

Master of Public Health
Integrative Learning Experience Report

**EXAMINING DEPRESSION IN ADOLESCENTS
AND
EXPLORING THE RELATIONSHIP BETWEEN ANTHROPOLOGY AND PUBLIC
HEALTH: INTERVIEWING DR. STEVEN CORBETT**

by

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MASTER OF PUBLIC HEALTH

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Abstract

Depression is an invisible illness, one that does not have a physical appearance like rashes or sores. Symptoms may include feeling sad, anxious, hopeless, pessimistic, worthless, guilty, helpless, irritable, and/or restless. In adolescents, depression is impactful and, if untreated, will carry into adulthood. There is an increase in prevalence of depression symptoms and diagnoses when compared to a decade ago. This is believed to be caused by the increased use of social media, which can be an avenue for bullying. Anthropology is a broad discipline that seeks to resolve issues and answer questions, especially when dealing with humanity. The discipline of public health is similar in that it also seeks to positively impact everyday lives. By taking an interdisciplinary approach, anthropology uses methodologies from public health, such as ways of describing health conditions through prevalence, incidence, morbidity, mortality, etc. In turn, public health utilizes concepts in anthropology like culture as a health factor, holism, critical perspectives, and qualitative analysis. The relationship between these two disciplines needs to continue.

Leveraging my interest in both depression and anthropology, I pursued my applied practicum experience at the Kansas Department of Health and Environment (KDHE) in the Epidemiology and Public Health Informatics Bureau. In my applied practicum experience (APE), I explored the topic of depression by utilizing the 2019 Kansas Youth Risk Behavioral Surveillance System (YRBSS) Survey results. I was also able to explore the relationship between anthropology and public health by interviewing my preceptor, Dr. Steve Corbett to learn more about applied experiences of these dual disciplines. Key findings with the YRBSS showed that females, those who identified as Hispanic/Latino, and those who were multiracial were more likely to develop symptoms of depression than their counterparts.

Subject Keywords: Kansas Department of Health and Environment; Public Health; Epidemiology; Depression; Anthropology

Table of Contents

Abstract.....	ii
Chapter 1 - Literature Review	2
Examining depression in adolescents	2
Exploring the relationship between anthropology and public health.....	3
Chapter 2 - Learning Objectives and Project Description.....	5
Chapter 3 - Results	7
Examining depression in adolescents	7
Table 3.1: Article 1 Result Table.....	8
Exploring the relationship between anthropology and public health.....	8
Chapter 4 - Discussion	10
Examining depression in adolescents	10
Exploring the relationship between anthropology and public health.....	12
Chapter 5 - Competencies.....	13
Student Attainment of MPH Foundational Competencies	13
Table 5.1 Summary of MPH Foundational Competencies	14
Student Attainment of MPH Emphasis Area Competencies	16
References	18
Appendix 1.....	20
Appendix 2.....	25
Appendix 3.....	28
Exploring the relationship between anthropology and public health.....	28

Chapter 1 - Literature Review

Examining depression in adolescents

As the National Institute of Mental Health (NIMH) puts it, depression in adolescents is more than just moodiness.¹ Although symptoms may look different for all individuals, when they are persistent and/or extreme, depression should be considered and can only be diagnosed by a health care provider.² Depression, like all mental illnesses, needs to be taken seriously as a disease. When left untreated, it can have devastating effects on the person and their loved ones. The World Health Organization (WHO) has described “depression, anxiety, and behavioral disorders” as the leading cause of disability worldwide among adolescents; suicide, an adverse symptom of depression, is the fourth leading cause of death in this age range worldwide.³ The WHO stresses that if mental health conditions of adolescents are not addressed, more severe symptoms can develop and can carry into adulthood.

The Centers for Disease Control and Prevention (CDC) provides a list of the signs of depression. These include feeling sad, hopeless, irritable, not wanting to do the things they normally enjoy, eating more or less than usual, sleeping more or less than usual, feeling fatigue or tired, feeling restless, difficulty paying attention, feelings of worthlessness or guilt, and practicing self-harm behaviors or having suicidal ideations. Having some of these signs could be normal under conditions like stress or illness, but they become a problem when the individual is having a hard time performing normal responsibilities, such as schoolwork, job duties, group activities, and more. Treatment for depression is normally therapy (behavioral or cognitive-behavioral), taking prescription drugs, or a combination of both.²

Risk factors that have been identified in adolescents include exposure to adversity, peer pressure, issues with identity, media influence, gender norms, quality of home life, relationships peers, violence (such as physical abuse, sexual abuse, or bullying), poor parenting tactics, and socioeconomic issues. The more risk factors an individual is exposed to, the greater the likelihood of mental health issues developing. Other conditions that can increase this likelihood as well include living condition, discrimination, inability to access support and services, major life events, and health conditions.³

Even though this age group is highly impacted by depression, more evidence is needed to determine what are the current trends among the population, especially with our ever-shifting society. Examining demographic information may be helpful to determine prevalence of depression in the state of Kansas. The Mental Health Task Force, which was established in 2017 by the Kansas Legislature, was created to determine the current status of the mental

health systems within the state.⁴ In their 2018 report, they recommended adoption of the Medicaid expansion model(s), reimbursement of behavioral health services, expansion of the federal Excellence in Mental Health Act, increasing crisis stabilization centers and prevention services throughout the state, implementing of the Crisis Intervention Act, expanding service options for children and adolescents, expanding intensive outpatient services, and increasing early intervention methods in early childhood. Their follow-up report in 2019 still recommended Medicaid expansion, increasing the number of crisis intervention centers, implementation of regulations related to the Crisis Implementation Act, expanding services for youth, and increasing early prevention methods.⁵

Exploring the relationship between anthropology and public health

Before the 2019 coronavirus pandemic, public health has always played an important role in determining how to improve the health of individuals, both in the community and globally. According to the WHO, public health can be defined as “the art and science of preventing disease, prolonging life, and promoting health through the organized efforts of society.”⁶ The practice involves actions that support public health services. Examples of these services can be providing environments where choosing to be healthy is an easy choice, advancing personal health and wellbeing, or preventing the worsening one’s health. Another discipline that is involved with the complex relationship of society and individuals is anthropology. Anthropology can be broadly defined as the study of what makes us human.⁷ The American Anthropological Association divides its discipline into four subsections: sociocultural anthropology, biological anthropology, archaeology, and linguistics. Even though these two disciplines are different, as public health heavily relies on evidence-based data and anthropology depends on theories and qualitative data, they often work together by seeking the answer of how to apply knowledge and understanding to solve current human problems.

Public health and anthropology are explored together in different areas of public health, such as environmental health, social health, and more. In anthropology, public health is normally explored in medical anthropology. Both disciplines together provide insight regarding the multiple factors that impact human health and well-being through the complex relationships with the physical, biological, economic, and political environments. The addition of anthropological methods helps create a bridge for public health to capture what is missing with public health’s traditional research and training methods. This is seen in practice in the field of public health during crises, such as the Ebola pandemic (2013-2016), Zika pandemic (2015-2016), and the Coronavirus pandemic (2019-present).⁸ The value that anthropologists bring in

the epidemiological and health emergency arenas are displayed through the ability to provide insight and dynamics of health, illness, and disease transmission. In fact, in 1996, there was call for a new field called “critical anthropology,” which would focus on identifying factors in health emergencies, leading to positive results in public health interventions.⁹

Although “critical anthropology” never became its own major subdiscipline, medical anthropology has been created and developed to examine the different cultural and historical approaches to healthcare and the biocultural adaptations to study human health and disease. The growth of this subdiscipline can be seen in literature concerning the topic “Public health and anthropology.” The Society for Medical Anthropology defines medical anthropology as a subdiscipline that reviews social, cultural, biological, and linguistic anthropology to better understand how these major disciplines influence health and wellbeing, how they experience and spread illness, and how to prevent and treat for illnesses.¹⁰ The subdiscipline also tries to determine how these subject areas may impact healing processes, therapy management, and medical systems. Medical anthropology utilizes multiple theoretical approaches and works within the public health domain by utilizing bioscientific epidemiology, which is the social construction of the understanding and politics of science as part of scientific discoveries and hypothesis testing. Medical anthropologists can see how the people’s health, large social organizations, and the environmental impact human relationships with one another and other species. In public health, this approach may look like answering questions concerning preventative health when determining if behaviors are “risky” or “protective”, learning the beliefs of health practices in other cultures or regions, and health policy impact towards health care provision. With anthropological theories intertwining with public health methods in teaching and research, we are seeing more public health practitioners working alongside anthropologists, and *vice versa*. Because of this, graduate schools are starting to offer dual degree programs or postgraduate certificates from these complementary fields. Some schools that provide this opportunity are the University of Washington, the University of Pittsburgh, Columbia University, and the University of North California.

Chapter 2 - Learning Objectives and Project Description

My APE at KDHE expected me to collect, analyze, and interpret data to provide information on the conditions of public health importance and the population's health status according to KDHE. My project came together during one of my early meetings with my preceptor, Dr. Steve Corbett in which we discussed the topics in public health that I was interested in. This is where I was first introduced to the YRBSS survey. I did further analysis on the disparities of depression symptoms in adolescents using the 2019 Kansas YRBSS dataset. The YRBSS dataset was analyzed via Statistical Analysis Software or SAS. Input and format of the results was provided to me by KDHE. My analysis started by reviewing the survey to find questions of interest. Question 25, which I thought was the best choice, asked, "During the past 12 months, did you ever feel so sad or hopeless almost every day for two weeks or more in a row that you stopped doing some usual activities?" The rationale behind this question was that it reveals three important things related to depression. The actual symptom, which is sadness. Frequency of the symptom, which is "every day for two weeks of more in a row and severity, which is related to the stopping of performing usual activities. The next step was to determine statistical significance between the relationship between the characteristics and question 25, which was done through SAS using the Pearson chi-square test. The Pearson Chi Square test is used to determine if a relationship has a goodness of fit, homogeneity, and independence. The results were written in a 750-word article for submission to the *Kansas Health Statistical Report*. The SAS code can be found in Appendix 1 and the article can be found in Appendix 2 of my ILE.

In my second project, I interviewed my preceptor, Dr. Steve Corbett, to learn more about his role at KDHE. The idea for this topic came to me when I was applying for PhD programs in fall 2022, specifically a degree in epidemiology. When talking to my preceptor, Dr. Steve Corbett, he said that it wasn't necessary to have a doctorate degree in epidemiology to teach public health in a university setting. I later found out that he had a doctoral degree in biomedical anthropology. Then, in my next meeting with my committee, one of my co-major professors, Dr. Justin Kastner suggested to create an article including an interview with my preceptor. This was an idea that appealed to me because learning is something I enjoy. Anthropology was a subject I knew about, but only vaguely, leading to my next step, preparing for the interview. I did this by building my knowledge on what anthropology really is. I wanted to determine what makes anthropology unique, what is biomedical anthropology, and if there is any history of

anthropology and public health working together. This article can be found in Appendix 3 of my ILE.

Chapter 3 - Results

Examining depression in adolescents

Results for YRBSS survey question 25, “During the past 12 months, did you ever feel so sad or hopeless almost every day for two weeks or more in a row that you stopped doing some usual activities?” were separated into three different characteristics: gender, race, and ethnicity, with race divided into three groups, “Multiracial,” “White,” and “Non-White.” Multiracial includes those who identify as more than one race, including those who identify as Hispanic and Non-Hispanic. For “Non-white,” this includes the other race categories American Indian/Native Alaskan, Asian, Black or African American, and Native Hawaiian/Other Pacific Islander, including those who identify as Hispanic and Non-Hispanic. This category was created because each race group was less than 100, which is below the threshold YRBSS uses for reporting. The sample size is 1417 and respondents ranged from 1,273 to 1,390. Table 1 displays whether individuals within these three groups answered “Yes” or “No” to determine risk of depression. Based on the results, for gender, females (40.86%, 95% CI: 36.00, 45.90, Chi Square: <0.0001) are more likely to exhibit depression symptoms compared to males. The category for ethnicity showed that for those who identify as Hispanic/Latino (40.22%, Chi Square: 0.0013) were at higher risk compared to their Non-Hispanic/Latino counterparts. Those identifying as multiracial (44.47%, Chi Square: 0.0100) have the highest likelihood for exhibiting depression symptoms.

Table 3.1: Article 1 Result Table

Table 1: YRBSS results for Question 25: During the past 12 months, did you ever feel so sad or hopeless almost every day for two weeks or more in a row that you stopped doing some usual activities?							
Characteristics	Response: Yes			Response: No			Pearson Chi Square
	Estimate	95% Confidence Interval		Estimate	95% Confidence Interval		
Gender							<0.0001
Female	40.86	36.00	45.90	59.14	54.10	64.00	
Male	24.39	20.96	28.18	75.61	71.82	79.04	
Ethnicity							0.0013
Hispanic/Latino	40.22			59.78	53.91	65.66	
Non-Hispanic/Latino	30.66			69.34	65.84	73.82	
Race and Ethnicity							0.0100
Multiracial	44.47			55.53			
Non-white	25.76			74.24			
White	30.02			69.98			

Exploring the relationship between anthropology and public health

There were several ideas about anthropology and the relationship the discipline has with public health that I learned as a result of this interview. First, I learned that higher education is necessary to pursue a career in anthropology. This is because programs in undergraduate courses focusses on exposure to all four subfields of anthropology. Upon graduation, the student is well versed in anthropology, but not necessarily prepared to perform anthropological work.

Next, I learned that there is an increase of anthropologists working in public health departments as health educators, program managers, and epidemiologists on the state level and national level and that Dr. Corbett’s situation isn’t rare. If an anthropologist has a background in medical anthropology or experience in the health field, it increases the likelihood of employment within the public health domain. An example of this would be how Dr. Corbett became an epidemiologist. After graduating with his master’s degree in nutritional anthropology, he gained public health experience at KU Med with the Center of Aging as a research analyst. The two responsibilities that he had were (1) educating KU Med students on issues relating to geriatric patients and (2) working with rural and underserved areas. It was this second program

that he gained interest in the tribes in Kansas and the prevalence of diabetes in the tribes. Because he was already trained as an anthropologist and was working at KU Med, public health came naturally. Overtime, he saw that this was something growing in field of medical anthropology, in which people recognized the value of having training in ethnography, and other anthropological techniques, and understanding that different cultures have different ways of viewing things and doing things, which may help with address public health problems.

A question that I had as my closing statement for this interview was “what do you think the two disciplines could learn from another?” Dr. Corbett answered that anthropology would learn the methodologies and terminologies of epidemiology. Concepts like incidence, prevalence, morbidity, and mortality and all the ways of describing the conditions of health and illness in a population. Dr. Corbett saw questions like, “What is the terminology of epidemiology and what does it tell?” and “why is it important to be aware of socio, cultural, and biological circumstance in trying to describe the health of the population statistically?,” from the textbooks he would teach from. Epidemiology on the other hand, is focusing more and more on addressing health disparities and the social determinants of health. Epidemiologists ask, “What are going to be the specific needs and issues of the population?,” and recognizes that an anthropological perspective can provide answers to that question. An example would be looking at disparities in a Native American tribe. Even when looking at the biological aspects of disease management, we still want to know what percentage comes from biology and what percentage comes from culture, or even both? To develop an educational intervention program is understand those things and determine how much is it caused by culture, how much of it is caused by biology, how much is it caused by history, etc. This is what anthropologist have brought in, which is taking account of the specific cultural, environmental circumstances in the population you are working with, making it easier to work with that population.

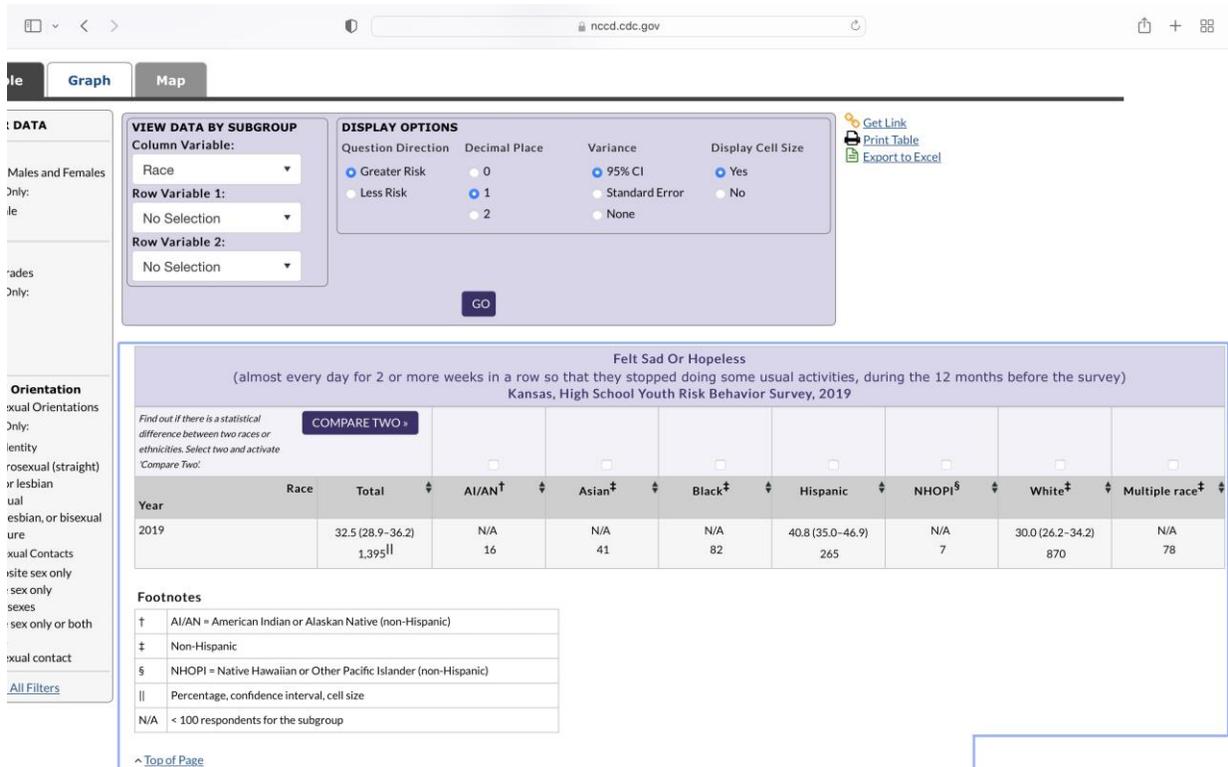
Chapter 4 - Discussion

Examining depression in adolescents

Adolescents in Kansas are more likely to have answered, “Yes” to the question “During the past 12 months, did you ever feel so sad or hopeless almost every day for two weeks or more in a row that you stopped doing some usual activities?,” if they are female, identify as Hispanic/Latino, and/or multiracial. Even though depression symptoms differ for everyone, these groups tend to be the ones identified as the ones who would benefit the most from intervention. Future studies that review depression in adolescents should try to determine what are the current trends and predict future ones for intervention and prevention-related programs targeting these groups. Limitations of this analysis include (1) the YRBSS data is self-reported, causing potential individual and recall bias and (2) the data does not include those who have started treatment within the last 12 months, which can hinder results when looking to target groups for intervention. This study helps with adolescents in Kansas because this is one of the first analyses of the 2019 Kansas YRBSS dataset.

When compared to the data released by the CDC, results for those who identified as multiracial differ. For the CDC, their analysis only showed that there were only 78 students who identified as multiracial for the 2019 Kansas YRBSS, which is below the threshold that is used to accurately evaluate data.¹¹ This is because when filtering the interactive data on the CDC’s website, race and ethnicity categories are combined, only allowing the user to select only one ethnicity and all race categories have a Non-Hispanic or Latino category. Refer to Image 4.1 below. When looking at the “Multiple race” category, there is a ‡ or a “double-dagger” symbol next to it. The footnotes indicate that the column has data for Non-Hispanics and Latinos only.

Image 4.1: Screenshot of CDC Table of Q25 Displaying Results Grouped by “Race” 11



Being able to explain why my data differs from the publicly available data is an important skill to have during this time of mistrust in science and facts. Spurious statistics could be loosely defined as false or unauthentic statistics. This could be implying correlation is causations, changing numbers so the data can prove your hypothesis better, and more. The consequences of spurious statistics are the mistrust of sciences, leading to detrimental effects. Questioning science is encouraged to bring us closer to accurate truths instead of relying outdated data. An example in public health would be the original belief of how illness occurs. The miasma theory was that illness came from “bad air” that would come from corpses and other unhygienic settings and objects. This was the theory before the germ theory and before the miasma theory was the theory of the four humors. The issue become a problem when questions turn into mistrust of facts that have already been proven. This leads to mistrust in scientific leaders and institutions, such as the CDC or Dr. Anthony Fauci, causing dangerous situations in the public. Examples of this can be seen in the medical community, where health and medical facts are being questioned, leading to the return of polio, mutations of the coronavirus, and serious health complications and death to those with compromised immune systems. This is why there is need

to explain methodology, discuss their results, and how projects and experiments can be improved on, so that the next student, researcher, or scientist can build upon what was done.

Exploring the relationship between anthropology and public health

Limitations of this interview included only being able to interview one public health professional with a degree in anthropology. More could be learned about the interdisciplinary relationship between anthropology and public health if interviews could be done to other public health professionals with a different role than Dr. Corbett and still having a background in anthropology. Interviewing public health professionals with education in public health and learning to use anthropological methods could also be useful to understand the benefits and barriers of using methodologies from another discipline.

Although several classes have helped me prepare for this project, my class, AAI801, Interdisciplinary Process, I thought was the most beneficial. As I was learning more about the relationship of the dual disciplines, which could be described as interdisciplinary, this class helped me to better understand the process of different disciplines working together. I am able to determine the potential drivers that could have brought these two disciplines together, benefits that they can bring to one another and to society, barriers that they may had to overcome, and more, eventually leading to a blending of theories and methodologies between the two disciplines.

Chapter 5 - Competencies

Student Attainment of MPH Foundational Competencies

The five MPH Foundational Competencies that were utilized the most in my APE's products are 3, 4, 6, 18, and 22.

When analyzing the 2019 YRBS, SAS was used to find correlations between multiple identifiers of the participants; one discovery we found was a difference in depression-related symptoms between demographic groups. This meets the Public Health Foundational Competency 3, which is "analyzing quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate." Through this analysis, I was able to find potential relationships between gender, race, and ethnicity with depression symptoms. Being able to fulfill this MPH competency gives me the confidence to continue doing so within my forthcoming role as the Population Health Epidemiologist in Clackamas County, Oregon.

With the results found from the 2019 YRBS, I was able to create an article that discussed the demographic differences with depression diagnoses and symptoms. The introduction of the article addressed competency 4, "interpreting results of data analysis for public research, policy, or practice." Being able to interpret data analysis into a useful and meaningful product is important in the field of public health because it allows me to collaborate with other professionals within the field and members of the community, making it a beneficial skill in both research and in practice.

Foundational competency 6 involves "discuss[ing] the means by which structural bias, social inequities and racism undermine health and create challenges to achieving health equity at organization, community and societal levels." This competency is addressed by my first and second deliverables from my APE. The article regarding the demographic gap with depression will address gender, race, and ethnicity. Fulfilling this competency allows me to become aware of these issues, which leads to working towards overcoming these biases in the workplace or community setting.

Public health is intertwined with the community, making communication an important skill to have. Public Health Competency 18 involves "select[ing] communication strategies for different audiences and sectors." This was met through my third project, and article exploring the relationship between anthropology and public health with an interview of my site preceptor, Dr. Corbett. This article will be submitted for publication in the *One Health Newsletter*, which is

available to students, professionals, and anyone with an interest in the One Health approach. Being able to create this product helped with strengthening my communication skills through writing to an audience outside of public health professionals.

The final MPH Foundation Competency, 22, requires the “[application of] systems thinking tools to a public health issue.” This was met by my second project with KDHE. For the article discussing the relationship between anthropology and public health with an interview with Dr. Corbett, a causal loop diagram (CLD) will show the steps of a program implementation and emergency preparedness from a public health point of view, with the inclusion of anthropologic methods. Being able to apply a systems thinking tool is beneficial for my future because it allows me to have a novel way of resolving conflicts in my future career.

Table 5.1 Summary of MPH Foundational Competencies

Number and Competency		Description
3	Analyze quantitative data collection methods using biostatistics, informatics, computer-based programming, and software, as appropriate	When analyzing the 2019 YRBS, SAS was used to find correlations between factors, one of which was a difference in depression-related symptoms between demographic groups.
4	Interpret results of data analysis for public health research, policy, or practice	The results relating to depression diagnoses and symptoms, from the 2019 YRBS, will be discussed in the article.
6	Discuss the means by which structural bias, social inequalities, and racism undermine health and create challenges to achieving health equity at organizational, community, and societal levels	The article that will explore the demographic gaps in depression, examining gender, race, and ethnicity.
18	Select communication strategies for different audiences and sectors	The article discussing the relationship between anthropology and public health will be submitted for publication in the <i>One Health Newsletter</i> . The article will be written in a manner in which the readers will be able to understand the concepts without prior knowledge of the disciplines.
22	Apply system thinking tools to a public health issue	For the article discussing the relationship between anthropology and public health with an interview with Dr. Corbett, a causal loop diagram (CLD) will show the steps of a program implementation and emergency preparedness from a public health point of view, with the inclusion of anthropologic methods. System archetype templates are also created to show similarities, differences,

	and what both disciplines can learn from the other.
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Below is a list of the 22 Public Health Foundational Competencies, the competency number, the courses they are taught in to facilitate completing the table above.

Table 5.2 MPH Foundational Competencies and Course Taught In

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		
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	
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

22 Public Health Foundational Competencies Course Mapping	MPH 701	MPH 720	MPH 754	MPH 802	MPH 818
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
Interprofessional Practice					
21. Perform effectively on interprofessional teams		x			x
Systems Thinking					
22. Apply systems thinking tools to a public health issue			x	x	

Student Attainment of MPH Emphasis Area Competencies

The five MPH Emphasis Area Competencies were fulfilled when completing my courses under the infectious diseases and zoonoses emphasis area.

For competency 1, I was able to evaluate modes of disease causation of infectious agents in DMP 814, Veterinary Bacteriology and Mycology. In this course, the objectives were to know names of pathogens and diseases they cause, pathogen characteristics, pathogenicity, pathogenesis, recognition of clinical signs and lesions associated to zoonotic diseases, and how diagnose, treat, and prevent infections.

I was able to fulfill competency 2 by investigat[ing] the host's response to infection, in my Principles of Veterinary Immunology class, DMP 817. The objective of this course was to learn the basic immunology to understand both normal and abnormal functions of the immune system. We were also required to know the differences in hosts in order to understand how the host fights off disease. Exams in the course tested my knowledge in immunology by asking me to identify cells that arrive to the infection site, cells at portals of entry, mechanisms of pathogen recognition, and the pathogen's own mechanisms to prevent death by immune cells. The second exam expected understanding of the major histocompatibility complex (MHC) and the roles its molecules and polymorphisms play in immune response. There was also an expectation to know what cytokines are produced by T-helper cells and the effects of these cytokines in the host. The third exam asked me to explain how an adjuvant works, provide examples of adjuvants, know the role of adjuvants, and to identify different types of vaccines and know how they work.

Competencies 3, 4, and 5 require examining the influences of environmental and ecological forces on infectious diseases, analyzing disease risk factors and selection of appropriate surveillance, and investigation of the role of vectors, toxic plants, and other toxins in infectious diseases. These are fulfilled in the class Introduction to One Health or DMP 710. Objectives of this course relating to the emphasis area competencies included identifying diseases with zoonotic potential and their routes of transmission, knowing how natural and human-made environmental issues impact both human and animal health, knowing how both animals and humans affect the environment, and identifying issues in nature and society relating to the One Health concept, as well as knowing methods on how they can be addressed.

Below is a list of the 5 MPH Emphasis Area Competencies in Infectious Disease and Zoonoses, the competency number, and description.

Table 5.3 Summary of MPH Emphasis Area Competencies

MPH Emphasis Area: Infectious Diseases and Zoonoses		
Number and Competency		Description
1	Pathogens/pathogenic mechanisms	Evaluate modes of disease causation of infectious agents.
2	Host response to pathogens/immunology	Investigate the host response to infection.
3	Environmental/ecological influences	Examine the influence of environmental and ecological forces on infectious diseases.
4	Disease surveillance	Analyze disease risk factors and select appropriate surveillance.
5	Disease vectors	Investigate the role of vectors, toxic plants, and other toxins in infectious diseases.

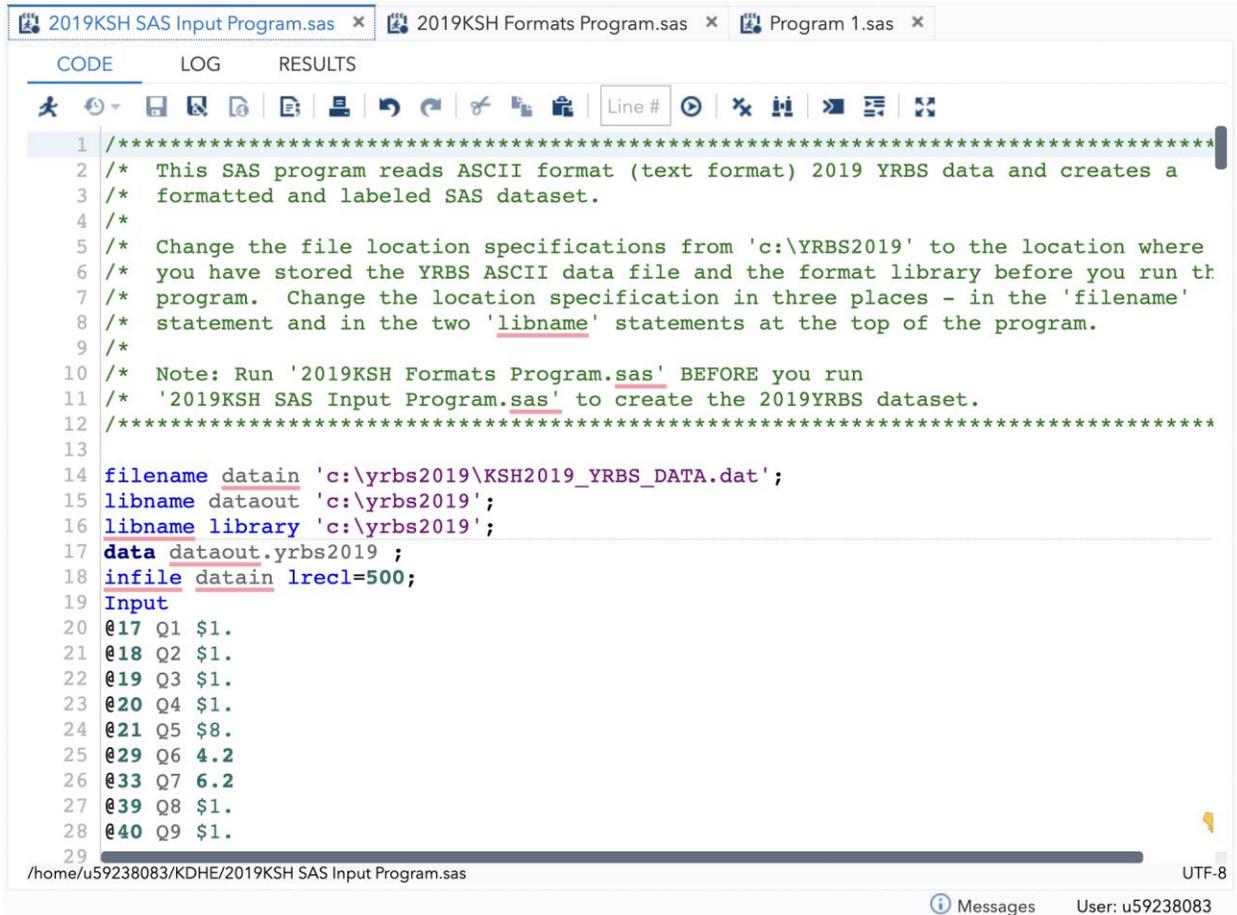
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12. Appendix 1

Image A1.1 2019 Kansas YRBSS Input Code for SAS Screenshot



```
2019KSH SAS Input Program.sas | 2019KSH Formats Program.sas | Program 1.sas
CODE LOG RESULTS
Line #
1 /*****
2 /* This SAS program reads ASCII format (text format) 2019 YRBS data and creates a
3 /* formatted and labeled SAS dataset.
4 /*
5 /* Change the file location specifications from 'c:\YRBS2019' to the location where
6 /* you have stored the YRBS ASCII data file and the format library before you run th
7 /* program. Change the location specification in three places - in the 'filename'
8 /* statement and in the two 'libname' statements at the top of the program.
9 /*
10 /* Note: Run '2019KSH Formats Program.sas' BEFORE you run
11 /* '2019KSH SAS Input Program.sas' to create the 2019YRBS dataset.
12 /*****
13
14 filename datain 'c:\yrbs2019\KSH2019_YRBS_DATA.dat';
15 libname dataout 'c:\yrbs2019';
16 libname library 'c:\yrbs2019';
17 data dataout.yrbs2019 ;
18 infile datain lrecl=500;
19 Input
20 @17 Q1 $1.
21 @18 Q2 $1.
22 @19 Q3 $1.
23 @20 Q4 $1.
24 @21 Q5 $8.
25 @29 Q6 4.2
26 @33 Q7 6.2
27 @39 Q8 $1.
28 @40 Q9 $1.
29
/home/u59238083/KDHE/2019KSH SAS Input Program.sas UTF-8
Messages User: u59238083
```

Image A1.2 2019 Kansas YRBSS Formatting Code for SAS Screenshot

```

1 | /*****
2 | /* This SAS program creates a permanent SAS format library that is used to analyze t
3 | /* analyze the 2019 YRBS dataset.
4 | /*
5 | /* Change the file location specification from 'c:\YRBS2019' to the location where y
6 | /* want the format library to be stored before you run this program. Change the
7 | /* location specification in the 'library' statement at the top of the program.
8 | /*
9 | /* Note: Run '2019KSH Formats Program.sas' BEFORE you run
10 | /* '2019KSH SAS Input Program.sas' to create the 2019 YRBS dataset.
11 | /*****
12 | libname library 'c:\YRBS2019';
13 | proc format library=library;
14 | value $H1S
15 | " " = "Missing"
16 | "1" = "12 years old or younger"
17 | "2" = "13 years old"
18 | "3" = "14 years old"
19 | "4" = "15 years old"
20 | "5" = "16 years old"
21 | "6" = "17 years old"
22 | "7" = "18 years old or older"
23 | other = "** Data Error **";
24 | value $H2S
25 | " " = "Missing"
26 | "1" = "Female"
27 | "2" = "Male"
28 | other = "** Data Error **";
29 |
/home/u59238083/KDHE/2019KSH Formats Program.sas

```

SAS code for 2019 Kansas YRBSS Analysis

DATA yrbs;

set YRBS2019Q1_Q134_2;

RUN;

DATA yrbsrace;

set yrbs;

FORMAT race eth \$25.;

IF raceeth in (7,8) THEN DO; /***CREATES A MULTIRACIAL CATEGORY FROM "Multiple - Hispanic" AND "Multiple - Non-Hispanic"****/

 race = 'Multiracial';

END;

IF raceeth = 1 THEN DO;

 race = 'Am Indian/Alaska Native';

```

    eth = 'Non-Hispanic/Latino';
END;
IF raceeth = 2 THEN DO;
    race = 'Asian';
    eth = 'Non-Hispanic/Latino';
END;
IF raceeth = 3 THEN DO;
    race = 'Black or African American';
    eth = 'Non-Hispanic/Latino';
END;
IF raceeth = 4 THEN DO;
    race = 'Native Hawaiian/Other PI';
    eth = 'Non-Hispanic/Latino';
END;
IF raceeth = 5 THEN DO;
    race = 'White';
    eth = 'Non-Hispanic/Latino';
END;
IF raceeth = 6 THEN DO;
    race = 'Hispanic/Latino';
    eth = 'Hispanic/Latino';
END;
IF raceeth = 7 THEN eth = 'Hispanic/Latino';
IF raceeth = 8 THEN eth = 'Non-Hispanic/Latino';
IF Q4 = '1' THEN DO;
    IF eth = ' ' THEN DO;
        eth = 'Hispanic/Latino';
    end;
END;
IF Q4 = '2' THEN eth = 'Non-Hispanic/Latino';
RUN;

proc freq data = yrbsrace;
table Q2 Q4 Q5 Q25 raceeth race eth / list missing;

```

```

TITLE 'Variable Frequencies';
run;

DATA Other;
set yrbsrace;
FORMAT Other $25.;
IF race ne 'Multiracial' THEN DO;
  IF raceeth in (1,2,3,4,7,8) THEN DO;  /**PUTS NON-WHITE GROUPS WITH <100 OBS
INTO AN OTHER CATEGORY AS "Non-White", EXCLUDING THOSE WITH RACE
"Hispanic/Latino"*/
  Other = 'Non-White';
END;
IF raceeth = 5 THEN DO;
  Other = 'White';
END;
IF raceeth = 6 THEN DO;
  Other = ";
END;
END;
IF race = 'Multiracial' THEN other = 'Multiracial';
RUN;

proc freq data = Other;
table Q2 Q4 Q5 Q25 raceeth race eth Other/ list missing;
TITLE 'Variable Frequencies';
run;

proc freq data = Other;
table raceeth*q25 race*q25 eth*q25 / list missing;
TITLE 'Race/Ethnicity Variables by Depression';
run;

proc surveyfreq data = Other nomcar;
strata stratum; cluster psu; weight weight;

```

```
tables Q2*Q25 race*Q25 eth*Q25 Other*Q25 /*(Q2 race eth)*/ / row CL (type = logit) chisq;  
FORMAT Q2 $H2S. Q25 $H25S. race eth Other;
```

Title 'Q25: During the past 12 months, did you ever feel so sad or hopeless almost every day for two weeks or more in a row that you stopped doing some usual activities?';

run;

Appendix 2

Examining depression in adolescents

Introduction

According to the National Institute of Mental Health, depression in adolescents is more than just moodiness.¹ Symptoms may look different between individuals. When symptoms become persistent and/or extreme, depression needs to be considered and diagnosed by a health care provider.² Depression, like all mental illnesses, needs to be taken seriously as a disease, and when left untreated, can have devastating effects on the person and their loved ones. The World Health Organization (WHO) has described “depression, anxiety, and behavioral disorders” as the leading causes of disability worldwide among adolescents; and suicide, an adverse symptom of depression, being the fourth leading cause of death in this age range.³

Even though this age group is highly impacted by depression, more evidence is needed to determine what are the current trends among them with our ever-shifting society. Examining how demographics may tie with the prevalence of depression is an important matter. The Mental Health Task Force was established in 2017 by Kansas Legislature.⁴ Their 2018 report recommended adoption of the Medicaid expansion model(s), reimbursement of costs related to behavioral health services, expansion of the federal Excellence in Mental Health Act, increase of crisis stabilization centers and prevention services, implementation of the Crisis Intervention Act, expansion of service options for minors, expansion of intensive outpatient services, and increasing early intervention methods.⁵ Their follow up report in 2019 contained the same recommendations.⁶

Methods

The Youth Risk Behavioral Surveillance System Survey (YRBSS) is a system of surveys that monitor behaviors contributing to death and impairment in both children and adults.⁷ Aside from depression, YRBSS monitors sexual behaviors, drug and alcohol use, prevalence of obesity, etc. The YRBSS survey is distributed nationally to students in grades 9-12 and was last administered in 2019 in Kansas. With the help of the Kansas Department of Health and Environment (KDHE), the 2019 YRBSS survey was analyzed. The question of importance was question 25: “During the past 12 months, did you ever feel so sad or hopeless almost every day for two weeks or more in a row that you stopped doing some usual activities?”; responses being

“Yes” or “No.” This question was selected because it is a measure of mental health and was the only question measuring depression without asking about suicidal tendencies.⁸ Responses to this question were formatted and analyzed in the Statistical Analysis System, or SAS.

Responses were then analyzed by age, grade, gender, race, and ethnicity categories based on the “Yes” and “No” responses. Missing responses were excluded from the analysis. A Chi-Square test was performed to determine statistical significance of the categories.

Results

Results for question 25 were separated into three different characteristics: gender, race, and ethnicity, with race being divided into three groups, “Multiracial”, “White”, and “Non-White.” Multiracial includes those who identify as more than one race. For “Non-white,” this includes the other race categories American Indian/Native Alaskan, Asian, Black or African American, and Native Hawaiian/Other Pacific Islander. This was created because each race group was less than 100, which is below the threshold YRBSS uses for reporting. The sample size for this group is 1417 and respondents ranged from 1,273 to 1,390. Table 1 displays whether individuals within these three groups answered “Yes” or “No” to determine risk of depression. Based on the results, for gender, females (40.86%, 95% CI: 36.00, 45.90, Chi Square: <0.0001) are more likely to exhibit depression symptoms compared to males. The category for ethnicity showed that for those who identify as Hispanic/Latino (40.22%, Chi Square: 0.0013) were at higher risk compared to their Non-Hispanic/Latino counterparts. Those identifying as multiracial (44.47%, Chi Square: 0.0100) have the highest likelihood for exhibiting depression symptoms.

Conclusion

Adolescents in Kansas appear to be more susceptible to depression if they are female, identify as Hispanic/Latino, and/or multiracial. Even though depression symptoms differ for everyone, these groups tend to be the ones identified as the ones who need the most intervention. Limitations of this analysis includes 1) the YRBSS data being self-reported, leading to individual and recall bias and 2) data does not include those who have started treatment within the last 12 months, which can hinder results when looking to target groups for intervention.

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Appendix 3

Exploring the relationship between anthropology and public health

According to the Centers for Disease Control and Prevention, public health can be defined as “the art and science of preventing disease, prolonging life, and promoting health through the organized efforts of society¹.” This term encompasses actions supporting public health services that provide an environment where people can continue to be healthy, advance their own health and wellbeing, or prevent the worsening of their health. Another discipline to consider that works with the complex relationship between society and individuals is anthropology. Anthropology can be broadly defined as the study of what makes us human². Even though these two disciplines are different in their definitions alone, they often work together to seek answers to solve current human issues. With anthropological theories intertwining with public health’s methods in teaching and research, we are seeing more public health practitioners working alongside with anthropologists and vice versa.

The union created between public health and anthropology can be seen in large public health departments and academia. Currently, the Kansas Department of Health Environment’s Senior Chronic Disease Epidemiologist, Dr. Steve Corbett, can be identified as one who practices the two disciplines, public health and anthropology. I met with Dr. Corbett and asked about his experiences and his thoughts about the relationship between anthropology and public health.

Jenny: What made you want to pursue schooling in anthropology? I saw that you started from your undergrad and pursued a Ph.D. in the discipline. I know that not a lot of people know what they want to do will switch majors in their undergrad or will pursue a different graduate degree.

Dr. Corbett: I did too. I started out as a history major, education actually. My focus was on history, social studies, etc. I learn that teaching didn’t pay very well, so I started taking classes out of interest. I came across one called, “The Biology of Organisms,” and that one was very evolutionarily centric. Because I always had an interest in varied sciences, I became interested in evolution. The next class I took the following semester was an anthropology class, which connected this interest in evolution with human evolution. That is where it kind of started.

Jenny: Is a higher degree necessary to pursue a career in anthropology or did you pursue higher education for personal reasons?

Dr. Corbett: If you're going to have an interest in anthropology as a career beyond the bachelor's degree, you really must get a masters because the undergraduate training is in all four fields. The reason being is that so you can get exposed to the four-field focus as an undergrad. There's a lot to learn. You got those four subfields, you got to take a class in each one. When completed, you're well versed in anthropology, but not really prepared to do any anthropology. If you really want to have a career, it's going to require at least a master's degree.

Jenny: I noticed that at some universities, you could do a PhD in bio-anthro (biological anthropology) or cultural and focus on global health and medical anthropology. I've been seeing an increase of programs across the United States similar to this, in which you can do a dual program. You can do two PhDs, or a PhD and an MPH (master's in public health). I think this may be because there is an increase in interest in the two disciplines working together.

Dr. Corbett: Yes, I think KU (University of Kansas) has a combination PhD/MPH in the anthropology department. It's a relatively a new thing, it's been going for maybe 15 years.

Jenny: Okay. You mentioned you had a focus on the indigenous population living in Kansas?

Dr. Corbett: Yes, I've done my master's degree work on a group because of my advisor. She did her work in African populations- indigenous African. The opportunity to do that type of work at the Ph.D. level was limited. I was working at KU med (University of Kansas Medical Center) in the Center of Aging. We already had some programs where we were training students at KU med to work in rural and/or areas where the population was medically underserved, so we had sites at the two of the four reservations here in Kansas. Initially I started to manage that program, and eventually, I saw opportunities, primarily in diabetes and looking at disease from a public health standpoint. Particularly the high rate of diabetes American Indians. They have some of the highest rates in the

world. Then looking at the theories behind why that would be. These were important ideas in anthropology – genetic anthropology; the topic of the thrifty genotype, as well as the new world syndrome, which was built on the thrifty genotype. The new world syndrome kind of describes indigenous people in North Americas, and those residing in the islands of the Pacific. When exposed to this more European style diet, you saw dramatic increases in obesity and diabetes, the idea being that there is some genetic component of this. So that's when I ended up being interested in it. There is an evolutionary component, genetic component, as to see why people can have such high rates of diabetes in a population that previously, only at the beginning of the century, the 20th century, they were seen as being almost immune to diabetes.

Jenny: What made you interested in public health? What made you apply for the senior chronic disease epidemiologist position?

Dr. Corbett: After I got my master's degree, I worked mostly in public health with KU Med and worked there for about 7 years. Most of which was with the Center of Aging. My boss had her PhD in anthropology, was a nurse. So, I went to work for her, primarily as a research analyst, we focused on two things. Educating KU Med students on issues particular to geriatric patients, so what kind of things would a health professional need to know when dealing with geriatric patients. And the other part was working with rural and underserved areas and so, because of that second program, is when I started working with the tribes and got interested in the diabetes problem, which related back to a course I took at KU. Because I was already trained as an anthropologist and working at KU med, I had a pretty good background in health, it seems that it fit naturally. I saw over time this was something that was growing in anthropology, medical anthropology. As people started to really recognize the value of having that (ethnographic) ability, understanding that different cultures have different ways of viewing things and doing things, that might help in addressing public health problems like diabetes.

Jenny: Do you have any ideas of the potential future of some of the public health departments that you've been seeing on the local level? Are we seeing more of an increase in anthropologists or methods you were talking about earlier?

Dr. Corbett: I think you see it more in the academic realm and larger public health agencies like the CDC (Centers for Disease Control and Prevention) and the state health departments. Local health departments, if they have the resources, might be able to utilize anthropologists, but so many of them, particularly in Kansas, don't have a lot of funding and don't have much in the way of staffing to get somebody specialized. Some don't even have an epidemiologist, never mind one that is trained in the anthropology.

Jenny: As an ending statement, what do you think the two disciplines could learn from one another?

Dr. Corbett: There's no questioning that anthropology is going to learn from the methodology and terminology of epidemiology. That there are these important concepts like incidence, prevalence, morbidity, and mortality, and all these ways of describing health, illness, and death. There's one of the textbooks I taught in physical anthropology had an entire chapter on biological anthropology, and those were one of the first things that were introduced was, "What is the terminology of epidemiology and what does it tell?," and "Why is it important to be aware of socio, cultural, and biological circumstances in trying to describe the health of the population statistically?" Then epidemiology, which is now focusing more and more on addressing health disparities, and the social determinants of health, recognizes that anthropology can bring that approach when dealing with those social determinants of health. What are going to be the specific needs and issues of that population; an anthropological perspective can bring that in. Depending on if you're looking at these biological aspects, such as, if you're working with a Native American tribe, there are certain disparities. Are these from biology, culture, both? What's going on? The only way to develop, let's say, an educational intervention program, is to understand those things and how much is it cultural, how much is it biological, how much is it historical, etc. That's what anthropologists have brought in. This kind of appreciation of any efforts to address the health disparities in populations should take account of the specific cultural, environmental circumstances in the population you are working with. And it makes it easier to work with the population.

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