

Master of Public Health Applied Practice Experience

by

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MPH Candidate

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MASTER OF PUBLIC HEALTH

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Chapter 1 - Portfolio Products

The Applied Practice Experience (APE) outlined in this report began when I approached Dr. Janine Seetahal about learning more concerning rabies in wildlife in the field of public health at the Kansas State University (KSU) Rabies Laboratory. Dr. Seetahal's prior experience with bats made this a great learning opportunity, and the KSU Rabies Laboratory is a world-renowned organization, receiving samples from many countries around the globe and specializing in serological and diagnostic rabies testing across many species.

There were two goals for my APE. For my first goal, I learned about Next Generation Sequencing (NGS) and trained with the Molecular team at KSU to learn how ribonucleic acid (RNA) viruses are detected in samples and the proper procedures for performing the assay. With this foundation, I progressed to collecting oral and fecal samples from rabies-negative bats that were previously brought in for rabies testing but had human exposure history. The intention was to perform a small surveillance study to see if these rabies-negative bats contained other viruses of significance to public health, but the regular sample testing load of the Molecular team became too great, and we were not able to pursue this further.

The second part of my APE focused on the need for an official procedure for properly collecting and monitoring the rabies titers of employees in both the Rabies Laboratory and those within the KSU Veterinary Diagnostic Laboratory. An official Standard Operating Procedure (SOP) and rabies titer monitoring spreadsheet of past and current employees were created as products to address this issue. This allows for a more streamlined way to conduct these important tasks. The SOP also details which positions perform which tasks, and it includes some background information on rabies and titer monitoring among laboratory employees. In crafting the SOP (portfolio product #1), I worked with the quality control team, the laboratory director, and two rabies laboratory sections. Compiling the spreadsheet (portfolio product #2) involved both an occupational health and infectious disease-related effort. This field experience (and its two portfolio products) was a fitting capstone to my 2-year-long journey of coursework in the MPH program. Tables 1.1 and 1.2 summarize these products and map them to five specific MPH competencies.

Table 1.1 Summary of Portfolio Products

Portfolio Product		Description
1	Rabies Laboratory Employee Titer Monitoring SOP	An SOP explaining the procedures for rabies titer monitoring of all rabies employees that work with rabies virus or rabies-suspect cases.
2	Rabies Laboratory Employee Titer Monitoring Spreadsheet	A spreadsheet containing the titers of past KVDL employees who meet requirements for rabies titer monitoring from 2018 to present.

Table 1.2 Portfolio Products and Competency Addressed

Portfolio Product		Number(s) and Competency(ies) Addressed	
1	Rabies Laboratory Employee Titer Monitoring SOP	1	Apply epidemiological methods to the breadth of settings and situations in public health practice
		2	Select quantitative and qualitative data collection methods appropriate for a given public health context
		21	Perform effectively on interprofessional teams
2	Rabies Laboratory Employee Titer Monitoring Spreadsheet	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

Chapter 2 - Competencies

As I worked in the Rabies Laboratory, I had the opportunity to emphasize five different competencies. These are summarized in Table 2.1. I learned about the application of epidemiological methods when I was reviewing the guidelines and recommendations for rabies titer monitoring. This knowledge was applied as I worked on the SOP. Job duties determine the frequency of necessary titer collections for employees. Exposure to concentrated rabies virus requires the highest frequency of testing at 6-month intervals, but other professions may require testing every two years, or only after a potential exposure. As we made plans for bat sampling, rabies-negative bats with a history of human exposure were the selected group since they held the most risk for zoonotic diseases impacting public health.

Table 2.1 Summary of MPH Foundational Competencies

Number and Competency		Description
1	Apply epidemiological methods to the breadth of settings and situations in public health practice	Rabies-negative bats with a history of human exposure were selected for sampling. Employees that work with concentrated rabies virus and rabies-suspect necropsy cases qualified for titer monitoring.
2	Select quantitative and qualitative data collection methods appropriate for a given public health context	NGS testing was selected for bat research and the RFFIT endpoint assay was selected for rabies titer monitoring.
3	Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate	Titers were evaluated for compliance with the recommended minimum threshold and other significant deviations, and were recorded in the Laboratory Information Management System and Microsoft Excel.
4	Interpret results of data analysis for public health research, policy or practice	Titers below the minimum threshold resulted in employee contact from their direct supervisor and a cessation of rabies-related job duties until an effective serological response is achieved.
21	Perform effectively on interprofessional teams	I worked with multiple teams, including Molecular, Quality Control, RFFIT, and Special Projects to find the relevant information for arranging health care, testing responsibility among sections, and how results are relayed in accordance with various regulations.

Selecting data collection methods for the right context was necessary for planning disease detection in the sampled bats. Next Generation Sequencing (NGS) testing was selected since most zoonotic bat viruses are RNA viruses. Rapid Fluorescent Foci Inhibition Test (RFFIT) with an endpoint determination is used for rabies titer monitoring to give the most accurate result, as opposed to a RFFIT screen determination.

I learned about analyzing the data using software by designing the monitoring spreadsheet to flag titer values below the minimum recommended value. Inputting the information into Microsoft Excel allows the ability to produce trendlines to observe how an employee maintains their titer over time. It also magnifies outliers that may point to potential rabies exposures when compared to the previous titer.

I also learned about interpreting results after analyzing them through the monitoring spreadsheet. Any values under the threshold require an immediate cessation of work, a booster, and a new titer demonstrating a serological response above the minimum threshold to resume job duties. Outliers that are significantly higher than the previous recorded titer would result in a retest—and, significantly, an investigation to determine the cause of the higher result and to rule out a potential exposure.

I had to perform effectively on interprofessional teams to learn new molecular techniques and a new assay. Working with Quality Control and multiple rabies laboratory sections was necessary to discuss responsibilities for certain job titles and sections. This included arranging health care for employees, testing responsibilities, and learning how to properly relay results to employees in accordance with HIPAA regulations.

In addition to the 5 core competencies, I also completed coursework in my chosen emphasis area, IDZ. My courses emphasized the competencies noted in Table 2.2.

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 the breadth of 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		

22 Public Health Foundational Competencies Course Mapping	MPH 701	MPH 720	MPH 754	MPH 802	MPH 818
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 societal 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 or implementation 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 principles of leadership, governance and management, which include creating a vision, empowering others, fostering collaboration and guiding decision making		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 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
Intreprofessional Practice					
21. Perform effectively on interprofessional teams		x			x
Systems Thinking					
22. Apply systems thinking tools to a public health issue			x	x	