

1960

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DEATH CERTIFICATION BY PHYSICIANS IN CASES ASSOCIATED WITH DIABETES

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Submitted in Partial Fulfillment for the Degree of
Doctor of Medicine

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April 1, 1960

Omaha, Nebraska

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INTRODUCTION

This study is an investigation of death certificates in which diabetes mellitus was mentioned as the underlying cause of death or as a contributing cause of death in 1958. It deals with Douglas County, Nebraska, residents who died in Douglas County.

One purpose of the study was to appraise diabetes as a lethal hazard, determining the total incidence of deaths and ascertaining the incidences in such separate categories as the death certificates would fruitfully provide, that is by sex and race, for example. Separate analyses were made of data contained in certificates in which diabetes was stated to be the underlying cause of death and of data contained in the certificates in which diabetes was mentioned as a contributing cause. The findings of the analyses have value in appraising diabetes as a public health problem and as an individual health problem; therefore, they have value in planning the public health program and in providing background information for clinicians.

A second purpose was to shed light upon what guides physicians follow in deciding whether a death is due to diabetes. The toll of diabetes in causing deaths in the population is commonly ascertained by studying the death certificates. But inherent in the morbid processes of diabetes are conditions that might lead a physician to certify death as due to some other process. There is no precise method for guiding physicians when they must make decisions as to whether a death should be ascribed to diabetes or to an accompanying,

sometimes lethal process. Therefore the question arises of what guides physicians as a group do utilize. Their decisions have effect upon the national compilations of death.

By way of review concerning the second purpose, the cause of death portion of the death certificate consists of the following items:

18	I. Disease or condition directly leading to death	Interval between onset and death
	(a) _____	_____
Antecedent Causes:	Due to (b) _____	_____
	Due to (c) _____	_____
18 II. Other significant conditions (Conditions contributing to the death but not related to the disease or condition causing death.) _____		

It can be noted that the underlying cause of death, the cause that the physician regards as finally responsible and that should be the cause compiled, is to be stated in 18, I, and is the lowest one mentioned in the sequence of 18, I. For example, if the physician lists under 18, I as follows: Coronary occlusion at 18, I, (a), arteriosclerotic heart disease at 18, I, (b), and diabetes mellitus at 18, I, (c), he regards diabetes mellitus as the cause of death and the death is so coded and recorded.

A major problem with diabetes and certification of death in cases involving diabetes and certain common accompanying conditions

is that of determining which condition should be certified as the underlying cause. It has been well-established that only a few diabetic patients succumb to conditions involving aberrations of physiology such as are reflected in coma and insulin shock. More often by far, the diabetic person develops arteriosclerosis or infection; and the cause, either proximate or underlying, is a vascular episode or an effect of infection. The question therefore arises of whether our death certificates over-state or under-state the role of diabetes as a lethal hazard. In summary, then, an important purpose of this study was to investigate the death certificates in order to obtain whatever evidence they present concerning certifications by physicians in these problem cases.

ANALYSES BASED UPON DATA ASSEMBLED FROM THE CERTIFICATES

A total of 2,956 deaths from all causes of residents of Douglas County dying in Douglas County were recorded in the calendar year 1958. Of these deaths 5.4% (161 persons) were certified as having diabetes at time of death. This thesis is concerned with these 161 diabetic deaths.

Table 2 is a summary of each of the 161 death certificates of people dying with diabetes: this includes both those who have diabetes listed as cause of death and those who have diabetes listed as "other significant disease." Included from each death certificate is the death certificate number, the race or color, sex, age, all diseases or processes leading to the patient's death, and whether an autopsy was performed. These are listed in sequence of death beginning with those that died on 1 January 1958 and ending with those that died on 31 December 1958. This year was selected because at the time this report was begun, it was the last full year.

Included in Table 2 in addition to the 161 diabetic deaths there are the death certificates of 2 stillbirths and 2 newborns born of diabetic mothers. These babies did not themselves have diabetes but rather their death was caused by a condition of the mother which had an effect on them solely due to the proximity of their vascular circulations; inclusion of their deaths would not serve the purpose of this thesis, that is of what causes do diabetic patients die, so they were not included in any of the statistics in

this report. They were included in the table solely for the sake of completeness in case they may be of use in some future studies using these tabulations.

Classification: Of the total of 161 deaths which had the word diabetes appearing on the death certificate, 36.6% (59 persons) had diabetes listed as cause of death, while the remaining 63.4% (102 persons) had diabetes listed as "other significant diseases" contributing to the cause of death. This latter group which comprises 63.4% of all deaths of diabetic patients is not included in official tabulations of diabetic deaths. A comparison of these two groups will be made in the following report.

Sex Distribution: The sex distribution in these diabetic patients was:

	<u>Total Diabetic Cases</u>	<u>Diabetes as Cause of Death</u>	<u>Diabetes as "other Significant Dis.</u>
Females	52.8% (86 persons)	50.9% (30 pers.)	54.9% (56 pers.)
Males	47.2% (75 persons)	49.1% (29 ")	45.1% (46 ")

This compares with the following sex distribution in the total deaths from all causes during the same year (2,956 persons).

Females 44.4% (1,311 persons)

Males 55.6% (1,645 persons)

This indicates a larger proportion of women die with diabetes than is their ratio in the general public deaths. This increased incidence of diabetes in female deaths is borne out, to even a greater degree, by comparing the above figures with those obtained from the

total diabetic deaths certified in the United States in 1957. (1)

They show of diabetic deaths the following sex distribution in our national total of 27, 180 deaths:

Females 61.0% (16,575 persons)

Males 39.0% (10,605 persons)

Autopsies Performed: Autopsies were performed in 34.2% (55 cases) of the total diabetic deaths, which confirmed the diagnosis of cause of death. Of the two groups, autopsies were performed in:

Cases with diabetes as cause of death--30.4%---18 cases

Cases with diabetes as contributory
disease-----36.3%---37 cases

Racial Distribution: The racial distribution of the 161 cases was as follows:

White 89.4% 144 persons

Negro 8.7% 14 persons

Indian 1.9% 3 persons

The racial distribution of the total deaths from all causes, 2,956 persons, where death certificates were investigated were as follows:

White 90.6% 2,645 persons

Negro 8.8% 260 persons

Indian 0.3% 8 persons

Mexican 0.2% 6 persons

Japanese 0.07% 2 persons

The racial distribution among all the investigated deaths is closely similar to that among the deaths in which diabetes was the underlying or contributing cause. Figures are not available for the racial distribution of residents living in Douglas County.

Causes of Death: Table I below shows the proximate causes of death recorded in the certificates listing diabetes as the underlying cause and by way of comparison, shows the underlying causes for the series in which diabetes was listed as a contributing cause.

Table 1.

Proximate Cause of Death in Patients Whose Cause of Death Was Listed As Diabetes (59 Cases)*	Cause of Death in Patients Who Had Diabetes as Contrib- uting to the Cause of Death (102 Cases)**
Cardiovascular disease	
Cerebro vascular - 22.6% - 14 deaths	11.1% - 12 deaths
Coronary vasc. - 29.0% - 18 deaths	28.7% - 31 deaths
Renal vascular - 16.1% - 10 deaths	0
Hypertensive - 3.2% - 2 deaths	12.0% - 13 deaths
Lung embolus - 1.6% - 1 death	0
Arteriosclerosis - 0	19.4% - 21 deaths
Aortic embolus - 0	0.9% - 1 death
Diabetic electrolyte imbalance - 19.4% - 12 deaths	0.9% - 1 death
Neoplasm 0	12.0% - 13 deaths
Infection	
Lung - 4.8% - 3 deaths	1.9% - 2 deaths
Kidney - 1.6% - 1 death	2.8% - 3 deaths
Other 0	2.8% - 3 deaths
Other causes (see next page)	

* A total of 62 causes are included here as 3 cases reported 2 causes of death on the same line of the death certificate.

** A total of 108 causes are listed here as 6 cases reported 2 causes of death on the same line of the death certificate.

Table 1. (Continued)

Proximate Cause of Death in Patients Whose Cause of Death Was Listed As Diabetes (59 Cases)	Cause of Death in Patients Who Had Diabetes as Contrib- uting to the Cause of Death (102 Cases)
Other causes	
Duodenal ulcer - 0	1.9% - 2 deaths
Subdural hemorr. - 1.6% - 1 death	0
Thrombopenic - 0 purpura	0.9% - 1 death
Prolonged bedrest - 0	0.9% - 1 death
Ruptured appendix - 0	0.9% - 1 death
Fractured hip - 0	0.9% - 1 death
Fibrous bowel - 0 bands	0.9% - 1 death
Congenital deformity and inactive rheu- matic fever - 0	0.9% - 1 death

Summary of Causes of Death:

Summarizing from Table 1, it may be seen that of the group in which diabetes was listed as the cause of death the proximate causes of death were:

Cardiovascular disease	72.6%	45 persons
Diabetic electrolyte imbalance	19.4%	12 persons
Infection	6.4%	4 persons
Accidental (head trauma)	1.6%	1 person

TABLE 2.

Death Cert. Number	Color or Race	Sex	Age	Cause of Death, Attributing Factors, and Other Significant Unrelated Diseases	Duration	Autopsy	Diabetes listed as other significant disease
100374	White	F	65	(a) Cerebro-vascular hemorrhage due to (b) arteriosclerosis due to (c) hypertension. Other sig. disease - diabetes mellitus	Mins. Yrs. Yrs.	No	Yes
100510	White	F	74	(a) Coronary occlusion due to (b) arteriosclerosis Other sig. dis. - diabetes mell.	Sudden Several years	No	Yes
100532	White	M	75	(a) Coronary occlusion due to (b) arteriosclerotic heart dis. due to (c) diabetes mell.	1 hr. Unk. 10 yrs.	No	No
100534	White	M	77	(a) Coronary occlusion due to (b) coronary thrombosis (c) coronary sclerosis Other sig. dis. - (1) diabetes mell., (2) cerebral thrombosis	Sudden 10 yrs. 10 yrs. 20 yrs. 8 yrs.	No	Yes
100537	White	F	57	(a) Hypertensive and arteriosclerotic heart disease Other sig. dis. - diabetes mell.	8 mo.	No	Yes

Death Cert. Number	Color or Race	Sex	Age	Cause of Death, Attributing Factors, and Other Significant Unrelated Diseases	Duration	Autopsy	Diabetes listed as other significant disease
100556	White	M	76	(a) Diabetes mellitus due to (b) Diabetic coma due to (c) Possible cerebral hemorr. Other sig. dis. - hypertension	? 24 hrs. 24 hrs. ?	No	No
100571	White	M	61	(a) Coronary heart disease due to (b) diabetes mellitus	Instant 10 yrs.	No	No
100677	White	F	71	(a) Thrombosis of left carotid artery due to (b) arteriosclerosis and hypertension Other sig. dis. - diabetes mell.	10 days 8 yrs.	No	Yes
100684	White	F	70	(a) Acute coronary occlusion due to (b) coronary atherosclerosis due to (c) generalized atherosclerosis Other sig. dis. - diabetes mell.	5 min. 1 yr. † 5 yr. † 5 yr. †	No	Yes
100687	White	M	75	(a) Cerebral thrombosis due to (b) Arteriosclerosis due to (c) Diabetes Other sig. dis. - (1) hypertension, (2) fracture left femur	2 hrs. 15 yrs.	Yes	No

Death Cert. Number	Color or Race	Sex	Age	Cause of Death, Attributing Factors, and Other Significant Unrelated Diseases	Duration	Autopsy	Diabetes listed as other significant disease
100689	White	F	85	(a) Acute congestive heart fail. due to (b) uremia, perforation into bladder due to (c) ca. of recto-sigmoid colon Other sig. dis. - diabetes mell.	2 days 2-10 hrs. 9 mo. 8 yrs.	No	Yes
100740	White	M	75	(a) Myocardial infarction due to (b) generalized arteriosclerosis Other sig. dis. - (1) diabetes mell., (2) multiple small strokes	1 hr. ? 8 yrs.	No	Yes
100788	White	M (still born-34 wks)		Fetal cause and maternal cause - Severe diabetes mellitus in mother		?	
100908	White	M	79	(a) Cerebral hemorrhage due to (b) diabetes, age, etc.	4 days 1 yr.	No	No
100928	White	M (still born-40 wks)		Fetal cause - none Maternal cause - diabetes mellitus		?	

Death Cert. Number	Color or Race	Sex	Age	Cause of Death, Attributing Factors, and Other Significant Unrelated Diseases	Duration	Autopsy	Diabetes listed as other significant disease
100933	White	F	70	(a) Coronary thrombosis due to (b) diabetes mellitus	8 hrs. 15 yrs.	No	No
100955	White	F	69	(a) Diabetes mellitus	4 yrs.	No	No
101038	White	M	40	(a) Cardiac decompensation, secondary to arteriosclerotic heart disease due to (b) cor pulmonale, pulmonary emphysema, post left upper lobectomy, pulmonary T.B., far advanced reinfection type. Other sig. dis. - diabetes mell. status post-gastrectomy	1 day 4 yrs. 4 yrs. 4½ yrs. 6 yrs.	No	Yes
101069	White	F	62	(a) Acidosis and coma due to (b) diabetes mellitus Other sig. dis. - (1) cerebral vascular accident, (2) generalized arteriosclerosis	12 hrs. yrs. 1 day yrs.	No	No
101121	White	F	65	(a) Bronchopneumonia and severe electrolyte imbalance due to (b) diabetes mellitus	7 days 7 yrs.	Yes	No

Death Cert. Number	Color or Race	Sex	Age	Cause of Death, Attributing Factors, and Other Significant Unrelated Diseases	Duration	Autopsy	Diabetes listed as other significant disease
101148	White	M	38	(a) Pulmonary edema and congestion assoc. with diabetes mellitus	Unk. 15 yrs.	Yes	No
101161	White	F	43	(a) Thrombopenic purpura with cerebral and generalized hemorrhages Other sig. dis. - mild diabetes	Sev. mos. 4 days Unk.	Yes	Yes
101165	White	F	69	(a) Acute cerebral hemorrhage due to (b) arteriosclerosis due to (c) diabetes mellitus	1 day 20 yrs. 20 yrs.	No	No
101186	White	F	55	(a) Thrombosis of pulmonary arteries due to (b) prolonged bed rest Other sig. dis. - diabetes mell.	Mins.	Yes	Yes
101214	White	F	64	(a) Cerebrovascular accident due to (b) cerebral arteriosclerosis due to (c) diabetes	1 hr. 10 yrs. 25 yrs.	No	No

Death Cert. Number	Color or Race	Sex	Age	Cause of Death, Attributing Factors, and Other Significant Unrelated Diseases	Duration	Autopsy	Diabetes listed as other significant disease
101240	White	F	91	(a) Auricular fibrillation with decompensation due to (b) hypertensive heart disease due to (c) diabetes	3 days years years	No	No
101377	White	F	65	(a) Acute cardiac arrest due to (b) arteriosclerotic heart disease, chronic Other sig. dis. - diabetes mellitus, chronic	sudden 4 yrs. years	No	Yes
101407	White	F	49	(a) Acute myocardial infarction due to (b) coronary atherosclerosis Other sig. dis. - diabetes	sev. days Unk. 15 yrs.	Yes	Yes
101425	Colored	M	71	(a) Congestive heart disease due to (b) diabetes mellitus Other sig. dis. - chronic nephritis	48 hrs. 4 yrs. 4 yrs.	No	No

Death Cert. Number	Color or Race	Sex	Age	Cause of Death, Attributing Factors, and Other Significant Unrelated Diseases	Duration	Autopsy	Diabetes listed as other significant disease
101444	White	M	63	(a) Acute myocardial infarction due to (b) coronary atherosclerosis Other sig. dis. - diabetes mellitus and ca. of rectum	2 days Years " 9 mo.	Yes	Yes
101471	White	M	63	(a) Uremia due to (b) nephritis Other sig. dis. - diabetes	1 mo. 2 yrs.	Yes	No
101513	White	M	83	(a) Cerebral thrombosis due to (b) cerebral arteriosclerosis Other sig. dis. - diabetes	Immed. Years	No	Yes
101544	White	M	51	(a) Uremic pneumonitis due to (b) Kimmelstiel-Wilson dis. due to (c) diabetes mellitus Other sig. dis. - Ludwig's angina	2-3 days 1 year 20 yrs.	Yes	No
101563	White	M	73	(a) cardiovascular renal disease due to (b) diabetes	10 yrs. 15 yrs.	No	No

Death Cert. Number	Color or Race	Sex	Age	Cause of Death, Attributing Factors, and Other Significant Unrelated Diseases	Duration	Autopsy	Diabetes listed as other significant disease
101564	White	F	82	(a) Peritonitis and pelvic abscess due to (b) ruptured appendix Other sig. dis. - diabetes; arteriosclerosis, generalized severe	12 days	Yes	Yes
101575	White	F	66	(a) Massive cerebral infarct. due to (b) internal carotid thrombosis due to (c) diabetes mellitus	Unk. 1 week 1 yr. †	No	No
101606	White	M	28	(a) Pulmonary edema due to (b) subdiaphragmatic abscess due to (c) leakage from duodenostomy opening (hemorrhaging gastric ulcer) Other sig. dis. - diabetes mell.	1 hr. 10 days 10 days	Yes	Yes
101611	White	M	77	(a) Fluid and electrolyte imbalance due to (b) staphylococcus enterocolitis Other sig. dis. - (1) congest. failure; (2) diabetes mellitus	2 days 4 days	No	Yes

Death Cert. Number	Color or Race	Sex	Age	Cause of Death, Attributing Factors, and Other Significant Unrelated Diseases	Duration	Autopsy	Diabetes listed as other significant disease
101614	White	M	67	(a) Myocardial infarction due to (b) arteriosclerotic heart disease Other sig. dis. - diabetes	Unk. Unk.	No	Yes
101617	White	M	64	(a) Cerebral vascular accident due to (b) generalized arteriosclerosis Other sig. dis. - diabetes	6 days 15 yrs.	No	Yes
101623	White	M	83	(a) Ruptured esophagus due to (b) chronic esophagitis due to (c) bleeding and penetrating duodenal ulcer Other sig. dis. - (1) diabetes mellitus, (2) arteriosclerosis	24 hrs. Unk. 1 mo. 11 yrs.	Yes	Yes
101649	White	M	64	(a) Hepatoma Other sig. dis. - diabetes mellitus	3 weeks	No	Yes

Death Cert. Number	Color or Race	Sex	Age	Cause of Death, Attributing Factors, and Other Significant Unrelated Diseases	Duration	Autopsy	Diabetes listed as other significant disease
101662	White	F	63	(a) Cerebral artery occlusion due to (b) cerebral arteriosclerosis Other sig. dis. - diabetes	2 hrs. 2 yrs. 5 yrs.	No	Yes
101674	White	F	57	(a) Coronary thrombosis due to (b) over weight due to (c) diabetes mellitus	10 min. 20 yrs. 6 yrs.	No	No
101726	White	M	81	(a) Pulmonary embolus due to (b) fracture right hip Other sig. dis. - diabetes	5 min. 3 weeks 5 yrs.	Yes	No
101730	White	M	73	(a) Probably myocardial infarction due to (b) coronary sclerosis due to (c) generalized arteriosclerosis Other sig. dis. - (1) diabetes, (2) ischemic leg ulcers	Mins. 1 yr. 1 yr. 5 yrs. + 1 yr.	No	Yes

Death Cert. Number	Color or Race	Sex	Age	Cause of Death, Attributing Factors, and Other Significant Unrelated Diseases	Duration	Autopsy	Diabetes listed as other significant disease
101731	White	M	63	(a) Brain abscess rt. cerebral hemisphere Other sig. dis. - diabetes	1 mo.	Yes	Yes
101788	Colored	F	68	(a) Electrolyte imbalance due to (b) small bowel obstruction due to (c) fibrous bands Other sig. dis. (1) diabetes, (2) pneumonitis, (3) congestive heart failure	Unk. Unk. Unk.	No	Yes
101808	White	M	63	(a) Uremia due to (b) Kimmelstiel-Wilson's dis. due to (c) diabetes mellitus	3 days 1 yr. Unk.	No	No

Death Cert. Number	Color or Race	Sex	Age	Cause of Death, Attributing Factors, and Other Significant Unrelated Diseases	Duration	Autopsy	Diabetes listed as other significant disease
101811	White	F	67	(a) Coronary occlusion Other sig. dis. - diabetes	2 days	No	Yes
101892	White	M	72	(a) Cerebral vascular accident due to (b) hypertensive heart disease due to (c) arterio sclerosis Other sig. dis. - diabetes	30 min. 10 yrs. 10 yrs.	No	Yes
101909	Colored	M	57	(a) Carcinoma of rectum with metastasis Other sig. dis. - (1) terminal uremia, (2) diabetes mellitus	Unk.	No	Yes
101918	White	F	24	(a) Uremic coma due to (b) Kimmelsteil-Wilson syndrome (?) due to (c) diabetes mellitus	10 days 20 yrs.	No	No
101954	Colored	F	57	(a) Acute coronary occlusion of anterior descending branch of left coronary artery due to (b) saddle embolism of bifurcation of abdominal aorta Other sig. dis. - diabetes	6 hrs. 4 hrs. Unk.	Yes	Yes

Death Cert. Number	Color or Race	Sex	Age	Cause of Death, Attributing Factors, and Other Significant Unrelated Diseases	Duration	Autopsy	Diabetes listed as other significant disease
102051	White	M	70	(a) Acute coronary occlusion (b) Arteriosclerotic heart dis. (c) Diabetes mellitus	14 hrs. years years	No	Yes
102167	White	M	69	(a) Cerebral and coronary arteriosclerosis Other sig. dis. - diabetes	5 yrs.	No	Yes
102168	White	M	68	(a) Acute nephritis (b) Chronic myocarditis (c) Diabetes mellitus	2 mo. 4 mo. 6 yrs.	No	No
102193	White	M	65	(a) Myocardial infarction (b) Coronary arteriosclerosis, obstruction of descending branch of left coronary Other sig. dis. - diabetes	10 days Unk.	Yes	Yes
102218	White	F	73	(a) Cerebral thrombosis Other sig. dis. - diabetes	3 days 5 yrs.	No	Yes

Death Cert. Number	Color or Race	Sex	Age	Cause of Death, Attributing Factors, and Other Significant Unrelated Diseases	Duration	Autopsy	Diabetes listed as other significant disease
102226	White	F	60	(a) Congestive heart failure (b) Myocardial fibrosis (c) Coronary arteriosclerosis Other sig. dis. - diabetes and generalized arterioscler.	many mo. same same	Yes	Yes
102228	White	F	85	(a) Cerebral occlusion (b) Arteriosclerosis (c) Diabetes mellitus Other sig. dis. - cerebral occlusion	1 day 10 yrs. 10 yrs. Over 2 yrs.	No	No
102283	White	F	72	(a) Cerebral hemorrhage (b) Idiopathic hypertension (c) Arteriosclerosis Other sig. dis. - diabetes mellitus with gangrene (double amputee)	2 days 16 years 16 yrs.?	No	Yes
102290	Colored	F	68	(a) Cardiac decompensation (b) Auricular septal defect and mitral stenosis (c) Congenital deformity and inactive rheumatic fever Other sig. dis. - diabetes	many yrs. 68 yrs. 68 yrs. 6 yrs.	No	Yes

Death Cert. Number	Color or Race	Sex	Age	Cause of Death, Attributing Factors, and Other Significant Unrelated Diseases	Duration	Autopsy	Diabetes listed as other significant disease
102308	White	M	66	(a) Pulmonary edema (b) Uremia (c) Diabetic kidney disease	4 hrs. 5 days + years	Yes	No
102317	White	M	77	(a) Bilateral subdural hematoma (b) Auto accident trauma (c) Diabetes mellitus	5 days	Yes	Yes
102333	White	F	58	(a) Metastatic carcinoma of brain (b) Carcinoma of breast Other sig. dis. - diabetes	3 mo. 3 yrs.	Yes	Yes
102414	White	M	61	(a) Cerebro-vascular accident Other sig. dis. - diabetes	9 days	No	Yes
102441	White	F	57	(a) Carcinoma of bladder with metastasis Other sig. dis. - diabetes	Unk. Unk.	No	Yes
102469	White	F	67	(a) Cardio-vascular accident Other sig. dis. - diabetes	2 wks.	No	Yes

Death Cert. Number	Color or Race	Sex	Age	Cause of Death, Attributing Factors, and Other Significant Unrelated Diseases	Duration	Autopsy	Diabetes listed as other significant disease
102474	Colored	F	67	(a) Congestive heart failure (b) Hypertension Other sig. dis. - diabetes	4 weeks 8 yrs.	Yes	Yes
102542	Colored	F	65	(a) Glomerulonephritis (b) Diabetes mellitus	2 mos. 14 yrs.	Yes	No
102551	White	M	74	(a) Embolism to right lung (b) Thrombophlebitis of leg (c) Diabetes and arteriosclerosis -	- - -	No	No
102555	White	F	68	(a) Coronary occlusion (b) Arteriosclerosis Other sig. dis. - diabetes mellitus, severe	24 hrs. ? yrs.	No	Yes
102568	White	F	81	(a) Cerebral thrombosis (b) Generalized arteriosclerosis Other sig. dis. - diabetes mellitus and paralytic ileus	Unk. Unk.	No	Yes

Death Cert. Number	Color or Race	Sex	Age	Cause of Death, Attributing Factors, and Other Significant Unrelated Diseases	Duration	Autopsy	Diabetes listed as other significant disease
102585	White	F	54	(a) Electrolyte imbalance and acidosis due to (b) Diabetes mellitus	48 hrs. 1 yr.	Yes	No
102609	White	F	69	(a) Cardiac failure (b) Myocardial infarction (c) Arteriosclerotic heart disease with coronary sclerosis Other sig. dis. - diabetes	1 week 1 week years	Yes	Yes
102626	White	F	89	(a) Myocardial infarct (b) Coronary occlusion Other sig. dis. - (1) senility (2) mild diabetes mellitus	3 yrs. 1 day 10 yrs. †	No	Yes
102632	Indian	F	48	(a) Renal failure (b) Kimmelstiel-Wilson disease (c) Diabetes mellitus	2 wks. (?) 14 yrs.	No	No
102674	Colored	F	74	(a) Coronary occlusion (b) Arteriosclerotic heart dis. Other sig. dis. - diabetes	- - -	No	Yes

Death Cert. Number	Color or Race	Sex	Age	Cause of Death, Attributing Factors, and Other Significant Unrelated Diseases	Duration	Autopsy	Diabetes listed as other significant disease
102750	White	F	57	(a) Acute coronary occlusion (b) Hypertensive-arteriole heart disease Other sig. dis. - diabetes	few days years	Yes	Yes
102780	White	M	76	(a) Carcinomatosis (b) Metastasis from stomach Other sig. dis. - diabetes	2½ mo. 2½ mo. 7 yrs.	Yes	No
102799	Colored	F	60	(a) Diabetic coma (b) Diabetes mellitus	24 hrs. Unk.	yes	No
102803	White	M	81	(a) Myocardial failure (b) Arteriosclerosis - general (c) Senility Other sig. dis. - diabetes	1 hr. 10 yrs.	No	Yes
102893	White	M	29	(a) Myocardial infarction (b) Arteriosclerosis of coronary arteries (c) Diabetes mellitus	1 hr. Unk. years	Yes	No

Death Cert. Number	Color or Race	Sex	Age	Cause of Death, Attributing Factors, and Other Significant Unrelated Diseases	Duration	Autopsy	Diabetes listed as other significant disease
102967	White	F	79	(a) Bronchopneumonia (b) General debility (c) Generalized arteriosclerosis ? Other sig. dis. - (1) cerebral thrombosis, (2) left hemaplegia, (3) bilateral midhigh amputation, (4) diabetes mellitus	5 days - 8 yrs. 13 yrs. †	No	Yes
103027	White	F	73	(a) Coronary thrombosis (b) Arteriosclerotic heart dis. (c) Diabetes mellitus	10 min. 6 mo. 5 yrs.	No	No
103078	White	F	83	(a) Apoplexy (b) Cerebral arteriosclerosis Other sig. dis. - diabetes	2 wks. 5 yrs.	No	Yes
103095	Indian	M	60	(a) Staph. aureus pneumonia Other sig. dis. - (1) diabetes mellitus, (2) benign prostatic mypertrophy	10 days	Yes	No

Death Cert. Number	Color or Race	Sex	Age	Cause of Death, Attributing Factors, and Other Significant Unrelated Diseases	Duration	Autopsy	Diabetes listed as other significant disease
103130	White	M	84	(a) Bronchopneumonia (b) Uremia (c) Chronic pyelonephritis Other sig. dis. - diabetes	10 days 12 days Unk.	Yes	Yes
103133	White	M	61	(a) Acute myocardial infarct. (b) Coronary arteriosclerosis Other sig. dis. - (1) diabetes mellitus, (2) diabetic glomerulosclerosis	hours years	Yes	Yes
103140	White	F	70	(a) Acute myocardial infarction (b) Hypertension and coronary artery disease Other sig. dis. - (1) diabetes mellitus, (2) accident	2 hrs. 11 yrs. 10 yrs.	No	Yes
103144	White	M	9½ hrs.	(a) Anoxia (b) Hyaline membrane Other sig. dis. - diabetes of mother		Yes	No
103217	White	M	83	(a) Cerebral hemorrhage (b) Diabetes (c) Cerebral hemorrhage Other sig. dis. - mild hypertension	hours 15 yrs. 1 yr.	No	No

Death Cert. Number	Color or Race	Sex	Age	Cause of Death, Attributing Factors, and Other Significant Unrelated Diseases	Duration	Autopsy	Diabetes listed as other significant disease
103222	Colored	M	77	(a) Coronary occlusion (b) Prob. carcinoma of prostate Other sig. dis. - diabetes	30 min. 18 mo.	No	Yes
103243	Indian	F	65	(a) Uremia (b) Acute renal oliguria (c) Carcinoma of gall bladder (cholectochotomy) Other sig. dis. - diabetes, mod.	- 3 days 1 yr.	No	Yes
103270	White	F	73	(a) Acute pulmonary edema (b) Acute coronary occlusion, partial (c) Coronary atherosclerosis Other sig. dis. - diabetes	1 hr. 1-2 hrs. 5 yrs. -	Yes	Yes
103276	White	F	63	(a) Coronary thrombosis (b) Obesity and diabetes	3-5 days -	Yes	No
103316	Colored	M	55	(a) Hypertensive vascular dis. (b) Diabetes mellitus	5 yrs. 18 yrs.	No	No

Death Cert. Number	Color or Race	Sex	Age	Cause of Death, Attributing Factors , and Other Significant Unrelated Diseases	Duration	Autopsy	Diabetes listed as other significant disease
103354	White	M	77	(a) Bilateral bronchopneumonia (b) Aspiration of gastric contents (c) Diabetic acidosis Other sig. dis. - diabetes	10-14 da. 10-14 da. 10-14 da.	Yes	Yes
103397	White	M	66	(a) Hemiplegia, right, etiology thrombosis of left internal carotid artery above the bifurcation (b) Diabetes mellitus Other sig. dis. - (1) internal and external hemorrhoids, (2) arteriosclerotic hypertension	18 days 4 yrs.	No	No
103403	White	F	62	(a) Cerebral thrombosis (b) Cause unknown Other sig. dis. - diabetes	12 hrs. - 10 yrs.	Yes	Yes
103418	White	F	58	(a) Arteriosclerotic heart dis. Other sig. dis. - diabetes	years	No	Yes

Death Cert. Number	Color or Race	Sex	Age	Cause of Death, Attributing Factors, and Other Significant Unrelated Diseases	Duration	Autopsy	Diabetes listed as other significant disease
103420	White	M	59	(a) Coronary thrombosis (b) Arteriosclerotic heart dis. Other sig. dis. - diabetes	Instant Unk.	No	Yes
103454	White	F	74	(a) Diabetes mellitus (b) Amputation left leg	5 yrs. 1 wk.	No	No
103468	White	M	74	(a) Cerebral thrombosis (b) Cerebral arteriosclerosis (c) Unknown Other sig. dis. diabetes mellitus	16 days Unk.	No	Yes
103482	White	F	49	(a) Hypostatic pneumonia (b) Cerebral thrombosis (c) Diabetes mellitus	3 days 8 days 7 yrs.	Yes	No
103483	White	M	47	(a) Acute Strep. cellulitis right leg (b) Infect. of callus, rt. leg Other sig. dis. - (1) Auricular fibrillation, (2) diabetes	1 wk. 2 wks.	Yes	Yes

Death Cert. Number	Color or Race	Sex	Age	Cause of Death, Attributing Factors, and Other Significant Unrelated Diseases	Duration	Autopsy	Diabetes listed as other significant disease
103495	White	F	76	(a) Cerebrovascular thrombus (b) Arteriosclerosis Other sig. dis. - diabetes	3 days 30 yrs.	No	Yes
103502	White	F	64	(a) Cerebral thrombosis (b) Cerebral arteriosclerosis (c) Diabetes mellitus	3 days Unk. Unk.	No	No
103505	White	F	76	(a) Acute cardiac failure (b) Arteriosclerotic heart disease with auricular fibrillation and (c) emboli to peripheral vessels Other sig. dis. - diabetes, mild	12 hrs. 15 yrs. 10 days	Yes	Yes
103542	White	M	63	(a) Diabetic acidosis Other sig. dis. - Carcinoma of pancreas	3 days 3 mo.	No	No
103547	White	F	67	(a) Cerebral hemorrhage (b) Hypertension Other sig. dis. - diabetes	5 days Indef.	No	Yes

Death Cert. Number	Color or Race	Sex	Age	Cause of Death, Attributing Factors, and Other Significant Unrelated Diseases	Duration	Autopsy	Diabetes listed as other significant disease
103562	White	M	80	(a) Infarcts of myocardium (b) Coronary arteriosclerosis Other sig. dis. - (1) diabetes, (2) pernicious anemia	1 yr, 3 da. years 20 yrs. 10 yrs.	Yes	Yes
103572	White	M	84	(a) Hypostatic pneumonia (b) Perforation in left lung from esophagus (c) Carcinoma of esophagus Other sig. dis. - diabetes	2 days 9 days 2-3 mo.	No	Yes
103576	White	M	75	(a) Cerebral thrombosis (b) Cerebral arteriosclerosis (c) Unknown Other sig. dis. - diabetes	13 days Unk.	No	Yes
103582	White	M	61	(a) Coronary Occlusion (b) Coronary arteriosclerosis Other sig. dis. - (1) diabetes (2) coronary occlusion	Immed. 3 yrs. 15 yrs. 4 yrs.	No	Yes
103598	White	F	44	(a) Cerebral hemorrhage (b) Arteriosclerosis (c) Diabetes mellitus	2 hrs. Unk. 15 yrs.	Yes	No

Death Cert. Number	Color or Race	Sex	Age	Cause of Death, Attributing Factors, and Other Significant Unrelated Diseases	Duration	Autopsy	Diabetes listed as other significant disease
103611	White	M	72	(a) Coronary thrombosis (b) Chronic arteriosclerotic heart disease Other sig. dis. - diabetes	Immed. 11 yrs. 11 yrs.	Yes	Yes
103632	White	M	69	(a) Cerebrovascular accident and diabetic acidosis (b) Arteriosclerosis and diabetes	- 3 days	No	No
103657	White	M	45	(a) Myocardial infarction Other sig. dis. - (1) diabetes (2) essential hypertension	10 min.	No	Yes
103667	White	M	73	(a) Coronary thrombosis (b) Coronary artery arteriosclerosis Other sig. dis. - (1) cerebral thrombosis, (2) residual hemiplegia, (3) diabetes mellitus	acute Unk.	No	Yes

Death Cert. Number	Color or Race	Sex	Age	Cause of Death, Attributing Factors, and Other Significant Unrelated Diseases	Duration	Autopsy	Diabetes listed as other significant disease
103676	White	M	76	(a) Diabetic coma (b) Diabetes mellitus	years years	No	No
103677	White	F	72	(a) Uremia (b) Arteriosclerosis (c) Diabetes	7 days 8 yrs. ?	No	No
103682	White	F	81	(a) Congestive heart disease (b) Arteriosclerotic hypertensive heart disease Other sig. dis. - diabetes	2 mo. -	No	Yes
103700	White	M	87	(a) Pulmonary edema (b) Diabetic gangrene (c) Diabetes mellitus (d) Arteriosclerosis Other sig. dis. - amputation of right leg, 1958	- 6 mo. 2 yrs. -	Yes	No
103723	White	F	76	(a) Coronary thrombosis (b) Diabetes mellitus	48 hrs. 20-25 yrs.	No	No

Death Cert. Number	Color or Race	Sex	Age	Cause of Death, Attributing Factors, and Other Significant Unrelated Diseases	Duration	Autopsy	Diabetes listed as other significant disease
103725	White	M	42	(a) Acute coronary infarct (b) Diabetes mellitus Other sig. dis. - chronic pyelonephritis	24 hrs. sev. yrs. sev. mo.	Yes	No
103730	White	F	6 hrs.	(a) Baby born of diabetic mother	hrs.	Yes	
103756	White	F	84	(a) Cerebro-vascular accident with left hemiplegia (b) Generalized arteriosclerosis Other sig. dis. - diabetes	6 wks. years	No	Yes
103760	White	M	58	(a) Uremia (b) Intercapillary glomerulocellulosis (c) Diabetes mellitus Other sig. dis. - hypertensive cardiovascular disease	2 wks. 2 yrs. 10 yrs.	Yes	No
103786	White	F	76	(a) Myocardial infarction (b) Hypertensive cardiovascular disease Other sig. dis. - diabetes	13 hrs. years	No	Yes

Death Cert. Number	Color or Race	Sex	Age	Cause of Death, Attributing Factors, and Other Significant Unrelated Diseases	Duration	Autopsy	Diabetes listed as other significant disease
103827	White	M	69	(a) Cardiovascular renal dis. uremia (b) Hypertension (c) Diabetes mellitus	1 wk. Unk. 6 yrs.	Yes	No
103839	White	M	87	(a) Coronary thrombosis (b) Coronary sclerosis (c) Diabetes mellitus	2 hrs. 5 yrs. 10 yrs.	No	No
103870	White	F	69	(a) Bronchopneumonia (b) Endometrial carcinoma Other sig. dis. - diabetes	5 days 1 yr. 1 yr.	No	Yes
103871	Colored	F	96	(a) Diabetic acidosis (b) Diabetes mellitus	3 days Unk.	No	No
103927	White	M	79	(a) Carcinoma of prostate with metastasis Other sig. dis. - diabetes	6 yrs.	No	Yes
104009	White	M	82	(a) Coronary occlusion (b) A.S.H.D. generalised A-S. Other sig. dis. - (1) old CVA (2) diabetes mellitus	3 hrs. ?	No	Yes

Death Cert. Number	Color or Race	Sex	Age	Cause of Death, Attributing Factors, and Other Significant Unrelated Diseases	Duration	Autopsy	Diabetes listed as other significant disease
104042	White	F	56	(a) Acute coronary occlusion with edema of lungs (b) Coronary sclerosis (c) Hypertension Other sig. dis. - (1) chronic bronchitis, (2) diabetes	2 days 2-3 yrs. 8 yrs.	Yes	Yes
104048	White	F	73	(a) Myocardial infarction (b) Coronary arteriosclerosis Other sig. dis. - diabetes	8 days Unk.	Yes	Yes
104072	White	F	62	(a) Left ventricular failure bronchopneumonia (b) Coronary sclerosis (c) Diabetes with renal failure	2 days † 2 mo. † 1 yr.	No	No
104086	White	M	85	(a) Diabetes mellitus	years	No	No
104119	White	F	84	(a) Myocardial infarction (b) A.S.H.D., generalized A-S. (c) Diabetes mellitus Other sig. dis. - deep vein thrombosis, left leg.	3 days Unk. Unk.	No	No

Death Cert. Number	Color or Race	Sex	Age	Cause of Death, Attributing Factors, and Other Significant Unrelated Diseases	Duration	Autopsy	Diabetes listed as other significant disease
104178	White	F	55	(a) Cerebral vascular accident (b) Arteriosclerosis, general. (c) Diabetes mellitus Other sig. dis. - nephrosclerosis	10 days years years	No	No
104188	White	F	82	(a) Bronchopneumonia (b) Cerebral thrombosis (c) Arteriosclerotic heart dis. Other sig. dis. - diabetes	2 days 3 days years	Yes	Yes
104198	White	F	81	(a) Pulmonary edema (b) Coronary insufficiency (c) Coronary sclerosis Other sig. dis. (1) diabetes (2) arteriosclerosis obliterans	1 hr. few da. Unk.	No	Yes
104221	White	F	81	(a) Portal thrombosis (b) Azotemia: nephrosclerosis (c) Generalized arteriosclerosis Other sig. dis. - (1) amputation left leg, (2) diabetes	- 4 da ?	Yes	Yes

Death Cert. Number	Color or Race	Sex	Age	Cause of Death, Attributing Factors, and Other Significant Unrelated Diseases	Duration	Autopsy	Diabetes listed as other significant disease
104241	White	F	87	(a) Cerebral thrombosis (b) Diabetes mellitus	24 hrs. 35 yrs.	No	No
104269	White	F	90	(a) Diabetes mellitus	years	No	No
104271	White	F	73	(a) Myocardial infarction (b) Coronary arteriosclerosis Other sig. dis. - (1) diabetes (2) acute cholecystitis (3) Gram-negative bacteremia	10 days 10 yrs.	No	Yes
104309	White	F	69	(a) Cerebrovascular accident (b) Arterial hypertension Other sig. dis. - diabetes	7 days 10 yrs.	No	Yes
104312	White	F	69	(a) Myocardial infarction (b) Arteriosclerotic heart dis. Other sig. dis. - diabetes	acute 1 yr.	No	Yes
104324	White	F	64	(a) Myocardial infarction (b) Coronary arteriosclerosis (c) Generalized arteriosclerosis Other sig. dis. - diabetes	15 min. 5 yrs. 10 yrs.	Yes	Yes

Death Cert. Number	Color or Race	Sex	Age	Cause of Death, Attributing Factors, and Other Significant Unrelated Diseases	Duration	Autopsy	Diabetes listed as other significant disease
104330	White	M	66	(a) Myocardial infarction, lateral left ventricle (b) Arteriosclerotic heart dis. Other sig. dis. - diabetes	1 day years	Yes	Yes
104396	Colored	M	74	(a) Hypertensive heart disease with decompensation Other sig. dis. - diabetes	6 mo.	No	Yes
104427	White	M	73	(a) Fungating carcinoma ascending colon with obstruction (b) Anemia from carcinoma (c) Carcinoma of ascend. colon Other sig. dis. - diabetes	3 mo. 1 yr. 1 yr.	Yes	Yes
104429	White	F	77	(a) CVA with quadraplegia and coma (b) Arterial hypertension Other sig. dis. - diabetes, mild	26 days Unk.	No	Yes

Death Cert. Number	Color or Race	Sex	Age	Cause of Death, Attributing Factors, and Other Significant Unrelated Diseases	Duration	Autopsy	Diabetes listed as other significant disease
104443	White	F	73	(a) Hypertensive cardiovascular disease Other sig. dis. - (1) fracture neck right femur, (2) myocardial infarction, (3) diabetes	10 yrs.	No	Yes
104499	White	M	93	(a) Pericardial tamponade (b) Ruptured left ventricle (c) Myocardial infarction (d) Arteriosclerosis Other sig. dis. - diabetes	Mins. Mins. 6-7 da.	Yes	Yes

Death Cert. Number	Color or Race	Sex	Age	Cause of Death, Attributing Factors, and Other Significant Unrelated Diseases	Duration	Autopsy	Diabetes listed as other significant disease
104506	White	F	79	(a) Cerebral thrombosis (b) Generalized cerebral thrombosis due to (c) generalized arteriosclerosis Other sig. dis. - diabetes	1 mo. 2 yrs. 10 yrs. 15 yrs.	No	Yes
104514	White	M	58	(a) Acute coronary thrombosis (b) Arteriosclerosis (c) Diabetes mellitus Other sig. dis. - hypertrophic cirrhosis of liver	3 days 10 yrs. 15 yrs. 22 yrs.	Yes	No
104550	Negro	F	65	(a) Congestive heart failure (b) Congestive heart disease (c) Diabetes mellitus	46 days 46 days 46 days	No	No
104582	White	F	60	(a) Nephritis, exact type undetermined Other sig. dis. - diabetes	Unk.	No	Yes
104584	White	M	71	(a) Terminal bronchopneumonia (b) Metastatic carcinoma (c) Carcinoma of left kidney Other sig. dis. - diabetes	Hrs. 1 mo. Sev. mos. Sev. yrs.	No	Yes

Death Cert. Number	Color or Race	Sex	Age	Cause of Death, Attributing Factors, and Other Significant Unrelated Diseases	Duration	Autopsy	Diabetes listed as other significant disease
104663	White	M	80	(a) Infarction of midbrain and portion of left cerebral artery (b) Thrombosis of basilar art. (c) Cerebral atherosclerosis Other sig. dis. - diabetes	2 wks. 2 wks. Yrs.	Yes	Yes
104681	White	M	87 q	(a) Congestive heart failure (b) Bilateral pneumonia (c) Arteriosclerotic heart disease Other sig. dis. - diabetes	12 hrs. 24 hrs.	No	Yes

Summarizing from Table I again, of the group in which diabetes was listed as "other significant disease", the cause of death is as follows:

Cardiovascular disease	72.2%	78 persons
Electrolyte imbalance	0.9%	1 person
Cancer	12.0%	13 persons
Infection	7.4%	8 persons
Other causes	7.4%	8 persons

Accordingly whether diabetes was listed as a primary or as a contributing cause of death, the patients succumbed in about the same proportions to vascular disease and infections.

Ages At Time of Death:

The average age at death, the median age and the range of ages in each of these two groups is as follows:

Cases with Diabetes As Cause of Death - 59 Cases	Average Age At Death	Median Age At Death	Ranges of Ages At Death
Females	66.8 years	65 years	24-96
Males	67.0 years	69 years	29-87
<hr/>			
Cases with Diabetes As "Other Significant Disease" 102 Cases			
Females	69.4 years	69 years	43-89
Males	69.9 years	73 years	28-84

Discussion:

It would be of value to ascertain whether the diabetic process led to life-shortening in the two groups. The average age at death among the 161 cases was 68.6 years. It was 66.9 years among the 59 deaths certified as due primarily to diabetes and 69.6 years for those cases in which diabetes was listed as contributing. Life expectancy in 1958 was slightly less than 69 years for infants born in 1958, but the people whose deaths are investigated here lived during years when life expectancy was shorter. The critical study to determine life-shortening effects would be to ascertain the individual ages of the people when diabetes first developed and the calendar year of onset, and to compare the longevity records of these people with those of a similar group who did not develop diabetes. It is impossible to obtain the necessary data for such a study. However, it is worthy of note that the average age at onset of diabetes for the entire group and for the separate groups was well beyond the age of 45 and probably beyond the age of 50, according to rough approximations derived from the certificates and according to published spot studies. For several decades people of ages beyond 45 have had life expectancies such that they live on the average to well beyond 70. It is evident, therefore, that diabetes is associated with a significant shortening of life.

One purpose of this study was to elicit any clues concerning whether diabetes is under-reported or over-reported as the primary cause of death, the problem arising particularly because in many

cases the physician must decide between diabetes and vascular disease or between diabetes and infection as primary. Various clinical aspects not noted upon the certificates doubtless affect his decision, but one factor became evident in this study. The death certification contains information concerning the duration of the recorded morbid processes. Perusal of the certificates stating diabetes to be the underlying cause showed that in every case the diabetes was stated to have been present for a longer time than was the proximate cause. Considering certain proximate causes, it is obvious that diabetes must precede, but in the case of vascular deaths this conceivably is not invariably true. It is conceivable that a person might have detectable arteriosclerosis and then develop diabetes of such nature that the latter disease should be certified. The decision finally is one of clinical judgment, but which unfortunately must rest upon knowledge not yet available scientifically concerning the effects of diabetes upon the development of arteriosclerosis. In any case, it seems noteworthy that in all these cases where diabetes was associated with a lethal vascular episode and arteriosclerosis, the physician invariably stated that diabetes had longer duration than did the arteriosclerosis. Possibly, therefore, if arteriosclerosis precedes the onset of diabetes, deaths due to vascular episodes always are attributed to arteriosclerosis and the diabetes is either not mentioned or is stated to be only contributory. It may be concluded, then, that the true number of diabetic deaths is greater than reported in death certificates.

SUMMARY

A study was made to determine by what means diabetic patients died. To do this all death certificates were reviewed in Douglas County for the year 1958. A second problem for which it was hoped this study would give some insight was that of determining what guides a physician in deciding whether to ascribe a death to diabetes or to some other more direct cause. Much more additional information was gained through this study, some of which is tabulated below.

In Douglas County in the year 1958 2,956 deaths of residents occurred. Of this group 5.4% or 161 persons were certified to have diabetes.

Of this 161 diabetic deaths 36.6% (59 persons) had diabetes attributed as cause of death. The remaining 63.4% (102 persons) had diabetes as "other significant diseases."

The sex distribution of the total diabetic deaths was:

Female - 52.8% Male - 47.2%

Of the cases with diabetes listed as cause of death:

Female - 50.9% Male - 49.1%

Of the cases with diabetes listed as other significant disease:

Female - 54.9% Male - 45.1%

Of total deaths in the same year:

Female - 44.4% Male - 55.6%

Of total diabetic deaths in the U.S. in 1957:

Female - 61.0%

Male - 39.0%

Autopsies were performed in 34.2% of all the diabetic deaths.

in 30.4% of deaths caused by diabetes.

in 36.3% of deaths with diabetes contributing.

Racial distribution of the diabetic deaths was:

White - 89.4%

Negro - 8.7%

Indian - 1.9%

Racial distribution of all deaths in the same year:

White - 90.6%

Negro - 8.8%

Indian - 0.3%

Mexican - 0.2%

Japanese - 0.07%

Proximate cause of death in the deaths due to diabetes was:

Cardiovascular disease 72.6%

Diabetic electrolyte imbalance 19.4%

Infection 6.4%

Accidental 1.6%

Cause of death in cases with diabetes as "other significant" disease:

Cardiovascular 72.2%

Diabetic electrolyte imbalance 0.9%

(cont. over)

Cause of death in cases with diabetes as "other significant" disease: (Continued)

Cancer	12.0%
Infection	7.4%
Other causes	7.4%

Average age at death:

	<u>Female</u>	<u>Male</u>
Cases with diabetes as cause of death	66.8 yr.	67.0 yr.
Cases with diabetes as "other significant disease"	69.4 "	69.9 "

The effect of diabetes on shortening of the life expectancy cannot be calculated but rough estimates indicate a significant shortening.

The clues that the attending physician uses in recording the cause of death when diabetes is present are not clearly detectable. However, when arteriosclerosis is present for a longer time than diabetes, that death is ^{never}~~always~~ attributed to diabetes.

CONCLUSIONS

1. In Douglas County in the year 1958, 5.4% of all deaths were diabetic persons.
2. Diabetes was listed as the cause of death in 36.6% of the cases, the remaining diabetics had diabetes listed as "other significant disease."
3. Cardiovascular disease accounted for three-fourths of all diabetic deaths, and 19% died directly of diabetes, uncontrolled, in electrolyte imbalance.
4. A larger portion of the diabetic deaths were females, both in Douglas County and nationally.
5. No racial preponderance was noted among the diabetic deaths.
6. The diabetic patient lives an undeterminable fewer number of years than the non-diabetic.
7. The author came to the conclusion that it is extremely important that the attending physician conscientiously complete the death certificate in all details possible because his word is taken as final as pertains the death of that person.

Statistics are only as reliable as the source from which they are derived, and many important decisions are made regarding the statistics drawn from death certificates. One should critically review statistics when it is not possible to completely evaluate the source of such statistics.
8. No clear cut criteria are evident which lead a physician to attribute death to diabetes if the person dies of some other

pathological process which could conceivably be hastened by the presence of diabetes. However, in every case of arteriosclerosis the physician who listed diabetes as a factor stated that diabetes has been present for a longer period of time than had been the arteriosclerosis. It is probable that some aggravation of the arteriosclerotic process takes place even though it has begun before the onset of the diabetes. This aggravation would very likely in many cases hasten the person's death, however in this study if arteriosclerosis occurred first, no physician attributed the death to diabetes. It is therefore concluded that the true number of diabetic deaths is higher than that reported in death certificates.

Other secondary gains derived by the author from this study are many. Some of those which come to mind are: 1) Additional insight into the problems faced by the physician in ascribing the cause of death in problem cases; 2) The organization set up for statistical evaluation of death certification as well as birth certification; 3) The problems encountered and satisfaction gained in doing original research and in organizing and putting in writing the conclusions and views one forms in his mind when doing such research; 4) The frequent unavailability of information as regards statistics in a particular field; 5) The association on the professional basis with persons only indirectly concerned with the practice of medicine; 6) The help that is available in solving most problems, either from

the literature or experienced persons in the field; 7) The critical attitude one develops when reviewing other published matters as pertains to reliability, statistical significance, interpretation, and the like.

ACKNOWLEDGEMENT

The author wishes to acknowledge the help and advice freely given by Doctor Carl J. Potthoff, Chairman of the Department of Preventive Medicine and Public Health, University of Nebraska College of Medicine, in the selection of the thesis topic and guidance in compiling the material.

The author also wishes to acknowledge the help of his wife, Phyllis June, and his son, Leslie Lee III, who have spent many days and nights alone, not only during the writing of this thesis, but also through the past school years.

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