Although genes and aging play strong roles in the development of type 2 diabetes, environmental conditions and health behaviors also contribute. Many cases of type 2 diabetes, therefore, can be prevented.

As illustrated in the figure below, there are two primary opportunities for preventing type 2 diabetes. First, living in a community where it is easy to be physically active and eat healthy food on a regular basis helps children and adults to maintain a healthy weight and normal blood sugar levels. Primary prevention strategies, such as healthy school lunches and walking trails, are therefore the first line of defense against type 2 diabetes.

Second, people who have been told by a healthcare provider that they have prediabetes — a condition marked by blood glucose or hemoglobin A1c levels that are higher than normal — can take steps to stop or delay the transition to type 2 diabetes by, for example, participating in a Diabetes Prevention Program (DPP).

### Diabetes prevention and treatment continuum

**Optimal health**
- Healthy community environments: Access to healthy food and places to be active
- Healthy behaviors: Physical activity, healthy eating, no tobacco use
- Healthy weight

**Prediabetes**
Blood glucose or A1c levels higher than normal but not high enough to be classified as diabetes. 15-30% of people with prediabetes develop diabetes within 5 years. 

Risk factors include: overweight or obesity, lack of physical activity, tobacco use, high blood pressure, toxic stress and family history.

Ohioans who are African American, age 45 years or older, low-income or have lower educational attainment are at increased risk.

**Diabetes**
No cure, but disease management can help to control blood glucose levels and mitigate further complications.

**Downstream impacts**
- Heart disease
- Stroke
- Blindness
- Loss of toes, feet or legs
- Kidney failure

**Upstream**
Primary prevention strategies to help children and adults stay healthy, such as:
- Enhanced physical education in schools
- Zoning laws to make communities more safe and walkable
- Recreational walking and biking trails
- Workplace wellness programs
- Healthy food incentives for SNAP participants

**Secondary prevention strategies to stop or delay transition to type 2 diabetes, such as:**
- Diabetes Prevention Program (education and follow-up support from a trained lifestyle coach for healthy eating, physical activity and other behavior changes)
- P-STAT (Screen Test Act Today) toolkit for healthcare professionals to identify and refer patients with prediabetes to diabetes prevention programs

**Disease management strategies, such as:**
- Patient Centered Medical Homes, case management and chronic care model (proactive, team-based care)
- Chronic disease self-management programs, such as Ohio’s Healthy U Diabetes Self-Management

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**Per-person cost of Diabetes Prevention Program**: $440

**Per-person cost of diabetes-related medical care**: $7,900

**Per-person cost of dialysis**: $67,000+
An excellent example of secondary prevention, DPP has been shown to reduce the incidence of type 2 diabetes by 58% over a three-year period. Participants learn about healthy eating, physical activity, and other behavior changes from a trained lifestyle coach over the course of 16 one-hour sessions. Follow-up sessions provide added support to help participants maintain their progress over time. In Ohio, several YMCAs and other organizations now offer CDC-recognized DPPs.

Once type 2 diabetes develops, there is no cure. Without appropriate control of blood sugar, many people with diabetes are at high risk for life-changing and life-threatening complications, including heart disease, kidney failure, blindness, limb amputation or stroke. Successful disease management, however, can help to control blood glucose levels and mitigate further downstream complications in nearly all people with diabetes.

**Disparities: Ohioans at risk**

Diabetes disproportionately affects African American and lower-income Ohioans, and black men in Ohio have much higher rates of diabetes mortality compared to other groups. Diabetes mortality also varies widely by county, with the highest rates in some rural communities. Harrison County in rural eastern Ohio had the highest age-adjusted diabetes death rate in 2012, which was nearly eight times higher than the county with the lowest rate, Wyandot.

Culturally-competent prevention programs designed to reach high-risk groups, such as black men, and prevention resources available in rural and low-income areas are therefore critical strategies for improving health equity in Ohio.

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**Access to Diabetes Prevention Program sites vs. dialysis centers**

<table>
<thead>
<tr>
<th>Upstream</th>
<th>Downstream</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 minutes or less drive time</td>
<td>16 to 30 minutes drive time</td>
</tr>
<tr>
<td>More than 30 minutes drive time</td>
<td></td>
</tr>
</tbody>
</table>

Source: Bureau of Health Promotion, Ohio Department of Health, 2015
### Out of balance: Access to prevention vs. access to dialysis in Ohio

Kidney failure requiring dialysis represents one of the most costly “downstream” impacts of type 2 diabetes. One result of long-standing uncontrolled diabetes, kidney failure due to diabetes, is irreversible and often requires lifelong treatment with dialysis to manage. A lifestyle change program such as a DPP can not only prevent or delay the development of diabetes, and its complications, but is also more cost-effective than using medications to control blood sugar. Therefore, comparing availability of CDC-recognized DPPs and kidney dialysis centers provides a snapshot of the resources available at both ends of the prevention spectrum, upstream and downstream, in Ohio (see maps on page 3). Almost all Ohioans (98%) live within a 30-minute drive of an Ohio-based kidney dialysis center; 84% live within a 15-minute drive of a dialysis center. By comparison, 65% of Ohioans live within a 30-minute drive of a CDC-recognized Diabetes Prevention Program; 37% live within a 15-minute drive of a DPP.\(^4\)

### Regaining balance: Innovative approaches to invest in diabetes prevention

Many of the policy ideas presented in Beyond medical care are already being implemented in Ohio communities and in other states. The figure below summarizes examples of how these opportunities have been leveraged to prevent type 2 diabetes.

#### Examples of innovations to support primary and secondary prevention of type 2 diabetes

<table>
<thead>
<tr>
<th>Policy opportunity</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Change incentives within the healthcare system</strong></td>
<td><strong>Insurance reimbursement for community-based prevention</strong>&lt;br&gt;Traditionally, health insurance plans have not covered community-based programs such as Diabetes Prevention Programs at YMCAs (Y DPP). In recent years, however, two health insurance plans in Ohio (United Health Care [UHC] and HealthSpan) now include Y DPP as a covered benefit. Under the HealthSpan agreement brokered by the Ohio Alliance of YMCAs, medical providers refer patients to their local Y DPP. YMCA Program Coordinators work closely with HealthSpan medical professionals to ensure the referral system thrives and stays visible to the medical providers. UHC and HealthSpan recognize that the downstream costs of providing care for patients with type 2 diabetes are much greater than the $400 annual per-person cost of Y DPP, UHC, for example, conducted a study of Y DPP that estimated that the savings from reduced medical spending would outweigh initial costs of widespread use of Y DPP within three years.(^11)</td>
</tr>
<tr>
<td><strong>Leverage new sources of funding</strong></td>
<td><strong>Wellness trust</strong>&lt;br&gt;The Massachusetts Prevention and Wellness Trust Fund included the Diabetes Prevention Program on its rigorously-selected list of evidence-based interventions eligible for funding. Local communities are now implementing DPP in a more widespread way thanks to grants from the Trust Fund.(^12)</td>
</tr>
<tr>
<td><strong>Nurture cross-sector partnerships and perspectives</strong></td>
<td><strong>Health and equity in all policies</strong>&lt;br&gt;Frequent communication between public health, the zoning commission, and private developers is helping Columbus to become a more walkable and bikable city that promotes physical activity. Columbus Public Health has institutionalized a “rapid Health Impact Assessment” process to evaluate health impacts of zoning and development decisions. As a result, the zoning code now requires that new developments in the city feature safe pedestrian access and bike racks.</td>
</tr>
</tbody>
</table>
Sources
9. Medical expenditures for people diagnosed with diabetes average about $13,000 per year, of which about $7,900 is attributed to diabetes. Medical expenditures for people with diabetes are approximately 2.3 times higher than for those without diabetes. Diabetes Care. “Economic costs of diabetes in the U.S. in 2012.” 2013.

To learn more
To view the complete publication “Beyond medical care: Emerging policy opportunities to advance prevention and improve health value in Ohio,” as well as more fact sheets about the specific policy opportunities discussed in the report, visit:

www.hpio.net/beyond-medical-care/