

Medical School Inequity Analysis Proposal*

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Abstract—This paper presents an analysis of racial and ethnic inequities in medical school admissions, using datasets from the Association of AAMC to explore the barriers that minority groups may face in accessing medical education. By examining medical school applicants and matriculants by race, ethnicity, and state of legal residence, this project aims to identify patterns of disparity and assess efforts toward diversity in the medical profession. Additionally, the project will present findings through an interactive web-based dashboard, enabling stakeholders to explore the data in real-time. The ultimate goal is to inform and promote actionable insights that encourage equity in the medical school admissions process and ensure that the future physician workforce better reflects the U.S. patient population.

I. OBJECTIVE

In today's world, the role of doctors has become increasingly important. No longer do doctors solve the world's growing health needs, but they also research and explore to find new ways to cure others. According to the Center for Medicare and Medicaid Services [1], "U.S. health care spending grew 4.1 percent in 2022, reaching \$4.5 trillion or \$13,493 per person. As a share of the nation's Gross Domestic Product, health spending accounted for 17.3 percent." The importance of medicine today goes beyond the patient and has become a major player in the U.S. economy.

With such a big share in the economy, it is necessary that the major players in medicine, the doctors, represent patients from all backgrounds. Thus, it is the goal of this project to explore the racial inequities that exist in medical school admissions in order to inform readers on the potential barriers to entry that ethnic minorities face. Additionally, analysis of state information regarding ethnicities will be done to provide a comparison on states that are doing "well" and those that are not. Lastly, we intend to deliver this information via a web-based dashboard that will allow users to interact with and analyze the data whenever and wherever they want.

II. MOTIVATION

As researchers, we are motivated by the opportunity to provide valuable information that can provide change. We believe that making this information known will encourage steps to be made that ensures that the future of healthcare is a diverse and fair future.

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III. TERMINOLOGY

We will identify these important terms as described by AAMC[2].

- Applicant: A person who has applied to at least one U.S. MD-granting medical school through AMCAS and TMDSAS.
- Matriculant: A person who has applied to begin at an U.S.-MD granting medical school in a specific academic year and enroll in that academic year.
- State of Legal Residence: The self-reported state in which the applicant reports on their application that they reside.
- Race/Ethnicity: American Indian or Alaska Native; Asian; Black or African American; Hispanic or Latino; Middle Eastern or North African; Native Hawaiian or Pacific Islander; White; and Some other race or ethnicity.

IV. APPROACH

A. Questions

We propose three questions to be answered in this study:

- In this quickly expanding industry, what racial inequities are currently present in the medical school admission process?
- What are our doctors of tomorrow going to look like?
- Is there enough efforts in diversifying the doctor pool so that it accurately reflects the U.S. patient population?

It is our hope that through this project we will be able to answer at least one of the questions above. For those that we cannot answer, we intend to provide enough information so to inform the reader and provide them with the ability to answer the other questions.

B. Data

In order to answer the aforementioned questions, a thorough process will be done to analyze each piece of data.

We intend to study and analyze the available Association of American Medical Colleges (AAMC) datasets [2] regarding medical school admissions. A primary focus will be on those relating to race/ethnic and state information regarding applicants and matriculants. It is our hope that AAMC datasets will suffice in answering the three questions proposed. Below is a list of the AAMC datasets being used:

AAMC DATASETS

- Applicants to U.S. Medical Schools by Race/Ethnicity and State of Legal Residence

- Matriculants to U.S. Medical Schools by Race/Ethnicity and State of Legal Residence
- MCAT Scores and GPAs for Applicants and Matriculants to U.S. MD-Granting Medical Schools
- MCAT Scores and GPAs for Applicants and Matriculants to U.S. MD Granting Medical Schools by Race/Ethnicity
- MCAT Scores and GPAs for Applicants to U.S. MD-Granting Medical Schools by State of Legal Residence
- MCAT Scores and GPAs for Matriculants to U.S. MD-Granting Medical Schools by State of Legal Residence

In order to study the datasets above, we will primarily focus on the applicants and matriculants MCAT and GPA, with a greater emphasis on the "Total MCAT" score and none of the MCAT subsections. Applicants and matriculants are both being studied because it is important to analyze the total applicant pool.

Additionally, an analysis of the "Average GPA and MCAT Score for Every Medical School in the US" dataset by International Medical Aid [3] will be used to provide an understanding of each medical schools. This will allow us to make comparisons between a states racial equity and admissions rate and each in-state medical schools admission rate. This will allow us to inform what schools potentially need to do better based on scores for the school and state.

V. RESPONSIBILITIES

Our team is composed of three members, all of them Computer Scientists.

- **Brent Maples:** Lead project, research datasets, write research paper, build front-end/back-end code-base.
- **Max Marcum:** Research lead, write research paper, investigate machine learning, build back-end code-base
- **Randy Lin:** UX/UI lead, write research paper, research datasets, investigate UI, build front-end code-base.

VI. TIMELINE

Below is a timeline of the work that shall be done and the expected deadlines.

- **September 27th, 2024** - Conversion of all datasets to readable format.
- **October 15th, 2024** - Initial GUI Creation
- **October 27th, 2024** - Initial Creation of Data Analysis Back-end
- **November 1st, 2024** - Initial Creation of Front-End
- **November 4th, 2024** - Begin Paper
- **November 6th, 2024** - Deliver on Minimum Viable Product (MVP)
- **November 18th, 2024** - Begin Presentation
- **November 20th, 2024** - Finalize Front-End/Back-End
- **November 22nd, 2024** - Finish Writing of Paper
- **November 27th, 2024** - Finish Presentation
- **December, 2024** - Present Project

This timeline is subject to change as the needs of the product continue to develop.

VII. OUTCOME

The intention of this paper is to provide an easy way to inform institutions of the potential racial inequities in medical school admissions. The paper will not dictate what actions should be taken, but rather leave it up to the reader to infer what steps can be taken next. The information made available will be a helpful resource in educating in-state medical schools and encouraging institutions to potentially improve their racial equity in the medical schools admission process. Lastly, we hope to be able to answer at least one of three questions stated in our approach.

REFERENCES

- [1] C. for Medicare Medicaid Services, "National health expenditure data: Historical," <https://www.cms.gov/data-research/statistics-trends-and-reports/national-health-expenditure-data/historical>, 2023, accessed: 2024-09-10.
- [2] Association of American Medical Colleges, <https://www.aamc.org/>, 2023, accessed: 2024-09-10.
- [3] MedicalAid.org, "Average gpa and mcats score for every medical school in the us," <https://medicalaid.org/average-gpa-and-mcat-score-for-every-medical-school-in-the-us/>, 2024, accessed: 2024-09-10.