

## 18. Diabetes

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### Goal

Reduce preventable disease and economic burden associated with diabetes and improve the quality of life for all persons who have, or are at risk for, diabetes.

### Overview

Diabetes is a major public health problem in Kentucky. Diabetes was the fifth leading cause of death in 2004, affecting an estimated 7.5 percent of the adult population. Kentucky ranks seventh among the 50 states for the highest prevalence of diabetes (2003). The prevalence of diabetes has steadily risen since the mid-1990s. A portion of this increase may be related to increased efforts to diagnose previously unrecognized diabetes or changes in the diagnostic criteria for diabetes. Nevertheless, this upward trend is expected to continue into the near future because of population characteristics and the rising prevalence of certain lifestyle risk factors for the disease.

Prevalence of diabetes is highest among men, individuals of African American descent, those aged 65 and older, and those living in the Appalachian region of the state. Death rates due to diabetes are also higher among men and African Americans in Kentucky. In fact, the age-adjusted death rate due to diabetes for African Americans (147 per 100,000) in 2002 was almost twice the comparable rate for the White population (78 per 100,000).

The medical complications of diabetes create an additional burden on the health care system in Kentucky. Specific problems include diabetic ketoacidosis, non-traumatic lower extremity amputations, cardiovascular and cerebrovascular disease, and end-stage renal disease. During 2002, there were 96,320 diabetes-related hospitalizations in the state. Direct and indirect costs due to diabetes in the Commonwealth were estimated at \$2.9 billion in 2002. These costs and the impact of diabetes on the population can be reduced through modification of lifestyle risks, early diagnosis, appropriate health care, and informed self-care.

### Summary of Progress

Progress is being made toward achieving the 2010 objectives. Significant improvement in the rate of lower extremity amputations has been made, with a decline from the 2000 baseline of 6 per 1,000 to 4.4 per 1,000 in 2002. The percent of adults who have a glycosylated hemoglobin measurement at least once a year has increased from the 2000 baseline of 82.9 percent to 86.9 percent in 2004. Significant improvement has also been achieved in persons with diabetes who perform self-blood glucose monitoring

daily, with an increase from 55.1 percent in 2000 to 61.7 percent in 2004. BRFSS data indicate that persons with diabetes who take an aspirin a day or every other day has increased from 47.6 percent in 2000 to 55 percent in 2003. Progress was made in persons with diabetes who receive formal diabetes self-management training, increasing from 45.7 percent in 2000 to 48.8 percent in 2004. Reducing anomalies in infants of mothers with diabetes has improved from 268 per 1,000 in 1998 to 234 per 1,000 in 2002. In 2000, the percentage of persons with diabetes who had annual foot exams was 63 percent. The percentage declined slightly to 62 percent in 2004.

Progress has been slow, however, in decreasing the prevalence of diagnosed diabetes. The rate has increased from 6 percent in 1996-98 to 7.5 percent in 2004. The diabetes death rate has also climbed from 76 per 100,000 in 1999 to 78 per 100,000 in 2002. The incidence rate for diabetes-related end stage renal disease (ESRD) has also increased. In 1998, 11.9 per 100,000 persons with diabetes had ESRD. The 2002 rate has increased to 14.8 per 100,000. The percentage of annual influenza vaccinations in persons with diabetes has shown a slight improvement from 52 percent in 1997 to 54.9 percent in 2004. BRFSS data from 2000 showed that 75.5 percent of persons with diabetes had an annual eye exam-which met the 2010 objective. However, the percentage decreased to 70.5 percent in 2004.

## **Progress toward Achieving Each HK 2010 Objective**

Mortality data are age-adjusted to the year 2000 standard population.

### **18.1. (Developmental) Reduce the incidence of diabetes. (DELETED)**

**Reason for Deletion:** There are no data to track this objective, and no data are expected in the near future.

### **18.2. Decrease the rate at which the prevalence of diagnosed diabetes is climbing so that it reaches no more than 6 percent of Kentucky's population 18 years and older.**

**Data Source:** Behavioral Risk Factor Surveillance System (BRFSS)

**Baseline:** In 1996-98, 5.0 percent of Kentuckians 18 years and older were informed by a doctor that they had diabetes. (gestational diabetes excluded)

#### **Select Populations 1996-98**

African American: 6.5 percent  
White: 4.9 percent  
Appalachian: 5.7 percent  
Male: 5.0 percent  
Female: 5.0 percent  
People aged 18 – 44: 1.4 percent

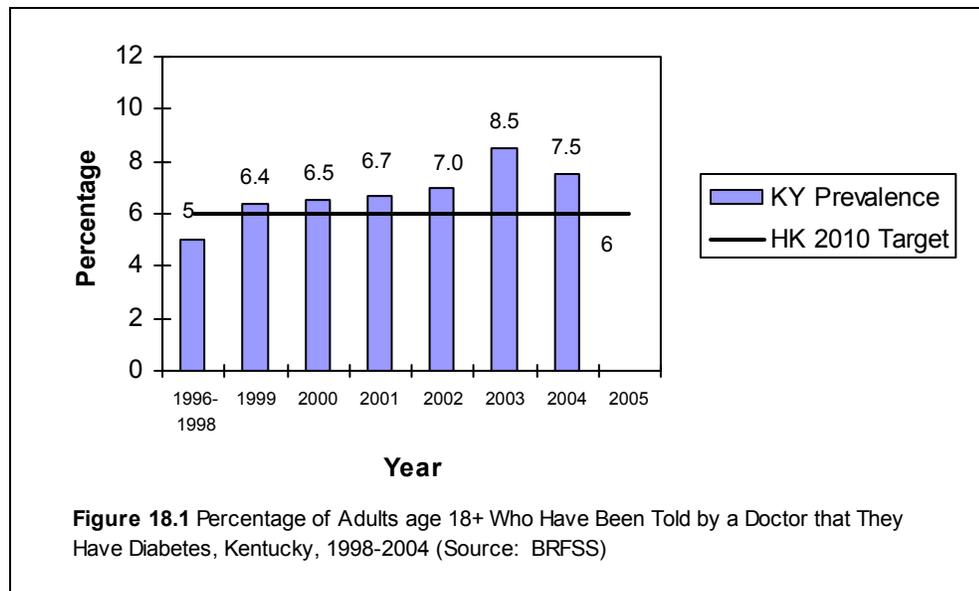
People aged 45 – 54: 5.9 percent  
 People aged 55 – 64: 11.0 percent  
 People aged > 65: 12.0 percent

**HK 2010 Target:** 6 percent

**Mid-Decade Status 2004:** 7.5 percent

**Select Populations: 2000 - 2003**

African American: 10.6 percent  
 White: 7.0 percent  
 Appalachian: 8.4 percent  
 Male: 7.9 percent  
 Female: 6.5 percent  
 People aged 18 – 44: 2.5 percent  
 People aged 45 – 54: 8.3 percent  
 People aged 55 – 64: 14.2 percent  
 People aged > 65: 14.6 percent



**Strategies to Achieve Objective:**

- The Department for Public Health’s Diabetes Prevention and Control Program (KDPCP) will implement various population-based diabetes prevention activities in partnership with local health department staff across the state aimed primarily at the health care delivery system and at the community with use of KDPCP’s “ Power of Prevention” curriculum and brochure.
- Collaborate and participate with the Department for Public Health’s obesity, comprehensive school health, nutrition and physical activity

staff and their partners (American Heart Association, Department of Education, Kentucky Dietetic Association, etc.) to implement activities in the areas of nutrition and physical activity targeting the health care delivery system, schools, worksites, and communities

- Collaborate with the Kentucky Action for Healthy Kids Task Force on interventions aimed at improving school policies related to nutrition and physical activity
- Collaborate with the Kentucky Diabetes Network (KDN) and key partners to develop and distribute various physician office tools/educational materials such as the KDN Pre-Diabetes Care Tool and National Diabetes Education Program's (NDEP) "Small Steps Big Rewards" Health Care Provider Tool Kit
- Collaborate with the KDN, local health departments, local diabetes coalitions and other partners on a media campaign promoting the "Move it, Lose, Prevent it – Type 2 Diabetes" message
- Collaborate with Extension Services in all 120 Kentucky counties to provide diabetes prevention presentations, to distribute prevention information and to implement physical activity and healthy nutrition programs

**18.3. (Developmental) Increase the proportion of persons with diabetes whose condition has been diagnosed. (DELETED)**

**Reason for Deletion:** There are no data to track this objective, and no data are expected in the near future.

**18.4. Slow the rise in the diabetes death rate (diabetes as a primary/underlying cause) to no more than 28 deaths per 100,000 persons. (See Revision)**

**18.4R. (REVISION) Limit the upward trend in the diabetes death rate to the 1999 baseline of 76 per 100,000.**

**Reason for Revision:** Use of Year 2000 standard to calculate death rates

**Data Source:** National Vital Statistics System, CDC WONDER, DATA2010. Includes primary cause, underlying cause and contributing causes of death, ICD10 codes E10 – E14.

**Baseline:** 76 deaths per 100,000 people in 1999

**Select Populations 1999**

African American: 135 per 100,000

White: 72 per 100,000

Male: 84 per 100,000

Female: 70 per 100,000

People under age 45: 3 per 100,000  
People aged 45 – 64: 63 per 100,000  
People aged 65 – 74: 272 per 100,000  
People aged ≥ 75: 687 per 100,000

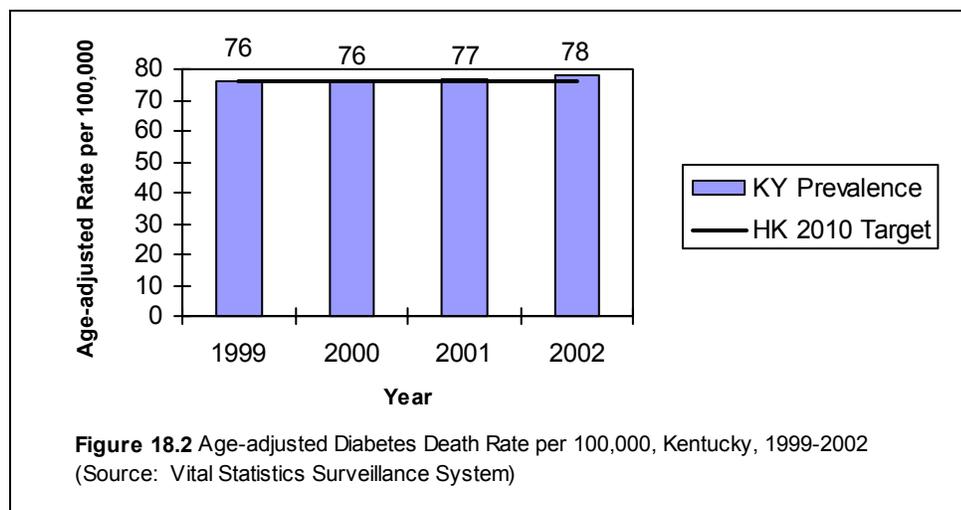
**HK 2010 Target Setting Method:** During the 90's the diabetes death rate has risen over 20 percent. Limiting the rise to the 1999 level would represent a significant slowing of the trend.

**HK 2010 Target:** 76 deaths per 100,000

**Mid-Decade Status:** 2002: 78 deaths per 100,000 people, age adjusted to the year 2000 standard

### Select Populations 2002

African American: 147 per 100,000  
White: 75 per 100,000  
Male: 89 per 100,000  
Female: 70 per 100,000  
People aged 0 – 44: 3 per 100,000  
People aged 45 – 64: 64 per 100,000  
People aged 65 – 74: 287 per 100,000  
People aged ≥ 75: 720 per 100,000



### Strategies to Achieve Objective:

- Promote the establishment and maintenance of local diabetes coalitions, support groups and self-management programs throughout the state

- Collaborate with the Kentucky Diabetes Network (KDN) and other organizations to implement the National Diabetes Education Program (NDEP) campaigns for “Control Your Diabetes for Life” and “Be Smart about Your Heart, Control the ABCs of Diabetes”
- The High Risk Population Advisory Committee of KDN will work to decrease disparities, particularly in the African American, Appalachian, Hispanic/Latino and senior populations.
- The American Diabetes Association will promote campaigns such as “Diabetes- Make the Link- Heart Disease and Stroke” and materials such as “Take the Test Know the Score;” and programs to raise awareness among the African American population.
- Develop and update newsletters, educational materials, and web pages related to diabetes, its risks and complications. Participating organizations include: the Kentucky Department for Public Health, the American Diabetes Association, Kentucky Area, the Juvenile Diabetes Research Foundation, the American Heart Association, the Kentucky Dietetic Association, the KDN, Health Care Excel, Kentucky chapters of the American Association of Diabetes Educators, local health departments, health plans, Appalshop and WMMT Mountain Radio, the Kentucky Medical Association and many other organizations
- Promote and provide up to date diabetes professional education opportunities via hospitals, universities, KDPCP, local health departments, coalitions, professional associations, and diabetes product companies
- Provide curricula, educational materials, training and mentoring to local health department staff for the provision of “Diabetes Self-Management Training”
- Provide individualized Medical Nutrition Therapy to persons with diabetes
- Increase opportunities for individual and group self-management training to individuals with diabetes and their families.
- Develop and distribute educational materials to improve physician practice and patient education
- Promote and support diabetes and/or CVD quality improvement projects/processes within the KDN Health Plan Partnership, private health plans, the Kentucky Department for Medicaid Services, the Drug and Therapeutics Information Service (DATIS), the Quality Improvement Organization for Medicare, community health centers, universities, and hospitals

**18.5. Slow the rise in deaths due to cardiovascular disease where diabetes is listed as either a supplemental cause of death or an existing condition to no more than 276 per 100,000 diabetic population.**

**Data Source:** Kentucky Vital Statistics (death certificates), 1997 and 2002. BRFSS, 1997 was used for estimated diabetes prevalence. Rates for age groups are age-specific rates; all other rates are age-adjusted.

**Baseline:** 283.3 deaths per 100,000 diabetic population in 1997, age-adjusted to the year 2000 standard.

**HK 2010 Target:** 276 deaths per 100,000

**Mid-Decade Status:** 334.2 deaths per 100,000 in 2002

**Strategies to Achieve Objective:**

Same strategies as for objective 18.4

**18.6. (Developmental) Reduce perinatal mortality in infants of mothers with diabetes. (DELETED)**

**Reason for Deletion:** There are no data to track this objective, and no data are expected in the near future.

**18.7. Reduce the frequency of major congenital malformations in infants of mothers with diabetes to no more than 25 per 1,000 births. (See Revision)**

**18.7R. (REVISION) Reduce the frequency of anomalies in infants of mothers with diabetes to no more than 233.3 per 1,000 births.**

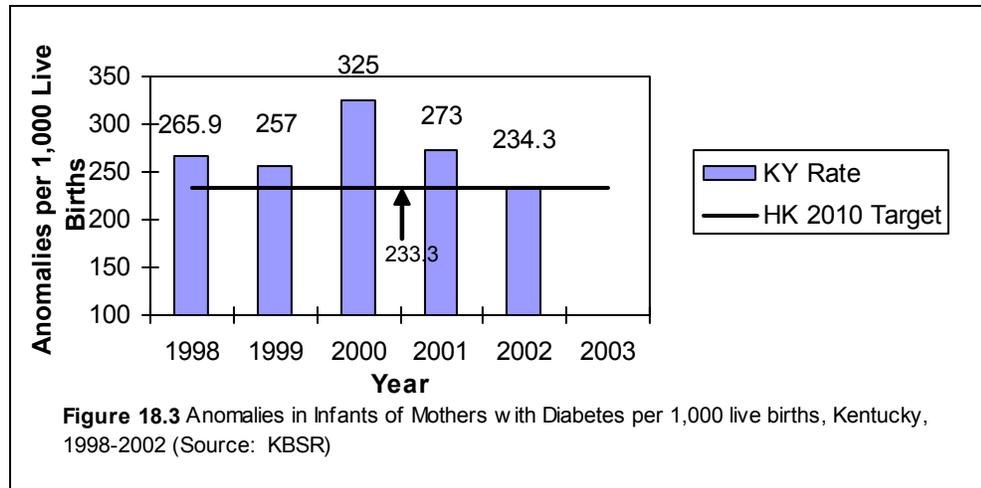
**Reason for Revision:** New data are now available, and the objective was revised to match the data collection format.

**Data Source:** Kentucky Birth Surveillance Registry (KBSR)

**Baseline:** 265.9 per 1,000 births in 1998

**HK 2010 Target:** 233.3 per 1,000 births

**Mid-Decade Status:** 234.3 per 1,000 births in 2002



### Strategies to Achieve Objective:

- The Department for Public Health will implement various clinical and community activities related to diabetes and pregnancy in partnership with local health department staff across the state.
- KDPCP will continue to work with DPH staff to develop/update protocols for appropriate screening guidelines, management when appropriate, pre-conceptual counseling, medical nutrition therapy, etc. to be used by local health departments.
- Local health departments, obstetricians, gynecologists, other physicians, and health professionals will provide pre-conceptual counseling and prenatal care.

**18.8.** (Developmental) **Reduce the frequency of foot ulcers among persons with diabetes. (See Revision)**

**18.8R. (REVISION) Maintain the frequency of foot sores lasting more than four weeks to no more than 13 percent among persons with diabetes.**

**Reason for Revision:** New data are now available, and the objective was revised to match the data collection format.

**Data Source:** BRFSS

**Baseline:** Thirteen percent of adults aged 18 and older with diabetes have had a foot sore that lasted more than 4 weeks in 2000.

#### **Select Populations 2002-2003**

African American: 11 percent

White: 14 percent

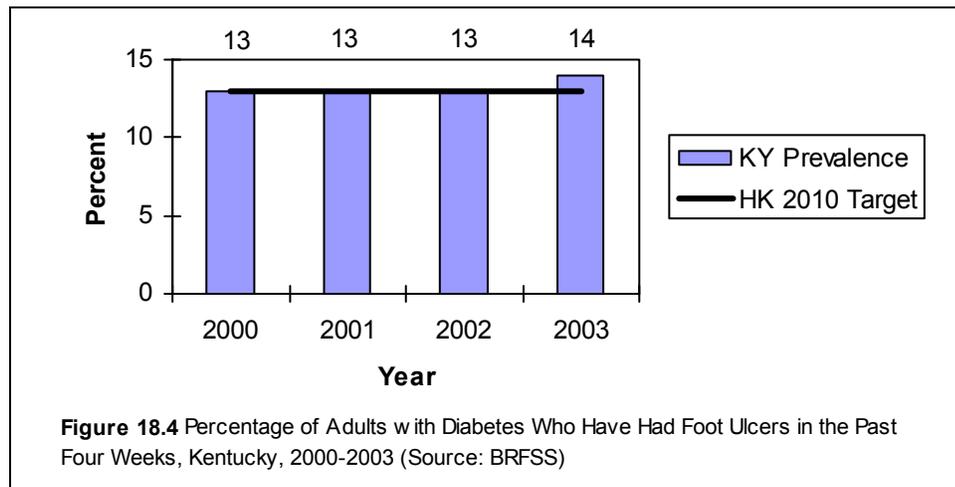
Appalachian: 16 percent

Non-Appalachian: 12 percent

Under age 65: 14 percent  
Over age 65: 3 percent

**HK 2010 Target:** 13 percent

**Mid-Decade Status:** 14 percent in 2003



**Strategies to Achieve Objective:**

- See strategies for Objective 18.4
- Promotion of national campaigns and materials such as “Feet Can Last a Lifetime”

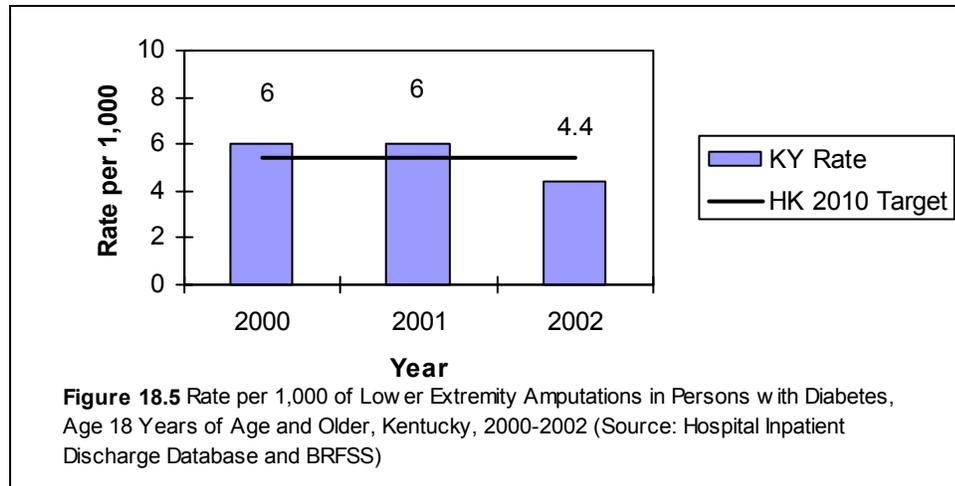
**18.9. Reduce the frequency of lower extremity amputation to 5.4 per 1,000 persons 18 years of age and older with diabetes.**

**Data Source:** Kentucky Hospital Inpatient Discharge Database, 2000, 2001, 2002. BRFSS prevalence estimates, 2000, 2001, and 2002

**Baseline :** 6.0 per 1,000 persons 18 years of age and older diagnosed with diabetes in 2000

**HK 2010 Target:** 5.4 per 1,000 persons age 18 and older with diabetes

**Mid-Decade Status:** 4.4 per 1,000 persons age 18 years of age and older in 2002



### Strategies to Achieve Objective:

- See strategies for Objective 18.4
- Promotion of national campaigns and materials such as “Feet Can Last a Lifetime”
- The Kentucky Podiatric Medical Association and other partners will promote the “Knock Your Socks Off” campaign using campaign educational materials.

### 18.10. (Developmental) Reduce the frequency of blindness due to diabetes. (DELETED)

**Reason for Deletion:** There are no data to track this objective, and no data are expected in the near future.

### 18.11. Decrease the incidence of ESRD due to diabetes requiring dialysis or transplantation to no more than 113.4 per 1,000,000 population. (See Revision)

### 18.11R. (REVISION) Decrease the incidence of diabetes related ESRD that requires dialysis or transplantation to no more than 11.3 per 100,000 population.

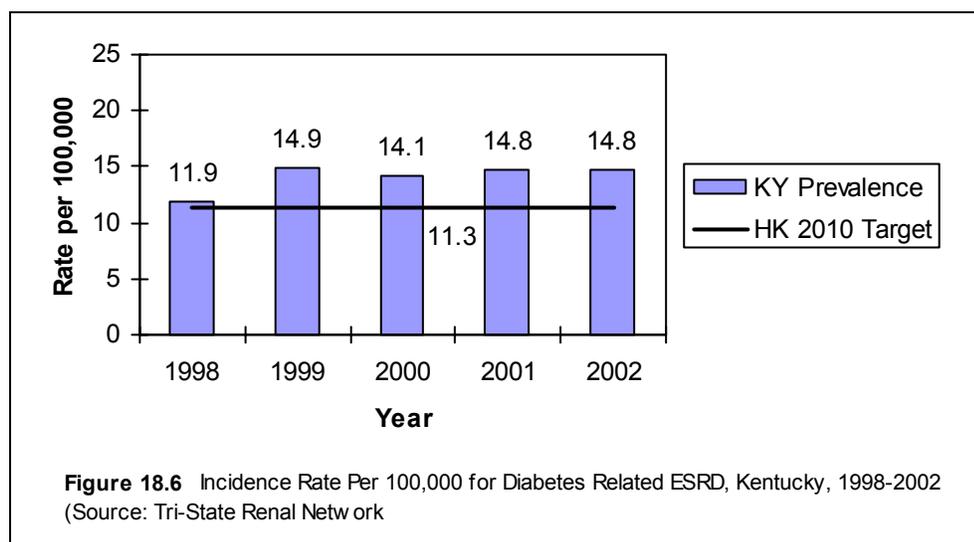
**Reason for Revision:** The objective was revised to match the data source.

**Data Source:** Tri-State Renal Network

**Baseline:** 11.9 per 100,000 persons with diabetes related ESRD that required dialysis or transplantation in 1998

**HK 2010 Target:** Reduce the incidence of ESRD to 11.3 per 100,000

**Mid-Decade Status: 14.8 per 100,000 in 2002**



**Strategies to Achieve Objective:**

- See strategies for Objective 18.4
- Promote the National Kidney Foundation of Kentucky awareness and screening program

**18.12.** (Developmental) **Increase the proportion of patients with diabetes who annually obtain lipid assessment (total cholesterol, LDL, HDL, triglyceride).** (DELETED)

**Reason for Deletion:** There are no data to track this objective, and no data are expected in the near future.

**18.13.** **Increase to 48 percent the proportion of persons with diabetes who have a glycosylated hemoglobin measurement at least once a year.** (See Revision)

**18.13R.** **Increase to 90 percent the proportion of persons with diabetes who have a glycosylated hemoglobin (A1C) measurement at least once a year.**

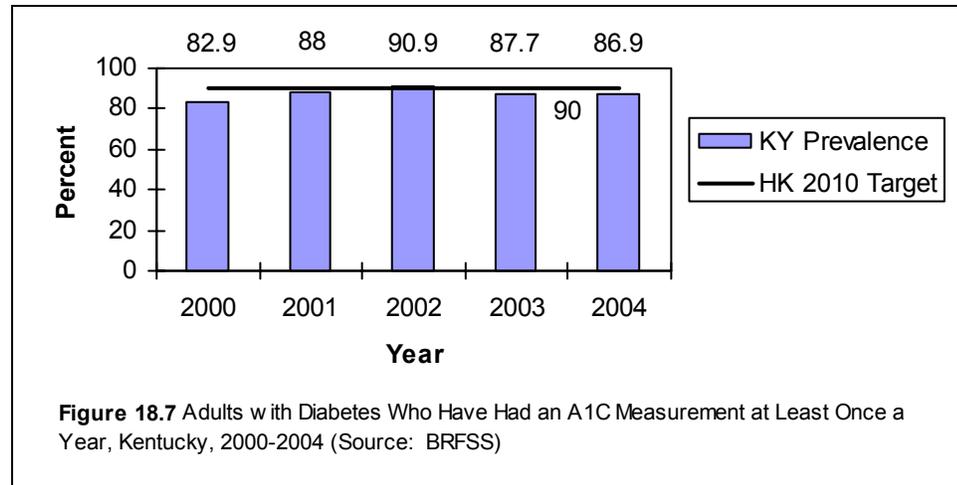
**Reason for Revision:** The target was increased due to changes in the BRFSS questions pertaining to A1C measurement.

**Data Source:** BRFSS

**Baseline:** 82.9 percent in 2000

**HK 2010 Target:** 90 percent of persons with diabetes have a glycosylated hemoglobin measurement at least once a year.

**Mid-Decade Status:** 86.9 percent in 2004



**Strategies to Achieve Objective:**

See strategies for Objective 18.4

**18.14. (Developmental) Increase the proportion of persons with diabetes who have at least an annual measurement of urinary microalbumin. (DELETED)**

**Reason for Deletion:** There are no data to track this objective, and no data are expected in the near future.

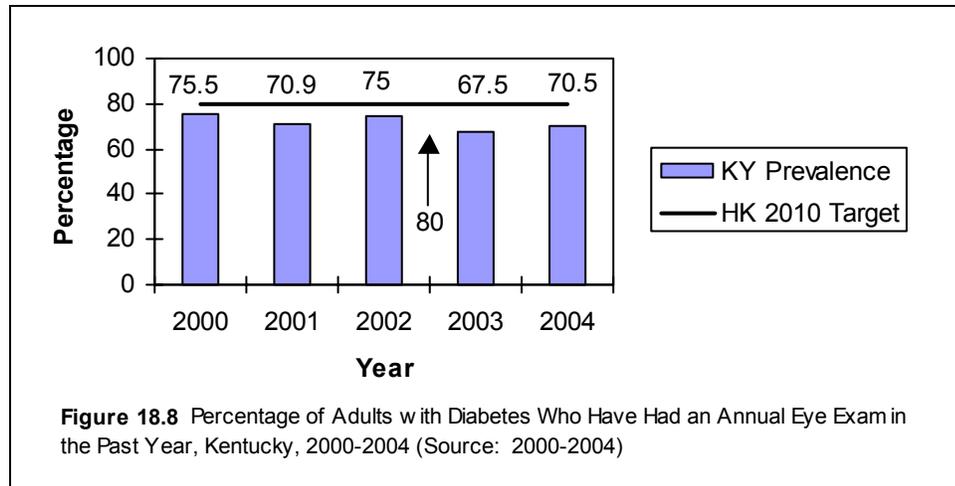
**18.15. Increase to 80 percent the proportion of persons with diabetes who have an annual dilated eye exam.**

**Data Sources:** BRFSS

**Baseline:** 75.5 percent of persons 18 years and older in 2000

**HK 2010 Target:** Increase to 80 percent the proportion of persons with diabetes who have an annual dilated eye exam.

**Mid-Decade Status:** 70.5 percent in 2004



**Strategies to Achieve Objective:**

- See strategies for Objective 18.4
- The Kentucky Optometric Association will promote Health Vision 2000.
- Civic organizations such as the Kentucky Lions Clubs will continue to promote special projects such as the Lions Eye Health Program, an educational effort focusing on prevention of vision loss due to glaucoma and diabetes.
- The Kentucky Academy of Ophthalmology will promote projects such as the “The National Eye Care Project”.
- The American Diabetes Association and partners will promote campaigns such as “Don’t Lose Sight of Diabetes”.

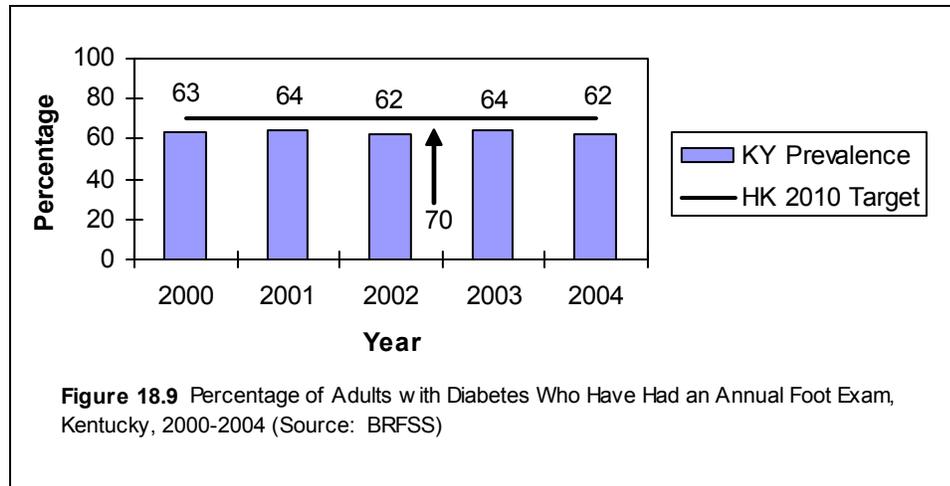
**18.16. Increase to 70 percent the proportion of persons with diabetes who have at least an annual foot exam.**

**Data Sources:** BRFSS

**Baseline:** 63 percent of persons 18 years and older with diabetes in 2000

**HK 2010 Target:** 70 percent

**Mid-Decade Status:** 62.1 percent in 2004



**Strategies to Achieve Objective:**

- See strategies for Objective 18.4
- Promotion of national campaigns and materials such as “Feet Can Last a Lifetime”
- The Kentucky Podiatric Medical Association and other partners will promote the “Knock Your Socks Off” campaign using campaign educational materials.

**18.17. (Developmental) Increase the proportion of persons with diabetes over 40 years of age that take aspirin daily or every other day. (See Revisions)**

**18.17R. Increase to 56 percent the proportion of persons with diabetes over 40 years of age that take aspirin daily or every other day.**

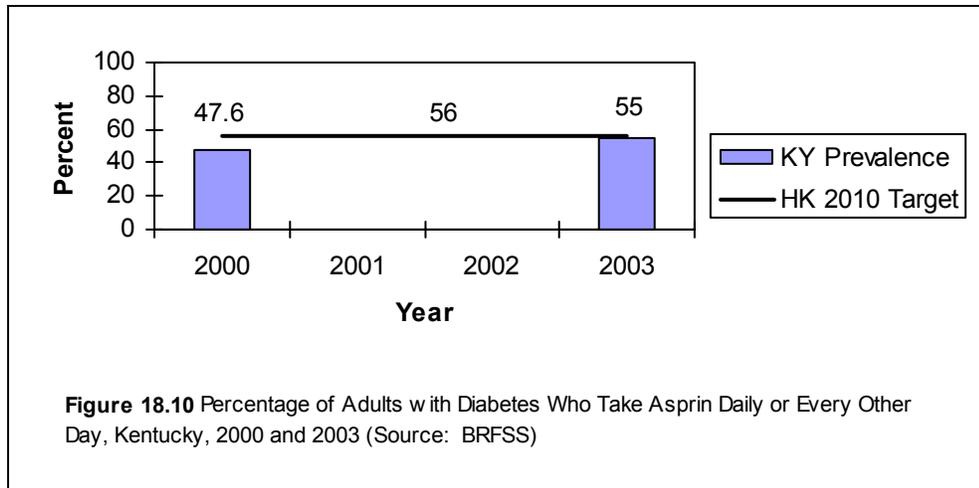
**Reason for Revision:** The objective was revised to incorporate a target based on the new baseline data.

**Data Source:** BRFSS, cardiovascular disease module.

**Baseline:** 47.6 percent in 2000

**HK 2010 Target:** 56 percent

**Mid-Decade Status:** 55 percent in 2003



**Strategies to Achieve Objective:**

- See strategies for Objective 18.4

**18.18. Increase to 45 percent the proportion of persons with diabetes who perform self-blood glucose monitoring at least daily.**

**18.18R. (REVISION) Increase to 65 percent the proportion of persons with diabetes who perform self-blood glucose monitoring at least daily.**

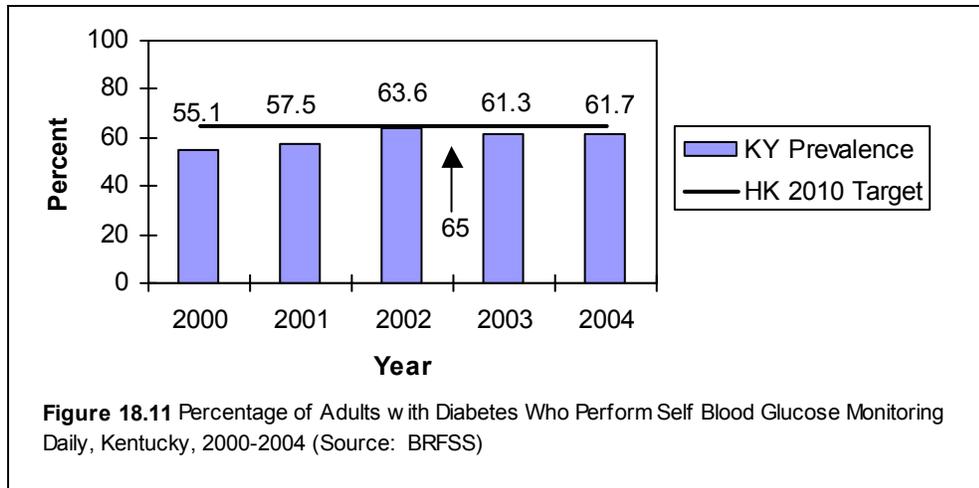
**Reason for Revision:** Reflects changes in the BRFSS question

**Data Source:** BRFSS

**Baseline:** 55.1 percent in 2000

**HK 2010 Target:** 65 percent

**Mid-Decade Status:** 61.7 percent in 2004



**Strategies to Achieve Objective:**

- See strategies for Objective 18.4

**18.19. Increase the proportion of persons with diabetes who have received formal diabetes self-management training. (See Revision)**

**18.19R. (REVISION) Increase to 49.8 percent the proportion of persons with diabetes who have received formal diabetes self-management training.**

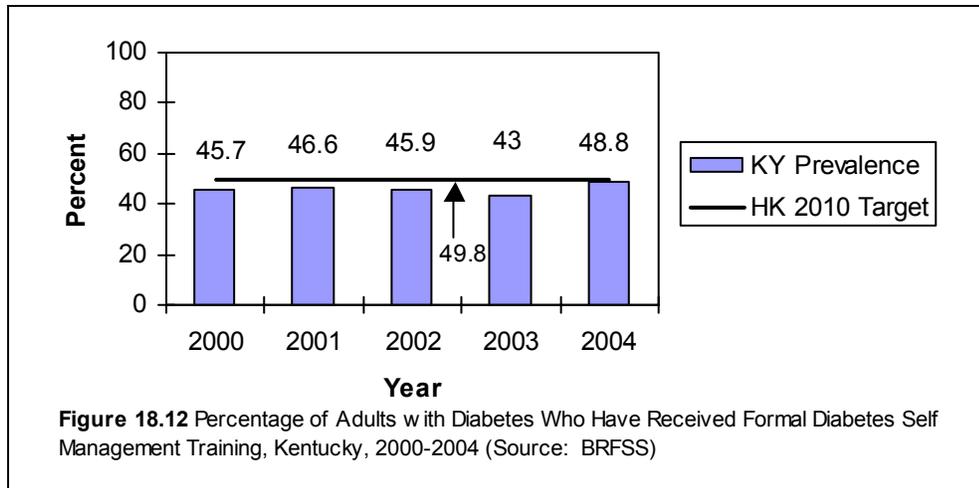
**Reason for Revision:** The objective was revised to match the data source.

**Data Source:** BRFSS

**Baseline:** 45.7 percent in 2000

**HK 2010 Target:** 49.8 percent

**Mid-Decade Status:** 48.8 percent in 2004



**Strategies to Achieve Objective:**

- See strategies for Objective 18.4

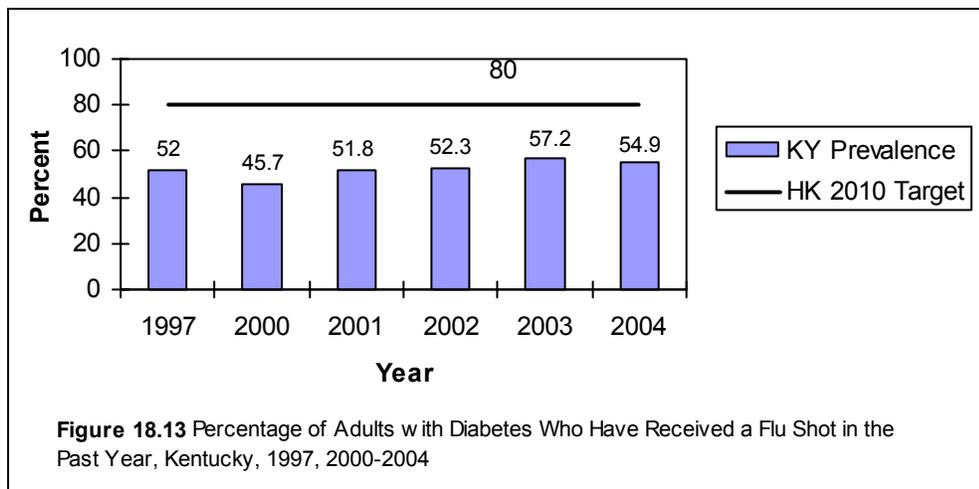
**18.20. Increase to 80 percent the proportion of persons with diabetes who receive an annual influenza vaccination.**

**Data Source:** BRFSS

**Baseline:** 52 percent of those 18 years of age and older in 1997

**HK 2010 Target:** 80 percent

**Mid-Decade Status:** 54.9 percent in 2004



**Strategies to Achieve Objective:**

- See strategies for Objective 18.4

- Promote public awareness campaigns geared toward increasing the importance of flu and pneumonia immunization especially targeting Appalachian and African American populations
- Kentucky Department for Public Health's Immunization Program will promote awareness via various means and distribute guidelines for appropriate immunization.

## **Contributors**

- Theresa Renn, RN, BSN, CDE, Kentucky Diabetes Prevention and Control Program, Adult and Child Health Improvement Division, Kentucky Department for Public Health, Chapter Co-Coordinator
- Teri Wood, PhD, Epidemiologist, Chronic Disease Branch, Adult and Child Health Improvement Division, Kentucky Department for Public Health, Chapter Co-Coordinator
- Ron Alsup, BA, Kentucky Diabetes Prevention and Control Program, Adult and Child Health Improvement Division, Kentucky Department for Public Health
- Reita Jones RN, BSN, Kentucky Diabetes Prevention and Control Program, Adult and Child Health Improvement Division, Kentucky Department for Public Health
- Linda Leber, RN, BSN, CDE, Kentucky Diabetes Prevention and Control Program, Adult and Child Health Improvement Division, Kentucky Department for Public Health
- George Robertson, MA, Division of Epidemiology and Health Planning, Kentucky Department for Public Health

## 18. Diabetes – Summary Tables

Summary of Objectives for Diabetes	Baseline	HK 2010 Target	Mid-Decade Status	Progress	Data Source
18.1. (DELETED)					
18.2. Decrease the rate at which the prevalence of diagnosed diabetes is climbing so that it reaches no more than 6 percent of the population 18 years and older.	5.0% (1996-98)	≤6%	7.5% (2004)	No	BRFSS
18.3. (DELETED)					
18.4R. Limit the upward trend in the diabetes death rate to the 1999 baseline of 76 per 100,000.	76/ 100,000 (1999)	≤76/ 100,000	78/ 100,000 (2002)	No	Vital Statistics
18.5. Slow the rise in deaths due to cardiovascular disease where diabetes is listed as either a supplemental cause of death or an existing condition to no more than 276 per 100,000 diabetic population.	283.3/ 100,000 (1997)	≤276/ 100,000	334.2/ 100,000 (2002)	No	Vital Statistics
18.6. (DELETED)					
18.7R. Reduce the frequency of anomalies in infants of mothers with diabetes to no more than 233.3 per 1,000 births.	265.9/ 1,000 (1998)	≤233.3/ 1,000	234.3/ 1,000 (2002)	Yes	Vital Statistics
18.8R. Maintain the frequency of foot sores lasting more than four weeks to no more than 13 percent among persons with diabetes.	Adults: 14% (2000)	≤13%	14% (2003)	No	BRFSS
18.9. Reduce the frequency of lower extremity amputation to 5.4 per 1,000 persons with diabetes.	6/ 1,000 (2000)	≤5.4/ 1,000	4.4/ 1,000 (2002)	Target Achieved	HOSP and BRFSS
18.10. (DELETED)					
18.11R. Decrease the incidence of diabetes related ESRD that requires dialysis or transplantation to no more than 11.3 per 100,000 population.	11.9/ 100,000 (1998)	≤11.3/ 100,000	14.8/ 100,000 (2002)	No	Tri State Renal Network
18.12. (DELETED)					
18.13R. Increase to 90 percent the proportion of persons with diabetes who have a glycosylated hemoglobin measurement at least once a year.	Adults: 82.9% (2000)	≥90%	86.9% (2004)	Yes	BRFSS
18.14. (DELETED)					
18.15. Increase to 80 percent the proportion of persons with diabetes who have an annual dilated eye exam.	Adults: 75.5% (2000)	≥80%	70.5% (2004)	No	BRFSS
18.16. Increase to 70 percent the proportion of persons with diabetes who have at least an annual foot exam.	Adults: 63% (2000)	≥70%	62.1% (2004)	No	BRFSS

Summary of Objectives for Diabetes	Baseline	HK 2010 Target	Mid-Decade Status	Progress	Data Source
18.17R. Increase to 56 percent the proportion of persons with diabetes over 40 years of age that take aspirin daily or every other day.	47.6% (2000)	≥56%	55% (2003)	Yes	BRFSS
18.18R. Increase to 65 percent the proportion of persons with diabetes who perform self-blood glucose monitoring at least daily.	Adults: 55.1% (2000)	≥65%	61.7% (2004)	Yes	BRFSS
18.19R. Increase to 49.8 percent the proportion of persons with diabetes who have received formal diabetes self-management training.	Adults: 45.7% (2000)	≥49.8%	48.8% (2004)	Yes	BRFSS
18.20. Increase to 80 percent the proportion of persons with diabetes who receive an annual influenza vaccination.	Adults: 52% (1997)	≥80%	54.9% (2004)	Yes	BRFSS

R = Revised objective