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**A Secondary Analysis of County Health Statistics for the
Galveston County of Texas Report**

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**A Secondary Analysis of County Health Statistics for the
Galveston County of Texas Report**

**by
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Dedication

For my son, Andy

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My dearest thanks to my supervisor, Dr. John Prochaska, for his encouragement and continually guidance on my capstone project.

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Abstract: The health of Galveston County communities (as is common with many areas outside large urban cities) is not fully summarized in a single report; however, a descriptive analysis would benefit community partners such as the Research Education and Community Health coalition who are interested in developing community health plans and for setting goals aimed at improving community health. The objective of this analysis is to compare reported health measures for Galveston County to Texas and the United States to see the most pressing health problems and their determinants of health such as race, gender, age, education and income. The methods included collecting secondary data from the Texas Behavioral Risk Factor Surveillance System for 2010, the County Health Rankings and Roadmaps, the 2013 American Community Survey 5-Year Estimates, and mortality data through the CDC Wonder Query system for Galveston County, Public Health Administration region 6/5S, Texas and the United States. Differences were calculated for each indicator between PHA 6/5S, Galveston County and Texas and/or the nation (for certain measures). To focus on greatest health concerns, only the highest differences were presented. Results revealed that Galveston County's leading cause of death is cancer compared to Texas and the US with cardiovascular disease as the leading cause. The greatest differences seen for health risks were in the health topics of Prostate Cancer Screening, Colon Cancer Screening, Immunizations, Tobacco Use, Alcohol Use, Mental &

Physical Health, and Health Access. 25% of these differences were associated with black race and 20% were associated with no high school education. County Health Rankings differences showed that Galveston County's premature death rate was higher than the state of Texas. For clinical care, the proportions of primary care providers and mental health providers are fewer patients per one provider compared to Texas. The conclusions of this report reinforce known health disparities such as minority status and lack of education. Cancer deaths as well and access to cancer screenings seem to be the greatest health problems in Galveston County; however, sub-county level data needs to be elucidated to understand more specific population health status.

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List of Abbreviations

AHIP	America's Health Insurance Plans
BRFSS	Behavioral Risk Factor Surveillance System
CDC	Centers for Disease Control and Prevention
CHNA	Community health needs assessment
CHR	County Health Rankings
DRE	digital rectal exam
GC	Galveston County
LHD	local health department
PCP	primary care provider
PSA	prostate-specific antigen
REACH	Research Education and Community Health
SES	socioeconomic status
TX	Texas

Chapter 1 Introduction

Significance and Specific Aims

Galveston County is located southwest of the metropolitan Houston area which is classified within the Texas Public Health Administration Region 6/5 in the southeast regions of Texas. It is considered a metropolitan county¹. Geography can be an important factor for health outcomes, but it is just one of many determinants of health². Socioeconomic status, race and ethnicity, education level, access to health care, and behaviors are several factors that should be considered when determining the drivers of health-related outcomes in Galveston County and understanding health disparities.

There are numerous academic, federal, and state maintained surveillance databases that hold population-level data for several of these factors for Galveston County, as well as at the state and national levels. Examples include several resources available at the Centers for Disease Control and Prevention. The Community Health Indicators, the County Health Rankings, the Behavioral Risk Factors Surveillance System as well as CDC Wonder are but a few of these tools that can be useful in identifying the most recent public health data and statistics².

For Galveston County, reporting this data in comparison to state and national statistics will increase knowledge of how Galveston County measures up to the state of Texas and the United States. The differences seen, for better or worse, may perhaps be further explained by the racial, ethnic, socioeconomic and/or environmental disparities or advantages known to be within Galveston County. The main advantage for utilizing these resources locally is that such an analysis can serve as one part of the foundation necessary for conducting a community health needs assessment for Galveston County. Such an analysis can provide community groups critical information to organize and allocate resources for strategic planning efforts. It may foster community group discussions that will benefit the efforts of all community health partners in determining the needs, disparities, and available resources within the entire county. With efforts at the community level, this secondary analysis can shed light on areas that need to be addressed.

Community-based interventions and models have shown to have a positive effect on overall health outcomes⁴. Therefore, planning with up to date information about the state of Galveston County's health outcomes and risk factors can lead to more precision for community partners in

the steps leading to a more comprehensive community health needs assessment. The health of Galveston County is of interest to community partners such as the Research Education and Community Health (REACH) Coalition. REACH consists of partnerships within Galveston County with aims of bridging academic resources and knowledge with community planning and action. These partnerships include institutions such as the University of Texas Medical Branch, community groups, centers, and organizations such as St. Vincent's Episcopal House which provides services to Galveston's indigent population. These relationships strive to positively impact Galveston's community health and wellness with the best practices and current information available. Having an analysis of health statistics in a comprehensive report will act as a tool for the REACH Coalition.

Ultimately, the goal of this capstone is to answer the following questions:

- What do the health disparities look like in Galveston County for population groups based on race, gender, and age? How do social, environmental, and economic factors affect the health status of Galveston County?
- How does Galveston County measure up compared to the state of Texas and the United States?
- Do we expect to see poorer health outcomes in populations with known characteristics associated with negative health outcomes, such as relatively high concentrations of minority populations and continental southwest geographical location? If we see the opposite, what are potential reasons for these unexpected observations and how can community partners further investigate these reasons?

While there are many determinants of health, a few major factors known to be correlated with poorer health are lower socioeconomic status (SES) and race, or minority status specifically. The CDC Health Disparities and Inequalities Report for the United States in 2013 documents a collection of 29 health problems and risk factors, of which some of the greatest disparities are seen in minority groups (e.g. non-Hispanic Blacks, Hispanics) and lower income or education levels.⁵ Because of the demographics of Galveston with lower SES populations and varying prevalence of minorities, the health outcomes may differ from the rest of Texas as well as the nation. This report will serve as one element of a comprehensive community health needs assessment that will be made available to equip partners with current knowledge of Galveston County health statistics so that sub-county level assessment can be planned and executed.

Background

When the ten Essential Public Health Services were developed, the first two of all services were designated under the Core Function of Assessment, which are 1) Monitor Health and 2) Diagnose and Investigate.⁶ Monitoring health involves identifying health risks, community health and vital statistics and well as identifying the assets within a community.⁷ Community health needs assessments (CHNAs) are one important tool for identifying and addressing prominent health risks for a specific population. This is accomplished by collecting primary data by way of a population-based survey and/or by analyzing secondary data available that can also serve as comparative data to understand local health related to regional, state, and even national outcomes.⁸ The process of community partners conducting a health needs analysis not only requires the investigation of up-to-date information about the population of interest, but also relying on the outcomes of the analysis to be guidance for decision-making⁸. By focusing efforts to assess health issues in a population, the results of a needs assessment should allow use of allocated resources from public and private sources in the most effective and efficient ways.

The CHNA is a systematic approach that ensures that an evaluation is done before treatment as is seen in the individual patient-doctor interaction but on a broader level.⁹ This approach promotes efficiency and efficacy when considering limited health service resources. CHNA utilizes the epidemiological, qualitative and comparative methods to describe the health of a population and its issues.⁹ there may not be an overt problem but rather a “health need”, which could affect the community for the better if changes on the social or environmental level take place after an assessment⁹. This is tailoring health services with evidence-based methods. A health care need can be benefitted from health care services and at the practitioner level⁹, but in order for clinicians and health centers to know specific needs, the health needs of a community must be understood. These health needs require a much broader look at the determinants of health that ultimately expose the health of a local society, its constructs that include social, economic, and political forces⁹. Therefore, partners such as REACH who have both public health as well as clinical fronts are striving to understand the health landscape of their potential patient population.

Not only is the CHNA a design to identify unmet and unaddressed health needs, it is also a guide to find innovative ways to change them for the health of the community. It can help compile a clear set of objectives to meet actual health needs rather than waste resources on

ineffective treatment plans for individuals and communities. There are several causes for wasteful spending and the rising costs in health care. America's Health Insurance Plans (AHIPs) trade associations state that causes such as defensive medicine, volume-based pay over value, use of medical technology without an effectiveness evaluation, higher prices for medical services and perhaps provider consolidation are drivers of rising health costs.¹⁰ Public perspectives over the rise in health care costs show that more than half of Americans polled believe that costs are rising faster than usual.¹¹ But a CHNA provides the groundwork that is necessary to discovering where resources are and are not making the greatest impact as the health of the community is investigated.

One CHNA performed in Wake County, North Carolina in 2013 demonstrates the process of community partners and community health centers combining efforts to gain an understanding of the greatest areas of concern for their county.¹² Seven entities that included the Wake County Human Services, WakeMed Health and Hospitals, Duke Raleigh Hospital, Rex Healthcare, Wake Health Services, the Capital Care Collaborative, and the United Way of the Greater Triangle joined together on this third collaborative CHNA for Wake County as an effort to avoid duplication efforts and expenses as well as to strengthen a multiple community partnership between organizations for the common goal of furthering Wake County's health and well-being. For primary data, an interview-based health opinion survey with 59 items covering a variety of health topics was developed. The locations for interviews were determined using emergency response methods already in place to ensure data that was collected would be representative and also generalizable to the entire county. Secondary data collection used some of the same and different resources to the current report for Galveston County such as the Behavioral Risk Factor Surveillance System, the County Health Rankings and Roadmaps, US Census Bureau and also the Healthy North Carolina 2020 with local government services were used as sources for health data. Based on these data collections and analyses along with community focus group sessions, nine areas of health concerns to the community were concerned. As one can see, these first steps of the CHNA for Wake County, NC, helped community partners identify health issues that were of concern to their local community. The assessment continued by holding five community forums throughout the county to further understand what the three health concerns the community held to be the greatest in Wake County. A comparison for the secondary data was done with state health data as well as a peer county of similar population size, Mecklenburg County. Though this CHNA's conclusions were

valuable to the investigators, several issues arose which highlight the need for further community partnership and common objectives. Because qualified health centers in North Carolina are mandated to complete a CHNA every 3 years, the preparation and execution of the assessment suffered from time constraints brought on by trying to meet deadlines required of the health centers and not necessarily the community-based entities, such as United Way and the county health services. These constraints were believed to have limited the actual scope of the assessment by not being able to acutely address root issues within the community. Yet, at the conclusion of this assessment report, further measures for greater time allotment and more input from community-based agencies were established for their future collaborations.

In terms of how just how impactful CHNAs are to the local health of a population, a review of the performance of local health departments (LHDs) sheds some light on the usefulness of assessments.¹³ Twenty-three studies were reviewed for their evaluation of LDHs performance based surveys regarding the 10 Essential Public Health Services or the National Public Health Performance Standards surveys of the Local Public Health System. The review found that LDHs had better performance scores when they involved themselves in local partnerships and interactions within the community. Furthermore, better performance was associated with the planning efforts of LDHs, which included CHNAs. But as can be seen with the Wake County CHNA, involvement and partnerships of LDHs with other community health centers and partners should include precise leadership to investigate the real issues affecting the LDH communities. Perhaps another lesson to be learned when developing a CHNA is to be mindful that approaching the exposure of root health problems involves careful planning. Pressure of deadlines from other community partners can hinder the work of the assessment as was learned in Wake County.

Bexar County, Texas in 2010 performed a CHNA as a collaborative effort between health centers, community organizations as well as businesses, known as the Health Collaborative, who are invested in improving county health effectively and efficiently.¹⁴ Again, primary and secondary data were obtained and analyzed from community focus groups, meetings and interviews as well as databases such as the US Census Bureau, the San Antonio Police Department, etc. One unique and important feature that the Health Collaborative had established in their 2002 CHNA was dividing their county into six geographic sectors which enabled an investigative perspective into sub-county level health status and issues. With the upcoming Galveston County CHNA being organized by REACH partners, this method of sub-county level

analyses will be one more strength that can expose even deeper health problems beyond what this secondary data report can present. Also, the fact that Bexar County Health Collaborative has committed to a CHNA every four years implies the need for strong teamwork from community partners. One conclusion the 2010 Bexar County CHNA arrived at was the decreased need for resources heavily focused on individual care programs due to the pervasive health issues present. Rather the Health Collaboration's CHNA allowed for recommendations of more long-term goals for prevention by increasing communication with community entities, residents, and encouraging strategic approaches to the need for changes in local policies. By understanding where the issues are in a population, the CHNA aims to address program effectiveness, program oversight in certain health areas, and again, best allocation of resources to meet the greatest needs within the community.

As REACH continues with the great undertaking of the Galveston County CHNA, community partners can have assurance that engaging in this first core function of assessment will strengthen the community of the county. This analysis of Galveston County health statistics is only one part of the process of what will be done to ensure that Galveston County residents have a good evaluation of their health problems and resources.

Chapter 2 Data and Methods

An analysis for selected health statistics was performed to compare measures for Galveston County with Texas as well as the United States overall. Data for the analysis was obtained from several publically available databases and tools, each of which will be discussed in detail below. Findings from the analysis were then used to populate tables to illustrate relative comparisons among Galveston County, Texas, and the United States.

For demographic information, a query was performed from the 2013 American Community Survey 5-Year Estimates, which is available through the U.S. Census Bureau American Fact Finder tool.¹⁵ This tool provides access to the annually collected American Community Survey database. The measures selected for this report from this database were age, gender, race, population, median income, poverty status, and educational level.



Mortality data was acquired from the CDC Wonder Query System for the Underlying Causes of Death for Galveston County, Texas, and the United States.¹⁶ Cross-tabulation with age, race, or any other variable was unable to be performed as a limitation of the query tool. The tool did provide the leading 15 causes of death. However, only the leading 10 causes of death were downloaded for comparison for this analysis.

The differences between Galveston County with Texas and the nation were presented for the 4 leading causes of death according to the rank for the county.

Figure 1. Health Service Region 6/5 South Map (Texas Department of State Health Services, 2015)

To measure determinants of health and health outcomes, the Texas Behavioral Risk Factor Surveillance System (BRFSS) data was accessed via the web-based query tool.¹⁷ Due to limitations related to sampling in this dataset, Galveston County data alone was not available through the web-based tool. Rather, the tool provides data at the level of Texas Department of

State Health Services Public Health Administrative Regions. Region 6/5S, which includes Galveston County (see Figure 1), included the data for the 35 risk factors presented in the BRFSS, listed in Table 1.

<i>Alcohol</i>	<i>Heart Health</i>
Binge Drinking	Cardiovascular Disease
Heavy Drinking	Angina or Coronary Heart Disease
Women & Drinking: 18-44 years*	Heart Attack or Myocardial Infarction
<i>Asthma</i>	Stroke
Diagnosed & Current Asthma	Heart Disease
<i>Diabetes</i>	<i>Immunizations</i>
Diagnosed diabetes	Never had a Pneumonia shot, age 65 Years and over*
<i>Fall Risk</i>	No Flu Shot in the past year, age 18 Years and over
At Risk for Injuries due to Falls, 45 years of age and over*	No Flu Shot in the past year, age 65 Years and over*
<i>Obesity/Overweight</i>	Had Hepatitis B vaccine
Obesity (BMI 30 or greater)	<i>Prostate Cancer Screening</i>
Overweight & Obesity (BMI 25 or greater)	No Digital Rectum Exam (DRE) within the past 5 years, Males 40 years of age or older*
<i>Colon Cancer Screening</i>	No Prostate-Specific Antigen (PSA) within the past 2 years, Males 40 years of age or older*
At Risk for not having a Blood Stool Test in the past 2 years, 50 years of age and older*	<i>Physical Activity</i>
Never had a Sigmoidoscopy or Colonoscopy, 50 years of age and older*	No Leisure Time Physical Activity
<i>Health Access</i>	<i>Tobacco Use</i>
Could not see a doctor because of cost	Current Smoker
No Health Insurance	Ever Smoked in Entire Lifetime
<i>Mental/Physical Health</i>	At Risk for Current Smoker or Using Smokeless Tobacco
Five or more days of Poor Mental Health	<i>Women's Health</i>
Five or more days of Poor Physical Health	No Mammogram within 2 Years, Women \geq 40 Years*
General Health Fair to Poor	No Pap Smear within 3 Years, Women \geq 18 Years*
Limited by Health Problems	
Kept from doing Usual Activities for 5 or more days due to Poor Physical or Mental Health	
Use of Special Equipment	
<i>All risk factors stratified by Gender, Race/Ethnicity (White, Black, Hispanic), Age Group (18-29, 30-44, 45-64, 65+ Years), Education (No high school, High school graduate, Some college, College +), and Income (<\$25,000, \$25,000-\$49,999, \$50,000+)</i>	
<i>*A risk factor that differed in stratification due to either gender and/or age group being included in the surveillance factor</i>	

Table 1. Texas BRFSS List of Risk Factors, 2010

The data for both Texas and Region 6/5S for 2010 were selected and organized into spreadsheets using Microsoft Excel 2010 Software. For each risk factor, the table included sample size, the percent at risk, and the 95% confidence interval for each of the variables. Further, when available, additional detail for each variable was provided based on gender, race/ethnicity, age groups, education and income. Due to the nature of some of the risk factors, some variables were not included in the data retrieved from the query tool (e.g. percent at risk for men were not included in statistics related to reporting women's health).

For each variable of each risk factor, the difference of percentage at risk in 6/5S from the state of Texas was calculated. Most risk factors included 16 variables for gender, race/ethnicity, age group, education and income, though as discussed previously because the nature of some risk factors, total variables fluctuated from 10, 12 and 14 for those certain risk factors. Final calculations totaled 518 differences within the 35 risk factors. Negative differences resulted when 6/5S values were larger than Texas values. Positive differences resulted when Texas values were greater than 6/5S values. In some cases there was no difference between 6/5S and Texas risk values, and these were not regarded in this portion of the analysis. In order to focus on the most pressing health concerns, the highest absolute differences were selected (between 2 and 4 values) for each of the thirty-five risk factors yielding 95 differences. For this narrowed selection, the confidence intervals from the Texas proportion and the 6/5S proportions were compared for statistical significance. Finally, as an effort to highlight the greatest health risks, twenty greatest absolute differences were selected as a snapshot for comparing Public Health Administrative Region 6/5S to the rest of the state of Texas.

In order to have more localized health statistics for Galveston County, the County Health Rankings data for 2014 was chosen to make a direct comparison of Galveston County to Texas and also to the national averages for the measures reported.¹⁸ The 2015 rankings were available; however, due to the necessity of predicting estimates for the remainder of this calendar year, 2014 rankings were chosen for this report. Data obtained from the County Health Rankings included the following measures. Health Outcomes included sub-categories of Length of Life and Quality of Life. Health Factors examined included sub-categories of Health Behaviors, Clinical Care, Social and Economic Factors, and Physical Environment. Thirty-five specific measures total are listed in Table 2.

Each measure was reported as a percentage, a rate, a ratio, or by a number on an index for the specific measure. A difference was calculated for each measure by subtracting the value for Galveston County from the value for Texas. Because only a margin of error was reported for the county alone, statistical significance could not be evaluated in comparison to the state. From these differences, the greatest 16 were chosen for this analysis once again as an effort to discover which health concerns were predominant in Galveston County. For the rates per 100,000, three values were selected. For the percent proportion, the greatest five absolute differences were selected. For the ratios regarding clinical care, the three available with the County Health Measures were all reported. All measures were also compared to the national average. The 5 measures without any difference (TX-GC=0) were reported but there was an emphasis on the difference from the U.S. values.

<u>Health Outcomes</u>	
<i>Quality of Life</i>	<i>Length of Life</i>
Poor or fair health	Premature death ^a
Poor physical health days	
Poor mental health days	
Low birthweight	
<u>Health Factors</u>	
<i>Health Behaviors</i>	<i>Social & Economic Factors</i>
Adult smoking	High school graduation
Adult obesity	Some college
Food environment index ^b	Unemployment
Physical inactivity	Children in poverty
Access to exercise opportunities	Inadequate social support
Excessive drinking	Children in single-parent households
Alcohol-impaired driving deaths	Violent crime ^γ
Sexually transmitted infections ^γ	Injury deaths ^γ
Teen births ^δ	<i>Physical Environment</i>
<i>Clinical Care</i>	Air pollution - particulate matter ^ε
Uninsured	Drinking water violations
Primary care physicians	Severe housing problems
Dentists	Driving alone to work
Mental health providers	Long commute - driving alone
Preventable hospital stays	
Diabetic monitoring	
Mammography screening	
<i>Measures reported as percentages except for the following:</i>	
^a <i>Years of potential life lost before age 75 per 100,000</i>	
^b <i>Factor index contributing to a healthy food environment, 0 (worst) to 10(best)</i>	
^γ <i>Cases per 100,000</i>	
^δ <i>Births per 1,000</i>	
^ε <i>Average daily density of fine particulate matter per cubic meter</i>	

Table 2. County Health Rankings List of Health Outcome and Health Factor Measures, 2014

Chapter 3 Results

2013 American Community Survey

Table 3 presents the demographic information for Galveston County, Texas and the United States. For gender, Galveston County does not vary from Texas or the United States greater than 1% for both male and female populations. For race, Galveston County has 1.7% more Black population than Texas and only 1% higher than the national percentage. For the Hispanic population, Galveston County has 15.6% less Hispanics (of any race) than Texas overall but still a higher percentage than the nation by 5.7%. For median income, Galveston County exceeds the state by \$4,351 annually and also the United States by \$3,886 annually. Individuals with incomes that are below 100% of the poverty level comprise 13.3% of residents in Galveston County, which is 4.2% less than Texas and again lower than the nation by 2.5%.

	<u>US</u>	<u>Texas</u>	<u>Galveston County</u>
Population	316,128,839	26,448,193	306,782
Male	49.20%	49.70%	49.80%
Female	50.80%	50.30%	50.20%
One Race			
<i>White</i>	73.70%	75.00%	78.40%
<i>Black</i>	12.60%	11.90%	13.60%
<i>Asian</i>	5.10%	4.10%	3.20%
Hispanic (of any race)	17.10%	38.40%	22.80%
Median age, years	37.5	34	37.4
Median income (dollars)	26,230	25,765	30,116
Below 100% of poverty level	15.80%	17.50%	13.30%
High school graduate (includes equivalency)	27.80%	25.20%	25.70%
<i>Source: U.S. Census Bureau. 2009-2013 American Community Survey 5-Year Estimates. SELECTED CHARACTERISTICS OF THE TOTAL AND NATIVE POPULATIONS IN THE UNITED STATES</i>			

Table 3. Demographics, Selected Characteristics for Galveston County with comparison to Texas and the United States, 2009-2013 ACS 5-Year Estimates

Mortality for Leading Causes of Death

The all-cause mortality data for the 10 leading causes of death and their age-adjusted rates can be seen in Table 4 for Galveston County, Texas and the United States. While Galveston County's first leading cause was malignant neoplasms, the number one cause of death for both Texas and the nation were diseases of the heart. Diseases of the heart were the second leading cause of death in Galveston County. While chronic lower respiratory disease (CLRD) ranked as the third leading cause of death for both Texas and the U.S., it was not ranked within the top four leading causes for Galveston County. For malignant neoplasms, Galveston County's mortality rate was 25.5 additional deaths per 100,000 than Texas and 19.2 additional deaths per 100,000 than the U.S.

For diseases of the heart interestingly, Galveston County's mortality rate was only slightly lower than both Texas and the U.S. by 1.7 deaths per 100,000 and 0.8 deaths per 100,000, respectively. The third leading cause of death for Galveston County, cerebrovascular diseases, had mortality rates greater than Texas by 2 deaths per 100,000 and by 6 deaths per 100,000 for the nation. Accidents (unintentional injuries) were the 4th leading causes of death and the death rate was 2.2 more per 100,000 than Texas but only 0.2 per 100,000 less than the U.S. Alzheimer's disease was the tenth leading cause of death in Galveston County and had a lower death rate than Texas by 8.3 deaths per 100,000 and 7.5 deaths per 100,000 for the country.

Galveston County		
Rank	Leading Causes of Death	Age-adjusted Rate per 100,000
1	Malignant neoplasms	182.4
2	Diseases of heart	169
3	Cerebrovascular diseases	42.2
4	Accidents (unintentional injuries)	39.2
5	Chronic lower respiratory diseases	37.2
6	Septicemia	19.5
7	Diabetes mellitus	18.8
8	Nephritis, nephrotic syndrome and nephrosi	18.6
9	Chronic liver disease and cirrhosis	12.3
10	Alzheimer's disease	16
Texas		
Rank	Leading Causes of Death	Age-adjusted Rate per 100,000
1	Diseases of heart	170.7
2	Malignant neoplasms	156.9
3	Chronic lower respiratory diseases	42.4
4	Accidents (unintentional injuries)	37
5	Cerebrovascular diseases	40.2
6	Alzheimer's disease	24.3
7	Diabetes mellitus	21.6
8	Septicemia	16.4
9	Nephritis, nephrotic syndrome and nephrosi	15.9
10	Chronic liver disease and cirrhosis	12.9
United States		
Rank	Leading Causes of Death	Age-adjusted Rate per 100,000
1	Diseases of heart	169.8
2	Malignant neoplasms	163.2
3	Chronic lower respiratory diseases	42.1
4	Accidents (unintentional injuries)	39.4
5	Cerebrovascular diseases	36.2
6	Alzheimer's disease	23.5
7	Diabetes mellitus	21.2
8	Influenza and pneumonia	15.9
9	Nephritis, nephrotic syndrome and nephrosi	13.2
10	Intentional self-harm (suicide)	12.6
<p><i>Source: Centers for Disease Control and Prevention, National Center for Health Statistics. Underlying Cause of Death 1999-2013 on CDC WONDER Online Database, released 2015.</i></p>		

Table 4. Ten Leading Causes of Death and Rates for Galveston County, Texas and the United States, 2013

Texas Behavioral Risk Factor Surveillance System

The Texas Behavioral Risk Factor Surveillance System for the most recent web-published data consists of thirty-five risk factors surveyed for 2010. These thirty-five risk factors were assigned into 14 health topics (Alcohol, Asthma, Diabetes, Fall Risk, Obesity/Overweight, Colon Cancer Screening, Health Access, Mental and Physical Health, Heart Health, Immunizations, Prostate Cancer Screening, Physical Activity, Tobacco Use and Women's Health). The twenty greatest differences of all calculated differences that were selected to reflect a comparison for the Public Health Administrative Region 6/5S and the state of Texas cover 7 of the 14 health topics (see Figure 2.) 35% of the 20 highest selected differences for 6/5S and Texas are directly cancer-related with 15% accounting for risks associated with colon cancer screening and 20% associated with prostate cancer screening.

Figure 2 reports the percentage at risk for Texas and for Region 6/5S for the twenty greatest differences of the BFRSS risk factors. For the health topics of tobacco and alcohol, 6/5S high school graduates are 8.1% more at risk for having ever smoked in their lifetime compared to high school graduates in all of Texas [Region 50.5%, 95% CI: 43.8, 57.1; State 42.4%, 95% CI: 39.3, 45.5]. Contrarily, 6/5S adults without a high school diploma were 6.7% less at risk for having ever smoked 100 cigarettes or more in their entire lifetime as compared to adults in the state without a high school diploma [Region 37.9%, 95% CI: 34, 42; State 31.2%, 95% CI 24.4, 38.9]. For women ages 18-44 years in 6/5S, black women were 6.5 % less at risk for excessive

alcohol use, described by the Texas BRFSS as consuming on average more than one drink per day and/or having five or more drinks on one or more occasions [Region 1.8%, 95% CI: 0.5, 6.4; State 8.3%, 95% CI: 4.7, 14.1]. For women ages 18-44 years in 6/5S, those who were high school graduates were also 6.5% less at risk for excessive alcohol use [Region 5.3%, 95% CI: 1.6, 15.8; State 11.8%, 95% CI: 7.6, 18].

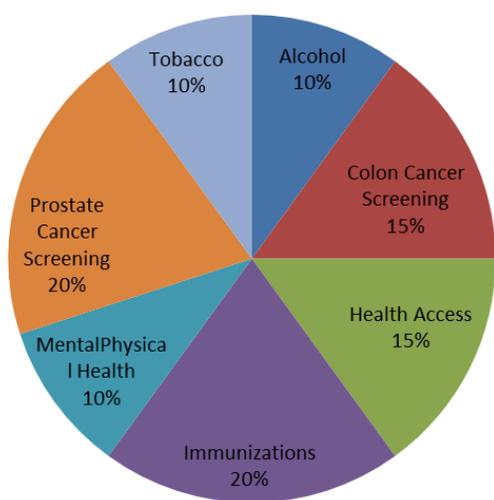


Figure 2. Most Common BRFSS Health Topics Covered For Highest Differences Analyzed

For health topics of mental and physical health, adults in 6/5S without a high school diploma were 6.9% less at risk for being limited by health problems as compared to adults in Texas without a high school diploma [Region 13%, 95% CI: 9.2, 18.1; State 19.9%, 95% CI: 16.9, 23.3]. For Hispanic adults in 6/5S, 8.2% were less at risk for being limited by health problems compared to Hispanic adults in Texas [Region 5%, 95% CI: 3.3, 7.4; State 13.2%, 95% CI: 11.3, 15.5]. This difference was the only statistically significant value found among the 20 greatest difference selected for this comparison.

For the topic of health access, 6/5S Adults without a high school diploma were 6.9% more at risk than Texas high school graduates for being unable to see a doctor because of the cost [Region 41.7%, 95% CI: 33.5, 50.3; State 34.8%, 95% CI: 31, 38.8]. Hispanic adults in 6/5S Region were 7.3% more at risk for not having health insurance compared to Texas Hispanics [Region 53.3%, 95% CI: 47.1, 59.8; State 46.2%, 95% CI: 43.2, 49.3]. For adults in 6/5S ages 18-29, 7.6% are less at risk for not having insurance compared to Texas adults ages 18-29 [Region 30.7 95% CI: 22.3; State 38.3 95% CI: 33.4, 43.5].

For the health topic of cancer screenings, 6/5S Adults, 50 years and older, without a high school diploma were 8.9% more at risk for never having a sigmoidoscopy or colonoscopy [Region 64.8%, 95% CI: 55.7, 73; State 55.9%, 95% CI: 51.5, 60.2]. 6/5S Black adults, 50 years and older, were 8% more at risk for never having a sigmoidoscopy or colonoscopy than Blacks 50 years and older in Texas [Region 47.1%, 95% CI: 38.5, 55.9; State 39.1%, 95% CI: 33.7, 44.8]. Conversely, 6/5S men 50 years and older with a high school diploma were at 34.1% at risk for never having a sigmoidoscopy or colonoscopy which is 7.3% less than compared to Texas men 50 years and older with a high school diploma at 41.4% [Region 95% CI: 27.9, 40.8; State 95% CI: 38.3, 44.5].

For men 40 years and older with an income of less than \$25,000 in 6/5S region, 46.9% are at risk for not having a digital rectum exam (DRE) within the past 5 years. This is 6.3% less than the same population in the state of Texas which is 53.2% at risk [Region 95% CI: 35, 59; State 95% CI: 47.9, 58.3]. For Black men 40 years and older in 6/5S, 33.1% were at risk for not having a digital rectum exam (DRE) within the past 5 years, which was 8.2% less than black men 40 years and older in the state at 41.3% [Region 95% CI: 20.8, 48.3; State 95% CI: 30.7, 52.9]. In 6/5S, Black men 40 years and older were at 36.3% risk of not having a prostate-specific antigen (PSA) within the past 2 years, which was 12.8% less than black men in the state at

49.1% [Region 95% CI: 23.4, 51.6; State 95% CI: 38.5, 59.8]. 6/5S Men, 40 years and older, with some college education are 10.2% more at risk for not having a PSA test within the past 2 years than men 40 years and older with some college education in Texas [Region 57.4%, 95%CI: 47, 67.1; State 47.2%, 95%CI:41.5, 52.9]

For the health topic of immunizations, 6/5S adults 65 years and older whose income ranged from \$25,000-\$49,999, 8.3% were more at risk for never having a pneumonia shot compared to the same Texas population. For 6/5S adults 65 years and older whose income exceeded \$50,000, 7.3% were more at risk for never having a pneumonia shot compared to the same Texas population whose income exceeded \$50,000 [Region 36.1%, 95% CI: 28.1, 45; State 28.8%, 95% CI: 24.9, 33]. 6/5S Adults, 65 years and older whose income ranged from \$25,000-\$49,999 were 8.8% more at risk for not getting a flu shot in the past year compared to the same population in the state of Texas [Region 43.4%, 95% CI: 34.9, 52.3; State 34.6%, 95% CI: 30.8, 38.6]. 6/5S Black Adults, 65 years and older were 8.3% more at risk for not having a flu shot within the past year compared to 65 years and older blacks in Texas.

It is worth noting that of the 20 selected differences from the BRFSS risk factors, 5 (25%) were based on Black race, followed by 4 (20%) based on no high school education. Differences among gender were not among the greatest values; however, some risk factors included gender and were stratified by other variables (e.g. age, income, race, education).

County Health Rankings

The County Health Rankings for 2014 were recorded and the differences were taken for Galveston County and Texas for Health Outcomes and Health Factors. For the rates per 100,000 population, the three greatest differences are reported. For health outcomes and health factors measured by percentage, the five greatest differences are reported. For the health factor of clinical care, all three ratios differences are described. Of all the factors reported in CHR for 2014, there were five health factors that showed no difference between Galveston County and the state of Texas. Of the health outcomes, length of life and quality of life were the only two factors with greatest differences. In Galveston County, the rate of premature death is 911 deaths higher per 100,000 of the age-adjusted population compared to the state of Texas. Intriguingly, in Galveston County, the proportion of those who reported having poor or fair health is 5% less than Texas' proportion and still less than the national average by 3% [GC- 13%; TX- 18%; US- 16%].

Of the health factors, there is at least one of the greatest differences in three of the four subcategories: health behaviors, clinical care, and social and economic factors. There was not a great difference seen in the physical environment measures. In terms of clinical care, the proportion of population to dentists in Galveston County is 2,483:1, which is 477 more people than the proportion for Texas dentists at 2,006:1. Compared to the U.S. national average at 1,663:1, the need for dental care providers within Galveston County is demonstrated with the 820 higher number of persons to one dentist. The ratio of primary care physicians (PCP) to the population in Galveston County is 1,436:1, which is 307 fewer persons than the state ratio of 1,743:1. This ratio, however, is higher than the national average ratio of PCP to population at 1,354:1. Similarly, the ratio of mental health providers to the population in Galveston County is 1,372:1, which is 385 fewer persons than the state ratio of 1,757:1. Yet, this is still a higher proportion of the population to mental health providers compared to the national average at 753:1.

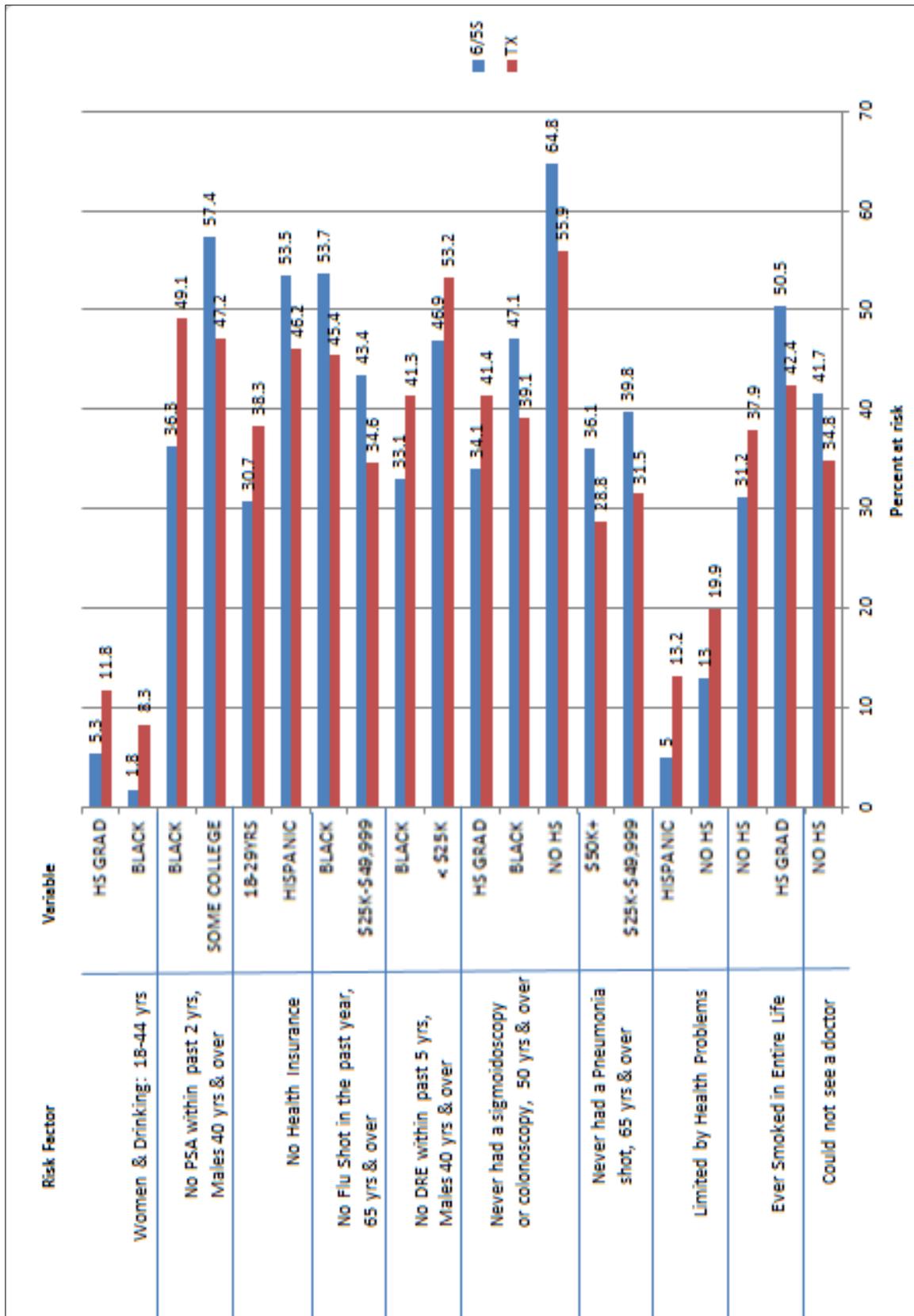


Figure 3. BRFSS Percent at Risk for TX and Region 6/5S of the 20 Highest Differences Analyzed

For health behaviors, the percentage of alcohol-impaired driving deaths in Galveston County was 5% higher than the state of Texas [GC- 38%; TX- 33%; US- 32%]. In Galveston County, the incidence rate of Chlamydia infection per 100,000 population is actually 85 infections less than the state of Texas and 57 less infections than the national average [GC- 401; TX- 486; US- 458]. In terms of social and economic factors, the amount of children in poverty in Galveston County is 17%, 9% less than the amount in Texas (26%). This health factor also measures less than the national average by 6%. Galveston County also has shown to have 101 fewer violent crimes per 100,000 population compared to Texas and also 58 fewer violent crimes than the national average [GC- 348; TX- 449; US- 406]. Interestingly, the percentage of adults 25-44 years of age who had some form of post-secondary education was higher in Galveston County by 5.2% higher than the state of Texas but only 0.3% more than the national average [GC- 63.3%; TX- 58.1%; US- 63%].

For Galveston County and the state of Texas, there are five health factors that showed no difference in percentage. These included adult smoking (adults who currently smoke every day or most days as well as those who have smoked at least 100 cigarettes in their lifetime), adult obesity (adults ages 20 and older with a body mass index of 30 kg/m² or greater), diabetic monitoring (diabetic Medicare patients ages 65-75 years who have received glycated hemoglobin (HbA1C) levels), inadequate social support, and the percentage of those who drive to work alone.

Chapter 4 Discussion

The minority landscape of Galveston is important to understanding the health of Galveston County as a whole. Even though the proportion of Hispanic population is greater than the non-Hispanic-Black population in Galveston County, support for the Hispanic Paradox may become clear.¹⁹ The proportion of Hispanics that are vulnerable to health risk factors is less than their race counterparts, and in fact, Hispanic race appears to be significantly less at risk for certain measures, specifically being limited by health problems compared to other races in Region 6/5S, which includes Galveston County. This analysis has shown that non-Hispanic blacks are more at risk for poor health outcomes, which could lead to higher mortality rates for this population. Non-Hispanic whites do not appear from this analysis to have poorer health compared their Hispanic or Black counterparts.

The assumption that wealth brings health is one that cannot necessarily be applied to Galveston County. Demographic information reveals that Galveston County has higher median income to both the state and the nation as well as lower percentage of its population that are below poverty level status compared to Texas and the U.S. However, some of the risk factor differences from the BRFSS show that even higher income is a variable that is associated with higher risk. In this analysis, the older population (65 Years and old) in higher income groups were most vulnerable for not having up to date immunizations, which is an issue that Galveston County's public health partners and advocates should pay attention to since this population is a higher risk group.

The mortality data seen in Galveston helps reveal the prominence of cancer within the county compared to the state and nation. In fact, the death rate difference was the greatest for malignant neoplasms when compared with the remaining causes of death. Taking into account the greatest differences seen in the BRFSS analysis were the cancer screening risk factors that made up 35%, it is not alarming that cancer remains the leading cause of death. Useful information would be the breakdown of neoplasm type attributed in Galveston County deaths and observe whether the more prominent cancers are colorectal and prostate cancer, which would reflect on the populations at higher risk for not getting screened according to recommendations.

For tobacco, having a high school education was correlated with having an increased risk for tobacco use, while the opposite was found for women with a high school education for alcohol use. Interestingly, black women alone were less at risk for excess alcohol use in 6/5S compared to the state.

Another interesting find is that 6/5S adults without high school education are also less at risk for being limited by their health problems. The Hispanic population in 6/5S is also lower for the same risk factor, but this analysis cannot show a relationship between these two variables and the outcome. Though it is perplexing that the Hispanic population is also more at risk for being uninsured.

According to the National Health Interview Survey 2014 Health Insurance Coverage Estimate, normally, those aged between 18-34 have the highest percentage of the uninsured in the U.S. (ranging from 15.4% to 26.3%). Notably, the uninsured rate for this age group in 6/5S is 30.7, which remains 4.4% higher than the upper limit of uninsured in the U.S. It is an interesting and perhaps unfortunate find that this is less at risk than the state of 38.3% adults uninsured.²⁰

Some of the BRFSS analysis may elucidate the reasons for Galveston County reporting a lower percentage of the population who claim to have poor to fair health compared to Texas. Considering the risk factor for prostate screening with PSA, black men 40 years or older had a much lower percentage at risk for not being screened compared to Texas. In the county, the ratio of primary care providers (PCPs) to patients is higher than the state but then again lower than the national average. The presence of PCPs may account for the black men population having a better chance for being screened due to the care of physicians within the community. But this does not explain why there are more deaths due to cancer in Galveston. Other factors such as environmental exposure and family history should be investigated at the sub-county level.

For cancer screenings, it appears that high education decreases the risk for older men (50 years and older) in 6/5S for not having recommended screenings. The USPSTF gives colorectal cancer screening the highest grade of A and recommends that adults beginning at 50 years of age have either fecal occult blood testing, sigmoidoscopy, or colonoscopy until age 75.²¹

Being black, regardless of gender, shows higher risk for not having appropriate colorectal cancer screening recommendations. However, being male in 6/5S carries less risk for not having colorectal cancer screening. In terms of prostate cancers screening, the USPSTF recommends

against prostate-specific antigen testing and gives it a grade of D.²² It also does not conclude that alternative screening such as with the DRE is successful in reducing mortality and morbidity of prostate cancer. The American Urological Association does however recommend a PSA screening along with a DRE for men starting at age 40 if they are asymptomatic and wished to be screened.

The risk for missing cancer screening is not elevated for race necessarily in 6/5S. Black males had less risk in 6/5S compared to Texas for missing prostate cancer screening of PSA testing and a DRE. Surprisingly, lower income status was also associated with lower risk for not having prostate cancer screening. In contrast, 6/5S men with higher education status were at one of the greatest differences observed for the risk of not having a PSA test.

For cancer screenings, Healthy People 2020 has an objective of increasing the proportion of adults (ages 50-75) who will receive colorectal cancer screening following current guidelines.²³ The target is an increase from the baseline of 52.1% of adults in 2008 to 70.5% by 2020. The percent at risk for 6/5S adults ages 50 and older for not receiving a sigmoidoscopy or colonoscopy is 38.6%. This implies perhaps then that 61.4% of this population in 6/5S have received one of these screening measures. With 5 more years until the 2020 target year, clinicians and public health partners are progressing in screening the population as a whole. In terms of prostate cancer screening, Healthy People does not have an objective to increase screening, rather the target is to increase the percentage of men 40 years and older who have a discussion with their healthcare provider about the benefits and risks of PSA testing. The goal is 15.9% in 2020.²³

Regarding immunizations especially for the vulnerable population of adults ages 65 and older, higher income and education appeared to be associated with a greater risk for either never receiving a pneumonia shot or not having their flu shot within the last year. Black older adults again were at higher risk in 6/5S than the rest of Texas for not having up to date immunization practices. Healthy People 2020 aims to have 70% of adults (ages 18-64) vaccinated against influenza.²⁴ Texas BRFSS implies that only 39.2% of adults in 2010 had their flu shot in the 6/5S region. For pneumococcal disease, Healthy People 2020 goals are for 90% of adults 65 years and older to have had a pneumococcal vaccine, which is 30% increase from the baseline of 60% of adults in 2008.²⁴ In 6/5S, the data reflects that 65.4% of adults 65 years and older in 2010 were vaccinated against pneumococcal disease.

The results for social and economic factors from the County Health Rankings validate the interesting information from the American Community Survey data showing Galveston to be less poor than not only the state but also the county. Yet Galveston County's high school educated population is average with the state of Texas and even a bit lower than the U.S. The assumption to be made then is that perhaps the wealth in Galveston County is spread out a little more evenly than in the state. But also to be considered is that there is a small percentage of the workforce that is making much higher wages than the average citizen, enough so that it appears all of Galveston County is richer than other counties in Texas on average. This is an important conclusion that should be further investigated at the sub-county level. There are more than likely pockets of the population within varying regions of the county. A community health needs assessment survey may be able to isolate more of these groups and also further assess their health status specifically.

In terms of education, there appears to be a discrepancy between reported data for the American Community Survey and the County Health Rankings. The ACS reports that Galveston County has 25.7% of the population with a high school education or equivalent (e.g. GED). However, the CHR states that 89% of Galveston County in 2014 graduated from high school.²⁵ Another value to look at is the 63.3% of Galveston County that has some form of post-secondary education, implying that high school education is completed. This yields a 37.6% difference. The discrepancy may be accounted for by a response bias due to the fact that ACS is based from U.S. Census Bureau community responses while CHR estimates graduates from cohort graduation rates that have been reported by Texas department of education.

This report has shed light on some interesting health issues in Galveston County and its health region 6/5S. It seems that black race and lower education are the most common variables that influence the greatest health risk difference from the state of Texas. However, as the results have shown, there are some risk factors where it seems the exact opposite is true, such as in tobacco use and prostate cancer screening. The predominant issues in Galveston County and this health region it appears are first with access to important recommended preventive services, particularly in regards to cancer screenings and immunizations, secondly with alcohol and tobacco related use and injury, thirdly with lack of health access overall. Various determinants are associated with each of these problems for Galveston County. The black minority population as well as the undereducated has the highest risk of not getting screened for colon cancer. With the greatest mortality as a cause of malignancy in Galveston County, this draws attention to the

inhibitors that block these population groups from preventive care. Curiously, black men are more likely than their non-Hispanic white and Hispanic counterparts to receive prostate-cancer screening. Several factors could be a cause for this interesting finding. Why is this population receiving tests that are not recommended as a preventive service? Galveston does have more PCPs per capita, so perhaps one issue lies with the promotion and education coming from primary care clinics.

Tobacco and alcohol use and injuries should be considered a pressing concern right now for Galveston mainly because of the populations currently affected and at risk. Those who have at least a high school education are more likely to have smoked in their lifetime. Ironically, those without a high school education are less at risk for using tobacco. So, the inquiry is 1) whether or not primary and secondary education programs are emphasizing the risks associated with tobacco use and 2) if programs in Galveston County within the school districts do exist, it is perhaps time to re-evaluate their effectiveness if young adults are being exposed to anti-tobacco campaigns but maybe having risks for unhealthy behaviors. Though not a blatant issue seen in the BRFSS analysis, the CHR revealed that alcohol-related driving deaths in Galveston County are higher than the state and country. Again, one place to begin at is the exposure to programs at schools and community centers. Are youth being educated before they learn to drive about the risks of drinking and driving?

Galveston County has given the assumption through this analysis that overall as a county, it is fairing economically favorably compared to both Texas and the US, especially with higher median incomes and lower poverty status. Yet those less than 35 years old along with those without a high school diploma have the greatest risks for being unable to access the basic care they need either due to cost or lack of insurance coverage. Clearly, these patterns appearing in Galveston County and this region of Texas need to be investigated. Hopefully, this report will help Galveston community partners such as REACH with their efforts in gathering further information at the sub-county level for Galveston County.

There are limitations in this secondary analysis that should be addressed. One limitation of this analysis for Galveston County is that it did not fully illuminate the health of the population at the sub-county level. Particularly, the Texas BRFSS data was not specific for Galveston County. This is important to realize that interpreting this data for the southeast part of Texas (6/5S) may not be an accurate depiction of the health status of Galveston County in terms

of risk factors. Another limitation for the BRFSS data is the time period. The data used for this analysis was from 2010. Yet the County Health Rankings data was reported for 2014, which some of the measures used the BRFSS data from more recent years to conclude their estimates. Further still, the American Community Survey data were the 5 year estimates from 2009-2013. While the differences calculated did not depart from the given data time period for each data set used, comparing this data to each other carries the risk of misunderstanding the values for a given measure across time. One advantage against this though is that there were no two measures exactly alike in any of the data sets.

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Vita

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