Disease Detectives: Increasing awareness of public health and medical laboratory science professions through competitive events
Sheri M. Gon, MPH, MLS
Pacific Global Health Conference, October 9, 2012

- Mean Performance on Science
  - Finland ranks number 1
  - US ranks 20
- Mean Performance on Reading
  - Finland ranks number 1
  - US ranks 12
- Mean Performance on Math
  - Hong Kong ranks number 1
  - US ranks 25

Source: Organization for Economic Cooperation and Development (OECD) and Program for Student Assessment (PISA)
Students score poorly in science exams, Star Advertiser (July 28, 2011)
- 22% of 10th graders score proficient in biology

Hawaii falls behind nation in science knowledge, Star Advertiser (January 25, 2011)
- Hawaii 8th graders lower than 41 states
We need STEM education!

- Lack of interest in STEM
- Poor scores in math and science
- No awareness of public health and medical laboratory careers
Science Olympiad in 1984

- Dr. Gerard J. Putz, Regional Science Consultant for Macomb County Intermediate School District in Michigan
- John C. “Jack” Cairns, State Science Supervisor for Delaware Department of Instruction

http://www.lacoe.edu/AcademicEvents/ScienceOlympiad.aspx
HSSO begins in 2008

- Franklin Allaire (State Coordinator)

http://honolulusunsethi.clubwizard.com/PhotoAlbums.cfm?AlbumID=11588&PhotoID=132225
Anatomy 2008

- Majority of questions were recall, identify, find
- Too much memorization
- Not enough critical thinking

Anatomy abandoned
Disease Detectives adopted
www.soinc.org
Based on public health incidents
- Food borne illness
- Infectious disease
Denise Nelson recruited to assist with DD
What is Disease Detectives?

- An annual competitive event for middle school and high school students.
- Teams of two students apply mathematical concepts and deductive skills to analyze a public health scenario.
- Teams are scored in a 50 minute competition.
The competition is fierce!
What does Disease Detective do?

- Makes STEM relevant
- Brings the concepts to life
- Engages students
  - Competitive event
  - Involves critical thinking
  - Involves team work
Making STEM Relevant

- Use case scenarios depicting real events
  - Influenza outbreak
  - Food borne illness

Case scenarios are fictional but realistic
Applies concepts that are in current use

Increasing Student Engagement

- Competition makes learning fun and exciting
- Students want to excel vs meet expectations

http://www.hssso.org/?q=node/4
Increasing Student Awareness

- Connects science to the event scenario.
- Connects math concepts to analyze situation.
- Connects to careers involved in scenario.

http://www.co.washoe.nv.us/health/php/epidemic.html
How do you get started with HSSO?

- Competitive events are announced in fall.
- Students select competitive event(s).
- Coaches download instructions from SO site.
- Coaches conduct practice sessions.
- Students are allowed a non-programmable calculator and one sheet with notes and formulae into the competitive event.
- State competition held in March.
Format was intentionally made to encourage critical thinking.

Answer sheets are collected at strategic points and then story/slides continue.

Allows for students to learn during the competitive event regardless of correct or incorrect answers.
Promoting the Professions

- There are professionals in healthcare other than RNs and MDs
- Professionals exist that are trained to respond to large scale events
- Only trained professionals are qualified to perform diagnostic testing in med labs
- Specific knowledge, attitudes, and skills are needed in PH work and med labs
The Sheri, Denise, and Eric Disease Detectives Show

HSSO at LCC, March 2010
Examples of PP Slides from DD

- For the next nine slides, pretend you are the student participants in Disease Detectives.

http://blog.studentloannetwork.com/financial-aid/federal-aid-for-students-without-need/
Monday morning and students are sick!

- Unusually large numbers of sick students reported at 3 high schools on Oahu
  - Farrington High School
  - Roosevelt High School
  - Kahuku High School

http://www.eduinreview.com/resources/how-to-stay-healthy-in-college/
Question #1a:
- Name the three routes of entry into a person’s body for microorganisms or chemicals.

http://principalposts.edublogs.org/page/2/
Reports from School Nurses

Most students are reporting symptoms of fever, cough and malaise

Question #1b:
Indicate which one is the most likely route of entry for this case (circle one in #1a).

http://www.ehow.com/info_7981174_issues-school-nursing.html
Farrington High School

- Total Student Population: 2579 Students
- Number of students called in sick: 638
- Number of students exhibiting fever, cough & malaise: 582

http://www.hauntednorthamerica.com/honolulu.htm
Roosevelt High School

- Total Student Population: 1672 Students
- Number of students called in sick: 481
- Number of students exhibiting fever, cough & malaise: 397

http://the.honoluluadvertiser.com/article/2007/Apr/30/ln/roosevelt.html
Kahuku High School

- Total Student Population: 1879 Students
- Number of students called in sick: 246
- Number of students exhibiting fever, cough & malaise: 217

Question #2:
An incidence rate is the number of people exhibiting an illness of interest divided by total at risk for the illness. Calculate the incidence rates for the following three schools using the information provided...

http://www.guardian.co.uk/technology/blog/2009/oct/15/texas-instruments-calculator
Question #2 Incidence Data

- **Farrington High**
  - Total Student Population: 2579 Students
  - Number of students called in sick: 638
  - Number of students exhibiting fever, cough & malaise: 582

- **Kahuku High**
  - Total Student Population: 1672 Students
  - Number of students called in sick: 481
  - Number of students exhibiting fever, cough & malaise: 397

- **Roosevelt High**
  - Total Student Population: 1879 Students
  - Number of students called in sick: 246
  - Number of students exhibiting fever, cough & malaise: 217
Question #3

- What other diseases present with these symptoms? *(List 2)*

Please turn in page one when completed!

http://www.crimescenecleaning.net/biospray
## Participation at HSSO

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<thead>
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<th>YEAR</th>
<th>NUMBER OF STUDENTS</th>
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<tr>
<td>2011</td>
<td>816</td>
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<td>2012</td>
<td>1,190</td>
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Participation in Disease Detectives

<table>
<thead>
<tr>
<th>YEAR</th>
<th>NUMBER OF TEAMS</th>
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<tbody>
<tr>
<td>2009</td>
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<tr>
<td>2010</td>
<td>10 HS</td>
</tr>
<tr>
<td>2011</td>
<td>11 HS and 13 MS</td>
</tr>
<tr>
<td>2012</td>
<td>13 HS and 13 MS</td>
</tr>
</tbody>
</table>

DD does the following:

- Presents public health issues and medical laboratory services in the context of HSSO Disease Detectives event
- Describes role of public health and med lab professionals
- Explains academic preparation
- Notes current and future workforce shortages
- Emphasizes job opportunities
What’s next?

- If DD is a method of recruitment for PH and med lab science, what’s next?
- Is there a measurable increased interest in PH and med lab professions after DD?
- What mechanisms/tools are there to measure impact of DD on students perception of PH and med lab professions?
- What are strategic metrics that can measure these aforementioned points?
Questions?

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