

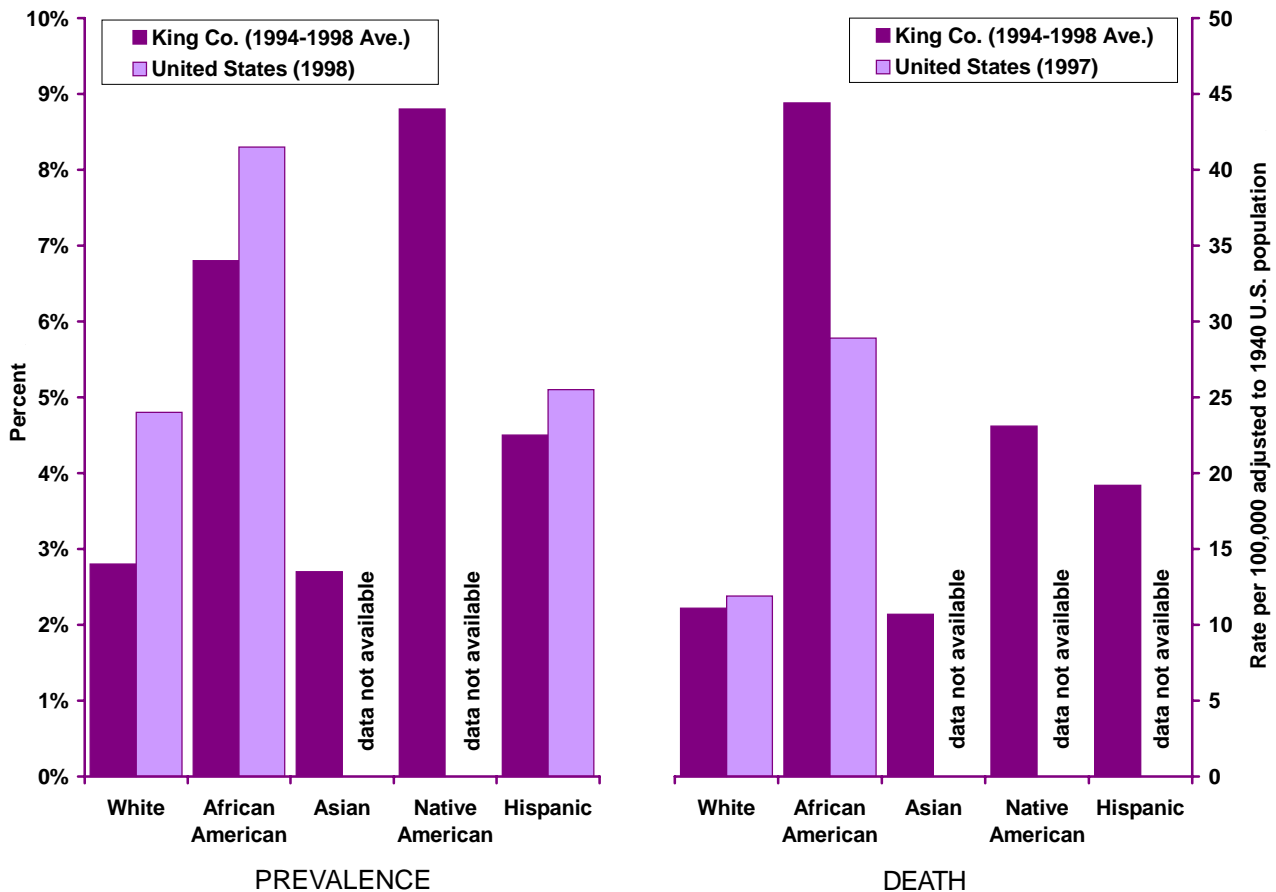
Public Health Data Watch

Public Health -- Seattle & King County
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Diabetes in King County:

- Diabetes is the seventh leading cause of death.
- About 66,000 King County adult residents have diabetes.
- The diabetes death rate in King County has increased 50% since the mid-1980s.
- The prevalence of and death rates for diabetes in African Americans, Native Americans, and Hispanics are substantially higher than whites. The death rate among African Americans is four times the rate for King County whites and 50% higher than African Americans nationally.
- Type 2 diabetes and its complications are potentially preventable.

Diabetes Prevalence and Death King County and the United States



Diabetes in King County

Diabetes is a chronic disease in which insulin deficiency and/or resistance to insulin action leads to a high level of sugar in the blood. Without proper treatment, diabetes can lead to serious complications such as kidney failure, blindness, and lower extremity amputation. In the United States, diabetes is the seventh leading cause of death, and the prevalence of diabetes has been increasing, especially in minority populations. Diabetes is a very costly disease. The American Diabetes Association estimates that nationally, the total direct and indirect costs of diabetes were \$98 billion in 1997. In King County, diabetes is also a significant public health problem. This issue of Data Watch summarizes data on diabetes for King County.

1. Demographics and Time Trend

Prevalence, Hospitalization, and Death

- In 1998, 3.5% of the King County adult population (about 44,000 persons age 18 and over) reported having been diagnosed with diabetes. In addition, another 22,000 adults in King County may have undiagnosed diabetes.¹
- In King County, there were 1,398 hospitalizations in 1998 in which diabetes was the primary cause, accounting for one percent of the total non-childbirth hospitalizations. Of these 1,398 hospitalizations, 467 (33%) were for diabetes with ketoacidosis (a severe chemical imbalance) or coma. Many of these hospitalizations may have been prevented by assuring appropriate management of diabetes in the outpatient setting.
- The total cost for the 1,398 hospitalizations for diabetes was over \$13 million, averaging \$9,297 per hospitalization.
- In 1998, there were 258 hospitalizations for diabetes-related lower extremity amputations.
- Diabetes is the 7th leading cause of death in King County. In 1998, 315 King County residents died from diabetes as the underlying cause. In addition, there were 531 deaths in which diabetes was a contributing cause. Diabetes-related deaths are often underreported.²
- The age-adjusted³ diabetes death rate per 100,000 in 1998 was 12.0 in King County, 13.6 in Seattle. The U.S. rate in 1997 was 13.5. The differences between the local rates and the national rate were not statistically significant. The U.S. Year 2010 objective is to reduce the age-adjusted death rate for diabetes to 12.0 per 100,000 persons. Although King County as a whole has met this objective, certain subpopulations, such as African Americans and people living in low income communities, have diabetes death rates that are much higher than the King County average rate.

¹ The number of undiagnosed diabetics is calculated based on the national estimate that one third of affected persons are undiagnosed.

² It is estimated that among persons known to have diabetes, about 40% have diabetes listed as a cause of death and 10% have diabetes recorded as the underlying cause of death.

³ The *age-adjusted rate* is a rate that mathematically removes the effect of age, by using a standard population. For this Data Watch the rate is adjusted to the age distribution of the 1940 U.S. population.

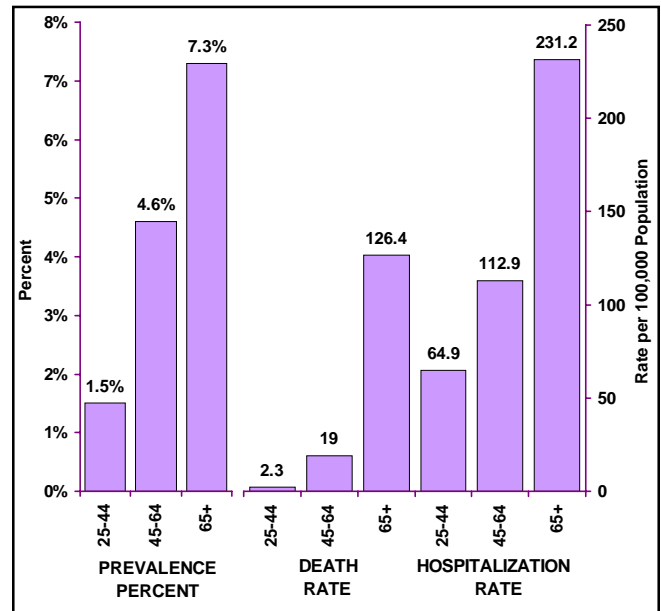
Age

- The risk of diabetes increases with age. Averaged over 1994-1998, 1.5% of persons age 25-44, 4.6% of persons age 45-64, and 7.3% of persons age 65 and older had been diagnosed with diabetes. The rates of hospitalization and death share the same age pattern (Figure 1).
- Of adults with a diabetes diagnosis, the average age at diagnosis was 48. About 7% were diagnosed before age 18 and nearly 70% were diagnosed at age 40 or over. Type 2 diabetes is increasingly being found in children and adolescents.

Race/Ethnicity

- Compared to whites, a higher proportion of African Americans, Native Americans, and Hispanics had diabetes. Their death rates were also higher than whites (Table 1). The rates for Asians were similar to the white rates.
- African Americans had especially high rates. In King County, the age-adjusted death rate in African Americans was about four times the white rate. The age-adjusted death rates in Native Americans and Hispanics were also significantly higher than the white rate.

Figure 1. Diabetes Prevalence, Death, and Hospitalization by Age, King County, 1994-1998 Averages



- The diabetes death rate for African Americans in King County was 50% higher than the national African American rate. Compared to the largest counties in the United States, African Americans in King County not only had the highest diabetes death rate but also the highest disparity between African Americans and whites (Table 2).

Table 1. Diabetes Prevalence and Death In King County and United States

	Prevalence* (1994-1998 Ave.)			Prevalence* (1998)
	Rate	95% CI	Number	U.S. Rate
White	2.8%	2.3, 3.3	30,059	4.8%
African American	6.8%	3.2, 10.3	2,930	8.3%
Asian	2.7%	0.8, 4.6	2,306	not available
Native American	8.8%	2.2, 15.4	1,371	not available
Hispanic	4.5%	1.9, 7.1	2,465	5.1%

	Death (1994-1998 Ave.)			Death (1997)
	Rate**	95% CI	No./Year	U.S. Rate**
White	11.1	10.4, 11.7	248	11.9
African American	44.4	37.7, 51.2	33	28.9
Asian	10.7	8.6, 12.9	19	not available
Native American	23.1	12.1, 34.0	3	not available
Hispanic	19.2	12.6, 25.7	6	not available

* Prevalence among adults age 18 and older.
 ** Per 100,000 population, age-adjusted to the 1940 U.S. population.

Table 2. Age-Adjusted Diabetes Death Rate Among the Largest U.S. Counties and King County, 1994-1996

County	White		African American		African American/White Rate Ratio
	Number	Rate	Number	Rate	
Los Angeles County, CA	3,258	11.6	967	27.2	2.3
Cook County, IL	2,496	12.6	1,238	26.5	2.1
Harris County, TX	1,172	14.9	486	29.4	2.0
Maricopa County, AZ	1,225	10.2	86	34.9	3.4
San Diego County, CA	904	8.5	76	20.9	2.5
Orange County, CA	860	9.2	14	18.3	2.0
Kings County, NY	897	12.4	640	21.9	1.8
Dade County, FL	1,216	10.7	326	29.1	2.7
Wayne County, MI	938	13.2	754	21.6	1.6
Dallas County, TX	754	12.7	307	31.6	2.5
King County, WA	720	10.9	91	37.8	3.5

Source: CDC Wonder.
 Note: King County is the 12th largest county in the United States.

Income

- The proportion of people with diabetes in households with an annual income of less than \$20,000 (5.8%) was more than twice that for people in households with higher incomes (2.4%).
- Similarly, the diabetes death rate is strongly related to neighborhood poverty level. The age-adjusted death rates in high, medium, and low poverty neighborhoods, averaged over 1994-1998, were 19.3, 14.1, and 8.9 per 100,000 respectively.

Geographic Area

- Among the 21 Health Planning Areas in King County, the highest diabetes death rates were in Central Seattle, Southeast Seattle, and White Center/Skyway. The age-adjusted death rates in these areas were significantly higher than the county rate (Figure 2).

Figure 2: Diabetes Death Rate in King County By Health Planning Area, 1994-1998 Average

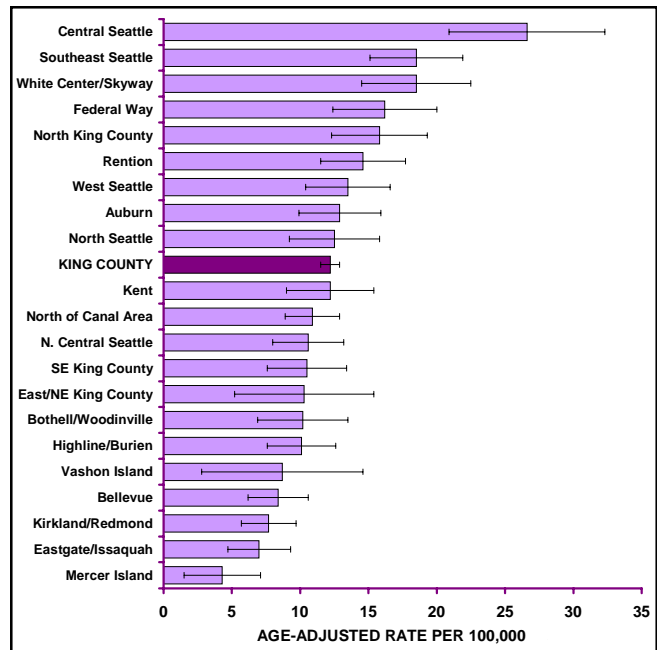
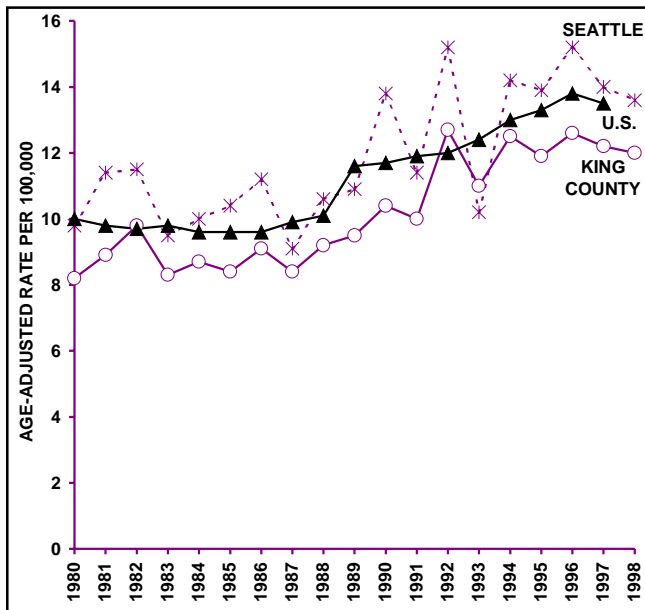


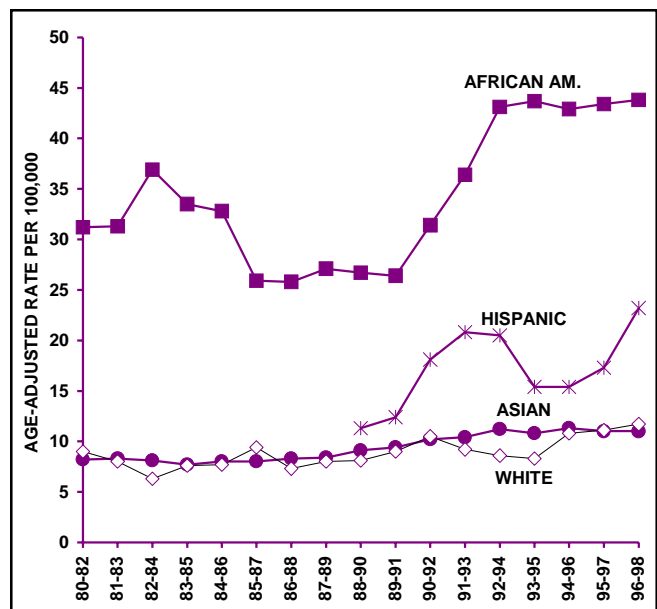
Figure 3: Diabetes Death Rate in King County, Seattle, and United States, 1980-1998



Time Trends

- Similar to the national trend, the diabetes death rate in King County has increased significantly since the mid-1980s. Most of the increase occurred between 1987 and 1996, when the death rate increased 50% and the number of deaths per year increased from 179 to 318 (Figure 3).

Figure 4: Diabetes Death Rate in King County By Race/Ethnicity, Three Year Rolling Averages, 1980-1998



- The largest increase in the death rate was among African Americans (Figure 4). The average number of deaths per year increased from 17 during 1989-1991 to 33 during 1996-1998 while the age-adjusted death rate increased 84% during the same period.

The increase in diabetes death can be attributed to the growing trends in a number of factors such as unhealthy eating and physical inactivity, as well as improved diagnosis and recording on death certificates.

2. Diabetes Risk Factors

Type 2 diabetes occurs more commonly among people with:

- Family history of diabetes
- Obesity (as a result of unhealthy eating and physical inactivity)
- African American, Native American, and Hispanic race or ethnicity
- Lower socio-economic status

- Age 45 or older
- Earlier tests for diabetes indicating borderline abnormal readings
- Physical inactivity
- History of diabetes during pregnancy or delivery of a baby weighing more than 9 pounds

The main modifiable risk factors are obesity and physical inactivity.

Obesity⁴

- In 1998, 48% of the King County adults were overweight (BMI ≥ 25), 38% in women and 58% in men. The obesity (BMI ≥ 30) rate was 14% in the overall adult population, 13% in women and 15% in men.
- Of persons age 40 and older in King County, averaged over 1994-1998, the prevalence of diabetes was 2.6%, 4.8%, and 12.9% respectively among normal or low weight persons (BMI < 25), overweight persons ($25 \leq$ BMI < 30), and obese persons (BMI ≥ 30) (Figure 5).

Figure 5: Bodyweight and the Prevalence of Diabetes Among King County Adults Age 40+, 1994-98 Average

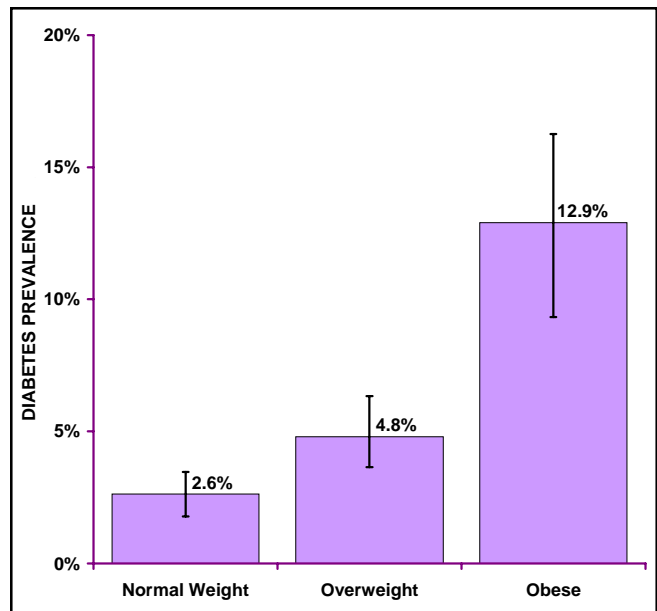
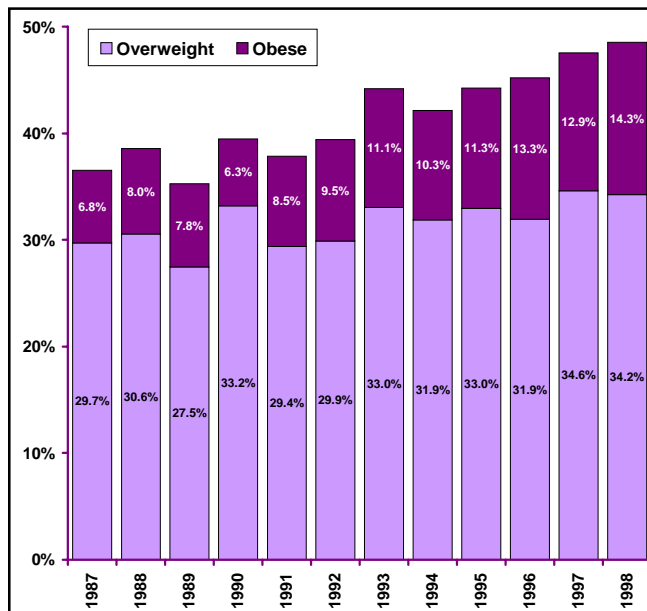


Figure 6: The Prevalence of Overweight and Obesity Among King County Adults, 1987-1998



- The prevalence of obesity (BMI ≥ 30) in King County, averaged over 1994-1998, was 21.7% in African Americans, 19.3% in Native Americans, 15.0% in Hispanics, 12.5% in whites, and 6.2% in Asians.
- Between 1987 and 1998 in King County, the prevalence of obesity increased significantly from 6.8% to 14.3% (Figure 6).

Physical Inactivity (Sedentary Lifestyle)⁵

Physical inactivity not only contributes to obesity but also independently increases the risk of Type 2 diabetes.

- In 1998, 50% of the adult population in King County lived a sedentary lifestyle.

⁴ Obesity can be determined by a measure called the BMI (Body Mass Index). The BMI is a ratio of weight to height (weight in kilograms / (height in meters)²). An adult who is 5'5" tall is considered overweight if he/she weighs 150 pounds or more, and is considered obese if he/she weighs 180 pounds or more. For a person who is 5'10" tall, the cut-off points are 174 pounds and 209 pounds respectively.

⁵ Sedentary lifestyle is defined as having physical activity less than 3 times per week and less than 20 minutes per time.

3. Diabetes Prevention and Control

There are two main types of diabetes. Type 2 diabetes accounts for 90-95% of all cases and is characterized by resistance to insulin action. Type 2 diabetes often develops during middle age. Type 1 diabetes is caused by lack of insulin and usually develops during childhood.

Primary Prevention

For Type 2 diabetes, strategies for primary prevention include:

- interventions at the population or community level to promote increased physical activity and decreased consumption of foods high in fat.
- targeted intervention for high risk individuals who have one or more risk factors for diabetes, including dietary changes, weight control, and regular physical activity. The occurrence of Type 2 diabetes could be reduced by 50% to 75% through reductions in obesity and 30% to 50% through increased physical activity.
- targeted intervention in communities with high diabetes rates such as the African American, Native American, and Hispanic communities.

Screening and Early Detection

Type 2 diabetes is often without obvious symptoms in its early stages. About one-third of the individuals who currently have diabetes are undiagnosed. Some of these individuals will already have developed diabetic complications at the time of diagnosis. However, the chance of finding diabetes among individuals without a risk factor is low and therefore unselected population screening is not cost-effective. It is recommended that screening should be limited to high risk individuals and populations.

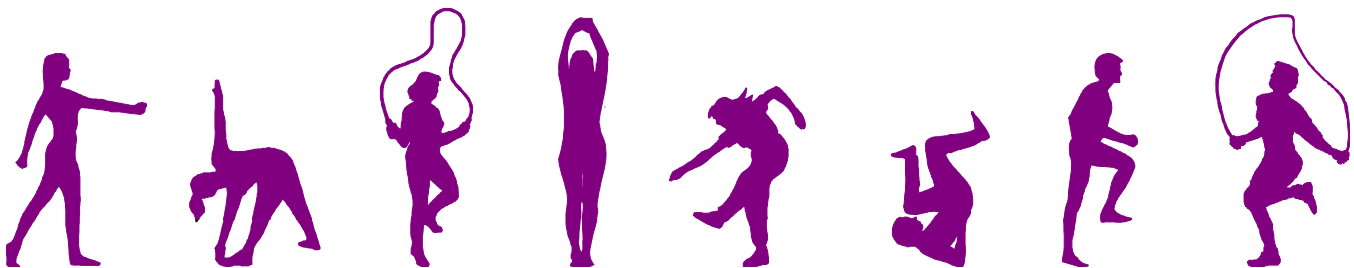
The American Diabetes Association recommends screening of high-risk individuals at three-year intervals. Screening can be accomplished by a simple blood test. In a community screening program, individuals who have been determined to be at high risk should follow up with a health provider for further evaluation.

Preventing diabetic complications among persons with diabetes

Diabetes is a chronic disease that requires lifelong care with the active involvement of the person with diabetes. In addition to medication, proper nutrition, weight reduction and physical activity, a number of measures can be undertaken by health providers to reduce the risk of diabetes complications. These measures include improving self-management skills of those with diabetes (such as self-monitoring of blood sugar levels), checking their blood pressure at every visit and controlling high blood pressure, conducting annual eye exams to detect diabetic eye damage, treating early signs of diabetic kidney damage, conducting foot exams, and eliminating other heart disease risk factors such as high cholesterol and smoking.

Improving the care of persons with diabetes can best be accomplished by setting up diabetes management systems at sources of medical care and integrating these with community resources. These systems can track the care of people with diabetes to assure that all components of a comprehensive care plan are provided for each individual. Recent studies show that good control of blood sugar can prevent many of the complications of diabetes.

- Averaged over 1994-1998, 68% of King County adults who have been diagnosed with diabetes checked their blood sugar level at least weekly. However, 20% never self-checked their blood sugar level, and 14% had not seen a health professional for their diabetes during the previous year.
- Of those who had seen a health professional at least once during the previous year, 17% were not checked for foot sores or irritations, and 34% did not receive an eye exam.



4. The REACH (Racial and Ethnic Approaches to Community Health) Project

A coalition of King County community organizations organized by Public Health - Seattle & King County recently received a grant from the Centers for Disease Control and Prevention to develop community-based strategies to improve the early diagnosis and management of diabetes among racial and ethnic minority populations. The goal of the REACH Project is to reduce racial/ethnic disparities in diabetes-related health in King County.

5. Websites and Resources

American Diabetes Association (ADA), Pacific Northwest Region

557 Roy Street, Lower Level, Seattle WA 98109-4219
Telephone: (206) 282-4616; 1-800-628-8808 (WA only)
Fax: (206) 282-4729

Diabetes Information and Nutrition --

American Diabetes Association (ADA)
Telephone: 1-800-342-2383
<http://www.diabetes.org>

The Diabetes Mall --

American Diabetes Association (ADA)
<http://www.diabetesnet.com/ada.html>

Diabetes and Public Health Resource --

Centers for Disease Control and Prevention (CDC)
Telephone: 1-800-311-3435
<http://www.cdc.gov/diabetes/>

National Diabetes Education Program --

National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)
Telephone: (301) 654-3327
<http://www.niddk.nih.gov/health/diabetes/ndep/ndep.htm>

Health Information, Educational, and Research --

National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)
Telephone: (301) 496-7348
<http://www.niddk.nih.gov/index.htm>

Washington State Diabetes Control Program --

Centers for Disease Control and Prevention (CDC)
Telephone: (360) 664-9086
<http://www.cdc.gov/nccdphp/ddt/states/wa.htm>

Diabetes in America --

National Institute of Diabetes and Digestive and Kidney Disease (NIDDK)
Telephone: (301) 654-3327
<http://diabetes-in-america.s-3.com/Default.htm>

Nutri-Topics: Nutrition and Diabetes --

United States Department of Agriculture (USDA)
Telephone: (301) 504-5719
<http://www.nal.usda.gov/fnic/pubs/bibs/topics/diabetes/>

Veterans Health Administration Diabetes Program --

Department of Veterans Affairs (VA)
<http://www.va.gov/health/diabetes/>

Diabetes in African Americans --

American Diabetes Association (ADA)
Telephone: 1-800-342-2383
<http://www.diabetes.org/africanamerican/>

Diabetes in African Americans --

National Institute of Diabetes and Digestive and Kidney Disease (NIDDK)
Telephone: (301) 654-3327
<http://www.niddk.nih.gov/health/diabetes/pubs/afam/afam.htm>

Japanese American Community Diabetes Study --

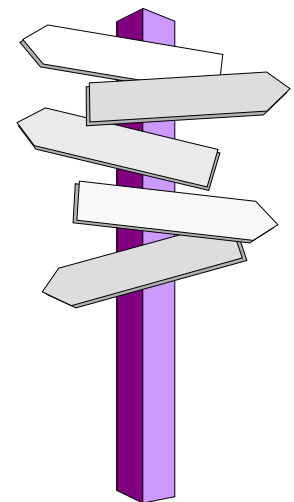
University of Washington (UW)
Telephone: (206) 543-5597
<http://depts.washington.edu/jacds/>

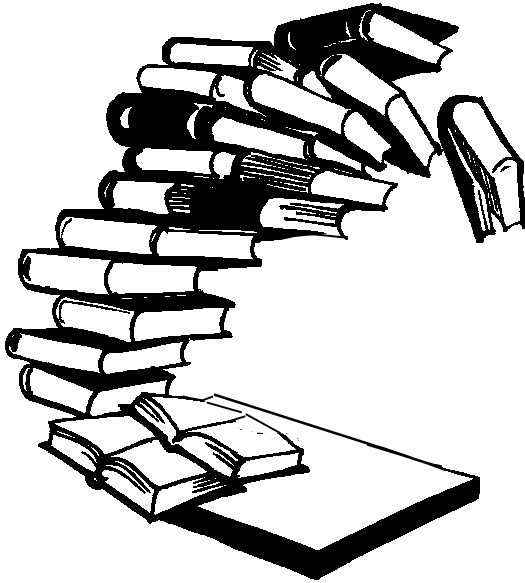
Native American Diabetes Project --

La Plaza Diabetes Wellness Connection
Telephone: (505) 272-4462
<http://www.laplaza.org/dwc/prof/nadp/mtg1a.htm>

Diabetes in Hispanic Americans --

National Institute of Diabetes and Digestive and Kidney Disease (NIDDK)
Telephone: (301) 654-3327
<http://www.niddk.nih.gov/health/diabetes/pubs/hispan/hispan.htm>





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Bishop DB, Zimmerman BR, and Roesler JS. Chapter 14. Diabetes. In: Chronic Disease Epidemiology and Control. Second Edition. Edited by: Ross C. Brownson, Patrick L. Remington, and James R. Davis. American Public Health Association. 1998.

CDC. Diabetes: A Serious Public Health Problem. 1999. <http://www.cdc.gov/nccdphp/ddt/surv1/surveill.htm>

CDC. The Public Health of Diabetes Mellitus in the United States.

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Public Health Data Watch monitors trends in key health indicators for King County. It is produced several times a year by the Epidemiology, Planning, and Evaluation Unit (EPE) of Public Health -- Seattle & King County with assistance from other staff of Public Health. For additional copies of this Data Watch please contact:

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