



**In
this
edition**

**Student
Research
Presentations**

**Brooklyn Health
Disparities
Summer 2014
Internship Program**

**Climate Change
& Public Health
Summer 2014
Internship Program
Trinidad & Tobago**

2014

Year Five: BHDC Summer Internship 2014

In 2004, the Arthur Ashe Institute for Urban Health, in partnership with the SUNY Downstate Medical Center, and the Office of the Brooklyn Borough President created the Brooklyn Health Disparities Center to reduce health disparities among minorities and new immigrants in Brooklyn, New York through clinical and community based research, education, outreach and training. Through its community engagement core, the Center, funded by the National Institutes of Health – National Institute on Minority Health and Health Disparities (NIMHD) has implemented an engaging health disparities summer internship program for high school students.

The Brooklyn Health Disparities Summer Internship Program (HDSIP) provides a community engaged health disparities summer course for students recruited from the Institute's Health Science Academy, a three-year after-school science enrichment program. In addition to didactic training on health disparities, students conduct research projects in collaboration with members of participating community-based organizations (CBOs).

In July 2014, 15 high school students participated in the 4-week Brooklyn based internship program, designed to engage minority youth while building the capacity of CBOs to conduct Community-Based Participatory Research (CBPR) on health equity issues. The students conducted their research projects at seven local community based organizations and focused on various health equity issues, resulting in advocacy and policy recommendations for local decision makers. Their internship experience culminated with oral and poster presentations of their projects at the Brooklyn Borough Hall.

For the past three years, the AAIUH has collaborated with the University of the West Indies in Trinidad & Tobago to conduct a summer internship program for secondary school students in Trinidad & Tobago. This year's program was hosted by the Faculty of Science & Technology, and builds upon earlier iterations of the program funded through two Fulbright Fellowship awards. Similar to the summer internship program in New York, the climate change and public health program in Trinidad & Tobago included community-based research projects conducted at local organizations. 15 students conducted six research projects, the research findings of which were highlighted in oral and poster presentations at a closing ceremony held at the UWI Inn Conference Centre in August 2014. This publication features the projects of both the US and Trinidad & Tobago based summer projects.

Marilyn Fraser-White, MD
Deputy Director, AAIUH
Fulbright Research Specialist, 2013



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Research Mentor: Frédérique Jean Baptiste

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CBO: American Cancer Society

Supervisor: LaToya Williams

Research Mentor: Shaunte Truick

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Health Literacy & Access to Health

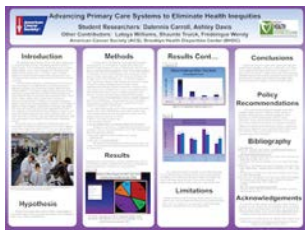
Accessible



Health literacy goes beyond the ability to read and write, and is defined as the extent to which individuals are able to access, process and understand basic health information to make informed health choices. It is impacted by individual and system level factors. In addressing health literacy, it's important that information be presented in a manner which is culturally and linguistically appropriate. Our students explored health literacy and access to care among various groups, including adolescents and individuals with disabilities.



A Study to Improve a Health Literacy Course for Urban Adolescents
Student: DiAndra Phillip
CBO: NYU College of Nursing Mobile Health Van Program
Supervisors: Betty Boyle-Duke, Tawny Lowe, Audrey Neff
Research Mentor: Frédérique Jean Baptiste



Advancing Primary Care Systems to Eliminate Health Inequities
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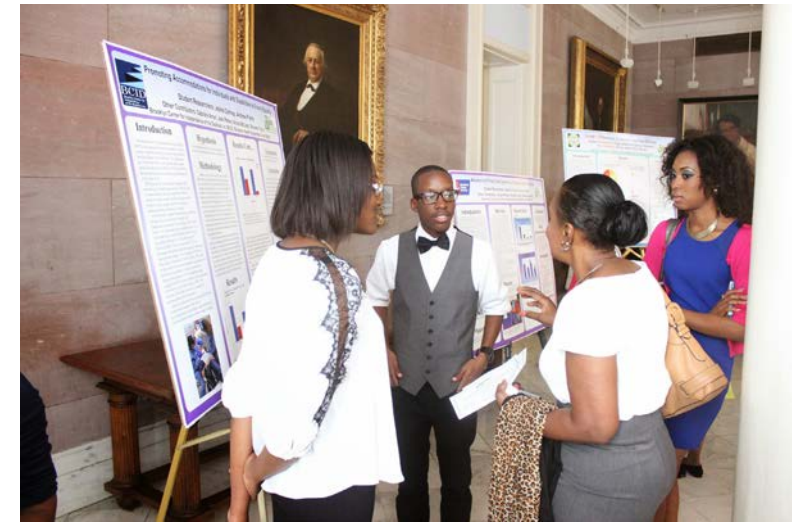
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Brooklyn Center for Independence of the Disabled

Promoting Accommodations for Individuals with Disabilities to Ensure Equality



(L - R) Student interns Jesika Donney and Andrew Pierre present their findings to attendees



A Study to Improve a Health Literacy Course for Urban Adolescents

Student Researcher: DiAndra Phillip

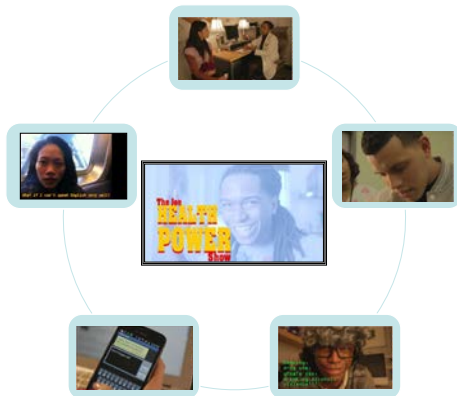
Other Contributors: Betty Boyle-Duke, Tawny Lowe, Audrey Neff, Frédérique Wendy
 NYU College of Nursing Mobile Health Van Program (MHVP), Brooklyn Health Disparities Center (BHDC)



Introduction

The deficiency in health literacy among adolescents is a public health problem. Health literacy is “the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions.” Much research has been done to assess health literacy in adults, but little is known about health literacy among adolescents (Manganello, 2007). Health classes at school (47%), parents (45%) and doctors (41%) remain leading sources of basic health information for young people (Rideout, 2001); however, deficiencies still exist in functional (not being able to spell a medical term), critical (not being able to differentiate accurate information from inaccurate information), and interactive (translating the health information to appropriate health behaviors) literacy (Jain & Bickham, 2014). Adolescents in particular are at a crucial stage of development where they must learn to independently navigate the healthcare system and advocate for their health needs.

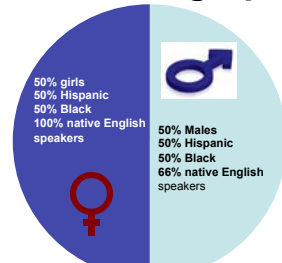
In an effort to promote health literacy among adolescents, the NYU College of Nursing Mobile Health Van Program (MHVP) developed a health literacy course consisting of eight short videos. Titled “The Joe Health Power Show,” the course addresses common health issues faced by adolescents such as diabetes, depression, substance abuse and reproductive health. The health literacy course was presented to a small group of adolescents to elicit their feedback about the course itself and its perceived effectiveness.



Hypothesis

Focus group participants (ages 14 to 16) will find “The Joe Health Power Show” effective in increasing overall adolescent health literacy upon course completion.

Demographics



- Question 1: • What did you like / not like most about the health literacy course and actors?
- Question 2: • What did you learn from the course?
- Question 3: • What would you change?
- Question 4: • Were the quiz questions clear?

Figure 1. Sample questions for focus group.

Methodology

A two-day focus group was conducted by MHVP staff and a Brooklyn Health Disparities Center (BHDC) research intern to assess the effectiveness of a health literacy course administered to a group of adolescents participating in the Summer Youth Employment Program. The focus group consisted of twelve male and female participants (n= 12), ages 14 to 16, identified through the BHDC. The MHVP staff coordinated the sessions with the appropriate teachers and administrators of the Summer Youth Employment Program.

A pre and post-test of ten questions each was administered to every participant, with short quizzes that contained three to five questions after each video. The questions and quizzes were designed to determine the effectiveness of the course. The participants were broken up randomly into three groups. Immediately following the post-test, participants were asked four questions (Figure 1) and wrote their responses on index cards. The separate groups were joined together to discuss what was written down by the participants.

Results

After the focus group was conducted and the data were entered, results showed higher post test scores with 85.8% more correct answers in the posttest compared to the 63.3% in the pretest (Figure 2). Major themes were also identified from participants’ responses about: course format, relevance, and clarity. Overall, respondents stated that the course was too long and repetitive, though they felt that the included health topics and actors were appropriate, and the information was presented clearly. Figure 3 depicts the most common focus group responses. Participants also suggested that the course would improve if it addressed concerns of a broader base rather than solely focusing on immigrants.

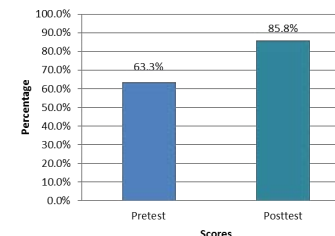


Figure 2. Pre and Posttest scores (n=12).

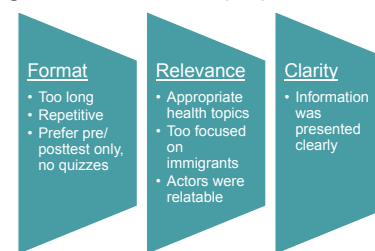


Figure 3. Focus group themes and responses.

Limitations

There were some limitations to this project. First, the focus group had a small sample size (n= 12). Second, the health literacy course was created for recent immigrant adolescents, which this focus group did not represent. Therefore, their feedback may not be representative of the intended target population. In addition, the participants may have provided socially desirable responses to the focus group questions. Lastly, the course was administered over a two-day period, which may have overwhelmed participants. Ideally, the course should be conducted over a period of two to three weeks in a high school classroom setting. In spite of these limitations, the data provide in-depth and culturally relevant information on how to improve an adolescent health literacy course.

Conclusions

This project provides valuable information to promote health literacy among urban adolescents as evidenced by their responses and post-test results. Participants’ feedback offered ways to improve “The Joe Health Power Show” for future implementation in New York City high schools. These results will guide future modifications to improve the format, content, and relevance of this health literacy course.

Policy Recommendations

Based on these findings, efforts to make health literacy education available in New York City’s high schools should be prioritized. A standard health literacy curriculum should be mandatory for every high school student to complete during health or physical education classes. In addition, funding for advertisements that show adolescents of different ages and ethnicities promoting the importance of health literacy would also be beneficial.

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Advancing Primary Care Systems to Eliminate Health Inequities

Student Researchers: Dalennis Carroll, Ashley Davis

Other Contributors: Latoya Williams, Shaunte Truick, Frédérique Wendy
American Cancer Society (ACS), Brooklyn Health Disparities Center (BHDC)



Introduction

The American Cancer Society (ACS) is the nation's largest non-governmental Cancer investor, contributing about \$3.4 billion to cancer research. ACS is dedicated to eliminating cancer as a major health problem. In New York, more than 107,000 people were diagnosed with cancer in 2011. ACS has a variety of support programs for cancer patients ranging from transportation to wigs. ACS also provides resources for the uninsured to receive free cancer screenings.

ACS has recently undergone a transformation, and for the first time in the history of the organization, it has staff and resources dedicated to primary care systems and Federally Qualified Health Centers (FQHCs). ACS chose to embrace this present study because it provides a greater opportunity to address health disparities and offers better leverage to help FQHCs and Community Health Centers (CHCs) improve health equity around cancer screenings in underserved communities. According to an Institute of Medicine Report written by the National Academy of Sciences, "The number of patients visiting Emergency Departments has been growing rapidly. EDs across the country are overcrowded, ambulances are turned away; patients, once admitted may wait in hallways for hours or even days before inpatient beds open up to them." (Warden, 2006) As a result, this leads to extremely long waits, patient dissatisfaction, walk-outs, and jeopardy of the reliability of the emergency department system.

This present study was undertaken to determine reasons why individuals would rather use their emergency room (ER) as opposed to their local Urgent Care Center (UCC). UCCs are walk-in clinics that treat non-fatal emergencies such as lacerations and strep throat.



This picture illustrates over crowding in a typical NYC hospital. Patients are being treated in hallways. <http://www.cnn.com/2008/01/15/ny.nyc.sandhospitals.jpg>

Hypothesis

People in low income areas will have little to no knowledge of Community Health Centers and urgent care centers when compared to those in more affluent neighborhoods.

Methods

A six-item survey (including four close-ended and two open-ended questions) was developed by research mentors from the Brooklyn Health Disparities Center in collaboration with ACS staff. Surveys were administered around the vicinity of four major hospitals to 100 people; 50 surveys administered in low income areas and 50 surveys in high income areas. They were chosen on the basis of the average income of the community area. Two hospitals located in "low" income areas (Kings County Hospital and University Hospital of Brooklyn) and two hospitals situated in "high" income neighborhoods (Methodist Hospital and Brooklyn Hospital Center) were chosen as the recruitment sites. Surveys were administered to adults around the hospital vicinity. All adults regardless of race/ethnicity or gender were approached for potential participation.

Over the course of the distribution of surveys, people listened to a short concise introduction. Using this approach, more individuals showed interest to participate in the survey, and this part of the research was completed with efficiency.

As a part of the research, the two CHCs, the Brownsville Family Health Center, and the Bedford Stuyvesant Family Health Center were contacted and asked about their policies on urgent care. The questions that were asked are as follows:

1. What is your policy on urgent care?
2. Do you accept walk-ins?
3. Do your patients follow up with their primary care physicians?

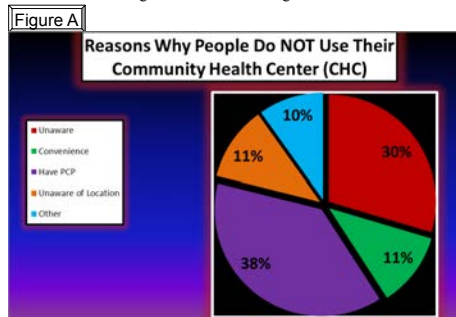
In addition to the surveys, an additional informal interview was conducted with one of the staff members of CITY MD. The questions that were asked are as follows:

1. Why aren't urgent care centers located in low income neighborhoods?
2. Why don't you accept Medicaid?

We discovered that obtaining information from the urgent care centers was much easier than obtaining general information from the two major CHCs.

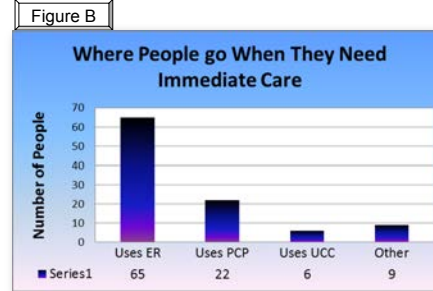
Results

Participants were asked whether or not they used their CHC. 29% of the respondents said they used their CHC and Figure A illustrates the reasons the remaining 71% had for not using their CHC.

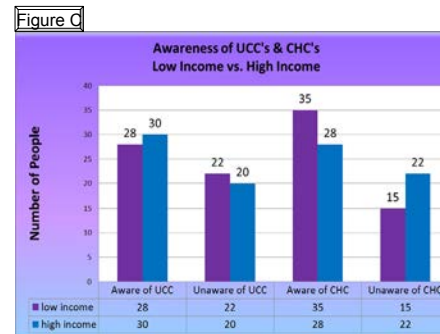


29% of the respondents used their Community Health Center, and this pie chart illustrates the reasons the remaining 71% of people had for not using the CHCs.

Results Cont...



Only 6% of respondents reported using UCCs.



The Urgent Care system is privately owned, which means that it is not funded by the government and they do not accept Medicaid. According to CITY MD, one of the major Urgent Care Centers, this is one of the main reasons why they do not exist in medically underserved communities as much as they do in high income areas.

Limitations

Getting connected to the Community Health Centers (CHCs) was difficult, due to the 20 minute hold times and being transferred many times. Also, our sample size was too small to speak to the bigger population of people that live in each neighborhood.

Conclusions

People were aware of Urgent Care Centers and Community Health Centers regardless of the area in which they lived. There was no significant difference in the level of awareness of UCCs and CHCs in low income vs. high income areas. These results are important because it can assist the American Cancer Society with developing new strategic health initiatives that support their mission to increase the usage of Community Health Centers.

Policy Recommendations

We recommend that funding be increased so that better equipped Urgent Care and Community Health Centers are available. More health plans should be accepted by these businesses to ensure the health equity between various individuals. The government should collaborate with the Urgent Care Centers to provide more options for insurance coverage. In addition, they should launch information sessions to educate the public about Urgent Care and Community Health Centers, which will ultimately reduce overcrowding in ERs, and increase awareness about UCCs and CHCs.

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Evaluating Preconception Health Literacy Among Generations

Student Researchers: Danielle Barrow, Zaria Holcomb

Other Contributors: Brandy Watts, Denise West, Shaunte Truick, Frédérique Wendy
 Brooklyn Perinatal Network, Inc. (BPN), Brooklyn Health Disparities Center (BHDC)



P20: MD006875-03

Introduction

Brooklyn Perinatal Network (BPN) was established in 1988 with a mission to prevent infant and maternal illness, as well as provide vital information to at-risk residents in minority dense neighborhoods. BPN implements innovative strategies such as supportive health and social service coordination to significantly reduce infant mortality rates and improve maternal health.

Preconception health encourages women to engage in healthy lifestyles before they become pregnant (CDC, 2012). If good health is not maintained during this time interval, the health of an unborn child can be severely affected. A research study conducted in Montana led to the theory that preconception health of women of reproductive age had substantial consequences on their ability to become pregnant, and their health intrapartum and postpartum (Lindsay, 2012).

Preconception health does not only apply if you are thinking or planning to get pregnant in the future (NYCDOHMH, 2001). It means 'taking hold of your health,' be it male or female, and feeling good about your health. It means 'picking up' healthy habits, and creating a life filled with love and support. It is essential for men to support their partners through pregnancy and be a protective figure for their children.

BPN, in partnership with the Brooklyn Health Disparities Center (BHDC), conducted a series of focus groups and surveys to gain a better understanding of people's views on preconception care. Specifically, the objective was to evaluate differences in the knowledge of preconception health between two different generations: Generation Y (15-36 years old) and Generation X (37 years and up). Such information would be useful for the development and implementation of health information classes targeted in communities with higher infant mortality rates.



This picture illustrates a woman in her reproductive years consuming drugs and alcohol.
<http://www.thepregnancyzone.com/wp-content/uploads/2008/04/preconception-health.jpg>

Hypothesis

Generation Y will be more knowledgeable on the preconception health surveys than Generation X because health classes today are more in depth, and have more scientific research to back up claims.

Methods

This research project employed the use of survey methodology. The survey was developed by a graduate research intern at BHDC in collaboration with BPN staff. Surveys were conducted at SUNY Downstate (East Flatbush) and Brooklyn Perinatal Network Inc. (Brownsville). They consisted of six questions designed to gather knowledge on preconception, interconception, and maternal care.

Surveys (n=122) were distributed either inside BPN's lobby in Brownsville or outside SUNY Downstate to passerbys near local bus stations and parks. Only individuals ages 15 and over were eligible to participate in the survey. To increase the sample size, an additional 20 phone surveys were conducted. All surveys were transferred over to Microsoft Excel for analysis. Many of the individuals contacted through the phone surveys were in our own network, which immensely increased the quantity of Generation Y. Generation Y consisted of 68% (n=93) of the respondents, while Generation X consisted of 32% (n=49).

Flyers and packets containing information about BPN, and perinatal health were also distributed to the participants. They provided information to parents regarding health care plans, children supplies, education and counseling on chronic diseases, and family planning services at various locations in Brooklyn.

Results

There was an interesting difference in the data collected between Generation X and Generation Y. When asked, "Smoking Hookah when pregnant will harm an unborn baby," 26% of Generation X indicated 'Don't Know' or asked what hookah was, while only 8% of Generation Y indicated 'Don't know' (Graph 1).

In addition, 20% of Generation X selected 'Don't know' for E-cigarettes, while only 4% of Generation Y chose 'Don't know' (Graph 2). Similar percentages were observed for both generations for the question pertaining to marijuana. There was a lot of similarity in certain responses- such as whether or not the use of alcohol and recreational drugs, such as cocaine, can affect the health of a child. Almost all the responses were "strongly agree."

A large proportion (41%) of overall respondents either "disagreed" or "Didn't know" that taking folic acid before pregnancy leads to a healthy baby. Moreover, both Generation Y (23%) and Generation X (12%) selected 'Don't know' for the use of folic acid during and before birth. (see graph 3)

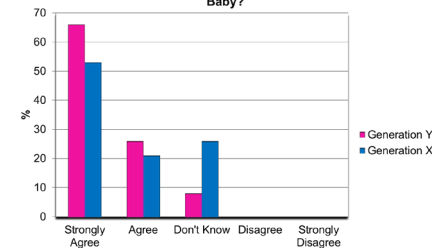


This picture illustrates a woman who understands the benefits of folic acid on an unborn baby's health.

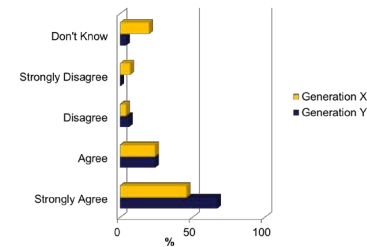
http://www.cdph.ca.gov/Health/InfectiousLiving/nutrition/PublishingImages/folicacid_150x180.jpg

Results

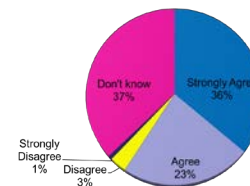
Graph 1: Does Smoking Hookah Affect the Health of an Unborn Baby?



Graph 2: Does Smoking E-cigarettes Affect the Health of an Unborn Baby?



Graph 3: Should Folic Acid Be Taken Before Pregnancy To Have a Healthy Baby?



Limitations

The sample size for Generation X responders was small. This was perhaps attributed to a large proportion of the "older" aged population that was working during the hours the surveys were distributed. Moreover, many people refused participation in the study. Non-English speaking persons were unable to participate because the surveys were written in English. Several post-menopausal women believed they couldn't participate because they didn't have any children or planned on having any in the future.

Conclusions

The data amassed led to the conjecture that Generation X lacked education on preconception health. This may be due to the fact that many of the substances listed, such as Hookah, were not prominent during Generation X's youth and reproductive age. More data will be needed to investigate this speculation.

Policy Recommendations

These findings could help invigorate strategies to help increase more general awareness on preconception health. More advanced health education programs (i.e., classes, pamphlets) need to be implemented and made available to the public.

Programs should include information on nutrition before and during pregnancy (such as the importance of folic acid), the effect of drugs on the health of a baby, maternal care, and how to take care of your health after pregnancy. Classes and interventions that provide health literacy should be integrated into health classes in schools. Counseling for women who are planning to become pregnant or are at risk of becoming pregnant, should be enacted in clinics throughout the city.

Policies should indicate that medical professionals must inform individuals on the risks of unhealthy habits on an unborn baby's health, such as bad nutrition, or smoking.

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Introduction

Church Avenue Merchant's Block Association (CAMBA) is a non-profit community based organization located in the East Flatbush section of Brooklyn, New York. CAMBA operates a choice-food pantry (Beyond Hunger Food Pantry) where individuals can self-select their food. CAMBA offers more than 150 integrated services and programs in economic development, education, youth development, family support, health, housing, and legal services (CAMBA, 2008). They help provide jobs for people with low income or on welfare, people who are currently at risk, or those transitioning to homelessness. They also help individuals living with, or at risk of HIV/AIDS, immigrants and refugees, children and young adults, entrepreneurs and other groups that are working to become self-sufficient.

Individuals with low income often have limitations on their food options, resulting in unhealthy eating habits. Families that turn to food pantries represent 16.4% of the 11.5 million low income families in the United States (Zedlewski, 2003). Access to fresh produce and other healthy foods differs between poor, ethnic, and wealthier non-ethnic neighborhoods (Lewis, 2006). Thus, food pantries are designed to ensure an adequate supply of nutritious foods. Food pantries may reduce the disparities in low income food choice.

Increased availability of food pantries, grocery stores, and farmers' markets, that offer healthier food options in low income communities, along with educational course offerings might encourage people to engage in healthier eating. This change could most likely reduce the risk of diseases such as diabetes, obesity, high cholesterol, and hypertension (Rustad, 2013). Food pantries are open to the entire public regardless of one's income. The purpose of this study is to understand what motivates food choice among low income individuals.

Hypothesis

Factors such as convenience, price and familiarity with food are associated with the food choices in low income households.



Figure 1: This chart illustrates the food options that CAMBA's Beyond Hunger Food Pantry encourages their clients to consume daily.

Methods

On Tuesdays and Thursdays, the days that the Beyond Hunger Food Pantry was open to the public, a survey assessing motivations behind food choices was distributed. The survey consisted of several 5-item Likert scaled questions covering topics such as health, mood, convenience, sensory appeal, natural content, price, weight control, familiarity, and ethical concern. Each question consisted of the following response options: 0: Don't Know, 1: Strongly Disagree, 2: Disagree, 3: Agree and 4: Strongly Agree. Each category was summarized for the participants in an explicit way, in order to decrease time consumption.

After CAMBA's clientele came in and picked the food of their choice, researchers approached and delivered to them an interviewer-administered survey. Once the data were collected from each survey, the information was tabulated into Microsoft Excel.

Results

A total of 122 participants (85 females) completed the survey. The majority of respondents were of Afro-Caribbean descent and approximately 50 years or older. Figure 2 displays the participant views on the level of importance of categories regarding healthy food choices. Figure 2 also shows that the categories: Health, Sensory Appeal, and Familiarity were more important to the respondents as opposed to the others. Figure 3 differentiates between two categories, sensory appeal and ethical concern. Sensory Appeal had the greatest effect on the participants' dietary choices, while Ethical Concern was inapplicable.

Our research showed that Sensory Appeal served as the most essential aspect of dietary choice. Overall, Ethical Concern was viewed as the least important aspect of dietary choice.

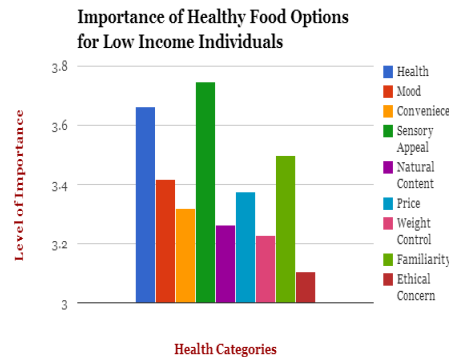


Figure 2: This chart shows the participant's views towards the level of importance of various categories regarding dietary choices.

Results Cont'd

Primary & Secondary Aspects of Dietary Choices

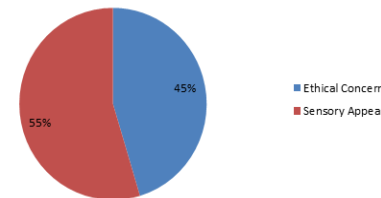


Figure 3: This graph shows what is viewed as the most and least important aspect of acquiring healthy dietary choices amongst males and females.

Limitations

- Study conducted at one community-based food pantry
- Limited days and times
- Small sample size for the project
- Lengthy survey
- Lack of interpreters; participants spoke different languages

Conclusions

Food pantries help to reduce hunger and hardship in the United States. After collecting and analyzing the data, the hypothesis was partially supported. Familiarity was an essential factor associated with food choices in low income households. Initially, the research inferred that convenience and price would also be significant factors to dietary choices. However, the factors proven to be more essential to food choices were sensory appeal and health. The results were inconsistent with the hypothesis.

Individuals of low income have restraints when obtaining healthy foods, such as high pricing in health food stores and low budgets. The efforts of food pantries could serve to reduce the risk of diseases that are prevalent in the community, such as diabetes, obesity, and hypertension.

Policy Recommendations

- State government and community-based organizations should aim to provide more food pantries, grocery stores, and farmers markets.
- Regulate availability of unhealthy foods in public service venues and promote healthier food.
- Establish advertisement on eating healthy, and providing information sessions for the public.

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Special thanks to our supervisors Ms. Lucila Santana (Project Coordinator at CAMBA), Mr. Issaye Fair and the staff at CAMBA's food pantry for helping us in conducting the surveys. Appreciation goes to our Research Mentor, Ms. Shaunte Truick and Ms. Nicole Primus, Education Coordinator at the Arthur Ashe Institute for Urban Health (AAIUH) and the Brooklyn Health Disparities Center (BHDC).



Promoting Accommodations for Individuals with Disabilities to Ensure Equality

Student Researchers: Jesika Donney, Andrew Pierre

Other Contributors: Gabriela Amari, Joan Peters, Nicole McLean, Shaunte Truick

Brooklyn Center for Independence of the Disabled, Inc (BCID), Brooklyn Health Disparities Center (BHDC)



P20: MD006875-03

Introduction

Brooklyn Center for Independence of the Disabled (BCID) is an organization that was created in 1956 by a group of parents working to promote equal benefits for their children with disabilities. The organization dedicated time and effort to end discrimination against people with disabilities (PWDs). BCID gives PWDs the tools and resources to become more independent in their daily lives.

BCID has grown over time and expanded their networking from battles against New York City taxis to ensure that they become accessible to PWDs, similar to Access-A-Ride. BCID has improved the lifestyle of many people and they will continue making a difference in society.

For this project, student researchers aim to identify the lack of accommodation for people with disabilities in dental and vision clinics. In the United States, 1 in 5 individuals have a disability, and 1 in 10 individuals have a severe disability (Stiefel, 2002). According to *Dental Care Considerations for Disabled Adults*, "on an annual basis 36.5% of individuals with severe disabilities aging 15 years and older reported a dental visit, compared to 53.4% of those with no disabilities" (Stiefel, 2002). This could be due to the lack of accommodations for people with disabilities. According to a study conducted at Waverly Park Hospital, 11% of disabled people, ranging from 20-85 years old, had a vision assessment in the last five years (McCulloch, 1996). This outcome is most likely caused by a scarcity of accommodations for the disabled.

Upon the conclusion of this research, BCID hopes to increase the awareness of the lack of accommodations for individuals with disabilities in vision and dental clinics, in order to make changes.



Hypothesis

Vision and dental facilities do not provide sufficient accommodations for people with disabilities.

Methodology

Methods used for this research project consisted of phone surveys and field observations for various dental and vision facilities in the borough of Brooklyn. These methods were used to find out if they accommodated the disabled. To initiate the phone interviews, a brief introduction of the research topic was used to provide information about the organization. Due to low response, a new tactic was used to interview the clinics. The interview questions were asked as if they were questions from a disabled patient's point of view. The responses given would indicate whether the facilities were wheelchair accessible for the front entrance and examination room, were able to perform a procedure in the wheelchair, and were able to provide a sign language interpreter.

The field observation portion of this research project required investigating each dental and vision facility that responded 'yes' saying that they accommodated people with disabilities. In order to account for accommodations, the clinics had to have a front door entrance, exam room door, and/or an alternative entrance at least 35 inches wide, a step no more than 2 inches high (unless a ramp was provided), and a trained staff to assist the patient out of their wheelchair and into the examination chair.

Results

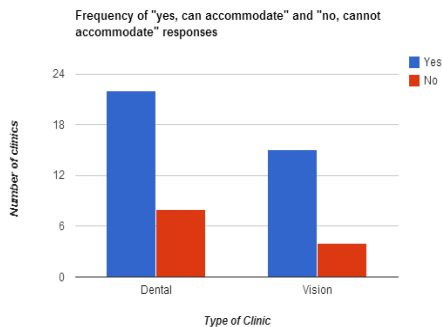


Figure 1: This graph shows the phone call assessments for dental and vision clinics. 71% of the dental and vision clinic respondents through phone surveys stated they accommodate people with disabilities.

Results Cont...

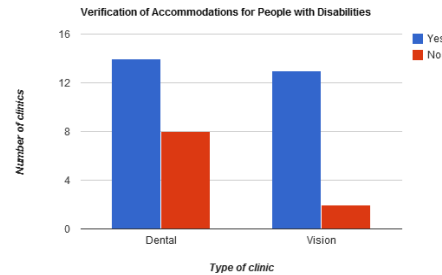


Figure 2: This graph shows verifications of the phone call assessments of dental and vision clinics stated they accommodated the disabled. After verification, 73% of clinics did accommodate the disabled as said during phone surveys.

Figure 1 represents the outcome of the phone survey. It indicates the amount of dental and vision facilities that accommodate and which do not. 22 dental clinics initially stated that they accommodated the disabled, while 8 of them said no. 15 vision clinics stated that they accommodated the disabled, while 2 clinics said they did not.

Figure 2 shows the confirmation of the clinics that stated through phone surveys that they accommodated individuals with disabilities, verified by field observations results. Out of the 22 dental clinics, 14 stated they accommodated the disabled and 8 dental clinics did not accommodate as they claimed. Out of the 15 vision clinics, 13 clinics accommodated, 2 clinics did not. While doing field observations, a majority of clinics had a similar challenge which was having front doors and exam rooms that were wheelchair accessible, without staff to aid the patient out of the wheelchair to transfer him/her into the examination chair. An interesting fact discovered during the phone surveys showed that there were more dental clinics present than vision, but at the end of the project more vision clinics accommodated people with disabilities compared to dental clinics.

Limitations

Due to time constraints, a small sample size was used, so the results cannot be generalized.

Conclusion

Through the research conducted in this project, the hypothesis was supported that many dental and vision clinics do not adequately accommodate the disabled, limiting them to the amount of places they could use to get services. This shows a disparity between the population of people without disabilities and people with them. Overall, the results of this project should help bring awareness of the inequality between people without disabilities and people with disabilities showing how much limited access the disabled population has to these services.

Policy

Recommendations

The government should revise the Americans with Disabilities Act (ADA), to enforce all dental and vision services to provide accommodations for the disabled. Also there should be ADA inspectors, to inspect clinics to make sure they are complying with the ADA.

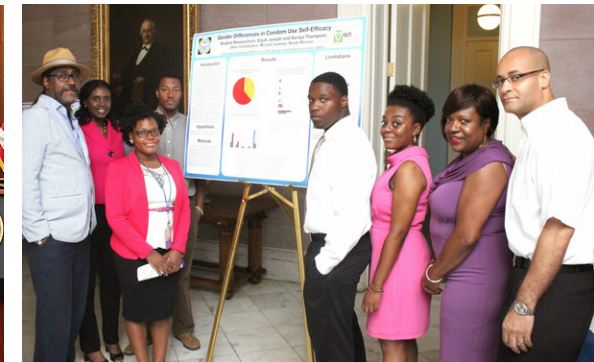
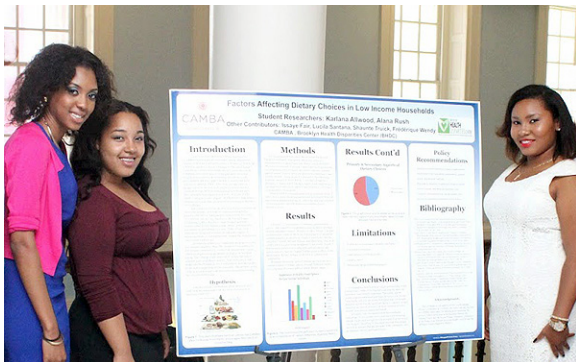
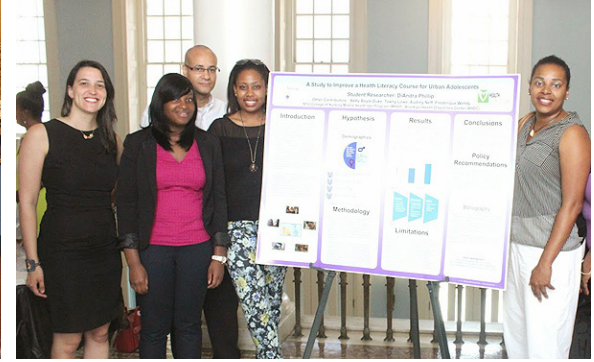
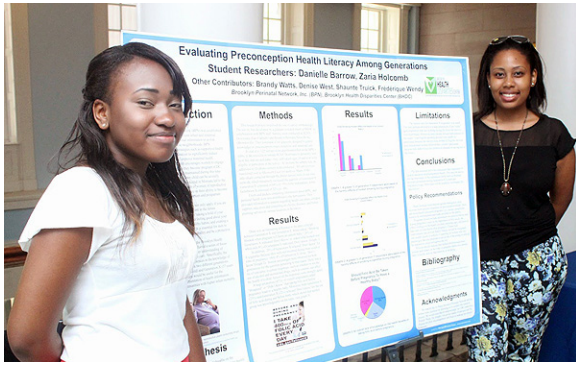
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summer2014

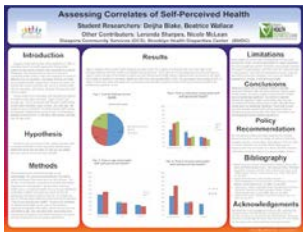




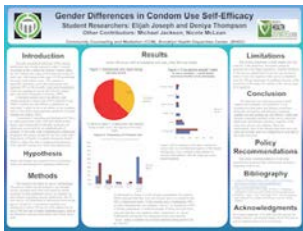
Perception of Risk

Central to beginning the conversation on health promotion and risk reduction behaviors, is identifying someone's perception of risk. Oftentimes, one's perception of risk influences the choices an individual makes regarding his/her health. Our students focused on various topics related to perception of risk, including condom use and the consumption of alcohol during pregnancy.

summer2014



Assessing Correlates of Self-Perceived Health
 Students: Deijha Blake, Beatrice Wallace
 CBO: Diaspora Community Services
 Supervisor: Leronda Sharpes
 Research Mentor: Nicole McLean



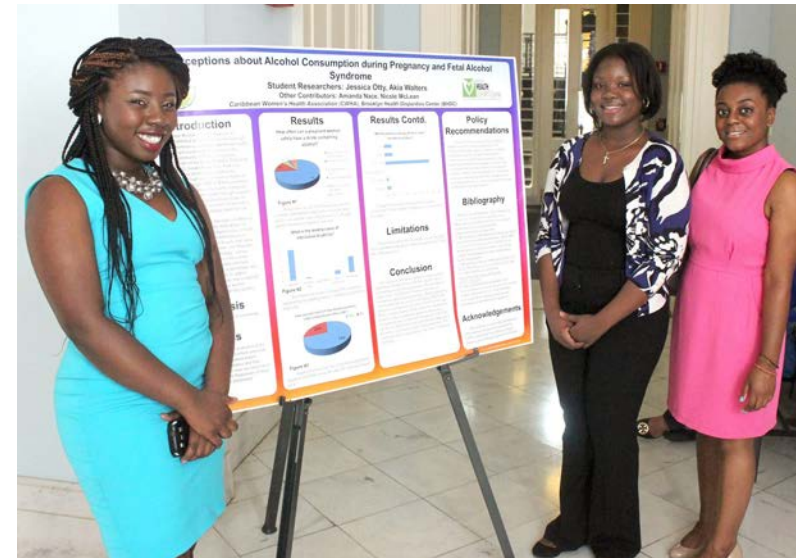
Gender Differences in Condom Use Self-Efficacy
 Students: Elijah Joseph, Deniya Thompson
 CBO: Community Counseling and Mediation
 Supervisors: Michael Jackson, Myriam Lamothe
 Research Mentor: Nicole McLean



Perceptions about Alcohol Consumption during Pregnancy and Fetal Alcohol Syndrome
 Students: Jessica Otty, Akia Walters
 CBO: Caribbean Women's Health Association
 Supervisors: Amanda Nace, Harriette Jordan
 Research Mentor: Nicole McLean

Caribbean Women's Health Association

Perceptions about Alcohol Consumption
 During Pregnancy and Fetal Alcohol Syndrome



(L - R) Student interns Jessica Otty and Akia Walters with HSA Alumni and mentor Nicole McLean

Assessing Correlates of Self-Perceived Health

Student Researchers: Deijha Blake, Beatrice Wallace

Other Contributors: Leronda Sharpes, Nicole McLean

Diaspora Community Services (DCS), Brooklyn Health Disparities Center (BHDC)



Introduction

Diaspora Community Services (DCS), established in 1981, is a Brooklyn-based non-profit organization that provides support to low-income residents, the chronically ill, as well as immigrants. DCS has three sites in New York City and a community health center in Haiti. DCS empowers its clients by offering access to education, counseling, housing, and other much needed benefits. Overall, DCS's mission and vision is to provide low-income minorities with access to quality health services, education, job training, adequate housing and social service support.

Factors shown to be associated with favorable perceptions of health include higher education, higher income, and younger age. Factors associated with fair/poor health ratings include lower education, lower income, and older age. We sought to assess correlations of self-perceived health among the Brooklyn neighborhoods served by DCS. The population typically serviced by DCS is 74% Black, 60% women, and 56% over the age of 40.

Hypothesis

Individuals who are young (13-26), college-educated, with an income of \$50,000 or more have better self-perceived health than those who are older (27 and up), not college-educated, with an income less than \$50,000.

Methods

This assessment was conducted through survey methodology. The survey was developed by DCS staff to collect information from those who use their services. The 48-item survey allowed respondents to provide information regarding socio-demographics, family history of disease, health access, and general health. This survey was distributed to Brooklyn residents who were also clients of DCS. All participants were given informed consent. The sample size was 95. Self-perceived health was determined by the question "How do you describe your health?" To assess the correlates of self-perceived health, we focused on the questions regarding demographic information, which included, but was not limited to age, race, education level, and income level. Frequencies of responses were determined and a chi-square test was employed to assess statistical significance.

Results

Figure 1 displays self-perceived health ratings by education level. The majority of individuals with more than high school education believed that their health was excellent/very good (61%). The p-value for the accompanying chi-square test was 0.5. Figure 2 shows the ages of the people surveyed and their self-perceived health ratings. Individuals who are young (13-26) rated their health as excellent or very good, slightly less often than older people (48% v. 53%). This association had a p-value of 0.87. In Figure 3, there were more individuals who received less than \$50,000. A majority of them (70%) perceived their health to be excellent/very good ($p = 0.16$).

Fig. 1: Overall Self-perceived Health

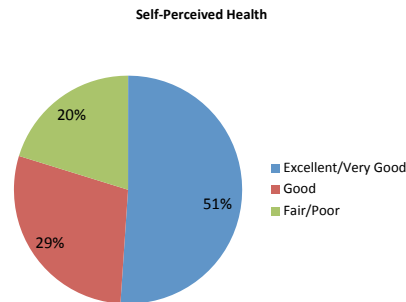


Fig. 3: How is age associated with self-perceived health?

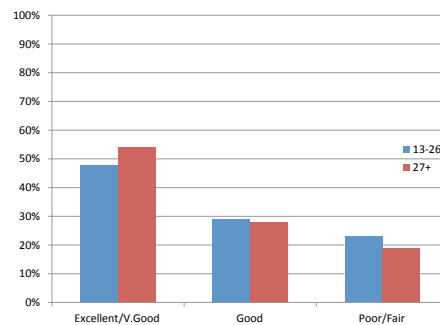


Fig. 2: How is education associated with self-perceived health?

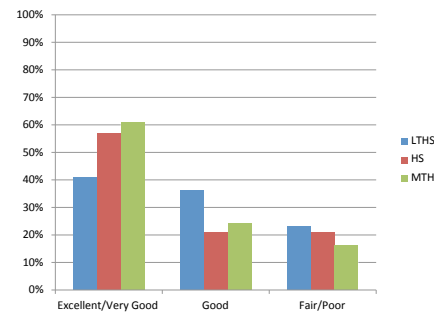
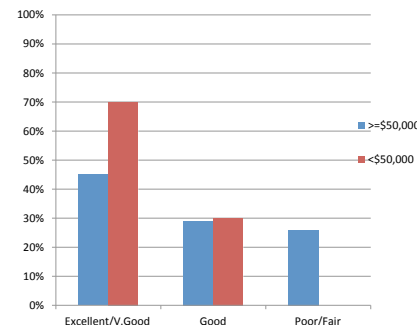


Fig. 4: How is income associated with self-perceived health?



Limitations

Small sample size (N=95) was a limiting factor for this study because the results cannot be generalized to a larger population. The survey length was another limitation; many people declined the request for participation, and those who did respond tended to skip questions. Out of the 95 individuals surveyed, nearly all were African American, therefore, race could not validly be analyzed as a correlate of self-perceived health.

Conclusions

While the frequencies of responses showed a possible association between high education level and self-perceived health, further chi-square analysis showed that this finding was not statistically significant. The evidence collected refuted the hypothesis stated. Surprisingly, older age was associated with better self-perceived health, although these results were not statistically significant. Those with income less than \$50,000 reported their self-perceived health as excellent/very good more often than their counterparts, but this finding also lacked statistical significance.

Policy Recommendation

We recommend creating education programs for minority groups to help them return to college, as well as to help them complete school to receive higher level degrees. From our data, it is shown that there are very few African Americans or Hispanics who have an income at or above \$10,000. Education could help increase the chance of receiving a higher income.

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Gender Differences in Condom Use Self-Efficacy

Student Researchers: Elijah Joseph and Deniya Thompson

Other Contributors: Michael Jackson, Nicole McLean

Community Counseling and Mediation (CCM), Brooklyn Health Disparities Center (BHDC)



Introduction

Sexually transmitted infections (STIs) among adolescents are a rising concern in today's society. According to the Centers for Disease Control, there are 19.7 million new cases of STI infection in the US each year, with young people (ages 15-24) accounting for nearly half of those cases. This statistic is especially surprising, given that adolescents only represent 25% of the sexually experienced population. Teens are engaging in sexual activities at younger ages, and more frequently (Lawrence, 1994).

Consistent condom use is an effective and reliable method to reduce risk of STI infection (Lam, 2004). Condom use self-efficacy is defined as an individual's belief in his or her ability to use condoms and it is one of the most important predictors of actual condom use (Baele, 2001).

Community Counseling and Mediation (CCM) is an organization that works with individuals in their homes and communities to promote awareness of adolescent sexual activity in neighborhoods of concern. CCM works with Comprehensive Adolescent Pregnancy Prevention, funded by the New York State Department of Health, to support community-based efforts to reduce the risk of unplanned pregnancies, STIs, and HIV among New York State adolescents.

Hypothesis

Males and females are expected to have dissimilar behaviors and perceptions regarding condom use.

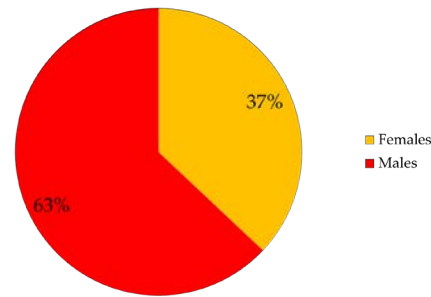
Methods

The research was based on survey methodology. The survey, which was developed by our research mentor, included items that were based on similar questions in prior published surveys on condom use and condom negotiation among adolescents. The 22-item survey was distributed to adolescents between the ages of 14 and 19. Convenience sampling was employed to collect 150 surveys from adolescents at two CCM sites and in highly populated places, such as the Broadway Junction train station and Fulton Street mall.

Results

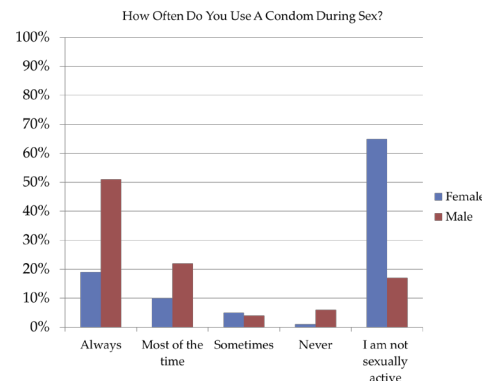
Of the 158 surveys, 44% of respondents were male, while 56% were female.

Figure 1: Adolescents who report being sexually active



As shown in figure 1, of adolescents who reported being sexually active, the majority (63%) were males.

Figure 2: Frequency of Condom Use



As illustrated in figure 2, of the females respondents, the majority (64%) indicated that they were not sexually active in contrast to the 18% of adolescent males. Of the sexually active respondents, 58% of males indicated they use condoms 'always' as compared to 19% of female respondents. A small percentage of those surveyed (4%) indicated that they use condoms either 'sometimes' or 'never.' Additionally, among the five adolescent males who reported 'never' using a condom, two of them reported testing positive for an STD/STI.

Figure 3: If my partner wouldn't want to use a condom, I could easily convince him/her of its necessity.

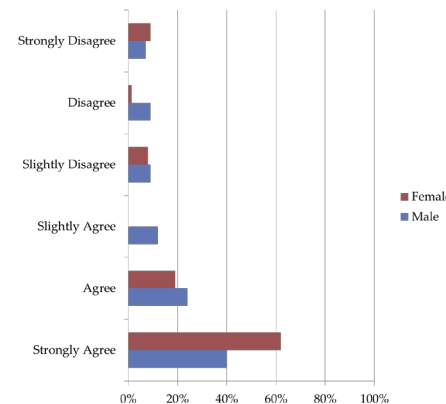


Figure 3 shows responses to the above mentioned survey item. An overwhelming majority of the females said that they were confident in their abilities to convince their partner, while the males gave more mixed responses.

Limitations

Due to time constraints, a small sample size was used (N= 150); therefore, the results cannot be generalized to the larger population. Another limitation is, the surveys administered were not very diverse in terms of race; the majority of the surveys completed were by African Americans. In addition, because of the sensitivity of the topic, the validity of the surveys may be in question.

Conclusion

The data that was collected seemed to both support and contradict our hypothesis. It was hypothesized that males and females would have dissimilar perceptions and behaviors regarding condom use and condom use self efficacy; males and females responded similarly to the survey questions. Both males and females said that a majority of the times they always use condoms. However interestingly, most of the females that were surveyed were not sexually active in comparison to over half of the males surveyed.

Policy Recommendations

One policy recommendation is to develop school-based programs that will promote awareness regarding condom use.

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Perceptions about Alcohol Consumption during Pregnancy and Fetal Alcohol Syndrome



Student Researchers: Jessica Otty, Akia Walters
 Other Contributors: Amanda Nace, Nicole McLean
 Caribbean Women's Health Association (CWA), Brooklyn Health Disparities Center (BHDC)



Introduction

Caribbean Women's Health Association (CWA), established in 1982, aims to provide high quality, comprehensive, culturally appropriate health, immigration, and social support services to the neighboring community. CWA is a regional coordinating body of the Infant Mortality Reduction Initiative (IMRI), funded by the New York City Council. IMRI was developed to combat the disproportionately high rates of infant mortality in New York City. Through IMRI, CWA coordinates city-wide efforts to improve the health of pregnant and postpartum immigrant women through research, conferences, training, and technical assistance for community providers. This research will provide a basis for future programs regarding maternal and child health.

Fetal Alcohol Spectrum Disorders (FASD) are the leading cause of preventable birth defects in North America. The National Organization on Fetal Alcohol Syndrome found that FASD affects an estimated 40,000 infants in the US each year, more than Spina Bifida, Down Syndrome, and Muscular Dystrophy combined. Prior knowledge surveys about FASD have been conducted with various health and allied healthcare providers and have proven useful in identifying gaps in knowledge and differences among provider groups to support prevention efforts. The present study was conducted to assess women's perception about alcohol consumption during pregnancy and fetal alcohol syndrome.

Hypothesis

Women underestimate the risks of consuming alcohol during pregnancy.

Methods

A 14-item survey was given to women over the age of 14 in the 11203 zip code area which surrounds CWA, to determine the common beliefs regarding alcohol use during pregnancy and fetal alcohol syndrome. The responses were recorded into a Microsoft Excel database and the frequencies of these responses were determined and interpreted.

Results

How often can a pregnant woman safely have a drink containing alcohol?

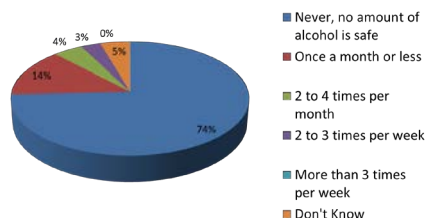


Figure #1

Though the majority of women surveyed (74%) correctly reported that a pregnant woman can never safely have a drink containing alcohol, 21% thought alcohol use during pregnancy was safe.

What is the leading cause of intellectual disability?

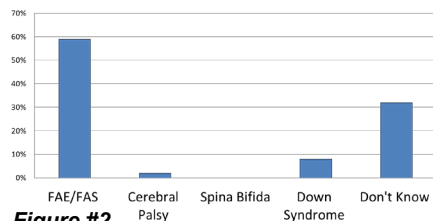


Figure #2

The majority of women surveyed (59%) correctly reported that the leading cause of intellectual disability is FAE/FAS.

Have you ever heard of Fetal Alcohol Syndrome (FAS) or Fetal Alcohol Effect (FAE)?

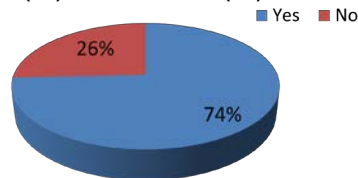


Figure #3

Figure #3 shows that 74% of the female population reportedly heard of FAS/FAE versus the other 26% that reported never hearing of it.

Results Contd.

Which substance do you think is most harmful to a fetus?

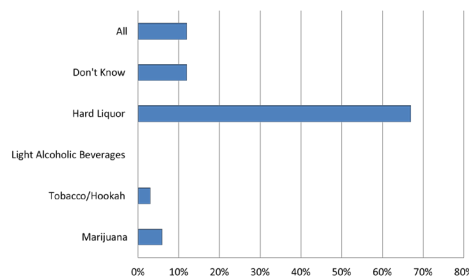


Figure #4 shows that the majority of women surveyed (67%) believed that hard liquor was most harmful to a fetus.

Limitations

Due to time constraints, the sample size for the study was small and thus the results could not be generalized for the rest of the population.

Conclusion

In conclusion, the results seemed to contradict the hypothesis. Women do not underestimate the risks of consuming alcohol during pregnancy. The data show that women over the age of 14, know the risks of consuming alcohol during pregnancy. While conducting our literature review, we also took notice of the health and emotional benefits of women's beliefs by their age. FAE/FAS can be avoided if younger women are given the knowledge about the risks of consuming alcohol during pregnancy. This could also lead to a decrease in the cases of intellectual disability.

Policy

Recommendations

Because there are many conflicting beliefs regarding alcohol use during pregnancy, all healthcare providers, especially those in obstetrics and gynecology should receive standardized information on alcohol use and pregnancy. Once health care providers are adequately educated, they can disseminate accurate information to expectant mothers.

Another recommendation is to implement community-based programs to provide education to multiple generations of women since many beliefs are solidified through socialization.

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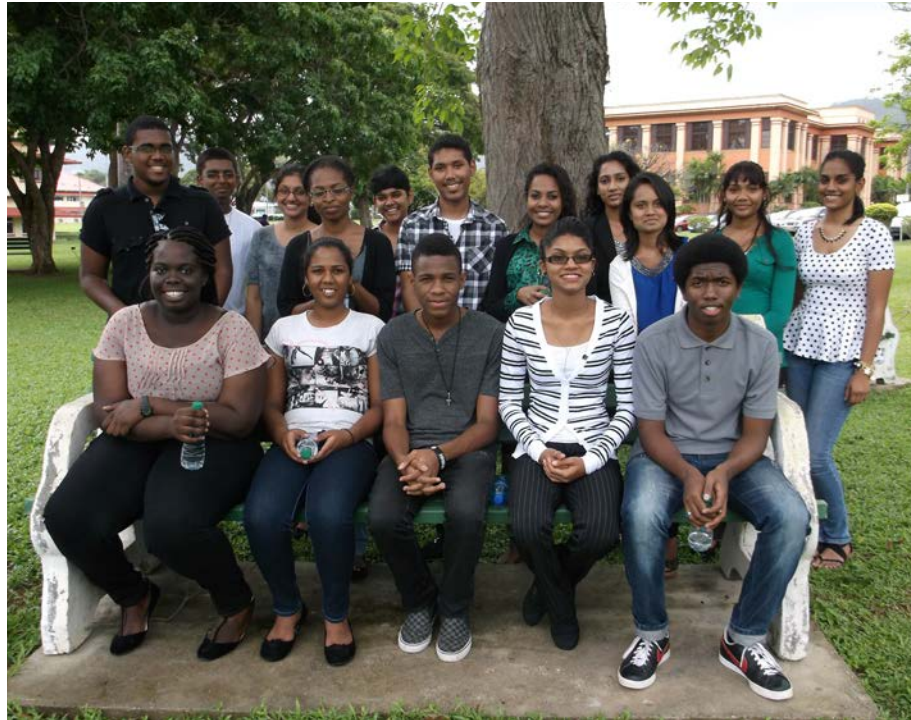


**Trinidad & Tobago
Summer Internship 2014**



Trinidad & Tobago Summer Internship 2014

For the past three years, the Arthur Ashe Institute for Urban Health has collaborated with the University of the West Indies (Trinidad & Tobago) to conduct the Summer Internship Programme for Secondary School Students. Each year, 15 to 20 students are recruited from high schools across Trinidad & Tobago to participate in the Internship. The first year's program (2012) was made possible by a Fulbright Nexus Award to the Institute's CEO, Dr. Ruth C. Browne, and focused on the Social Determinants of Health. In 2013, the Institute's Deputy Director, Marilyn Fraser White, MD was awarded a Fulbright Research Specialist award to conduct a summer internship focused on climate change and public health. The 2014 summer internship also focused on climate change and was supported by funding from various sources, including the US Embassy, the University of the West Indies (St. Augustine's campus) and private donors. 15 students conducted six research projects at six Non-Governmental Organizations (NGOs) in Trinidad & Tobago. This section highlights the research projects of our students.

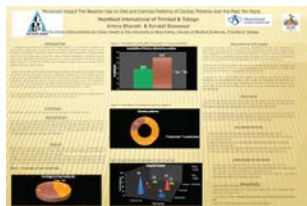




Effective ways in Mitigating the Effects of Surface Water Runoff in the St Ann's Area
Students: Gareth Walker, Kryssa Boodram
NGO: Fondes Amandes Community Reforestation Project



Exploring Teenagers' Perceptions of Climate Change and Its Effects on Public Health in Trinidad & Tobago
Students: Renée Browne, Kefim Scott, Saianna Solomon
NGO: Pointe-a-Pierre Wild Fowl Trust



Perceived Impact the Weather has on Diet and Exercise Patterns of Cardiac Patients Over the Past Ten Years
Students: Arlene Bharath, Kendall Bissessar
NGO: Heartbeat International of Trinidad & Tobago



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Presenters: Ms. Nandi Mitchell, Dr. Bernice Dyer-Regis, Mr. Amilcar Sanatan, Dr. Bennie Berkeley, Dr. Azad Mohammed, Dr. Alan Williams, Dr. Monica Davis, Ms. Michelle Gill, Ms. Myrna Ellis, Professor John Agard, Mrs. Dennise Demming, Mr. Salorne McDonald, Dr. Avery Hinds, Ms. Lynette Joseph-Brown, Mr. Rubadiri Victor, Mr. Gregory Sloane-Seale, Ms. Suelan Chin, Dr. Rohan Maharaj. Special thanks to Ms. Myrna Ellis (Coordinator).



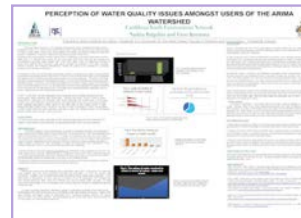


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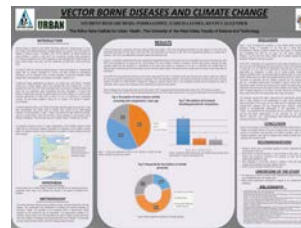
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Perception of Water Quality Issues Amongst Users of the Arima Watershed
Students: Nadira Balgobin and Enzo Kinsiona
NGO: Caribbean Youth Environment Network



The Impacts of Industrial Oil Spills on Human Health and the Environment of the La Brea Community
Students: Melyssa Amann, Faith Sookram, Anna Ramnarine
NGO: OilFields Workers' Trade Union



Vector Borne Diseases and Climate Change
Students: Indira Gopee, Earlisha James, Kevin Callender
NGO: Urbaniseme



Effective ways in Mitigating the Effects of Surface Water Runoff in the St Ann's Area

Gareth Walker and Kryssa Boodram

Fondes Amandes Community Reforestation Project; The Arthur Ashe Institute for Urban Health & The University of West Indies, Faculty of Medical Sciences, Trinidad & Tobago



INTRODUCTION

The Fondes Amandes Community Reforestation Project (FACRP) was founded in 2006 by Tacuma and Akliah Jaramogi, in hopes of having a cleaner and healthier living environment for their family. They did so by engaging in reforestation programmes. The major indicator to them that they needed to act for their community, was the severe St Ann's flood in 1993 which affected the entire area. Since the FACRP has been established, no known major flood has affected the residents or area of St Ann's. Also, before the establishment of FACRP, the hilly areas consisted mainly of dry leaves and soil and trees. These environmental conditions made St. Ann's more susceptible to fires, flooding, landslides and flash flooding and are linked with surface water runoff.

FACRP is a highly regarded Non-Governmental Organization (NGO) and has served its community extremely well in ending the annual forest fires, a yearly 'gayap', in the area, amongst many other environmental issues. A forest fire is an uncontrolled fire occurring in vegetation more than 6 feet (1.8 m) in height. They often reach the proportion of a major conflagration and are begun by combustion and heat from surface and ground fires. Forest fires spread rapidly through the top most branches of the trees before involving undergrowth or the forest floor (Britannica, 2008). Their holistic views combined with the indigenous Karinya (Carib) ideals of protecting nature and respecting 'her heritage' work hand in hand to provide a healthier, safer living environment for the community of St Ann's.

Surface water run off is caused mainly by storms or heavy rainfall (Perلمان 2014), and also by urbanization, as it creates impervious surfaces such as pavements and buildings, (National Research Council 2008). Pavements and buildings create a barrier which blocks soil from direct rainfall. This contributes greatly to surface water run off, as this barrier reduces or even stops the absorption of water into the soil. The water therefore is not allowed or doesn't have time to percolate through the soil and be absorbed, and picks up loose sediment. Overtime, this sediment builds up to such an extent that these water pathways are eventually clogged. This contributes to floods which are known to cause destruction to homes and livelihoods, just as in the St Ann's area.

As the number and susceptibility of settlements and forest fires increases, flooding increasingly becomes a natural hazard. Adverse impacts include loss of life, property damage, contamination of water supplies, loss of crops, and social dislocation and temporary homelessness. Though there are many effects of increased surface water run-off, there are also measures which have been implemented to stop or reduce these effects. Some of these implemented measures consist of land use, erosion and flood control programs, (Lin B. 2012).

As water runs off the land, it collects contaminants which can alter the metabolic rate of aquatic species. These alterations can lead to death, such as fish kills, or alter the balance of populations present. Other specific impacts are on animal mating, spawning, egg and larvae viability, juvenile survival and plant productivity (Saeey, 2002). These contaminants have been shown to have very adverse effects on wildlife and causes horrendous changes to some aquatic life.

Flood control program strategies have been developed to minimize peak flows and reduce channel velocities. An example of one such strategy is check dams - a low, fixed structure, constructed of timber, loose rock, masonry, or concrete, to control water flow in an erodible channel or irrigation canal (McGraw, 2003). Some of the techniques commonly applied are provision of holding ponds that buffer riverine peak flows (US Army Corps of Engineers, 1996).

Among previously established effects of surface water run off, landslides is another detrimental effect. On November 20th 2011, there was flooding in the area of Maraval, Trinidad, which resulted in landslides. These landslides were as a result of a forest fire early the previous year (Trinidad and Tobago Express, 2011). This was due to a lack of trees, together with heavy downpour. Another contributing factor to landslides is deforestation which is, the process whereby natural forests are cleared through logging and/or burning, either to use the timber or to replace the area for alternative uses (WWF, 2010).

HYPOTHESIS

Surface water runoff can be effectively mitigated by checking dams.

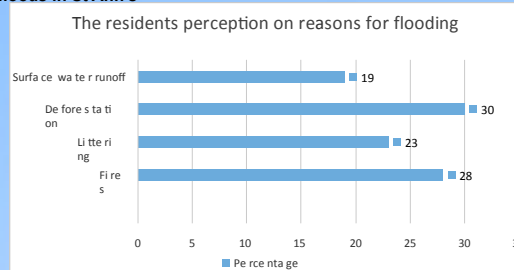
METHODOLOGY

The primary data were obtained by administering 28 questionnaires to the residents in the Fondes Amandes, St. Ann's area. This questionnaire contained a series of close ended questions with just one open-ended question regarding recommendations for the mitigation of surface water runoff. This method of data collection was chosen as it was seen most successful in other similar research projects when second any research was undertaken. The data and information collected was then analyzed using Excel, where tables and graphs were created to effectively illustrate the findings. Pie charts, line graphs and bar charts were used as they are most affluent in visually recognizing patterns, trends and anomalies in data.

With regards to secondary data sources, various mediums were used, to provide a wide range of information. These sources included related authority websites, newspaper articles, journals and books, which were from international, regional and local origins. By use of this extensive database, a more comprehensive understanding of the topic and themes were established.

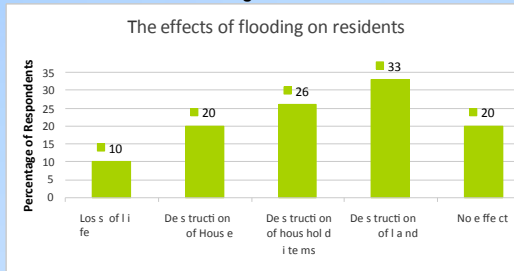
RESULTS

FIGURE 1 : Respondents views on the main reason for the cause of floods in St Ann's



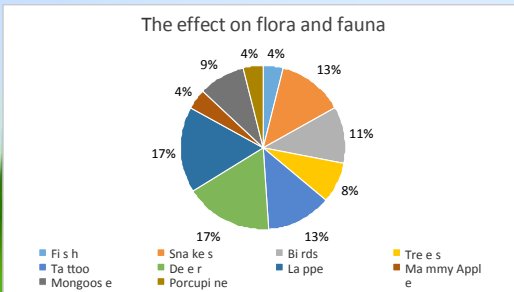
From the graph above, 30% of respondents reported deforestation as the main reason for the floods in the St. Ann's area, whereas 19% thought that it was due to surface water runoff.

FIGURE 2 : The effects of flooding on residents in the St Ann's area



The line graph above illustrates that 33% of respondents experienced destruction of land after flooding in their St Ann's area while 10% were affected in terms of loss of life.

FIGURE 3 : Reduction of flora and fauna within the St Ann's area



From the pie chart above, it can be concluded that deer and lappet have had the most dramatic reduction in species with 17%, while fish, mammal apple and porcupine were amongst the least reduced species with 4%.

DISCUSSION

What has clearly been established is that deforestation is the main reported cause of surface water run off in the Fondes Amandes, St. Ann's area, as illustrated in Figure 1. Deforestation destroys trees and habitats. This allows for raindrops to hit the surface floor harder and begin deteriorating it. A possible way to decrease the impact of the calamity was found to be reforestation. By engaging in reforestation work in the affected areas, there would be considerably better surface water run off management, in turn leading to less floods and destruction of property.

Many residents have been adversely affected by floods, as shown in Figure 2. These effects include loss of life (10%), destruction of houses (20%), destruction of household items (26%), but the most prevalent effect of flooding was seen to be destruction of land (33%). Some residents were not affected, (20%), which could have been because they live in the more hilly areas of St. Ann's.

Most of the residents recognized a connection between forest fires and surface water run off, as shown in Figure 1 and suggested that the best way to mitigate this was the implementation of check dams. Others suggested to stop the run-off in the area was through the use of check dams and reforestation work, as opposed to contour draining. They suggested this because they saw a considerable decrease in surface water run-off and floods.

The flooding in this area caused by the surface water run off has not only affected the wildlife and residents, but also trees in the area as presented in Figure 3. Residents have recognized a drastic decrease in the number of some species, which include Deer (17%), Lappes (a type of forest rodent) and Tattoos (local Trinidadian wild meat) (13%). Some residents went so far as to say they have not seen a deer in their area for years. The residents have complained to the relevant authorities and some measures have been implemented. Authorities have paved the river bed so as to reduce the amount of sediment washed Downstream, resulting in buildup. From this it was seen that the authorities have worked with the community to reduce the amount of flooding in the St. Ann's area.

CONCLUSION

In conclusion, it was found that the most effective way to mitigate surface water run off in the Fondes Amandes, St. Ann's area, is check dams (based on suggestions by skilled people working with FACRP and our investigations regarding the depth of check dams and its correlation to the average amount of rainfall in the area). With the use of check dams, together with educating the residents in the St Ann's area on this topic, there should be very few dangers or disasters in the St Ann's area in the future.

RECOMMENDATIONS

- The residents of the St Ann's should be educated on the hazardous effects of littering and deforestation on the environment and in retrospect, their community.
- Local authorities should make more conscious efforts to promote the ideal usage of land, waste and other materials amongst the St Ann's area. This will assure that all land is used and altered appropriately to minimize the effects of surface water runoff and other consequential disasters such as fires and flash flooding.
- FACRP should work together with the government ministries and authorities in promoting, educating and administering environmental safety and sustainable development and usage of land to members of the St Ann's area.

LIMITATIONS OF THE STUDY

- Due to the small population of the Fondes Amandes area, it was impossible to collect data from the desired sample size of 50 people.
- All respondents worked for the NGO (FACRP) and have a vested interest in its mission. This may represent a respondent bias impacting the reliability of the study's data.
- The limited time in which this research had to be completed. Had there been more time, this study could have been developed further in understanding and analyzing the system of rainfall, check dams and the rivers and ravines within the area.

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Exploring Teenagers' Perceptions Of Climate Change And Its Effects On Public Health In Trinidad & Tobago

Renée Browne, Kefim Scott & Saianna Solomon

Pointe-a-Pierre Wild Fowl Trust, The Arthur Ashe Institute for Urban Health & The University of the West Indies, Faculty of Science & Technology, St. Augustine Campus



INTRODUCTION

According to the Environmental Protection Agency of The United States (2014), climate change refers to any significant change in the measures of climate lasting for an extended period of time. The Economic Commission for Latin America and the Caribbean (2013) released a paper entitled "An assessment of the economic and social impacts of climate change on the health sector in the Caribbean." It suggested that climate change affected the fundamental bases of good human health, which are clean air, safe drinking water, sufficient food and secure shelter. In their research, it was discovered that climate change is known to impact health through three dimensions; extreme heat, natural disasters, and infections.

The Pointe-a-Pierre Wildfowl Trust, founded in 1966, is an independent, environmental, non-governmental organization located within the Petrotrin compound in Pointe-a-Pierre, Trinidad. This organization is involved in research, breeding and translocation of endangered wetland birds into natural wildlife areas in Trinidad and Tobago. The organization also lobbies for improved environmental policies and promotes awareness of environmental issues through daily environmental education programmes.

This research problem was of particular interest to the Pointe-a-Pierre Wild Fowl Trust due to their ongoing passion for education and deep concern about climate change and its impacts on public health in Trinidad and Tobago. The Trust believed that this research project would be a good opportunity to observe how teenagers understand and think of climate change and, its effects on public health.

From the findings of this research, teenagers' awareness of climate change and its impact on public health will be assessed. This will allow for future plans to be made to increase their awareness of this issue.

HYPOTHESIS

Teenagers in Trinidad and Tobago are not fully aware of what climate change is and do not perceive it as a public health concern.

METHODOLOGY

A total of 30 questionnaires were distributed to visitors at the Wild Fowl Trust, between the ages of 12-18, of an average of 100 visitors who came to the organization daily. These questionnaires were self-administered, and contained 12 quantitative questions. Data results were then analyzed using Microsoft Excel. Secondary data were also collected via documentaries, internet articles and pamphlets, supplied by the Wild Fowl Trust.

RESULTS

Figure 1- Number of respondents having knowledge of climate change

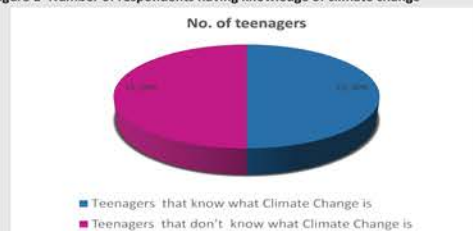


Table 1- Teenagers' awareness of the causes and effects of climate change.

Awareness of climate change causes and effects	Aware	Not Aware
Rapid spread of diseases such as dengue and malaria.	26.7	73.3
Rise in sea level leading to coastal erosion.	50.3	49.7
Increased vulnerability to natural disasters such as hurricanes, flooding and landslides.	56.7	43.3
Increase in number of cases of cardiovascular and respiratory diseases such as asthma.	16.7	83.3
Clearing vast amounts of trees in areas to construct houses and other buildings	53.3	46.7
Leaving light bulbs, laptop and phone chargers and other electrical appliances on or plugged in even when not in use.	33.3	66.7
Using products which contain chlorofluorocarbons	43.3	56.7
Importing and purchasing foreign products.	30	70

Effects Causes

Table 2- Respondents' answers to "True or False" questions based on climate change and its effects on public health

Effects of Climate Change on Public Health	True	False
Rapid spread of vector-borne diseases such as malaria, dengue and chikungunya	63.3	36.7
Increase in the amount of cardiovascular and respiratory diseases	50	50
Increase in the spread of leptospirosis from rats' urine to humans	40	60
Increase in the occurrence of natural disasters eg. hurricanes	86.7	13.3
Increase in the spread of waterborne diseases eg. cholera	56.7	43.3

DISCUSSION

The results of this research showed the following: only 50% of the participants actually knew the correct definition of climate change as shown in Figure 1, which implies that more should be done to increase teenagers' awareness of climate change.

From table 1, most respondents were more knowledgeable about the environmental effects of climate change than the health related effects, thus inferring that not enough has been done to link climate change to health. In linking climate change to public health, 60% of the respondents answered incorrectly in associating Leptospirosis with climate change, but 86.7% answered correctly in linking climate change to environmental issues. Once again, this suggests that there has been sufficient education of climate change having an effect on the environment but not on public health.

CONCLUSIONS

The results of the study were inconclusive, as 50% of the respondents, had knowledge of climate change. However, although 50% were aware of climate change, 77% of the teenagers did not believe that climate change affected public health. It was also found that 17% of the participants were under the impression that they do not contribute to climate change.

POLICY RECOMMENDATIONS

Based on the findings of the research, it is recommended that:-

- ❖ More emphasis be placed in the school curriculum on educating youth about the issue of climate change and its effects on public health
- ❖ The government implement more community projects to encourage youth's involvement in taking care of the environment
- ❖ The government grant environmental organizations subsidies to aid in expanding their youth education programmes
- ❖ Social media be utilised as an outreach tool to capture youth's interest in environmental issues such as climate change and its effects on public health

LIMITATIONS OF THE STUDY

- ❖ The limited sample size prevented the collection of additional data to give a more comprehensive result and accurately represent a wider portion of the population.
- ❖ The respondents surveyed only represented four of the eight districts in the country. Therefore, findings could not be generalized to represent the entire country.

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Perceived Impact The Weather has on Diet and Exercise Patterns of Cardiac Patients over the Past Ten Years

Heartbeat International of Trinidad & Tobago

Arlene Bharath & Kendall Bissessar

The Arthur Ashe Institute for Urban Health & The University of West Indies, Faculty of Medical Sciences, Trinidad & Tobago



INTRODUCTION

Heartbeat International of Trinidad and Tobago (HBITT) is a non-profit, charitable and humanitarian organization situated at the Eric Williams Medical Sciences Complex. It was founded to aid indigent individuals. Eligible candidates receive pacemakers and defibrillators free of cost. This project was chosen as a cardiac oriented intervention, selected to use the information obtained to educate heart patients and supply information that can be used by other researchers. Studies are centered around weather changes and how it impacts cardiac patients' diet and exercise habits.

Roberts (2012) and Lancet (2007) stated that the weather also affects the intake of liquids and foods such as watermelon and other vegetables. Watermelon is 90% water and is an excellent way to stay hydrated and keep cool. The weather also affects the exercise habits of individuals. Individuals who exercise outdoors would be less likely to do so if the weather is too hot or too rainy. The weather also affects the time that an individual may exercise such as very early in the morning or late in the evening, when the temperature is cooler.

The study investigates the impact of weather on diet and exercise habits of cardiac patients. These individuals have been HBITT patients for more than 10 years.

HYPOTHESIS

The weather has an impact on the diet and exercise patterns of cardiac patients.

METHODOLOGY

The study used a structured self-administered questionnaire to collect data from a pool of HBITT patients. This sample consisted of approximately 78 cardiac patients, age 14 and older, using non-probability sampling methods. Secondary information was obtained using previous studies taken from records of HBITT as well as various articles, magazines and internet sites. The data was also analyzed using excel spreadsheets.

RESULTS

When asked if they knew what a heart healthy diet consists of, 56% of individuals were unaware while 44% knew (see fig. 1). When asked if the weather affected the availability of food, 37% reported 'yes' while 60% said no (see fig.2). Change in weather affected the exercise regime of the 74% of individuals while 26% of individuals reported being undisturbed by the weather's effect on exercise regimen, as seen in figure 3. Individuals also reported drinking more liquids on a hot day versus a cold day (see fig. 4).

Figure 1 : Knowledge of heart healthy diet.



Figure 2 : Perceptions of the effect of weather on food availability.

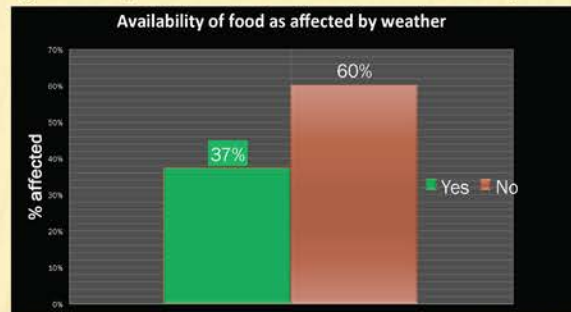


Figure 3: The effect of weather on exercise regimen

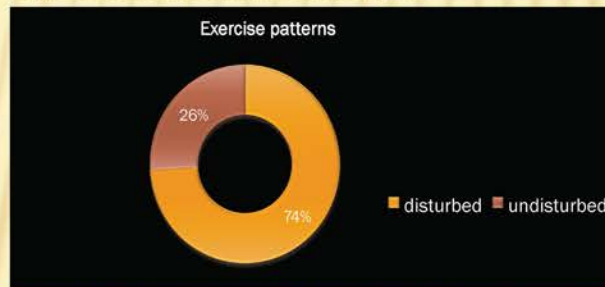
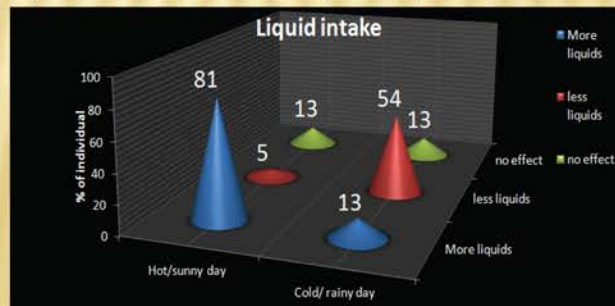


Figure 4: Liquid intake by individuals on hot or cold days.



DISCUSSION & CONCLUSION

According to Clarke (2013), the guidelines established by the U.S. Department of Agriculture, indicates that the average person's diet should contain mostly whole grains, fruits, vegetables and fat-free or low-fat dairy products. It's best to consume meats such as chicken and turkey, along with legumes, eggs and healthy nuts. It is also recommended that portion sizes be limited to control weight gain and reduce risks for cardiovascular.

Studies found that the availability of food was not affected by the weather. Although food was readily accessible, due to the lack of knowledge about the content of a healthy diet, individuals were hindered in maintaining a well balanced diet.

In agreement with Lancet (2007), the weather also impacts the exercise patterns of individuals, by determining the place, time of day and frequency one exercises. For instance, on hotter and rainy days, individuals preferred to not exercise outdoors. Their liquid intake also increased on hotter days versus rainy days, showing that weather affects the diet(liquids).

CONCLUSION

The weather did impact the diet (liquid and fruits with high water content) and exercise patterns of cardiac patients. Our study showed that the exercise patterns of individuals who did engage in exercise, were disturbed due to rainfall and/or intense heat.

According to McMichael (2006), the weather has impacted diet and exercise over the past ten years. An emerging broader approach addresses a wider spectrum of health risks due to the social, demographic, and economic disruptions of climate change.

RECOMMENDATIONS

- Establish indoor exercise facilities at reasonable membership costs. This is recommended because the heat and rainfall cannot deter an individual once inside an air conditioned building.
- Educate individuals who do not know what constitutes a healthy diet so that they could access healthy foods.
- Allow for the increased availability of liquids and 'cooling foods' such as watermelon and water by vendors, through importing food to have it available year round.

LIMITATIONS OF THE STUDY

1. Patients who were minors and those with speech impairments had to be represented by a relative or guardian during the administering of the questionnaire which resulted in more time allotted to complete the survey.
2. As patients were at the study area primarily for medical attention, many were ill and physically unable to participate in the study.

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PERCEPTION OF WATER QUALITY ISSUES AMONGST USERS OF THE ARIMA WATERSHED

Caribbean Youth Environment Network

Nadira Balgobin and Enzo Kinsiona



The Arthur Ashe Institute for Urban Health & The University of the West Indies, Faculty of Science and Technology, Trinidad & Tobago

INTRODUCTION

The Arima Valley is home to 31,301 residents and business owners, (Trinidad and Tobago Human Development Atlas, 2012), most of whom receive their supply of water from the Arima river. Pipe borne water is limited in certain areas of Arima; thus some residents and workers rely directly on water from rivers and springs for residential, commercial, religious and agricultural purposes (Perez 2012)

According to the Environmental Protection Agency (EPA), a "watershed" is the area of land where all of the water under it or draining from it goes into the same place (EPA 2012). There are four quarries and a Christophene agriculture estate located north of the Arima valley, within the watershed. According to Florida Keys National Marine Sanctuary, water quality describes the condition of the water, including chemical, physical, and biological characteristics, usually with respect to its suitability for a particular purpose such as drinking or swimming.

The presence of these quarries and agricultural estate, presents a challenge to the quality of water accessed by residents and business operators downstream. A study on environmental issues (Perez 2012) highlighted the negative impact of quarrying and agricultural activities on the Arima watershed. The results of the study indicated "increased amounts of total suspended solids in the river water" downstream of the quarries and agricultural estate. Furthermore, in a proposal submitted by the Trinidad & Tobago chapter of the Caribbean Youth Environment Network (CYEN-TT), the organization's formative data highlighted the beliefs of residents of the Arima area that "the high levels of dust, in the valley, due to quarrying activities, especially in the dry season, caused illnesses such as asthma and sinusitis".

CYEN-TT, a non-profit, voluntary organization aims to empower youth to address socio-economic and environmental issues impacting their communities. Working with youth, CYEN-TT aims to assist communities in preserving and conserving their natural resources. Any compromises to the quality of water in the Arima watershed, presents a threat to the sustainability of this resource and poses a public health challenge particularly to those relying on this water shed as their primary source of water. Researching water quality issues, focuses on the level of basic knowledge of water and perception of water quality within the Arima watershed, amongst its users. This research focused on the physical aspects of water quality (i.e taste, odour and colour).

HYPOTHESIS

H1: There is a low level of basic knowledge of water quality amongst users of the Arima watershed. H2: Impact on water quality is poorly perceived, among residents/workers within the Arima watershed.

METHODOLOGY

This study employed a survey methodology (structured) to investigate perception and knowledge of water quality among residents within the Arima watershed. The assessment tool, which was developed by the student research team and finalized by CYEN-TT consisted of 22 questions, both open and close-ended. The surveys were administered in person with the exception of a few, for which the research team piloted an electronic version, administered through the social media tool Facebook. Particular attention was taken to obtain informed consent from study participants, to clarify that researchers were independent of any institution other than CYEN-TT and to ensure that responses were confidential.

Using the sample size calculator (www.surveysystems.com), and based on the population size of Arima, the study sample size of 96 was determined with a Confidence Level of 95% and Confidence Interval of 10. Surveys were administered in the Arima Downtown area known as 'the dial', the hub-bub of commercial and transportation activity and Verdant Vale, a rural area, on the outskirts of Arima.

All data were collated and analyzed using Microsoft Excel, and then used to test the hypothesis. All ethical considerations inclusive of pre-approval and anonymity were observed.

RESULTS

Seventy-one surveys were administered with a participation rate of 89%. Thirty-seven (37) responses were obtained from the Arima Downtown community and seventeen (17) from the Verdant Vale Community. In addition nine (9) questionnaires were administered through social media (Facebook). Of the total number of respondents, 25 were male and 38 female. Of the 63 participants, 76% indicated that they received pipe-borne water, while the remaining 24% did not receive water via pipes. Of those receiving pipe-borne water (76%), the average number of times water was reported as available via pipe was 3 times per week.

To assess knowledge, researchers attempted to gauge: (i) participants knowledge of their water source; (ii) knowledge of key water terminology and (iii) knowledge of safe water treatment procedures. Based on the data collected, the largest number of respondents (47%) incorrectly selected WASA as the primary source of water. The correct response, rain was selected by 22% of the respondents. River accounted for 21% and other 10% of the remaining responses.

Results Continued

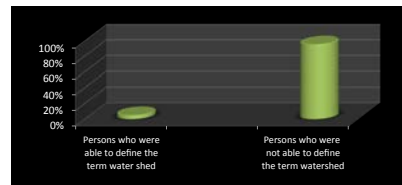


Fig 1. Illustrating Respondents who provided correct definition of the term watershed

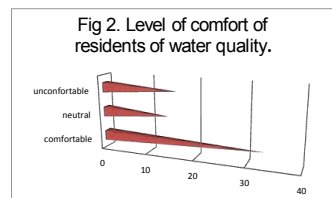


Fig 2. Level of comfort of residents of water quality.

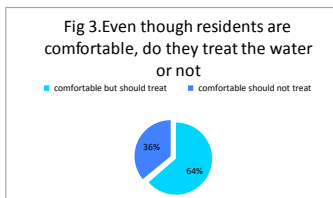


Fig 3. Even though residents are comfortable, do they treat the water or not

Figure 1 and 2 shows whether respondents that were comfortable, neutral or uncomfortable.

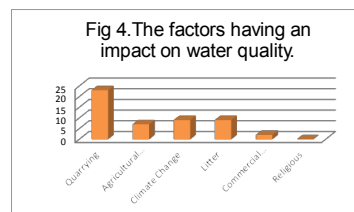


Fig 4. The factors having an impact on water quality.

Residents perception on which factor impacts the water quality available. (see fig 4)

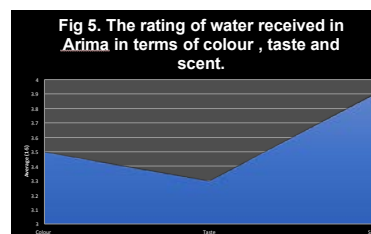


Fig 5. The rating of water received in Arima in terms of colour, taste and scent.

Figure 5 showed that the highest rating of the water quality was scent, followed by colour and taste being the least rated.

DISCUSSION

Figure 1 illustrated that 95% of the respondents incorrectly defined the term watershed therefore having little knowledge of the term watershed, while 5% of the respondents provided a correct definition of the term watershed.

As seen in figures 2 and 3 of the 63 respondents, the majority, (52%) indicated that they were comfortable or very comfortable using the water that they received for cooking or drinking. Of this 52%, the majority, (84%) indicated that despite being comfortable/very comfortable with the water, they believed that they should treat the water before drinking or using it for cooking. Only 36% of those who originally indicated being comfortable/very comfortable, believed that they did not have to treat the water before cooking/drinking.

As illustrated in figure 4, quarrying was identified by the largest number of respondents (37%) as the factor having the most significant impact on the quality of water they received. Litter (14%) and climate change (14%) were the second most frequently selected factors. Quarrying was the most significant impact on the water quality because there were no settling ponds in the area where quarrying was taking place. Settling ponds would have served to help prevent the river water from becoming contaminated.

Figure 5 shows that the majority of the residents perceived their water to be of a good standard in terms of clearness/lack of colour but during the rainy season they found the water to have a lot of 'slush' from the mountain sides. When the water supply was interrupted, upon its return, the water appeared to be 'orange-ish' in colour.

CONCLUSION

In conclusion, hypothesis 1, which stated there is a low level of basic knowledge of water quality amongst users of the Arima watershed was proven to be valid as residents provided little information on a basic, fundamental area as seen before with the definition of the term watershed. H2: Water quality is poorly perceived, among residents/workers within the Arima watershed was proven to be invalid, as many respondents identified quarrying as having the most significant impact on water quality which tied in with previous literature research.

RECOMMENDATIONS

- Greater effort is required by WASA to ensure their water quality reports are readily available to the general public to enhance knowledge and increase awareness of water quality issues.
- Programs such as the 'WASA Design and Build' which is geared towards promoting purification and conservation of water in respective secondary schools should be advertised in a greater way to promote youth involvement with current water issues.
- Stringent policies should be implemented and enforced upon National Quarries and Christophene farmers to prevent run-off of fertilizers and sediments contaminating the water supply and decreasing water quality. Also settling ponds will be useful in preventing water contamination in the rivers.

LIMITATIONS OF THE STUDY

The results of this study cannot be generalized since the target sample size of 96 (representative of the people residing in Arima) was not met. The study evaluated residents' perceptions and was not based around actual content.

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THE IMPACTS OF INDUSTRIAL OIL SPILLS ON HUMAN HEALTH AND THE ENVIRONMENT OF THE LA BREA COMMUNITY, TRINIDAD



Melyssa Amann, Faith Sookram & Anna Ramnarine

The Arthur Ashe Institute for Urban Health & The University of the West Indies, Faculty of Science & Technology



INTRODUCTION

According to Wikipedia (2014), oil spill can be defined as the release or leakage of liquid petroleum hydrocarbon into the environment. It usually seeps into adjacent water bodies often presenting a hazard to the affected societies and environments. The discharge of these chemical substances into the atmosphere can pose many threats to both humans and to the natural environment. Humans can acquire a number of health ailments as a result of oil spills and the environment is also adversely affected.

The oil spill which is the focal point of this research project transpired on December 17th 2013, in the Gulf of Paria along the west coast of Trinidad, at a refinery belonging to the national oil company Petrotrin. 7453 barrels of high sulphur fuel oil were released into the environment. This event drastically affected the La Brea community located on the south-western side of the island.

According to Lenntech (2014), exposure to sulphuric substances can have detrimental effects on human health including neurological effects and behavioural changes, disturbance of blood circulation, heart damage, effects on eyes and eyesight, reproductive failure, damage to immune systems, stomach and gastrointestinal disorder, damage to liver and kidney functions, hearing defects, disturbance of the hormonal metabolism, dermatological effects, suffocation and lung embolism. Along with these ailments, oil spills in general cause several adverse health conditions such as skin irritation, nausea and vomiting, respiratory problems, liver diseases and cancer.

An article by the Government Accountability Project (GAP) (2013) stated that the oil dispersant Corexit 9500A, which was used by Petrotrin to emulsify the crude oil during their clean up, poses severe threats to human health. Common side effects include blood in urine, heart palpitations, kidney damage, liver damage, migraines, multiple chemical sensitivity, neurological damage resulting in memory loss and rapid weight loss. Furthermore, according to the United States, Incident Command System, oil spills cause injury and death to countless marine animals and wildlife and can also cause long term damage to fragile ecosystems such as those within mangroves and coral reefs.

The Oil Workers' Trade Union, founded in 1937, seeks to ensure that working class individuals are awarded equal rights and fair treatment and that optimum safety conditions are maintained in the work environment. Moreover, this non-government organization has a keen interest in the social conditions within the community, which, in this instance is primarily healthcare. As a result, the organization has invested many resources into investigating of this disaster and its impacts.

HYPOTHESIS

The industrial oil spill has extensive negative impacts on the environment and health in La Brea, Trinidad.

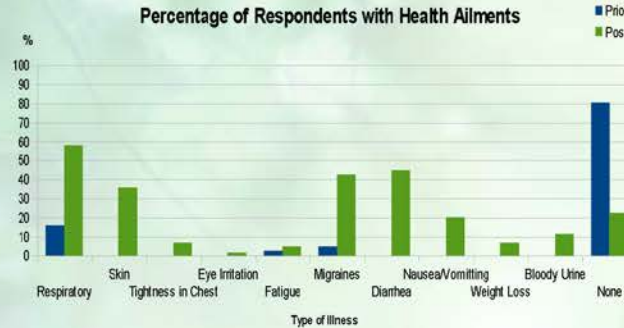
METHODOLOGY

The focus of this preliminary study was to determine the validity of the research hypothesis. The research team worked with the Oil Workers' Trade Union and carried out a quantitative study. A questionnaire was developed inclusive of sixteen closed-ended and one open-ended question. This open-ended question allowed respondents to provide specific additional detailed information.

This research included a pre-study which comprised of secondary data obtained from the internet, reports and newspapers. A session was then granted to the research team and Comrade Cole Keser (an OWTU representative) to obtain an endorsement and consent for distribution of the questionnaires.

Primary data were obtained using 45 questionnaires. Three sites at La Brea were selected and 15 questionnaires were administered at each site. Only one person per household was selected. These locations ensured a wide spread of data, and that the affected residents of the La Brea Community were properly represented. A codebook was developed to analyze the data using Microsoft Excel. Charts, graphs and illustrations were utilized to present the data.

RESULTS

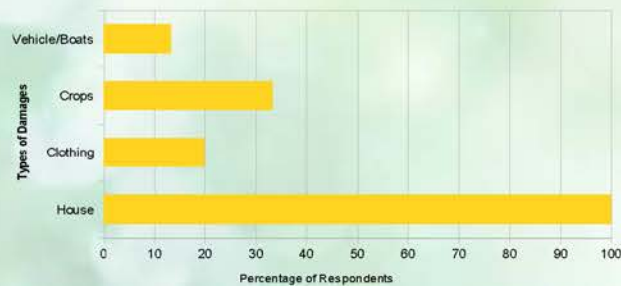


Types of Health Ailments



Types of Damages

Experienced by the Respondents



DISCUSSION AND CONCLUSION

HEALTH

Before the oil spill, 80% of the sample population reported no health problems and were considered healthy. Immediately after the spill, only 22.2% of the population reported themselves as still healthy, all of whom lived beyond 2 miles from the affected area. This means that the remaining 77.8% of the population, all of whom lived less than 2 miles away from the spill, reportedly acquired health problems or had worsened symptoms of ailments after the spill.

PROPERTY

100% of households in Coffee Beach had damages done to either their vehicle/boat(13.3%), plants/crops(33.3%), house(100%), and/or clothing(20%). Two households from other areas also reported having damages to their boats which were tied in the water at the time of the spill.

ENVIRONMENTAL STATE

48% of the sample population described the environment immediately after the spill as severely damaged. 51% described the present state as normal. Of the households less than 2 miles away from the spill, 76.7% of residents described the environment immediately after the spill as severely damaged. Presently, 43.3% said that the environment still hasn't returned to a normal or minimally damaged state.

POLICY RECOMMENDATIONS

Industrial plants should be constructed within a safe distance from residential areas to minimize disastrous events posing a threat to human health. Also, contingency plans established to clean up oil spills, should exclude harmful oil dispersants such as Corexit 9500A, which pose a threat to human and animal life.

LIMITATIONS OF THE STUDY

- A number of participants were illiterate, and thus the questionnaire had to be administered orally.
- Some residents of La Brea were hesitant to disclose information as the subject matter was sensitive to them.
- The participants' bias towards the issue at hand may have influenced their answers to the questions and their objectivity may have been compromised

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INTRODUCTION

Climate change, as defined by the ENSAA Technology states that, "Climate change is a long-term change in the statistical distribution of weather patterns over periods of time that range from decades to millions of years," (T.Kalligeris, 2011). By this definition, the effects following can cause problems in society to arise due to the uncustomary changes being experienced. The Global Humanitarian Forum (GHF) published a report estimating that 315,000 people die due to climate change every year, and they predict this will rise to half a million by the year 2030.

According to Center for Climate and energy solutions, a vector borne disease is, "A disease that results from an infection transmitted to humans and other animals by blood-feeding arthropods, such as mosquitoes, ticks, and fleas. Examples of vector-borne diseases include Dengue fever, viral encephalitis, Lyme disease, and malaria," (solutions, n.d.).

Trinidad and Tobago, experiences two seasons, a dry season and a rainy season. Increased rainfall due to climate change, allows more breeding sites and increased size of vector population (Sci Dev Net, 2014). There is increased vector survival due to increased humidity and heavy rain can synchronise vector host-seeking and virus transmission. In another light however, breeding sites may also be washed away by the heavy rainfalls. As a result of these increased opportunities for water build up, there is in turn an opportunity for mosquitoes to breed. This also makes available a chance for an increase in the spread of mosquito-borne diseases.

An article published in 2010 by the Trinidad and Tobago News Blog stated that at that time, there were approximately 600 clinical cases of Dengue fever caused by the Aedes aegypti mosquito, and approximately 21 cases in Tobago. Few deaths have also followed this disease, more so in young children. There has also been a recent outbreak of a new mosquito-borne disease, Chikungunya. There have been just over 5 reported cases in Trinidad since July 24th.

It is therefore necessary to get an in depth understanding of the correlation between intense rainfall and the vector-borne diseases transmitted by mosquitoes, as the problem currently exists. This research therefore aims at identifying the correlation of intense rainfalls and vector borne diseases.



Map showing areas which are prone to breeding mosquitoes in Southwest Tobago.

HYPOTHESIS

Intense rainfall due to climate change increases the opportunities for breeding grounds for mosquitoes, which may in turn increase the chances of the spread of mosquito-borne diseases.

METHODOLOGY

The primary data were collected using quantitative method, participant observation and map analysis. The questionnaire was administered to residents and business personnel of Southwest, Tobago. The population at the southwest district is approximately 20,000 residents and the sample size was 30 respondents. The questionnaire consisted of 17 questions, and by using a map, the respondents were able to identify locations where they have seen habitats of mosquitoes that could spread vector-borne diseases. The secondary sources included scholarly articles, and ArcGIS mapping software program.

RESULTS

Of the 30 questionnaire respondents, 44% were males and 56% were females. 50% of the respondents fell between the age category of 15-35; 33% of the respondents were within the age range of 36-50 and 16% of the respondents were 50 years or over. 50% of the respondents studied up to a tertiary level of education, while 16% of the respondents completed studies at the secondary level.

In figure 1, our findings revealed that 43% of the questionnaire respondents perceived that this year had a more intensified rainy season than past years, while 39% of the participants did not agree with this. The remaining 18%, were unaware of whether a change in intensity really occurred. Although the larger population stated that they observed an intensification of this year's rainy season in comparison to the last, it is perceived that changes were not very prominent on the basis that 39% did not agree, and that 18% were totally unaware. This implies that the changes were not drastic or worth observation by respondents.

Of the 43% of the respondents who observed a more intense rainy season this year, in comparison to last year, they were then asked to clarify if as a result of this, they also observed more breeding grounds for mosquitoes. 70% of the respondents said yes. 16% reported that they did not observe this, while 14% were unaware of whether the rainfall intensity increases the changes for mosquito breeding sites. It was understood, that they had this perception by basis of observation, that is, seeing more mosquitoes in their residential area present this rainy season.

Figure 3 displays what changes were observed this rainy season. 53% of respondents believed that there were heavier rains, 27% observed increased frequency of rainstorms; and 20% of these respondents believed that the rain fell for longer periods of time. This was each respondent's personal observations.

Fig 1: Perception of more intense rainfall, occurring now compared to 1 year ago.

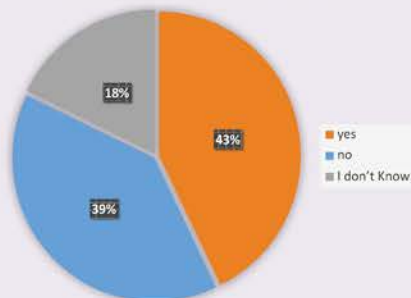


Figure 1. Shows the respondents opinion of the intensity of rainfall this rainy season compared to the last rainy season.

Fig 2: The opinion of increased breeding grounds for mosquitoes.

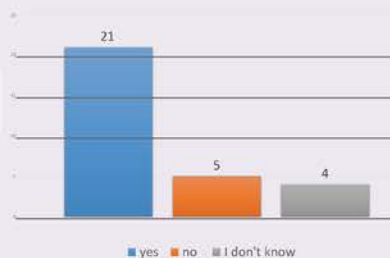


Figure 2. Shows the respondents opinion as to whether they have seen more opportunities for mosquito breeding grounds.

Fig 3: Respondents description of rainfall presently.

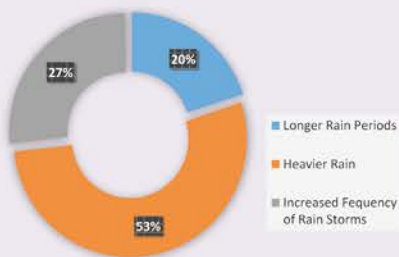


Figure 3 Shows respondents description of rainfall presently.

DISCUSSION

Figure 1, aims at showing the perception of more intense rainfall occurring now, in Southwest, Tobago, in comparison to one year ago. It shows that 43% of the respondents observed a greater intensity this rainy season in comparison to last year. Considering that 39% did not agree, and 18% were unaware of any changes, it may be said that climate change has not greatly impacted the area of Southwest, Tobago from last year to present.

Of the 43% of respondents who agreed that the rainy season intensified, we went on to ask if they saw more breeding ground opportunities as a result of this observation. Figure 2, shows that 21 of 30, (70% of the respondents) noted that there was an increase in opportunities for mosquitoes to breed, due to climate change resulting in an observed intensified rainfall. The secondary research findings stated, "As a result of heavy rainfall, flooding may occur which also provides breeding grounds for vectors indirectly." This shows an agreement with the statistics observed from the questionnaire, as well as a correlation between figure 2 and figure 3. Figure 3, shows that 53% of the respondents agreed that they have noticed heavier rainfalls, the reason being that these respondents may have noticed the impact of heavy rainfalls in their village. The 27% who noted 'increased frequency of rain storms' may have noticed the rain falling frequently within a week, while 20% of the respondents noted 'longer rain periods'.

The secondary sources also stated, "inter-annual and inter-decadal climate variability have a direct influence on the epidemiology of vector borne diseases." In the general perception of this study, we have noted that the respondents were aware of mosquito borne diseases and how mosquitoes breed; therefore, based on the findings of the questionnaire administered to the respondents of Southwest, Tobago, the respondents have recommended that the community should have clean-ups and clear drains, regular patrols in the community by the environmental HEALTH personnel and regular spraying. These responses were given in light of mitigating the impacts of mosquitoes.

CONCLUSION

Based on the findings of this study, the intense rainfall that caused areas in southwest Tobago to be flooded because of the poor drainage system, will increase the breeding grounds of mosquitoes, thus increasing the mosquito population. With an increased mosquito population, it will make the mosquito borne disease morbidity rate higher. The hypothesis was therefore proven.

RECOMMENDATIONS

- Residents should spray surroundings regularly to prevent mosquitoes which may carry diseases in their area.
- Drains should be clean and cleared of bush and debris so that water can continue flowing, thus preventing mosquitoes from breeding as there will be no still waters (areas identified on map).
- Have campaigns in communities, schools or villages to inform the public about mosquito-borne diseases and proper mitigation methods.
- Cover or remove any open containers from the area.

LIMITATIONS OF THE STUDY

- The target group, to which the research team distributed the questionnaires was not very knowledgeable about the research topic.
- Getting willing questionnaire participants to respond to the questionnaire was challenging.

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BHDC and Community Engagement Core

Ruth C. Browne, Sc.D
Principal Investigator

Moro Salifu, MD
Principal Investigator

Marilyn Fraser-White, MD
Director of Community
Engagement Core

Michael Joseph, Ph.D
Co-Director, Community
Engagement Core

Nicole Primus, MPA
Education Coordinator

Humberto Brown, MA
Seminar Director

Mary Valmont, Ph.D
Associate Director,
Health Science Education

Pamela Straker, Ph.D
Project Coordinator

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Arthur Ashe Institute for Urban Health 450 Clarkson Avenue Brooklyn NY 11203 www.arthurasheinstitute.org