**Needs Statement**

According to data released by the American Heart Association in 20081, approximately 7,000,000 individuals older than 20 years, have had a stroke. It is a leading cause of disability and death in the United States. Strokes can be divided into two categories, hemorrhagic or ischemic, both of which limit blood supply to certain areas of the brain impairing its ability to receive oxygen and leading to cell death1. The area of the brain affected determines which impairments will follow for the individual. The impairments can affect sensation, motor ability, speech, perception, proprioception, balance, gait, strength and range of motion.10

Lifestyle choices significantly impact one’s risk for stroke. Since lifestyle choices develop over many years, they typically become habit and can lead to a slow, building threat for development of hypertension, hardened and blocked arteries, and other predisposing factors for strokes. Some of these potentially harmful modifiable risk factors include smoking, excessive alcohol consumption, drug abuse, sedentary lifestyle, poor diet, high cholesterol, atrial fibrillation, diabetes, and obesity.2 The non-modifiable factors are age, family history, gender, race, and patent foramen ovale (congenital hole in the heart).2

One population that is often not targeted in stroke education efforts is adolescents. According to a USA Today article6, the CDC has reported the growing incidence of stroke in younger individuals. The number of strokes in those aged 15 to 44 has increased drastically over the last 10 years. According to Dr. Mary George, a CDC medical officer, “we really need to encourage our young people to lead healthy lifestyles from the time they are very young. Stroke is largely preventable and eating a healthy diet, getting regular physical activity, and avoiding tobacco and alcohol abuse can go a long way.”6 This new information makes it more important than ever to educate our young people on stroke and its detrimental effects.

Additionally, stroke appreciably affects minority populations and subsequently those of low income and education. The risk for first-time stroke incidence in African Americans are almost twice that of Caucasians.1 Furthermore, individuals of Hispanic descent have a higher risk for developing risk factors associated with stroke than whites. They have a higher incidence of hypertension, hypercholesterolemia, stroke and heart attack. When compared to Caucasians, Hispanics and Blacks had a significantly higher incidence of diabetes.3 A study conducted by Pathak and Sloan found a higher incidence of obesity, diagnosed hypertension or drug abuse among blacks.4 The presence of these risk factors is widely known to be linked to lower income levels which are often also linked to lower education levels. In an article published in US news, African ancestry and genetics have less to do with hypertension prevention than education level does.5 There is a significant correlation between low education levels and the presence of hypertension in blacks with each year of education showing a 0.51 mmHg decrease in blood pressure.5 This finding is an encouraging one, suggesting that race actually has less impact on the risk factors for stroke and by increasing access to stroke education in adolescent minority populations could alter many of these modifiable risk factors at a young age, influencing early lifestyle choices.

As noted above an important population to consider for stroke education is adolescents. One of the best ways to reach these adolescents is through high schools. More specifically, high school sophomores, who are usually around ages 15 and 16. They are at an impressionable age, where influence is highly malleable, and fall in the middle of the high school age spectrum. Oftentimes stroke pathology, risk factors, and effects are not introduced until university-level education. Unfortunately, many minority high school students will not attend college for various reasons including limited funds, low primary education status and possibly apathy. By introducing these concepts early on in high school, we increase our ability to reach young people with a message that may not reach them otherwise. Based upon the 2009-2010 demographics of Durham County Public Schools there are over 18,000 African American students within the school system out of an estimated 35,784 students.11  This large minority representation within the county’s public schools gives an opportunity for early intervention for stroke within all high school sophomores in Durham County. By targeting high school sophomores for stroke education, the initiative will obtain a representative sample of a high school population on a larger scale, and allowing all eligible students to participate in the program.

As an educational tool, documentaries are becoming more of a mainstream product, glorified by advertisement and thrilling personal accounts of experiences across the spectrum. Many of today’s primetime broadcasting channels have adopted the “mockumentary” as a way for accounting for the lives of fictional characters with small interview sound bits. For a typical high school student, a documentary could represent something very relevant and relatable, where ordinary people share their views on every day happenings.

**Background**

Furthermore, documentaries have been shown to impact social change. Films such as *Supersize Me*, *Sicko*, and *An Inconvenient Truth*, all use varying logical, emotional, and scare tactics to encourage behavioral change. The film *Supersize Me* particularly raised a great deal of awareness towards the unhealthy content of fast food and in one way or another caused the public to become more aware of the effects of unhealthy eating. In a study conducted by Cottone and Byrd-Bredbenner,12 researchers explored the effects of the film on young adults (ages 18 to 26). The experimental group scored significantly higher on knowledge, stage of change, and consciousness raising as compared to the experimental group.12

Despite the popular use of documentaries as an educational tool, there are few that target high school students. However, evidence has shown that implementation of classroom based health education initiatives have shown increases in knowledge base in children and adolescents. Killen et al9 conducted a study regarding the implementation of a cardiovascular disease risk reduction for tenth graders. The program consisted of 20 classroom sessions 50 minutes each with each student carrying out a self-change project to address the lifestyle factors that lead to cardiovascular disease. This project had encouraging short-term effects, though long term effects were not measured.8 Another program was successful with third and fourth grade students in North Carolina to educate them on heart healthy foods, dangers of smoking, and regular physical activity. Short-term improvements were seen in cholesterol levels and skin fold tests, higher knowledge about cardiovascular health, and decreased blood pressures. The study concluded that classroom-based education on cardiovascular health was more beneficial than targeting only high-risk groups.9 Unfortunately, both studies lack the long-term follow-up that would gauge effectiveness and retention.

Another study by Das et al found that there was an overall poor knowledge in both the general public and stroke survivors of the risk factors and warning signs of stroke. Both groups suggested written educational materials, audiovisual, and community surveys to increase general knowledge of stroke.7 Thus, high school students of all races, ethnicities and levels of risk could benefit from stroke education.

With the existing knowledge of racial disparities that exist with stroke incidence, the impact that early, preventative intervention can have, and the impact of documentaries as a tool for social and behavioral change, this project will aim to engage adolescents in the fight against stroke. Using the health beliefs model, researchers will target modification of current perceived risk and perceived benefit of intervention of at-risk teenagers.13 With knowledge-equipped teens, prevention can start at an early generation, and possibly trickle up to older generations to ignite widespread change.

**Objectives**

* The initiative will target all high school sophomores in at least 8 out of 12 Durham County Public Schools to stroke education in April-May 2013. It will take place over the course of 2 months, revealing the documentary to one school per week. A control group will consist of the remaining 4 high schools in Durham County.
* The assembly will aim to encourage high school sophomores to educate their families on pathology and risk factors of stroke as well as basic medical management.
* Prior to taking the test of knowledge, students will receive a survey in which they rate their likeliness to educate their families about stroke and rate the effectiveness of the program. Students will rate this survey with a Likert Scale of Most Likely to Least Likely for willingness to share information with parents or guardians, and Most Effective to Least Effective for questions regarding the effectiveness of the program. A 70% effectiveness rating will deem the program effective as perceived by students. A 70% willingness to share with parents or guardians will deem the program effective in passing the message along to a larger population.
* After the question and answer session students will return to their classrooms and receive a 40 question multiple-choice test of knowledge based upon the information received during the session.
* Overall 70-80% of students will pass the test of knowledge (with a 70% passing grade) and will be implemented to all high school students in Durham County Public Schools.
* A 2-year follow-up test on knowledge and a health status survey will be conducted in the same schools with the students as high-school seniors to assess retention and global health rating. A passing grade for the knowledge test will be a score of 70%.

**Methods**

The design of this intervention will be a cohort study with a control group without intervention for comparative purposes. This initiative will firstly aim to create and display an informative documentary on the risk factors of stroke, personal accounts from family members and persons with previous stroke, and basic medical management in the instance of stroke. This documentary will be shown to raise awareness and knowledge in high school sophomores about stroke along with a team of medical professionals consisting of a physician, radiologist, physical therapist, occupational therapist and speech therapist. After the viewing of this video a question and answer session will be held with the students and medical team to clarify and address more specific scopes of practice. The assembly and documentary viewing will take place in assembly rooms of Durham County Public Schools. Once the documentary has been viewed and questions have been addressed, the students will be tested on knowledge to determine retention of the information and surveyed to assess willingness to pass information along to family members The initiative will also provide an option for parents to receive contact information for further educational opportunities. A 2-year follow-up test on knowledge will be conducted in the same schools with the students as high-school seniors to assess retention. If this program is not successful in meeting its objectives, considerations will be made for revising the program to implement on a larger scale.

**Evaluation**

*Assessment*

Prior to documentary development, students will receive a short survey to investigate perceived risk and perceived benefit of intervention of stroke. This will help establish a baseline for high school sophomores to determine the necessary content for the documentary.

After the assembly presentation, the assessment will consist of student surveys to predict willingness to convey the learned information to parents or guardians of students involved and effectiveness of the documentary presentation and question and answer session. Students will then receive a test on knowledge after the documentary presentation, consisting of 40 multiple-choice questions. Students must receive a minimum grade of 70% to pass. 70-80% passing rate will consider this program a success.

As discussed above, a two-year follow-up will be conducted when the students are high school seniors. The same test on knowledge will be administered along with a global health rating survey to assess eating habits, recreational activities, tobacco-use, and alcohol use. The survey will be anonymous to protect privacy of students.

*Limitations*

There are several limitations to this proposal to consider. The control group consisting of 4 high schools does not represent an equal amount of students as compared to the intervention group. Also, there is not a true way of enforcing attendance of students who may be absent the day of assembly despite the fact that it is a mandatory assembly. Unfortunately the initiative may not be able to alter perceived risk based on students’ unreceptiveness to the message. This could be based upon general apathy or current family history or home situation. There are many factors overall that could lead to an unreceptive subpopulation within the high school sophomores exposed to the information. Though the initiative will aim for an appropriate education level of a high school sophomore, there may be some who are not educationally prepared for the information, and may not understand that material. By not reaching the complete sample of sophomores the results could be skewed to those who willingly attended school that day. A way to circumvent this could be to wait to inform students of the assembly till the day of the presentation.

*Relevance*

 The findings from this study will determine whether or not the message has reached high school sophomores in Durham County Public Schools. It will also determine whether high school sophomores are likely to “pay it forward” and give this information to their families. Depending on this program’s success, it could be highly appropriate to use for all high school students. High school is an important time to introduce these health concepts. As discussed above, with the early adoption of unhealthy habits early prevention measures have been shown to impact health choices in children and adolescents. This program could even be extended to younger ages, with some modifications for age-appropriate information and documentary formation. By educating our young people about a highly relevant health issue of today, we can formulate a prevention driven generation that strives to stay informed and works to protect the older generations.

**Conclusion**

Historically, young people have often been the driving force for social change. By working towards removing racial disparities in education of young people, health education can become more uniform, young people will recognize perceived risk and perceived benefit of intervention.

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