

Master of Public Health Applied Practice Experience

by

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submitted in partial fulfillment of the requirements for the degree

MASTER OF PUBLIC HEALTH

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2023-2024

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2025

Table of Contents

Chapter 1 - Portfolio Products.....	2
Table 1.1 Summary of Portfolio Products	2
Table 1.2 Portfolio Products and Competency Addressed	3
Chapter 2 - Competencies.....	4
Table 2.1 Summary of MPH Foundational Competencies	5
Table 2.2 MPH Foundational Competencies Course Mapping	5
Table 2.3 Application of Systems Thinking Tools to a Public Health Issue	7
Chapter 3 - Information Needed if Completing a Thesis Only	Error! Bookmark not defined.
Student Attainment of MPH Emphasis Area Competencies	Error! Bookmark not defined.
Table 3.1 Summary of MPH Emphasis Area Competencies	Error! Bookmark not defined.

Chapter 1 - Portfolio Products

The Applied Practice Experience (APE) was conducted in coordination with the Food and Drug Administration (FDA) in Lenexa, Kansas. The work centered around the Total Diet Study Program (TDS) (<https://www.fda.gov/food/reference-databases-and-monitoring-programs-food/fda-total-diet-study-tds>). The FDA Total Diet Study (TDS) is an ongoing program that monitors several nutrient elements, pesticide residues, and contaminants in retail food offerings in the United States. Currently, regional facilities collect food samples for testing from three cities within the region. My project was based on determining whether or not samples from three cities were required or if the sampling requirement could be reduced. I also created a Cost-Minimization Analysis assignment for HCA-510 Healthcare Economics at the University of North Carolina, Wilmington, to improve course outcomes. These projects were completed between December 2023 and February 2025, with a minimum of 240 hours spent conducting data analysis and curriculum development.

Table 1.1 Summary of Portfolio Products

Portfolio Product		Description
1	ANOVA Analysis Results – 3 Cities	Determine if sampling results from three cities are statistically different using ANOVA data analysis technique.
2	ANOVA Analysis Results – Outliers	Determine if outlier samples are significantly different using ANOVA data analysis technique.
3	Percentage of Samples < LOD Results	Provide data visualizations for various food samples, showcasing the percentage of samples whose concentrations were below the limit of detection.
4	TDS Presentation	Present data analysis findings to the TDS team and provide insights on the differences between regional and national production of retail food offerings.
5	CBA Game-Based Assignment	Create a game-based assignment for a healthcare economics course. The

		assignment is set in a fictitious hospital, and administrators must decide between several products to determine which product has the highest benefit-cost ratio.
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Table 1.2 Portfolio Products and Competency Addressed

Portfolio Product		Number and Competency Addressed	
1	ANOVA Analysis Results - 3 Cities	3	Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate.
		4	Interpret results of data analysis for public health research, policy or practice.
2	ANOVA Analysis Results – Outliers	3	Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate.
		4	Interpret results of data analysis for public health research, policy or practice.
3	Percentage of Samples < LOD Results	3	Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate.
		4	Interpret results of data analysis for public health research, policy or practice.
4	TDS Presentation	14	Advocate for political, social or economic policies and programs that will improve health in diverse populations.
		19	Communicate audience-appropriate public health content, both in writing and through oral presentation.
5	CBA Game-Based Assignment	10	Explain basic principles and tools of budget and resource management.
		14	Advocate for political, social or economic policies and programs that will improve health in diverse populations.

Chapter 2 - Competencies

Competency 3: “Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate.”

I conducted data analysis using data sets provided by the Total Diet Study team. I utilized R programming language to find descriptive statistics and conduct analysis using ANOVA. The data sets utilized comprised food samples that were tested for 27 different nutrients and contaminants. The data sets included data from three different cities, outliers from individual cities, and data designated as being either above or below the limit of detection (LOD). The use of ANOVA allowed to determine if the samples were statistically different from one another.

Competency 4: “Interpret results of data analysis for public health research, policy or practice.”

Data analysis results were interpreted to determine statistical significance and recommendations were made. The results were utilized to indicate that testing in multiple cities may not be required as most samples obtained yielded statistically equivalent results. Results were organized and data visualizations created.

Competency 10: “Explain basic principles and tools of budget and resource management.”

Teaching quantitative courses can be challenging, especially in multidisciplinary programs. I created a game-based low-stress learning assignment that utilized Cost-Benefit analysis to determine how to use limited resources (money) to undertake a project in a fictitious hospital. This competency also addresses the TDS project in that the findings can be utilized to reduce unnecessary testing.

Competency 14: “Advocate for political, social or economic policies and programs that will improve health in diverse populations.”

The cost-minimization assignment project allowed me to examine new technologies that will help rural regional hospital systems to mitigate operational cost challenges. The TDS project may also be used to consider whether food sample testing is being conducted in communities that are disproportionately impacted by foodborne contaminants.

Competency 19: “Communicate audience-appropriate (i.e., non-academic, non-peer audience) public health content, both in writing and through oral presentation.”

I conducted a presentation to the TDS team to showcase my findings. I provided data visualizations and added potential considerations for future studies. I utilized my previous experiences in the food industry to prepare for this presentation, and I urged the team to consider partnering with industry to determine which foods are being manufactured regionally vs. nationally, as nationally produced foods would only need to be sampled in one facility vs. several facilities. Regional food production would likely require additional testing due to the potential for final products with different nutrient and contaminant levels.

Table 2.1 Summary of MPH Foundational Competencies

Number and Competency		Description
3	Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate.	TDS Data was analyzed to determine whether or not there is a statistical difference between samples. Utilized ANOVA.
4	Interpret results of data analysis for public health research, policy or practice.	Examine the results of the data analysis and make recommendations for future sampling protocols.
10	Explain basic principles and tools of budget and resource management.	Findings can help reduce costs by decreasing unnecessary retesting. Creating the game-based learning assignment helps explain how resources are managed in a fictitious hospital setting.
14	Advocate for political, social or economic policies and programs that will improve health in diverse populations.	The TDS project work advocates for equitable food safety policies that protect communities disproportionately affected by foodborne contaminants. Explain CMA results to show how project implementation will reduce costs at a medical facility.
19	Communicate audience-appropriate (i.e., non-academic, non-peer audience) public health content, both in writing and through oral presentation	Present content to TDS team in an interactive format with data visualizations.

Table 2.2 MPH Foundational Competencies Course Mapping

22 Public Health Foundational Competencies Course Mapping	MPH 701	MPH 720	MPH 754	MPH 802	MPH 818
Evidence-based Approaches to Public Health					

1. Apply epidemiological methods to settings and situations in public health practice	x		x		
2. Select quantitative and qualitative data collection methods appropriate for a given public health context	x	x	x		
3. Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate	x	x	x		
4. Interpret results of data analysis for public health research, policy or practice	x		x		

Public Health and Health Care Systems

5. Compare the organization, structure and function of health care, public health and regulatory systems across national and international settings		x			
6. Discuss the means by which structural bias, social inequities and racism undermine health and create challenges to achieving health equity at organizational, community and systemic levels					x

Planning and Management to Promote Health

7. Assess population needs, assets and capacities that affect communities' health		x		x	
8. Apply awareness of cultural values and practices to the design, implementation, or critique of public health policies or programs					x
9. Design a population-based policy, program, project or intervention			x		
10. Explain basic principles and tools of budget and resource management		x	x		
11. Select methods to evaluate public health programs	x	x	x		

Policy in Public Health

12. Discuss multiple dimensions of the policy-making process, including the roles of ethics and evidence		x	x	x	
13. Propose strategies to identify stakeholders and build coalitions and partnerships for influencing public health outcomes		x		x	x
14. Advocate for political, social or economic policies and programs that will improve health in diverse populations		x			x
15. Evaluate policies for their impact on public health and health equity		x		x	

Leadership

16. Apply leadership and/or management principles to address a relevant issue		x			x
17. Apply negotiation and mediation skills to address organizational or community challenges		x			

Communication

18. Select communication strategies for different audiences and sectors	DMP 815, FNDH 880 or KIN 796				
19. Communicate audience-appropriate (i.e., non-academic, non-peer audience) public health content, both in writing and through oral presentation	DMP 815, FNDH 880 or KIN 796				
20. Describe the importance of cultural competence in communicating public health content		x			x

Interprofessional Practice

21. Integrate perspectives from other sectors and/or professions to promote and advance population health		x			x
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Systems Thinking

22. Apply a systems thinking tool to visually represent a public health issue in a format other than a standard narrative			x	x	
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Table 2.3 Application of Systems Thinking Tools to a Public Health Issue

Report on the use of the Systems Thinking Tool(s) you selected at the beginning of your APE in the table below. Describe why you selected this tool for your APE, how you were able to apply this tool, or how it could be applied to a specific situation or public health issue encountered during your APE. Please include an appropriate diagram for the tool where appropriate, for example a causal loop diagram (CLD) if you applied the CLD tool.

Use of Systems Thinking Tools

Systems Thinking Tool	Description of Use
Process Mapping	Utilized process mapping to create a flowchart that outlines the entire process from data collection, cleaning, statistical analysis, and interpretation. Utilize process mapping to determine if CBA game-based assignment improved course outcomes and/or outcomes on the Peregrine assessment.

