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Assessing the Association Between Income and Breast Cancer Screening Practices

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Epidemiology

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Abstract

Objectives

To determine how breast cancer screening practices differ between high- and low-income women aged 40-74. To determine the effects of sociodemographic factors on the relationship between income and breast cancer screening practices.

Methods

This was a cross sectional study. Survey data was obtained from women aged 40-74 who completed the Behavioral Risk Factor Surveillance Survey (BRFSS). The exposure was income. The outcome was if a woman ever received a mammogram. The final sample size was 171,111 participants. Regression models were used to assess the association between income and screening practices.

Results

There was a significant association between income and mammogram screening (P value <.001, 95% CI= 0.66, 0.81. Education was a significant effect modifier in this relationship. Income and mammogram screening were significantly associated with two of the four educational levels assessed. Results for insurance, race/ethnicity, and age varied by educational level.

Conclusions

Income was significantly associated with receiving mammogram screenings. Working to improve affordability of care, access to care and education about screening could help reduce the effects of income and education on screening.

Introduction

Breast cancer is the most frequently diagnosed cancer and the leading cause of cancer-related deaths among women globally.[1] Breast cancer is a disease in which the cells of the breast grow out of control.[2] Risk factors associated with developing breast cancer include family history of the disease, BReast CAncer gene (BRCA) 1 or BRCA2 gene mutations, factors that influence endogenous estrogen exposure, drinking alcohol, excess body weight, and use of exogenous hormones like oral contraceptives.[1]

Within the United States, breast cancer accounts for 30% of all new female cancers annually.[3] The American Cancer Society estimates that in 2024, approximately 42,000 women will die from breast cancer, and 310,000 women will be diagnosed with breast cancer. There is a 1 in 8 chance that a woman who develops breast cancer in the United States will die from the disease.[3] Death rates due to breast cancer have been steadily declining since 1989.[3] This reduction in breast cancer mortality is due to breast cancer screening.[3]

Breast cancer screening includes a variety of practices to check a woman's breast for cancer before signs and symptoms develop.[4] Screening does not prevent breast cancer but allows the cancer to be found earlier when it is easier to treat. Mammography is a screening technique in which an X-ray pictures of the breast are taken.[5] Since 1990, mammography has reduced breast cancer mortality in the United States by 40%.[6] A 2020 study from the American Cancer Society showed that women who had mammogram screening had a 41% reduction in their risk of dying from breast cancer within ten years.[7]

The National Comprehensive Cancer Network and the American Cancer Society recommend yearly mammogram screening for women aged 40-74.[8] As of 2021, only 75.9 % of women 40-74 within the United States receive one annually.[9] This is likely because several factors affect a woman's ability to receive regular mammograms. Known factors impacting a women's ability to receive regular mammograms include a woman's race/ethnicity, education, age, and health insurance plan.[8,9] As of 2021, 82% of eligible Black women had received mammograms in the past two years, compared to 76% for White women, 74% for Hispanic women, 67% for Asian women, and 59% for American Indian and Alaska Native women.[8] Delays in diagnosis, treatment, and follow-up after receiving a mammogram also are affected by race and ethnicity, predominantly affecting Black and Hispanic women.[10] Studies have also shown that women with low educational attainment, high school or less, were 11.5% less likely to be screened for breast cancer compared to those with high educational attainment, college or more.[11] Lastly, only 42% of women without health insurance received a screening within the past two years.[11] The causes of these disparities vary, but many are linked to deep rooted social or racial inequities or biases.[10.11]

However, little is known about the effect income has on breast cancer screening practices. Previous studies have identified a link between income and breast cancer development and mortality.[12] Previous studies have also identified neighborhood-level predictors of socioeconomic status, such as overcrowding or renting a home, to be significantly associated with breast cancer screening adherence.[13] However, the individual-level effects of income on screening practices have not been as thoroughly investigated. Additionally, there has

been little research into how known causes of disparity interact with income to affect breast cancer screening practices.

The primary question of this study is how breast cancer screening practices differ between high- and low-income women aged 40-74. Additional insights this study aims to provide are the effects insurance and other sociodemographic factors, such as race and education, may have in the relationship between income and breast cancer screening practices.

Through a better understanding of the disparities surrounding breast cancer screening, public health authorities can create interventions and policies that are focused on reducing these disparities. It also allows for the creation of targeted policies and programs aimed at assisting women affected by these disparities.

Methods

Study design

This study was cross-sectional study and used data from the 2022 Behavioral Risk Factor Surveillance System Questionnaire (BRFSS). BRFFS is a health-related telephone survey that collects data on health-related risk behaviors, chronic health conditions, healthcare access, and the use of preventative services from noninstitutionalized adults in the United States and other participating areas.[14] The questionnaire consists of core components, optional modules, and state-added questions.[14] Data for this study came from core section 8: demographics, core section 10: breast cancer and cervical cancer screening, and core section 3: health care access.

Random digit dialing was used to collect BRFSS data.[14] Landline telephone numbers were divided into high and medium-density strata based on sets of one hundred telephone numbers with the same area code, prefix, first two digits of the suffix, and all combinations of the last two digits. Stratified sampling designs were used to select numbers from these groups. Cellular numbers were sampled using commercially available sampling frames that draw numbers at random based on a set formula or algorithm.

The data was then weighted to ensure the sample of the U.S. population was representative. The weighting methodology used by BRFSS utilized both design factors and demographic adjustment of the population, specifically iterative proportional fitting or ranking.[13] This design accounts for the probability of selection and adjusts for nonresponse bias and non-coverage errors.[13]

Subjects

This study's subjects were women aged 40-74 who answered the 2022 BRFSS questionnaire. The inclusion criteria included women aged 40-74 and completion of the race, insurance, education, income, and breast cancer screening questions. The exclusion criteria included men, women not aged 40-74, and individuals who did not complete or refused to answer the race, insurance, education, income, and breast cancer screening questions. The total BRFSS sample size was 445,132 participants. The inclusion and exclusion criteria resulted in a final sample size of 107,111 participants, with most of the missing data coming from excluding male participants and participants not in the specified age range.

Exposure

The exposure variable was income. Income levels were categorized as either low or high income. To be considered low income, a women's income could not exceed 200% above the federal poverty limit. This cut-off was based on data relating to the federal poverty limit and standard classifications in similar research.[14] Low income was classified as $35,000 and below and high income as $35,000 and above.

Outcome

The outcome variable was whether a participant ever had a mammogram. This variable, opposed to other breast cancer screening variables in the BRFSS data set, was used because the focus of this study was overall ability to receive a mammogram. Rather than receiving a mammogram within a specified time period, participants were asked if they had ever received a mammogram (yes/no).

Covariates

Covariates in this study include insurance plan, race, age, education, and sex as. Race, education, and insurance were included in this study as they are all known to affect breast cancer screening practices in women.[11,10,9] These covariates, aside from sex, were used to assess effect modification or confounding within the association between income and breast cancer screening practices. Sex was categorized into male or female and used to refine the target population. Age was also used to refine the target population. Age was divided into seven categories: 40-44, 45-49, 50-54. 55-59, 60-64, 65-69, and 70-74. Race was categorized as White, Black, or African American, Aian, Hispanic, and Other. Education was categorized as did not graduating high school, graduated high school, attended college or technical school, and

graduated from college or technical school. Insurance was categorized as a plan purchased through an employer or union, private nongovernmental plan, Medicare, Medicaid, any other form of health insurance, and no coverage. The original data set had an extensive list of insurance plans. However, many of them had very low cell counts, and were combined into the other plans category instead of listing individual plans.

Statistical Analysis

All statistical analysis was done in SAS (version 9.3 SAS Institute, Cary, NC). All variables using this this study were categorical. A univariate analysis was used to assess the baseline characteristics of the sample population. This step will also be used to remove missing or excluded values from the data set.

A bivariate analysis was used to examine the crude association between income and breast cancer screening practices and evaluated the association between the covariates and breast cancer screening practices. The results produced by this analysis were considered crude as they did not control for any other variables. The results of this analysis determined what variables would be carried into the multivariate regression model.

Joint tests using the interaction between the covariate and the exposure were done to determine if confounding or effect modification was present in the association between income and breast cancer screening practices.

A multivariate analysis was used to examine the association between income and breast cancer screening practices. This step was also used to control for confounding and effect

modification in the relationship between income and breast cancer screening practices. The multivariate model was created using backward selection. A stratified multivariate analysis was conducted to control the effect modification of education.

Ethical consideration

This study used publicly available de-identified public health surveillance data and was therefore not subject to IRB oversight.

Results

Descriptive statistics (Table 1) showed that most women in the study population were high-income (71%). Additionally, most of the women in the study population, had received a mammogram (90%). The most common race/ethnicity in the study population was White (62%), followed by Hispanic (15%) and Black or African American (12%). When looking at educational attainment 35% graduated college, 32% attended college, 23% graduated high school and 10 % did not graduate high school. Lastly, the most common forms of insurance were employer-provided plans and Medicare (42.8% and 25.8% respectively).

The crude analysis for income can be seen in Table 2. High income among women was significantly associated with decreased odds of never receiving a mammogram (POR=0.73; 95% CI=0.66, 0.81 P value <.001). Compared to women aged 70-74, women aged 40-44 had significantly increased odds of never receiving a mammogram (POR= 19.4 95% CI= 15.53, 24.21 P-value <.001). As the age range increased the odds of a woman never receiving a mammogram decreased. Compared to women who had employer insurance plans women with no coverage

had significantly increased odds of never having a mammogram (POR= 4.67, 95% CI= 3.72, 5.84 P-value <.001). When compared to White women, Asian women had the highest odds of never receiving a mammogram (POR= 2.11 95% CI= 1.60,2.77 P-value <.04). Women who graduated college had significantly decreased odds of never receiving a mammogram when compared to women who did not graduate high school (POR= 0.53, 95% CI= 0.46, 0.65 P- value <.001). No health insurance coverage was significantly associated with increased odds of never receiving a mammogram (POR= 4.67 95% CI= 3.72,5.84 P-value <.001). Private health insurance was significantly associated with decreased odds of never receiving a mammogram (POR= 0.49 95% CI= 0.40, 0.60 P-value <.001).

Joint testing revealed education to be an effect modifier in the relationship between income and mammogram screening practices. Testing did not show any of the covariates to be confounders in the relationship between income and mammogram screening practices. Therefore, stratified multivariate analysis was done because education was considered an effect modifier.

The results of the multivariate analysis are stratified by education, as shown in Table 3. After stratification, those who graduated high school and those who graduated college were significantly associated with decreased odds of never receiving a mammogram (POR= 0.64 95% CI= 0.51, 0.81 P-value <.001) and (POR= 0.57 95% CI= 0.43, 0.75 P-value <.001) respectively. Women with insurance no coverage and who did not graduate high had significantly increased odds of never receiving a mammogram across all levels of education. Women with Medicaid insurance who graduated high also had significantly increased odds of never receiving a

mammogram (POR=1.87 95% CI= 1.17,3.0 P value=<.003). All other insurance plans were non-significant.

In the crude analysis, when compared to White women, all other races of women had increased odds of never receiving a mammogram. However, in the stratified analysis among women who graduated college, both Black women and Hispanic women had significantly decreased odds of having never received a mammogram. were (POR=.74 95% CI= .5894, P-value <.001) and (POR=.87 95% CI= 1.50,3.54 P-value <.001) respectively. Hispanic women who graduated high school also had significantly decreased odds of having never received a mammogram when compared to White women of the same educational level (POR= .57 95% CI= .42, .78 P-value <.001). Asian women who graduated high school, had significantly increased odds of having never received a mammogram when compared to White women of the same educational level (POR= 2.45 95% CI= 1.14, 5.26 P-value <.001).

Discussion

The crude analysis showed a significant association between income and receiving a mammogram (P value <.001). Further testing revealed that education was an effect modifier in this relationship. High-income women who graduated high school and those who graduated college had decreased odds of never receiving a mammogram when compared to low-income women of the same educational level. These results indicate that education strengthens the association between income and receiving a mammogram for women who did not graduate high school and did not graduate high college.

The result of race correlates with research that shows mammogram screening varies across different racial and ethnic groups.[15] Although many of the disparities in mammogram screening associated with race (poor imaging facility access, poor quality imaging facilities, etc.) are a result of larger systemic issues or the compounding of multiple systemic issues.[15]

The crude insurance data also aligns with previous research.[10,15] However, stratification by education had profound effects on the relationship between insurance and receiving mammograms. After stratification, women with no coverage across all levels of education had significantly increased odds of never receiving a mammogram. Women with Medicaid insurance who graduated high also had significantly increased odds of never receiving a mammogram. These results were somewhat unexpected, given the existing literature about the effects insurance has on a woman ability to receive a mammogram.

With these results, public health authorities can create comprehensive and targeted interventions to increase low-income women's ability to receive a mammogram. Women with higher income will typically have access to better health care, the ability to afford healthcare or insurance, and the ability to easily take time off work for screening appointments.[8,16] These factors could make it easier for high-income women to receive screening mammograms when compared to low-income women.[10, 15,17] Interventions working to either reduce cost or expand care to women who previously would not have been able to access mammogram screening has been shown to improve screening rates.[18] The use of mobile mammogram screening buses, for example, has been shown to improve mammogram screening rates among medically underserved women.[17]

These results will also assist public health authorities in reevaluating the messaging and education women receive about mammograms. The results showed that a woman's race and education level significantly affected their ability to receive mammograms. These results may indicate a disconnect in current messaging about the importance of mammograms for these groups of women. Previous studies evaluating racial disparities in breast cancer screening found that Black Women were less likely than White women to be aware of breast cancer screening tests.[19] However, among women who were aware of screening tests Black women had a higher compliance than White women.[19] Additionally, culturally sensitive approaches to messaging may be needed. Studies have shown that developing culturally sensitive education for breast cancer screening increased mammogram screening attendance by up to 18% among Asian, African, Hispanic, or Oceanian women living in Western countries.[20,21]

Limitations of this study include the fact that the study was cross-sectional. The drawbacks of a cross-sectional study include the inability to determine causality. While we can't conclude that low income directly leads to an inability to receive a mammogram, we can observe an association between low income and women who have never undergone a mammogram. Another limitation is that due to the way the data was collected, self-reported phone interviews, recall and response bias may be present. Additional bias may be present due to missing and refused data being excluded from analysis.

Another limitation is the R-squared value produced by the multivariate model was .12. The low-pseudo-R-squared indicates a poor model fit. Ideally, there would have been additional variables in the model to evaluate a participant's history or family history of breast cancer. This

could have also been used to adjust for the income associated variation in the development of breast cancer. High-income women have an increased risk of developing breast cancer when compared to low-income women.[12,] Both factors may have affected the relationship between income and breast cancer screening practices. Individuals who have a history of breast cancer or at an elevated risk for cancer development are more likely to receive regular mammogram screening opposed to those with no history or elevated risk of breast cancer development.[12] Lastly, there was a comparatively low number of low-income women in this study population (30,688 low-income women vs 77,173 high-income women). Variables that could have expanded the measurement of the income variable to include more low-income women may have resulted in a better model.

Areas of future research include further analysis of the joint effects of education and income on breast cancer screening practices. Further investigation into the root causes of the various disparities associated with mammogram screening and how they may be resolved is another key area of future research. Lastly, investigation into programs or interventions that have successfully improved mammogram screening rates and how to expand or replicate those programs in other priority populations is needed.

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Tables and Figures

Table 1: Characteristics of Females Aged 49-74, 2022 Behavioral Risk Factor Surveillance System. N= 107111

Variable		N	Weighted %
Age			
	40-44	14221	15.82
	45-49	13708	12.11
	50-54	16460	14.78
	55-59	17873	13.99
	60-64	22099	16.80
	65-69	23518	13.75
	70-74	21681	12.75
Income level			
	Low income (<$35,000)	30688	29.48
	High income (>$35,000)	77173	70.52
Ever had a mammogram			
	Yes	119062	89.86
	No	10498	10.14
Race/Ethnicity			
	White	96991	62.92
	Black or African American	11398	12.41
	Asian	2599	5.00
	Hispanic	10720	15.37
	Other	5220	4.29
Education status			
	Did not graduate High School	6329	10.39
	Graduated High School	26721	22.61
	Attended College or Technical School	37230	32.35
	Graduated from College or Technical School	59023	34.65
Health insurance plan			
	A plan purchased through an employer or union	51193	42.48
	private nongovernmental plan	11532	9.69
	Medicare	42305	25.89
	Medicaid	9325	8.55
	Any other form of health insurance	10407	8.11
	No coverage of any type	4798	5.29

Table 2: Measures of income and sociodemographic characteristics by ever had mammogram 2022 Behavioral Risk Factor Surveillance System. N= 107111

Variable	Yes mammogram N (Weighted %)	No Mammogram N (Weighted %)	Prevalence Odds Ratio	95% CI
Income level				
Low income (<$35,000)	27,539 (28.77%)	3,149 (35.57%)	Reference	Reference
High income (>$35,000)	71,360 (71.23%)	5,813 (64.42%)	0.731	(.66, .81)
Age				
40-44	9,553 (11.71%)	4,668 (52.15%)	19.4	(15.5, 24.2)
45-49	11,784 (11.55%)	1,924 (17.10%)	6.45	(5.10, 8.16)
50-54	15,324 (15.27%)	1,136 (10.42%)	2.97	(2.31, 3.83)
55-59	17,061 (14.81%)	812 (6.74%)	1.98	(1.48, 2.65)
60-64	21,317 (17.96%)	782 (6.44%)	1.56	(1.20, 2.04)
65-69	22,872 (14.86%)	646 (3.97%)	1.16	(.87, 1.56)
70-74	21,151 (13.83%)	530 (3.17%)	Reference	Reference
Race/ Ethnicity				
White	89,939 (63.96%)	7052 (53.74%)	Reference	Reference
Black or African American	10,586 (12.60%)	812 (10.76%)	1.02	(.89, 1.16)
Asian	2,242 (4.64%)	357 (8.22%)	2.11	(1.60,2.77)
Hispanic	9,376 (14.63%)	1,344 (21.94%)	1.78	(1.56, 2.04)
Other	4,562 (4.17%)	658 (5.34%)	1.53	(1.26, 1.83)
Education status				
Did not graduate High School	5444 (9.61%)	885 (17.21%)	Reference	Reference
Graduated High School	24244 (22.60%)	2477 (22.65%)	0.44	(.37, .52)
Attended College or Technical School	34204 (32.39%)	3026 (32.07%)	0.56	(.56, .47)
Graduated from College or Technical School	54943 (35.40%)	4080 (28.08%)	0.53	(.46, .65)
Health insurance plan				
A plan purchased through an employer or union	46,741 (42.51%)	4,452 (42.18%)	1.18	(.98, 1.43)
private nongovernmental plan	10,669 (9.85%)	863 (8.23%)	Reference	Reference
Medicare	40,823 (27.54%)	1,482 (11.27%)	0.49	(.40, .60)
Medicaid	7,993 (8.04%)	1,332 (13.02%)	1.94	(1.57, 2.38)
Any other form of health insurance	9,384 (7.96%)	1,023 (9.36%)	1.41	(1.12, 1.76)
No coverage of any type	3,452 (4.08%)	1,346 (15.93%)	4.67	(3.72, 5.84)

95% CI represents 95% Confidence Interval.

Table 3: Adjusted Multivariate Logistic Regression: Impact of Sociodemographic Variables on Breast Cancer Screening stratified by education. 2022 Behavioral Risk Factor Surveillance System. N= 107111

	Crude analysis		Did not graduate High School	Graduated High School	Attended College or Technical School	Graduated from College or Technical School
	Prevalence Odds Ratio	95% CI	Prevalence Odds Ratio (95% CI)	Prevalence Odds Ratio (95% CI)	Prevalence Odds Ratio (95% CI)	Prevalence Odds Ratio (95% CI)
Income status						
Low income	Reference	Reference	Reference	Reference	Reference	Reference
High income	0.731	(.66, .81)	1.49 (.885, 2.50)	0.64 (.51, .81)	1.02 (.81, 1.30)	.57 (.43, .75)
Age						
40-44	19.4	(15.53, 24.21)	18.09 (4.76, 68.77)	24.47 (14.5, 41.3)	24.47 (13.6, 43.8)	16.0 (8.27, 31)
45-49	6.45	(5.10, 8.16)	5.118 (1.39, 20.18)	9.03 (5.15, 15.8)	7.48 (4.10, 13.6)	4.64 (2.32, 9.25)
50-54	2.97	(2.31, 3.83)	3.64 (1, 13.24)	2.89 (1.70, 4.93)	3.55 (1.93, 6.51)	1.89 (.95, 3.79)
55-59	1.98	(1.48, 2.65)	2.30 (.59, 9.01)	2.87 (1.64, 5.10)	1.88 (.92, 3.83)	1.28 (.55,2.97)
60-64	1.56	(1.20, 2.04)	1.91 (.50, 7.36)	2.16 (1.22, 3.81)	1.59 (.86, 2.93)	1.06 (.52, 2.14)
65-69	1.16	(.87, 1.56)	1.15 (.33, 4.01)	1.03 (.618, 1.71)	.85 (.51, 2.93)	1.61 (.81, 3.23)
70-74	Reference	Reference	Reference	Reference	Reference	Reference
Race/Ethnicity						
White	Reference	Reference	Reference	Reference	Reference	Reference
Black or African American	1.02	(.89, 1.16)	0.588 (.34, 1.01)	0.77 (.58, 1.01)	.79 (.58, 1.06)	.74 (.58, .94)
Asian	2.11	(1.60,2.77)	0.459 (.11, 1.84)	2.45 (1.14, 5.26)	1.17 (.49, 2.76)	2.3 (1.50, 3.54)
Hispanic	1.78	(1.56, 2.04)	0.743 (.50, 1.11)	0.57 (.42, .78)	.88 (.65, 1.18)	.87 (.66, 1.15)
Other	1.53	(1.26, 1.83)	0.475 (.213, 1.06)	1.08 (.73, 1.6)	1.26 (.86, 1.84)	1.10 (.76, 1.56)
Health insurance						
Employer plan	1.18	(.98, 1.43)	1.63 (.44, 6.02)	1.09 (.74, 1.60)	.77 (.51, 7.17)	1.16 (.91, 1.50)
Private plan	Reference	Reference	Reference	Reference	Reference	Reference

Medicare	0.49	(.40, .60)	1.59 (.50, 5.01)	1.53 (.94, 2.50)	1.03 (.61, 1.71)	.65 (.32, 1.30)
Medicaid	1.94	(1.57, 2.38)	1.65 (.53, 5.15)	1.87 (1.17,3.0)	1.08 (.68, 1.71)	1.28 (.84, 1.95)
Any other form of health insurance	1.41	(1.12, 1.76)	2.40 (.76, 7.90)	1.14 (.71, 1.85)	1.1 (.67, 1.81)	1.07 (.77, 1.48)
No coverage of any type	4.67	(3.72, 5.84)	3.62, (1.14, 11.50)	2.69 (1.71, 4.23)	3.15 (2.0, 5.1)	4.71 (2.91, 7.64)

Adjusted for age, insurance, and race/ethnicity.

95% CI represents 95% Confidence Interval.

Appendix A: Biography and resume

My name is Hannah Zantow, and I am a second-year student at the University of Nebraska Medical Center. I am pursuing my MPH with a concentration in Epidemiology. While at UNMC I had the opportunity to work with the Kansas Department of Health and Environment analyzing regional changes in school entry vaccine coverage pre and post pandemic. After graduation I hope to move back home and continue pursuing my passion for public health. In my free time I can usually be found cozying up to a good book or baking.

Hannah Zantow

Phone: 701-408-9018 Email: hannahzantow@gmail.com

Education

South Dakota State University Brookings, SD
August 2018-May 2022 Graduation May 202
B.S. Microbiology

University of Nebraska- Medical Center Omaha, Ne
August 2022-May 2024 Graduation May 2024
MPH Epidemiology- Honors

Experience

Lab Assistant
January 7,2019 – August 5, 2022
Microbiology Prep Lab, South Dakota State University
Brookings, SD

- Preparing culture media and other solutions for teaching labs and our own use.
- Preforming quality control tests on all media made.
- Cleaning lab classrooms, equipment, and glassware.

Research Assistant
June 21, 2021 – August 3, 2021
North Dakota State University
Fargo, ND
"Effects of Low Soil pH on Soybean Root Morphology"

- Utilized basic and advanced lab equipment, technology, and protocols daily.
- Accurately measured and documented progress in all projects I was involved in.
- Presented the results of my research to professors and other students.

Intern
May 21, 2022 – August 3, 2022
Kansas Department of Health and Environment
Omaha, NE

- Assessed changes in school entry vaccine prevalence on a regional level.
- Created data analysis plan.
- Utilized statistical software to generate data.
- Created one page summary sheets of results which were sent out to regional partners.
- Presented the results of my project to students and faculty.

Skills

- Teamwork
- SAS Software
- Word, PowerPoint, Excel
- Communication
- Time management
- Organizations

Certificates/ Trainings

- Media Communication Training
- Psychological First Aid training
- FEMA IS-800.D: Introduction to National Response Framework

References

Nina Herrera- Former Employer Phone: 1(612)-272-6127 Email: Nina.Herra@sdstate.edu
Larry Cihacek- Former supervisor Phone: 701-730-0623 Email: larry.cihacek@ndus.edu
Andrea May- Former supervisor Phone: 785-207-1962 Email: andrea.may@ks.go