

Relationship Between Insurance Status and Diabetes Control: Common Complications of Type II Diabetes in African American Populations

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Abstract

The AllofUs is a nationwide program that aims to collect data from 1 million Americans to better understand the past, present and future of Americans as a whole. With this program, researchers are able to extract data in order to better understand a disease or how a particular group of people are affected by the various social determinants of health. For this project, there are two current aims - to look at how insurance type and Medicaid expansion affects type II diabetes rates on a state level. The other aim is to compare rates of disorders due to type II diabetes in African American populations compared to other ethnic groups in the country.

Research shows that there are more African Ameircans with type II diabetes in this country compared to other groups. It is also true that African American have higher rates of complications due to type II diabetes. Also, insurance can access the healthcare access that someone has in his or her community. We hope to use a statistical analysis to see if the AllofUs data shows a statistical significance between disorders due to type II diabetes in African American communities compared to other ethnic groups. We also want to see if there is statistical significance in states that accepted or denied Medicare expansion and the rates of type II diabetes in different states.

There are many limitations of this project. So far, we have only accessed level I data from AllofUs, the data that is readily available, however it lacks the specificity that we need. Once there is IRB approval and we have access to level II and III data from AllofUs, our perspective and object aims may change. Type II Diabetes and its complications is a very intricate issue, with many factors and types of disease progression. We want to ensure that we meet our project goals and that they remain clear, to avoid confounding variables or confusion with our project.




Background

- All of Us Research Program - Nationwide, Longitudinal Cohort aiming to build a diverse database that holds representative data exploring how biology, environment, and lifestyle impact certain populations’ health outcomes.
- According to the American Diabetes Association (ADA), the prevalence of diagnosed Type II Diabetes in US is 13.2% in African Americans vs 7.6% in non-Hispanic Whites.

- Precision Medicine: Public Health Initiative that grew out realization that patient care/ treatment isn’t always a “one size fits all” solution for all patients

- Type II Diabetes is a risk factor for numerous chronic complications, including several cancers





















Methods



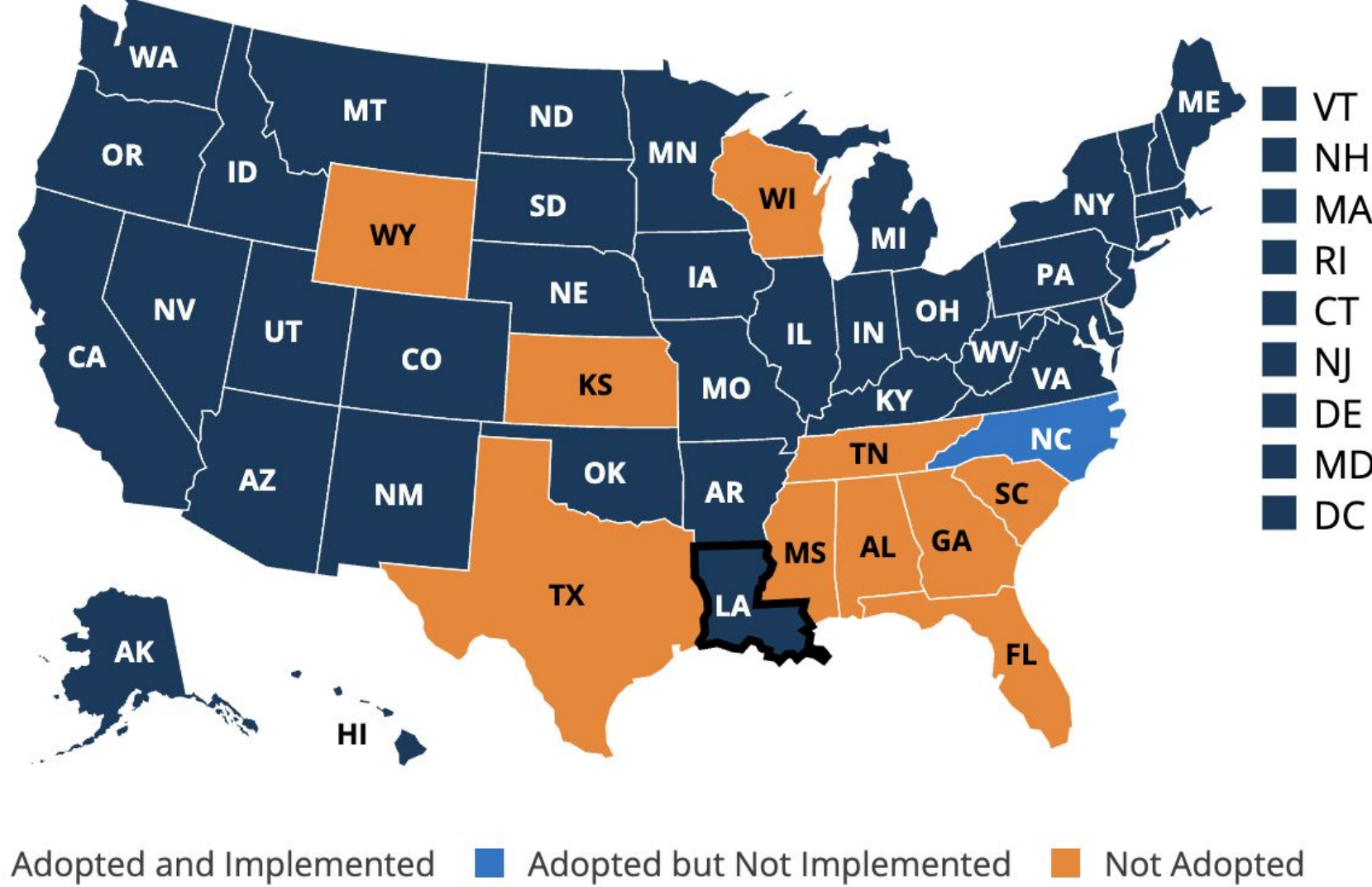
- using de-identified data points from All of Us database derived from participants surveys and perform a statistical analysis
- calculating how many participants has type II diabetes and categorize them by race, ethnicity, location, insurance, and education
- determine the relationship between these factors and how severe their diabetic complications are

Preliminary Findings

Since the AllofUS program aims to capture a comprehensive data on the American population, it is important that current data collected aligns with previous research finding. In a diabetes complications study conducted published in 2021, data showed that the most common disorders due to Type II Diabetes are Chronic Kidney Disease (CKD, at 37% of people with Type II Diabetes had CDK due to their Type II Diabetes), and Retinopathy (11.7%) [9]. When considering race, the study showed that for the individuals with retinopathy due to type II diabetes, about 39% of them were African American, and about 6.8 in every 1,000 African Americans had CKD [9]. Using the AllofUS data, there were similar findings regarding disease complications. The AllofUs data results reported that renal disorder due to type II diabetes was the second most common disorder at about 5%, after nervous system disorders due to type II diabetes at 6.32% of collected patient population[7].

7. Disorder of nervous system due to type 2 diabetes mellitus	16,100	6.32 %	  
Also Known As  Neurologic disorder associated with type 2 diabetes mellitus, Disorder of nervous system due to type ... See More			
8. Renal disorder due to type 2 diabetes mellitus	12,680	4.98 %	  
Also Known As  Kidney disorder associated with type 2 diabetes mellitus, Renal disorder due to type 2 diabetes mell... See More			
9. Acute hypoxemic respiratory failure	10,760	4.22 %	  
Also Known As  Acute type 1 respiratory failure, Acute type 1 respiratory failure, Acute hypoxemic respiratory fail... See More			
10. Peripheral neuropathy due to type 2 diabetes mellitus	10,160	3.99 %	  
Also Known As  Peripheral neuropathy with type 2 diabetes, Peripheral neuropathy due to type 2 diabetes mellitus (d... See More			
11. Chronic kidney disease due to type 2 diabetes mellitus	9,920	3.89 %	  
Also Known As  Chronic renal impairment due to type 2 diabetes mellitus, Diabetic chronic renal impairment due to t... See More			

Current Conclusions



■ Adopted and Implemented ■ Adopted but Not Implemented ■ Not Adopted

It is important to recognize various data analysis that could be derived from the AllofUS data. According to the Kaiser Family Foundation, about 50% of Americans receive their health insurance from an employer, while about 21% use Medicaid, and 14% are on Medicare [8]. Unfortunately on the AllofUs survey, insurance is defined as insured and uninsured. With the variability of insurance from a state and federal level, and variability from private to government-funded, it is important to be mindful of this variability and aware of the limitations when using AllofUs for information about insurance. There is also the need to have clarity in the results and avoid confounding variables when analyzing the type II diabetes complications within African American communities. However, there are more specific things that need defined. For example, while the diabetic retinopathy is considered a nervous system disorder (specifically a neurovascular disorder), this specification is not made on AllofUs. These are questions and concerns that must be considered moving forward with the project and when analyzing the Level II and III datasets from AllofUs [7]. Overall, there are many factors that must be considered as we continue to work on this project and create streamline goals to bring attention to type II diabetes and the implications that insurance can have on treatment, or how health outcomes differ for African Americans with this condition.

Discussion

Although we are currently limited in accessing Level II and III AllofUs data to answer our research questions, this type of clinical investigation research proves to be important and relevant to underserved populations. Type II Diabetes remains prevalent amongst the African American community compared to other racial/ethnic groups and it’s important to look at the social factors contributing to the disproportionate rates. Some major factors include location, access to health insurance, and type of coverage- all of which are factors that are not so easily changeable in people’s lives. We hope that by exploring the intersection between race, health insurance coverage, and the complications associated with Diabetes, future researchers and doctors are better equipped to provide effective treatment and long-term relief for groups disproportionately affected by Type II Diabetes.

Future Exploration

Barriers patients face in accessing Insurance

Barriers patients face addressing complications of disease

Barriers patients face in enrolling into AllofUS program

We hope to:

- Ensure that the AllofUS program consider all factors when collecting the population data as this could prove crucial to the goal of the program for instance the type of insurance individuals have and the coverage
- Bring awareness to the various barriers that patients face in trying to achieve the healthcare goals

Limitations

Data Collection Limitation

- Non-specific definitions for complications. These terms need to be defined by the team
- Undefined statistical analysis tool due to limitations to accessible data.
- Inferential statistics, chi-square tests, logistic regression, or other relevant methods. The statistical analysis will provide quantitative evidence to support the associations between variables and the severity of diabetic complications.

Patient Care Limitations

- Health insurance access doesn’t necessarily translate to better health outcomes. Patient adherence to medications and motivation to keep up with preventive medicine measures could affect outcome
- Confounding Factors that contribute to healthcare outcome including transportation, healthcare team, nutrition

Acknowledgements

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