# NEW FRONTIERS IN HEALTH

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- a review of the incidence, impact and implications of minor and unrecognised illness in the community.

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# FOREWORD

by Professor W. J. H. Butterfield, O.B.E.

Professor of Medicine,
Guy's Hospital Medical School

THIS booklet is about the future of medicine. It presents information about the many sick people who do not consult their doctor hoping their symptoms will evaporate, in contrast to the many others who strike us as having more than their fair share of our time.

From this information, it is clear that there are going to be even more changes than the adjustments we have already made to the start of a National Health Service, antibiotics, forms, vast new fields of knowledge. The old emergencies, lobar pneumonia, empyema, mastoiditis, have disappeared: doctors are being cast, whether they like it or not, in a new role as interested in and responsible for all the human frailties. This is not exactly what many of us had in mind when we started our training, but such nearly total responsibility for the larger numbers of minor illnesses — the stresses of affluence, obesity, varicose veins, haemorrhoids — is not so far from the ideals to which the profession has always aspired.

Over the next decade, the nation as a whole will move towards shorter working hours, and doctors will probably have more, not less, demand made upon them. It may be necessary to change over from medical care on demand to medical care according to need. Furthermore, there will be many

difficulties from the increasing challenge of geriatrics, chronic disease and psychiatry, especially in general practice.

To meet all this, and still have any time for its own leisure and recreation, the medical profession will have to organise itself and its ancillary staff. To organise, it will have to make decisions based on facts. To make decisions based on facts requires an accurate appraisal of the health of the nation, not necessarily as reflected in our textbooks or current statistics. Getting accurate appraisals is what this booklet is about.

W. J. H. Butterfield

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COMPARATIVELY minor disorders and diseases are often dismissed as having little significance, and those who complain of them may even be classed with the hypochondriacs. There is also a tendency to consider expenditure on the prevention and treatment of apparently minor illness as less justified than expenditure on more serious diseases. Along with these views, goes the opinion that 'health education' in the broadest sense creates hypochondria, and encourages unnecessary calls upon the health services. This paper sets out to examine the extent and impact of minor and undiagnosed ill health, and the degree to which the disregard of such illness conceals its true significance. To what extent are we right to regard deviations from perfect health as normal 'ups and downs' in the way we feel?

In the first half of the 20th century, interest was understandably directed mainly towards serious illness, such as pneumonia, tuberculosis, diphtheria, appendicitis and what was still called 'lunacy'. Although many of these diseases have been controlled or conquered most attention is still focused on the later and more serious stages of illness, and on the *complications* of underlying disorders. So far comparatively little attention has been paid either to minor disease or to the early 'silent' stages of illness. It is a characteristic of many of the most important current diseases that they develop insidiously, and may not be recognised until it is too late for effective therapy.

Minor illness and the early stages of more serious illness are difficult to separate, and each involves two distinct though overlapping concepts. The first concept covers the apparently trivial diseases of which the patient is aware, although he may or may not regard them as requiring treatment. Some of these

diseases may be the precursors of more serious conditions. The second concept covers the 'silent' illnesses, caused by mental or physical disorders of which the patient is himself unaware.

As in the Peckham Experiment the term 'diseases' will be used in this paper to describe deviations from perfect health in cases where the patient suffers discomfort and realises or believes that it has some medical significance. The term 'disorders' will be used to describe deviations from normal good health which are unrecognised as such by the patient.* Disorders may be unrecognised either because they have caused no symptoms or because the patient fails to appreciate the significance of the discomfort he is suffering. For example, cancer in the early stages may produce no symptoms so that its presence is unsuspected. Someone with a gastric disorder may have adjusted his way of life so that it causes him no discomfort. In primitive communities or amongst underprivileged groups, people often disregard quite obvious and significant deviations from perfect health. Many Egyptian agricultural workers, for example, accept haematuria caused by bilharzia as a 'normal' condition, and do not associate it with their chronic tiredness. The 'navvy' in England regards his 'cough and spit' every winter as nothing more than a 'smoker's cough' and his breathlessness as being merely due to his age.

Unrecognised disorders and untreated diseases which exist amongst the population have been described as 'the submerged part of the clinical iceberg'. Ill health which is recognised and treated makes up 'the tip of the iceberg'. This 'tip' consists of those who are aware of their illness and

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* This distinction between diseases and disorders was made in the results of medical examinations carried out during the Peckham Experiment. They defined deviations from good health as 'dis-eases' if the patient had been aware of them. In the original sense they had caused the patient subjective dis-ease. They termed other deviations from normal good health, of which the patient had been unaware, 'dis-orders'. These latter were based solely on the objective findings of the doctors. The distinction between a disease and disorder may, of course, be subjective. A person who is aware that he cannot eat a normal fatty meal without discomfort, may not necessarily describe himself as suffering from 'indigestion'. He may consider his discomfort to be no more significant than the gastric symptoms which occur after he has consumed an excess of alcohol. In this case his indigestion would be classed as a 'disorder'. It would only become a 'disease' within this definition if he regarded his discomfort as a medical problem.

## TABLE 1

Findings at routine medical examination at Peckham Health Centre. 1935-39.

*Source:* Pearce, I. H. and Crocker, L. H. *The Peckham Experiment* 1943.

| | | *Percentage* |
|---|---|---|
| Number undergoing medical treatment | 245 | 8 |
| Total suffering from disease | 812 | 26 |
| Total with identifiable disorders, but without disease | 1,954 | 64 |
| Apparently healthy | 300 | 10 |
| Total number examined | 3,066 | 100 |

have called for some form of medical attention. In general, morbidity studies record only this exposed part of the ill health which exists in the community. There are many other people who accept mild symptoms of disease without calling for medical attention; there are even more who would be found on thorough and critical medical examination to be suffering from disorders of which they are unaware. These others make up the 'submerged part of the iceberg' which usually goes unrecorded. People only become patients and can only be recorded in the morbidity statistics if they are prepared to describe their symptoms and if their condition is diagnosed professionally.

One of the first systematic attempts to assess the magnitude of the 'iceberg' was during the Peckham Experiment in the 1930s. A total of 3,066 individuals were medically examined at the Health Centre between 1935 and 1939. 2,766, or 90 per cent, were classified as suffering from some identifiable disorder or disease. Of these, only 245 had been receiving medical attention before coming forward for their routine examination. These accounted for less than a third even of the 812 who were conscious of disease. (*Table* 1).

In Peckham in the 1930s the analogy of the iceberg seemed remarkably appropriate. Less than one-tenth of those with some disorder or disease were receiving medical attention. Even allowing for the zealous recording of marginal disorders it is probable that many of the other nine-tenths could have benefitted from treatment. Their undetected disorders ranged from cancer to flat feet, and from nephritis and haematuria to vitamin deficiencies.[1] Understandably, many of the disorders found were associated with the social conditions of the 1930s. During one phase of the experiment almost a thousand cases of iron deficiency were recorded amongst 1,660 individuals examined.* In this sample, there were about a hundred cases of clinical malnutrition, 74 of rickets and 284 cases of untreated dental decay.[2]

After the Peckham Experiment, the next systematic study of minor ill health in the community was the Survey of Sickness, which formed part of the Government's Social Survey between 1943 and 1952.[3] About 4,000 statistically selected members of the general public over the age of 16 were interviewed each month, and asked about their health in the two preceding months. The Survey therefore determined only the incidence of diseases; unrecognised disorders would not be reported, as there was no medical examination. It showed that out of every 100 people who had complained of some illness, only 23 had attended their doctor. As in the case of the Peckham results, it seemed that about three out of four people who suffered from some disease either treated it themselves or left it untreated. In 1951, 75 per cent of the women interviewed and 67 per cent of the men reported that they had suffered some disease during the previous month. Although the figures cannot be directly compared, the Survey of Sickness suggested an even more widespread incidence of disease than the Peckham studies. Many of the diseases were, of course, trivial self-limiting conditions such as common colds.

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* The standard used was that of 100 per cent = 16·8 mgms. of iron per 100 c.c. of blood. A variation of more than 5 per cent from this standard was considered to justify close study and enquiry. Working with this standard, 996 cases of iron deficiency were recorded in the 1,660 individuals examined. Liver activated iron was usually an effective treatment, "in many cases raising the haemoglobin within a week or two to within the 100 per cent range".

During 1954-55 a study was conducted in a Hertfordshire housing estate by the Public Health Department of the London School of Hygiene and Tropical Medicine.[4] It investigated some aspects of both medicine given on prescription and self-medication, and it concluded that two-thirds of those interviewed had treated themselves with non-prescribed medicines during a four week period compared to about a quarter who had taken prescribed medicines.* The report of the study included the comment that "self-medication was not, on the whole, an alternative to general practitioner consultation. Among those reporting similar numbers of illnesses, those who took two or more self-prescribed medicines had higher general practitioner consultation rates than did those who took none or only one self-prescribed medicine. The majority of those who took medicines prescribed by the general practitioner supplemented them with self-prescribed medicines".

It also concluded that "taking an overall view of the consumption of medicines, although much self-prescribing, particularly of aspirins and laxatives, went on amongst the population of this housing estate, there were even larger numbers of persons suffering from one or other morbid condition who neither prescribed for themselves nor had the doctor prescribe for them. Medicines were taken for only four-tenths of the illnesses reported for both adults and children in a four-week period". This, too, suggests that there was a considerable degree of minor illness in the community, much of which was untreated.

Two separate studies of dysmenorrhea — a subject possibly still considered taboo at the time of the Peckham study, when it was reported comparatively rarely — indicated that between 45 per cent and 50 per cent of women suffer some pain during their menstrual periods. One study was conducted amongst 500 patients in ten general practices.[5] In the second study, conducted by interviewing a stratified sample of 1,000 women throughout Britain, only 18 per cent of those interviewed had *ever* consulted a doctor for this condition.[6] This is a further

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* Typical non-prescribed medicines are antacids, aspirin, cough mixtures, laxatives and linaments.

indication of the extent of disease which exists without being referred to the medical profession.

The incidence of unrecognised disorders is perhaps of more medical significance than untreated disease in the population. As the Peckham results indicated, many disorders are comparatively minor, and of little importance clinically. For example, iron deficiency, flat feet or enlarged adenoids often neither cause symptoms nor impair efficiency. However, recent studies have concentrated on disorders of more profound clinical significance. Cancer, diabetes and glaucoma are examples. Undoubtedly, cancer can sometimes be cured if diagnosed in the pre-symptomatic stage. There is evidence that diabetics may have a more favourable prognosis if they are recognised early. Blindness from glaucoma can often be prevented if the disorder is detected and treated early enough.

A comprehensive review of various studies which have been carried out into the extent of unrecognised disorders in the community was published in 1963 by J. M. Last of the Medical Research Council's Social Medicine Research Unit.[7] For a number of disorders he estimated the incidence of recognised and unrecognised cases in the 'average' general practice of 2,250 patients. Extrapolating from some of his figures, it has been possible to construct a table showing the extent to which certain conditions are recognised to exist in England and Wales and the further extent to which it is believed that they may exist unrecognised. (*Table* 2).

If these estimates are correct, the population must contain more than 2 m. untreated hypertensives, 400,000 women with untreated urinary infections, 300,000 untreated cases of definite or probable rheumatoid arthritis; as well as about 1½ m. people with conspicuous psychiatric morbidity, 300,000 with glycosuria and diabetic blood sugar curves, and almost 600,000 with signs and symptoms of bronchitis, *none of whom* are seeking medical treatment. Even allowing for some overlap between the groups, the total number of people who are unwittingly tolerating ill health to this extent would be of the order of 5 m. — more than one in ten of the adult population.

It is not possible, however, to determine the full extent of the clinical iceberg. No sample of the public likely to be

## TABLE 2

"The Clinical Iceberg". England and Wales. 1962.

*Source:* J. M. Last, *Lancet*, 1963, II, 28.

| *Disorder* | | *Number of recognised sufferers* 1,000s | *Total number including recognised and unrecognised cases* 1,000s | |
|---|---|---|---|---|
| Hypertension | Males 45+ | 170 | 620 | a |
| | Females 45+ | 500 | 2,720 | |
| Urinary infections | Females 15+ | 420 | 830 | b |
| Glaucoma | Aged 45+ | 60 | 340 | c |
| Epilepsy | | 160 | 280 | |
| Rheumatoid arthritis | Aged 15+ | 230 | 520 | d |
| Psychiatric disorders | Males 15+ | 560 | 1,200 | e |
| | Females 15+ | 1,290 | 2,120 | |
| Diabetes mellitus | | 290 | 600 | f |
| Bronchitis | Males 45-64 | 500 | 980 | g |
| | Females 45-64 | 390 | 500 | |

*Notes:* (a) casual diastolic B.P. 100 mm. Hg. and over.
(b) significant bacteriuria.
(c) early chronic glaucoma.
(d) 'definite' and 'probable' rheumatoid arthritis.
(e) 'conspicuous psychiatric morbidity'.
(f) glycosuria and 'diabetic' blood sugar curve.
(g) signs and symptoms of bronchitis.

available for medical examination will necessarily be representative. Examination can only be made compulsory for certain selective groups — those applying for life assurance, or entering certain types of employment, for example. People who come forward for voluntary examination are necessarily self-selected. A mass miniature radiography unit, for instance, may particularly attract those who suspect they have some chest disorder — or the reverse.

Further, the line which divides health from disease and disorder is indistinct, and is largely a matter of definition, either by the patient or the doctor. Even with such a dramatic disease as poliomyelitis, infection may cause entirely unnoticed development of immunity; it may result in the mildest of disease, probably recorded only as a single day slightly 'off colour'; it may cause a more serious illness resulting in transient paralysis; or finally, it may be responsible for generalised paralysis and rapid death. All these can be considered as cases of poliomyelitis; the clinical picture may range from absence of symptoms to death, and the variation between these two extremes is continuous, without clear-cut demarcations. A vigilant physician may diagnose a mild non-paralytic infection as poliomyelitis — whilst in another similar case the patient may have scarcely complained of the symptoms and consulted no doctor. The same is true of less serious illnesses. Gastric disturbances or pains of the limbs or back are diseases defined primarily by the subjective judgment of the patient. One person with these symptoms might describe himself as suffering from a disease, whilst another might accept the same sensations as normal, and declare himself entirely healthy.

Disorders, also, are defined by arbitrary standards. If blood pressure, haemoglobin and the blood sugar level are found to fall outside prescribed limits, the patient is diagnosed as suffering from hypertension, anaemia or diabetes, whether or not he feels any discomfort. The problem is further complicated because different authorities define disorders differently. There is no universal agreement on the weight above which a person becomes obese; and even particular haemoglobin levels and blood pressures are not universally accepted by different authorities in the definition of anaemia or hypertension.

The 'clinical iceberg', therefore, has no clear-cut surface, as does ice when it floats in water. There is a continuous progression from perfect health to extreme morbidity, and the frontier between health and ill-health depends on the personal definitions of the individual and his physician. The reported incidence of diseases and disorders in a community depends first on what degree of deviation from health

individuals accept personally without complaint, and second, on the extent to which clinical signs and pathological changes are recognised by the medical profession. It is often meaningless to compare morbidity statistics from communities who impose different standards, or from the same community over different periods of time, or even from different social classes within the same community at the same time. What is being measured and reported may be different in each case.

It seems likely that the standards of acceptable health in a community rise concurrently with progress in therapeutic and preventive medicine. Primitive peoples are mainly concerned with major diseases — leprosy, cholera and malaria for example. As living standards improve, the community becomes concerned with less serious diseases, so that the total *reported* morbidity increases as the people become healthier. This is the paradox of medical progress. Britain during the past 30 years illustrates a further stage in this development. As diagnostic tests are developed and more precise physiological standards applied, a larger proportion of the population are recognised to be suffering from disorders. Diabetes is one example*; and many cases of cancer may have gone undiagnosed as such during the first half of the century. Deaths due primarily to those causes were probably attributed to the secondary infections. Limitation of a person's field of vision, as a result of early glaucoma, is generally unnoticed by the patient and it is only now that cases are being recognised by skilled ophthalmic specialists carrying out routine examinations. Blood tests carried out at antenatal clinics reveal many cases of anaemia which would formerly have gone undiagnosed. It is important to remember that these 'increases' in disorders which result from better diagnosis do not imply that the disorders are more common. It is only that they are more commonly recognised.

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* In the early part of this century it was considered that about 0·1 per cent of the population were diabetic. On the basis of the currently accepted blood sugar levels and testing techniques epidemiological studies in several limited communities in Britain have consistently shown that about 1·4 per cent of the population are 'diabetic'.[8] This increase is due not only to more extensive programmes of medical screening but also to the fact that the disorder has been defined in biochemical rather than clinical terms.

Because many disorders become more prevalent in old age, the rising proportion of elderly people in the population will tend to have the effect of increasing the extent of unrecognised and untreated illness. The elderly and their families often accept disorders as a 'normal' part of the ageing process, and fail to call upon the available medical services. Williamson and others in Edinburgh conducted a survey amongst a sample of those aged 65 and over from three general practices. They reported that a "high prevalence of morbidity was found, much of it quite unknown to the general practitioner". (*Table* 3). The most significant aspect was the incidence of unrecognised mental disorders. They considered that 27·5 per cent of those seen had a recognisable degree of dementia although only 3·5 per cent had, in fact, been recognised.[9]

Even within a given community at a given time there is, and can be, no standard specification for good health. No one can, or should, expect the whole population to be 'perfectly' fit. At the other extreme, no one can regard a man as being healthy if he has a disabling and potentially crippling or fatal disorder, even if he is personally unaware of his condition. Somewhere between these two extremes there must be a level of 'acceptable' health. This level cannot simply be defined for the community as a whole. It must be determined for each individual within the community, for example, according to his type of work and more especially according to his age. An office worker requires a different type of fitness from a manual labourer. A man reaching retirement must obviously expect to have less good health than when he first started work.

Nevertheless, although it cannot be exactly quantified, there can be no doubt that in Britain at the present time there is a very considerable amount of untreated minor disease and of minor and unrecognised disorders amongst the population. Probably for every one attending the doctor, there are two or three more feeling unwell. Many others will be suffering from disorders of which they are unaware. The significance of this is two-fold. First, there may be an immediate social and economic impact for the patient, whose disorder or disease may restrict his life or impair his performance at work.

## TABLE 3

Recognised and unrecognised disabilities in those over 65 years. Edinburgh. 1962.

*Source:* Royal College of Physicians, Edinburgh. *The Care of the Elderly in Scotland*, 1963.

| *Diagnosis* | *Percentage known to be suffering by their general practitioner* | *Total percentage with disabilities (known and unknown)* |
|---|---|---|
| Disability of the feet | 5·5 | 43·0 |
| Disability of the locomotor system (excluding feet) | 21·0 | 37·0 |
| Anaemic | 1·0 | 8·0 |
| Disease of urinary tract | 2·5 | 12·0 |
| Dementia | 3·5 | 27·5 |

Second, there may be long term effects, especially from the existence of undetected disorders, which may develop into serious or fatal diseases.

# THE IMPACT OF MINOR ILL HEALTH

THE immediate impact of minor ill health is exceptionally difficult to measure whether it is due to trivial disease or to the early stages of more serious illness. This is largely because other factors overshadow it. An important local football match may cause more absenteeism than minor illness. A man's quarrel with his wife at breakfast may upset his work pattern much more than any disease — although the quarrel may, in turn, have been precipitated by some mental or physical disorder. However, although the effects of minor illness defy precise quantification it is interesting to examine the results of studies which give some indication of their impact.

The official statistics recording absence from work are a by-product of claims for sickness benefit, and thus only include absences of more than three working days. They tend, therefore, to exclude minor illnesses. Some individual employers, however, have recorded absences due to sickness lasting three days or less. These may not, of course, be representative of industry as a whole.

One of the most comprehensive studies was conducted by the London Transport Executive between 1949 and 1952.[10] Illnesses were divided into those causing absences of four calendar days or longer, supported by a medical certificate, and those causing absences of one to three days.* The latter were separated from the rest primarily because they did not always have to be supported by medical certificates. It was

* In the case of absences of one to three days, the number of days recorded as being lost will be comparatively little affected by whether working days or the total number of calendar days absence are included. Almost inevitably if the absence encompasses a weekend it will last more than three calendar days. If working days only are recorded the effect will be to transfer some absences lasting four or five calendar days into absences lasting only three working days, thus increasing the amount of short-term absence recorded. In the case of many L.T.E. employees, however, this does not apply as these men work a shift system throughout the week.

## TABLE 4

Sickness Absences. Annual average duration per person (days). London Transport Executive. 1949-52.

*Source: Health in Industry.* L.T.E. 1956. Tables 39, 40, 108 and 109.

| | *Male Bus Conductors* | | *Male Clerical and Technical Staff* | |
|---|---|---|---|---|
| *Age Group* | *Absences of 1, 2 or 3 days* | *Absences of 4 to 184 days* | *Absences of 1, 2 or 3 days* | *Absences of 4 to 184 days* |
| 20–24 | 1·60 | 6·09 | 1·60 | 3·59 |
| 25–29 | 1·09 | 5·41 | 1·65 | 3·90 |
| 30–34 | 0·74 | 5·96 | 1·55 | 5·32 |
| 35–39 | 0·55 | 6·04 | 1·37 | 7·31 |
| 40–44 | 0·47 | 6·55 | 1·32 | 7·33 |
| 45–49 | 0·55 | 9·62 | 1·46 | 7·79 |
| 50–54 | 0·52 | 14·94 | 1·27 | 9·36 |
| 55–59 | 0·51 | 19·72 | 1·53 | 12·71 |
| 60–64 | 0·51 | 23·00 | 1·59 | 14·74 |

therefore often necessary to rely on the statements of the workers themselves that they had, in fact, been ill. In these cases it would only have been possible to record subjective 'diagnoses'.

*Table* 4 shows the short-term and long-term sickness absences for different age groups of male bus conductors and male clerical workers. These show a remarkable pattern. Short-term absences remain fairly constant for all ages of clerical workers while short absences fall away sharply for conductors over the age of 24. For long-term absences, young conductors have a higher absence than young clerks. The situation is reversed in the middle age groups, but past the age of 45 long-term sickness absence increases with age much more rapidly for conductors than for clerks.

It is interesting to speculate on the reasons for some of these differences. For both groups, it would be expected that

illnesses would tend to last longer and occur more frequently as the men get older. This accounts for the increase in long-term sickness absences in the older age groups. The fact that sickness absence does not, however, increase between the age of 20 and 45 for bus conductors may be due to a process of 'selective re-employment'. Younger men who find themselves unfit for the job will tend to move off into other more suitable employment. Those still employed at the age of 40 may, therefore, to some extent, be 'self selected' from amongst those who are fit to do the job.

Short-term sickness absence will not necessarily decrease as long-term sickness increases. Although some 'short' illnesses will undoubtedly last longer as men get older, they may, as it were, be replaced by additional short-term illnesses. Such seems to have been the case amongst the clerical workers. The difference between clerks and conductors in the case of short-term illness may be partly explained by their different methods of payment. The former continue to receive their salary during sickness absence. The latter receive neither wages nor sickness benefit for a short illness. In the youngest age group, who probably have few financial responsibilities, this difference may be unimportant. However, older bus conductors, who will suffer direct financial loss if they are absent from work, may be tempted to remain on duty despite a minor disease.

This in turn could be partly responsible for the greater amount of long-term sickness absence amongst the older conductors. It is possible that the conductor who has stayed at work in order to continue earning his wages despite a 'minor' disease may precipitate a more serious long-term illness. The clerk who stays at home when he has a minor disease runs less risk of developing a serious or chronic condition.

The different working conditions of clerks and conductors, however, must undoubtedly also be a factor. In spite of any selective re-employment which might have occurred it would be understandable if some older bus conductors developed conditions which made it impossible for them to carry out their duties, whilst similar conditions might do little to

## TABLE 5

Average Days' Sickness absence per year (calendar days). London Transport Executive. 1949-52.*

*Source: Health in Industry.* L.T.E. 1956. Various Tables.

| | 1 - 3 *days absence* | 4 *or more days absence (maximum* 182) |
|---|---|---|
| Men aged 40-44 | | |
| Bus drivers | 0·40 | 6·7 |
| Conductors | 0·47 | 6·6 |
| Motormen + guards | 0·42 | 6·8 |
| Male workshop workers | 0·59 | 5·8 |
| Clerical and technical workers | 1·32 | 7·3 |
| Women aged 40-44 | | |
| Clerical workers (unmarried) | 1·76 | 11·6 |
| Clerical workers (married) | 2·63 | 15·4 |

*Clerical staff 1950-52 only.

handicap the clerks. There may also be a class difference between the general health of the bus conductors and the clerical workers.

*Table* 5 shows the average short-term and long-term sickness absences amongst various classifications of London Transport male and female employees in the age group 40-44. Sicknesses of more than three days accounted for approximately the same total absence for each of the male groups. Apart from the higher rate for clerical workers, the same is true for shorter absences also. Both long and short-term absences were considerably higher amongst women, especially those who were married. The total average absences for all age groups and all grades are shown in *Table* 6. From this it appears that minor disease was responsible for about two-thirds of a day

## TABLE 6

Average days' sickness absence for all ages and grades (calendar days). London Transport Executive. 1949-52.

*Source: Health in Industry.* L.T E. 1956. Various Tables.

| | | *Number of days* |
|---|---|---|
| Men | 1-3 days' sickness | 0·6 |
| | 4 or more days (max. 182) | 9·0 |
| Women | 1-3 days' sickness | 2·6 |
| | 4 or more days (max. 182) | 10·6 |

per year amongst men, and about two and a half days per year for women.*

Another study was conducted by the British Iron and Steel Research Association at a works near Sheffield between 1947 and 1951.[11] Amongst other causes of absence they recorded the number of working days lost through 'certificated' and 'uncertificated' sickness. With the reservations already discussed, the latter can be assumed to be caused by minor diseases. The extent of absence due to certificated sickness was similar to that in the L.T.E. study, bearing in mind that the latter referred to calendar days as opposed to working days in the Iron and Steel study.†

* There are two reasons why the L.T.E. sickness absence figures cannot be compared to M.P.N.I. statistics. First, the former record calendar days; whilst the Ministry record working days. Against this, since 1948 the M.P.N.I. figures have included those people continuing to receive sickness benefit after an absence of more than 6 months. The L.T.E. figures record absences only for six months.

† The Iron and Steel study was conducted amongst men who remained in continuous employment for four years. Presumably, those developing chronic sicknesses would be excluded, although there is no indication of the maximum length of sickness absence which was included in the study. The Iron and Steel figures applied to the whole male working populations would have given a total number of days sickness absence of about 120m. The M.P.N.I. in 1954 (the first year for which the statistics are available) reported a total number of days sickness absence for men of 195m. The difference is compatable with the probable extent of absence due to chronic sickness, and the effect of studying a specially selected sample who remained in continuous employment.

## TABLE 7

Absence due to certificated and uncertificated sickness. Park Gate Iron and Steel Co. Limited, 1947-51.

*Source:* Hill, J. M. M., and Trist, E. L. *Industrial Accidents, Sickness and other Absences.* Tavistock Publication No. 4, page 9: Table IV; page 31: Table I.

| | *Shifts lost per 1,000 shifts* | *Days' absence per year (working days)* |
|---|---|---|
| Certificated sickness | 34·4 | 7·6 |
| Uncertificated sickness | 3·9 | 0·9 |

The extent of uncertificated sickness also fell in the range indicated by the L.T.E. study. In calendar days it accounted for about one-tenth of the amount of absence caused by more serious sickness, and rather less than one day per man per year. (*Table* 7).

Based on these figures it seems reasonable to estimate the absence from work due to minor disease at about two-thirds of a day per man per year, and rather over two days per woman per year. It can therefore be concluded that minor disease, causing absences from work lasting one to three days, is responsible for a loss of the order of 25 m. working days each year. This is about one-tenth of the number of days lost through serious sickness (causing absences lasting four or more days) although in the case of short-term sickness a larger proportion of the total absences occur amongst women.

A loss of 25 m. working days a year through minor illness must have some impact upon the economy. In theory, this loss could be represented by the equivalent number of days' earnings.* On this basis, the loss would be equivalent to approximately £50 m. a year. It is more likely, however, that

* Following the marginal productivity theory, earnings tend to be equal to the value of the marginal product. That is, in theory, if one additional worker were employed his contribution to productivity would exactly equal the amount he was paid.

the larger organisations carry 'spare staff' to stand-in for those off sick. The cost to the economy of short-term sickness in the working population could therefore be represented by the overhead cost of carrying this spare capacity, which in theory would amount to the same sum. In practice, such a cost is difficult to calculate as the spare capacity for sickness would be part of that carried to replace members of staff off-duty for other purposes, such as training, holidays and so forth. The effect of short-term sickness can be even more intangible if it is offset by the remaining employees working overtime.

Apart from production lost through sickness absence, deviations from good health can affect the performance of those who remain at work. Poor vision and persistent tiredness, for example, could result in reduced efficiency. In this area, again, 'minor illness' and the early stages of more serious illness overlap, and their effects are inseparable, although the latter, if untreated, will persist and become progressively more serious. Many minor illnesses — the common cold, for example — are usually self-limiting; but even in that case there is little to distinguish between recurrent infections and a chronic upper respiratory condition.

It would be quite unrealistic to suppose that any estimate could be made of the cost of minor ill-health amongst those at work. There are, however, some examples where disabilities have impaired a worker's performance or prevented him from doing his own job. Another study by the London Transport Executive has shown that 23·6 per cent of drivers returning from lengthy sickness absence were unfit to resume driving. Although no longer ill enough to remain at home, the London Transport medical staff considered them unfit to return to their own job.[12] A study by the Industrial Survey Unit of the Empire Rheumatism Council in Scotland reported that 21 out of 340 miners had either changed their job, or wished to change, because they suffered from rheumatic diseases.[13]

It is impossible to mount controlled experiments to measure exactly the effect of disease on a person's performance. However, the regular nature of the physical and psychological changes during the menstrual cycle have provided an oppor-

tunity to study their effect on behaviour. It is likely that this may be similar to the effects of other minor disturbances caused by disorders or disease. Studies by Dalton have shown that accidents and crimes occurred significantly more frequently just before or during menstruation than at other times.[14,15] The behaviour and work of school girls also appeared to be affected by the menstrual cycle.[16,17] In one of the two surveys mentioned previously 15 per cent of women reported that dysmenorrhea occasionally interferred with their social activities, mainly because of pain.[6] Presumably, such pain would also affect their work.

There may be an analogy between the way in which minor deviations from perfect health affect performance, and the way in which it is impaired by unfavourable working conditions. Individual studies have established that heat, humidity, lighting and noise level all have a demonstrable effect on performance in certain types of work.[18] It seems likely that mild endocrine disorders, impaired vision and headaches, could be responsible for comparable reductions in efficiency.

Finally, based on police reports, the Ministry of Transport have concluded that fatal and serious accidents involve vehicle users who were ill, fatigued or physically defective in about 550 cases a year.[19] Although this represents less than 1 per cent of all such accidents it almost certainly understates the true impact of these factors.

The social and economic importance of health in industry is reflected by the fact that many large industrial organisations feel justified in employing part-time or full-time medical officers. They not only advise on the working conditions which are likely to ensure good health, but also employ ancillary staff to provide treatment for the minor illnesses and accidents which occur during working hours. In addition, in many industries and occupations, it is no longer enough to consider whether an employee is fit in the abstract. The important question — as in the case of an airline pilot — may be whether he is fit for the particular job he has to do. It is increasingly the responsibility of the Industrial Medical Officer rather than of the employee's personal physician to make this decision.

# THE IMPACT OF UNDIAGNOSED DISORDERS

COMPARED to the problems involved in assessing their immediate impact it is relatively easy to plan and carry out studies to measure the long-term effect of unrecognised disorders. However, the opportunity to detect such disorders in large samples of the population has only existed in recent years. Epidemiological studies which prove conclusively the effect of early treatment, for example of cancer of the cervix or of diabetes, necessarily take many years. In 1955, an analysis of the results of screening programmes carried out in America proved inconclusive.[20] Nevertheless, in many cases, especially since then, the indications of improved prognosis are sufficiently dramatic to demand immediate action without waiting for the results of further prospective studies.

For instance, in British Columbia, between 1955 and 1960, general practitioners screened about one-third of sexually mature women in an attempt to detect cancer of the cervix at a presymptomatic stage. As a result, the incidence of invasive carcinoma of the cervix fell by about one-third, despite an overall rise in carcinoma of the cervix throughout Canada.[21] In Czechoslovakia by the end of 1962, legislation had already resulted in more than 3 m. females being examined for cancer of the cervix. In one year they detected 4,000 cases, most of which were at an early enough stage to make a cure possible.[22] Many authorities now regard cancer of the cervix as a preventable disease, although it is still responsible for almost 2,500 deaths annually in the United Kingdom. The only question is how often women would have to be routinely examined in order to eliminate these deaths altogether.

Another dramatic example is blindness due to cataract and glaucoma. As long ago as 1953 a Ministry of Health report by Arnold Sorsby made the following comment after analysing

the blindness register: "Even more than in previous years the problem of blindness has become a problem mainly bearing on the elderly. With some 60 per cent of the newly registered being age 70 years or more the outstanding issues are the blinding affectations of old age — as is shown by the fact that cataract, glaucoma and the senile macular degenerations now account for 59·7 per cent of all causes of blindness. Nothing can at present be done for the 15·3 per cent suffering from senile macular lesions, but both cataract and glaucoma are essentially remediable affections. The high proportion of cataract patients who have not had any treatment — as much as 80·0 per cent in the present study — and the considerable proportion of glaucoma patients who are blind in spite of operation — as much as 57·8 per cent — indicate that there is room for better organisation of facilities for the operative treatment of cataract and an urgent need for better methods for the early diagnosis of glaucoma."[23]

Between them glaucoma and cataract are responsible for between 3,500 and 4,500 persons out of the total of about 11,000 added to the blind register each year. Yet there is still relatively little attempt to detect and treat cases before it is too late.

Studies on other diseases, although their results may still be unsupported by more extensive investigations, have suggested that there may be many cases in which early diagnosis and treatment are important. In osteoarthritis of the hip joint, early operations were carried out in a number of patients who were subsequently followed up for ten years. The progress of the disease had been arrested in nine-tenths of the cases.[24] Delay in treatment may not only be important in chronic disorders, but also in acute diseases. For example, an inflamed appendix is likely to rupture unless treatment is prompt. One study showed that when admission to hospital was delayed for more than 48 hours the inflamed appendices in 83 per cent of children had ruptured.[25*]

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* These figures should be interpreted with caution, as cases being admitted to hospital are *ipso facto* the more serious ones. Other cases may remain at home unrecorded. Nevertheless, there does seem to be an excellent case for early admission to hospital.

## TABLE 8

Effect of delay in treatment of rash.

*Source:* Molloy, C. C. *Transactions of the Ass. I.M.Os.* July 1958, p. 57, Table VI.

| *Duration of rash before treatment* | *Duration of rash after commencement of treatment (cases requiring more than 2 weeks' treatment)* | | | |
|---|---|---|---|---|
| | *2 – 6 weeks* | | *over 6 weeks* | |
| | *No. of cases* | *per cent* | *No. of cases* | *per cent* |
| 0 - 7 days | 36 | 86 | 6 | 14 |
| 7 - 28 days | 17 | 50 | 17 | 50 |

Even with a minor ailment such as a rash there is some evidence that a delay in initiating treatment may make eventual cure more difficult. *Table* 8 shows one of the findings from a study conducted at the Swynnerton Royal Ordnance Factory.[26*] Rashes persisted longer than six weeks in only 14 per cent of cases when treatment was started within seven days. In cases where treatment was postponed for between seven and 28 days, however, the rash persisted for more than six weeks in 50 per cent of cases. Some of this difference may be explained by the fact that cases which would, in any case, have lasted for only a short time would automatically be excluded from the second group. However, much of this effect will have been eliminated by disregarding cases in both groups which cleared up within two weeks of starting treatment.

It appears that both major illnesses and minor afflictions can be cured more easily if treatment is undertaken promptly. In diseases such as cancer, this is a matter of life and death; in the case of glaucoma, it can prevent a disastrous disability; in minor ailments it may determine the length of absence from work and the duration and cost of eventual treatment.

* Of the 150 cases included in this study, 35 were considered to be 'contact' dermatitis, 42 to be 'seborrhoea' and 32 to be eczema. The remainder were conditions such as urticaria, erythema, impetigo, lichen simplex and tinea pedis.

It has been a regrettable feature of the history of medical care in Britain that there have often been delays in introducing measures which could demonstrably improve the health of the nation. In Canada, for example, diphtheria immunisation virtually eliminated the disease as a cause of death from the early 1930s. Yet, almost a decade later, diphtheria was responsible for more than 2,000 deaths a year in the United Kingdom. It required a massive government publicity campaign in the 1940s to persuade mothers to have their babies immunised.

The use of silver nitrate drops to prevent blindness due to ophthalmia neonatorum was first proposed in 1884 by Karl Crede[27] yet as recently as 1922 in Britain ophthalmia neonatorum was responsible for 30 per cent of blindness in provincial schools for the blind. It was still responsible for nine per cent of cases in 1944, 60 years after an effective prophylactic measure had been described and advocated.[28]

B.C.G. vaccination, the enforcement of 'smokeless zones' and the wearing of car safety belts are other measures which can prevent illness or injury. Despite the fact that they have been available for many years, they have not yet been fully adopted in Britain. These delays could be due either to apathy or to a reluctance on the part of the individuals and the community to accept the costs inherent in their implementation. It seems clear that powerful advocacy is sometimes required before even the most obvious advances in the health field are put into practice.

# THE COST OF BETTER HEALTH

THE fact that the demand for medical care has persisted despite the decline of many diseases has been used to support the argument that the Health Service is being used unnecessarily, or even that Britain is becoming a race of hypochondriacs. However, an examination of the facts suggests a very different explanation. Many disorders and diseases which could benefit from medical treatment still go undiagnosed and untreated. People are only gradually beginning to except attention for these conditions. The extra demand for medical care which this creates has compensated for the reductions in the treatments of many traditional illnesses. In the past it has also been suggested that more emphasis on preventive medicine and early treatment should reduce total expenditure on medical care. Unfortunately this is an unrealist expectation.

First, there is the sheer size of the 'clinical iceberg'. Second, there is the difficulty of distinguishing between trivial illness and the early stages of more serious disorders. If the latter are to be controlled, it is likely that many less serious deviations from good health will also be corrected. This is by no means undesirable, but it involves greater demands on medical resources than would result if the early stages of serious disorders could, in some way, be isolated from the other forms of apparently minor ill health.

Third, it is likely that the early detection and control of illness will increase the proportion of 'high medical risks' in the population—people who, though otherwise living a full and normal life, require more than average medical care. Fourth, as the frontiers of health advance the population will become less willing to tolerate conditions which, in the past, they have accepted as inevitable. It is this rising expectation of health which has sometimes been confused with hypochondria,

although, in fact, it is very different from the morbid preoccupation with illness which is itself a clinical condition. Uncorrected faults in vision and hearing and the loss of all one's teeth were regarded by many as a 'normal' part of ageing before the introduction of the National Health Service. Future generations of old age pensioners will rightly expect these and other disorders to be prevented or corrected.

More and more abnormalities — such as mental defectiveness due to phenylketonuria — are likely to be shown to have a biochemical basis. As in that case, it will be possible to test for the disorder before it has a chance to do permanent harm. Both the tests, and the subsequent measures to compensate for the ideosyncrasy, may be costly.

The mass miniature radiography service costs almost a million pounds per year, and detects about 10,000 previously undiagnosed cases of tuberculosis and about 15,000 other heart and chest disorders.[29],[30] Various estimates have been made of the cost of detecting cases of cancer of the cervix and pre-cancerous lesions. It is probable that a service to screen all women over the age of 40 once every five years would cost somewhere over £1 m. a year.* The incidence of cervical cancer suggests that such a service would detect about 4,000 new cases annually. In the case of diabetes, the cost of recent surveys indicates that it would probably involve an expenditure of about £300,000 a year to screen the population for undetected diabetics once every five years.† For other disorders, comparable costs would probably be involved; although each individually could be less expensive when incorporated in a comprehensive screening programme.

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* This estimate is based on the assumption that the cytological examination of a cervical smear would cost about ten shillings—approximately the average cost to the N.H.S. of a pathological examination. Between two and two and a half million women would be examined each year. In practice it is likely that less expensive biochemical tests may be developed, but the lower cost of the tests would probably be offset by expenditure on publicity which would be necessary to persuade women to come forward for examination. It is assumed that the tests would be carried out by an expansion of existing laboratory services, and would not necessitate entirely new facilities.

† Although routine tests for glycosuria are essentially inexpensive, the organisation and publicity for diabetes surveys have usually raised the total costs to about £5 per case detected. This level of expenditure would involve a total cost of about £1·5 m. to detect the 300,000 unrecognised diabetics thought to exist in England and Wales.[31]

It therefore seems likely that, if it were possible to provide a comprehensive programme for the early detection of disorders within the existing framework of the Health Service and mainly using existing personnel, it would involve additional expenditures of several million pounds each year. If it proved necessary to set up and staff entirely new centres to concentrate primarily on this work it would probably be even more costly.

There are unlikely to be substantial savings in treatment costs to offset this expenditure. The larger number of cases being treated would absorb the savings from shorter treatments started sooner. It must always be cheaper to the Health Service if patients live and die untreated.

Irrespective of financial considerations, medical manpower in Britain cannot expand substantially over a short period, because there is an inevitable delay of almost a decade between the decision to expand the medical schools and the availability of the correspondingly larger number of trained medical practitioners. Medical auxiliaries, also, take time to train. In the short term, therefore, even unlimited finance would not enable the health services to provide unrestricted facilities for early diagnosis and treatment. Consequently, it is important that the most significant aspects of the 'clinical iceberg' should be tackled first. It would create impossible problems if all those with minor illnesses were suddenly to call for medical attention.

# THE PATTERN OF THE FUTURE

THE prevailing pattern of ill health differs from that of the past. Modern medicines, the public health services and better living conditions have made possible the control of the 'conspicuous' diseases — those which made the patient unmistakably aware that he was suffering from an illness. With the former pattern of ill health, a passive health service was perhaps appropriate. However, present-day morbidity often develops insidiously and involves comparatively minor deviations from perfect health. This presents new medical problems whose implications have not yet been fully appreciated.

The health services would need to develop and adapt if they were to cater adequately for the new pattern of diseases. The cost of this development would continue to outweigh the savings which have resulted from the conquest of traditional diseases, and would mean a rising level of expenditure on health. One way to restrain this rising expenditure would be to identify more accurately those sectors of the population who are 'at risk' for various illnesses. Another would be to develop tests which detected significant disorders as simply and unambiguously as possible.

It is unrealistic to expect that everyone should enjoy 'perfect' health, and it would be unreasonable to strive for it. Man will always be faced with more or less important diseases and disorders caused by the environment in which he exists, and which to a large extent he has created. On the other hand, there is very much that could now be done to correct disorders, to control diseases, and to raise the present general level of health. The costs which this would involve should be seen in perspective against the benefits inherent in having as healthy a community as possible.

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The Office of Health Economics was founded in 1962 by the Association of the British Pharmaceutical Industry with the following terms of reference:

1. To undertake research to evaluate the economic aspects of medical care.
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