

# Sickness and Injury Experience of Employed Diabetics

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In recommending standards for the employment of diabetics, the Committee on Employment of the American Diabetes Association<sup>1</sup> has expressed the view that "controlled diabetics without complications are good employable risks." The Committee also states: "When it is said that a diabetic is a good employment risk, reference is made to the well-controlled, well-regulated diabetic who keeps himself constantly under medical supervision. These people should prove to be quite acceptable, as the experience of hundreds of companies employing such diabetics indicates. Indeed, because they are self-disciplined and well-balanced individuals, they often become outstanding workers in whatever positions they occupy." Soskin,<sup>2</sup> citing his personal experience with the diabetic employee, believes that "the feeling engendered by the nonprejudicial acceptance of his handicap is apt to make him an unusually hard-working and loyal employee." Beardwood<sup>3</sup> surveyed thirty-one industrial firms in the Philadelphia area, and reported instances where work performance and attendance of diabetics compared favorably with those of nondiabetics. He also uncovered prejudices against diabetics which resulted from unfavorable isolated experiences and ignorance of the nature of the disease on the part of employers. Brandaleone and Friedman,<sup>4</sup> studying forty diabetics in the Third Avenue Transit System in New York City, found that, apart from two diabetics who had very prolonged absences, the absence rate of the diabetics was about the same as that of the nondiabetics. They also found no difference in accident rates and a somewhat lower rate of nonmedical absences among the diabetics. In reporting the experience of ninety-two diabetics in the Home Office of the Metropolitan Life Insurance Company, Dublin and Marks<sup>5</sup> cited the favorable record of these diabetics from the standpoint of length of service, attendance and cooperation with company physicians. They believe that their study and others which they reviewed "indicate that the work

record of diabetics in industry is satisfactory."

In general, these observations and comments express a plea to employers to take into account the distinction between the well-controlled diabetic and the poorly controlled, uncooperative diabetic; to assess each prospective diabetic employee on an individual basis; and to understand the relation of the diabetic's condition to job requirements.

As sound as these views are, there appears to be a reluctance on the part of a large number of employers to hire diabetics. In a recent survey of business and industrial firms conducted by the Committee on Employment of the American Diabetes Association,<sup>6</sup> about one quarter of the 127 participating companies stated that they do not employ known diabetics. The most frequently stated reasons were "previous poor experience" and "insurance reasons."

Before adopting a policy with respect to the hiring of diabetics, the employer has a right to know what he can expect from diabetics in such matters as attendance, frequency of disabling illness and safety performance. Although many employers have expressed favorable opinions in this respect, there is a dearth of statistical information on the subject. To our knowledge, the only well-controlled study in this country was done by the then Department of Labor from 1945 through 1947 as part of an industrial survey to evaluate the performance of physically impaired workers.<sup>7</sup>

As a means of appraising some aspects of the diabetic as an employee, we undertook a survey of all known diabetics in the du Pont Company. In this article, we will report our findings on sickness absenteeism, injuries, and status of diabetes control. Information concerning productivity and work efficiency lies outside the scope of our research activities.

In addition to gathering data on the items just cited, our survey enabled us to obtain prevalence figures and a great deal of laboratory and clinical information with which to study factors that have a bearing on the etiology and course of the disease. These findings are presented in another paper.<sup>8</sup>

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## SOURCE OF MATERIAL AND SURVEY PROCEDURES

*Company medical facilities, policies, and records*

During the past twenty-five years, it has been the practice of the du Pont Company to provide periodic physical examinations to all employees. These examinations are given, in almost all instances, by Company physicians. The laboratory work includes hemoglobin determinations, white blood cell counts, and urinalyses to test for the presence of sugar and albumin. More intensive blood and urine studies are performed when indicated. The routine examination also includes a chest X ray and, for older employees, an electrocardiogram.

Almost all employees have been receiving their medical examinations once a year, but many are seen more frequently for consultations and special examinations to detect possible adverse effects of potential occupational hazards. In addition, production employees who are absent for reason of illness or injury must report to the plant medical unit for evaluation upon their return to work.

When an employee exhibits abnormal conditions that require treatment or further diagnostic measures, he is referred to his family physician or a specialist. Contact between the Company and the local medical community is maintained to follow up cases that arise. This contact is also needed in the administration of the Company sickness benefit plans, which require the attending physician to certify the cause of disability.

Employees with glycosuria are given postprandial blood sugar or glucose tolerance tests. Most Company installations have facilities to administer these tests, but those which do not, have the work done at a local laboratory. Some Company physicians have blood sugar determinations made when there is a family history of diabetes without glycosuria. All employees suspected of having diabetes are followed closely until a diagnosis of diabetes is clearly established or rejected.

The Company does not refuse employment to anyone because of diabetes mellitus, except when the applicant cannot demonstrate that he is able to control the disease. The suggested policy and procedure for Company physicians is stated as follows: "Uncontrolled diabetes is a severe hazard. These cases should not be accepted, under any circumstances, until the blood sugar is within normal limits and medically controlled. If the applicant is accepted, he should be followed up every three months or so, or at least until the examiner satisfies himself that the diabetes is well managed."<sup>9</sup> Diabetic employees are encouraged to seek the help and advice of their plant physicians for problems concerning the

management of their diabetes.

*Survey procedures*

Our survey was begun in June, 1956. At that time, we distributed questionnaires, dealing with various aspects of diabetes, to all Company physicians, and asked them to complete the questionnaire by interviewing every diabetic in their plant. Thus, the Company physician was given the responsibility of identifying the diabetics. Since each doctor is assigned about 800 employees, the names of the few diabetics seen by them could easily be recalled. Nevertheless, we allowed a little more than a year to elapse for the completion of the questionnaires. During that time, each physician examined all of his patients at least once, and was in a position to identify diabetics not recalled by him at the start of the survey.

The choice of diagnostic criteria was left, of course, to the judgment of the employee's personal physician. In questionable cases, we recommended to the Company physician that, for purposes of this study, a diagnosis of diabetes be made when the blood sugar exceeds 170 mg. per 100 ml. in one half to one hour after the ingestion of a test meal (or a meal high in carbohydrates) and/or when the blood sugar does not return to a level below 150 mg. per 100 ml. two hours after the meal.

After obtaining the names of all the known diabetics in the Company, we selected a control employee, matched to each diabetic by age (five-year categories), sex, occupation (i.e., production or salaried)\* and location. The controls were selected by means of random numbers from a complete listing of Company employees.

We then requested the medical records of the diabetics and controls to abstract information pertinent to our study. We also asked the medical or personnel units in each installation to list for us all of the sickness absences and injuries that were experienced by the diabetics and controls during the year 1956, including the cause of illness and number of days of disability.

## PREVALENCE OF DIABETES

During the one-year period in which the survey was conducted, Company physicians reported 408 cases of diabetes among 90,596 surveyed employees, a prevalence rate of 4.5 per 1,000 persons. These cases comprise 370 men and 38 women. Prevalence rates, shown in table 1, indicate the well-known increase in prevalence with age. In our figures, the sharpest increase

\*Production employees include craftsmen, operatives, service workers, and laborers. Salaried employees consist of professional, technical, clerical, administrative, and managerial personnel.

TABLE 1  
Prevalence of diabetes mellitus by age and sex  
(Rates per 1,000)

Age	All employees		Men		Women	
	No.	Rate	No.	Rate	No.	Rate
Under 20	1	1.3	1	2.8	0	0
20-24	1	0.1	0	0	1	0.4
25-29	8	0.6	8	0.7	0	0
30-34	29	1.9	26	2.0	3	1.3
35-39	50	3.4	47	3.7	3	1.5
40-44	56	4.3	52	4.6	4	2.7
45-49	54	5.1	50	5.3	4	3.1
50-54	76	10.2	68	10.3	8	9.4
55-59	68	14.7	60	14.5	8	15.7
60-64	65	21.3	58	21.0	7	23.8
Total	408	4.5	370	4.8	38	2.7

occurs at about fifty years.

The over-all prevalence rate is higher among men than women; i.e., 4.8 per 1,000 compared to 2.7 per 1,000. This difference, however, is due, to some extent, to the higher proportion of older persons among the male employees. When the rates are standardized for age, the respective prevalence rates for men and women are 4.7 per 1,000 and 3.4 per 1,000.\*

The prevalence rates in the Company should not be projected to the general population because of the select nature of the Company employees. This point is discussed in greater detail in the article previously cited.<sup>8</sup>

#### SICKNESS ABSENTEEISM

Company medical units and personnel sections provided us with a complete record of sickness absenteeism during the year 1956 for 389 of the 408 diabetics and 382 of the 408 nondiabetic controls. The records sent to us indicated the cause of illness and the number of days of disability for each absence.

#### *Differences between diabetics and controls*

Comparing the two groups as a whole, the diabetics experienced a somewhat higher rate of sickness absenteeism than did the nondiabetics, from the standpoint of both frequency and severity. There were a total of 220 absences among the 389 diabetics and 181 among the 382 controls. Expressing these figures as frequency rates, we obtain, respectively, 56.6 and 47.4 per 100 persons. The probability of this difference occurring by chance alone is less than 0.01.

Severity indices were also higher in the diabetic group. The mean number of days of disability among diabetics with one or more absences was 28.0; among the controls, 17.5. The median number of days was 12.6 in the diabetic group and 7.0 in the control group. The difference between the two medians is expected to occur by chance alone less than one time in twenty.

\*The rates were standardized by the indirect method, using the over-all Company rates as the standard rates.

The 389 diabetics were disabled for a total of 4,200 days, an average of 10.8 days per person, while the 382 controls were disabled for a total of 2,150 days, an average of 5.6 days per person.

Eighty-six of the 389 diabetics, 22.1 per cent, were disabled during the year for a total of ten or more days. This is compared to 13.7 per cent among the controls ( $P < .01$ ). Disability of thirty or more days occurred in 9.7 per cent of the diabetics and 5.8 per cent of the controls ( $P = .05$ ).

Cumulative frequency distributions of the number of sickness absences and the number of days of disability among the diabetics and controls are shown in tables 2 and 3. The curves shown in figure 1 indicate that, from the time of onset of disability, diabetics return to work at a somewhat slower rate than do the nondiabetics.

In table 2 it is worth while noting that 86.4 per cent of the diabetics had either no absences or only one absence during the year, and only 4.1 per cent were absent more than twice, indicating that the problem of absenteeism among the diabetics, as well as nondiabetics, is concentrated in a small minority of individuals.

#### *Variation by age, occupation, and severity of diabetes*

Although sickness absenteeism among the diabetics as a whole was greater than that of the controls, differences between the two groups varied according to age, occupation, and severity of diabetes. The effect of these factors is seen in table 4 where several indices of sickness absenteeism are presented. In making comparisons with the controls, the three variables were analyzed by the following dichotomous subdivisions: Age, under fifty years and fifty to sixty-four years; occupation, production employees and salaried employees; and se-

TABLE 2  
Number of sickness absences during 1956 among diabetics and controls

Number of sickness absences	Diabetics		Controls	
	No.	Per cent	No.	Per cent
None	240	61.7	259	67.8
One	96	24.7	92	24.1
Two	37	9.5	18	4.7
Three	14	3.6	7	1.8
Four	2	0.5	3	0.8
Five or more	0	0	3	0.8
Total no. of cases	389	100.0	382	100.0

#### Cumulative frequency distribution:

Number of sickness absences	Diabetics		Controls	
	No.	Per cent	No.	Per cent
One or more	149	38.3	123	32.2
Two or more	53	13.6	31	8.1
Three or more	16	4.1	13	3.4
Four or more	2	0.5	6	1.6
Five or more	0	0	3	0.8

TABLE 3

Number of days of disability during 1956 among diabetics and controls

Number of days of disability	Diabetics		Controls	
	No.	Per cent	No.	Per cent
None	240	61.7	259	67.8
1 to 4	34	8.7	48	12.5
5 to 9	29	7.5	23	6.0
10 to 14	22	5.7	9	2.4
15 to 19	10	2.6	8	2.1
20 to 29	16	4.1	13	3.4
30 to 59	20	5.1	13	3.4
60 to 89	7	1.8	6	1.6
90 or more	11	2.8	3	0.8
Total no. of cases*	389	100.0	382	100.0

Cumulative frequency distribution:

Number of days of disability	Diabetics		Controls	
	No.	Per cent	No.	Per cent
1 or more	149	38.3	123	32.2
5 or more	115	29.6	75	19.7
10 or more	86	22.1	52	13.7
15 or more	64	16.4	43	11.3
20 or more	54	13.8	35	9.2
30 or more	38	9.7	22	5.8
60 or more	18	4.6	9	2.4
90 or more	11	2.8	3	0.8

\*Does not include nineteen diabetics and twenty-six controls for whom absence records were not available.

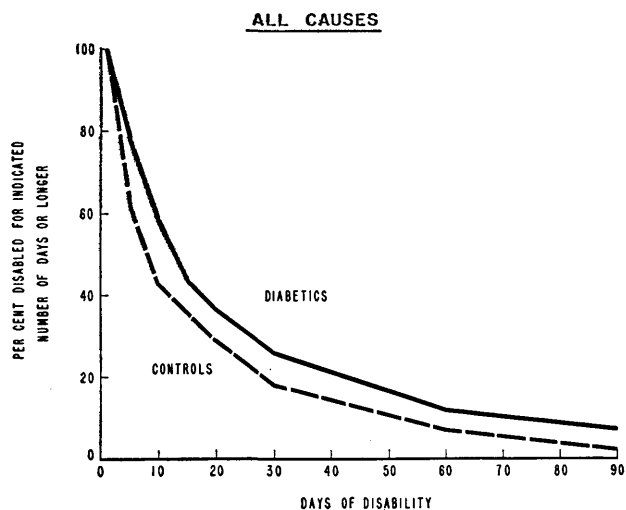


FIG. 1. Cumulative per cent frequency distributions of the number of days of disability among diabetics and controls who were absent at least once during 1956 because of illness or injury. These data are based only on cases with absences.

verity of diabetes, diabetics who take insulin (moderate and severe cases) and those who do not (mild cases).

The figures in the table indicate that production employees who take insulin accounted for most of the excess rate of sickness absenteeism found in the diabetic group. In this category of diabetics, the frequency rate was 70.1 absences per 100 persons. This is contrasted to 46.8 among production diabetics who take

no insulin and 41.3 among the production employees in the control group (see figure 2). The probability of these differences occurring by chance alone is less than 0.01. Although the rate among the mild diabetics is somewhat greater than it is in the control group, the difference is not significant. A similar pattern is seen in rates of prolonged sickness absenteeism; i.e., the percentages of persons disabled for 10, 30, and 60 or more days. Among salaried employees, there were no significant differences in absence rates among the two diabetic groups and the control group.

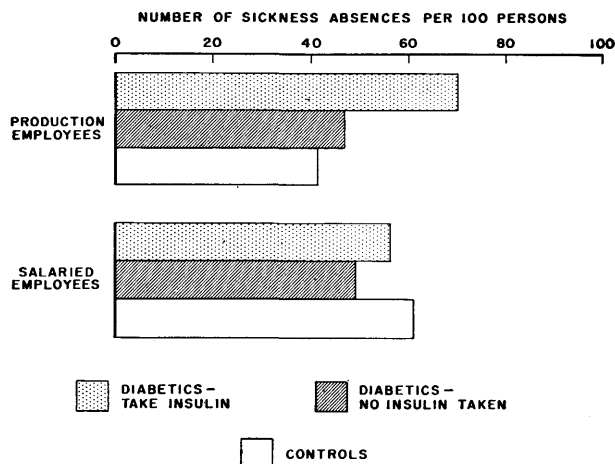


FIG. 2. Disability rates for all causes of illness or injury incurred during 1956 among diabetics and controls, by occupation and severity of diabetes.

The severity of the diabetes did exert some influence on the frequency of sickness absenteeism, but its effect was most pronounced in cases of very prolonged absences among the older production employees. Referring to table 4, it is seen that among production diabetics fifty to sixty-four years of age who take insulin the per cent disabled for thirty or more days was 19.2, compared to 10.3 among the mild diabetics and 5.4 among the controls ( $P < .05$ ). The per cent disabled for sixty or more days in each of these groups was, respectively, 15.4, 3.8, and 3.1 ( $P < .01$ ).

*Causes of sickness absenteeism*

A breakdown, by cause of illness, of the sickness absences that occurred in the diabetic and control groups during 1956 is shown in table 5. About one half of the absences in each group was due to respiratory infections and diseases of the digestive system. In neither of these disease categories is there a significant difference in incidence between the diabetics and nondiabetics. The absence frequencies for other illnesses are small, and none of the differences is greater than would be

TABLE 4

Sickness absenteeism during 1956 among diabetics and controls by age, occupation and severity of diabetes

	Severity	Both			Production			Salaried		
		All ages	Under 50 yrs.	50 to 64 yrs.	All ages	Under 50 yrs.	50 to 64 yrs.	All ages	Under 50 yrs.	50 to 64 yrs.
Number of persons	Diabetics—take insulin	200	118	82	127	75	52	73	43	30
	Diabetics—no insulin	189	73	116	126	48	78	63	25	38
	Controls	382	194	188	264	135	129	118	59	59
Number of absences per 100 persons	Diabetics—take insulin	65.0	72.0	54.9	70.1	82.7	51.9	56.2	53.5	60.0
	Diabetics—no insulin	47.6	45.2	49.1	46.8	47.9	46.2	49.2	40.0	55.3
	Controls	47.4	56.7	37.8	41.3	54.8	27.1	61.0	61.0	61.0
Per cent absent one or more times	Diabetics—take insulin	41.5	44.1	39.0	46.5	53.3	36.5	34.3	27.9	43.3
	Diabetics—no insulin	34.4	30.1	37.1	31.7	29.2	33.3	39.7	32.0	44.7
	Controls	32.2	36.6	27.7	29.2	35.6	22.5	39.0	39.0	39.0
Per cent disabled for 10 or more days	Diabetics—take insulin	26.0	26.3	25.6	33.9	36.0	30.8	12.3	9.3	16.7
	Diabetics—no insulin	18.0	16.4	19.0	19.0	16.7	20.5	15.9	16.0	15.8
	Controls	13.6	13.4	13.8	14.0	14.8	13.2	12.7	10.2	15.3
Per cent disabled for 30 or more days	Diabetics—take insulin	11.5	8.5	17.1	14.2	10.7	19.2	8.2	4.7	13.3
	Diabetics—no insulin	7.4	5.5	8.6	7.9	4.2	10.3	6.3	8.0	5.3
	Controls	5.8	6.2	5.3	5.7	5.9	5.4	5.9	6.8	5.1
Per cent disabled for 60 or more days	Diabetics—take insulin	7.0	4.2	11.0	9.4	5.3	15.4	2.7	2.3	3.3
	Diabetics—no insulin	2.1	1.4	2.6	2.4	0	3.8	1.6	4.0	0
	Controls	2.4	2.1	2.7	3.0	3.0	3.1	0.8	0	1.7
Median no. days of disability among persons absent one or more times	Diabetics—take insulin	14.0	13.0	16.0	15.0	14.3	35.0	5.5	5.5	5.8
	Diabetics—no insulin	10.7	11.5	9.5	15.0	11.0	15.0	7.3	11.0	6.0
	Controls	7.0	5.4	11.2	9.5	6.5	15.0	5.6	3.5	6.0

\*The probability that the differences among the three groups will occur by chance alone is less than .05.

†The probability that the differences among the three groups will occur by chance alone is less than .01.

expected by chance alone. The higher over-all frequency of sickness absenteeism among the diabetics was due, primarily, to absences which resulted directly from their diabetic condition. In table 5, these absences are shown in the category, "Care and management of diabetes." There were twenty-five such absences, which occurred in twenty-three diabetics. Four of seven absences classified as "drug reactions" were due to insulin shock.

The incidence of absences due to diabetes is presented in table 6 by age, occupation, and severity of diabetes. These figures clearly show that these absences occurred predominantly among production employees under fifty years of age who take insulin. The incidence in this group was 17.3 per cent; i.e., thirteen absences among seventy-five diabetics.

As one would expect, absences due to diabetes were more frequent among the moderate and severe cases than in the mild group. These absences occurred in only 2.1 per cent of the diabetics who do not take insulin, but in 9.5 per cent of those who do take insulin ( $P < .01$ ).

*Duration of disability by cause*

Table 7 shows the mean number of days of disability among the diabetics and the controls for respiratory infections, nonrespiratory illnesses, and diabetes. It can be seen that the duration of disability is greater among the diabetics than the nondiabetics for both respiratory and nonrespiratory illnesses.

Figure 3 shows cumulative distribution curves of duration of disability due to respiratory infections among the diabetics and the controls. The chart clearly shows that, after the onset of disability, the nondiabetics returned to work at a faster rate than did the diabetics. The median number of days of disability among the diabetics was 3.5, compared to 2.5 in the control group. Ten per cent of the controls and 25.4 per cent of the diabetics were disabled for one week or longer ( $P < .05$ ).

DISPENSARY VISITS

Company medical units are equipped to provide first aid and medication to employees who report to the medical section with injuries and minor complaints.

The most frequently recorded reasons for coming to the dispensary are abrasions and lacerations, colds, simple headaches, gastrointestinal upsets, muscular pains, dysmenorrhea and allergies.

A comparison was made between the diabetics and controls with respect to the frequency of their dispensary visits during the two-year period, 1955-56. The findings, presented in table 8, show no significant

TABLE 5  
Causes of sickness absenteeism

Cause of absence	Number of absences	
	Diabetics	Controls
Respiratory infections	67	60
Diseases of digestive system	32	33
Musculoskeletal disorders	15	16
Nonrespiratory infections	13	13
Heart disease	8	3
Other cardiovascular disease	6	5
Drug reactions	7*	2
Genitourinary disorders	6	6
Accidents	5	3
Miscellaneous disorders	36	40
Care and management of diabetes	25	—
Total	220	181

\*Includes four cases of insulin shock.

TABLE 6  
Incidence of absence from work during 1956 for care and management of diabetes, by age, occupation and severity of diabetes

	Total	Number absent	Per cent absent
All diabetics	389	23	5.9
No insulin taken	189	4	2.1
Take insulin	200	19	9.5
Production:			
No insulin—under 50	48	2	4.2
No insulin—50 to 64	78	1	1.3
Takes insulin—under 50	75	13	17.3
Takes insulin—50 to 64	52	4	7.7
Salaried:			
No insulin—under 50	25	0	0
No insulin—50 to 64	38	1	2.6
Takes insulin—under 50	43	2	4.7
Takes insulin—50 to 64	30	0	0

TABLE 7  
Duration of disability among diabetics and controls by type of illness

Type of illness	Diabetics				Controls			
	Number of absences a	Total number of days of disability b	Mean number of days of disability		Number of absences a	Total number of days of disability b	Mean number of days of disability	
			Per absence b/a	Per person b/389			Per absence b/a	Per person b/382
Respiratory infections	67	358	5.3	0.9	60	222	3.8	0.6
Nonrespiratory illnesses	124	3,407	27.5	8.8	121	1,928	15.9	5.1
Diabetes	29	435	15.0	1.1	—	—	—	—
All absences	220	4,200	19.1	10.8	181	2,150	11.9	5.6

differences between the two groups.

ACCIDENT RECORD

In studying accident susceptibility we find that the occurrence of minor (nondisabling) injuries yields much more information than major and submajor injuries. Apart from the much greater frequency of minor injuries, the differences between the occurrence of a major and a minor injury are dependent upon chance and the nature of the external situation, rather than the degree of accident susceptibility of the person or persons involved.

Records of minor injuries were available for 384 diabetics and 382 controls. During 1956, the diabetic group experienced eighty-two injuries, or 21.4 per 100 persons. In the control group there were seventy-eight injuries, a rate of 20.4 per 100. The frequency distributions, in table 9, are almost the same for both groups, and the difference can be ascribed to chance.

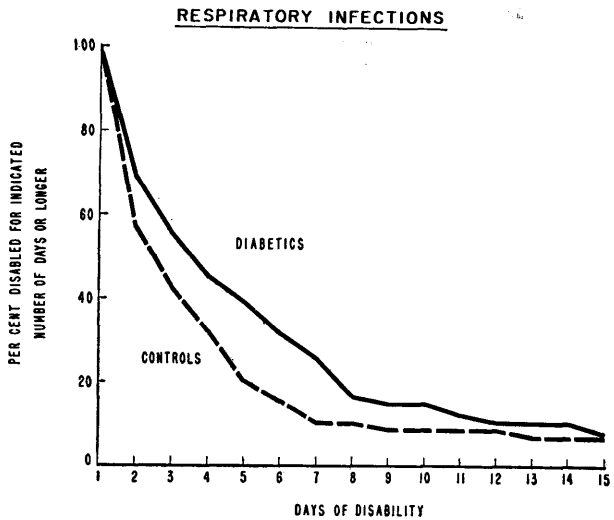


FIG. 3. Cumulative per cent frequency distributions of the number of days of disability among diabetics and controls who were absent at least once during 1956 because of respiratory infections. These data are based only on cases with absences.

It should be borne in mind that records of minor injuries list only those which were reported by the worker. In some instances, the injured person may not believe his injury to be severe enough to require medi-

TABLE 8

Dispensary visits, exclusive of retreatments, among diabetics and controls, 1955-56

Number of dispensary visits	Diabetics		Controls	
	No.	Per cent	No.	Per cent
None	33	13.4	43	16.4
1 or 2	70	28.4	68	25.9
3 or 4	54	22.0	51	19.5
5 or 6	34	13.8	35	13.4
7 or 8	24	9.8	28	10.7
9 or 10	9	3.7	15	5.7
11 or 12	12	4.9	6	2.3
13 or 14	6	2.4	5	1.9
15 or more	4	1.6	11	4.2
Total no. of cases*	246	100.0	262	100.0

Cumulative frequency distribution:

Number of dispensary visits	Diabetics		Controls	
	No.	Per cent	No.	Per cent
1 or more	213	86.6	219	83.6
3 or more	143	58.2	151	57.7
5 or more	89	36.2	100	38.2
7 or more	55	22.4	65	24.8
9 or more	31	12.6	37	14.1
11 or more	22	8.9	22	8.4
13 or more	10	4.0	16	6.1
15 or more	4	1.6	11	4.2

\*Records of dispensary visits were not maintained for 162 diabetics and 146 controls. Most of these employees are salaried.

cal attention. Diabetics, however, are generally aware that their wounds, no matter how slight, may become seriously infected if not given prompt attention. For this reason, a diabetic is more likely to report an injury than a nondiabetic. If this is true, the rate of minor injuries may actually be lower in the diabetics.

With regard to other types of injuries that occurred during 1956, there were two major injuries among the diabetics and none in the control group. Both groups experienced three submajor injuries. Five diabetics and three controls suffered lost-time non-occupational injuries. All of these differences are within the limits of sampling error.

The occurrence of injuries and sickness absenteeism among diabetics and nondiabetics was studied by the Bureau of Labor Statistics from 1945 through early 1947 in a sample of industrial firms.<sup>7</sup> Records of 144 diabetics were compared to those of 244 matched controls. All were production workers. Days lost because of sickness occurred at a higher rate in the diabetic

group; i.e., 2.6 compared to 1.3 per 100 work days. Differences in injury rates were slightly higher among the diabetics, but it is questionable whether they are

TABLE 9

Minor injuries during 1956 among diabetics and controls

Number of injuries	Diabetics		Controls	
	No.	Per cent	No.	Per cent
None	332	86.5	327	85.6
1	36	9.4	38	9.9
2	8	2.1	12	3.1
3	4	1.0	4	1.1
4	2	0.5	1	0.3
5	2	0.5	0	0
Total	384	100.0	382	100.0

significant. The rate of nondisabling injuries, expressed as the number of injuries per 10,000 exposure hours, was 7.8 in the diabetic group and 7.4 in the control group. Disabling injuries occurred at a rate of 15.6 per 1,000,000 exposure hours among the diabetics and 12.9 among the controls.

Although different indices are used, the findings of our survey and that of the Bureau of Labor Statistics are essentially the same, insofar as they suggest that diabetic production workers experience a higher rate of sickness absenteeism than nondiabetics, but do not have a greater susceptibility to accidents.

DISCUSSION

In assessing the sickness absence experience of diabetics on the basis of the data just presented, these points should be stressed. First, of the thirty-nine excess absences in the diabetic group (220-181), twenty-five were classified under the heading of "Care and management of diabetes," and an additional four were due to insulin shock. Thus, twenty-nine of the thirty-nine excess absences, about 75 per cent, were due directly to the diabetic condition, rather than to complicating illnesses. Secondly, these twenty-nine absences occurred in twenty-seven persons. This is only 7 per cent of the entire group of diabetics. Thirdly, the excess absenteeism among the diabetics was concentrated primarily among moderate and severe production diabetics. Generally, absence rates of salaried diabetics and of mild diabetics in production work were about the same as those of nondiabetics. Fourthly, the large majority of diabetics do not pose a serious problem with regard to absenteeism. During a one-year period, 86.4 per cent of the diabetics had either no absences or only one absence and 95.9 per cent had two absences or less.

From these findings the conclusion may be drawn that rates of sickness absenteeism among diabetics as a whole might be reduced, to a large extent, to that of

nondiabetics by directing efforts toward obtaining better control in a small group of diabetics, particularly moderate and severe cases among production workers.

With regard to the duration of sickness absenteeism, there are two possible explanations for the excess noted among the diabetics. One is that the diabetes itself may contribute to the severity of other illnesses. Another, but more likely, explanation is that the family physician may treat the diabetics more conservatively than he would a nondiabetic for the same condition. For example, when the insulin dosage is increased due to fever, the family physician may believe that a few extra days at home are necessary to regulate insulin dosage to preclude insulin shock or glycosuria.

#### SUMMARY

A survey of diabetics in the du Pont Company uncovered 408 cases, a prevalence rate of 4.5 per 1,000 persons. To evaluate the sickness absence and injury experience of these diabetics, a control group was drawn at random from the Company population so that one control employee was matched to each diabetic by age, sex, occupation (i.e., production or salaried) and geographical location.

Rates of sickness absenteeism were greater among diabetics than nondiabetics from the standpoint of both frequency and severity, but the excess occurred primarily among mild and severe diabetic production workers. Absence rates among salaried diabetics and among mild diabetic production workers were about the same as those of the controls. Most of the excess absences in the diabetic group were due directly to their diabetic condition, rather than to complicating illnesses. During a one-year period, 86.4 per cent of the diabetics had either no absences or only one absence.

The rate of return to work following the onset of illness was somewhat slower in the diabetic group than in the control group. This was true for illnesses in general and for respiratory infections in particular.

There was no significant difference in the occurrence of minor injuries between the diabetics and the controls.

In general, the study indicates that the great majority of diabetics do not pose any special problem with regard to sickness absenteeism, and that diabetics are no more susceptible to injuries than are nondiabetics.

#### SUMMARY IN INTERLINGUA

##### *Maladia e Vulnerationes in Empleatos Diabetic*

Un enquete al Compania du Pont constatava 408 casos de diabete, i.e. un incidentia de 4,5 per mille. Pro evaluar le absentismo pro maladia e le frequentia de vulnerationes in iste gruppo, un selection aleatori esseva

effectuate in le population del compania de maniera que in le resultante gruppo de controlo omne subjecto esseva appareate con un subjecto del gruppo diabetic tanto in etate e sexo como etiam in typo de occupation (i.e. production o empleo salariate) e loco geographic.

Le incidentia de absentismo pro maladia esseva plus alte in diabeticos que in non-diabeticos, tanto ab le puncto de vista del frequentia como etiam ab le puncto de vista del severitate; sed le excesso occorreva primariamente in subjectos con moderate e sever diabete inter le travaliatores de production. Le absentismo inter le diabeticos salariate e inter le travaliatores de production con leve diabete esseva plus o minus le mesme como in le gruppo de controlo. Le plus grande parte del excesso in le absentias del gruppo diabetic esseva causate directemente per le condition diabetic plus tosto que per complicationes secundari. Durante un periodo de un anno, 86,4 pro cento del diabeticos habeva nulle absentia o solmente un.

Le retorno al travalio post le declaration del morbo esseva un pouco plus lente in le gruppo diabetic que in le gruppo de controlo. Isto valeva pro morbos in general e pro infectiones respiratori in particular.

Nulle differentia significative esseva constatate inter le diabeticos e le gruppo de controlo con respectu al occurrentia de vulnerationes minor.

A generalmente parlar, le studio indica que le grande majoritate del diabeticos non pone problemas special con respectu al absentismo pro maladia e que diabeticos non es plus susceptibile de contraher vulnerationes que non-diabeticos.

#### REFERENCES

- <sup>1</sup> Committee on Employment of the American Diabetes Association: Employment of diabetics. *Diabetes* 1:336-37, July-Aug. 1952.
- <sup>2</sup> Soskin, S.: Diabetes—its relation to industry. *Ind. Med. and Surg.* 23:106-07, Mar. 1954.
- <sup>3</sup> Beardwood, J. T.: Industry's role in the employment of the diabetic. *Ibid.* 19:271-74, June 1950.
- <sup>4</sup> Brandaleone, H., and Friedman, G. J.: Diabetes in industry. *Diabetes* 2:448-53, Nov.-Dec. 1953.
- <sup>5</sup> Dublin, L. I., and Marks, H. H.: The diabetic in industry and his employer. *Ind. Med. and Surg.* 19:279-82, June 1950.
- <sup>6</sup> Committee on Employment of the American Diabetes Association: Analysis of a survey concerning employment of diabetics in some major industries. *Diabetes* 6:550-53, Nov.-Dec. 1957.
- <sup>7</sup> Bureau of Labor Statistics: The performance of physically impaired workers in manufacturing industries. U. S. Dept. of Labor, Bulletin 923, 1948, pp. 110-14.
- <sup>8</sup> Pell, S., and D'Alonzo, C. A.: Diabetes mellitus in an employed population. *J.A.M.A.* 172:1000-06, March 5, 1960.
- <sup>9</sup> Fleming, A. J., D'Alonzo, C. A., and Zapp, J. A.: *Modern Occupational Medicine*. Philadelphia, Lea and Febiger, 1954, p. 50.