Closing the Gap

Making More Equitable Diabetes Healthcare a Reality
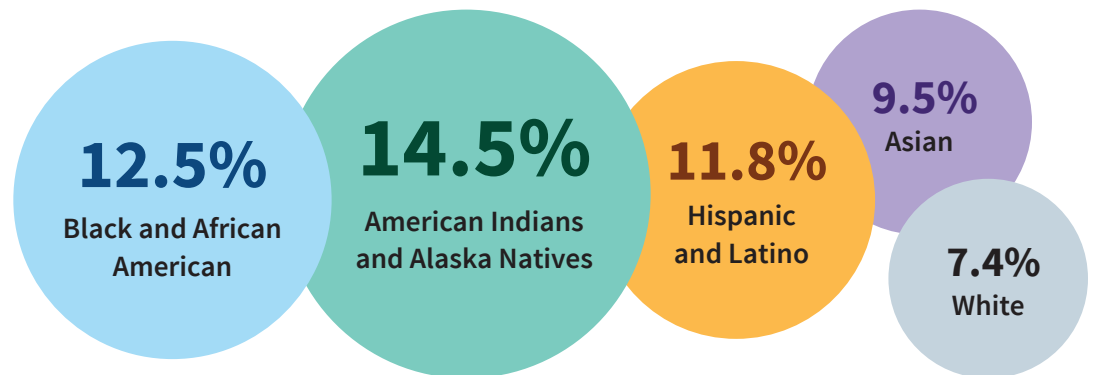
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Diabetes is a health equity issue

Diabetes is one of the biggest and most costly chronic diseases in the country. 35 million adults live with type 2 diabetes in the U.S., including 1.4 million newly diagnosed in 2019 alone.[1] It's an epidemic, and it disproportionately impacts people of color and those with lower socioeconomic status.

Indigenous, Black, and Hispanic and Latino American patients suffer the highest rates of prevalence and are more likely to experience premature death and severe complications, including blindness and amputations.[1] Moreover, increased prevalence and preventable complications are also inversely related to education, income, and other social determinants of health.[2]

These gaps in health outcomes for different groups uncover an ugly truth—diabetes care is not always created equal. There are deep, systemic inequities across race, ethnicity, and socioeconomic status that mean some people are more at risk for developing diabetes, and influence the quality of care they receive.

And while pursuit of health equity is a popular topic of conversation, the hard work to actually reduce inequities requires bold risk-taking and constant iteration in how we deliver care. In this white paper, we will address how health disparities contribute to higher prevalence and worsening outcomes in type 2 diabetes, and identify opportunities for making more equitable care a reality.

Prevalence of diagnosed diabetes in the United States[1]

12.5%
Black and African American

14.5%
American Indians and Alaska Natives

11.8%
Hispanic and Latino

9.5%
Asian

7.4%
White

"I'm a Native American, and diabetes is rampant in our community. We are constantly seeing the horrors of diabetes, including progressive sickness, blindness, kidney issues, amputations, and sometimes even death. It's important to me to convey the hope for a healthier life that Virta has brought me to other Native Americans so that they can experience this lifestyle change like I did."

Former Virta Patient

Elizabeth, Chickasaw Nation

How do Social Determinants of Health impact diabetes care?

Social determinants of health (SDOH) are the social and environmental conditions that people grow up, work, and live in that influence their health. Level of income, quality of housing, and experiences of discrimination are just a few examples of how SDOH can shape a person's health outcomes for their diabetes.

Social Determinants of Health

Income

Access to nutritious food

Housing

Education and literacy

Exposure to pollution

Social support and safety

Level of stress

Experience of discrimination

For example, as income rises, the chances of developing diabetes and experiencing complications decreases.[2] Diabetes occurs most often in lower-income brackets, and is more likely to impact people who experience food insecurity or live in a food desert.[3]

Diabetes is also an expensive condition. Before Virta, 72% of surveyed Virta patients paid out of pocket for their diabetes medications, and nearly 15% paid over $100 every month.[4] Financial stress can force patients to skip or adjust their insulin or other medication to save money, putting them at risk for missing work, inability to do everyday activities, and even hospitalization.[2]

Implicit bias can also influence quality of care. Research shows that some white providers maintain implicit biases against patients of color—especially Black patients.[5] And while research into the impacts of racial discrimination on diabetes is new, results from recent studies suggest that racial discrimination is associated with a 40% increased risk of developing diabetes as well as higher glucose levels once diagnosed.[6]

Food Insecurity

16%

of people with diabetes are food insecure, compared to 9% of people without diabetes[2]

Rx Affordability

14–20%

of adults with diabetes report reducing or delaying medications due to cost[3]

How can new care models overcome disparities in diabetes care?

Efforts to ensure health equity start with how healthcare systems are designed. Much is written about the promise of innovative companies to design new models of care that use digital approaches and technology to address health disparities. So, is the digital health revolution closing gaps in diabetes care?

There are a few key areas where new care delivery models show promising results for reversing disparities in diabetes care:

1 Equal Access to Providers

Most diabetes patients only meet with their primary care physician for a few short visits a year, and some don't have regular access to a provider at all. Remote monitoring care eliminates friction by providing patients virtual access to their clinical team. No need for arranging transportation or taking time off of work. Advanced telehealth models can also keep patients safe by allowing them to engage in treatment wherever they are—whether tracking their biomarkers from the comfort of their home or reaching out to their care team during a late-night shift at work.

2 Continuous Oversight and Engagement

Tracking and reporting key biomarkers regularly, even daily, helps patients stay engaged and generates important clinical data that can be used to guide needed interventions in near real-time.

3 Food-As-Medicine Approaches to Reverse, Not Manage, Diabetes

More and more evidence for using nutrition to prevent and reverse diabetes continues to emerge. In 2018, the American Diabetes Association listed nutrition therapy using carbohydrate restriction as a highly effective, first line therapy for treating type 2 diabetes. Nutrition therapy can be easily adapted to each individual's unique needs, values, and preferences. Telehealth lends us the technology to deliver food-as-medicine interventions to people of all different backgrounds, at scale.

4 Behavioral Support and Community

Lifestyle changes are hard, and success often depends on support from loved ones, care teams, and others with similar lived experience. To reduce disparities in health outcomes, creating spaces where people feel comfortable and understood is critical. This includes everything from tailoring treatment to language preferences, receiving compassionate and culturally competent support from care teams, and finding community with and peer support from other patients who share similar experiences.

Virta's Outcomes

We've discussed the promise of new care models and digital health to close the health equity gap in diabetes, but we also wanted to take a close look at how we're actually doing. Data is one of the most powerful tools for uncovering gaps in care. As a healthcare company with an ambitious mission to broadly reverse type 2 diabetes, we need to take a hard look at how outcomes vary across different groups in order to identify what is going well, and where we need to do better.

Virta's landmark clinical trial began in 2015, and we've shown that patients can realize incredible outcomes when following a food-as-medicine approach, delivered through an advanced telehealth model. The results were life-changing - on average, patients achieve a 1.3% reduction in A1c, a 60% reduction in Rx utilization, and 12% weight loss.[7] But how do these health outcomes vary across important demographic factors in the real world, including socioeconomic conditions, race, and ethnicity? Do all Virta patients improve in treatment, despite demographic differences?

Socioeconomic Conditions

To answer this question, Virta's research team first investigated the level of socioeconomic advantage or disadvantage across our patient population using the Area Deprivation Index (ADI). The ADI is used by governments, non-profits, and health systems across the world to measure inequities caused by socioeconomic disparities.[8] The ADI reflects an area's level of socioeconomic advantage or disadvantage, and is influenced by a variety of factors, including:[9]

INCOME

EMPLOYMENT

EDUCATION

HOUSING

Map of the United States by the Area Deprivation Index

Worse health outcomes are often associated with higher levels of socioeconomic disadvantage, so assessing health outcomes by a geographic area's level of relative advantage or disadvantage can be helpful to identify if health disparities exist.

Legend: Area Deprivation Index Quintiles

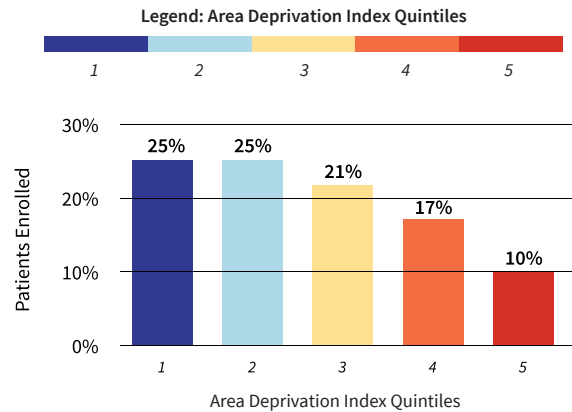*Most disadvantaged*   *Least disadvantaged*
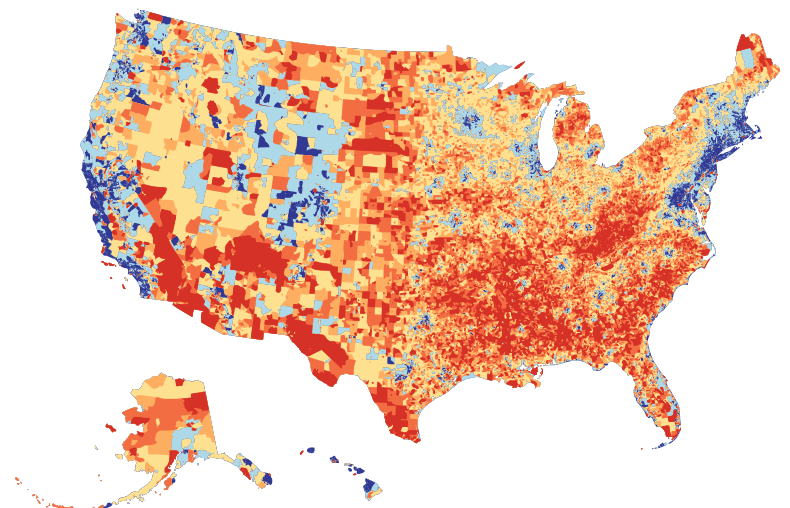
The Area Deprivation Index and Virta's Patient Population

Virta researchers mapped our patient population and outcomes according to the Area Deprivation Index and found that Virta enrolls patients from all socioeconomic backgrounds.[10]

Next, we matched patient health outcomes to the socioeconomic conditions of their local area, and determined that Virta delivers substantial reductions in blood sugar in type 2 diabetes patients, regardless of where they live.[11]

>25% of Virta's patients live in the top 40% of the most disadvantaged areas in the country

Legend: Area Deprivation Index Quintiles

1   2   3   4   5

Patients Enrolled vs. Area Deprivation Index Quintiles

| Quintile	Patients Enrolled
1	25%
2	25%
3	21%
4	17%
5	10%

Blood Sugar Improvement on Virta by Area Deprivation Index (Socioeconomic Advantage or Disadvantage)

1 = Lowest Deprivation, 5 = Highest Deprivation

AREA DEPRIVATION INDEX QUINTILES   ● 1   ● 2   ● 3   ● 4   ● 5

ADA Target A1c (below 7.0)

Sub-diabetic A1c (below 6.5)
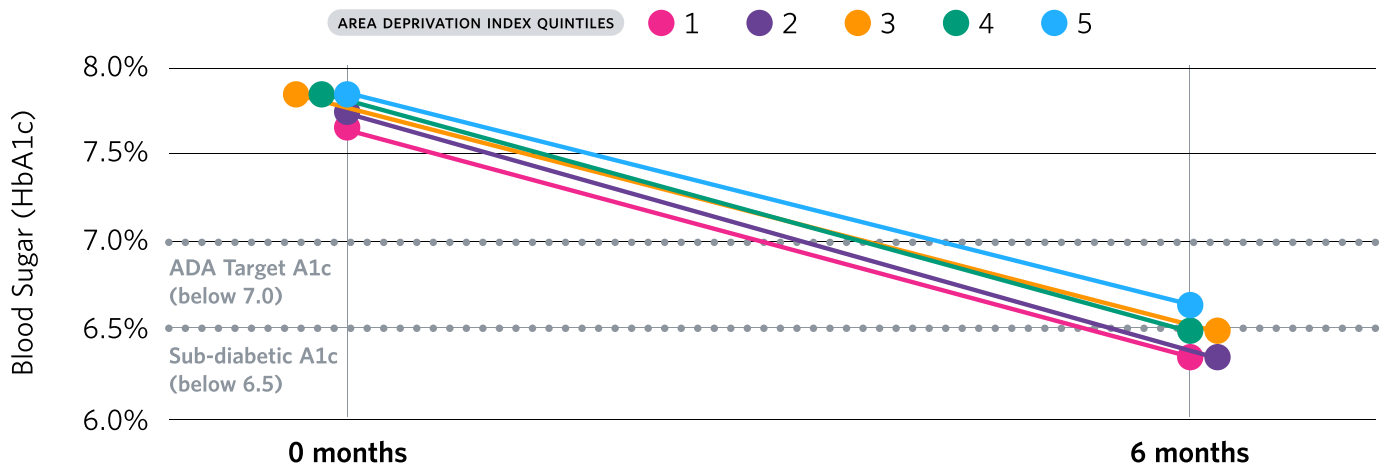
0 months — 6 months

Our analysis showed that Virta patients achieve clinically and statistically significant improvements in A1c 6 months after enrollment in Virta. All groups on average achieved A1c below 7.0%, which is the American Diabetes Association's target for blood sugar outcomes that are associated with less risk of complications. And some groups even reduced average A1c to below 6.5%, which is the diagnostic threshold for diabetes.

One-third of surveyed Virta patients who paid out of pocket for their diabetes medications said that Rx elimination was the top reason they enrolled in Virta.[12]
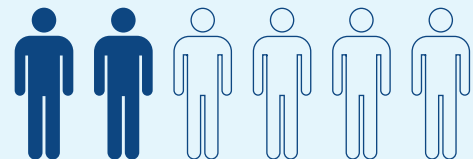
85% of surveyed Virta patients with an annual income below $45,000 responded they could find Virta-friendly-foods within their budget without difficulty.[13]
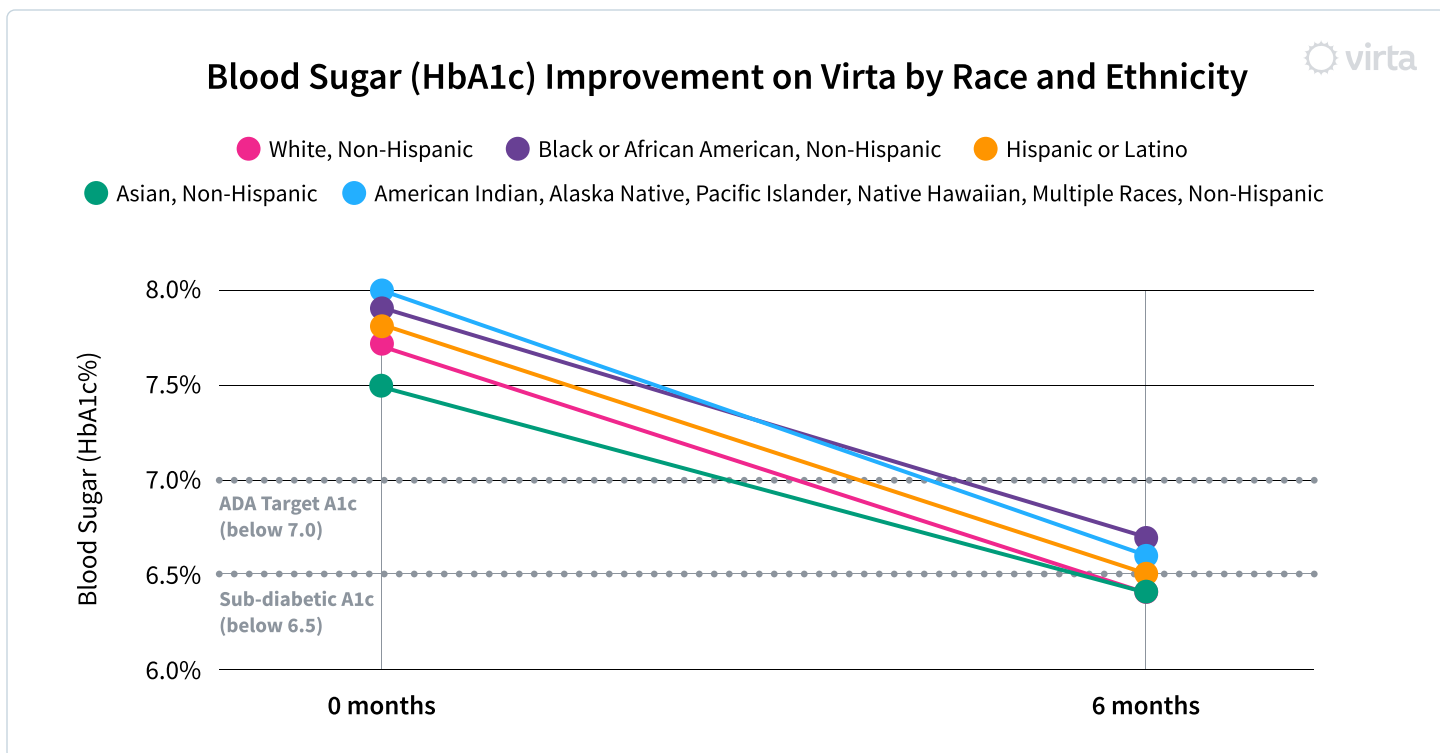
Race and Ethnicity

Socioeconomic disparities are not the only differences that impact the prevalence and outcomes of type 2 diabetes. Diabetes also disproportionately impacts racial and ethnic minority groups. Despite this well-established fact, very few interventions make an effort to show outcomes of their treatment by race and ethnicity. And while socioeconomic conditions and race and ethnicity may in some cases overlap, the ADI cannot be used as a proxy for race and ethnicity. To better understand what is happening for various sub-populations, outcomes must be evaluated using race and ethnicity data.

Virta's research team disaggregated outcomes and assessed them within self-reported racial and ethnic groups. Results showed that all groups achieved at least a 1% reduction in A1c on average, irrespective of race or ethnicity.[14]

Results of this analysis showed that all patients met or fell below the ADA treatment target of an A1c below 7.0% after 6 months. Some groups even reached A1c less than 6.5%, the level for diagnosis of diabetes.

> *Every 1% decrease in A1c* *is associated with reduced complications of type 2 diabetes, including cardiovascular events and kidney and eye diseases.*[15]

Blood Sugar (HbA1c) Improvement on Virta by Race and Ethnicity

○ virta

● White, Non-Hispanic   ● Black or African American, Non-Hispanic   ● Hispanic or Latino
● Asian, Non-Hispanic   ● American Indian, Alaska Native, Pacific Islander, Native Hawaiian, Multiple Races, Non-Hispanic

Blood Sugar (HbA1c%)

8.0%

7.5%

7.0% — ADA Target A1c (below 7.0)

6.5% — Sub-diabetic A1c (below 6.5)

6.0%

0 months   6 months

Taking action to close the gap—Virta's commitments to achieving health equity

At Virta, our mission is to reverse diabetes in 100M people by 2025. To achieve this goal, we must reduce disparities in diabetes care.

1 Listen, learn, and engage

Our patients are our most important stakeholders, and there is no substitute for understanding personal experience. We're partnering with our newly-developed patient diversity council and connecting with allies and community leaders to listen, learn, engage, and improve our treatment for our patients, supporting each person's unique needs.

2 Rigorously analyze data

Looking at outcomes by race and ethnicity and socioeconomic conditions to uncover and understand any gaps in our care is essential to continued innovation and inclusivity. We're committed to disaggregating and carefully scrutinizing our own data to continue to improve every patient's experience.

3 Walk the walk internally

While we're a health "tech" company, people are at the core of what we do—both patients and employees. Providing our internal teams with cultural competency training and hiring a diverse team who can truly understand different patient experiences are core tenets of our health equity strategy.

Citations & Resources Consulted

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11. Virta Health Registry, covariate adjusted mean A1c at baseline and 6 months among T2D patients retained ≥ 180 days (83% retention) with lab HbA1c at 6±3 months (Cohort of n=7031), data as of 7/11/2022.

12. Virta internal survey with between 1134 and 1248 Virta patient respondents to this series of questions, August 2022.

13. Virta internal survey with 1402 Virta patient respondents, Aug 2022. 1401 patients responded to this question.

14. Virta Health Registry, covariate adjusted mean A1c at baseline and 6 months among T2D patients retained ≥ 180 days (83% retention) with lab HbA1c at 6±3 months (Cohort of n=7031), data as of 7/11/2022.

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