Case Study

IQVIA's Analytics Research Accelerator and CDC Hypertension Surveillance

Background

The Centers for Disease Control and Prevention (CDC) aimed to enhance its hypertension surveillance capabilities across the United States. To achieve this, the CDC collaborated with IQVIA to leverage the Analytics Research Accelerator (ARA), built on an unrivaled set of federated data sources, to easily identify health trends and population patterns via robust analytic tools. This initiative focused on utilizing various electronic health records (EHR) — Ambulatory Electronic Medical Records and PharMetrics® Plus data — to construct a detailed phenotype for hypertension. This enabled various teams across the CDC to conduct rapid comprehensive analysis and provide insights into the state of hypertension at various demographic levels, resulting in several public health publications.

Challenge

The primary challenge the CDC faced was to accurately identify and analyze the prevalence and control of hypertension among diverse populations and geographical locations in the U.S. This required the processing of vast amounts of EHR data to extract meaningful patterns and trends related to hypertension.

Solution

IQVIA's Analytics Research Accelerator provided a robust platform that integrated advanced analytics and machine learning algorithms to process and analyze EHR data from more than 90 million individuals. Of those, the CDC identified more than 11 million U.S. adults with hypertension using three criteria, alone or in combination: diagnosis codes, blood pressure (BP) measurements, and antihypertensive medications. This was compared to estimates from the National Health and Nutrition Examination Survey, which defines hypertension as a blood pressure of 130/80 mm Hg or higher, or the use of at least one antihypertensive medication. ARA facilitated the creation of a hypertension cohort, which served as the foundation for subsequent analyses.

Outcomes

The development of an electronic phenotype for hypertension allowed the CDC to quickly and easily extend their analysis of hypertension to different patient groups. Key findings were as follows:

- **State-Level Hypertension Prevalence and Control Among Adults in the U.S.[1]:** The analysis revealed significant variations in hypertension prevalence and control across different states, highlighting the need for targeted public health interventions. This study provided the first-ever estimates of hypertension control for all states and Washington, D.C., supporting EHR-based surveillance for hypertension prevention and control efforts at the state level.
- **Hypertension Prevalence and Control among U.S. Women of Reproductive Age[2]:** The study provided the first state-level estimates of hypertension control among women of reproductive age and identified a subset of the population that required special attention due to unique health considerations associated with reproductive health.
- **Leveraging EHRs in Hypertension Surveillance[3]:** The use of EHR data proved to be a powerful tool in monitoring hypertension, allowing for real-time surveillance and more responsive healthcare strategies.
- **Hypertension-Associated Medical Expenditures[4]:** The research provided insights into the economic burden of hypertension, emphasizing the importance of effective management and control strategies to reduce healthcare costs.
- **State-Level and County-Level Prevalence and Control[1]:** The detailed analysis at both state and county levels offered a granular view of hypertension distribution, which is crucial for resource allocation and policy making.
- **Methodological Innovations:** The project introduced new weighting methods to minimize selection bias in EHR-based studies, enhancing the reliability of the findings.

Conclusion

The partnership between the CDC and IQVIA, facilitated by the Analytics Research Accelerator, significantly advanced the understanding of hypertension prevalence and control in the U.S. The insights gained from this initiative are instrumental in shaping future public health policies and interventions aimed at combating hypertension and its associated health implications.

1. He S, Park S, Fujii Y, et al. State-Level Hypertension Prevalence and Control Among Adults in the U.S. Am J Prev Med. 2024.
2. Weng X, Woodruff RC, Park S, et al. Hypertension Prevalence and Control Among U.S. Women of Reproductive Age. Am J Prev Med. 2024 .
3. He S, Park S, Kuklina E, et al. Leveraging Electronic Health Records to Construct a Phenotype for Hypertension Surveillance in the United States. Am J Hypertens. 2023.
4. Kumar A, He S, Pollack LM, Lee JS, Imoisili O, Wang Y, Kompaniyets L, Luo F, Jackson SL. Hypertension-Associated Expenditures Among Privately Insured US Adults in 2021. Hypertension. 2024 Nov;81(11):2318-2328. doi: 10.1161/HYPERTENSIONAHA.124.23401. Epub 2024 Sep 10. PMID: 39253807.

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