INDIANA
DIABETES STRATEGIC PLAN
2020-2026

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Indiana State
Department of Health

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** - No longer in this position.

II.   Endorsement Letter

Dear Hoosiers,

In 2018, the Indiana General Assembly recognized an opportunity to collaborate on a statewide initiative to increase awareness and treatment for diabetes and prediabetes.

In 2018, as much as 12.5% of Indiana's adult population was diagnosed with diabetes compared to the national average of 10.9%. Overall, diabetes was the seventh-leading cause of death in Indiana in 2018. However, disparities exist: diabetes was the fourth-leading cause of death for blacks, seventh for white males, third for black males, and third for black females in 2017. While effective treatment exists, diabetes is often uncontrolled or poorly controlled, needlessly interfering with school, work, and leisure activities. Anyone, anywhere, at any age can develop type 2 diabetes. Many adults have had type 2 diabetes for several years before their symptoms are recognized. By the time they are diagnosed, many have already started to develop complications of diabetes, such as visual impairment, kidney failure, heart disease, stroke, and nerve damage. Detecting and diagnosing diabetes early means that it can be treated, and the risk of serious complications can be reduced.

The 2019 Indiana Diabetes Strategic Plan includes current diabetes data (prevalence, mortality, trends, hospitalizations, costs, comorbidities, and disparities). In addition, this report contains statewide goals to reduce the burden of diabetes across all populations, an assessment of health and financial impact that diabetes has on state and local jurisdictions, and proposed strategies to reduce the impact of diabetes.

The Indiana State Department of Health's role is to inform the public of the impact of diabetes in our state primarily through data surveillance and reporting. It is our goal that the data be used as indicators and evidence for strategic planning, decision-making, program improvement, and needs assessment.

Our challenge today is to activate our communities and organizations to prevent type 2 diabetes and to treat and manage this disease which continues to threaten life expectancy and quality of life.

Sincerely,

Kristina M. Box, MD, FACOG
State Health Commissioner
Indiana State Department of Health

III. Executive Summary

Indiana House Enrolled Act 1175 was passed by the Second Session of the 120th General Assembly in 2018 with the purpose of amending Section 1 IC 16-46-16 of the Indiana Code as a new chapter. This legislation tasked the Indiana State Department of Health (ISDH) with developing a state strategic plan for the purpose of identifying and significantly reducing the prevalence of type 2 diabetes and prediabetes in Indiana, to collaborate with the Indiana Family and Social Services Administration (FSSA), and to establish workgroups to assist in the development of the strategic plan. The act also required the ISDH to update the strategic plan every two years.

This initial response to the charge from the Indiana General Assembly is intended to address the state of diabetes in Indiana along with the work that is currently being done to combat the disease and provide recommendations on work that could improve rates in the future.

The purpose of the strategic plan is to:

- Establish baseline benchmarks for diabetes and prediabetes in Indiana using Indiana-specific data;
- Identify barriers to effective prevention, screening, and treatment for diabetes, including specific barriers affecting providers and patients;
- Identify current technologies and best practices for diabetes screening, treatment, and prevention;
- Increase the number of people screened regularly for diabetes using evidence-based methods;
- Create partnerships with public and private entities to increase awareness of diabetes and of the importance of diabetes screening, treatment, and prevention;
- Estimate the annual direct and indirect state healthcare costs attributable to diabetes and prediabetes; and
- Identify actions necessary to increase diabetes screening rates and to reduce the morbidity and mortality from diabetes, and establish a schedule for implementing those actions.

The purpose of this document is to establish the baseline plan for combating diabetes in the State of Indiana through strategic partnerships and serve as a living document that must evolve as the state of diabetes in Indiana evolves to guide a coordinated approach among diverse partners.

The data establishing prevalence of diabetes among adults in Indiana for this report is taken from the Centers for Disease Control and Prevention's Behavioral Risk factor Surveillance System (BRFSS) and from the Indiana Network for Patient Care (INPC). The INPC is a health information infrastructure that includes patient information from health systems around the state of Indiana.

The strategic planning process began with a kick-off stakeholder meeting on November 27, 2018. Three workgroups were formed, including: Data and Healthcare Costs, Prevention and Screening, and Treatment and Management. Stakeholders included community coalition members, academic partners, other state agencies, and elected officials. Stakeholder input guided the development of this report.

The United States healthcare model has historically been focused on diagnosing and treating disease in individual patients. Public health focuses on preventing disease in populations. Health is recognized by the World Health Organization (WHO) as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." For Indiana to move toward a population health model, policymaker deliberations will benefit from including stakeholders that represent Indiana's diversity and varied levels of business, education, health, and government.

IV. Summary of Goals and Objectives

Goal 1: Use data to drive population-based diabetes strategies.

Objective 1: Develop common diabetes measures for Indiana public health practitioners and healthcare providers to use.

Objective 2: Use diabetes data as a transformative suite to drive transformation of the healthcare system in Indiana.

Goal 2: Educate the public and connect individuals the tools and resources available to support them in pursuing a healthy lifestyle to prevent diabetes

Objective 1: By the end of 2021, increase access and utilization to localized nutrition and physical activity resources throughout the state by integrating information into existing communication channels for improved information dissemination

Objective 2: By the end of 2021, develop a resource for development of coordinated local and statewide diabetes prevention policies that target large systems such as employers, schools and worksites.

Objective 3: By 2025, implement state-level policies that foster diabetes prevention by focusing on workplaces, including child care facilities and schools.

Goal 3: Increase clinical prediabetes screening, testing, and referral of high-risk patients to National Diabetes Prevention Programs.

Objective 1: By 2021, implement a National Diabetes Prevention Program (National DPP) in at least 10 out of the top 20 counties with highest diabetes prevalence in Indiana through increased public and private provider knowledge.

Objective 2: By 2025 implement state policies that will increase access to the National Diabetes Prevention Programs.

Goal 4: Increase access to, and coverage of, treatment and management processes and tools for patients with diabetes.

Objective 1: By 2021, investigate and address potential Medicaid-specific barriers to comprehensive diabetes management and treatment.

Objective 2: By 2021, decrease the prior authorization wait time by 25% for both pharmacists and authorizing physicians.

Objective 3: By 2025, raise healthcare provider awareness about available Indiana Medicaid coverage for self-management diabetes-specific technologies, including continuous glucose monitors (CGMs) and insulin pumps.

Goal 5: Support development and sustainability of Diabetes Self-Management Education and Support (DSMES) programs to utilize the American Association of Diabetes Educators (AADE) or American Diabetes Association (ADA) national standards and evidence-based curricula.

Objective 1: By 2025, increase the number of AADE-accredited or ADA-recognized DSMES programs throughout the state of Indiana by 10%.

Objective 2: By 2021, define the knowledge, skills, and abilities in the role of a community health worker in diabetes education.

Objective 3: By 2025, increase DSMES program sustainability by providing technical assistance to organizations.

Goal 6: Increase the number of people with diabetes who use diabetes self-management services (e.g. DSMES, Medication Therapy Management (MTM), Medication Nutrition Therapy (MNT), Chronic Disease Self-management Program (CDSMP), Diabetes Empowerment Education Program (DEEP), etc.), to reduce risk factors, morbidity, and mortality associated with diabetes.

Objective 1: By 2025, increase the number of people with diabetes who receive DSMES by 10%.

V.   Burden of Diabetes in Indiana

Prediabetes and diabetes are leading public health concerns across the United States and Indiana. According to the United Health Foundation's 2018 America's Health Rankings, Indiana ranks 36th in the United States for prevalence of diabetes (rankings are from lowest to highest prevalence). Diabetes mellitus, commonly referred to as diabetes, is a group of metabolic diseases in which high levels of glucose (blood sugar) exist in the body over an extended period of time. This results in the pancreas not producing enough or no insulin, or the body does not respond correctly to the insulin produced. This malfunction raises blood glucose levels and leads to the development of medical complications. Diabetes and associated complications lead to lower quality of life, economic burden, disability or death, as well as a vast economic drain on federal, state and personal resources. Type 1 diabetes is related to genetic and environmental factors that lead to little to no insulin produced by the body. However, 90% to 95% of diabetes diagnoses are type 2, where the body does not respond to insulin produced to reduce blood sugar due to insulin resistance (More information about the types of diabetes can be found in Appendix E.)

The 2017 Centers for Disease Control and Prevention (CDC) National Diabetes Statistics Report estimates that 30.3 million Americans have diabetes; of those, 7.2 million have not been diagnosed. This percentage has been steadily increasing every year since at least 1994. Table 1 and Figures 1 thru 7 illustrate this increase over time using an age-adjusted percentage of adults with diabetes overall and by age groups and gender for Indiana and nationally.

The 2018 Behavioral Risk Factor Surveillance System (BRFSS) estimates 12.48% of Indiana adults (or 639,444 adults) were told by a doctor or other health professional that they have diabetes.

Obesity is a risk factor for type 2 diabetes and is used in this report to indicate a body mass index (BMI) greater than 30. According to the 2018 Indiana Behavioral risk Factor Surveillance System, more than 30% of Hoosiers are considered obese. The Indiana State Health Improvement Plan (https://www.in.gov/isdh/files/Indiana_State_Health_Plan_I-SHIP.pdf) discusses how obesity and related health conditions affect the health of the state and activities to achieve optimal health for Hoosiers. Other risk factors include physical inactivity, smoking, racial and ethnic minorities, age over 40, prior gestational diabetes, and having a family member who has diabetes.

Diabetes disproportionately affects minority populations, with 14.2% of black Hoosiers diagnosed with diabetes, compared with 12.6% of white Hoosiers.

According to Harvard Endocrinologist, Clinical Investigator, and Educator Dr. A. Enrique Caballero, genetic factors are present in minority populations that affect the ability of the pancreas to produce and respond to insulin. Additional complicating factors include a tendency for abdominal obesity, a lack of access to healthy foods and physical activity opportunities, and disparities in income, education, health literacy and access to health care—all of which contribute to prevention and management of the disease. This strategic plan represents one effort to make the public, healthcare providers, insurance companies, and policy makers aware of these disparities and their consequences.

Table 1. Prevalence of Diabetes and Prediabetes by Demographic Group – Indiana, 2018

Demographic Group	Diabetes Prevalence (%)	Prediabetes Prevalence (%)
Total	12.48%	9.43%
Sex		
Male	13.62%	8.47%
Female	11.40%	10.30%
Race/Ethnicity		
White/Non-Hispanic	12.63%	9.34%
Black or African American/Non-Hispanic	14.17%	10.98%
Other Race/ Non-Hispanic	6.57%	
Multi-Racial/Non-Hispanic	11.70%	9.27%
Hispanic	10.52%	8.71%
Age		
18-34	2.30%	4.55%
35-44	6.49%	8.33%
45-54	12.24%	10.44%
55-64	19.94%	15.14%
65+	25.77%	12.71%
Education		
Less than high school	17.74%	10.89%
High school diploma or GED	13.32%	10.30%
Some post high school education	11.98%	9.44%
College graduate	9.08%	7.38%
Income		
Less than $15,000	20.56%	16.60%
$15,000 - 24,999	18.73%	13.58%
$25,000 - 34,999	14.85%	7.38%
$35,000 - 49,999	12.98%	9.34%
$50,000 - 74,999	10.86%	7.95%
$75,000 +	7.46%	7.40%

Source: BRFSS

Figure 1.
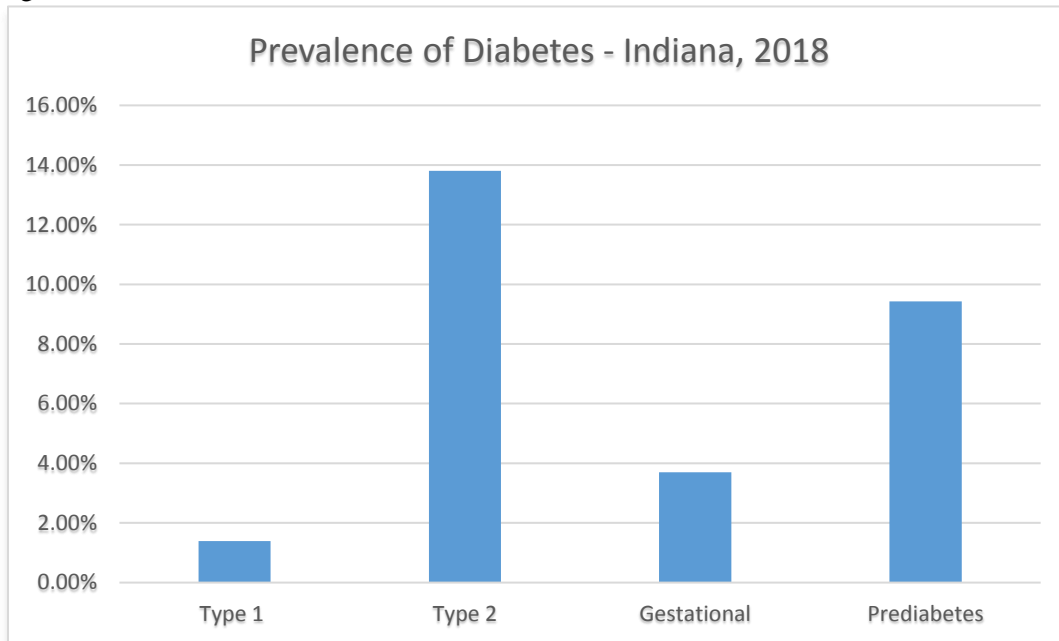
Sources: INPC, BRFSS, Management Performance Hub (MPH) (Vital Statistics)

Figure 2. Map of Diabetes Prevalence by County

Source: INPC

Figure 3. Map of Diabetes Prevalence by ZIP Code

Source: INPC

Figure 4.

Percentage of Adults with Diabetes--Indiana, 2011-2018
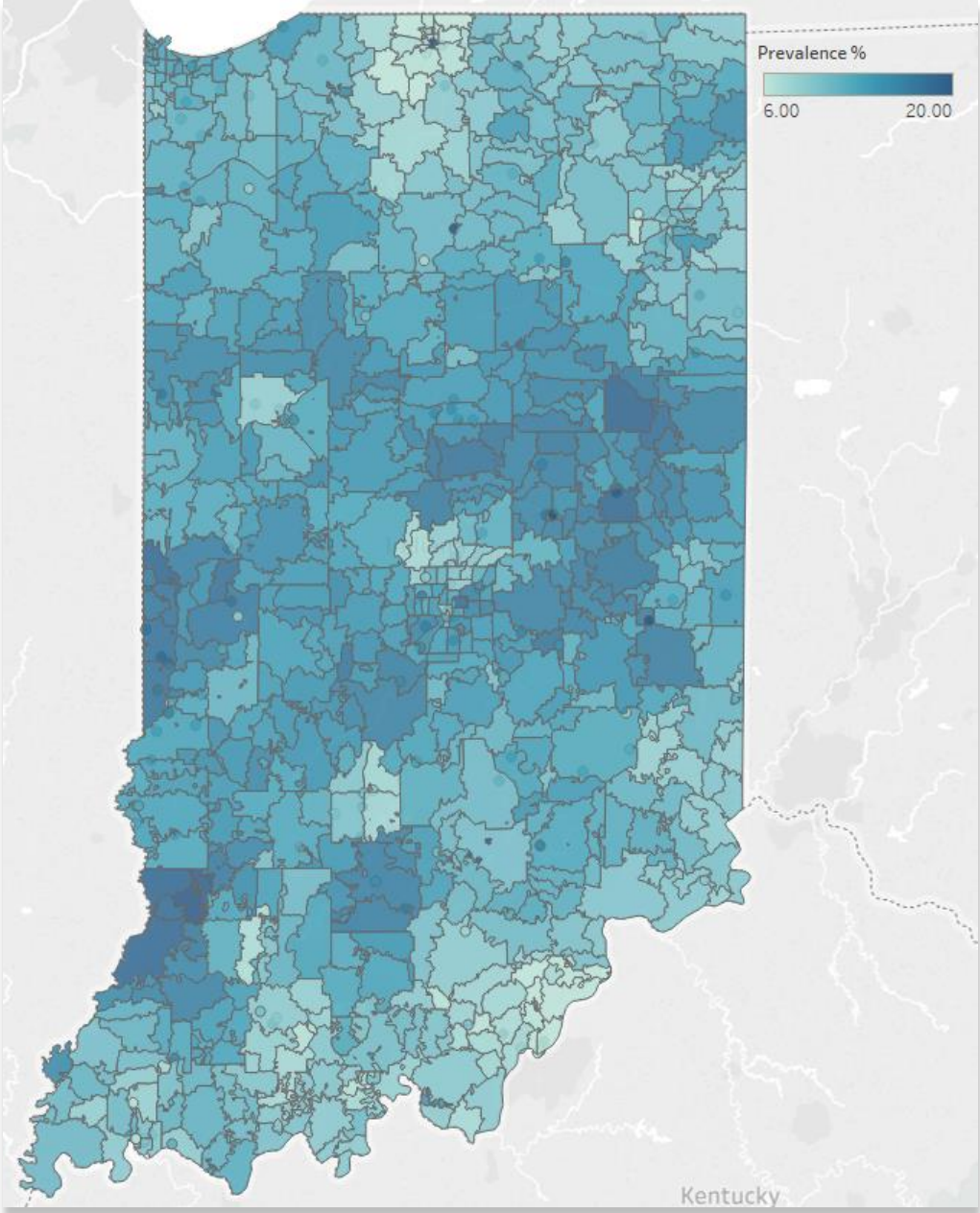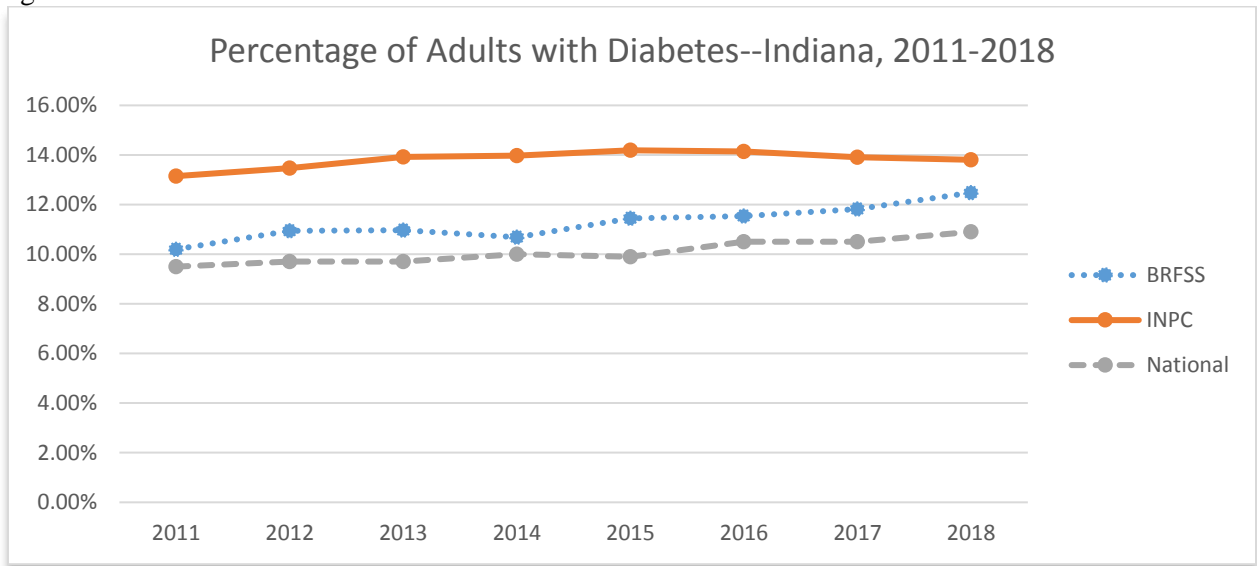
Source: BRFSS, INPC

Figure 5.

Source: INPC, 2018

Diabetes Prevalence by Age Group
Indiana, 2012-2018

Figure 6.

Diabetes Prevalence by Race/Ethnicity
Indiana, 2012-2018
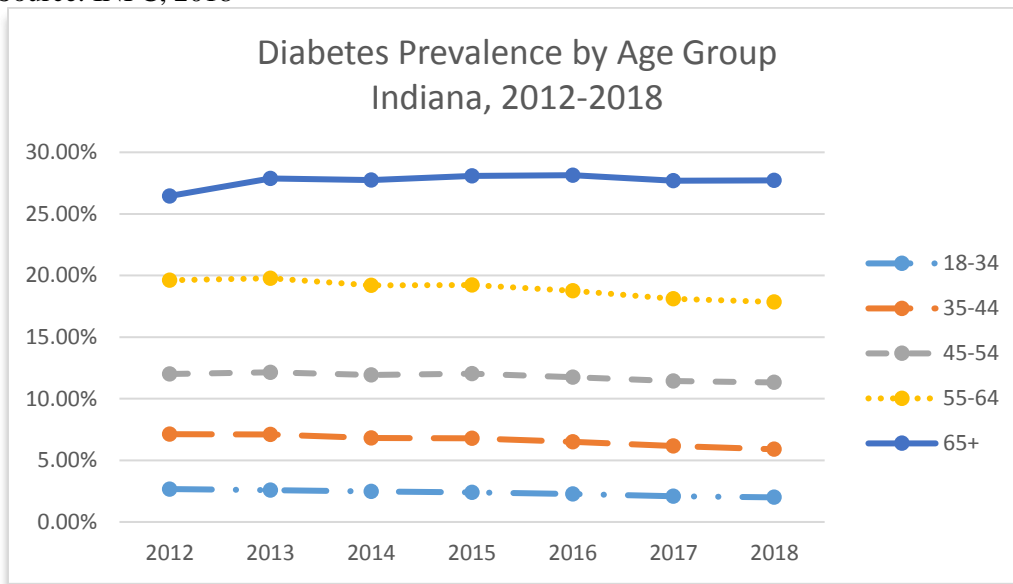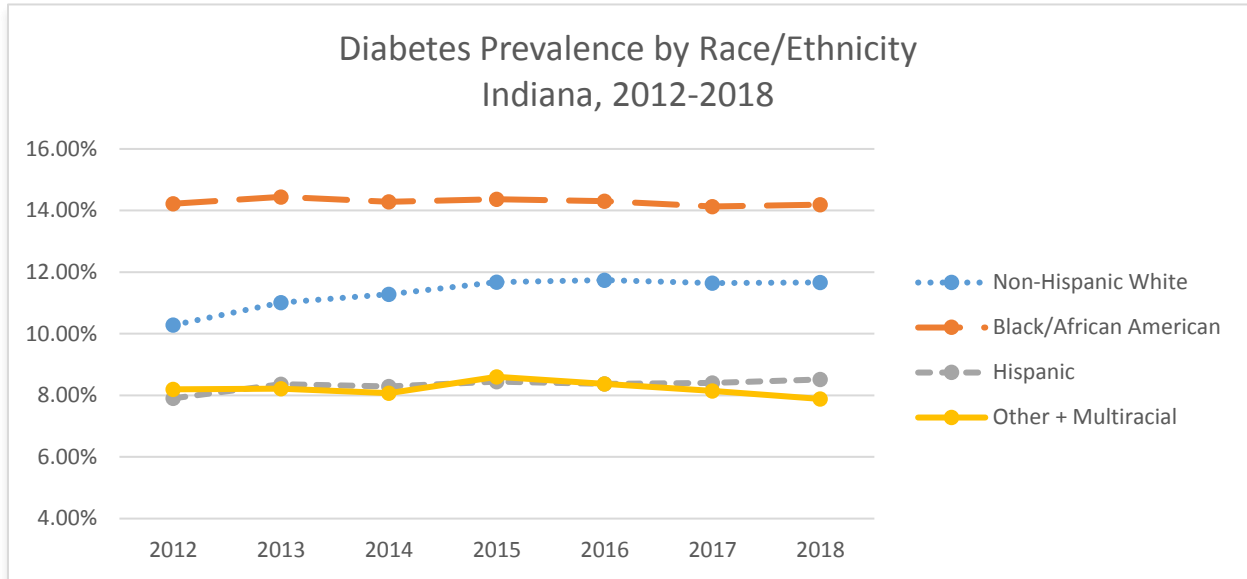
Source: INPC, 2018

Figure 7.

Diabetes Prevalence by Gender - Indiana, 2018
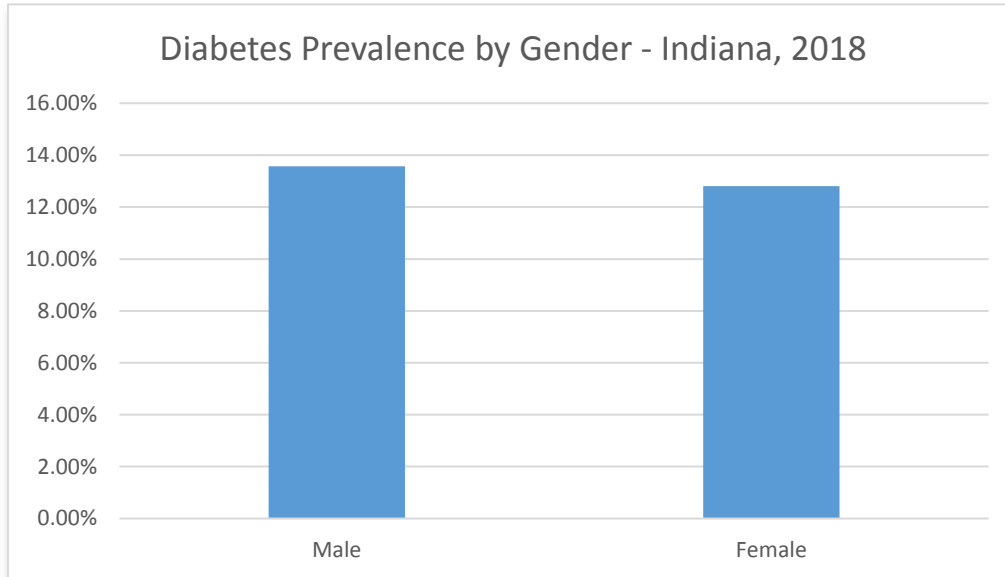
Source: INPC, 2018

Prediabetes

"Prediabetes" refers to a condition where insulin resistance is impairing fasting glucose levels but the diagnostic criteria for diabetes are not met. Many interventions can successfully delay the onset of diabetes if this condition is diagnosed and treated early. Nationally, an estimated 33.9% of U.S. adults, aged 18 years or older (84.1 million people) had prediabetes in 2015, based on their fasting glucose or A1C level (CDC, 2017 National Diabetes Statistics Report). Nearly half (48.3%) of adults aged 65 years or older had prediabetes, but according to BRFSS, only 14.1% were aware that they had this condition. In Indiana, only 9.34% of adults 18 and older report being told they have prediabetes (BFRSS, 2018).

Prediabetes was added as a new diagnosis to the International Statistical Classification of Diseases and Related Health Problems (ICD-10) in October, 2016. The addition of this diagnostic code has increased awareness among medical providers and the general population. Lifestyle change programs, such as the National Diabetes Prevention Program (DPP), have been proven effective to prevent or delay the onset of diabetes. With support from the CDC, the National Institutes of Health (NIH), the American Diabetes Association (ADA), and the Ad Council, health promotion campaigns have been implemented to curb the rising incidence of prediabetes in Indiana and across the nation.

Figure 8.

Source: BRFSS, 2018

Figure 9.

Prediabetes Prevalence by Age Group
Indiana, 2018

A bar chart showing prediabetes prevalence by age group with values approximately: 18-34 at 4.5%, 35-44 at 8.3%, 45-54 at 10.4%, 55-64 at 15.1%, 65+ at 12.7%. Y-axis ranges from 0.00% to 16.00%.

Source: BRFSS, 2018

Figure 10.

Prediabetes Prevalence by Race/Ethnicity
Indiana, 2018

A bar chart showing prediabetes prevalence by race/ethnicity with values approximately: Non-Hispanic White at 9.3%, Black/African American at 11.0%, Other at 8.8%. Y-axis ranges from 0.00% to 12.00%.

Source: BRFSS, 2018

Figure 11.

**Prediabetes Prevalence by Gender
Indiana, 2018**

Source: BRFSS, 2018

Contributing Health Factors
Several conditions and behaviors are risk factors for diabetes and its complications, including smoking and obesity. Smoking rates in Indiana were above the national average in 2018, with 21.1% of adults reporting smoking in Indiana compared to the national rate of 16.1%. Obesity is higher in Indiana compared to the nation, 34% versus 31% (defined as percentage of adults with a body mass index of 30.0 or higher based on reported height and weight). This presents a significant opportunity for improving the health of Hoosiers.

Figure 12.
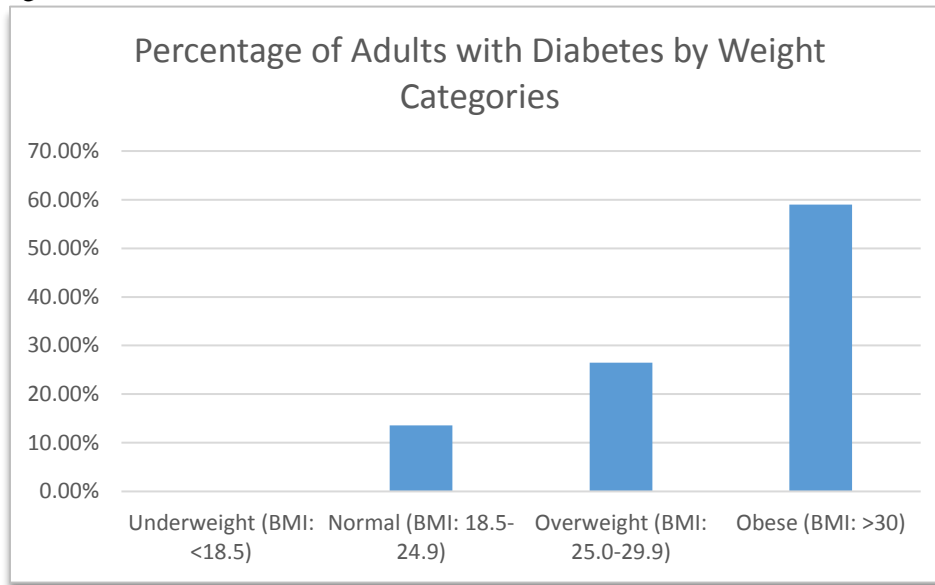
"What percentage of adults with diabetes are normal weight, overweight or obese?"

Source: BRFSS

Figure 13.

Percentage of Current Adult Smokers with Diabetes
Indiana, 2012-2018
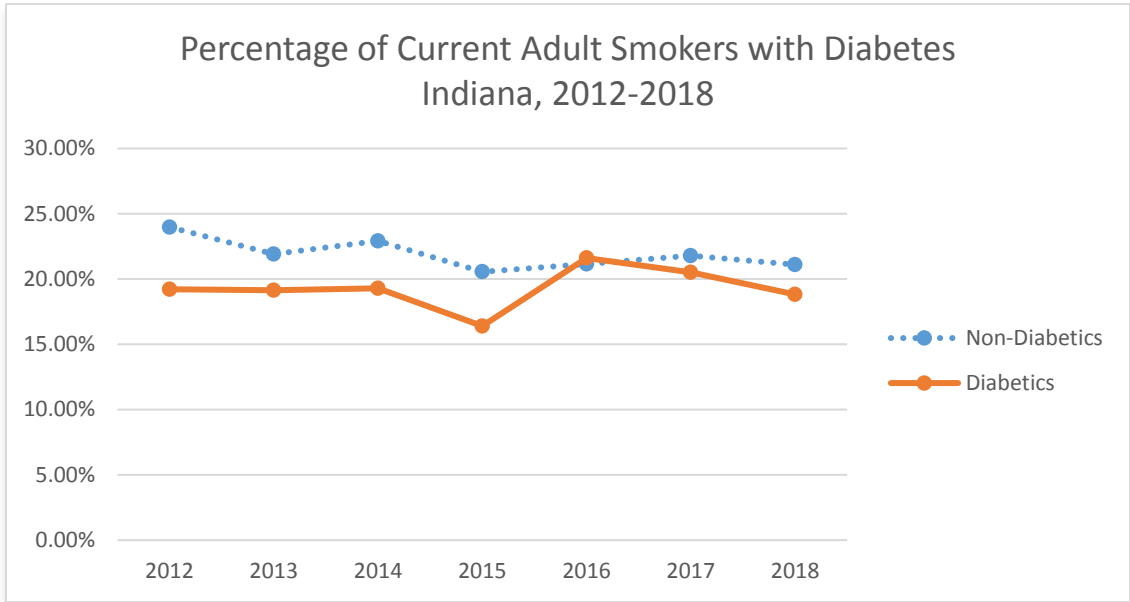
"How many Indiana adults are current smokers/have ever been smokers?"
Source: BRFSS, 2018

Figure 14.

Percentage of Adults With Diabetes Who Have Ever
Smoked--Indiana, 2012-2018
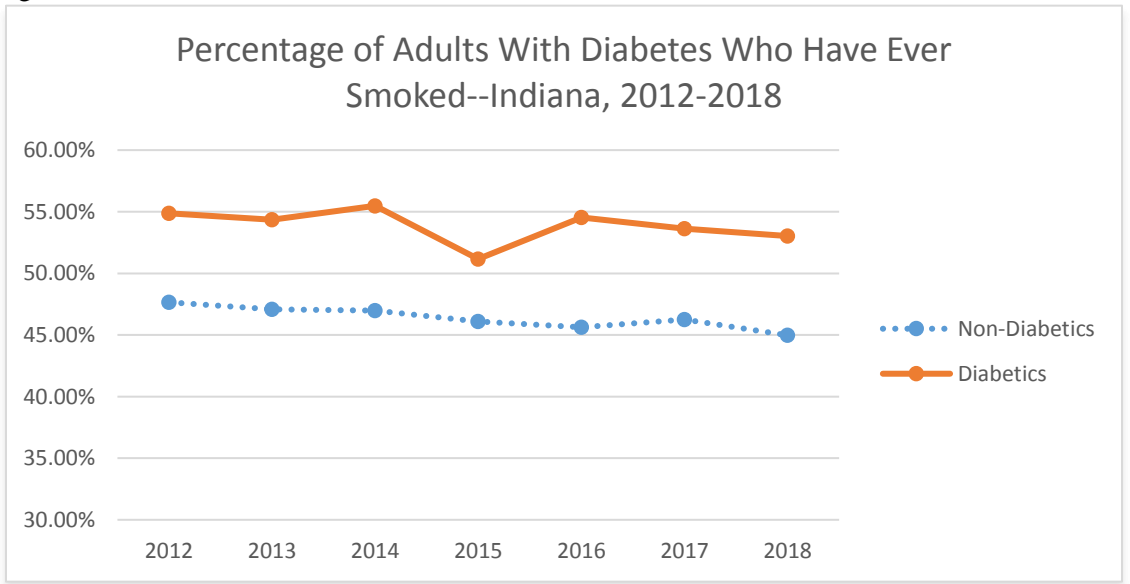
"How many people with diabetes are current smokers (or have been smokers)?"
Source: BRFSS, 2018

Comprehensive Diabetes Care

People with diabetes who have high blood sugar (blood glucose, have higher levels of hemoglobin A1C (HbA1c). When people lower their HbA1c close to normal, they are less likely to have additional health problems caused by their diabetes. These health problems can include heart attack or stroke, eye or kidney problems, or problems with pain, tingling and/or numbness in hands and feet. Health education programs such as the Diabetes Self-Management Education and Support program (DSMES) are available statewide to help patients control their diabetes and provide self-management education to patients.

Figure 15.
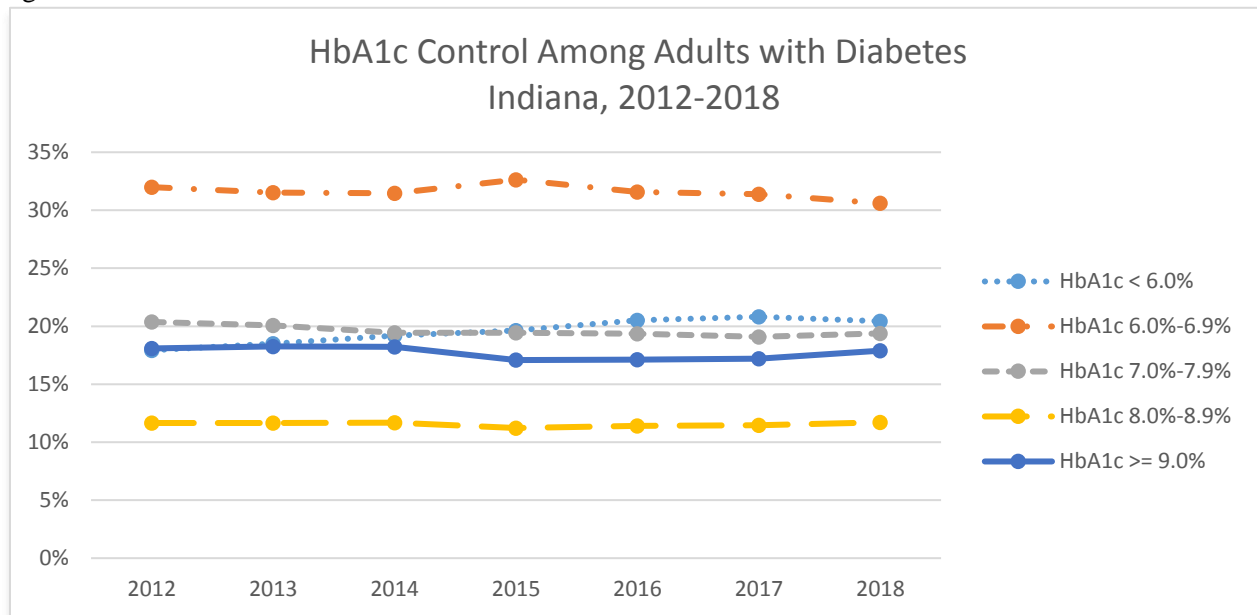
Source: INPC

Morbidity and Mortality

Overall, diabetes was the seventh-leading cause of death in Indiana in 2018. According to the 2017 CDC National Diabetes Statistics Report, diabetes was also the seventh-leading cause of death in the United States in 2015. This finding is based on death certificates in which diabetes was listed as the underlying cause of death. Diabetes as a condition, particularly in the context of poorly managed blood glucose levels, causes early death and morbidity from cardiovascular disease, kidney disease, and other co-morbid medical conditions such as cancer. The effect on quality of life cannot be overstated. Diabetes is a risk factor for these morbidities that can be modified by people with diabetes keeping their HbA1c in control. Figures 16 – 18 show the percentage of deaths in Indiana due to diabetes mortality.

Figure 16.
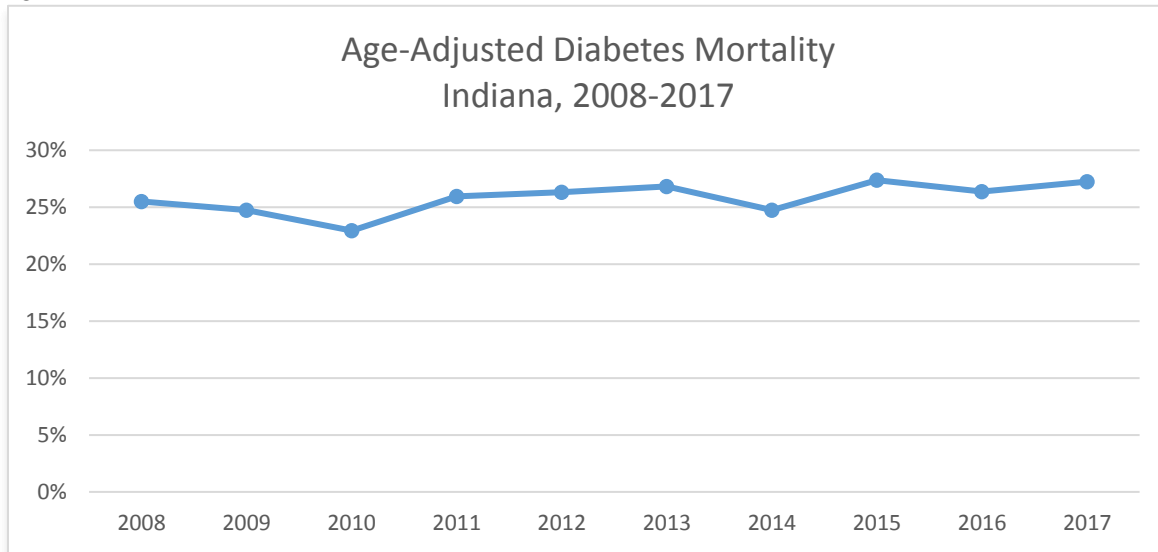
Source: MPH (Vital Statistics)

Figure 17.

Age-Adjusted Diabetes Mortality by Gender
Indiana, 2008-2017

Source: MPH (Vital Statistics)

Figure 18.

Age-Adjusted Diabetes Mortality by Race/Ethnicity
Indiana, 2008-2017
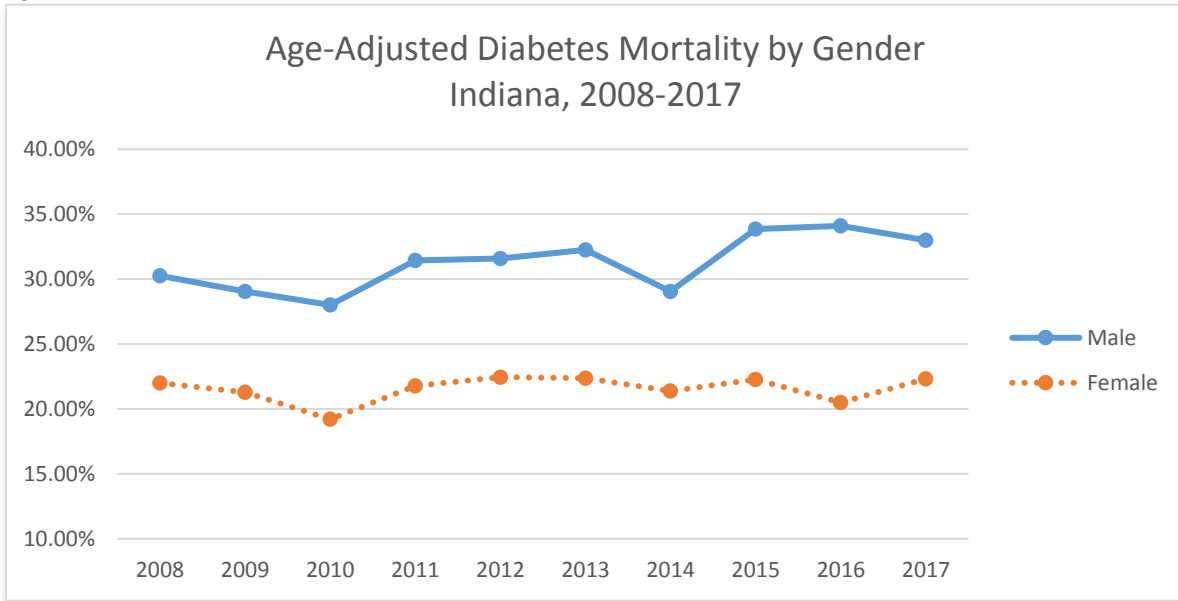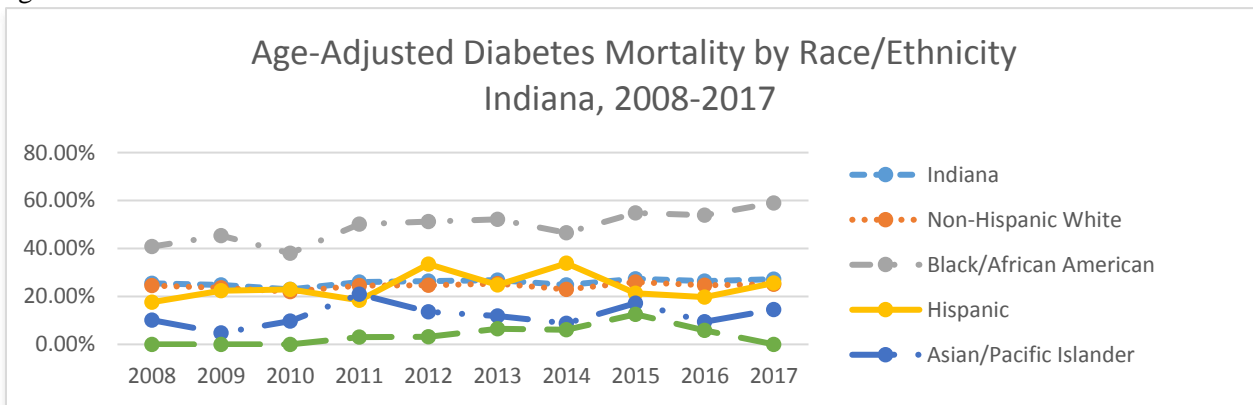
Source: MPH (Vital Statistics)

Healthcare Cost of Diabetes in Indiana

Diabetes is very costly; total direct and indirect estimated cost of diagnosed diabetes in the United States in 2012 was $245 billion, with average medical expenditures for people with diagnosed diabetes about $13,700 per year. About $7,900 of this cost can be attributed to diabetes. According to the Healthcare Cost and Utilization Project (HCUP), 12 million ED visits in 2016 were related to diabetes for adults aged >18 years; almost 70% of these visits were charged to Medicare and Medicaid. Additionally, in 2008, nearly one in five hospitalizations were related to patients with diabetes, totaling over 7.7 million stays and $83 billion in hospital costs.

Table 2. Indiana Inpatient Hospitalization costs vs. Inpatient Diabetes Costs

Disease	Costs
Diabetes Inpatient Costs	$ 141,742,560.12
All Other Indiana Inpatient Hospitalization Costs	$ 8,146,485,685.88
Total	$ 8,288,228,246.00

Source: HCUP, 2016

Figure 19. Indiana Inpatient Hospitalization Costs vs. Inpatient Diabetes Costs
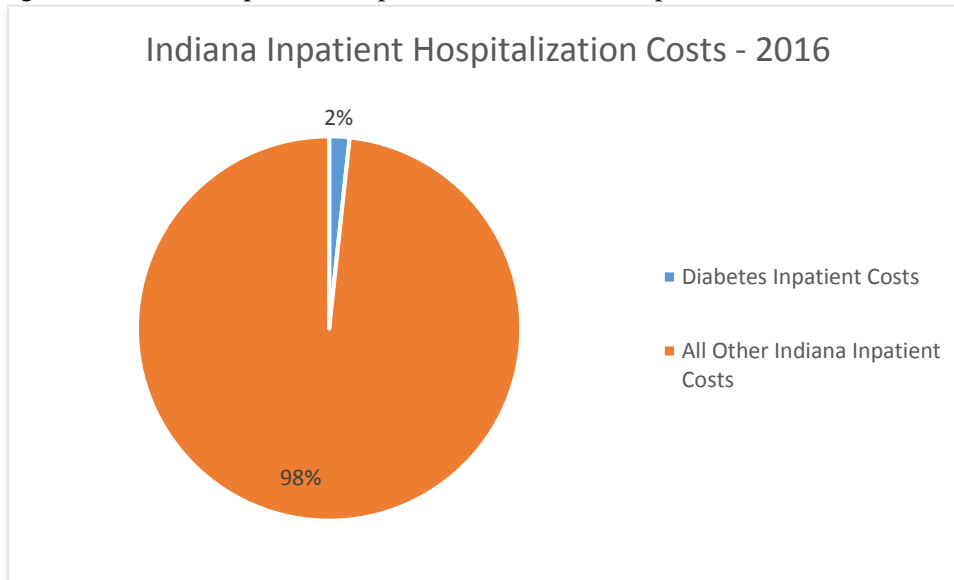
Source: HCUP, 2016

Gestational Diabetes

Gestational diabetes is a type of diabetes that is first seen in a pregnant woman who did not have diabetes before she was pregnant. This type of diabetes can often be controlled through eating healthy foods and being regularly physically active. Obesity is a risk factor for preterm birth, infant mortality, and gestational diabetes. Nationally, the percentage of women with a BMI ≥30 significantly increased from 21.4% in 2012 to 24.1% in 2015. In Indiana, it is estimated that 3.7% of pregnant women had gestational diabetes in 2018.

Figure 20.
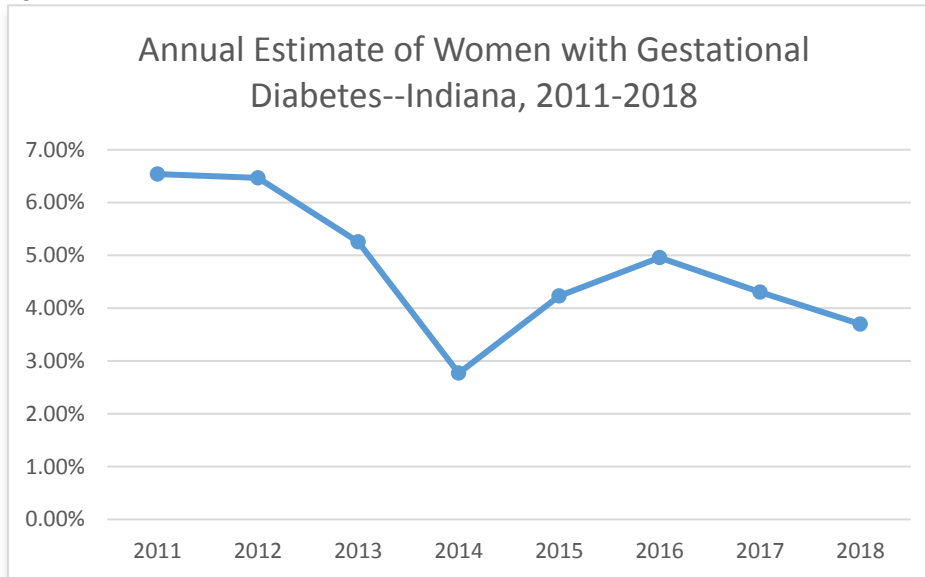
Source: INPC, MPH (Vital Stats)

VI. Goals and Objectives

Data and Surveillance

Goal 1: Use data to drive population-based diabetes strategies.

_____

Measure: Data Committee has established common diabetes measures and sources for all data sets.
_____

Objective 1: Develop common diabetes measure set across the Indiana provider community.

Strategies
- Align measures and data collection with national quality measure conventions (e.g. CMS, National Quality Forum (NQF)).
- Identify set of common diabetes care measures to be utilized with data partners across the state.
- Encourage provider monthly tracking and utilization of diabetes data.
- Utilize diverse sources of available data, including surveillance and claims/service-based reporting, to capture ongoing execution of diabetes strategies.

Objective 2: Use diabetes data as a transformative suite to drive transformation of the healthcare system in Indiana.

Strategies
- Support public availability and access of diabetes surveillance data through establishment of a biannual report to be housed on the ISDH website highlighting current state of diabetes in Indiana.
- Develop a report on the costs of diabetes as specified in the statute.
- Facilitate improvements in diabetes care across settings through diabetes quality improvement and tracking activities.
- Promote expansion of clinical care process measures beyond diabetes, to include other chronic conditions and co-morbidities and social determinants of health.

Prevention and Screening

In the United States, more than 100 million adults (43% of the US population), 18 years of age and older, are now living with diabetes or prediabetes (CDC, 2017). Among this group, 30.3 million Americans, or 9.4% of the U.S. population, have diabetes, while another 84.1 million have prediabetes. Nearly 25 percent of adults living with diabetes do not know they have the condition. However, about 88 percent of adults with *prediabetes* do not know they have it. More people are diagnosed with diabetes as they age. Among adults, aged 18 to 44 years, 4% have diabetes. Among those 65 and older, 25% have diabetes (CDC, 2017).

At least 9.43% of Indiana adults have reported that they have been diagnosed with prediabetes (BRFSS, 2018). However, it is estimated that at least 33% of adults in Indiana have prediabetes. Prediabetes is a condition when individuals have higher than normal blood glucose levels, but not high enough to be diagnosed as Type 2 diabetics. Those who have prediabetes are at high risk for developing type 2 diabetes, which can only be managed after developing as it cannot be cured. People with prediabetes have several options to manage their blood glucose, which include eating healthier, increasing their physical activity, or joining a National Diabetes Prevention Program (National DPP).

Diabetes prevention programs assist individuals to set goals, learn how to eat healthy diets, increase physical activity, self-motivate, and solve problems that prevent making healthy lifestyle changes. Indiana has numerous sites where individuals can join in-person programs, which are depicted in the map. The map also shows the 20 counties with the highest diabetes prevalence in red and the 20 counties with the lowest diabetes prevalence in green (Robert Wood Johnson Foundation, 2019).

Figure 21.
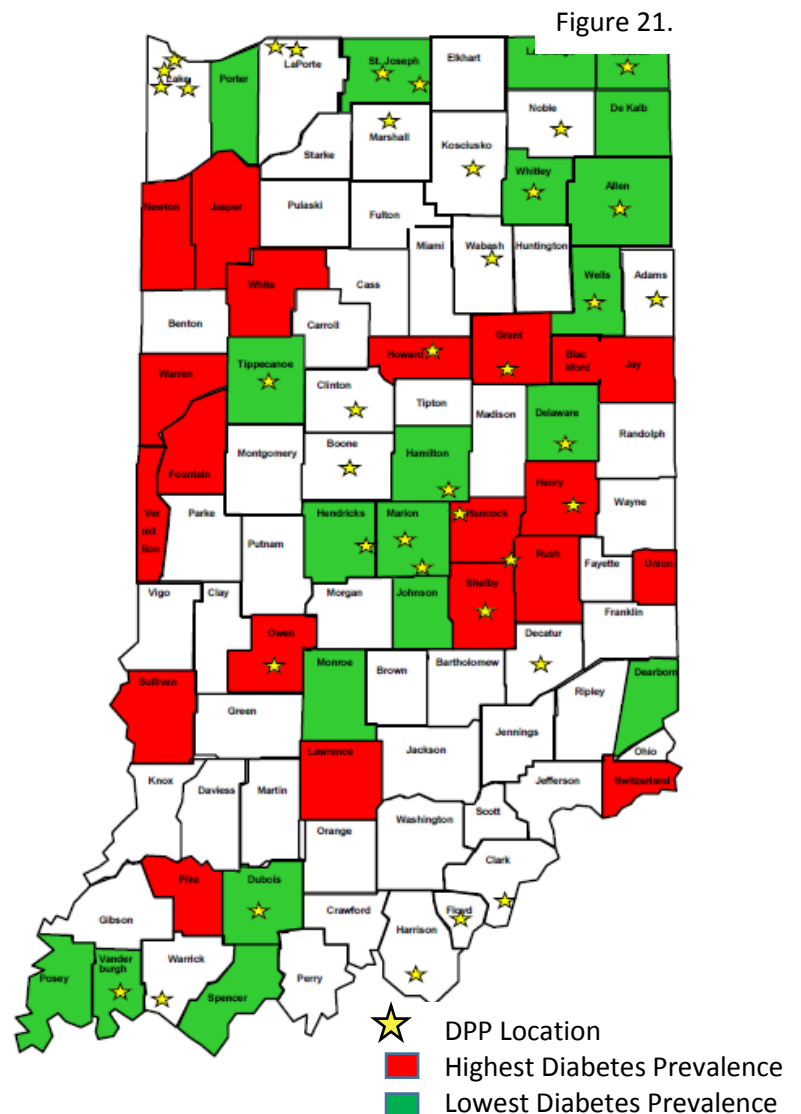
Goal 2: Educate and connect people to the tools and resources available to support them in pursuing a healthy lifestyle to prevent diabetes.

_____

Measure: Percentage of Indiana population at high risk of being diagnosed with prediabetes. Baseline – 9.43 (2018 Indiana BRFSS)
_____

Objective 1: By the end of 2021, increase access and utilization to localized nutrition and physical activity resources throughout the state by integrating information into existing communication channels for improved information dissemination.

Strategies
1. Partner on the development and promotion of a statewide tool that can serve as a searchable repository for local nutrition and physical activity resources. Examples include publishing school facility shared-use programs that are available, walking trails, healthy cooking classes, weight loss programs and other exercise programs.
2. Work to incorporate resources into a statewide network. An example would include Indiana 211.
3. Identify other potential avenues for coordinating and distributing information. As an example, providers should receive the same information that is in the statewide tool for the consumer.
4. Coordinate with and use resources provided by the Supplemental Nutrition Assistance Program – Education administered by ISDH Division of Nutrition and Physical Activity in conjunction with Purdue University Extension Services.

Objective 2: By the end of 2021, develop a resource for development of coordinated local and statewide policies that target large systems such as employers, schools and worksites.

Strategies
1. Coordinate and disseminate resources that would support the implementation of school wellness policies.
2. Provide food pantries with resources that contain healthy food guidelines.
3. Disseminate available worksite wellness toolkits such as those provided by the Indiana State Department of Health, the Centers for Disease Control and Prevention or American Heart Association.

Objective 3: By 2025, implement state-level policies that foster diabetes prevention by focusing on workplaces, including child care facilities and schools.

Strategies
1. Provide funding for IDOE that will provide technical assistance for schools to more effectively implement their school wellness policies.
2. Educate lawmakers, stakeholders, and decision makers about the health and economic benefits of preventing diabetes.
3. Develop partnerships with organizations that have similar advocacy goals and infrastructure to advocate for prevention and for people with prediabetes and diabetes.

Goal 3: Increase clinical prediabetes screening, testing, and referral of high-risk patients to National Diabetes Prevention Programs.

_____

Measure: Number of individuals who attend the National Diabetes Prevention Program. Baseline – 7400. (CDC Diabetes Prevention Recognition Program (DPRP) Evaluation Report, 2019)

_____

Objective 1: By 2021, implement a National Diabetes Prevention Program (National DPP) in at least 10 out of the top 20 counties with highest diabetes prevalence in Indiana through increased public and private provider knowledge.

Strategies
1. Provider/Healthcare Systems
    a. Utilize the online American Diabetes Association (ADA) risk assessment tool
    b. Utilize the existing American Medical Association resources to assist with provider education and the National DPP referral process.
    c. Education and referral process should include directions to patients that are specific with supplemental resources, such as a handout.
    d. Increase referrals to accessible National DPP programs/resources that either have a physical location or can be accessed virtually.
2. Public Awareness
    a. Increase awareness of the Indiana-specific online ADA risk assessment tool and knowledge of actions to take if high risk. Action steps include: reduce weight if overweight, increase activity, start National DPP program.
3. Partner Organizations
    a. Assess community partners to assist with diabetes education and screening.
    b. Increase awareness of accessible National DPP programs/resources that either have a physical location or can be accessed virtually.
    c. Increase the number of National DPP programs in areas without coverage by establishing programs between partner organizations.

Objective 2: By 2025, implement state policies that will increase access to the National Diabetes Prevention Programs.

Strategies
1. Increase state insurance coverage policies for the National Diabetes Prevention Program through Indiana State Medicaid.
2. Determine which services and ICD codes are covered for payer reimbursement.
3. Advocate for Medicaid National DPP coverage, reimbursement for transportation, and reimbursement options for telehealth National DPP.
    a. After telehealth National DPP reimbursement is attained, develop healthcare systems partnerships to assist National DPP programs to bill insurers.
4. Increase the use of commercial insurance coverage for the National Diabetes Prevention Program through general legislative action.
    a. Advocate for the inclusion of National DPP coverage within the Indiana state diabetes legislation rules.
    b. Advocate for other commercial insurance coverage of National DPP. Example includes increasing awareness of the cost savings benefit.
5. Advocate for reimbursement of transportation and reimbursement options for telehealth DPP.

       a. After telehealth National DPP reimbursement is allowed, develop healthcare systems partnerships to assist DPP programs to bill insurers.

       b. Encourage CDC certified programs to add distance-learning certification.

6. Advocate for the use of the new category III tracking codes, which utilize the National Board of Health and Wellness Coaching standards to allow dietitians and nutritionists to be reimbursed for prediabetes counseling and education.

7. Advocate for state funding to help establish and certify new National DPP programs for their first-year expenditures.

Treatment and Management

Being diagnosed with diabetes is a life-altering event. Diabetes can be difficult to treat and manage, for multiple reasons. The treatment for a person with diabetes is completely individualized, meaning that a treatment plan that works for one person will not work for another.

It is important to properly treat people with diabetes and to arm them with powerful, up-to-date tools and resources that can make managing diabetes easier, avoiding life-altering complications. Without proper treatment and/or if a person with diabetes is having difficulties managing their chronic disease, severe complications can occur, such as glaucoma or blindness, kidney disease, nerve damage, wound infections that can lead to amputations, and cardiovascular disease and stroke. Poor treatment and management of diabetes can also result in development of gingivitis and increased risk for depression.

Healthcare professionals can prescribe a number of different medications and devices that can assist with the treatment of and management of diabetes, but they can also refer people with diabetes to evidence-based, lifestyle change programs, like the Diabetes Self-Management and Education Support Program (DSMES), as a treatment method and a way to form habits that can help with the management of diabetes. However, people with diabetes do not always have access to these different resources due to lack of healthcare coverage, proximity and/or transportation to lifestyle-change programs, and/or the healthcare provider's awareness of these resources.

The following goals, objectives, and strategies address the access, coverage, education and utilization of medications, diabetes-related devices, and evidence-based lifestyle change programs to improve the standards of treatment for people with diabetes and ease the management of the disease for people with diabetes.

Goal 4: Increase access to, and coverage of, treatment and management options for patients with diabetes.

_____

Measure: Number of individuals who attend Diabetes Self-Management Education and Support (DSMES) Programs. Baseline – 25,600 (CDC DSMES State Data, 2018).
_____

Objective 1: By 2021, investigate and address potential Medicaid-specific barriers to comprehensive diabetes management and treatment.

Strategies
1. Review restrictions on prior authorization for payers.
2. Develop recommendations for process improvement and change to PA workflow.

Objective 2: By 2021, Decrease the prior authorization wait time by 25% for both pharmacists and authorizing physicians.

Strategies
1. Compare prior authorization wait times for paper versus digital prior authorization.
2. Develop recommendations for process improvement and change to PA workflow.

Objective 3: By 2025, raise healthcare provider awareness about available Indiana Medicaid coverage for self-management diabetes-specific technologies, including continuous glucose monitors (CGMs) and insulin pumps.

Strategies
1. Review the Indiana State Medicaid coverage for DSMES programs to ensure its current use meets national standards and to ensure DSMES providers are included in, and reimbursed by, Medicaid managed care provider networks.
2. Produce a guidance document for providers that increases awareness and utilization of the Indiana Medicaid Preferred Diabetes Supply List (PDSL) and steps to get coverage of supplies not currently on the list.
3. Develop recommendations for process improvement and change to Indiana State Medicaid coverage policy.

Goal 5: Support development and sustainability of DSMES programs to utilize AADE or ADA national standards and evidence-based curricula.

_____

Measure: Number of AADE-accredited or ADA-recognized DSMES program in Indiana. Baseline – 63 Programs. (CDC DSMES State Data, 2018)
_____

Objective 1: By 2025, increase the number of AADE-accredited or ADA-recognized DSMES programs throughout the state of Indiana by 10%.

Strategies
1. Facilitate the recognition and accreditation process for DSMES programs through capacity building and targeted technical assistance.
2. Provide training on accepted curricula (e.g. ADA or AADE) and lead trainer training.

Objective 2: By 2021, define the knowledge skills and abilities in the role of a community health worker (CHW) in diabetes education.

Strategies
1. Review current use of CHW reimbursement codes.
2. Establish a framework for CHW reimbursement.

Objective 3: By 2025, increase DSMES program sustainability by providing technical assistance to organizations.

Strategies
1. Provide educational marketing materials to increase participation in existing DSMES programs.
2. Review DSMES program curriculum to ensure consistency with national standards.
3. Encourage DSMES programs to have a presence on their organizations' web sites.

Goal 6: Increase the number of people with diabetes who use diabetes self-management services (e.g. DSMES, MTM, MNT, CDSMP, DEEP, etc.), to reduce risk factors, morbidity, and mortality associated with diabetes.

_____

Measure: Number of individuals who attend Diabetes Self-Management Education and Support (DSMES) Programs. Baseline – 25,600 (CDC DSMES State Data, 2018).
_____

Objective 1: By 2025, increase the number of people with diabetes who receive DSMES by 10%.

Strategies
1. Explore options to increase the accessibility/convenience/frequency of services.
2. Increase the number of people with diabetes referred to a DSMES program through an opt-out DSMES referral system.
3. Offer transportation vouchers or partner with organizations that provide vouchers to programs where patient transportation options are limited.

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Appendix B

House Enrolled Act No. 1175

AN ACT to amend the Indiana Code concerning health.

Be it enacted by the General Assembly of the State of Indiana:

SECTION 1. IC 16-46-16 IS ADDED TO THE INDIANA CODE AS A NEW CHAPTER TO READ AS FOLLOWS [EFFECTIVE JULY 1, 2018]:

Chapter 16. Strategic Plan to Reduce Diabetes

Sec. 1.

(a) The state department shall develop a strategic plan to identify and significantly reduce the prevalence of diabetes and prediabetes in Indiana.

(b) In developing the strategic plan under subsection (a), the state department shall collaborate with the office of the secretary of family and social services.

(c) The state department shall establish workgroups to assist in the development of the strategic plan. The members of a workgroup may include the following:

    (1) The commissioner or the commissioner's designee.

    (2) The secretary of family and social services or the secretary's designee.

    (3) The state superintendent of public instruction or the state superintendent's designee.

    (4) The dean of the Indiana University Richard M. Fairbanks School of Public Health or the dean's designee.

    (5) Health care providers specializing in diabetes prevention, screening, treatment, research, or education.

    (6) Health care providers who provide direct patient care.

    (7) Representatives of any medical, nursing, or dental school located in Indiana.

    (8) Middle school, high school, or college level health instructors.

    (9) Individuals diagnosed with diabetes or at risk for diabetes.

    (10) Public health advocates who work with diabetes or diabetes prevention.

    (11) Representatives of community based and faith based organizations involved in providing education, awareness, or support relating to diabetes.

    (12) Any other persons the state department determines are necessary.

    (13) Public health advocates who work with individuals with kidney disease.

    (14) Representatives of organizations that address minority health and health disparities.

(d) The state department shall update the strategic plan every two (2) years.

Sec. 2.

In developing and updating the strategic plan under section 1 of this chapter, the workgroups established under section 1(c) of this chapter shall do the following:

(1) Establish baseline benchmarks for diabetes and prediabetes in Indiana using Indiana specific data.

(2) Identify barriers to effective prevention, screening, and treatment for diabetes, including specific barriers affecting providers and patients.

(3) Identify methods to increase use of evidence based screening to increase the number of people screened regularly for diabetes.

(4) Review current technologies and best practices for diabetes screening, treatment, and prevention.

(5) Develop methods for creating partnerships with public and private entities to increase awareness of diabetes and of the importance of diabetes screening, treatment, and prevention.

(6) Estimate the annual direct and indirect state healthcare costs attributable to diabetes and prediabetes.

(7) Identify actions necessary to increase diabetes screening rates and to reduce the morbidity and mortality from diabetes, and establish a schedule for implementing those actions.

Sec. 3.

Before December 31, 2019, the state department shall deliver a written report to the governor and, in an electronic format under IC 5-14-6, to the general assembly that includes:

(1) the strategic plan developed under section 1 of this chapter; and

(2) Recommendations on goal implementation and schedule compliance related to the strategic plan developed under section 1 of this chapter.

Sec. 4.

This chapter expires July 1, 2026.

Appendix C

Data Sets Used in Report

Several different data sets were analyzed individually for this Diabetes Strategic Plan and are reflected in the charts and narratives of the Burden Section. Each dataset has strengths and limitations in assembling an accurate depiction of the disease and its risk factors at the state level. Datasets used in the Plan include the Indiana Network for Patient Care; the Centers for Disease Control and Prevention's Behavioral Risk Factor Surveillance System, and the Indiana State Department of Health's birth and death records.

A.   The Indiana Network for Patient Care

Portions of the data for these analyses are derived from the Indiana Network for Patient Care (INPC). Launched in the 1990's by a collaboration led by the Regenstrief Institute (www.regenstrief.org), the INPC provides clinical information at the point of care for the treatment of patients. It is the nation's largest inter-organizational clinical data repository, with more than 12 billion standardized clinical data elements, and is the primary platform that enables the Indiana Health Information Exchange (IHIE). The exchange is updated daily and connects more than 100 hospitals, 18,000 practices and over 50,000 providers. Additional summary statistics can be found in Table 3. While supporting the clinical care process is the primary purpose of the INPC, it also serves as an information resource for many research and population health initiatives.

Table 3: Summary statistics for the Indiana Network for Patient Care (INPC)

Description	Count
Unique Patients	19 million
Clinical Observations	12 billion
Text Reports	300 million
Prescriptions	15 million
Clinical Encounters	

INPC Diabetes Cohort Definitions
Using data from the INPC and in collaboration with the Indiana State Department of Health, Management Performance Hub (MPH), and IHIE, the diabetes-related cohort definitions were developed for this report are listed in Table 4 below:

Table 4: Definitions used to compute diabetes-related subgroups.

TYPE	CLINICAL DESCRIPTION	DEFINITION	DATA SOURCE	DATA SOURCE OWNER
Type 1 Diabetes	Insulin-dependent diabetes mellitus [IDDM] or juvenile-onset diabetes	ICD9: 250.01, 250.03, 250.11, 250.13, 250.21, 250.23, 250.31, 250.33, 250.41, 250.43, 250.51, 250.53, 250.61, 250.63, 250.71, 250.73, 250.81, 250.83, 250.91, 250.93 ICD10: E10.*	INPC	Regenstrief Data Core
Type 2 Diabetes	Non-insulin dependent diabetes mellitus [NIDDM]	ICD9: 249.00, 249.01, 249.10, 249.11, 249.20, 249.21, 249.30, 249.31, 249.40, 249.41, 249.50, 249.51, 249.60, 249.61, 249.70, 249.71, 249.80, 249.81, 249.90, 249.91, 250.00, 250.02, 250.10, 250.12, 250.20, 250.22, 250.30, 250.32, 250.40, 250.42, 250.50, 250.52, 250.60, 250.62, 250.70, 250.72, 250.80, 250.82, 250.90, 250.92, 357.2, 362.01, 362.02, 362.03, 362.04, 362.05, 362.06, 366.41 ICD10: E11.* Labs (at least 2 instances of): Resting glucose levels > 200 mg/dL Fasting Glucose levels > 140 mg/dL Fasting Glucose levels < 60 mg/dL HbA1c >= 6.5% Pharmacy order/fills: Acarbose, Acetohexamide, Avandia, Byetta, Chlorpropamide, Diabeta, Diabinese, Exenatide Inj, Glipizide, Glipizide Xl, Glucotrol, Glyburide, Glyburide Prestab, Metformin, Micronase, Orinase, Pioglitazone, Precose, Rezulin, Rosiglitazone, Tolazamide, Tolbutamide, Tolinase, Troglitazone	INPC BRFSS	Regenstrief Data Core ISDH
Gestational Diabetes	Affects only pregnant women and, if not treated, can increase short and long-term health risks for mother and child	ICD9: 648.83 ICD10: O24.*	INPC	Regenstrief Data Core
Prediabetes	Blood sugar level higher than normal but not high enough to be type diabetes	ICD9: 790.29 ICD10: R73.03 Labs (At least 2 instances of): Resting glucose levels between 140-199 mg/dL HbA1c between 5.7%-6.4%	BRFSS	ISDH
General Diabetes Self-Reported			BRFSS	ISDH

B.   Behavioral Risk Factor Surveillance Survey

The Behavioral Risk Factor Surveillance System (BRFSS) is the largest continuously conducted health survey system in the world, with more than 400,000 American adults participating each year. The BRFSS was established in 1984 by the Centers for Disease Control and Prevention (CDC). Indiana was one of the 15 states that participated from the start. By 1993, all states and territories had implemented the BRFSS. The Indiana State Department of Health (ISDH) is responsible for collecting this vital information on the health status of Hoosiers.

The BRFSS uses a disproportionate stratified sampling of landline telephone numbers and random sampling of cellular and landline telephone numbers to interview non-institutionalized adults aged 18 years and older. The CDC then assigns weights to each observation. This weighting system allows the data to be compared to Indiana's state population and for the calculation of disease prevalence estimates in Indiana. These prevalence rates show the estimated percentage of how many people have been told they have a certain health condition, in this case diabetes and prediabetes. (https://www.in.gov/isdh/25194.htm)

C.   Indiana Birth and Death Certificates

Birth Certificates – Natality
The Indiana Natality Dataset includes information on live births to Indiana residents that occurred during calendar year 2017. Information is presented at the state, county, and city level (for the 35 Indiana cities with populations over 25,000 in the 2010 census). The Dataset includes data by age, race, and marital status of the parents; characteristics of the newborn, e.g., birth order and age of mother; and outcome indicators, e.g., tobacco use during pregnancy, gestation length, and birthweight.

The ISDH, through provisions in Indiana Code 16-37-1, (http://iga.in.gov/legislative/laws/2019/ic/titles/001) administers "a system of vital statistics for Indiana." The ISDH Vital Records Division compiles data from original birth certificates filed with the ISDH and from transcripts of original certificates for Indiana residents giving birth in other states. The Data Analysis Team in the ISDH Epidemiology Resource Center compiles these data and produces standard statistical reports. For more information on this dataset:
https://www.in.gov/isdh/reports/natality/2017/preface.htm.

Death Certificates – Mortality Data
The Indiana Mortality Dataset provides a summary of all the deaths of residents of Indiana classified by the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10) cause of death code. Summary tables have also been developed for each county and selected cities within Indiana. The information provided in these tables is intended for health professionals, students, legislators, and others interested in the health status of the Indiana community. (For the most recent compete published report: https://www.in.gov/isdh/19096.htm).

The Indiana Mortality Dataset uses the ICD-10 coding system to classify and group causes of death. The ICD-9 coding system was in use from 1978 to 1998. Although these two systems have much in common, causes of death in this report are exactly comparable to causes of death since 1999, but not to causes in previous reports.

The Indiana Mortality Reports also uses the 2000 standard million population to age-adjust the mortality rates. Reports before 1999 used the 1940 standard million population. Consequently, rates in the latest

2017 Report are comparable to rates since 1999 but not to rates in previous reports. State-level rates based on the 2000 standard million population were calculated for 113 selected causes of death for the years 1995-1998 and are available online. The leading causes of death and populations of interest are provided in the tables within the 2017 Report's Highlights section. The intent of the 2017 Report is to provide information to assess the changing health status of the Indiana communities, to develop resources and interventions in areas of need, and to improve modifiable health risk behaviors for adverse health conditions.

Information is provided to the State on each cause of death under the authority of Indiana Code 16-37-1-3 (http://iga.in.gov/legislative/laws/2019/ic/titles/001). More information on the Mortality Dataset can be found at: https://www.in.gov/isdh/reports/mortality/2017/preface.html.

D.   Hospital Discharge Data

All non-federal acute care hospitals are required to report inpatient and outpatient hospital discharges. Long-term care, rehabilitation, and behavioral health hospitals may voluntarily report. Data is shared for all reporting hospitals, and the number of reporting hospitals varies by year.

Hospitals submit data quarterly to the Indiana Hospital Association (IHA). IHA processes the records for accuracy, consistency and completeness, and requests resubmissions as necessary. Once finalized, the ISDH combines the quarterly data for annual release.

The public inpatient data sets include all inpatient hospital discharges submitted by Indiana hospitals. Inpatient data is aggregated by hospital, primary payer, and:
- **APR-DRG and Severity**: All Patients Refined Diagnosis Related Groups; classification of patients by reason for admission and severity of illness (minor to extreme) designed for all payers and patients of all ages
- **MS-DRG**: Medicare Severity Diagnosis Related Groups; classification of patients by reason for admission and severity of illness (with or without complications or comorbidities) designed for Medicare patients
- **Principal Diagnosis**: condition identified as chiefly responsible for the patient's admission
- **Principal Procedure**: procedure performed for definitive treatment or taking care of a complication, and most related to the principal diagnosis.

Discharges are classified as inpatient or outpatient by each reporting hospital. The admission criteria distinguishing inpatient and outpatient visits may vary across hospitals. Billing procedures also vary by hospital, including the services provided and length of stay constituting one inpatient or outpatient discharge.

All counts reflect unique hospital discharge records. Counts do not necessarily reflect unique patients. Patients with more than one discharge from a hospital, for the same diagnosis, procedure, or condition in a year, are counted for each unique discharge record.

- Inpatient hospital discharges or hospitalizations generally refer to hospital discharges in which a patient was admitted to the hospital.
- Outpatient hospital discharges generally refer to hospital discharges in which a patient received health services without being admitted to the hospital.
- Emergency department visits refer to outpatient hospital discharges where emergency department services were provided. Inpatient hospitalizations may also involve emergency department services but are not included in counts of

emergency department visits.

For more information on Indiana Hospital Discharge Data, go to: https://www.in.gov/isdh/20624.htm.

E.   Age-Adjusted Rate Calculations:

The age-adjusted rates were calculated using the 19 U.S. 2000 Standard Populations shown in Table 1. Please note the US 2000 Standard Population is given in units of 1,000s and the total of the standard population is 274,634,000. The last column shows what fraction each of the 19 age groups contributes to the total standard population.

Table 5.

	Ages	US 2000 Std. Population	US 2000 Std. Population Fraction
0	All ages	274634	1
1	01 to 04 years	15192	0.0553173
2	00 years	3795	0.0138184
3	05 to 09 years	19920	0.0725329
4	10 to 14 years	20057	0.0730317
5	15 to 19 years	19820	0.0721688
6	20 to 24 years	18257	0.0664776
7	25 to 29 years	17722	0.0645295
8	30 to 34 years	19511	0.0710436
9	35 to 39 years	22180	0.080762
10	40 to 44 years	22479	0.0818508
11	45 to 49 years	19806	0.0721178
12	50 to 54 years	17224	0.0627162
13	55 to 59 years	13307	0.0484536
14	60 to 64 years	10654	0.0387934
15	65 to 69 years	9410	0.0342638
16	70 to 74 years	8726	0.0317732
17	75 to 79 years	7415	0.0269996
18	80 to 84 years	4900	0.0178419
19	85+ years	4260	0.0155116

Table 1

In order to calculate the crude rates, the number of the diabetes-related deaths as defined by ICD9 codes (E10 – E 14) in each of the 19 standard age ranges for a given year was tabulated. This count was then divided by the population in Indiana in that age range and multiplied by 100,000 to give the crude death rate per capita.

$$crude\ rate\ in\ 2017 = (\frac{count\ of\ Indiana\ deaths\ in\ age\ range\ in\ 2017}{Indiana\ population\ in\ age\ range\ in\ 2017}) \times 100,000$$

In order to calculate the age adjusted rate, the crude rate for a given year and age range is multiplied by the fraction of the standard population in the give age range. This product is a weighted crude rate for a given age range. These values are shown in the left most column in Table 1. For example, the weighted crude rate for ages 40 to 44 in 2017 would be:

$$weighted\ crude\ rate\ 2017 = \left[(\frac{\#\ Indiana\ deaths\ 2017\ age\ 40\ to44}{Indiana\ population\ in\ 2017\ age\ 40\ to\ 44}) \times 100,000\right] \times 0.0815$$

This calculation is repeated for all 19 of the standard age groups. Finally, the final age-adjusted rate for a given year is calculated by summing the weighted crude rates for across the standard age groups returning a single number.

A similar procedure was followed when calculating the age-adjusted rates for specific genders or ethnicities. For example, the weighted crude rate for females in 2017 between the ages of 40 and 44 would be calculated by the following:

$$crude\ rate\ in\ 2017 = (\frac{\#\ Indiana\ deaths\ in\ 2017\ for\ females\ (40-44)}{Indiana\ pop.\ of\ females\ in\ 2017\ (40-44)}) \times 100,000$$

$$weighted\ rate\ 2017 = \left[(\frac{\#\ Indiana\ deaths\ for\ female\ 40\ to44}{Indiana\ pop.\ of\ females\ in\ 2017\ (40-44)}) \times 100,000\right] \times 0.0815$$

The weighted rates across all age groups for females in a given year would then be summed to form the final age adjusted rate for females in Indiana in that year. The ethnicity specific age adjusted rates were calculated following this same procedure.

The methodology used can be found with an additional tutorial at this link:
https://seer.cancer.gov/seerstat/tutorials/aarates/step1.html .

Appendix D

References

National Diabetes Statistics Report, Centers for Disease Control and Prevention. Accessed: December 2019. Available: https://www.cdc.gov/diabetes/data/statistics/statistics-report.html

Prediabetes Infograph, Indiana State Department of Health. Accessed December 2019. Available: https://www.in.gov/isdh/26609.htm.

Epidemiology Resource Center Data Team, Indiana State Department of Health, Epidemiology Resource Center, 2018 Behavioral Risk Factor Surveillance System Data, December 2019.

The Indiana Network for Patient Care: A Working Local Health Information Infrastructure. Health Affairs. Vol. 24, No. 5, September/October 2005 Available: https://www.healthaffairs.org/doi/full/10.1377/hlthaff.24.5.1214.

Robert Wood Johnson Foundation. County Health Rankings: Diabetes. (2019). Available: https://www.countyhealthrankings.org/app/indiana/2019/measure/outcomes/60/data?sort=desc-2

Geiss, L. & Albright, A. (Eds.). (2007). Proceedings from 67th Annual Scientific Sessions. Chicago: American Diabetes Association.

America's Health Rankings, United Health Foundation, 2019 report. Available: https://www.americashealthrankings.org/explore/annual/measure/diabetes/state/IN.

Harvard Health Blog. Racial and ethnic minority communities hit hard by type 2 diabetes: Here's what we can do. . Harvard University. December 17, 2017. https://www.health.harvard.edu/blog/racial-and-ethnic-minority-communities-hit-hard-by-type-2-diabetes-heres-what-we-can-do-2017121912969

American Diabetes Association. Economic costs of diabetes in the U.S. in 2012. Diabetes Care. 2013; 36(4):1033–1046.

U. S. Census Bureau, American Fact Finder Population Estimates. Accessed: January 2020. Available: https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk

Appendix E

Acronym List

AADE	American Association of Diabetes Educators
ADA	American Diabetes Association
AHA	American Heart Association
BMI	Body Mass Index
BRFSS	Behavioral Risk Factor Surveillance Survey
CDC	Centers for Disease Control and Prevention
CDSMP	Stanford Chronic Disease Self-Management Program
CHW	Community Health Worker
DEEP	Diabetes Education Empowerment Program
DPP	National Diabetes Prevention Program
DSMES	Diabetes Self-Management Education and Support Program
ED	Emergency Department
ESRD	End Stage Renal Disease
HCUP	Healthcare Cost and Utilization Project
IDOE	Indiana Department of Education
IFG	Impaired Fasting Glucose
IGT	Impaired Glucose Tolerance
IMHC	Indiana Minority Health Organization
INPC	Indiana Network for Patient Care
ISDH	Indiana State Department of Health
IU	Indiana University
JDRF	Juvenile Diabetes Research Foundation
MHS	Managed Health Services
MNT	Medical Nutrition Therapy
MPH	Management Performance Hub
MTM	Medication Therapy Management
NIH	National Institutes of Health
PA	Prior Authorization
PDSL	Preferred Diabetes Supply List
PRAMS	Pregnancy Risk Assessment Monitoring System
WHO	World Health Organization

Appendix F

Types of Diabetes

Diabetes mellitus [ICD10 Codes E08-E13] is a group of diseases characterized by high levels of glucose (sugar) in the blood, resulting from defects in insulin production, insulin action, or both. Insulin is necessary for the body's regulation of blood glucose levels. It is a hormone produced in the pancreas and contributes to the metabolism of sugars, starches, and other foods into energy. Without a properly functioning insulin signaling system, blood glucose levels become elevated and other metabolic abnormalities occur, leading to the development of medical complications. These complications may lead to diminished quality of life, disability, or even death.

Prediabetes [ICD10-CM-E10-R73.03]: Prediabetes is a term used to describe individuals who are at increased risk of developing type 2 diabetes. Individuals with prediabetes have higher blood sugar levels than normal, though not high enough to be diagnosed with diabetes. Pre-diabetes is characterized by impaired fasting glucose (IFG) or impaired glucose tolerance (IGT) and in some cases both. IFG is a condition in which the fasting blood sugar level is 100 to 125 milligrams per deciliter (mg/dl) after an overnight fast, and IGT is a condition where the blood sugar level is 140 to 199 mg/dl after a two-hour oral glucose tolerance test. Those with pre-diabetes are likely to develop type 2 diabetes within 10 years, unless active steps are taken to prevent or delay diabetes.

Type 1 Diabetes [ICD10-CM-E10]: Type 1 diabetes was formerly known as juvenile-onset diabetes or insulin-dependent diabetes mellitus. Type 1 diabetes most often appears during childhood or adolescence and accounts for 5-10% of all diagnosed cases of diabetes. In type 1 diabetes, the body's immune system destroys the cells that produce insulin. Since the body produces little or no insulin, individuals with type 1 diabetes must take insulin daily to survive. Type 1 diabetes is usually diagnosed within a short time of onset because the symptoms are severe and occur rapidly.

Type 2 Diabetes [ICD10-CM-E11]: Type 2 diabetes was formerly called adult-onset diabetes or non-insulin-dependent diabetes, and usually begins as insulin resistance, a disorder in which cells do not use insulin properly. Over time, the resulting inefficiency contributes to a loss of insulin production capacity by the pancreas. Type 2 accounts for 90–95% of individuals diagnosed with diabetes. Some individuals control their blood glucose by exercising regularly and maintaining a healthy diet, but many require medical intervention to achieve recommended blood glucose levels. Type 2 diabetes most often appears in individuals older than 40 years of age, but is increasingly being diagnosed in children and teens and is no longer considered a disease exclusive to adults.

Gestational diabetes [ICD10-CM-E13-24.4]: Gestational diabetes is a form of glucose intolerance diagnosed in 2-10% of women during pregnancy. This type of diabetes will increase a woman's risk of developing type 2 diabetes in the future, and place the child at greater risk of being overweight and developing diabetes later in life. Gestational diabetes requires treatment during pregnancy to normalize maternal blood glucose levels to avoid medical complications in the infant.

Other Types of Diabetes [ICD10-CM-E08, E09, E13]: Other types of diabetes may result from specific genetic conditions, immune or endocrine dysfunction, surgery, drug or alcohol addiction, infections, or malnutrition. Such forms of diabetes only account for 1-5% of all diagnosed cases.

Source: Geiss, L. & Albright, A. (Eds.). (2007). Proceedings from 67th Annual Scientific Sessions. Chicago: American Diabetes Association.