Recent Statistics On Diabetes

RECENT DATA ON DIABETES MORTALITY

Health conditions in the United States in 1952 were for the most part favorable and the death rate for the country fell to an all-time low, when allowance is made for the increase in the average age of the population. An important factor in the situation was the low prevalence of severe respiratory infection. This is reflected also in the decline in the mortality from diabetes in the country last year. Figures for the whole year are now available for the urban wage-earning population represented by the Industrial policyholders of the Metropolitan Life Insurance Company. They show that the death rate from diabetes dropped from 15.2 per 100,000 in 1951 to 14.0 last year, a reduction of 8 per cent.

Mortality data for the first three quarters of the year are available for the country as a whole, based on a 10 per cent sample, and for the several areas for which the statistics are collected.

The statistics for both the first six and first nine months of 1951 and 1952 are presented in Table 1. They indicate a modest decline in the death rate from diabetes in the country last year. In contrast, the rates in most of the large cities included in the table went up in varying degree. This holds true also for the two Canadian cities, Toronto and Montreal.

In England and Wales the death rate from diabetes in the first nine months of 1952 showed a sharp reduction as compared with the same period of 1951. The decline in mortality was 15 per cent, and was somewhat greater among men than among women. In great part, the improvement reflects the absence of any severe respiratory epidemic during the first nine months of last year, whereas in the early part of 1951 influenza was very prevalent and caused a sharp though temporary rise in the death rate from several diseases including diabetes. If comparison is made with the years prior to 1949, it is found that the death rate from diabetes in England and Wales is below that for any similar period in recent years except 1948.

Figures for the broad geographic divisions of this country, based upon the 10 per cent sample, are shown in Table 2. For most areas of the country the death rates in both the first half and the first nine months of last year were lower than in the two preceding years. For the first nine months the rise over 1951 was particularly marked in the Middle Atlantic and Mountain regions. The rate for the latter, however, is based on a relatively small number of deaths and is subject to wide fluctuation.

DIABETES AND OVERWEIGHT

The association between overweight and diabetes is certainly well established. Nevertheless, up-to-date statistics on the matter have interest and value for physicians. New data are available on the mortality from diabetes in a follow-up study of approximately 51,000 policyholders of the Metropolitan Life Insurance Company who were rated up solely because of overweight. The study was based upon those insured between 1925 and 1934 and traced to 1950. Thus the period of observation extends up to 25 years. Table 3 presents the facts on the excess mortality of these over-weight persons from a number of diseases. It is significant that the relative excess of the death rate from diabetes, is greater than for any other major disease. Among males the death rate from diabetes was nearly four times that among standard risks, and for females the ratio was about of the same order. This may be compared with a ratio of approximately 1½ times the expected for all causes in overweights of both sexes.

Submitted by Herbert H. Marks, Chairman, Committee on Statistics. The Committee welcomes suggestions or actual material suitable for these papers from Association members and other readers of the Journal.

CAUSES OF DEATH AMONG DIABETICS AND DURATION OF DIABETES IN FATAL CASES

The proportion of deaths from arteriosclerosis among diabetics steadily mounts as the mortality from infec-

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TABLE 1. RECENT DATA ON DIABETES MORTALITY

Deaths and Death Rates—January-June and January-September 1951 and 1952

Area	Death Rates per 100,000 Jan.-Sept. 1952	Jan.-Sept. 1951	Jan.-June 1952	Jan.-June 1951	Number of Deaths Jan.-Sept. 1952	Jan.-Sept. 1951	Jan.-June 1952	Jan.-June 1951
United States (10% sample)	16.2	16.4	16.6	17.0	1,877	1,881	1,276	1,288
Metropolitan Life Ins. Co. Industrial Policyholders	14.0	15.2	14.3	16.5	1,949	2,127	1,325	1,539
New York State	20.7	20.0	21.2	21.1	2,361	2,248	1,612	1,579
New York City	20.5	19.5	20.7	20.4	1,235	1,159	835	808
Maryland, Resident	19.2	20.0	20.1	22.4	351	359	245	267
Baltimore	24.3	21.6	24.0	24.3	174	154	114	102
Boston	25.0	25.3	28.6	23.6	150	153	114	94
Philadelphia	27.0	24.9	29.2	27.0	426	389	307	280
Toronto	16.2	15.7	15.1	16.3	81	77	50	53
Montreal, Resident	17.3	15.8	17.0	17.6	134	121	88	90
London (Administrative County) England and Wales					219	241	156	169
Total	7.4	8.7	8.2	9.7	2,442	2,840	1,776	2,100
Males	5.0	6.0	5.6	6.7	795	938	589	702
Females	9.6	11.2	10.5	12.4	1,647	1,902	1,187	1,398

Note: Rates for the states and cities are based upon local estimates of population. United States data based upon the returns from a 10 percent sample of death certificates received in vital statistics offices, as published in Current Mortality Analysis, a monthly report of the National Office of Vital Statistics of the U. S. Public Health Service.

TABLE 2 NUMBER OF DEATHS AND DEATH RATES FOR DIABETES IN GEOGRAPHIC DIVISION United States Reporting Area for the 10-percent Sample; First Six Months and First Nine Months 1950, 1951 and 1952

Geographic Division	Death Rates per 100,000* 1952	1951	1950	Number of Deaths* 1952	1951	1950
			January-September			
U. S. reporting area	16.2	16.4	16.5	1877	1881	1859
New England	20.0	25.4	21.2	142	170	147
Middle Atlantic	22.0	18.1	20.8	510	415	476
East North Central	19.5	20.8	21.2	458	480	485
West North Central	17.7	18.2	17.5	192	195	187
South Atlantic	11.8	13.0	13.8	193	209	210
East South Central	9.9	10.6	9.4	87	93	80
West South Central	9.9	13.1	10.7	111	145	117
Mountain	15.5	10.1	7.8	61	39	28
Pacific	11.2	12.3	11.6	123	135	129
			January-June			
U. S. reporting area	16.6	17.0	17.4	1276	1288	1299
New England	20.9	26.4	21.1	98	119	98
Middle Atlantic	23.1	18.3	22.5	356	278	341
East North Central	20.8	22.2	22.2	324	339	337
West North Central	17.5	20.3	19.0	126	144	135
South Atlantic	11.7	13.1	15 2	127	140	153
East South Central	10.7	9.9	8.3	63	57	47
West South Central	9.3	12.2	11.6	69	89	84
Mountain	14.6	11.7	8.5	38	30	20
Pacific	10.4	12.6	11.5	75	92	84

*Excludes armed forces overseas.

Note: These data from the 10 per cent sample are subject to sampling error. The number of deaths, as given, does not cover the entire United States for each month but is limited by the completeness of the reporting area. The size of the reporting area is indicated by the footnote on page 7 of each monthly issue of the "Current Mortality Analysis."

Source: Data furnished by National Office of Vital Statistics of the U. S. Public Health Service.

TABLE 3 PRINCIPAL CAUSES OF DEATH AMONG MEN AND WOMEN LIMITED TO SUBSTANDARD INSURANCE BECAUSE OF OVERWEIGHT, ATTAINED AGES 25-74 YEARS.

Issues of 1925-1934 Traced to Policy Anniversary in 1950
Metropolitan Life Insurance Company

Death Rates of Standard Risks in Each Sex = 100 Percent

Cause of Death	Men Number of Deaths	Men Per cent Actual of Expected Deaths	Women Number of Deaths	Women Per cent Actual of Expected Deaths
All Causes*	3,713	150	2,687	147
Diabetes mellitus	205	383	235	372
Principal cardiovascular-renal diseases	1,867	149	1,103	177
Organic heart disease, diseases of the coronary arteries and angina pectoris	1,377	142	697	175
Cerebral hemorrhage	247	159	226	162
Chronic nephritis	243	191	180	212
Cancer—all forms	385	**97**	476	**100**
Leukemia and Hodgkin's disease	26	**100**	23	**110**
Tuberculosis—all forms	24	21	20	35
Pneumonia—all forms	98	**102**	78	**129**
Cirrhosis of the liver	96	249	32	**147**
Appendicitis	76	223	41	195
Biliary calculi (gallstones)	19	206	50	284
Ulcers of stomach and duodenum	30	67	10	**

*All ages, 20 and over.

** Deaths too few to warrant calculation of mortality ratio.

Note: Boldface denote that the deviation from the Standard is not statistically significant.

TABLE 4 PRINCIPAL CAUSES OF DEATH OF 12,281 DIABETICS

Experience of Joslin Clinic, Boston, Mass. 1898-1951*

Cause of Death	Naunyn Era 1898 to May 31, 1914	Allen Era June 1, 1914 to Aug. 6, 1922	Banting Era Aug. 7, 1922 to Dec. 31, 1936	Hagedorn Era Jan. 1, 1937 to Dec. 31, 1943	Chas. H. Best Era Jan. 1, 1944 to April 27, 1951
	Per cent of All Causes				
All Causes	100.0	100.0	100.0	100.0	100.0
Diabetic coma (primary)	63.8	41.5	8.3	2.9	1.8
Cardio-renal-vascular	17.5	24.6	54.4	65.7	70.8
Arteriosclerotic	17.5	24.3	54.0	65.3	70.2
a. Cardiac	6.1	9.9	29.8	41.3	46.5
b. Nephritic	3.4	3.8	4.8	4.6	6.7
c. Apoplexy	2.8	4.9	9.3	11.6	12.3
d. Gangrene	3.7	4.2	8.0	5.2	2.8
e. Site unassigned	1.5	1.4	2.1	2.6	1.8
Other circulatory and rheumatic heart disease	—	0.4	0.4	0.4	0.6
Infections, total	7.4	12.7	13.6	10.4	6.6
Pneumonia & respiratory	4.3	7.7	6.8	5.6	4.1
Gall-bladder	—	0.5	0.5	0.5	0.3
Carbuncle	1.8	1.6	1.0	0.5	—
Kidney, acute	—	0.1	0.9	0.9	0.8
Other infections	1.2	2.8	4.4	2.8	1.3
Cancer	1.5	3.8	8.7	8.7	9.2
Tuberculosis	4.9	4.9	4.1	2.3	1.9
Accidents	—	0.8	2.1	1.8	2.1
Inanition	0.3	2.2	0.1	—	**
Insulin reactions	—	—	0.2	0.3	0.3
All other and unknown causes	4.6	9.4	8.5	7.9	7.4
Number of deaths	326	836	4138	3482	3499

*Deaths reported through April 27, 1951.
**Less than .05.

TABLE 5 PRINCIPAL CAUSES OF DEATH OF 656 DIABETICS

Deaths Between January 1, 1950 and 1952*
Experience of Joslin Clinic, Boston, Mass.

Cause of Death	Per cent of All Causes
All Causes	100.0
Diabstic Coma (Primary)	1.1
Cardio-renal-vascular	75.9
Arteriosclerotic	75.6
Cardiac	47.6
Coronary and Angina	35.8
Renal, total	13.0
Diabetic Nephropathy	9.3
Typical or Unqualified**	8.2
Probable	1.1
Cerebral	12.7
Gangrene	1.1
Site Unassigned	1.4
Other circulatory and rheumatic heart disease	0.3
Infections, total	5.8
Pneumonia and respiratory	4.0
Gall bladder	0.2
Kidney, acute	0.6
Other infections	1.2
Cancer	9.6
Tuberculosis	0.9
Accidents	1.8
Insulin reactions	0.2
All Other and unknown causes	4.8
Number of deaths	656

*Deaths reported through April 7, 1952
**22 confirmed by autopsy

TABLE 6 DIABETES MORTALITY AMONG 656 DECEASED DIABETICS

Deaths Between January 1, 1950 and 1952*
Experience of Joslin Clinic, Boston, Mass.

a. Average Duration of Life Subsequent to Onset of Diabetes, By Age Groups at Onset

Age Groups at onset	Number of cases	Duration years
All Ages	656	15.2
0-9	27	21.2
10-19	52	19.3
20-39	102	21.1
40-59	314	15.5
60 & over	161	8.5

b. Duration of Life Subsequent to Onset of Diabetes: Number and Percent of Cases Classified According to Duration

Duration years	Number of cases	Percent
All Cases	656	100.0
Less than 5	88	13.4
Less than 1	18	2.7
1	19	2.9
2	20	3.0
3	18	2.7
4	13	2.0
5-9	107	16.3
5	16	2.4
6	24	3.7
7	20	3.0
8	15	2.3
9	32	4.9
10-14	146	22.3
15-19	120	18.3
20 & over	195	29.7
Average 15.2	Median 14.5	

*Deaths reported through April 7, 1952.

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tions and diabetic coma declines. As Table 4 shows, 7 out of 10 deaths among patients of the Joslin Clinic since 1944 have been due to arteriosclerosis in its various manifestations. This compares with approximately two thirds of the deaths in 1937-1943 and a little over half in the period 1922-1936. The only major category in the arteriosclerosis group to show a decrease is gangrene, which in the latest period accounted for less than 3 per cent of the deaths as compared with 5.2 per cent in 1937-1943. Cancer ranks next to arteriosclerosis among the causes of death in this experience, with 9.2 per cent of all deaths since 1944 as compared with 6.6 per cent for infections as a group.

The facts on the causes of death in the experience of the Joslin Clinic between January 1, 1950 and April 7, 1952 include a more detailed statement with regard to renal deaths, and in the light of recent developments, special attention has been paid to diabetic nephropathy. Of the 656 deaths recorded in the period specified, 3 out of 4 were due to arteriosclerosis. Of the total, 13 per cent are ascribed to renal causes, including 9.3 per cent specified as nephropathy. In the majority of these cases the available details supported this diagnosis, with confirmatory evidence from autopsy in 22 of the 61 cases classified as nephropathy. In this recent series, only 1.1 per cent of the deaths was due to primary diabetic coma. These data are presented in Table 5.

Facts on the duration from onset to death for the fatal cases from 1950 to April 7, 1952 are shown in Table 6. For all cases the average duration was 15.2 years; for cases with age at onset under 40 it was at its maximum, exceeding 21 years, for the age groups under 10 and 20 to 39.

Among these 656 recent fatal cases only 2.7 per cent of the deaths occurred within a year after onset and only 13.4 per cent within five years of onset. In nearly one third of the cases the duration exceeded 20 years.

Physical Medicine and Obesity

Insofar as reduction of weight is concerned, physical agents are capable only of increasing the caloric output or the fluid output of the human body and they are not capable of diminishing caloric input. Because any increase of output of fluids must promptly be compensated for by an equal input of fluids and because increasing the caloric output is extremely difficult and often dangerous, the limitations of physical medicine in reducing bodily weight immediately became apparent.

Many nonmedical "weight-reducing parlors" or "slenderizing salons" exploit various combinations of baths, massage and exercise. Usually such plans for reduction of weight depend basically on a special low-calorie diet which is introduced somewhat surrepitiously in conjunction with the highly tooted physical procedures. . . .

All of the hot baths can produce a transient loss in weight through the production of profuse perspiration. Loss of weight from sweating may exceed 2 pounds in an hour when a patient is placed in any one of these hot baths. However, such reduction in weight by loss of water from the tissues does not indicate that there has been decrease in the amount of adipose tissue and the body will soon regain enough water to make up for this transient dehydration. . .

Stimulating cold baths, Scotch douches and needle showers produce a mild increase in tone of muscles with a slight increase in metabolic rate. Although they produce a feeling of well-being, the increase in metabolic rate is so slight and of such short duration that it is not sufficient to produce any noticeable loss of weight.

Strangely, it does not seem to be well known, even among members of the medical profession, that no form of external manipulation is capable of removing adipose tissue from a particular region of the body. Massage will not reduce local deposits of fat. Massage will not increase muscular strength. Massage will not cause any significant change in the basal metabolic rate. . .
There is no scientific proof whatever that massage of any type can be effective as a reducing measure.

—From *Physical Medicine and Obesity* by Frank H. Krusen, M.D. in *The Journal* of the American Medical Association