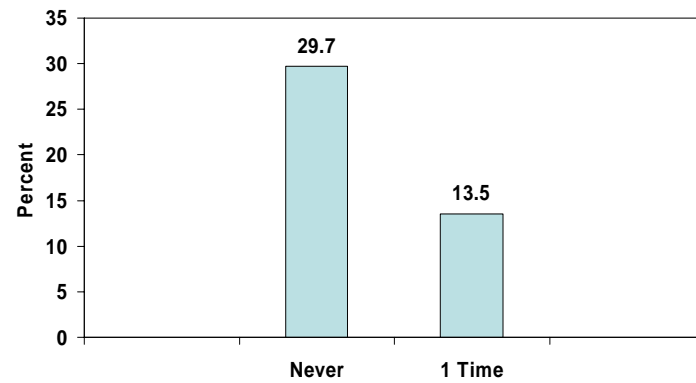


Eye and Foot Care

Diabetic eye disease is the leading cause of blindness in the United States, while diabetes contributes significantly to disability due to lower extremity amputations (LEA). Prevention of diabetes related blindness and LEA require good control of blood sugar. However, equally important are eye and foot care which include eye exams to screen for retinopathy and the identification and treatment of foot ulcers. Data

Figure 5— Average percent of diabetic patients who reported never or only one time having their feet checked by a doctor or health professional in the past 12 months: BRFSS 2001-2003 data.



from the BRFSS show that for the three year period of 2001-2003 the average percent of diabetic persons reporting that they had received screening for retinopathy in the past 12 months was 64.3%. During the same period, only 6.7% of diabetic persons indicated that they had never been screened for retinopathy. Figure 6 shows that on average 43.2% of diabetic persons interviewed in the BRFSS in 2001 through 2003 said that they had their feet checked by a doctor or health professional one time or less in the past 12 months. These data suggest that health professionals affiliated with diabetes care in the USVI should place more emphasis on monitoring of the diabetic foot.

III. Diabetes Self-Management

The BRFSS collects information on the frequency with which diabetic patients do blood glucose self-monitoring and check their feet for sores and ulcerations. On average, for the 3-year period from 2001 to 2003, 32.2 % of diabetic respondents to the BRFSS indicated that they check their blood glucose at least once per day. For the same time period the average percentage of diabetic persons who indicated that they never monitor their blood sugar is 16.5%. Approximately 60.2% of all diabetic persons interviewed in the BFRSS during the years 2001-2003 reported that they check their feet for sores at least once per day, while 17.3% said that they never check their feet.

Table 1— Frequencies with 95% Confidence Intervals and odds ratios relating the presence and absence of diabetes education to lack of glucose self-monitoring and lack of food checking for sores and ulcers: BRFSS 2003.

	With	Without		
Variables	Diabetes Education	Diabetes Education	Crude Odds Ratios	p-value
N	62	125	---	---
Do not Self-monitor	4.62 (0.00-28.22)	20.16 (6.06-34.26)	5.2(1.5-18.0)	.0044
Do not Check Feet	10.94 (0.00-32.94)	17.80 (2.90-32.70)	1.7(0.7-4.4)	.2207

Table 1 shows recent data from the 2003 BFRSS comparing the frequencies of blood glucose self monitoring and self check of their feet between persons who received diabetes education and those who did not. These data show that persons with diabetes who did not receive diabetes education were 5 time more likely to refrain from self-monitoring blood sugar than those who received diabetes education. This significant difference persisted [Odds ratio 5.2, 95% CI= 1.5-18.4] even after adjusting for age and overall educational level.



**ASSESSMENT OF DIABETES MANAGEMENT
IN THE US VIRGIN ISLANDS**

In 2003 persons who received no diabetes education were 5 times more likely to refrain from monitoring their blood sugar

Diabetes mellitus is the 5th leading cause of death in the U.S Virgin Islands (USVI). Mortality due to diabetes is largely the result of complications arising from the disease. Severe complications due to diabetes such as blindness and lower extremity amputations reduce the quality of life of the person with diabetes. To the extent that the disease is properly managed, complications can be reduced and premature mortality decreased. This report summarizes data available through the Behavioral Risk Factor Surveillance System (BRFSS) and other sources on indicators of the quality of diabetes management in the USVI. The BRFSS collects information by telephone interview from a population-based sample of Virgin Islands residents age 18 and older. Additional sources of data included Hospital Discharge Reports, reports from Public Health Clinics, insurance claims and, whenever possible, data from population-based epidemiological studies.

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I. Control of Blood Sugar

A cornerstone of effective management of diabetes mellitus is the control of the patient's blood sugar. The effectiveness of blood sugar control is evaluated by measuring the blood sugar level to determine if it is within an acceptable range. A diabetic person who is "out of control" has too much sugar in his/her blood. During the past decade, the measurement of the hemoglobin A1c level (HbA1c) from a fasting blood sample has emerged as the method of choice for assessing control of blood sugar. The hemoglobin A1c test measures the amount of sugar that is attached to hemoglobin in the red blood cells of a person. If there is too much sugar in the blood, the excess sugar gets attached to the hemoglobin inside the red cell. The red cells live for about 120 days and the hemoglobin in the red cells carry a memory of what the average blood sugar level was during the life span of the red cell. As a result, the hemoglobin A1c test can be used to estimate the average blood sugar level of a person during the past 2 to 3 months. A person without diabetes has an A1c level of about 5%. It is recommended by the American Diabetes Association that for a diabetic person the A1c level should be below 8%.

Quantitative data on A1c levels are not collected in the BRFSS. However, estimates of A1c levels and the frequency of diabetic persons under control in the USVI are available from other sources. Figure 1 shows data for 48 patients who visited the Frederiksted Health Center on the island of St. Croix in 2003 and for a population-based sample of 160 diabetic persons who participated in the Virgin Islands Diabetes Study (VIDS), 1995-1999. The data in Figure 1 show a similar mean A1c level (average 9.2%) for diabetic patients at the Frederiksted Health Center and the VIDS. More than 50% of the patients in both sources had A1c levels that were above the 8% value recommended by the American Diabetes Association.

Figure 1: Summary of A1c outcomes in the Frederiksted Health Center (FHC) & Virgin Islands Diabetes Study (VIDS)

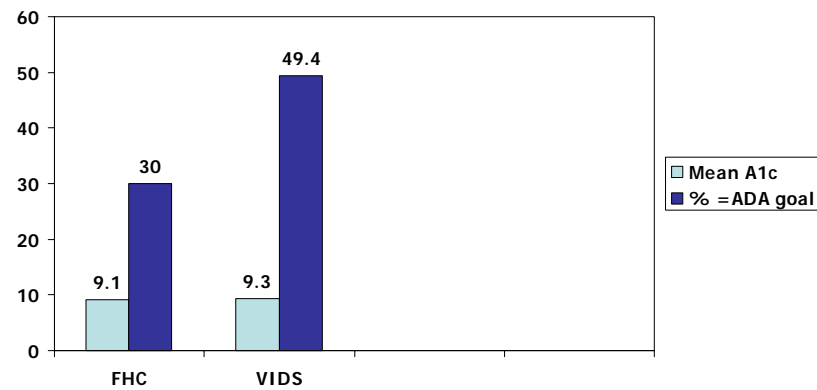
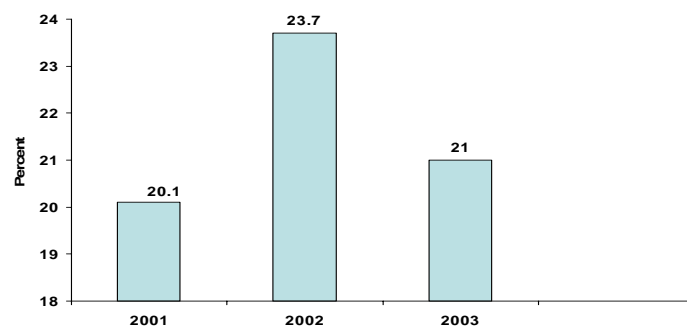


Figure 2--Uncontrolled diabetes as a percent of total hospital admissions with diabetes listed as the primary diagnosis at the Juan F. Louis Hospital, St. Croix.



Data from the Juan F. Louis Hospital on St. Croix (Figure 2) show that over the three-year period from 2001 to 2003 about one-fifth of diabetes related admissions to the hospital were for uncontrolled diabetes. Since these admissions are preventable they represent added cost to the health care system that could be reduced if better control of blood sugar levels were achieved.

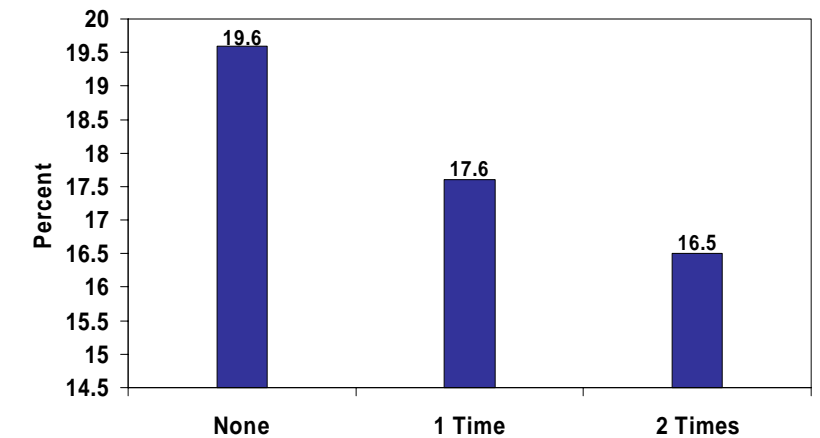
II. Diabetes Management Services

Hemoglobin A1c Testing

In the BRFSS persons with diabetes were asked how many times they had received a hemoglobin A1c test in the past year. A summary of the responses to this question for the years 2001 to 2003 is presented in Figure 3.

On average almost 20% of respondents could not recall having at least one A1c test requested by a doctor or other health professional in the past year. In total 53.7% had their A1c value checked two or fewer times during the past year. Assuming that patients visit their physicians or specialty clinics a minimum of one time per quarter a least 4 A1c tests per patient might be expected. These data suggest that there is a need for public health efforts to increase the proportion of diabetic patients receiving A1c tests and the frequency of A1c testing in the USVI.

Figure 3 - Percent of diabetic persons who reported a doctor or nurse checked their A1c level two or fewer times in the past year: BRFSS 2001-2003



CIGNA is the largest health insurance carrier in the USVI with over 20,000 participants. Data from the CIGNA database for the USVI for the years 2002 and 2003 show that there were 11,297 and 13,047 insured physician visits for diabetes related care. An A1c test was requested in approximately 5.4% of these diabetes related visits in each of the two years. Figure 4 shows the frequency distribution of those patients who received an A1c test by the number of tests they received. The vast majority of patients (~91%) received only one A1c test each year even though nearly all patients had at least 3 physician visits. These data suggest that despite the availability of insurance coverage, the frequency of A1c testing remains low in the USVI.

Figure 4— The percent of the time a physician requested one, two or more A1c tests each year for diabetic patients covered by CIGNA in 2002 and 2003.

