PARTNERSHIP TO FIGHT CHRONIC DISEASE

A VISION FOR A HEALTHIER FUTURE

PFCD Health Equity Fact Sheets

Background

Racial and ethnic health inequities are one of the most salient forms of health inequities in the U.S. Prior literature shows that racial and ethnic minority groups experience higher rates of illnesses and deaths across various health conditions, including type 2 diabetes, hypertension, obesity, asthma, and other cardiovascular diseases when compared to the non-Hispanic White population.[1,2] Some studies have also highlighted the economic burden of racial health disparities in the U.S. For example, Waidmann (2009) found that the burden of disparities for diabetes, stroke, hypertension, and renal disease prevalence among Blacks and Hispanics (compared to Whites) will cost the U.S. health system approximately $337 billion over a ten-year period.[3] For almost all population groups, health outcomes fall below national targets as defined by published standards of care or national goals such as Healthy People 2030.[4–10]

While building upon prior findings, this study developed national and state estimates of the economic impact of reducing racial disparities in treatment of chronic disease and quantified contributing factors that might improve health outcomes for all populations.

Overview

The aim of this study is to understand opportunities to advance health equity by estimating racial and ethnic differences in the direct medical burden (i.e., cost of ambulatory visits, emergency visits, hospitalizations, pharmacy, and other costs) and indirect economic loss (loss of productivity due to absenteeism and premature mortality) of nine common chronic diseases among insured adult patients at both the U.S. national and state level. The chronic diseases included within this analysis are type 2 diabetes mellitus (T2DM), hypertension, hypercholesterolemia, coronary heart disease (CHD), stroke, asthma, HIV, colorectal cancer, and arthritis.

To quantify the impact of *advancing health equity*, we simulate scenarios in which disease outcomes across patients of each race and ethnicity groups are improved to meet guideline-recommended health targets (“health targets” scenario). Additionally, to assess the value of *improving health disparities* among communities of color, we developed scenarios in which disease outcomes in these communities are improved to reach the level of the non-Hispanic White population (“reduced health disparity” scenario). We compared these scenarios against the “status quo” projection (i.e., if current levels of disease care continued over the 10-year projected period and modeling natural history of disease) to obtain the cumulative burden of these chronic diseases between 2022 to 2031.

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Methods

We used simulation and disease-specific models to estimate the cost of health inequity and the cost of health disparity in the U.S. among insured adult patients. The Disease Prevention Microsimulation Model (DPMM) [11–13] was used to project the impact of disease treatment and prevention for adults with T2DM, heart disease, kidney disease, hypertension, or hypercholesterolemia with the goal to improve control of these diseases and help prevent further incidence of stroke, heart attack, and other sequelae. An Excel-based model was used to project outcomes of patients with asthma, HIV, colorectal cancer, and arthritis. Detailed methods on each approach follow.

Estimating the cost of health inequity

In the disease burden models, differences between the "status quo" and "health targets" scenarios in health and economic outcomes were calculated to reflect the potential medical cost savings and indirect economic benefits from improved health profile—or the gross impact of health inequity.

- **Status quo:** This scenario models the natural progression of disease over the next 10 years for people of different race groups. Diseases and conditions are described by discrete health states representing changes in biometrics (e.g., glucose tolerance, weight gain, etc.) and history of chronic conditions.
- **Health targets:** This scenario models combined improvements in lifestyle and medical intervention that result from meeting the guideline-recommended health targets for biometric characteristics and onset of chronic condition complications over the modeled time course.

Racial and ethnic differences in estimated medical cost savings are associated with differences in population characteristics (e.g., disease comorbidities, age, sex, exposure to social determinants) and the racial and ethnic groups population sizes. Racial and ethnic differences in estimated absenteeism (i.e., work loss) related cost savings are likely associated with differences in the labor-sector distributions, population characteristics (e.g., disease comorbidities, age, sex, exposure to social determinants), and the population size across racial and ethnic groups.

Estimating the cost of health disparities

The methods to estimate the cost of health disparities was achieved by comparing the outcomes from the "status quo" scenario with the "reducing health disparity" scenario—instead of the "health targets" scenario. The cost of health disparities model estimates the gaps in health status and associated medical costs achieved by Black and Hispanic patients compared

to White patients projected over ten years if the natural course of the disease continues without intervention. To adjust for patient-level factors in the cost of health disparities model, the Black and Hispanic populations were matched to the White population on age, sex, and insurance status.

- **Status quo:** This scenario models the natural progression of disease over the next 10 years for the sample of White patients. Diseases and conditions are described by discrete health states representing changes in biometrics (e.g., glucose tolerance, weight gain, etc.) and history of chronic conditions.
- **Reducing health disparities:** This scenario models the clinical and economic burden of hypothetical Black and Hispanic patient cohorts that have similar age, gender and insurance type as White patients from the "status quo" scenario while keep their own health profile.

Population

The population consists of adults 18 years and older, who have commercial, Medicare, or Medicaid health insurance coverage. The population modelled has or is projected to have (by 2031) at least one of nine chronic conditions, including: Type 2 diabetes, hypertension, hypercholesterolemia, coronary heart disease, stroke, asthma, HIV, arthritis, or colorectal cancer.

Population data sources

Data sources used to construct the de-identified, representative samples of the population in each geographic location included the 2020 U.S. Census Bureau, for data on county demographics; the 2013–2020 National Health and Nutrition Examination Survey (NHANES); the 2020 American Community Survey (ACS); the 2019 and 2020 Behavioral Risk Factor Surveillance System (BRFSS); and 2018 Centers for Medicare and Medicaid Services (CMS) data on people living in nursing homes and residential care facilities.

Model Specification and Assumptions

- Model
  - Type of model: The DPMM model is a published Markov-based simulation model [11–13] used to quantify the burden of T2DM, hypertension, hypercholesterolemia, CHD, and stroke. Asthma, HIV, colorectal cancer, and arthritis burden are modeled separately in Excel.
  - Timeframe: Costs are projected over a ten-year timeframe (2021 – 2031).

- Costs
    - Medical cost savings are measured by the average reduction in health care expenditures (e.g., hospitalizations, ER visits, inpatient care, medicine) for a patient population with select chronic conditions when health targets are achieved over 10 years. Prediction equations for direct and indirect medical expenditure in the DPMM were derived using the 2018–2020 Medical Expenditure Panel Survey (MEPS) data. Costs of diseases in the Excel model were estimated based on published studies on healthcare utilization and expense of each conditons.[14–17] Medical costs represent average costs across all racial and ethnic groups (i.e., non-race specific) and insurance types.
    - Absenteeism cost savings are calculated as the average dollars saved due to not missing work because the population's chronic conditions were well controlled and met health goals over 10 years. The economic value of disease-related absenteeism were calculated using median weekly earnings from the U.S. Bureau of Labor Statistics and represent the average race-specific (or average costs across racial and ethnic groups).[18]
    - Cost Adjustments: Costs were converted to 2022 dollars using the medical component of the consumer price index and state-adjusted by Cost-of-Living Adjustment (COLA) index.[19]
- Racial and ethnic subgroups
    - Hispanic
    - Non-Hispanic Asian
    - Non-Hispanic Black
    - Non-Hispanic White
    - Other/Unknown Race
        - Note: Other/Unknown Race included populations were race and ethnicity data were unavailable or the data sample size was limited, and therefore unable to reported separately.
- Recommended health targets are defined as the following:

Chronic Condition /Risk Factor	Improvement Goal	Reference
Type 2 diabetes	Reduce blood glucose (A1c) to equal or less than 7% (and better management of CVD as applicable)	ADA Standard of Care 2021[4]
Hypertension	Reduce high blood pressure to 130/80 mm Hg or lower	ACC/AHA Treatment Guideline 2019[5,7]
Hypercholesterolemia	Reduce LDL cholesterol by 50%	ACC/AHA Treatment Guideline 2019[5,8]

Chronic Condition /Risk Factor	Improvement Goal	Reference
Coronary heart disease	Reduce coronary heart disease deaths to 71.1 per 100k individuals	Healthy people 2030[9]
Stroke	Reduce stroke deaths to 33.4 per 100k individuals	Healthy people 2030[9]
Chronic respiratory disease	Increase proportion of people with well-controlled asthma (and increase use and adherence of asthma control medication) to 100%	CDC National Asthma Control[20]
HIV	Increase the proportion of persons aged 13 years and over living with diagnosed HIV infection who are virally suppressed to 95%	Healthy people 2030[9]
Arthritis	Reduce the proportion of adults with provider-diagnosed arthritis who are limited in their ability to work for pay due to arthritis to 29.5%	Healthy people 2030[9]
Cancer	Increase the proportion of adults who get screened for colorectal cancer to 74.4%	Healthy people 2030[9]

Additional Measures of Health Disparities

Primary Care Health Professional Shortage Areas (HSPA)

- Primary care health professional shortage area are based on data from Kaiser Family Foundation.[21] Determining if an area is an HSPA involves comparing the number of providers in an area compared to the population served. Thresholds are set by federal regulation. By regulation, areas with a population to primary care provider ratio of 3,500 to 1 or 3,000 to 1 for areas with unusually high needs are considered primary care health professional shortage areas.

Medication Adherence Data

- Medication adherence is estimated as the proportion of days covered (PDC). A PDC below 80% is estimated to be poor adherence.[22]
- Adherence rates were derived based on results from several studies with adherence rates by different insurance types, diseases, and race or ethnicity.[23–26]

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About PFCD

The Partnership to Fight Chronic Disease (PFCD) is an internationally recognized organization of patients, providers, community organizations, business and labor groups, and health policy experts committed to raising awareness of the number one cause of death, disability, and rising health care costs: chronic disease. We support efforts to promote health equity in health-literate, culturally meaningful, and accessible ways that engage and empower all to achieve optimal health and well-being.

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