

Juvenile Diabetes Cure Research Tax Check-Off Program Annual Report

January 1 - December 31, 2009



Edward G. Rendell, Governor

Juvenile Diabetes Cure Research Tax Check-Off Program

Created in September 2004 with the passage of Act 133, Juvenile Diabetes Cure Research, the Juvenile Diabetes Cure Research Tax Check-Off Program (Program) provides a state income tax check-off option for individuals to contribute a portion of their state tax refund to support research for juvenile diabetes, more commonly known as Type 1 diabetes. The Program funds research grants focused on restoring normal blood levels, preventing and reversing complications of the disease and/or prevention of juvenile diabetes.

The research funds are collected by the Pennsylvania Department of Revenue and administered through the Diabetes Prevention and Control Program, Pennsylvania Department of Health (Department). The Department also accepts contributions for the Program (see page 4 for information on contributing to the Program). This report highlights the activities of and contributions to the Program for calendar year 2009.

Type 1 Diabetes Overview

Type 1 diabetes, previously known as insulin-dependent diabetes mellitus (IDDM), or juvenile-onset diabetes, is an autoimmune disease in which the immune system destroys the insulin-producing beta cells of the pancreas that regulate blood glucose. As a result, the pancreas no longer produces insulin, the hormone needed to convert sugar (glucose), starches and other foods into energy needed for living. Although the disease can be diagnosed at any age, it is most often diagnosed in children, adolescents and young adults but lasts a lifetime.

Type 1, Type 2, gestational and rare types of diabetes accounted for \$174 billion in healthcare costs in the United States. The nation spends \$11,744 on each person with diabetes, compared to \$2,935 on those who don't have diabetes, as of 2007.¹

Type 1 diabetes is the third most prevalent severe chronic disease of childhood in the United States. In the ages from 10 to 19, Type 1 diabetes has been diagnosed in children of all races.² The exact cause of Type 1 diabetes is unknown, with no known way to prevent it. Currently, there is no cure. The disease comes on suddenly, causes dependence on injected or pumped insulin for life and carries the constant threat of devastating complications. While insulin injections or infusions allow a person with Type 1 diabetes to stay alive, they do not cure diabetes, nor do they necessarily prevent the possibility of the disease's devastating effects, which may include: kidney failure, blindness, nerve damage, heart attack and stroke. Research focused on Type 1 diabetes provides hope to detect its causes and to find a cure.

Type 1 Diabetes Statistics

According to the Centers for Disease Control and Prevention (CDC), it is estimated that 23.6 million people of all ages in the United States have diabetes (with 17.9 million diagnosed and 5.7 million undiagnosed).³ It is estimated that five to ten percent of diabetic adults have Type 1.³ It is estimated that about one in every 400 to 600 children and adolescents has Type 1 diabetes.⁴ Diabetes is the single most costly chronic disease.¹ Diabetes was the seventh leading cause of death listed on U.S. death certificates in 2006³ and the eighth leading cause of death in 2008 in Pennsylvania.

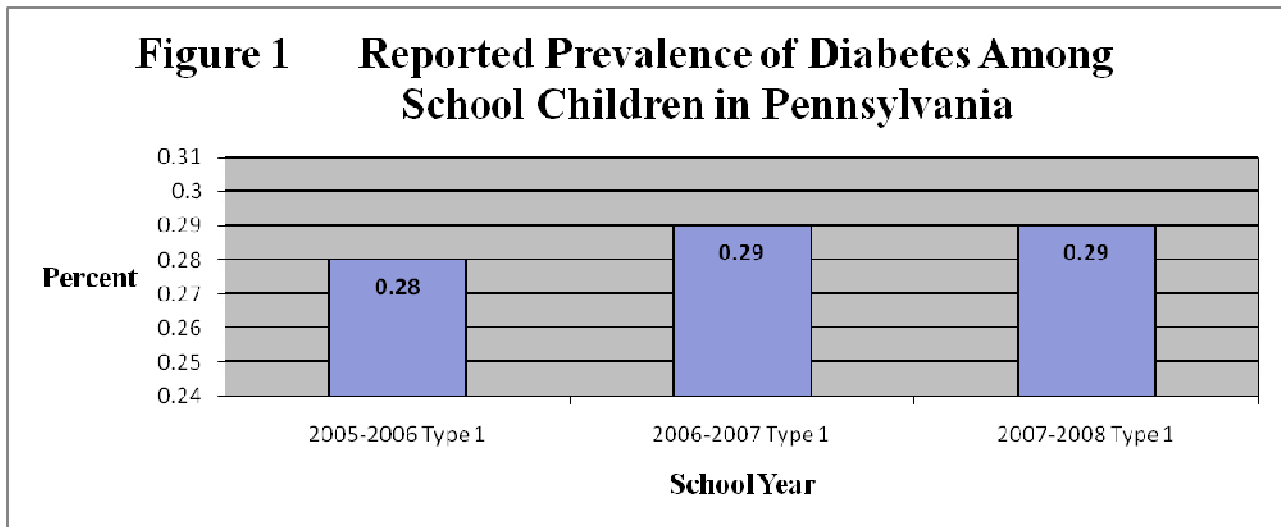
In an effort to gain a better understanding and a better statistical picture of diabetes in children, the CDC and the National Institute of Diabetes, Digestive and Kidney Diseases funded the SEARCH

study, a multi-center study focusing on children and youth in the United States who have diabetes. This five-year study was a national effort to identify the number of children and youth under the age of 20 who have diabetes, both Type 1 and Type 2, and to provide the opportunity to learn more about the disease, its complications and its effects on the everyday lives of those who have it. A diverse population of children and youth under age 20 from six geographic locations across the country was studied. While data from the study is still being analyzed, the published findings so far indicate:

- The majority of new cases of diabetes in kids are Type 1, and most diagnoses in children under age 10 are Type 1 diabetes.
- Of participants with Type 1 diabetes, 56 percent had a first degree relative—a parent, sibling or grandparent—with the disease.
- Children diagnosed with Type 1 diabetes had higher rates of obesity than children without diabetes.⁵

The Department collects information regarding students with the medical diagnosis of Type 1 and Type 2 diabetes, as well as other chronic diseases. School districts complete the information based on their current grade configurations. Consequently, the numbers could include a pre-kindergarten class, if the school district provides such a class. Thus, age ranges could include those from four to 21 years of age for children with special needs.

The data in Figure 1 displays the total number of students who were reported as having been previously diagnosed with diabetes or diagnosed with diabetes within the indicated school year. Beginning in the 2005-2006 school year, the data collection process was revised to differentiate between Type 1 and Type 2. The chart below displays only Type 1 diabetes reported by Educational Institutions for school years 2005-2006, 2006-2007 and 2007-2008.



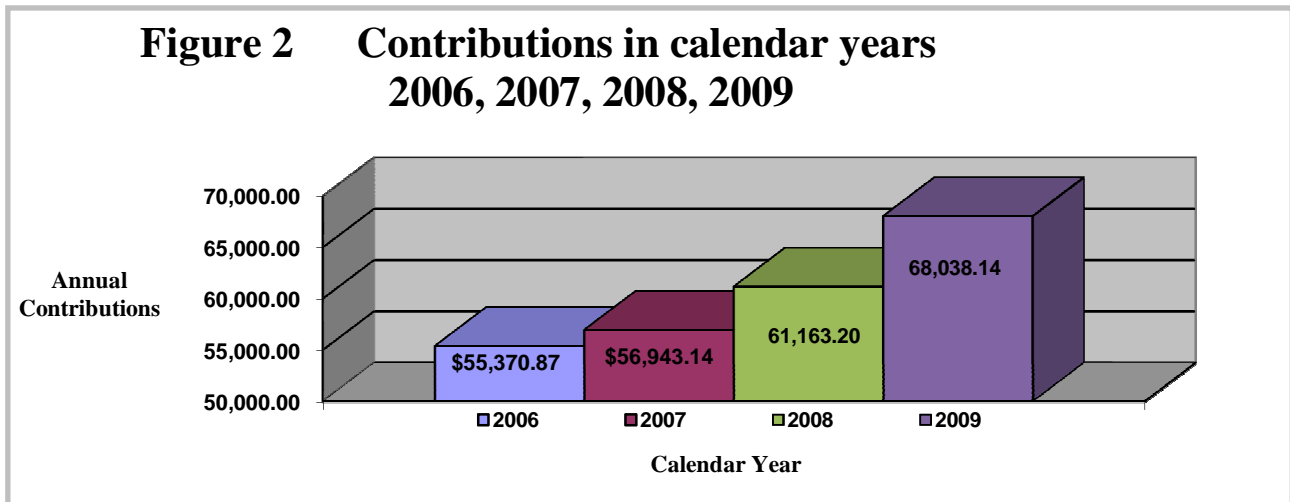
Source: Division of School Health, Pennsylvania Department of Health

Disclaimer:

Data is reported annually by Educational Institutions to the Pennsylvania Department of Health. Responsibility for data accuracy lies with individual Educational Institutions. The Department specifically disclaims responsibility for any analysis, interpretations or conclusions made by the user.

Tax Check-Off / Private Contributions

Tax year 2008 (calendar year 2009) was the fourth year in which contributions were collected for this fund. Contributions to the fund in 2009 totaled \$68,038.14. The cumulative balance as of December 31, 2009, was \$141,515.35.



Administration of the Program

The Diabetes Prevention and Control Program is responsible for the administration of the Program. The \$100,000 grant was awarded to The Pennsylvania State University's College of Medicine to conduct vision impairment diabetic retinopathy research for patients with Type 1 diabetes. Research began January 1, 2009, and will end on December 31, 2010.

Significant progress has been made using these funds. Thus far, the results of these studies have led to three submitted manuscripts that describe roles for altered lipids in diabetic retinopathy and complications:

1. Fox TE, Bewley MC, Unrath KA, Pedersen MM, Anderson RE, Kim JK, Bronson SK, Flanagan JM, Kester M. Circulating sphingolipid biomarkers in models of Type 1 diabetes. (Submitted **Diabetes**)
2. Fox TE, Young MM, Pedersen MM, Han X, Gardner TW, Kester M. Diabetes diminishes phosphatidic acid in the retina: implications for reduced mTOR signaling and increased neuronal cell death in diabetic retinopathy. (Submitted **The Biochemical Journal**)
3. Fox TE, Young MM, Kester M, Gardner TW. Insulin Signaling in Retinal Neurons is Regulated Within Cholesterol-enriched Membrane Microdomains (Submitted **American Journal of Physiology**)

Together, these results identify novel therapeutic and dietary interventions for complications of diabetes. The Pennsylvania State University's College of Medicine is currently working to leverage these findings for additional extramural funding.

The fund account balance will continue to be monitored and efforts made to continue to increase contributions to the fund.

Plans for Fiscal Year 2010-2011

The Diabetes Prevention and Control Program intends to release a Request for Application (RFA) in the late fall of 2010. The purpose of the resulting grant is to conduct research that focuses on juvenile diabetes as it relates to restoring normal blood levels, preventing and reversing complications from the disease and/or preventing juvenile diabetes. Research funds from the program will allow researchers to initiate their research with the intention of seeking sustainable funding from national funding sources.

To contribute to the Program Fund:

Individuals may indicate the amount of their state tax refund they wish to contribute to the Juvenile (Type 1) Diabetes Cure Research Fund; or contributions may be payable to the Juvenile (Type 1) Diabetes Cure Research Fund and sent to:

Pennsylvania Department of Health
Bureau of Administrative & Financial Services
Division of Budget
625 Forster Street
Health and Welfare Building
Harrisburg, PA 17120

This report was prepared by the Diabetes Prevention and Control Program, Division of Nutrition and Physical Activity, Bureau of Health Promotion and Risk Reduction, Pennsylvania Department of Health. To contact the Program:

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www.health.state.pa.us/diabetes

For Additional Information

For additional information regarding Type 1 diabetes, including managing the disease and current research being conducted, please visit the following:

- Centers for Disease Control and Prevention, <http://www.cdc.gov/diabetes>
- American Diabetes Association, <http://www.diabetes.org>
- Juvenile Diabetes Research Foundation, <http://www.jdrf.org>
- SEARCH for Diabetes in Youth, <http://www.searchfordiabetes.org/patient/index.cfm>

References

1. Juvenile Diabetes Research Foundation. Fact Sheets: General Diabetes Facts, Type 1 Diabetes (Juvenile Diabetes) Facts. (November 2008). <http://www.jdrf.org>.
2. National Institute of Diabetes and Digestive and Kidney Diseases. National Diabetes Statistics, 2007 fact sheet. Bethesda, MD: U.S. Department of Health and Human Services, National Institutes of Health, 2008.
3. Centers for Disease Control and Prevention. National Diabetes Fact Sheet: general information and national estimates on diabetes in the United States, 2007. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2008. http://www.cdc.gov/diabetes/pubs/pdf/ndfs_2007.pdf.
4. American Diabetes Association. Total Prevalence of Diabetes & Pre-diabetes. Retrieved February 3, 2009, <http://www.diabetes.org/diabetes-statistics/prevalence.jsp>.
5. SEARCH for Diabetes in Youth. SEARCH Countdown Article: Who Has Diabetes? Retrieved April 2, 2010, <http://searchfordiabetes.org/public/provider/countdown.cfm>.