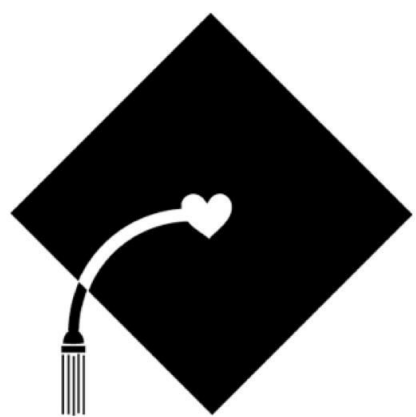# AMERICAN CANCER SOCIETY CHARLESTON HOPE LODGE
BROOKE HORTON
BONNER LEADER PROGRAM

COLLEGE of CHARLESTON
BONNER LEADER PROGRAM
1770

Introduction

For my senior capstone, I chose to tie in my experience of working at the American Cancer Society Charleston Hope Lodge with our focus in the Bonner Leader Program-Social Justice.

During my freshman and sophomore years at the College of Charleston, I had to the opportunity to volunteer at the American Cancer Society Charleston Hope Lodge.

Established in 1970, Charleston Hope Lodge was the first of its kind in the country. Founded by Margot Freudenberg, a holocaust survivor and leader within the Charleston medical and business communities.

During this time at Hope Lodge I was able to gain a variety of professional development skills, I was able to gain confidence when it came to my ability to interact with the patients, and I was able to plan and organize events to support the patients and caregivers at the lodge. The premise of my capstone is to critically analyze a variety of social factors determine how effective our access to healthcare is.

Focus of Service

During the first two years of my service, I was a long-term volunteer. My role within this site was to work the front desk which included checking patients in and out and completing daily tasks. I assisted with the maintenance of Hope Lodge; cleaned the kitchen, common areas, rooms, etc. I also helped with dinner preparation and clean up which was provided each night for the guests. I also worked on various special projects such as planning various events for the patients at the Hope Lodge including game nights, and volunteer appreciation events.

During my junior year, I had the opportunity to be a Weekend Manager at the Hope Lodge. My duties as a Weekend Manager included maintaining the safety and comfort of guests, volunteers, and other visitors as my primary focus. I provided assistance and support as needed to ensure a safe, supportive environment is maintained and that issues that arose were handled immediately and effectively. I completed guest admissions, orientations and check-outs as needed. I also oversaw volunteers that were scheduled during my shift. Overall I maintained a collaborative work relationship with the American Cancer Society staff and community volunteers.

The Patients

This experience was undoubtedly one of the most rewarding yet emotionally and mentally exhausting experiences of my life. That being said, some of my greatest accomplishments came from getting to interact with the patients at Hope Lodge. The group of individuals that I had the opportunity to encounter during my time there were unlike any that I had ever met. Every patient had an overwhelming resilience for life.

These individuals gave me a completely new expectation of what it means to be a "good" human being. They showed me the true power and strength of the human character by giving me a completely new standard of what it means to love unconditionally. They showed me the importance of giving courage, showing kindness, and being strong. Being able to be small part of their journeys was undeniably one of the most rewarding experiences of my life.

Conclusions

Without the Bonner Leader Program, I would not have gained the professional and interpersonal skills that I am equipped with today. Having the opportunity to work at the American Cancer Society Charleston Hope Lodge allowed me to grow more than I ever thought possible. Being a Public Health major and having this experience, I was able to acknowledge a variety of social justice issues, such as lack of access to care, systemic racism within our healthcare system and how it affects how access to care, and the white privilege that is exceedingly present within our healthcare system.

It was an interesting growth experience to be a volunteer within this community. From a volunteer's perspective I saw various systems at play. Interacting with patients and caregivers for three years I was granted the opportunity to see individuals from various walks of life. Each of these individual's backgrounds influenced or changed my perspective of the world. Ultimately, I would not be the person that I am today without this experience and without the Bonner Leader Program.

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SeeCSD:
A view inside our local school-to-prison pipeline

ANJALI NAIK, *BONNER LEADER PROGRAM*
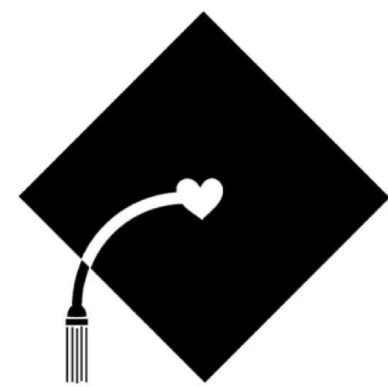
COLLEGE *of* CHARLESTON
BONNER LEADER PROGRAM
1770

Introduction

Racism and policing have become keywords attached to Charleston in the past 4 years. Through Bonner capstone, I had the opportunity through the Bonner program to develop a voice and stake in these local issues that I once believed to be out of my hands as a college student.

Within 3 years of working with a Bonner service-site Girls Rock Charleston, a grassroots nonprofit that uses music as a vehicle for social change and builds power with girls and trans youth, I grew from volunteer to organizer and co-founded a new after school program primarily to empower youth involved in the juvenile justice system. I explored many roles during this time from financing to curriculum programming.

At the same time, I have been in school developing skills in art and computer science as a Computing In The Arts major, and I was not yet sure how to integrate my interest of computer-based art into this social justice work. I was able to separately explore those skills as I created poster designs and ran the GRC website for years, but I was ready to explore how my personal interests and skills could forward social justice in a new way.

For my Bonner Capstone, I challenged myself to provide a transdisciplinary approach to computers, art, and social justice through the creation of an interactive data visualization. This adjustable graphic would compile and display the data of the year's annual Charleston County school-based arrest report, a data set which we have previously calculated by hand. I would create this website as a teaching tool of the trends within the demographic of youth that are arrested in school.

Left: photograph of a drawing from a youth member of the Girls Rock Charleston after school program

Right: two screenshots of the data visualization module on my self-programmed website SeeCSD

Methods

The visualization is based off of one data sheet that I received through Charleston Area Justice Ministries while working with them as a Girls Rock organizer. The data sheet is public information, but it is normally 10 pages of numbers and letters, provided as a PDF file, and currently only accessible if requested from Charleston County School District from an organization. I attempt to alleviate these issues by creating a website that is understandable for people at different education levels, uniquely organized to more effectively show trends, and publicly accessible.

The data set I received shows a list of every student arrest within a semester and their race, gender, age, school, and charge. I wanted to make use of all 5 of these demographics in the visualization, but organize them in a way that is easier to digest. In this light, I made the visualization interactive so that users can choose whether they want to organize students by one category or several.

I created containers (boxes) representing either CCSD schools, charges, or ages. When selecting a organization, my algorithms move through the data set and draw a student arrest (represented by a circle) into a container when . My focus is race and sex trends. I tied these two categories to the color and size of the circles, so that they could be shown in any organization chosen. For instance, a user may view how many students are arrested at each age group, and choose to see the race and sex breakdown within each box. The viewer may find a trend in Black males being arrested at an earlier age than other demographics.

Throughout the development of the data visualization, I met with different community members (nonprofit staff, students, and professors) to hear their responses and get insight on areas of improvement. Feedback was an important piece in this capstone project. For example, after one suggestion for more readability, I added an advanced feature for Race and Sex to be able to highlight specific populations.

Results

Once completing all the data structures and compiling the data, the visualization proved to be very effective in communicating large social disparities in student arrests.

Organizing student arrests by school showed many empty boxes compared to several nearly full boxes, indicating schools which funnel students into the juvenile system.

Organizing by charge made apparent the high volume of youth arrested for "Disturbing Schools" and "Disorderly Conduct", vague charges which Girls Rock Charleston and the ACLU are filing suit over, compared to small numbers of violent charges. Black females are shown to be most likely charged with Disturbing Schools or Disorderly Conduct.

Organizing by age was less shocking trend-wise, still however showing many children who are arrested at 9 and 10 years old, and almost all arrests upon elementary and middle school age being Black.
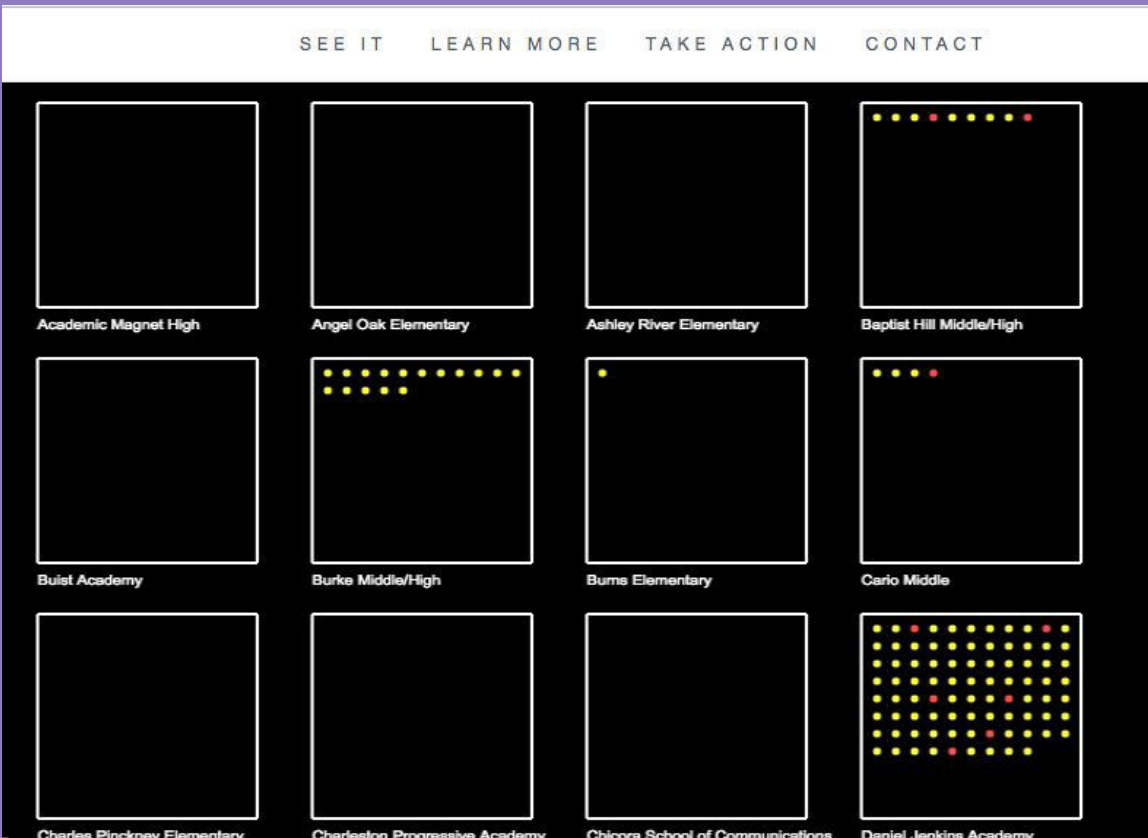
Conclusions

For this project, I used three different web-development coding languages which I had no prior experience in. That being said, it was a major challenge to present the data in a way that is professional and yet manageable to program in the given time. Despite the challenges, the visualization was successful in it's goals, proven by positive feedback and appropriate takeaways from adults and youth to which I presented.

Currently, I plan to partner with Charleston Area Justice Ministries given their interest and work within school-based arrest. I aim to look for sponsorship to launch the website this year (2017). The website is still undergoing some development in providing descriptive information about the school-to-prison pipeline in other sections of the site before it is ready to launch.

This capstone has proven to me that a skill as unique as computing in the arts can be beneficial for social justice and nonprofit work Visualizing data and making information accessible are paths to creating dialogue, shared understanding, and a call to action for issues which are intimidating for the general public to engage. This data visualization shows how the school-to-prison pipeline is a major issue in Charleston County, and far too many youth have been hidden from the community's attention for far too long.

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Several sources which served as references and inspiration for the concept of this data visualization are provided below.
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Reducing Health Disparities in Our Youth

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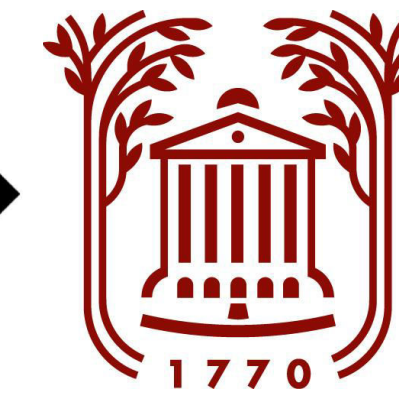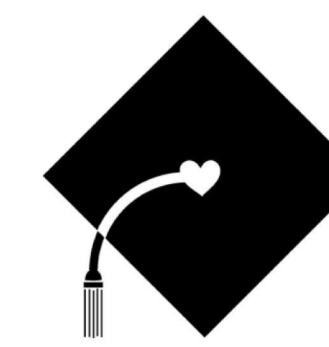
COLLEGE of CHARLESTON
BONNER LEADER PROGRAM

Introduction

My senior capstone is based on a health intervention organized for Chucktown Squash after school program. The program was entitled the Squash Health and Wellness Fest. The duration of the program was 15 weeks and included informative yet interactive sessions, healthy snacks, and games. A pretest and posttest measured the student's overall progress.

I chose 5 specific health concerns/areas of improvement based on a joint assessment conducted with the students and program coordinator, Remy Starker. The 5 relevant health topics included:

1. *The Importance of Fresh Fruits and Vegetables*
2. *How to Eat Healthy on a Budget*
3. *Hydration is Key*
4. *Hygiene*
5. *Sugar Consumption Reduction*

The Health Intervention was constructed to provide useful knowledge about relatable and relevant health issues. The goal was to increase the students' awareness and encourage them to change specific health behaviors. I am grateful I had an opportunity to share the knowledge I gained from a degree in Public Health with my mentees. As a result, student will have the capacity to improve their overall quality of life and reach their maximum potential while playing squash on the courts.

Methodology

Week 1-3: Mentor training reviewed the purpose of the program and leading by example with healthy lifestyle choices. Mentors identified our own strengths and interests and analyzed how we can incorporate them in order to enrich the scholars.

Week 4 (09/14/2016) We conducted a fitness test using the FitnessGram Pacer test, calculating BMI, crunches and flexibility. Students will be tested at the end of the semester to track progress and encourage further development.

Week 5 (9//19/16, 9/21/16, 9/23/16) Mentors completed a cultural competency training involving a poverty simulation and discussion.

Week 6-7 Hurricane Matthew Evacuation Preparation, so programming was shortened for the week.

Week 8-9 (10/17/16, 10/20/16) I conducted the first session of an intervention, I started with a pretest, containing a Likert scale and questions assessing attitudes toward various health topics. I presented a prezi about the Importance of Fresh Fruits and Vegetables, distributed a trifold, and facilitated a discussion about health eating habits, especially among the youth.

Week 10-11: I conducted the second session of an intervention called Chucktown Squash Health and Wellness Fest. I presented a prezi about eating healthy on a budget and distributed a comic trip for the students to take home. Students were instructed to write a paragraph long reflection, those who read aloud were rewarded with fruit leather, a tasty but nutritious snack containing 1 serving of fruit and no added sugar.

Week 12 (11/10/16) I conducted the third session: I presented on the Importance of hydration, false advertisements that do not promote water consumption, and a module for behavior change. We used fruit infusion to make water more appealing. Water was infused with watermelon, strawberries, lemon, oranges, mint, and kiwi. Students calculated how much water they should drink each day and set a goal based on BMI. Students wrote a reflection vowing to make water related behavior changes based on the information given in the session.

Week 13 (11/17/16) I conducted the fourth session of an intervention: I gave a presentation on hygiene and handwashing. I encouraged the scholar's creativity by dividing 4 groups to create advertisements for deodorant. The winning group received a prize. We played performed improv related role play scenarios including a person, place, and problem related to hygiene. A brief mime game demonstrated the World Health Organization's 11 steps of hand washing.

Week 14-15 (12/01/16) I conducted the fifth session of an intervention, I gave a presentation on 'The Truth about Sugar' and then led a discussion about future behavior changes to reduce adolescence sugar consumption. We played a game where teams guess the amount of sugar in various food items such as soda, candy, cereal, fast food salads, and juice. Afterwards, we played Jeopardy to review content from all 5 Sessions.

Conclusion

I conducted a post-test, containing a likert scale and questions assessing attitudes toward health topics discussed in the intervention. Student's awareness and attitudes of the 5 health concepts increased by 23%.

Throughout the health intervention I was able to connect with the students and understand why they were making certain health decisions and then improve the behaviors with valuable knowledge

As a result I was able to connect three key areas my own passion and interest. I addressed social issues such as lack of access to fresh fruits and vegetables (food deserts). At the time the closest grocery store to most of the students, the BILO on meeting, was replaced. The key factors in impacting a health behavior change are a supportive environment, awareness, and the behavior change itself. I incorporated all three into my intervention to ensure effectiveness.

With a minor in sociology, I witness the connection between personal health and social determinants. Those in underserved communities experiences health disparities at an increased rate. In most cases health behavior is influenced by media, environmental conditions , and family. Many acquired behavior are cultural and generational. As a mentor to growing adults, it is my responsibility to share the skills and knowledge I have gained from Public Health because an individual's education and socioeconomic status has direct relationship with their health status. This includes access to quality care and access to knowledgeable resources which lead to making informed health decisions.
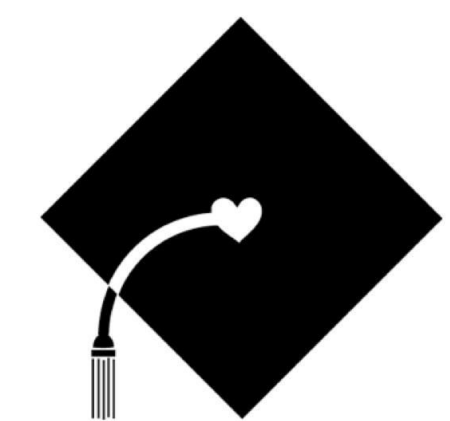
Special Thanks

Humanitarian Machine Learning
STEPHEN J. BALDWIN
BONNER LEADER PROGRAM

COLLEGE of CHARLESTON
BONNER LEADER PROGRAM
1770

Introduction

Machine learning is a subfield of computer science that gives computers the ability to learn without being explicitly programmed. Instead, computers are fed data and they learn by algorithmically identifying patterns in that data. Given the availability of data routinely collected by humanitarian organizations, *Can humanitarian organizations improve their impact by employing machine learning techniques?* The answer to such a question is vastly complex, touching on fields of computer science, mathematics, ethics, sociology, and psychology. This research attempts to scratch the surface by exploring the theoretical limitations and implications of humanitarian use of machine learning.

Current Landscape

Machine learning has countless commercial applications in modern technology and is employed frequently in healthcare, finance, social tech, and marketing. Many people experience a benefit from machine learning without even realizing it. For instance, credit card companies often utilize machine learning methodologies in order to detect fraudulent transactions. It is estimated that humans produce 2.5 quintillion bytes of data per day and 90% of the data in the world today has been created in the last two years.[1] It is not feasible for people to consume such quantities of data without the help of a computer. Therefore, it is likely that data science fields like machine learning will continue to grow. Machine learning itself can be applied virtually anywhere data is collected with the assumption that there are patterns to be found in that data.

Humanitarian efforts have not been immune to this development. GiveDirectly, a nonprofit that gives money to some of the poorest households in rural Kenya and Uganda via mobile phone transfers, attempted to identify impoverished villages with satellite imagery in 2013. Their metric for poverty was the proportion of thatched roofs to metal roofs, and although their algorithm was not accurate enough to be used, later similar efforts have been more promising.[2] In August 2016, researchers in Stanford's Sustainability and Artificial Intelligence Lab found that they could predict poverty with 75% accuracy using nighttime lights in satellite images as a rough proxy for economic wealth.[3]

Disaster relief has also benefitted from machine learning. Artificial Intelligence for Digital Response (AIDR) is an algorithm

that was developed at the Qatar Computing Research Institute. This algorithm consumes microblog data and helps to identify and classify crisis locations in real time so that responders can react appropriately.
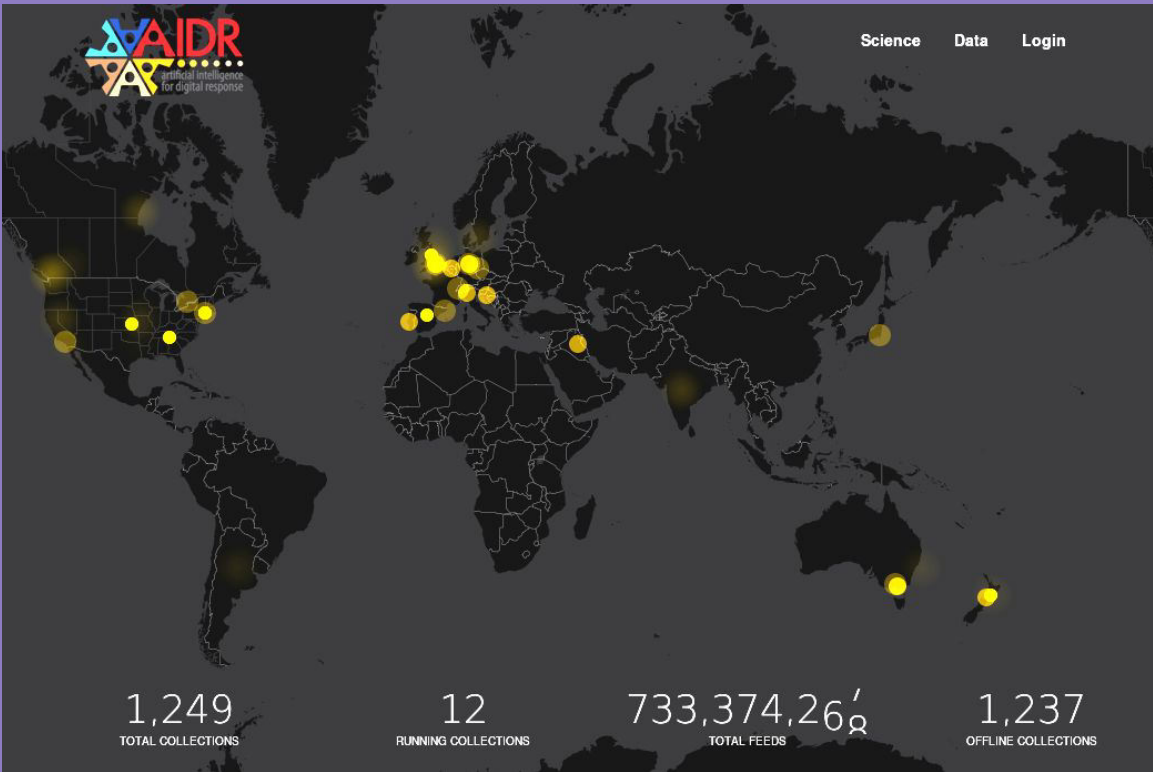

Figure 1. AIDR web application displaying current crisis areas

Perhaps no other field has adopted machine learning quite like healthcare. Machine learning has been used for medical diagnosis, bioinformatics, and DNA sequencing to name a few. In some cases, machine learning has performed better than traditional medical practices. For instance, researchers have been able to achieve a positive predictive value of 81% for autism on infants 6-12 months old using machine learning, whereas previous methods could only achieve such accuracy at 24 months. They did this by using machine learning to identify abnormal brain development patterns.[4]

Machine Learning

Machine learning is the study of algorithms that learn from, and make predictions on, data. During a training phase, such algorithms are given training data to generalize from. Training data can usually only represent a small fraction of the variability of all possible inputs, therefore generalization is key to machine learning. Applications where training data is provided alongside targets or solutions are known as supervised learning problems. These problems often involve the classification of data into a finite number of discrete categories. Where the output is one or more continuous variables, this is considered to be a regression problem. A researcher could use supervised learning to classify handwritten digits into discrete categories. This would be done by first training the algorithm with known images so that it could respond reasonably to unknown images.
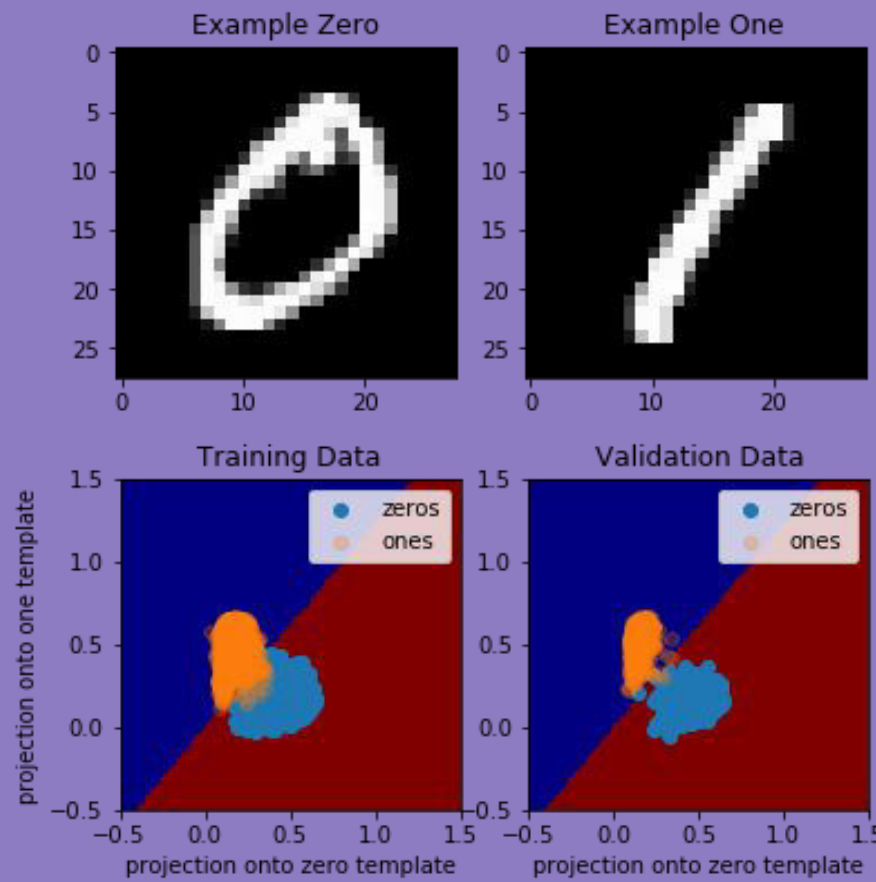

Figure 2. Supervised learning classifying handwritten 1s and 0s.

Other machine learning problems employ an unsupervised approach. They are trained by finding patterns in data with no defined target values. Such problems find solutions by clustering data rather than finding discrete categories for each datum. Finally, reinforcement learning is used to find suitable actions to take in a given situation. Such algorithms find the optimal action to take by calculating the rewards and costs for each potential action.

Case Study

The case study for this research analyzes the implications of using machine learning for loan approvals. Although this is not directly a humanitarian concern, it is a real application of machine learning with the potential to have deep social impacts. Traditional methods of risk assessment for loans utilize FICO scores which tend to hurt younger borrowers and foreign borrowers by targeting them with higher-interest loans.[5] Machine learning could conceivably overstep these biases and therefore make loans more accessible to more people with fewer defaults.

However, machine learning is merely an extension of human culture and can therefore show some of the same biases as humans if trained with biased data. Further, machine learning can create its own bias by finding correlations in data where there should be none. An example found in this research was an algorithm that linked people who pay inside rather than at the pump with being smokers and smokers were more highly correlated with a lack of creditworthiness.[5] It seems that, although machine learning has the potential to reduce traditional bias on loan risk assessment, its use should be knowledgeably pursued with proper accountability.

Conclusions

Because of the growing ubiquity of machine learning in modern day society, humanitarian efforts are not likely to go untouched. Some organizations have embraced this change. Machine learning, when used properly, has been highly effective in many domains. However, algorithms should be employed with care, especially where people are involved. It has been shown that machine learning can reflect some of the same biases people have when trained with biased data. Although beyond the scope of this research, some of this bias could be reduced using principles of proper data acquisition. Further, machine learning is only used for analysis and prediction. For this science to have a positive impact, it must be paired with passionate conscientious citizens that are willing to turn the insights of machine learning into action.

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Thematic Analysis of Chronic Diseases Among Geriatric Populations in the U.S.

JULIA TAYLOR
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COLLEGE *of* CHARLESTON
BONNER LEADER PROGRAM
1770

CASC Influence

- This thematic analysis was influenced through an internship with Charleston Area Senior Citizens.
- CASC is a non-profit agency that services Berkeley, Charleston, and Dorchester Counties.

Mission:
"Enhancing the Lives of Older Adults in the Community"

- **Services provided**:
1. Ansonborough House
2. Community Support Services
   a. College of Charleston Center for Civic Engagement
3. Senior Companion Program
   a. Senior Corps
   b. Volunteers 55 +
      i. Matches volunteers with older adults that need assistance
4. Emergency Services
   c. Emergency Food Pantry
   d. Transportation
4. Foster Grandparent Program
5. In-Home and Support Services
   a. In-Home Help
   b. Respite Care
   c. Alzheimer's Resources
6. Meals on Wheels of Charleston
   a. 161,500 meals served in 2016
7. RSVP Program
   a. Volunteers 55 +
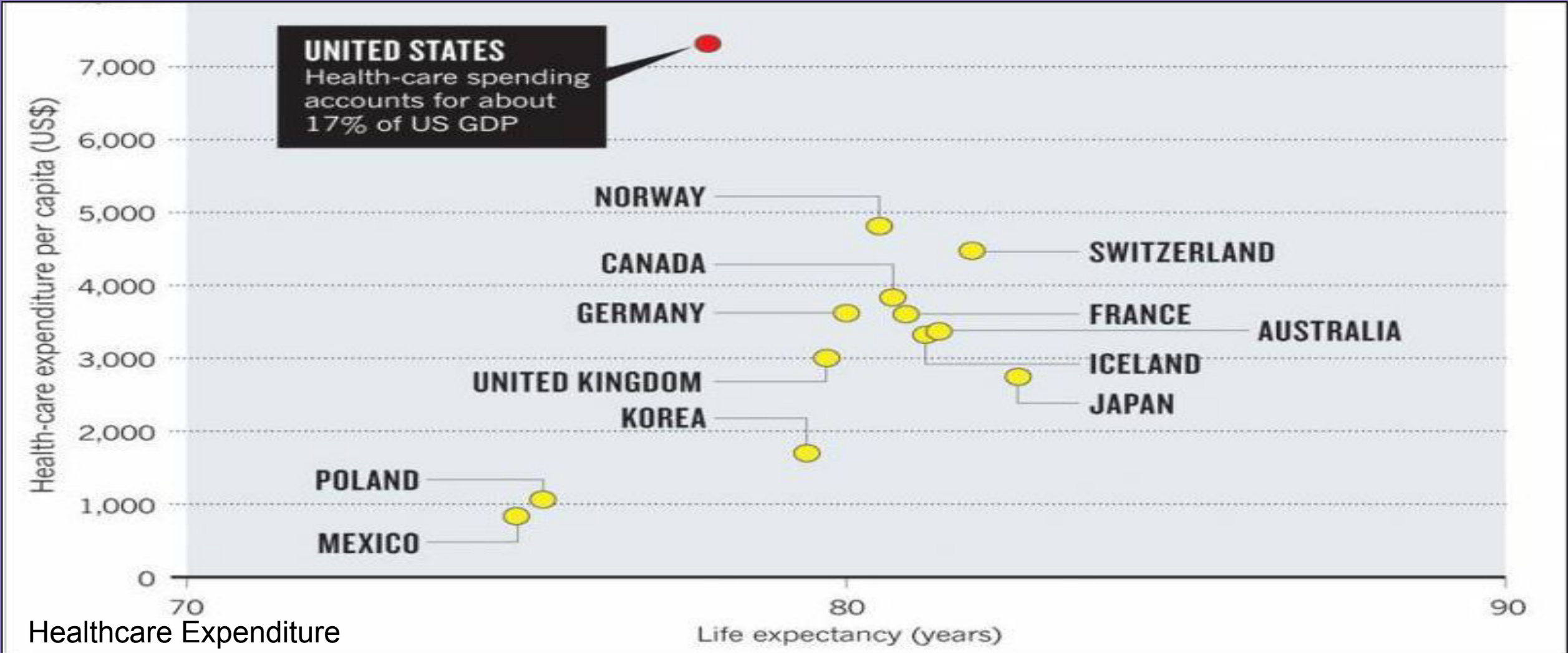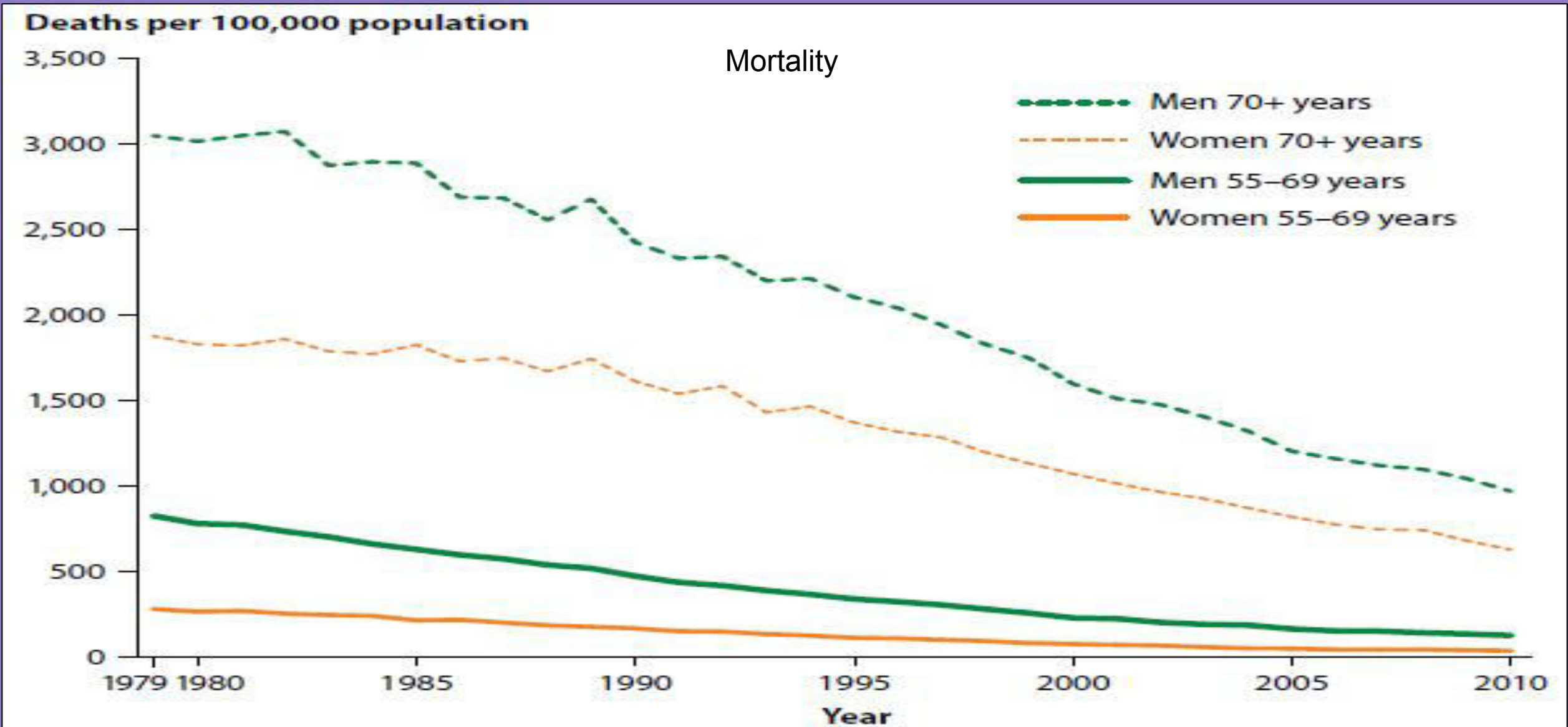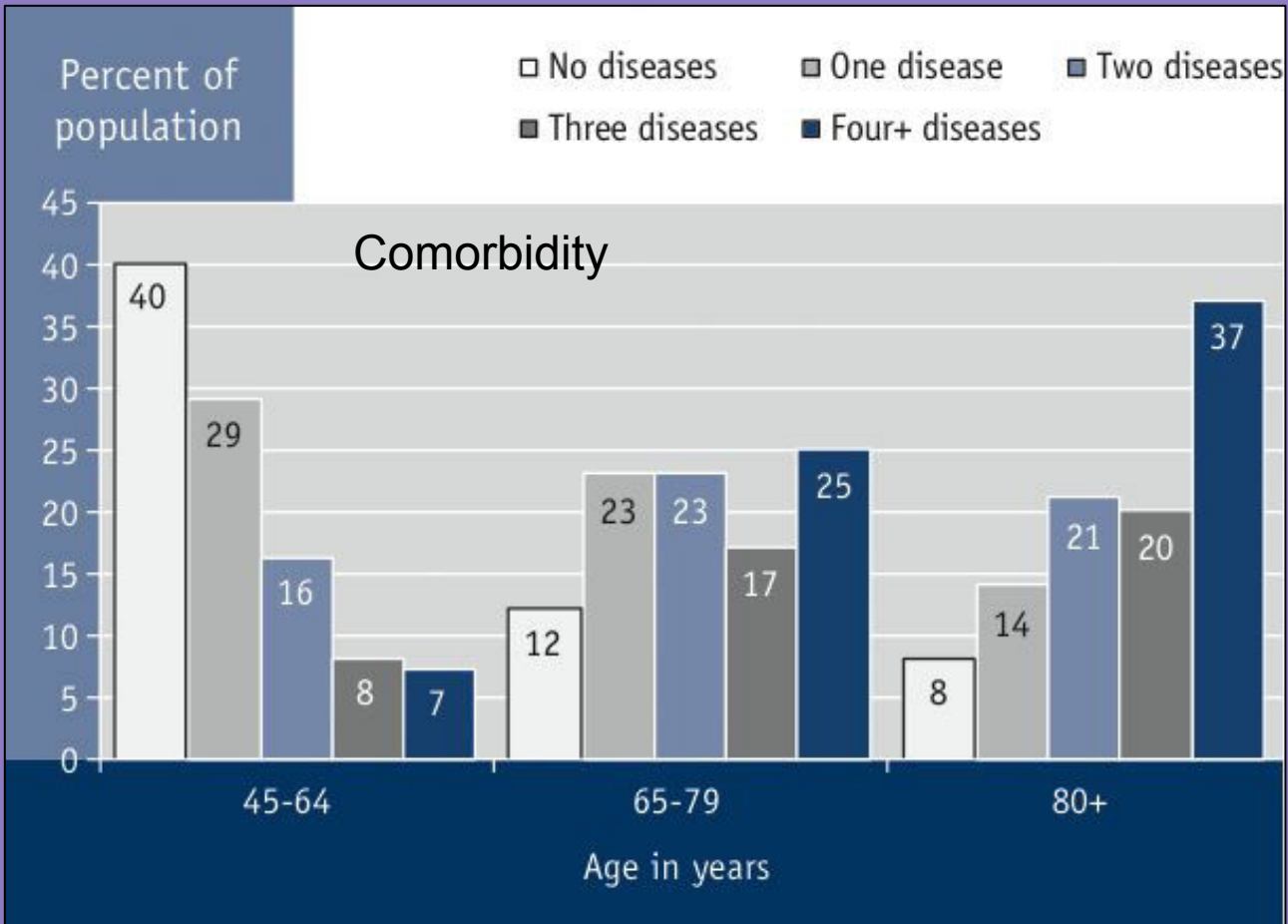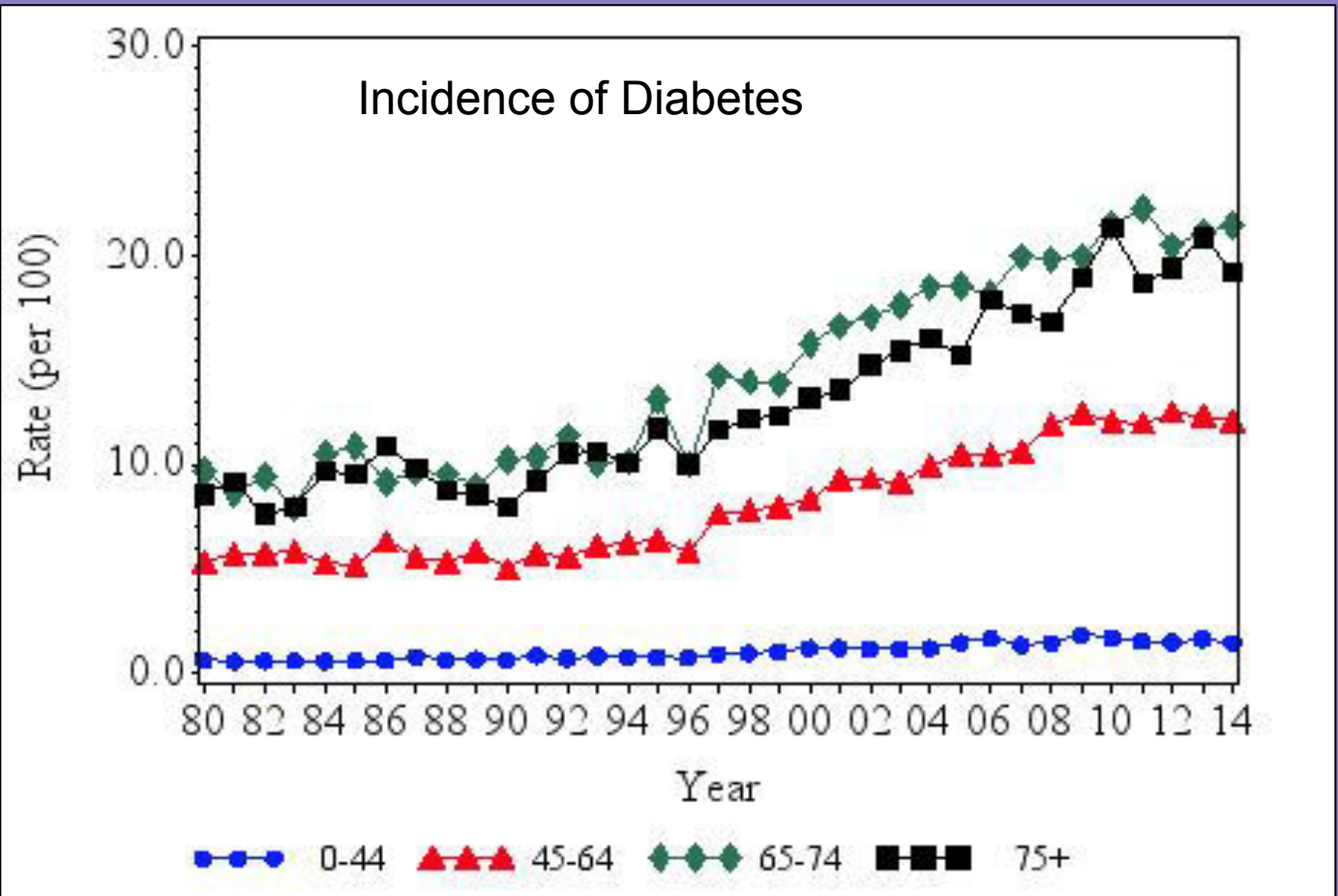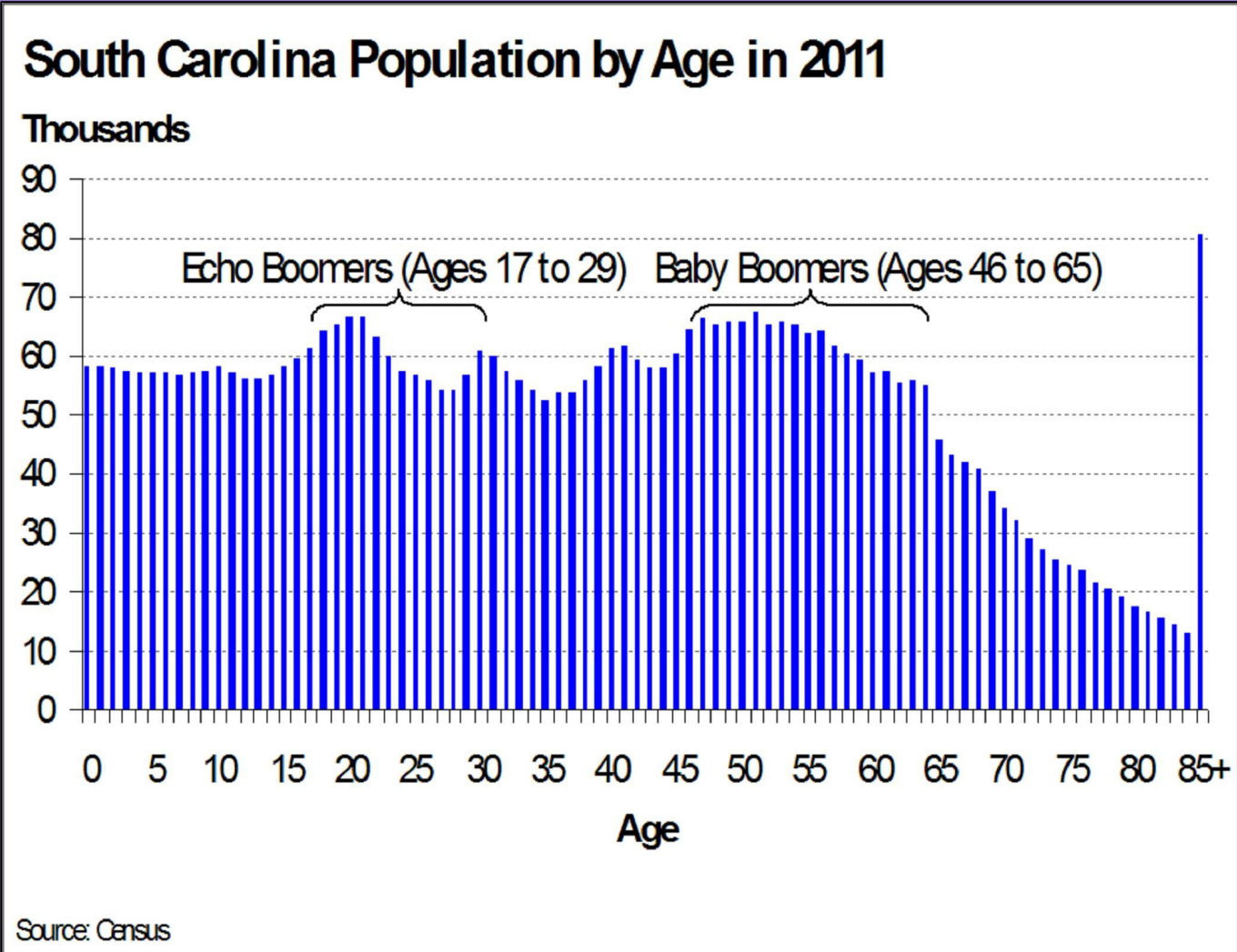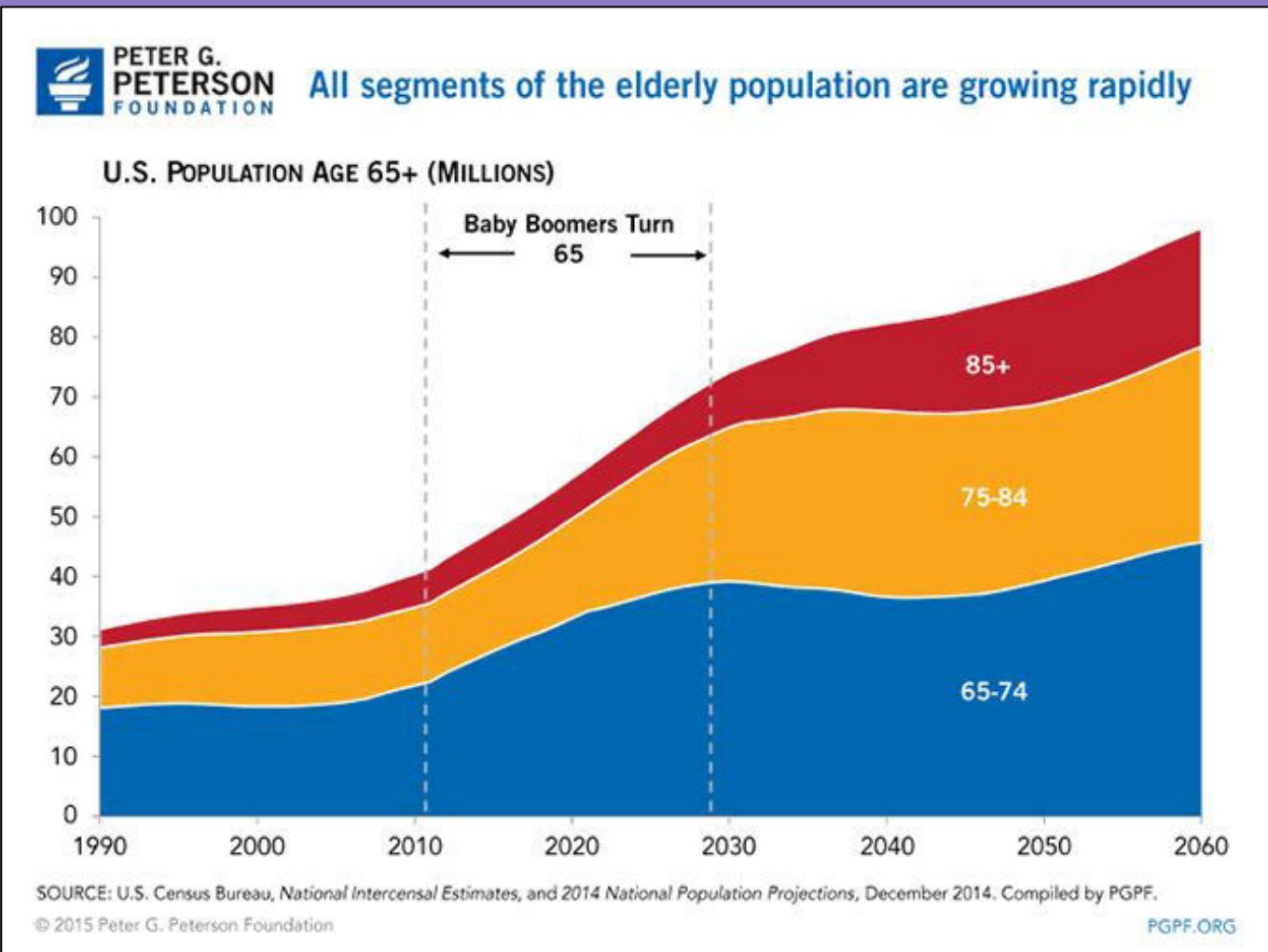   i. Matches acquired skills to organizations that need assistance

It is hypothesized that older populations are more vulnerable than any other demographic of the population, therefore it is more common for them to have one or more chronic diseases due to a number of factors, such as: biological factors and lifestyle factors.

Chronic Diseases

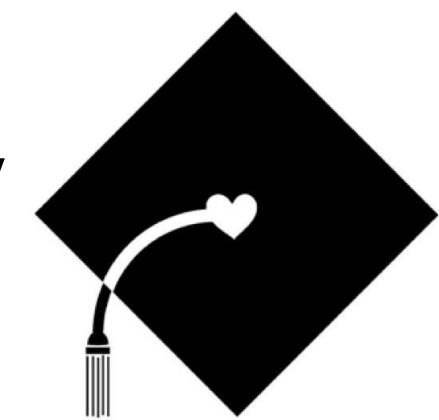For the purpose of this present paper, older populations consisted of individuals 55 years of age or older.

Chronic Diseases:
1. Diabetes
2. Heart Disease
3. Kidney Disease
4. Alzheimer's Disease

Topics within each Chronic Disease:
1. Incidence and Prevalence Rates
2. Morbidity and Mortality
3. Costs to Society
4. Causes and Risks
5. Treatments and Cures
6. Preventative Measures

PETER G. PETERSON FOUNDATION — All segments of the elderly population are growing rapidly

U.S. POPULATION AGE 65+ (MILLIONS)

SOURCE: U.S. Census Bureau, National Intercensal Estimates, and 2014 National Population Projections, December 2014. Compiled by PGPF.
© 2015 Peter G. Peterson Foundation   PGPF.ORG

South Carolina Population by Age in 2011

Thousands

Echo Boomers (Ages 17 to 29)   Baby Boomers (Ages 46 to 65)

Age

Source: Census

Incidence of Diabetes

Rate (per 100)

Year

0-44   45-64   65-74   75+

Percent of population

No diseases   One disease   Two diseases   Three diseases   Four+ diseases

Comorbidity

Age in years

Deaths per 100,000 population

Mortality

Men 70+ years
Women 70+ years
Men 55–69 years
Women 55–69 years

Year

UNITED STATES
Health-care spending accounts for about 17% of US GDP

Health-care expenditure per capita (US$)

NORWAY
CANADA
GERMANY
UNITED KINGDOM
KOREA
POLAND
MEXICO
SWITZERLAND
FRANCE
AUSTRALIA
ICELAND
JAPAN

Healthcare Expenditure

Life expectancy (years)

Meat Consumption and its Association with Early-Onset Puberty

Jasmine Lazarus
BONNER LEADER PROGRAM

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1770

Introduction

Abstract

This study was conducted to analyze the effects of consuming meat containing antibiotics and its effects on the development of early onset puberty in females. Enrolled in this retrospective case control study was 11 girls ages 12 -18. The dependent variable is the development of early-onset puberty. Precocious puberty is defined by symptoms of breasts development, menstruation, and growth of pubic hair and/or underarm hair before the age of 8 years old. The independent variable was measured based on the amount consumed per day. The analysis included 11 girls recruited through a school survey. A weak association was found in the odds ratio (OR) 0.95 (CI 0.66, 1.37) between the exposure of regular consumption of meat containing antibiotics and the outcome of females with early onset puberty. The results show no significant association between meat consumption containing antibiotics and early-onset puberty.

Background

Society is moving at a fast pace and convenience foods are becoming a regular routine of everyday life. This alarming pace fosters the consumption of meat which has been linked to developmental influences. Several researchers suggest higher intakes of fat or animal protein are associated with earlier menarche, whereas higher intakes of carbohydrates, thiamine, iron, fiber and vegetable protein are related to later menarche.

In 1985, the Dortmund Nutritional Anthropometric Longitudinally Designed (DONALD) study investigated the extent to which current dietary recommendations are met in the years of preceding puberty onset was associated with the chronological age at the onset of pubertal growth spurt and body composition (Cheng et al, 1986). The study concluded that children with lower diet quality experienced early-onset puberty, independently of prepubertal body composition.

However, research done by Mi-Kyeong Kim, a pediatric specialist, analyzed the obesity index changes in girls with precocious puberty who needed more of the GnRHa treatment, as well as dietary habits of girls who needed weight loss (Heo, 2010). This study had its limitations due to the small number of subjects at a hospital participating in the questionnaires (Shim KS, 2011). The study showed that girls with precocious puberty had poor dietary habits and lifestyles in relation to obesity. This included but was not limited to fast eating and less physical activity which required intervention.

Although there has been numerous research and interest in the levels of nutrition habits in females, fewer studies have investigated a specific type of food product as an exposure. Antibiotics have been linked to the many adverse health effects in humans as well as a growing resistance in fighting certain bacterial strains (CDC). The current study was established to better understand how the the consumption of meat containing antibiotics correlates to onset puberty in young females.

Methods

Study Design/Sample

The data was gathered as a retrospective case-control study since precocious puberty is a rare condition yet a growing in incidence. Due to the target audience, females with self-reported early-onset puberty, time efficiency was imperative. However, because the sample consisted of minors, a distinction between primary and secondary participants was used to carry out the procedures of the study.

Participants were recruited through parent letters sent to Chucktown Squash students. .Families who wished to participate were instructed to mail the letters with a the completed survey back to our corporate office. Notification of those who were eligible/ineligible were sent to corresponding households. The initial sample was 9 girls aged 12-18. Primary participants were excluded if adopted , albino , had not yet begun puberty, had a personal history of brain trauma/tumor(s), had/has a chronic diseases of malabsorption. The eligible sample was comprised of 11 girls (4cases, 5 controls): African American (*N*=9). The mean age of the sample was 13 years old. Parent demographics were taken separately.

After conducting my research, I followed it by a post-test intervention.The intervention was simply informing the females of eating healthier with less proportions of meat. To measure this, the girls had to correctly create a My-plate with the use of magazines. This method turned out to be most effective concluding my study.

	Early-Onset Puberty	No Early-Onset Puberty	Total
High Consumption of Meat Containing Antibiotics	1	2	3
Regular/Low Consumption of Antibiotic-Free Meat	1	5	6
Total	2	7	9

Results
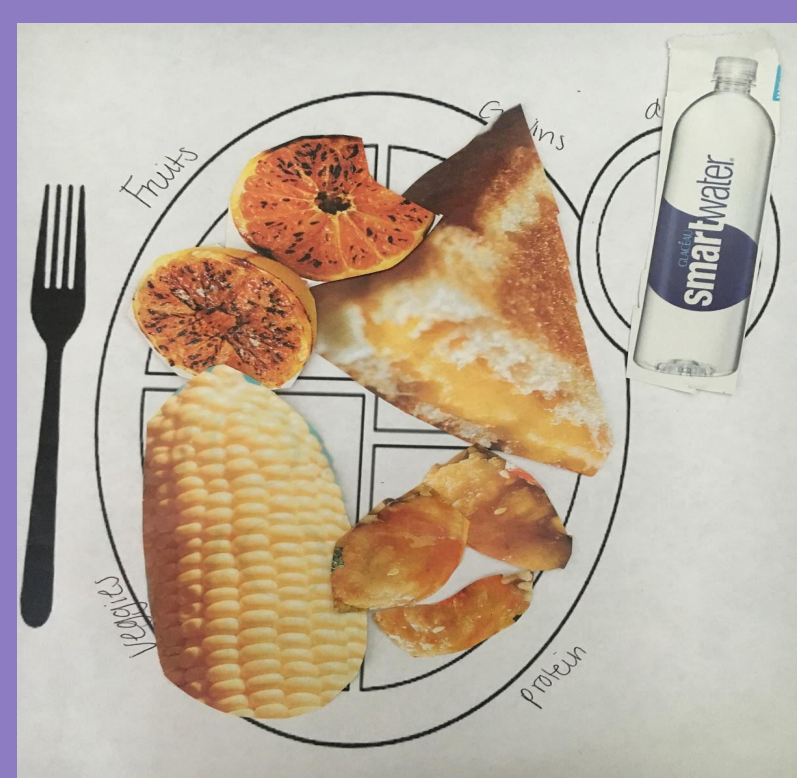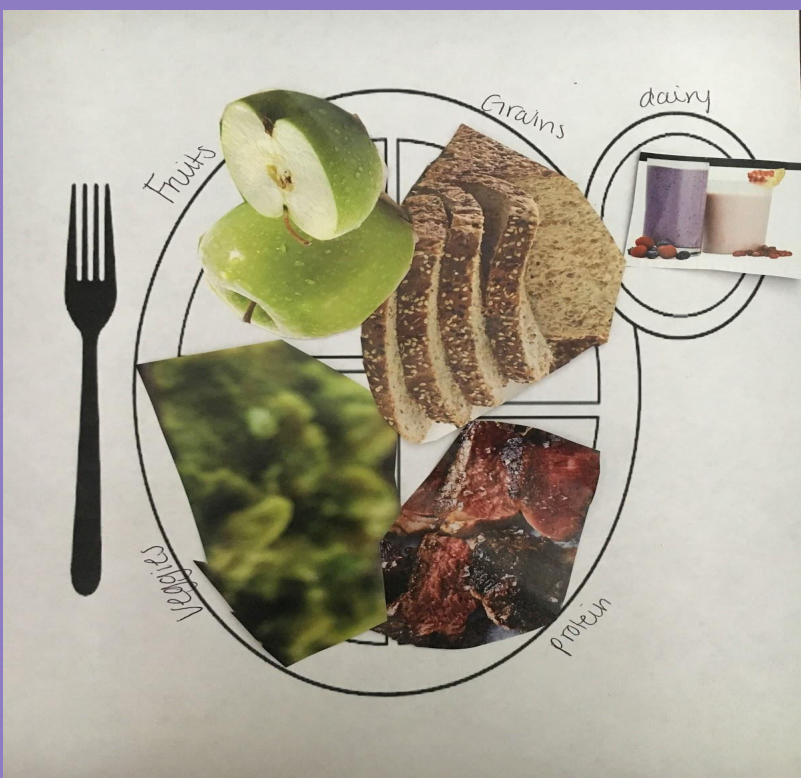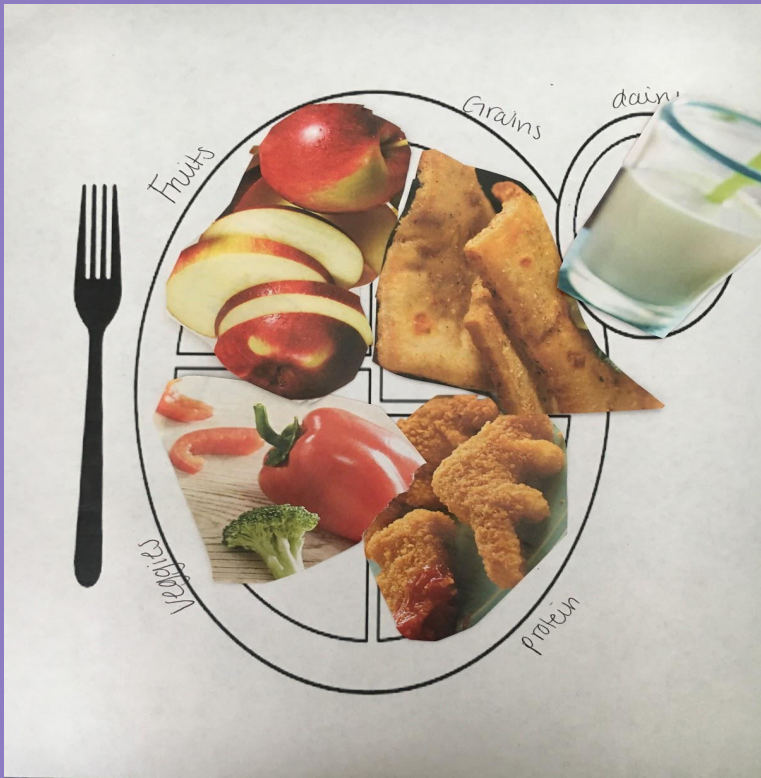
Measures

Prior to the data collection, approval was obtained through the parent letters. The recruitment survey, Survey 1, was used to determine cases and controls. Survey 1 asked primary participants general questions regarding demographics specifically, race and age as well as "at what age did you begin menstruation; at what age did you begin breast development; and at what age did you notice the development of pubic hair and/or hair under your arms." There were 2 responses that followed the questions: (a) 8 years of age ;(b) >9. Secondary participants were asked about general demographics as well, specifically race and income.

The follow-up survey, Survey 2, was more specific to eating patterns prior to the onset of the primary participants puberty. Survey 2 asked the secondary participants "what type of meat with the following labels:Certified Organic and American Grassfed Certified, Animal Welfare Approved, and Certified Humane." For those who answered yes, the following question asked participants to specify which labeled meat products that purchased. Another question asked "how often does the subject consume these products?" The choices where (a)4 days per week and (b)3 days per week.

Results

Of the total participants, 22% experienced early-onset puberty and 77% did not. Of the 22% that experienced early-onset puberty, 11% were exposed to regular consumption of meat containing antibiotics. Additionally, it was surprising to find that of the 22%, African American females accounted for the majority (4) of the cases, although the results remain insignificant.

The calculated OR expressed a 0.95 (CI 0.66, 1.37) weak increased association of consuming meat antibiotics with the outcome of early-onset puberty. The OR was adjusted for body mass index (BMI), income, insurance coverage, race. Since the odds ratio was more than 1, there was an increased odds of consuming meat with antibiotics among females with early-onset puberty compared to females without early-onset puberty. The calculated confidence interval was found to not be statistically significant since the interval crossed over the value of 1. From all of our calculated statistically measures, we did not find a significant link between the regular consumption of meat with antibiotics and females who experienced early-onset puberty.

Conclusions

Analysis revealed that more than half of the girls with regular consumption of meat containing antibiotics experienced a normal onset of puberty. The lower than expected percentage of girls who experienced precocious puberty concluded a rejection in the null hypothesis. Since the odds ratio was more than one, there was an weak increased association of exposure among females with early-onset puberty compared to females without early-onset puberty.

The study shows strength in it being one of the first studies to explore the association between the consumption of meat containing antibiotics and the onset of puberty. Additionally, the study uses a diverse sample of participants and a sufficient case to control ratio. Study limitation can be contributed to the many confounders that were unable to be accounted for including foods eaten outside of the household such as school lunches, current health state, and the environment. Lack of information regarding the true amount of antibiotics within meat products and a more precise account of how much meat was eaten by participants may have negatively impacted the study.

Due to the nature of the study, we are unable to pinpoint an exact exposure because the exposure has already occurred.
Future studies should use a prospective study to better measure the association. A prospective study design, it will allow the participants to track their nutritional intake which will adhere to more accurate results. More research should be done to clarify the independent variable and its effects on the onset of puberty.

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