**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. 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 plagues 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 group 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 times.

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

In addition, you will build towards:

**BIG Dream Learning Goals:**

- evaluate scientific resources for data acquisition

- demonstrate effective oral communication skills

- identifying relevant numerical data sources and to extract numerical data from bivariate line and bar graphs

- utilize these data to generate graphs that effectively visually represent the data and extend models beyond the data presented

 - gain comfort and confidence in their mathematical skills and will be to 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.

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:

2) Describe the symptoms of whooping cough.

3) What is the death rate (virulence) of whooping cough? IN other words, who likely would you have died if you have whooping cough in 1950? Sight your sources.

4) In two or three sentences, using your own words, what is the social value of vaccination programs?

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 collect in their **Rainbow Teams**.

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

Within your team:

1. One student will present thoughts from their pre-class work with the group.
2. If you have identified the similar issue and would like to extend on this idea provide this information before the next person speaks.
3. The next student will share his or her 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?

Class Discussion on Vaccines

Grading: (formative assessment) participation is required

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

Each team will be given a childhood disease for which there is now a vaccine. Within your team consider the following:

1. What are the symptoms of the disease? (all students have laptops)
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. Keeping in mind the additional information you might want determine the value of a vaccine, use the internet to locate numerical data regarding the implementation and efficacy of the vaccine either within the US or internationally.
5. Using the numerical data you have identified generate a visual representation that communicates the value of the vaccines to the general public. This can be a graph or other visualization.

**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 it in the correct folder:

* 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

**Post Class Activity:**

Communicating the value of vaccinations for the disease you were assigned:

Complete the visual representation of the numerical data you collected in class. Generate a 3-minute video OR an infographic (students have already been taught to do this) that utilizes the visualization but also includes additional insight gathered regarding the disease you were assigned.

Dear Nathalia,

I think this is a really interesting assignment that gets at a very important topic, i.e., the importance and effectiveness of vaccinations.  I think there are many strengths in this assignment and I also really like that you use a variety of different pedagogical strategies for teaching these skills (e.g., videos, collaborative group work, hands-on data analysis, etc.).

I think this assignment may benefit from some additional scaffolding and examples.  As I imagined myself working on it, in several areas I had some questions about exactly what you wanted.  It also wasn't clear to me how all the questions (or the assignment overall) would be evaluated.  I also wondered about the correspondence between your QR learning goals and this specific assignment.  For example, you say (in your learning goals) that you want students to "extract numerical data from bivariate line and bar graphs," but I don't see anything in the assignment that teaches them (or requires them) to do this.  I see this assignment as giving students numerous opportunities to review and work with data (and that's great!), but in terms of developing specific skills it seems to me that more direction may be needed.  In any case, I put some comments in your document using MS Word's markup function where I think some additional guidance may be helpful and where I noticed a few typos here:  https://docs.google.com/document/d/1h3Hj3oXpMr5LKK2oW4-IY\_CsvZguPTjl7KPLytiPyBo/edit

Wednesday, 07/23/2014 1:00 AM by [Esther Wilder](https://bbhosted.cuny.edu/webapps/lobj-expo-bb_bb60/user/866CD87DF00C1237/)

Hi Nathalia,

Great topic and the learning goals are well said.  I got lot of information from the video clip.  When I was reading through the lesson plan it involves so much activities, but I do not see how you are going to measure the learning goals in the domains of knowledge and conceptual understanding, thinking and attitude, values, disposition, and habit of mind.   Esther posted some examples of lesson plan from the previous NICHE group. may be that pattern can be followed.

Friday, 07/25/2014 6:51 PM by [Soosairaj Therese](https://bbhosted.cuny.edu/webapps/lobj-expo-bb_bb60/user/4608C50844054E44/" \o "Visit Soosairaj's expo site" \t "content)

Hi Nathalia,

I tried to edit on the google doc that Esther created for you to help you correct typos on the assignment, but I could not make that work.  Sorry!  You definitely will want to review the assignment carefully for spelling and grammar.  Here's one line, for example:

Original:

3) What is the death rate (virulence) of whooping cough? IN other words, who likely would you have died if you have whooping cough in 1950? Sight your sources.

What I think you meant:

3) What is the death rate (virulence) of whooping cough? In other words, what proportion of individuals would have died of whooping cough in 1950? Cite your sources and show your calculations.

I agree with the comments above.  Great, important topic!  I like that you spell out the QR learning objectives under "Big Dream Learning Objectives," and I would like to see you tie your assignment more directly to those specific objectives.  Nice use of multiple pedagogical approaches with the video, data analysis, etc.  Cool post-activity, getting students to create new knowledge in a great format.

I suggest you take on the role of a student in your class doing this assignment as written, step-by-step for one of the diseases, and see where things are unclear.  Or get one of your bio colleagues to try this step-by-step.  With a little more time and attention to those details, I think this could become a very nice assignment.

-- Corri