identify a discussion facilitator to moderate the discussion, identify a secretary to take notes on the basic discussion and fill out the participation chart in the portfolio. In addition, please identify a presenter who will speak on behalf of the team to the class later during this project.

Within your team:

1. One student will share their thoughts from the pre-class work with the group.
2. If you (any other member of the group) has identified a similar issue and would like to extend on this idea/or topic, please contribute to the discussion before allowing the group to move on to the next students thoughts/ ideas.
3. The next student will share their thoughts until each student has presented.

Reconvene the entire class.

PAUSE and CONSIDER Individually

What surprised you most about what have you learned about vaccinations?

What additional information would you like?

Do you think about vaccines for yourself or friends differently now? If so, how?

Class Discussion on Vaccines

Grading: (formative assessment) to receive a participation point for this class you must contribute to the class discussion. Instructor will note participation as a check or check plus on the participation sheet for the day. Check plus is awarded for particularly active participation or a particularly insightful comment.

Address the individual questions presented above.

Begin to discuss the value of vaccines in society. What information would you need to determine the value of a vaccination program?

Work in your Rainbow Team – preparation for final unit project

Each team will be given a childhood disease for which there is now a vaccine. Within your team use the internet (all students have laptops) to gather the following information regarding your groups disease. This will likely take 1.5 to 2 of the class periods with students working outside of class to finish the project. Please make sure that number 5 is completed by the end of the 2nd class period:

1. What are the symptoms of the disease?
2. How virulent is the disease?
3. Are there any unique characteristics of the disease epidemics as seen for whooping cough that must be considered?
4. Recall the discussion of the value of vaccines in society. What information would be helpful to have in order to demonstrate the value of a vaccination program? Locate a data table with this information. If there is only a graphic representation of this data, generate your own version data table by retrieving numerical information from this source. (For example: Locate numerical data regarding the implementation and efficacy of the vaccine either within the US or internationally. You may also look specifically at NYC if there have been local outbreaks).

Class Discussion on Vaccines

Once most groups have identified the data located at least a portion of the data that they feel they need, we will reconvene as a class and discuss the data they have identified and consider ways to visually represent this data. In previous classes we will have explored the key components of bivariate line and bar graphs.

1. Generate a visual representation of the relevant data you have identified (i.e. bivariate line or bar graphs). If you are able to model future trends based on the data you have chosen to present, please do so.

http://www.cdc.gov/pertussis/images/incidence-graph.jpg

http://www.cdc.gov/pertussis/images/incidence-graph-age.jpg

Final project for this unit: Groups will work at their own pace so some will start in class and completed as a part of the homework- see syllabus for due date. Here is a sample infographic:

http://www.upworthy.com/it-took-studying-25782500-kids-to-begin-to-undo-the-damage-caused-by-1-doctor?g=3&c=upw1

http://static.businessinsider.com/image/5356e61decad04f6549307a5/image.jpg

Once you have identified the relevant data (items 1-5), generate an infographic that communicates the value of vaccination for this disease to the general public. Include as much of the information you have gathered as possible. The visual representation generated in 5 is a required component of your infographic.

Portfolio work

Write the names of all the students present in your team on your portfolio work.

Date the work and indicate the lecture number.

Place in the correct folder:

- A copy of the notes on the basic discussion regarding the pre-class assignment and the participation chart
- A summary of the groups project
- A list of the goals for next class
- Anything else your team wants to return to in a future class