CHRONIC DISABILITIES AND CAPACITY FOR WORK A STUDY OF 3,299 MEN AGED 16-64 IN A GENERAL PRACTICE AND AN OIL REFINERY

BY

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Despite the extensive reports on morbidity which have been published in the past two decades, surprisingly little information is available about the prevalence of chronic impairment of function in our community (Townsend, 1967). When this affects long-term working (and therefore earning) capacity, the economic cost in loss of productivity as well as the personal and social consequences of such a disability can be very severe. Some of these people may not attend their doctor for long periods, particularly when their condition is one, such as an amputation, that does not deteriorate or cause much discomfort, and thus they would not be ascertained in studies based upon attendances in general practice such as those arranged by the General Register Office (Logan and Cushion, 1958). By the same token, they may not have time off work and therefore not be recorded in reports on medical incapacity such as that of the Ministry of Pensions and National Insurance (1965). Nevertheless, their inability to undertake normal work consistent with their training and experience can seriously affect their economic status and that of their dependants.

The Committee on Medical Rating of Physical Impairment (1958) observed that disability is not purely a medical condition but depends upon the patient's ability to work in the presence of a medical impairment taking into account non-medical factors such as age, sex, education, and socio-economic status. In this country, the manpower shortage during World War II demonstrated that many people suffering from significant or even severe permanent impairment could be gainfully employed. The recommendations of the Tomlinson Report (1943) were incorporated almost unchanged into the Disabled Persons (Employment) Act of 1944. This legislation was designed to help the disabled to obtain employment, and since 1946 all employers of twenty persons or more are required to employ a quota of 3 per cent. disabled persons from the Register of Disabled Persons which is kept by the Ministry of Labour.

The Act defines a disabled person as one who "on account of injury, disease, or congenital deformity is substantially handicapped in obtaining or keeping employment, or in undertaking work of a kind which, apart from that injury, disease, or deformity, would be suited to his age, experience, and qualifications". To be accepted for registration the applicant's disability must also be likely to last for at least 6 months and he must be ordinarily resident in Great Britain. Registration is voluntary, and it is the experience of doctors in industry that many disabled workers do not choose to register, and some are very reluctant to do so when it is suggested to them. Employers sometimes find that they have less than their quota of registered disabled workers although they usually have other disabled workers who can be persuaded to register themselves in order to raise the number to the required level.

This survey was undertaken to measure the prevalence of chronic medical conditions and longterm disability for normal work in a general practice and a nearby oil refinery.

POPULATIONS AT RISK

The general practice is in a semi-rural area of Essex about 30 miles from London. With two principals, the list is about 5,800 and the population at risk for the survey was taken as males between the ages of 16 and 64. The National Health Service (N.H.S.) envelopes of all males in the practice on December 31, 1966, were inspected to identify age groups; the dates of birth of 61 men were not known and these were obtained from the N.H.S. Central Register. The age structure is shown in Table I (opposite).

There were 179 men in the practice who were also employed in the refinery and they are included only in the refinery population.

 TABLE I

 PRACTICE AND REFINERY POPULATIONS Men at Risk on December 31, 1966

Age	Practice		Refi	nery	Combined	
(yrs)	No.	Per cent.	No.	Per cent.	No.	Per cent.
16-19 20-24 25-29 30-34 35-39 40-44 45-49 50-54 55-59 60-64	105 99 125 189 180 181 129 97 100 99	8.0 7.6 9.6 14.5 13.8 13.9 9.9 7.4 7.7 7.6	90 176 193 248 270 324 294 224 176 Nil	4.6 8.8 9.7 12.5 13.5 16.2 14.7 11.2 8.8	195 275 318 437 450 505 423 321 276 99	6.0 8.3 9.6 13.3 13.6 15.3 12.8 9.7 8.4 3.0
All Ages	1,304	100	1,995	100	3,299	100

A wide range of occupations can be found in the practice. Although no register of jobs exists, it is considered that about half the men have no form of occupational medical service since they work for small firms or shops, or on the land, or are selfemployed. The remainder are about equally divided between national or local government employment, large industrial organizations with full-time medical services, and other industries with part-time medical services. In this respect, the men in the practice are rather better served than the country as a whole.

The oil refinery is about 3 miles from the practice and, although it has been there for over 50 years, it expanded considerably in size about 20 years ago. About two-thirds of the men are paid hourly, and production and maintenance engineering each account for some 40 per cent. of the male work force. There is a well-established apprentice training scheme for which youths are employed at the age of 16, but in contrast to national practice the retirement age is 60. The population is stable with an annual turnover of about 5 per cent.; the number of men at risk on December 31, 1966, is also shown in Table I.

The two populations are similarly distributed in most of the 5-yearly age groups; significant differences over the 95 per cent. confidence level only occur in the youngest, the 45 to 49 and the 50 to 54-year age groups, and men over 60 are not employed at the refinery. The proportions under and over the age of 40 do not differ significantly.

IDENTIFICATION OF MEN WITH DISABILITIES

The names of all the men on the Register of Disabled Persons were already known at the refinery, and those of men in the practice were obtained from the local office of the Ministry of Labour.

Full medical records, including a comprehensive pre-employment medical examination and records of all absences from work due to sickness or injury, which are held in the refinery have been described already (Taylor, 1967). Records are also held of all long-term restrictions placed on the working capacity of employees as well as all attendances at the medical department. The practice records consist of the usual N.H.S. envelopes and enclosures, and one of us (A.J.F.) has been in the practice for nearly 20 years.

The definition of a chronic medical impairment of function used in the survey was that of the Ministry of Labour already mentioned. The conditions selected were all those that could have, or actually did, affect the man's working capacity for at least one year. The conditional term was used since, for example, a below-knee amputation has no effect on the working capacity of a sedentary worker but would limit that of a labourer. Each man was therefore considered only in relation to his age, and not at this stage to his occupation.

The medical records of all men in both populations were carefully inspected and notes made of those with disabling chronic medical conditions present on or before December 31, 1966.

CLASSIFICATION OF MEN WITH CHRONIC CONDITIONS BY WORKING CAPACITY

After consideration of various criteria we have used four grades which are broadly similar to those used by the National Health Survey (1965), but modified to fit the statutory definitions current in Great Britain:

Grade A Men unfit for work of any sort consistent with their age, training, and experience, and thus medically unemployable.

Grade B Men whose work had already been changed or substantially modified because of their medical condition.

Grade C Men who were able to continue in their normal occupation despite the disability, but who were limited in their ability to change their occupation (or in some cases to be promoted) because of it. This grade would include the sedentary amputee referred to above.

Grade D Men who, despite a permanent medical impairment, were not restricted in their ability to change their occupation to most other jobs consistent with their age, training, or experience, except those for which high standards of physical fitness are required. Thus a man blind in one eye from childhood who was well adapted to his disability would not be accepted as a public transport driver, even though he could do most ordinary jobs.

SOURCES OF ERROR

The size of the population at risk in the refinery is accurate since the figures were obtained from the payroll. For the practice, the men were counted from the N.H.S. records. The Executive Council adjusts the population each quarter, but there may have been some who had moved in or out of the practice whose records had not yet been altered. It seems likely however that such inaccuracies would be small since the practice is stable in size. There is a greater likelihood of error in the ascertainment of men with chronic disability or disease, although the names of all men on the Register of Disabled Persons were known. In the practice, ascertainment can come only if the man reports his condition and notes have been taken on the records. In the refinery, however, all employees have had a pre-employment examination. and many also have periodic medicals because of work with toxic hazards. Thus a physical impairment might be recognized even if not reported. A validity check has been made on this by personal questioning of 100 men between the ages of 40 and 54 not already identified as disabled and taken at random from each of the two populations. This revealed only one clerk with osteo-arthritis of a knee who would have been placed in Grade C. Thus it seems unlikely that errors of ascertainment are large, although deliberate concealment cannot be ruled out.

Finally, the allocation of a man to one of the four grades can also be mistaken, although there is little likelihood of error in the medically unemployable (Grade A). The distinction between Grades B and C rests largely upon the man's usual occupation and upon whether or not a change of job has occurred. All the disabled men between the ages of 40 and 54 have been seen and their grading reassessed after an interview and medical examination. This showed that a number of men had been graded too low: ten out of 112 (9 per cent.) for the refinery, ten out of seventy (14 per cent.) for the practice. Some of these mistakes were due to deterioration of the medical condition since the last recorded entry in the notes; in others the man himself had arranged a change of work without reference to the doctor. Two-thirds of these errors in grading were occupational rather than medical, the correct grade being B rather than C. These known errors have been corrected in the results, and since this age group accounts for almost half the total number of disabled, the overall error of undergrading may be in the order of 5 per cent.

FINDINGS

DISABILITY IN THE PRACTICE AND REFINERY POPULATIONS

The prevalence of disability in each grade is shown in Table II.

In the general practice men with a chronic condition which had not made them change their normal occupation (Grade C) formed the largest group. There was also, as might be expected, a rise in the prevalence of disability with increasing age, most marked in the more severely disabled grades. The findings amongst the refinery population were similar.

The overall disability rate in the practice $(122 \cdot 7)$ per thousand) is somewhat higher than that in the refinery $(103 \cdot 3)$ per thousand), but this difference is not statistically significant $(\chi^2 = 2 \cdot 6756; 0 \cdot 2 >$ $P > 0 \cdot 1)$. Moreover there were 23 men who were unemployed because of their disabilities, and none over the age of 60 in the refinery. Adjustment of the practice population to include only employed men aged 16–59 makes the overall prevalence of disability (95 \cdot 5) per thousand) even closer to that in the refinery, $(\chi^2 = 0.449; 0.7 > P > 0.5)$. Nor do the rates differ significantly between similar grades of disability; furthermore the durations of disability were also similar in both communities.

TABLE II COMBINED POPULATION Number of Men in each Disability Grade

Sariaa	Ann Comm	Desclation	Disability Grade					Datas
Series	(yrs)	Fopulation	A	В	С	D	All Grades	per 1,000
General Practice	16-24 25-34 35-44 45-54 55-64	203 314 361 226 199	$\begin{array}{r} 2\\ 2\\ -\frac{4}{15} \end{array}$	2 4 9 15	4 12 8 14 30	2 10 12 7 8	8 26 24 34 68	39 · 2 82 · 8 66 · 4 150 · 4 341 · 7
	All Ages	1,304	23	30	68	39	160	122.7
	Rates per 1,000		17.6	23.0	51.2	29.9	122.7	
Refinery	16-24 25-34 35-44 45-54 55-59	266 441 594 518 176		2 11 27 14	4 7 18 37 27	1 2 20 21 15	5 11 49 85 56	18 · 8 24 · 9 82 · 5 164 · 1 318 · 2
	All Ages	1,995	-	54	93	59	206	103 - 3
	Rates per 1,000		-	27 · 1	46.6	29.6	103.3	

DISABILITY IN THE TWO POPULATIONS COMBINED

The observation that the prevalence of disabling conditions in both the practice and the refinery did not differ, and our impression that the main problems of disabled men were similar in both communities, led us to look at the whole group of 366 disabled men. The numbers in each grade for the combined population are shown in Table III.

TABLE III COMBINED POPULATION Number of Men in each Disability Grade

Age	Bogula		Disability Grade					
(yrs)	tion	A	в	с	D	All Grades	1,000	
16-24 25-34 35-44 45-54 55-64	470 755 955 744 375	$ \begin{array}{r} 2\\ 2\\ -\\ 4\\ 15 \end{array} $	4 15 36 29	8 19 26 51 57	3 12 32 28 23	13 37 73 119 124	27 · 7 49 · 0 76 · 4 159 · 9 330 · 7	
All Ages	3,299	23	84	161	98	366	110.9	
Rates per 1,000		7.0	25.2	49·1	29.7	110-9		

CHRONIC CONDITIONS AND REGISTRATION AS A "DISABLED PERSON"

By no means all medically-impaired men are registered as disabled, and a number of registered disabled men are not severely impaired. The overall prevalence of registered disabled men of working age in the practice (2.97 per cent.) and at the refinery (3.46 per cent.) are close to the national "quota" of 3 per cent. Calculation from figures published by the Ministry of Labour (1966) shows that the national rate of registered disabled men was about 3.4 per cent. of the male working population aged 16-64, whilst the rate in this area in 1966 was about 2.5 per cent. (Ministry of Labour, 1967). This latter figure is approximate, since all persons over age 15 in the employment field can register and the population has had to be adjusted to exclude those living in the area but working outside it.

The men registered as disabled were not representative of the disabled men found in either population studied in this survey, although a higher proportion of men in Grades A and B were registered than in Grades C and D (Tables IV).

The percentage of disabled men who have registered with the Ministry of Labour is highest among those who have had a total or partial limitation affecting their usual occupation (Grades A and B). There is a significant (P < 0.01) difference between them and men who have not had to change their job (Grades C and D). Although this is what might be expected, it is notable that nineteen men (18 per cent. of all registered men) had disabilities

TABLE IV COMBINED POPULATION Registered Disabled Men in each Disability Grade

Age	Total	Re	Per-				
(yrs)	Disabled	A	в	с	D	All Grades	of Total Disabled
16-24 25-34 35-44 45-54 55-64	13 37 73 119 124	- <u>2</u> - <u>3</u> 6			2 6 9 2	9 23 51 25	24 32 43 20
All Ages	366	11	43	35	19	108	30
Percentage Disabled	of Total	48	52	22	19	30	

which had not appreciably affected their working capacity (Grade D). Indeed half of the men on the register were engaged in their normal occupations.

The proportion of men on the register is highest in the 45 to 54-year age group, and this differs significantly (P < 0.05) from that of older and younger men. This is partly due to fourteen war-disabled, all of whom were registered in this age group. The lower proportion of registrations in men over 55 may be due to the fact that most men who become disabled later in life do not feel the need to register.

MEDICAL CONDITIONS CAUSING DISABILITY

Classification of the causes of disability into fifteen main diagnostic groups provided further evidence of the close similarity between the practice and the refinery. Comparison of prevalence rates among employed men aged 16 to 59 years in each population showed, for example, that coronary heart disease affected eleven men in the practice and 25 in the refinery ($\chi^2 0.741$; 0.5 > P > 0.3), disorders of the spine affected nineteen and 35 respectively $(\gamma^2 \ 0.537; \ 0.5 > P > 0.3)$, and complicated peptic ulcer affected fourteen and 24 ($\chi^2 0.004$; 0.95 > P>0.9). Only tuberculosis showed a significant difference in prevalence, since it had affected fifteen men in the practice and eleven in the refinery $(\gamma^2 4.619; 0.05 > P > 0.02)$, although none was on active treatment at the time of the survey.

The diagnoses in the different grades of disablement showed some interesting trends and furthermore many men suffered from more than one condition. Since the criterion for selection of a chronic condition in this survey was that it should be (or have been) of sufficient severity to allow the man affected to register himself as disabled if he so wished, both the main and also subsidiary causes of disability are included in the analysis (Table V, overleaf).

Coronary heart disease was recorded in 47 men and was the main cause of disability in 44 of them; complicated peptic ulcer or partial gastrectomy was recorded in 43, but was the main cause of disability in only 24, and in eighteen of these the working capacity was not affected (Grade D). For this reason, the number of men in whom the condition was the predominant cause of disability is also included in Table V.

 TABLE V

 COMBINED POPULATION

 Major Types of Medical Condition causing Disability in

 366 Men and the number of men having these as main causes

		Gr	All Grades			
Condition	A	B	с	D	Total	Main Cause of Disability
Disorders of the spine	4	17	34	11	66*	49
disease	5	23	15	4	47	44
Chronic bronchitis						
and asthma	4	10	26	5	45	35
Complicated peptic ulcer/Gastrectomy Psychological Tuberculosis Severe visual loss Hypertension War wounds	4† 1 1 2	6 10 3 2 5 9	18 25 10 13 10 4	19 3 15 9 2 5	43 42 28 25 18 18	24 23 25 21 8 17
Rheumatic heart	-	ľ	-	· ·	15	14
disease Epilepsy Diabetes Polyarthritis Skin disease	1 1 2 —	2 5 5 2	7 8 5 3 5	$\begin{bmatrix} 5\\ -7\\ 3\\ - \end{bmatrix}$	15 14 13 13 7	13 12 11 10 5

* Includes six with ankylosing spondylitis, five as a main cause. † Includes one with severe mental deficiency.

Disorders of the spine are the most common and half of the men are in Grade C. Coronary heart disease is the commonest condition in both Grades A and B, but 40 per cent. of those affected have not needed a change of job (Grades C and D). Complicated peptic ulcer, tuberculosis, and diabetes are most frequent amongst men in Grade D, and are thus no longer important causes of severe disability in this part of the country.

Disorders of the spine were frequently associated with other more disabling conditions, but they were still the main cause in four men in Grade A, twelve in Grade B, 23 in Grade C, and ten in Grade D. Coronary heart disease was the main cause in five, twenty, fifteen, and four men in each Grade respectively, whilst for chronic bronchitis and asthma the numbers were three, seven, 21, and four.

The numbers of men in the various diagnostic groups who had registered themselves as disabled reveal something of the motives underlying this voluntary act of registration. The only condition in which a majority of the men had registered were war wounds (94 per cent.) and occupational injuries (67 per cent.); only 15 per cent. of men disabled by other injuries had chosen to register. With diseases also, the proportions were low; between 25 and 20 per cent. of men with tuberculosis, disorders of the spine, coronary heart disease, and rheumatic heart disease were registered, and at the other extreme, no man with hypertension, diabetes, or skin disease was registered at all. These observations confirm the impression that the men on the Register of Disabled Persons are not representative of all disabled men in this type of community.

THE PROBLEM OF MULTIPLE DIAGNOSIS

Of the 366 men identified as suffering from chronic medical conditions, 138 (38 per cent.) had two or more pathologically separate conditions, and 27 (7 per cent.) three or more. There was no difference in the proportions with multiple conditions between practice and refinery (Table VI).

 TABLE VI

 PRACTICE AND REFINERY

 Proportion of Men in each Grade with Multiple Conditions

Contr	Practice		Refine	ery	Combined		
Grade	No.	Per cent.	No.	Per cent.	No.	Per cent.	
A B C D	15/23 16/30 25/68 5/39	65 53 37 13	26/54 39/93 12/59	48 42 20	15/23 42/84 64/161 17/98	65 51 39 17	
All Grades	61/160	38	77/206	37	138/366	38	

As might be expected, these men were more frequently found in the more seriously disabled grades and also in the older age groups. The question arises however whether this is purely a function of the ageing process, and the figures were studied to clarify this. The mean age of men with only one diagnosis was $44 \cdot 8$ years, that of those with two was $52 \cdot 1$ years, and that of those with three or more conditions was also $52 \cdot 1$ years, figures which suggest some age effect.

However, the proportion of men with multiple conditions in each grade of decreasing disability also fell from 65 per cent. in Grade A, through 51 and 39 to 17 per cent. in men in Grade D. The problem was examined by comparing men with multiple conditions within age groups and grades of disability (Table VII).

TABLE VII					
COMBINED POPULATION					
Number of Men having Multiple Conditions, by age and grade					

Age Group		Gr	ade		All Grader
(yrs)	A	В	С	D	All Olaucs
16-24 25-34 35-44 45-54 55-64	$\frac{\frac{1}{1}}{\frac{3}{11}}$	1 6 19 16	2 6 26 30		4 16 57 61
All Ages	15	42	64	17	138

Reference to Table IV allows calculation of the percentage of men having multiple conditions in each Grade and age group, and it becomes clear that both factors are associated with this phenomenon. The calculation of rates of multiple disability standardized for age shows that the regular progression from Grade A to Grade D is unaffected:

Observed Rate (per cent.)	Rate per cent. Standardized for Age
° 65	58
51	49
39	39
17	19
	Observed Rate (per cent.) 65 51 39 17

But standardizing for grade of disability in three age groups shows that no increase in the proportion of men with multiple diagnoses occurs over the age of 54 years.

	Observed Rate	Rate per cent.
Age (yrs)	(per cent.)	Standardized for Grade
16-44	16	19
45–54	48	48
5564	49	44

Multiple causes of impairment were found to occur in all the main diagnostic groups, but the order of frequency is largely the reverse of that observed amongst the registered disabled. Men affected by war wounds and occupational injuries rarely had a subsidiary disability, whilst those suffering from other injuries and psychosomatic and also psychological disorders, as well as disorders of the spine, frequently had more than one disabling condition.

DISCUSSION

The existing arrangements in Great Britain for the occupational protection and the welfare of disabled people are recognized as being somewhat unsatisfactory (Townsend, 1967), and some reorganization is being contemplated. There is, however, a notable lack of data upon which to base estimates of the number and types of disabled people in the population. This paper is an attempt to provide a few facts from a small sample of the male working population in Essex. As far as we can ascertain no comparable survey has been reported in this country in recent years. Several observations from this survey warrant discussion, and we hope that some of them may lead to further investigation to verify our findings.

No single method of estimating the extent of chronic disease in a community is entirely reliable when taken by itself (Morris, 1964). This also applies to the measurement of disability. Of the five main ways in which data can be obtained (hospital records, reporting by doctors, mass screening, door-to-door enquiries, and records from non-medical organizations), this survey has used mainly the second. Wilbar (1967) has discussed the inherent weaknesses of all these methods, and this survey is no exception, although we have obtained supporting evidence from personal examination of 200 men and from the records of the Ministry of Labour. The development of a comprehensive health record linkage system as envisaged by Acheson (1967) would be of great value for this type of study.

It came as a surprise that the prevalence of medical impairment of function in the practice and the refinery is so similar after adjustment for the medically unemployable and men over the age of 60 in the practice. This statistically significant similarity was unaffected even when the 179 men from the practice who were also employed in the refinery were either included in the practice population ($\gamma^2 =$ 0.204; 0.7 > P > 0.5), or excluded from both groups $(\chi^2 = 0.048; 0.9 > P > 0.8)$. This leads us to conclude that the system of employment at the refinery, which includes self-selection by the individual both to enter and to remain as well as personnel and medical selection procedures, has not resulted in a significantly lower disability rate than that found in the neighbourhood as a whole. Rejection of applicants has been extremely uncommon in recent years but was somewhat more frequent over 10 years ago; 148 (72 per cent.) of the 206 men with chronic conditions were first employed before 1952. The condition was known at the pre-employment examination in sixty men (29 per cent.) and, of those employed before 1952, forty (27 per cent.) were then known to have a chronic condition. Only with tuberculosis is the rate significantly lower in the refinery.

An overall prevalence of chronic disorders which have some effect on physical activity (all Grades) of $12 \cdot 7$ per cent. in the practice and $10 \cdot 3$ per cent. in the refinery can be compared with the rate of $11 \cdot 7$ per cent. for all men over 17 years in the United States in 1961–63 (National Health Survey, 1965).

The small size of our sample will not allow accurate comparison of prevalence of individual diseases with national surveys such as that of Logan and Cushion (1958). Furthermore, the methods of ascertainment and criteria for inclusion as a chronic disability differ from the morbidity survey which only recorded patients consulting the doctor. One comparable figure from the National Health Survey (1965) records a rate of $16 \cdot 8$ per thousand males limited by heart disease, and the rate for our combined population of men in Grades A to C was $16 \cdot 1$.

This survey has demonstrated that, for both our communities, the Register of Disabled Persons does not provide a representative sample of the disabled population, in terms both of severity and of types of illness. This is partly due to the inadequacies of the law, and also to the way in which both employers and in some cases the men themselves misuse its spirit whilst maintaining its letter. The law is designed to ease the employment problems of disabled persons, and is not concerned to the same extent with the disabled once they are employed. The "quota" system allows a registered disabled person in employment who subsequently recovers from the disability to remain as part of the employer's quota as long as he continues in that employment. This explains the apparently anomalous examples of men who occupy places in the quota but are no longer disabled. Some of the nineteen registered men who were placed in Grade D fall into this category.

On the other hand there is a considerable reluctance on the part of many disabled men to register, and the survey has shown that only half the men in Grades A and B are registered. Many of them are afraid of a "stigma" or loss of a driving licence, whilst others feel that their job will become less secure. The Ministry of Labour can refuse permission for an employer to engage additional healthy workers until his proportion of registered disabled employees reaches the quota of 3 per cent., but only 52 per cent. of firms in fact satisfy the quota (Townsend, 1967). To suggest that an employer must take on more registered disabled workers when he already employs a number of unregistered disabled men will produce a rapid rise in registrations from that factory until the quota is achieved. This occurs in most organizations but does nothing to help the unemployed disabled man.

The present system of a 3 per cent. quota which applies to all industries except fishing fleets and underground mines is clearly in need of review. The difference between Grades B and C in this survey depends solely upon the man's normal occupation, and there is a considerable difference between work places in their proportion of sedentary or indoor jobs. A refinery is dispersed over a large area and most units are in the open air. An unrestricted motor function is essential for all but a few sedentary workers, whereas some factories, where much of the work is done indoors on assemby lines or at benches. may be able to employ a higher proportion of workers with such disorders. There should be a review of the quota for different types of work places. an amendment to ensure that only currently disabled workers can hold places in the quota, and more positive encouragement for really disabled people to register.

The pre-eminent place of disorders of the spine as a cause of disablement comes as no surprise, although this group of conditions is often dispersed in other reports under various diagnostic headings varying from lumbago and cervical spondylosis to sciatica and brachial neuritis. In the morbidity survey of Logan and Cushion (1958), these disorders were the third in frequency of "patients consulting" after bronchitis and the psychological group. Table V shows that half of the men in this group have been able to continue in their normal job, and this is achieved largely by re-education of lifting technique, physiotherapy, and for a few the use of a spinal support; others do not lift weights in the ordinary course of their work. In common with the observation of Wincott and Caird (1966), we found that a major problem in the management of men who had suffered a myocardial infarction was the fear and insecurity that this condition engenders. The recent change in routine treatment of such patients by encouraging more rapid ambulation and a return to normal life as soon as possible has certainly helped considerably, and it seems likely that a study of this nature in some years' time may show a higher proportion able to continue in their normal occupation.

Chronic bronchitis and asthma combined occupy third place in the causes of disablement, and bronchitis alone was the cause in only 34 of the men. This relatively low place is supported by evidence from the large survey of sickness absence (Ministry of Pensions and National Insurance, 1965), which showed that the urban district in which both the refinery and the practice are situated had a standardized sickness duration ratio of only 48 days, less than half the national average.

As has been mentioned, complicated peptic ulceration was a main cause of impairment in 24 men, but in eighteen of these the condition was mild enough for them to be placed in Grade D. Of the remaining six men, all in Grade C, three had troublesome post-gastrectomy syndromes, two had other physical ailments which together with persistent dyspepsia justified the grading, and one man had had recurrent pain and loss of time from work from a proven ulcer for 10 years but had declined surgical treatment. The overall prevalence of complicated peptic ulceration amounted to 13.0 per thousand in the combined population, which may be compared, with the reservations already mentioned, to the figure of 16.8 for men of the same age range reported by the Research Committee of the College of General Practitioners (1962).

Multiple diagnoses proved to be common amongst the disabled. Krueger (1966) has shown that over half of all deaths in the United States in 1955 had more than one diagnosis, even after exclusion of "underlying causes". The proportion of multiple diagnoses rose with age from 29 per cent. in children under the age of 5 to 72 per cent. among persons over the age of 84. In a random sample of elderly patients from three general practices, Williamson (1966) reported that physical examinations revealed that elderly males had a mean of $3 \cdot 26$ "disabling pathological processes" each and that the rate for women was a little higher. Townsend (1967) reported that nearly half of his sample of 211 disabled persons had at least two disabilities. The present survey has shown that multiple conditions were found in half the disabled men in the 55 to 64 year age group, and that these men had a mean rate of 1.67 diagnoses each. It would appear, however, that age is not the only factor in this phenomenon and further investigation is required.

SUMMARY

The ability to work is a fundamental need and its loss or restriction can have serious consequences to the individual, his family, and the community. Despite extensive literature on the amount of ill health in the country, few epidemiological studies have reported on the extent of chronic disabilities and their effect on working capacity.

This survey in a general practice and a nearby oil refinery showed that long-term disability was present in about 11 per cent. of men of working age. Moreover, there were no significant differences between the two communities in the prevalence of disabling conditions or their effect on employment. Thus the methods of selecting workers in the refinery have not produced a healthier population.

Out of 366 men identified as suffering from chronic disabilities, 23 were medically unemployable, 84 had been forced to change their work, and 161 were limited in their ability to undertake other work. Only 108 of the men were registered with the Ministry of Labour as Disabled Persons, and it is shown that they are not representative of the whole group of disabled in terms of severity of disablement or of diagnosis.

The commonest causes of disablement were disorders of the spine, coronary heart disease, and chronic bronchitis or asthma. Over one-third of the men studied had multiple diagnoses and the evidence suggests that this phenomenon is not solely a function of age.

The results are compared with those of other studies and it is proposed that the law on the employment of the disabled should be reviewed. We should like to thank Prof. R. S. F. Schilling and Dr Muriel Newhouse for their advice and encouragement in the preparation of this paper, and also for a grant from the London School of Hygiene and Tropical Medicine towards the cost of this investigation.

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