



Center for Clinical and  
Translational Science

**18<sup>th</sup> Annual CCTS Spring Conference**

**Translating Equity into Action**

**Frederick Douglass High School  
Students Poster Session**

**Monday, March 27, 2023  
10:00 – 11:00am**

**Abstract Book**

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**Frederick Douglass High School Poster Session**

**Poster Presentation 201**

Abstract Title: **Breast Cancer**

Author(s): E. M. Anderson, Biomedical Sciences Pathway, Frederick Douglass High School  
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**Abstract:** The purpose of this experiment is to achieve a better understanding of breast cancer prevalence at a state, national, and global level. Additional purposes include researching treatments, future implications, and layout diagnoses and known and suspected risk factors. We worked to highlight the descriptive epidemiology of breast cancer by finding credible and relevant sources that revolve around our topic. We drew information from cancer centers, statistics, graphics, maps, Ph.D. papers, clinics, and cancer organizations. From the results of our experiment, we discovered that both incidence and mortality are of the highest cancers in women, though mortality rates are on the decline. We also discovered that many environmental and behavioral factors can increase the risk of developing breast cancer- not just genetic and biological factors. The most universal factors found were being female, obese, mature in age, nulliparous, having a family or personal history of breast cancer, hormonal imbalances, and unusual development. The rates of breast cancer in Kentucky are unstable and have no trends but U.S. and global rates support each other. Breast cancer technologies continue to advance, but the latest include 3-D mammography/breast tomosynthesis.

Supported by: Frederick Douglass High School Biomedical Sciences (BMS) Pathway

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**Poster Presentation 202**

Abstract Title: **Renal Cancer**

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Davaun Hart, Biomedical Sciences Pathway, Frederick Douglass High School

**Abstract:** The purpose of this project is to find a deeper understanding of how renal cancer impacts human health globally. The research was conducted by focusing on how renal cancer is detected, diagnosed, and treated. By focusing on statistics, who is affected and where it is affecting people was discovered. Pathologists have identified more than 30 types of renal cancer with renal cell carcinoma being the most common type of renal cancer with 9 out of 10 kidney tumors being this type. The most common symptom of renal cancer is blood in urine which is also known as hematuria. Men, African American, and Alaskan natives/ American indians are more likely to get renal cancer than women and other ethnicities. The most common sites of metastasis are the lungs, brain, and bones. Risk factors present through smoking, obesity, ethnicity, being male, pollutants, and having certain inherited syndromes. If the renal cancer is inherited it has an autosomal dominant mode of inheritance in families affected. This cancer has a relatively low mortality rate at 3 per 100,000 people in the United States but it is on the rise.

Supported by: Frederick Douglass High School Biomedical Sciences (BMS) Pathway

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**Poster Presentation 203**

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Abstract Title: **Study of Leukemia: The Treatment, Risk Factors, Types, Symptoms, Screenings, Mortality Rates, Prevalence, and Incidence**

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**Abstract:** Leukemia is a common type of cancer that affects the function of white blood cells (leukocytes). A mutation often occurs in bone marrow cells which alter the function of leukocytes. Normal routine screening cannot detect leukemia. Therefore, it is difficult to detect leukemia in its early stages. This study broadens the awareness of leukemia's effects. Research was conducted through reliable sources (studies, diagrams) to compose a poster for a more in depth understanding of leukemia. The poster details how leukemia affects the human body. The poster explores the types of leukemia, mortality rates, incidence, and prevalence rates (KY, US, Global), available treatments, and overall risk factors. Leukemia can affect any person, however is more prevalent in men and Caucasians. It affects leukocytes, platelets, and lymphocytes' growth and development. It is usually due to a mutation in an individual's genetics, exposure to benzene, or smoking. The altered leukocytes do not function properly causing bone and joint pain, excessive bleeding, poor clotting, and infection. Leukemia cannot be detected in routine screenings, only with a biopsy. There is no cure for leukemia, but treatment options exist: chemotherapy, immunotherapy, radiation therapy, targeted therapy, hematopoietic cell transplant, and chimeric antigen receptor T-cell therapy.

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**Poster Presentation 205**

Abstract Title: **Non-Hodgkin's Lymphoma**

Author(s): C. Craig, Biomedical Sciences Pathway, Frederick Douglass High School;  
T. Meacham, Biomedical Sciences Pathway, Frederick Douglass High School;  
E. Loza, Biomedical Sciences Pathway, Frederick Douglass High School

**Abstract:** Non-Hodgkin's Lymphoma (NHL) is severe cancer affecting the lymphatic system, with the ability to spread discreetly throughout the body. NHL is prevalent in developed countries including the United States, with Kentucky being one of the most prevalent states. This research and presentation were performed over Non-Hodgkin's Lymphoma because of its high prevalence and mortality in Kentucky and the US. Research completed over NHL was accomplished using recent and credible sources to ensure accurate data. Research was focused around the statistics about Non-Hodgkin's Lymphoma regarding its incidence, prevalence, mortality, and biological factors. Around the world, developed, first-world countries such as the US and Australia, have higher incidence rates, while developing countries, such as Peru and Egypt, have higher mortality rates. Within the United States, eastern states, including Kentucky, have higher incidence and mortality rates. Biological factors including gender, age, and race also played a role. The incidence of NHL is higher in men compared to women. Women also have higher rates of responsiveness to treatments, leading to a lower mortality rate. Regarding age, older individuals have a higher average incidence. Race also plays a role in the development of NHL as it is more frequent amongst white people due to their exposure to certain illnesses associated with Non-Hodgkin's Lymphoma. Overall, NHL is a serious cancer affecting many different types of people, so research and education are necessary in order to reduce its effects on the world population.

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**Poster Presentation 207**

Abstract Title: **Renal Cancer**

Author(s): B. R. Torrez, Biomedical Sciences Pathway, Frederick Douglass High School  
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M. S. Robinson, Biomedical Sciences Pathway, Frederick Douglass High School  
N. T. Byron, Biomedical Sciences Pathway, Frederick Douglass High School

**Abstract:** The purpose of this literature review is to inform people of renal cancer and the impact it has on various populations. This research was conducted by using search engines to find trustworthy sources to get reliable information. This literature review discusses general information regarding renal cancer including the types of renal cancer, risk factors associated with developing renal cancer, and diagnostic tools. A more in depth description of renal cancer is provided that discusses the incidence and mortality rate of renal cancer on a state (Kentucky), national, and global level. In addition to this, the incidence and mortality rate of renal cancer based on ethnicity and gender is also evaluated. Finally, various treatment options and possible future treatment options are discussed. The research conducted led to the conclusion that America is greatly affected by renal cancer compared to other parts of the world, with the southern states specifically being greatly affected. There are various treatment options available, however they don't always help cure renal cancer. A final conclusion can be made that renal cancer is a more deadly cancer compared to other cancers, and better treatments are needed to help lower the deadly consequences associated with renal cancer.

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**Poster Presentation 209**

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Abstract Title: **Endometrial Cancer: The Overview and its Effects on Women**

Author(s): S. J. Kemper, Biomedical Sciences Pathway, Frederick Douglass High School  
J. Wolfe, Biomedical Sciences Pathway, Frederick Douglass High School  
L. Loutete, Biomedical Sciences Pathway, Frederick Douglass High School

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**Abstract:** The purpose of this project is to gain knowledge and to inform others of how endometrial cancer affects different populations around the world as well as specific groups of women. The research was conducted using peer reviews and reliable sources to give accurate information on who it affects, how it affects different body systems, and how to help treat it. Endometrial cancer only affects women, black women in particular. It usually occurs during post-menopause and only 2-14% of women during menopause get endometrial cancer. Factors that increase the likelihood of endometrial cancer include obesity and metabolic syndrome, and just taking estrogen alone. Symptoms of endometrial cancer include unusual vaginal bleeding, spotting during post menopause and thin white clear vaginal discharge, and some pelvic pain. Some tests to diagnose include examining the endometrium, pelvic exams, transvaginal ultrasounds, and a hysteroscopy. It was found that Kentucky has one of the lower mortality rates in America with endometrial cancer. Still, America was found to be on the higher end compared to other countries. With these rates there are also many options for treatment for endometrial cancer, examples include, surgery, radiation, chemotherapy, hormone therapy, targeted therapy, and immunotherapy

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**Poster Presentation 211**

Abstract Title: **Breast Cancer**

Author(s): A. J. Lock, Biomedical Sciences Pathway, Frederick Douglass High School  
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S. Covey, Biomedical Sciences Pathway, Frederick Douglass High School

**Abstract:** This literature review was conducted to study the biostatistics of breast cancer. It presents the incidence and mortality of breast cancer; it also examines how these rates are affected by factors like location of residence and cancer type. Research seems to indicate that Europe has relatively high incidence, yet the highest mortality rates occur in island countries like Barbados and Fiji. For a more localized frame of reference, Kentucky's crude incidence tends to be higher in central Kentucky, with notable outliers including Henderson county and Knott county. However, breast cancer mortality rates tend to show the opposite of this trend, with mortality rates being higher in eastern Kentucky, and with more widely spread outliers. These trends can be attributed to higher population counties having more cases of breast cancer, and less populated counties experiencing higher rates of poverty. Mortality rates are consistently higher than average for triple-negative breast cancer and inflammatory breast cancer, regardless of location or region. Overall, location of residence and cancer type have significant impacts on both the incidence rates and mortality rates of breast cancer.

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**Poster Presentation 213**

Abstract Title: **Examining Incidence, Mortality, and Other Prevalent Statistics on Leukemia on Three Levels: State, Country, and World**

Author(s): Jonas Maggard, Biomedical Sciences (BMS) Pathway, Frederick Douglass  
Evan Neary, Biomedical Sciences (BMS) Pathway, Frederick Douglass  
Kristi Claire, Biomedical Sciences (BMS) Pathway, Frederick Douglass  
Charis Raglin, Biomedical Sciences (BMS) Pathway, Frederick Douglass

**Abstract:** Research was conducted with a goal to inform the uninformed about the incidence, prevalence, prognosis, treatment, biological factors, and mortality of Leukemia, cancer of the blood. Throughout the research of this disease, many current articles were reviewed and many scientific journals were examined to find relevant and credible data regarding Leukemia. Major prevalence in Kentucky was shown to be about 16.9 cases per 100,000 people (2019), prevalence in the US is 13.2 cases per 100,000 people (2019), and worldwide prevalence depends on the age range. Around the world, Leukemia makes up 32% of cancer in children ages 0-14, and 82% of leukemia cases are found in lower HDI areas. In terms of mortality, state-wide statistics show that there were 6.3 Leukemia deaths per 100,000 in KY, country-wide stats show a 5-year mortality rate of ALL to be 11% for people 20 and under, and a 5-year mortality rate of 60% for people 20 and older. Additionally, sub-saharan Africa is the only region in the world with decreasing cancer rates. Throughout the research process, other info was found, such as prevalence by race. For example, sources claim that black people have a smaller prevalence than white people, who have a smaller prevalence than hispanic people.

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**Poster Presentation 215**

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Abstract Title: **Lung Cancer: It's State, National, and Global Impacts**

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Author(s): A. Magsig, Biomedical Sciences Pathway, Frederick Douglass High School  
J. Victory, Biomedical Sciences Pathway, Frederick Douglass High School  
H. Chloe, Biomedical Sciences Pathway, Frederick Douglass High School

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**Abstract:** The purpose of this project is to develop a deeper understanding of lung cancer and how it affects different populations. All aspects of this cancer were investigated, including incidence, mortality, prevalence, diagnosis, and treatment. Research was conducted using relevant online sources such as articles and graphs. All of these parameters were evaluated on a state, national, and global level. What our group concluded from this research was that the state of Kentucky has the highest lung cancer incidence in the nation. Lung cancer is the second most common cancer worldwide and the main cause for the development of lung cancer is cigarette smoking.

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**Poster Presentation 217**

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Abstract Title: **Non- Hodgkin's Lymphoma: An Introduction to a Deadly Disease**

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Author(s): Jackson Smith, PLTW Medical Interventions, Frederick Douglass High School, KY  
Emily Arnemann, PLTW Medical Interventions, Frederick Douglass High School, KY  
Ariana McPherson, PLTW Medical Interventions, Frederick Douglass High School, KY  
Matthew Ramsey, PLTW Medical Interventions, Frederick Douglass High School, KY

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**Abstract:** Non-Hodgkin's Lymphoma (NHL) is a category of cancers that arises from the lymphocytes of the immune system. It is a deadly disease that has claimed the lives of many in the United States. Non-Hodgkin's lymphoma was originally discovered in the 20th century by Dr. Thomas Hodgkin's. Our purpose for beginning this research was to not only expand our knowledge of this disease, but to understand the effects it has on others in our community and around the world. This study is a literary review of Non-Hodgkin's Lymphoma, its effects, as well as current and potential treatment options available to the public. As it stands, Non-Hodgkin's Lymphoma is a relatively treatable disease with survival rates averaging to 64 percent nationally. Current treatments are limited and expensive, but new and developing treatments aim to provide a wider range of treatments for patients suffering from this disorder.

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**Poster Presentation 219**

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Abstract Title: **Stomach Cancer Project**

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Author(s): T. T. Newton, Biomedical Sciences Pathway, Frederick Douglass High School  
C. Hill, Biomedical Sciences Pathway, Frederick Douglass High School  
D. Jones, Biomedical Sciences Pathway, Frederick Douglass High School

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**Abstract:** This research was conducted to get further studies on the impact of stomach cancer on a state, national, and global scale. Using data from multiple medical literature, we found out how stomach cancer reacts to various factors. This includes how gender, age, race, and HDI rating all impact incidence and mortality in stomach cancer. This led us to find that there are environmental factors that can impact stomach cancer. For example, geography and large amounts of processed foods.

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**Poster Presentation 221**

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Abstract Title: **Thyroid Cancer**

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Author(s): Hinal Patel, Biomedical Sciences Pathway, Frederick Douglass High School  
Amelia Mays, Biomedical Sciences Pathway, Frederick Douglass High School  
Noah Jones, Biomedical Sciences Pathway, Frederick Douglass High School

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**Abstract:** Thyroid cancer has been on the rise globally especially in women. The purpose of our research was to analyze the different types of thyroid cancer causes and effects of them on humans. When doing the research we ensured to use reliable sources that were less than 10 years old, written by credible authors and organizations that had reliable data. There are 4 types of thyroid cancer that we based our research on: papillary, follicular, anaplastic and medullary thyroid cancer. We found in our research that there are two main types of cells in the thyroid gland: Follicular and C cells. These cells will grow out of control and crowd our normal cells in the thyroid glands. In our research we also found that thyroid cancer is more commonly found in women than men due to fluctuation of hormones in women. Genetics causing a person to have thyroid cancer is less than 5% with it mainly being familial medullary cancer that's likely to be obtained genetically in a person. In our research, the data we found showed that the cancer incidence in Ohio and Kentucky are around the same for both men and women. In conclusion thyroid cancer is the most prevalent endocrine cancer globally with women more likely to obtain thyroid cancer.

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**Poster Presentation 223**

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Abstract Title: **Prostate Cancer**

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Author(s): J. Hill, Biomedical Sciences Pathway, Frederick Douglass High School  
J. Fee, Biomedical Sciences Pathway, Frederick Douglass High School  
A. Rowe, Biomedical Sciences Pathway, Frederick Douglass High School

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**Abstract:** Our purpose is to expose the effects of the many different types of prostate cancer on the male population. When doing our research, we made sure to look into newer sources of information in order to obtain accurate data. We also made sure to use reliable sites written by trustworthy researchers who have relevance in the field. There are multiple types, but we based our research mainly on adenocarcinomas (comes from the gland cells in the prostate and the tubes). Sex and geography play a big role in the diagnosis of this cancer due to only men having prostates and prostate cancer being more common in North America, northwestern Europe, Australia, and on the Caribbean islands. With the wide range of areas with high rates of prostate cancer 13% of all cases are African American males.

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**Poster Presentation 225**

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Abstract Title: **Lung Cancer and the Effects on People in Kentucky**

Author(s): C. Gayne, Biomedical Sciences Pathway, Frederick Douglass High School  
A. Roberts, Biomedical Sciences Pathway, Frederick Douglass High School  
J. Robert, Biomedical Sciences Pathway, Frederick Douglass High School

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**Abstract:** Lung cancer is seen as a pressing issue in many communities, especially in Kentucky. In this project we collected findings based on research on the effects of lung cancer on a state, national, and global level. Among these findings, non-small cell lung cancer was found to be the most common and deadly type of lung cancer out of the four main types. Non-small cell lung cancer falls into three separate classifications being adenocarcinoma, large cell carcinoma, and squamous cell carcinoma. Also, inhaling certain materials puts people at an increased risk for developing lung cancer, like asbestos can lead to mesothelioma or smoking can lead to small cell lung cancer. In the statistics, it was found that males had both higher incidence and mortality compared to females. According to one of the studies, lung cancer has a higher mortality rate than the national average in the state of Kentucky. In conclusion, people who are around possible airborne cancer causing substances or other potential risk factors should get screened for lung cancer.

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**Poster Presentation 227**

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Abstract Title: **Pancreatic Cancer**

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Author(s): H. Z. Roy, Fredrick Douglass High School Biomed Student  
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A. F. Newton, Fredrick Douglass High School Biomed Student

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**Abstract:** This research aims to find the effect pancreatic cancer has on our local and global populations and find a way to solve the issue. This experiment was made using analysis from recent, credible sources from medical facilities such as John Hopkins Medicine, the American Cancer Society, and Kentucky Cancer Registry. The experiment focuses on pancreatic cancer diagnosis, burden and mortality, risks, and treatments for pancreatic cancer. We will hopefully find the issues causing pancreatic cancer in Kentucky using the experiment and research. The experiment and analysis can also help to show the effective treatments and help take advantage of them in the future.

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**Poster Presentation 229**

Abstract Title: **Impacts of Leukemia: Research on the Location and Effects of Leukemia on Human Health**

Author(s): J. R. Snyder, Biomedical Sciences Pathway, Frederick Douglass High School  
G. H. Needham, Biomedical Sciences Pathway, Frederick Douglass High School  
D. L. Kaono, Junior, Biomedical Sciences Pathway, Frederick Douglass High School

**Abstract:** The goal of this research project is to acquire knowledge regarding the incidence rates, mortality rates, treatments, prognosis, and risk factors of leukemia in target areas. Sources including but not limited to the CDC, Cancer Registry, Mayo Clinic, and the Lymphoma&Luekemia Society provided the necessary research to accomplish a well-rounded understanding of leukemia. There are a wide variety of leukemias, with the majority of cases being one of seven types. Kentucky's incidence and mortality rates for no specific type from 2019 were 16.5 and 7 (per every 100,000 people), respectively. Kentucky has the highest incidence rate nationwide. Research revealed that Down Syndrome was significantly linked to AML (Acute Myeloid Leukemia), while other known factors like previous radiation exposure, tobacco use, and Benzene increase the risk of developing some form of Leukemia. The most efficient treatment for this cancer would be a bone marrow transplant from a compatible donor, however there are other options available such as chemotherapy and targeted drug therapies. Conclusively, it can be determined that Leukemia prevalence and mortality is not linked to any one target area for a known reason. Additionally, the treatments and future direction for this cancer have significantly increased the survival rate for patients suffering from it.

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**Poster Presentation 231**

Abstract Title: **Bio-Statistical Analysis of Thyroid Cancer**

Author(s): B. C. Strehl, Frederick Douglass Biomedical Sciences Pathway, Lexington, KY;  
R. Baker, Frederick Douglass Biomedical Sciences Pathway, Lexington, KY;  
A. Palley, Frederick Douglass Biomedical Sciences Pathway, Lexington, KY

**Abstract:** The purpose of this poster is to find a deeper understanding of how thyroid cancer impacts our society. Research covered from patient, to practice, and beyond. How thyroid cancer is detected, diagnosed, treated, and statistics on who and where is affected was correlated and analyzed into a commentary visual. Thyroid cancer is the most common endocrine cancer with 5 types, papillary and follicular being the most common. A high incidence rate of 14.6 per populous size of 100,000, a 184% increase since 2012. Risk factors present as being female, exposure to radiation, genetic conditions/gene mutations, low iodine intake and lifestyle factors. With a very low mortality rate, thyroid cancer often occurs more in western/modernized nations due to a larger availability of testing. Due to this increase in availability, we are able to see the increases in incidence rates state and nationwide.

Supported by: Frederick Douglass Highschool Biomedical Sciences (BMS) Pathway

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**Poster Presentation 232**

Abstract Title: **Prostate Cancer**

Author(s): Erik Wolfe, Biomedical Sciences, Frederick Douglass High School  
Jackson Campbell, Biomedical Sciences, Frederick Douglass High School  
Katie Draper, Biomedical Sciences, Frederick Douglass High School

**Abstract:** The purpose in this project is to further our knowledge and understanding of Prostate Cancer and how it impacts different demographics around the world. This project was conducted by reviewing literature of credible and relevant resources from the year 2000 up to present day. This is so that all of the information on this project will be relevant and up to date. Some of the main points on this presentation are incidence, mortality, and prevalence of prostate cancer. Biological factors such as sex and age will also be evaluated. Prostate cancer is cancer that occurs in a gland in males. Sex becomes a vast factor in this cancer, as only men can be diagnosed with prostate cancer. More specifically, African American men over 50 are more likely to get prostate cancer. Prostate cancer is the second leading cause of cancer death in men. About 1 man in 41 will die of prostate cancer.

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