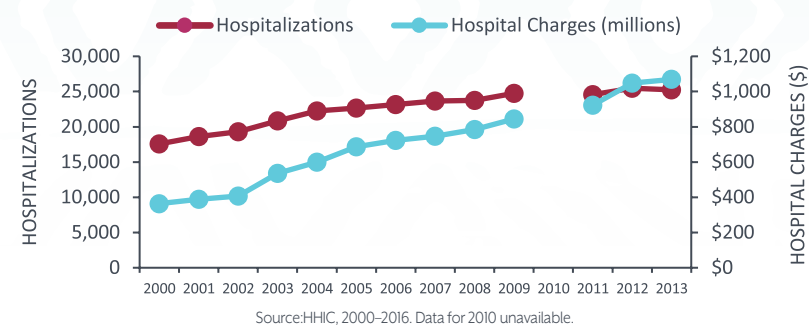


ECONOMIC BURDEN

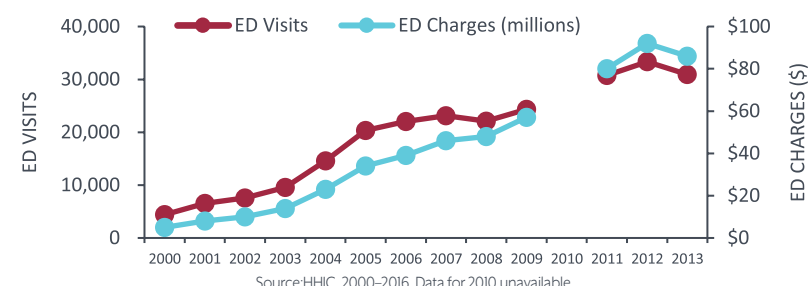
HOSPITALIZATION COSTS

Since 2000, the number of hospital discharges with a diabetes diagnosis increased significantly in Hawai'i, reaching its highest point in 2013 with over 25,000 hospitalizations.¹⁵ Concomitant with this increase was a three-fold rise in hospitalization costs from \$364 million in 2000 to a staggering \$1.1 billion in 2013, or over \$42,000 per hospitalization.



EMERGENCY DEPARTMENT COSTS

Emergency department (ED) visits with a diabetes diagnosis also increased in Hawai'i each year since 2000.¹⁶ In 2013 there were nearly 31,000 ED discharges with a diagnosis of diabetes that resulted in \$86 million in ED charges; approximately \$2,800 per ED visit. This represents a 7-fold increase in ED visits and a 17-fold rise in costs between 2000 and 2013.



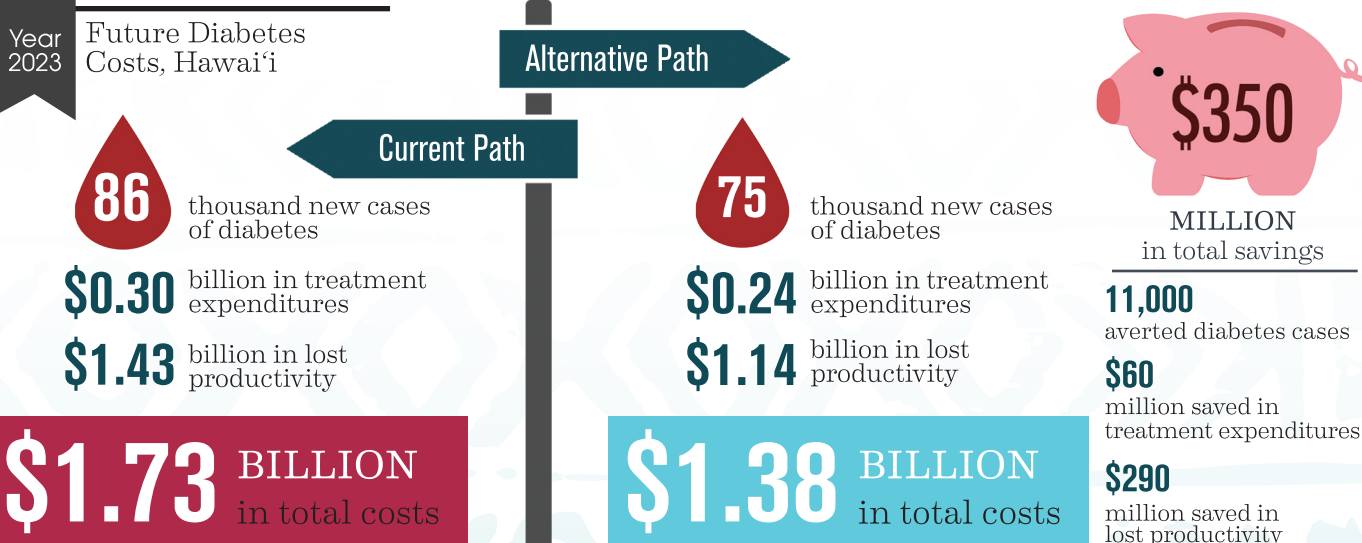
Prevent Diabetes Hawai'i is a broad-based, multi-organizational, statewide community collaborative whose goal is to bring the public and private sectors together in an effort to prevent or delay the onset of type 2 diabetes among Hawai'i residents. This initiative is supported by the Hawai'i State Department of Health's Diabetes Prevention and Control Program and the Centers for Disease Control and Prevention (CDC).

In 2013, the State of Hawai'i was funded by the CDC to implement community and health system interventions in support of reducing health disparities and preventing diabetes, heart disease, and stroke. This funding was made possible through the State and Local Public Health Actions to Prevent Obesity, Diabetes, Heart Disease and Stroke (DPI4-1422) grant, complementing the activities funded under the State Public Health Actions (DPI3-1305) grant.



2 PATHS — 2 CHOICES

On our current path, Hawai'i will experience unprecedented increases in chronic disease over the next 20 years. In 2007, a report by the Milken Institute projected the number and cost of diabetes in Hawai'i in the year 2023. In 2023 alone, they project 86,000 new diabetes cases.¹⁶ But there is an alternative path. With modest improvements in prediabetes prevention through lifestyle behavior change (including weight control combined with improved nutrition, exercise, reductions in smoking, and early disease detection) and diabetes management, Hawai'i could avert 11,000 cases, leading to \$350 million in future economic savings. Of this, \$290 million would come from gains in productivity, and \$60 million would come from reduced treatment spending. Potentially, additional cases can be averted through more aggressive measures, leading to greater cost savings.



SOURCE: Adapted from Milken Institute

PREVENT Diabetes HAWAII

Working together to stop the growing threat of type 2 diabetes

SUGGESTED CITATION

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NONDISCRIMINATION IN SERVICES

We provide access to our programs and activities without regard to race, color, national origin (including language), age, sex, religion, or disability. Write to the Hawai'i State Department of Health's Affirmative Action Officer at P.O. Box 3378, Honolulu, HI 96801-3378 or (808) 586-4614 (voice/TTY) within 180 days of the problem.

This publication was supported by the CDC State and Local Public Health Actions to Prevent Obesity, Diabetes, and Heart Disease and Stroke (DPI4-1422) grant. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the CDC.

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Copies of this report can be downloaded from <http://health.hawaii.gov/diabetes>
To learn how you can prevent diabetes, please visit: www.healthyhawaii.com



Diabetes is a serious, common, and costly disease, and is currently the 7th leading cause of death nationwide and in Hawai'i. People afflicted with diabetes experience more disabilities, depression, unhealthy days, and are at greater risk of developing health complications such as heart disease and stroke.¹ The past two decades have seen staggering increases in prediabetes and diabetes due to pronounced changes in the human environment, behavior, and lifestyle. The disease is now growing at an epidemic rate and affects nearly 600,000 people, or 1 in 2 Hawai'i residents.^{2,3} Between 2000 and 2010, the prevalence of self-reported adult diabetes in Hawai'i increased from 5.2% to 8.3%, a 60% increase. Prediabetes among Hawai'i adults increased 50%, from 9.6% in 2011 to 14.4% in 2014. Escalating rates of obesity have fueled this trend, such that obesity and diabetes have been called "twin epidemics" (Figure 1). Furthermore, diabetes costs the state \$1.5 billion each year in direct medical costs and loss of productivity, and is responsible for \$1 in every \$10 health care dollars spent.⁴

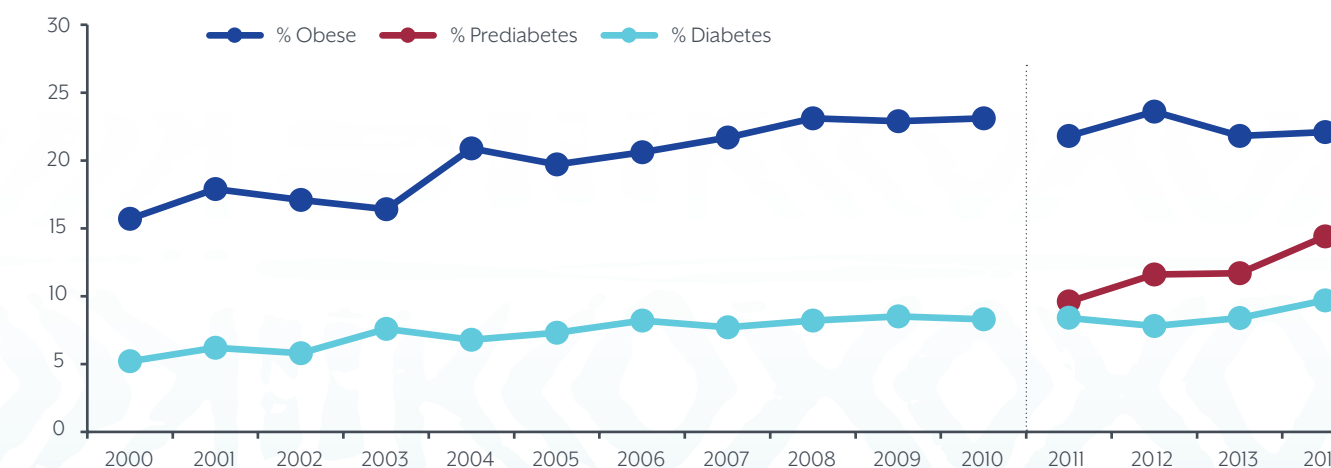


Figure 1: The "Twin Epidemics" of Obesity & Prediabetes/Diabetes SOURCE: BRFSS, 2000–2014. Prediabetes data prior to 2011 are not shown due to changes in the survey question. Note: Starting in 2011, the BRFSS adopted a dual sampling frame (landline plus cell phones) and iterative proportional fitting methodology. As a result of these methodological changes, BRFSS data from 2011 and onward are not directly comparable to data from previous years.

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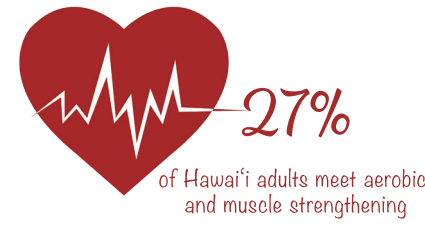
RISK FACTORS

The good news is that diabetes is largely preventable, manageable, and controllable.

By making a few lifestyle changes, people can reduce their risk of prediabetes or delay the development of diabetes and improve their overall quality of life. About 9 cases in 10 can be avoided by addressing certain behavioral and lifestyle risk factors such as getting to a healthy weight, increasing physical activity levels, eating nutritious foods, moderating intake of sugary beverages (and alcohol), and quitting smoking.⁵

PHYSICAL ACTIVITY

Regular physical activity is important for overall health and well-being and is a key part of maintaining healthy bones and joints, preventing weight gain, developing lean muscle, and decreasing the risk of diabetes. The American Heart Association recommends both aerobic and muscle strengthening exercises for adults and youth.



Hawai'i adults eat 5 or more fruits and vegetables daily

NUTRITION

A balanced diet that provides essential nutrients can help to maintain a healthy weight. Studies show that regular consumption of leafy greens such as lettuce and spinach may also reduce the risk of diabetes.⁶ The U.S. Department of Agriculture Dietary Guidelines for Americans recommends 2½ cups of vegetables and 2 cups of fruit per day for a person consuming a 2,000-calorie diet.

SUGARY DRINKS

Sugary beverages are the largest source of added sugars in the American diet and a leading cause of uncontrolled weight gain. Regular consumption of sugary beverages (1 or more cans per day) is associated with fatty liver disease⁷ and a 26% greater risk of developing diabetes.⁸



TOBACCO

Tobacco use is the leading cause of preventable death and disease in the U.S. and Hawai'i. The risk of developing diabetes is 30–40% higher for smokers compared to non-smokers, and the danger increases with the number of cigarettes smoked.⁹

Other Risk Factors



Family History



Alcohol Consumption



High Blood Pressure

Source: BRFSS, 2012–2014

DIAGNOSIS & SCREENING

DIAGNOSIS

Diabetes is a disease in which the body does not properly process food for use as energy, causing blood glucose levels to rise higher than normal. Before type 2 diabetes, however, people typically develop “prediabetes” — defined by elevated blood sugar that is higher than normal but has not quite yet reached the threshold for type 2 diagnosis.¹⁰ Without intervention, **15% to 30% of those with prediabetes will develop type 2 diabetes** within 5 years.¹¹ Fortunately, prediabetes can be reversed. Therefore, early detection of prediabetes is crucial so that essential lifestyle changes can be made to prevent disease progression.

SCREENING

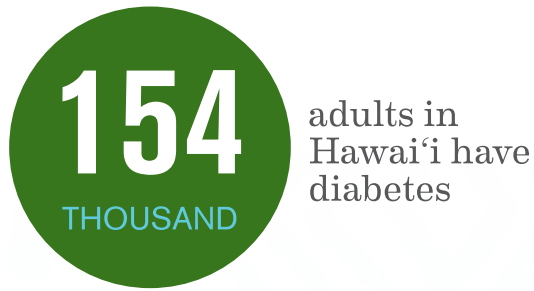
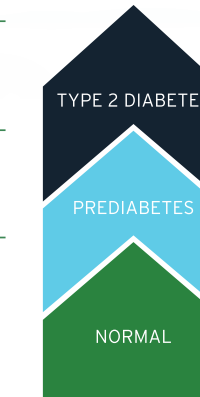
There are no clear symptoms of prediabetes, so you may have it and not know it. In fact, this condition can go undiagnosed for up to 10 years given the subtlety or absence of symptoms in the early stages of development. Rising blood glucose levels, however, can begin to cause damage to the body. In Hawai'i, 442,000 adults now have prediabetes.^{2,3} Of these, 282,000 do not know they have the disease — that is 2 out of 3 adults with prediabetes. In addition, 154,000 adults already have diabetes, of whom 46,000 — about 3 in 10 adults — do not know they have the disease.

Variable	Predictable	Diabetes
Hemoglobin A1c Level, %	5.7–6.4	≥ 6.5
Fasting Plasma Glucose Level		
mmol/L	5.6–6.9	7.0
mg/dL	100–125	≥ 126
Oral Glucose Tolerance Test Results*		
mmol/L	7.8–11.0	11.1 [†]
mg/dL	140–199	≥ 200
Random Plasma Glucose Level		
mmol/L	—	11.1
mg/dL	—	≥ 200 [‡]

* 2-h plasma glucose level after a 75-g oral glucose tolerance test.

[†] In the absence of unequivocal hyperglycemia, results should be confirmed by repeating testing.

[‡] Only diagnostic in a patient with classic symptoms of hyperglycemia or hyperglycemic crisis.



Source: BRFSS, 2014. Undiagnosed prediabetes and diabetes — American Diabetes Association.

Early and routine screening is fundamental to preventing or delaying illness. The American Diabetes Association (ADA) and U.S. Preventive Services Task Force (USPSTF) recommend ‘multiple risk-factor based diabetes screening’ every 3 years. Risk-factor based screening involves a comprehensive assessment of different factors associated with diabetes, such as being obese, having a family history of diabetes, and having high blood pressure. These recommendations offer guidance to primary care providers on appropriate preventive care and has been shown to improve identification of individuals living with undiagnosed diabetes as well as those with prediabetes.

NATIONAL DIABETES PREVENTION PROGRAM

The National Diabetes Prevention Program (National DPP) is a partnership of public and private organizations that offers evidence-based, cost-effective interventions to reduce prediabetes and type 2 diabetes. The National DPP is focused on making improvements across 4 pillars: (i) prediabetes awareness; (ii) health plan and employer coverage; (iii) clinical screening, testing, and referrals; and (iv) availability of CDC-recognized lifestyle change programs.

The CDC recognizes lifestyle change programs that meet quality standards, use an approved curriculum and trained lifestyle coach, and submit annual data reports demonstrating program effectiveness as Diabetes Prevention Programs (DPP). Those with prediabetes can prevent the onset of type 2 diabetes and lower their risk of diabetes-related complications, like having a heart attack or stroke, by joining a DPP.

Research has shown that people with prediabetes who participate in a DPP can reduce their risk of developing diabetes by 58% (71% for people over 60) when they lose 5% to 7% of their body weight through healthier eating and 150 minutes of physical activity a week.¹² Results were sustained even ten years after completion of the program, as people were one third less likely to develop type 2 diabetes.¹³

NATIONAL DPP 4 PILLARS



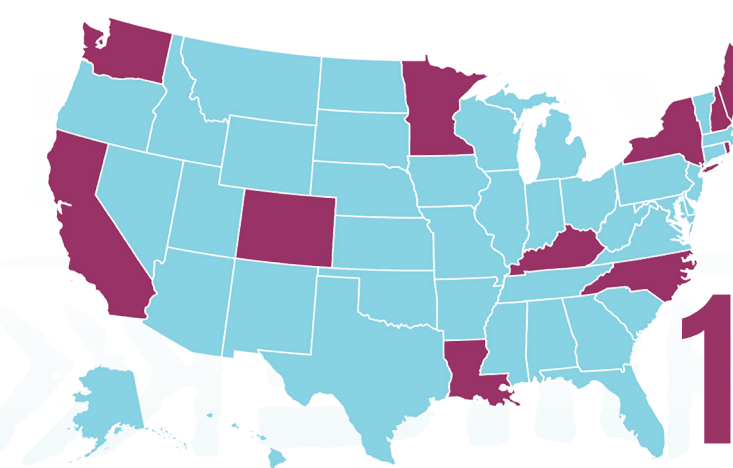
RAISE awareness of prediabetes

PROMOTE the National DPP as a covered health benefit

INCREASE clinical screening, testing, & referrals to CDC-recognized lifestyle change programs

EXPAND availability of CDC-recognized lifestyle change programs

In March of 2016, the Centers for Medicare and Medicaid Services (CMS) certified DPP as a cost savings program that reduced net spending and improved the quality of patient care without limiting coverage or benefits (fulfilling the expansion requirements of the Social Security Act, Section 1115A).¹⁴ DPP is the first ever preventive service model to be adopted by CMS. Medicare coverage of DPP will begin on January 1, 2018. Currently, over 70 commercial health plans across the country offer some DPP coverage. States are increasingly adopting the program for their own employees because of the program's proven record of cost effectiveness and positive outcomes. Eleven states, including California, Colorado, Kentucky, Louisiana, Maine, Minnesota, New Hampshire, New York, North Carolina, Rhode Island, and Washington now provide coverage of DPP for their employees. DPP is not a covered employee benefit in Hawai'i.



11 STATES offer the National Diabetes Prevention Program as a covered benefit

Research shows structured lifestyle interventions can cut the risk of diabetes in

HALF

