Conducting Public Health Surveillance and Communicating Data in Maternal and Child Health

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Background

- Public health surveillance is a cornerstone in the practice of maternal and child health (MCH).
- At the undergraduate level, few students have the opportunity to engage in hands-on experiences working with large population-based data and communicate this information.
- New technology is available for working with and evaluating national and state-level data that do not require the use of data analysis software.

Objective

- To implement and evaluate an applied research project that examines trends and disparities in key MCH indicators for the state of Maryland.

Methods

Study Population

- Students in an undergraduate MCH course at the University of Maryland.

Study Design: Mixed-methods study

- Students used interactive data tools to produce informative graphics, which they compiled into a final report.
- To evaluate student learning, a post-project anonymous survey was administered to assess MCH knowledge (Fall) and skills before and after the project (Fall-pre and Fall-post, respectively).
- The same survey (pre-project questions only) was administered to a comparable MCH class that did not receive the project (Spring).

Measures

- MCH knowledge of key indicators and data
- Public health surveillance and data skills and skill development before and/or after the project (Likert scale of 1 = Not at All and 5 = Very Much)
- What worked well, what didn't, what could be improved

Analysis

- Likert scale distributions for each response were examined and summarized as means or proportions
- Mean knowledge and confidence in skills Likert scores were compared between post-project (Fall_post) and pre-project (Fall_pre) using paired ttests and with a comparable class (Spring 2019) using unpaired ttests.
- Open-ended responses were reviewed and coded into common themes by two research assistants. Data were double-coded and analyzed using Google spreadsheet.

Results

Figure 1. Mean Likert scores of student responses to public health surveillance skills questions

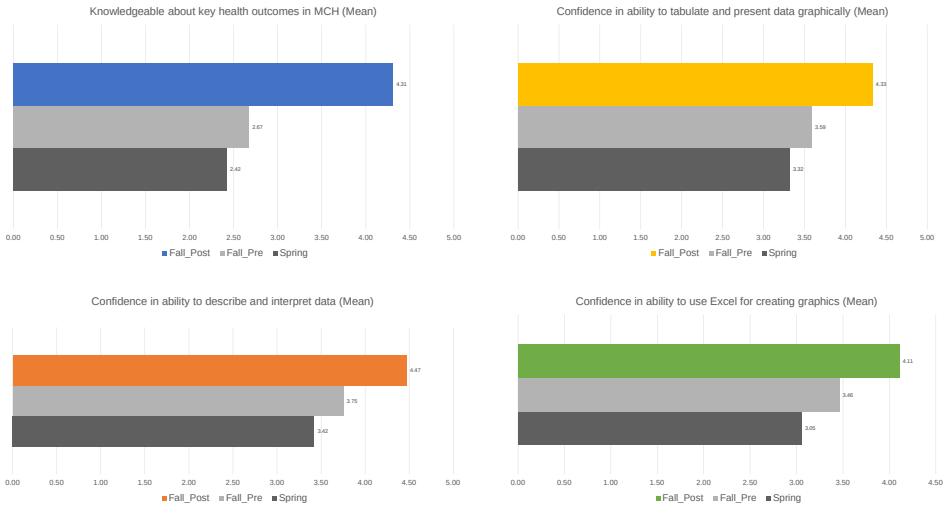

Table 1. Percentage of students responding "A lot (4)" or "Very Much (5)" to having improved their skills or identified skills that needed development after project completion (Fall_post only)

	Skills that improved after project completion	Skills identified as needing to develop after project completion
Problem solving	74.1%	24.7%
Researching	75.3%	24.7%
Analysis of data	76.5%	26.2%
Presenting written information	74.1%	21.4%
Working with others in a group	70.6%	23.5%
Delegating Responsibilities	73.0%	31.8%
Time Management	65.9%	33.0%

- Overall knowledge scores were higher in the Fall (8.6 points out of 16) compared with the Spring (7.0 points) semester (p=0.001).
- Mean Likert scores of student responses to public health surveillance skills in the Fall post-project were significantly higher than their pre-project responses across all skills questions and compared with Spring students who did not receive the project (p-values < 0.001 across all comparisons). No significant differences were observed between Fall pre-project and Spring across all skills questions (p>0.05) (Figure 1).
- A majority of students reported that the project improved their learning across several domains (over 65%). Less than a third of students identified skills that needed developing after the project; the highest proportion needing improvement was delegating responsibilities (31.8%) and time management (33.0%). (Table 1).

Results

Qualitative responses

Key themes centered around learning outcomes, collaboration, and instruction. Selected quotes highlight these themes across 3 domains:

What worked:

- "… it allowed us to gather information about our own region/state. Being knowledgeable on your own state's health issues is a great beginning to understanding the health field."
- "The opportunity to create a brief similar to the CDC's brief. I felt very professional and official."
- "That it challenged me to work with others and hear other ideas."
- "The instructions were clear and we had ample time to think about it."

What didn't work:

- "I am not great at interpreting data, so it was a source of frustration at times."
- "…using excel to make tables."
- "I never support group projects in college settings, especially when people likely have conflicting schedules, more importantly, different levels of focus in education."
- "I wish it wasn't repetitive of the information provided already. I wish there was more interpretation and application pieces."

Suggestions for improvement:

- "The project itself was great and information. I wouldn't change anything about it."
- "Possibly make it for individuals and not groups."
- "… encourage students to seek out statistical data from other approved sources."
- "… having certain parts due by a certain time and then have a final compilation of the information to ensure students are on track."

Conclusions

- Overall, the project demonstrated gains in knowledge and skills related to MCH surveillance.
- This project could be adapted to a range of data analytic skills, is replicable in different states, and could be expanded to include other data sources.
- Finally, it prepares undergraduate students with real-world skills in public health surveillance necessary for the MCH workforce.

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