

VIRGINIA EPIDEMIOLOGY BULLETIN

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Diabetes Surveillance in Virginia*

This article presents preliminary information about diabetes surveillance in Virginia. For the first time, statewide data are being compiled and analyzed to determine the burden of diabetes in our state. Although there are still many limitations to the data, many of these will be addressed as data collection continues. The goal is to define the characteristics of Virginians with and at risk for this disease so that health professionals can study how best to address diabetes in our state. As further information from this project becomes available, we hope to share it with you.

Introduction

In 1994, the Virginia Department of Health (VDH) received a grant from the Centers for Disease Control and Prevention to address diabetes in Virginia as part of a multi-state Diabetes Control Program. To achieve the goals of the program, VDH is working in partnership with the Virginia Affiliate of the American Diabetes Association, the Virginia Center for Diabetes Professional Education at the University of Virginia, and the Survey Research Laboratory at Virginia Commonwealth University. The grant has three primary components:

- Interaction with two local communities to assess their burden of diabetes, define target groups for interventions that will be designed by the locality, and implement and evaluate these interventions;

- Initiation of a Virginia Diabetes Task Force to develop a plan to address diabetes statewide; and
- Surveillance to determine the morbidity and mortality associated with diabetes in Virginia and to follow trends over time.

The locations for the community-based projects were chosen based upon several factors, including the prevalence of high risk groups in the area, the availability of local data for use in monitoring implemented interventions, and the interest of multiple agencies in the area. The projects are located in the Eastern Shore Health District, which encompasses Accomack and Northampton counties, and the Lenowisco Health District, which includes Lee, Wise, and Scott counties and the independent city of Norton.

The Virginia Diabetes Task Force, made up of health professionals from the private and public sectors, educators, insurance representatives, and persons with diabetes, had its first meeting in May 1996. Since then, the group has met every two months to consider such issues as surveillance, reimbursement, access to care, and patient, professional and public education. This report will focus on diabetes surveillance.

Surveillance

Surveillance is the ongoing and systematic collection of outcome-specific data for analysis, interpretation, and result dissemination to health professionals to assist in disease control. Surveillance for diabetes in Virginia was designed to determine the burden of diabetes on this population, identify and prioritize major health problems associated with diabetes, and describe these problems in terms of age, race, sex and geographic location of patients. Although surveillance for communicable diseases has been a prominent

part of the public health system for almost 100 years, chronic disease surveillance is relatively new. Traditionally, disease surveillance depends upon reporting of individual cases by physicians, hospitals and laboratories, but assessing chronic disease morbidity and mortality presents different challenges. Therefore, an alternative type of surveillance system was developed for diabetes surveillance in Virginia. This system relies upon the analysis of various data that are already being collected and was modeled after a system used by the National Center for Chronic Disease Prevention and Health Promotion. The data sources currently used to determine the burden of diabetes in Virginia include:

- Behavior Risk Factor Surveillance System (BRFSS) data - available through the Survey Research Laboratory at Virginia Commonwealth University,
- Vital Statistics Mortality Data - from the VDH Center for Health Statistics,
- Hospital Discharge Data - from Virginia Health Information, a private nonprofit organization that compiles health care information from hospital discharge data,
- End-Stage Renal Disease data - from the Health Care Financing Administration (HCFA),
- Outpatient data - from community health clinics in the community-based project locations and a state-based health maintenance organization. These data have just been acquired and have not yet been analyzed.

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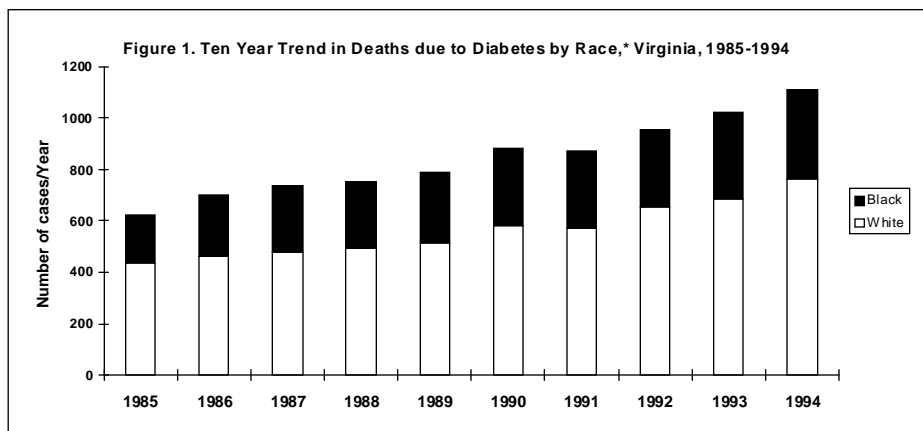
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The Prevalence of Diabetes in Virginia

The prevalence of diabetes among adults in Virginia is estimated by using data from the BRFSS, a state-based yearly telephone survey of 1,800 non-institutionalized persons >17 years of age that includes the question: "Have you ever been told by a health care professional that you have diabetes?" Thus, this survey identifies diagnosed and self-reported cases of diabetes only. Because the number of people identified with diabetes each year by this survey is small, BRFSS data from three years were pooled to estimate that approximately 4.7% of Virginia's population over 17 years of age has been diagnosed with diabetes, compared to 5.0% nationally. Persons aged 65 to 74 years have the highest prevalence of diabetes (12.0%); the occurrence in females is higher than in males (5.3% versus 4.1%); and the prevalence in blacks is substantially higher than in whites (7.5% versus 4.2%).

Since 1995, the Virginia BRFSS has included a module specific to diabetes. Persons who say they have been diagnosed with diabetes are asked questions designed to determine the level of their knowledge regarding the disease, their role in management of the disease, and the type of health care they are receiving for their disease. Data from the 1995 BRFSS have been analyzed and although the numbers are small and must be interpreted with caution, the results revealed some interesting information about persons with self-reported diabetes, such as:

- The average age of persons with diabetes was 59 years (range = 24-83 years) and the average age at which they were diagnosed with diabetes was 49 years (range 6-77 years).



*Two to ten deaths per year due to diabetes were reported in the Other race category. These numbers are too small to show on this graph.

- Respondents with diabetes were at almost three times the risk for hypertension when compared to persons without diabetes (Relative Risk = 2.7, 95% Confidence Interval = 2.2-3.3, p-value <0.01).
- Thirty percent of respondents with diabetes were currently using insulin.
- Only 31% reported checking their blood glucose levels daily; 14% never checked it.
- Sixty-five percent had never heard of glycosylated hemoglobin, an important marker for blood-glucose control.
- Fifty-one percent reported impaired vision for reading, but 30% had either not had their vision checked in over two years or had never had it checked.
- Thirty-three percent had not had their feet checked in the previous year.
- Thirty-six percent participated in no recreational physical activity.

These results suggest the need for more effective patient education that results in pa-

tients being able to manage their illness more responsibly.

Mortality Due to Diabetes

Deaths due to diabetes (*International Classification of Diseases*, 9th edition, code 250 [ICD-9 250]) were identified by examining the underlying cause of death listed on death certificates. Since 1990, diabetes has been the seventh leading cause of death in Virginia, as nationally. The ten-year trend in deaths due to diabetes shows an increase from 626 deaths in 1985 to 1,115 in 1994 (Figure 1). The number of deaths increased in both the white and black populations, by 75% and 84%, respectively. The crude death rate increased 58%, from 10.9 deaths per 100,000 population in 1985 to 17.2 per 100,000 in 1994. Nationally, in 1993, the most recent year for which data could be found, the crude death rate due to diabetes was 12.4 per 100,000.

As shown in Table 1, in 1994, the death rate increased with age and the overall death rate was higher in women than men. Death rates for black men and women were twice the rates of white men and women.

Diabetes-Associated Morbidity

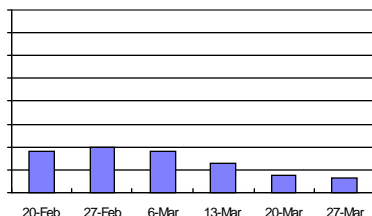
Attempts to assess diabetes-associated morbidity in Virginia have been undertaken by examining hospital discharge data for Virginia residents. To date, analysis has been completed on 1994 data; examination of 1995 data is in progress. Hospital discharge information on all admissions to Virginia hospitals is reported quarterly to Virginia Health Information where it is checked for errors, stripped of patient-identifying information, and compiled and made available for research and health planning purposes. Data collection began in July 1993. The 1994 data were incomplete for the first six months of the year because not

Table 1. Number of deaths due to diabetes and rate per 100,000 population, Virginia adults (>19 years of age), 1994*

Age	Males				Females			
	White	Black	Other	Age-Specific Death Rate	White	Black	Other	Age-Specific Death Rate
20 - 44	19	6	0	1.8	13	9	0	1.6
45 - 64	75	44	0	19.6	80	53	1	21.0
65 - 74	105	43	0	80.1	110	65	2	75.8
75+	113	32	1	152.8	246	96	2	186.4
Total >19	312	125	1	19.5	449	223	5	28.1
Race-Specific Death Rate	17.4	32.6	1.5		23.7	50.7	6.7	

*Diabetes listed as Underlying Cause of Death on death certificates, VDH Center for Health Statistics.

FLU CORNER



The 1996-1997 physician-based sentinel surveillance system in Virginia identified widespread activity through January 16, 1997. To date, 141 laboratory-confirmed cases of influenza type A and 1 case of laboratory-confirmed influenza type B have been reported in the state.

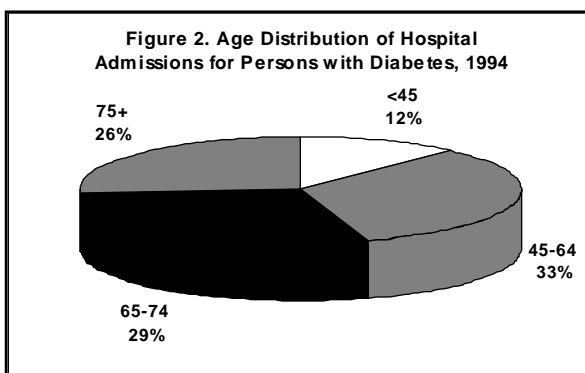
all hospitals reported initially; however, since the missing data were dispersed throughout the state and not concentrated in one region, racial, gender and age distributions are expected to be relatively accurate. Because individuals could not be identified in this database, analysis of data from Virginia Health Information is based on the number of hospital admissions.

During 1994, 728,477 admissions to Virginia hospitals were reported, of which 81,016 (11.1%) were for persons with diabetes. For this report, an admission for a person with diabetes is defined as any hospital admission for which diabetes (ICD-9 250) was listed as one of eight possible diagnosis codes on the hospital discharge summary. Diabetes was the primary diagnosis for 1.2% of all admissions.

In half of the admissions for persons with diabetes, the patient entered the hospital through the emergency room. Females accounted for 58.3% of admissions for persons with diabetes, similar to that for all admissions (59.5%). The average age was

63.6 years, compared to 44.3 years for all admissions. One-third of admissions that included a diagnosis of diabetes were for persons between the ages of 45 and 64 years (Figure 2).

Admissions with diabetes listed as any one of eight diagnosis codes had an average cost per admission of \$10,046 (median cost = \$8,724) and an average length of stay of 8.3 days (median length of stay = 6.8 days). Over \$800,000,000 was spent on hospital admissions for individuals with diabetes during 1994. Medicare was the listed payer for 59.0% of admissions for persons with diabetes, commercial insurance companies paid for 21.8% and Medicaid was responsible for 6.1%. This compares to



31.5%, 36.8% and 12.6%, respectively, for total 1994 hospital admissions.

Circulatory disorders were listed as the primary diagnosis for over one third of admissions for persons with diabetes. Major cardiovascular disease, other than coronary heart disease (CHD) and cerebrovascular accident, was the primary diagnosis in 14.6% of admissions for persons with diabetes. CHD was more common among white men with diabetes, accounting for 17.2% of their admissions. This compares to 8.9% of admissions for black males with diabetes and 10.5% of admissions for females with diabetes.

The most frequently recorded diagnosis among admissions with a primary diagnosis of diabetes was diabetic ketoacidosis, an indication of failure to manage the disease. This was the cause of admission for 2.7% of male and 2.5% of female admissions with diabetes. The average age was substan-

tively less than that for persons with other diabetes admissions at 34 years for males and 36 years for females. Proportionately, more than twice as many black male admissions were for diabetic ketoacidosis compared to white male admissions (4.4% versus 2.1%).

Lower extremity amputations (LEA), another possible indication of problems in diagnosis or management, were identified in 2.0% of admissions for persons with diabetes. Males accounted for 55.6% of these admissions. Proportionately, 1.4 times as many black male admissions were for LEA compared to white male admissions (3.6% versus 2.5%). By age, admissions for males between the ages of 45 and 64 years had the highest rate of LEA (3.2 per 100 admissions).

The annual number of incident cases of end stage renal disease due to diabetes (D-ESRD) in Virginia increased from 343 cases in 1990 to 603 cases in 1994, as determined from population-based data from HCFA. Although blacks account for only about one-fifth of the Virginia population, they accounted for half of all new cases of D-ESRD. The incidence rate for D-ESRD in blacks increased from 15.0 cases per 100,000 population in 1990 to 24.4 per 100,000 in 1994 and has consistently been four times the rate in whites (3.4 per 100,000 in 1990 and 6.2 per 100,000 in 1994) (Figure 3).

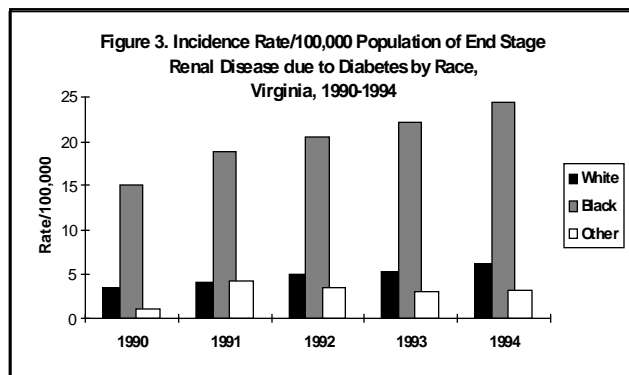
Conclusion

Surveillance for diabetes in Virginia is only in the beginning stages. This is a new kind of surveillance accomplished by adapting several methodologies. It is an ambitious and complex undertaking. For example, in order to obtain surveillance data on children with diabetes, both outpatient data and a study in one of the community-based project locations will be used. We look forward to presenting this data, as well as updates on diabetes surveillance in Virginia in the future.

*Submitted by Elizabeth Eustis Turf, Ph.D.

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Cases of Selected Notifiable Diseases Reported in Virginia*

Disease	Total Cases Reported, December 1996						Total Cases Reported Statewide, January through December		
	State	Regions					This Year	Last Year	5 Yr Avg
	NW	N	SW	C	E				
AIDS	108	1	18	5	21	63	1211	1460	1138
Campylobacteriosis	61	11	14	17	10	9	790	648	695
Giardiasis	70	14	24	6	7	19	405	318	371
Gonorrhea	864	40	69	116	201	438	9292	10342	13679
Hepatitis A	42	1	21	5	4	11	214	238	188
Hepatitis B	26	1	9	3	6	7	155	118	166
Hepatitis NANB	1	0	0	0	1	0	17	21	37
HIV Infection	84	4	7	8	13	52	987	1257	1377
Influenza	429	16	0	350	9	54	841	1484	1069
Legionellosis	13	1	0	12	0	0	50	28	20
Lyme Disease	5	0	4	0	0	1	54	55	111
Measles	0	0	0	0	0	0	3	0	11
Meningitis, Aseptic	24	2	3	4	3	12	234	780	447
Meningitis, Bacterial†	8	1	2	0	2	3	74	130	115
Meningococcal Infections	10	1	1	0	6	2	66	64	57
Mumps	0	0	0	0	0	0	16	28	49
Pertussis	11	4	3	1	1	2	107	31	37
Rabies in Animals	42	12	5	6	10	9	612	459	378
Rocky Mountain Spotted Fever	1	0	0	0	1	0	54	34	23
Rubella	0	0	0	0	0	0	2	0	0
Salmonellosis	114	10	38	23	19	24	1229	1358	1163
Shigellosis	80	23	19	25	5	8	746	412	496
Syphilis, Early‡	45	1	6	3	11	24	800	1144	1359
Tuberculosis	38	5	15	2	7	9	353	359	405

Localities Reporting Animal Rabies: Accomack 1 raccoon; Albemarle 2 skunks; Alexandria 1 skunk; Appomattox 1 skunk; Bedford 1 skunk; Caroline 1 opossum; Chesapeake 1 raccoon; Chesterfield 1 raccoon; Cumberland 1 skunk; Essex 1 raccoon; Fairfax 1 cat, 1 raccoon, 1 skunk; Frederick 1 skunk; Goochland 2 raccoons, 2 skunks; Hanover 1 cow, 1 fox; King George 1 skunk; Loudoun 1 raccoon; Lynchburg 1 raccoon, 2 skunks; Madison 1 raccoon; Mecklenburg 1 skunk; Northampton 1 cat, 1 raccoon; Northumberland 1 fox; Page 1 skunk; Powhatan 1 raccoon; Rappahannock 1 raccoon; Rockingham 1 skunk; Shenandoah 1 skunk; Spotsylvania 1 raccoon; Stafford 1 raccoon; Virginia Beach 3 raccoons; Wythe 1 raccoon.

Occupational Illnesses: Asbestosis 19; Carpal Tunnel Syndrome 2; Hearing Loss 2; Pneumoconiosis 14.

*Data for 1996 are provisional.

†Other than meningococcal.

‡Includes primary, secondary, and early latent.

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