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THE HEALTH OF THE NATION*

BY

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An occasion such as this gives an opportunity to take stock of the national health—a subject which concerns all of us. We are perhaps too much inclined as a profession to limit our vision to our success, or otherwise, in the treatment of the individual sick person who seeks our aid, and to forget that the function of doctors as a profession is to preserve health, to try to get our patients to come to us at the beginnings of disease and

not to wait until irreparable damage has been done and even heroic measures may fail to restore health. But before we can give serious thought to the preservation of health we must know what are the diseases which afflict us and what are those which cause premature death. We can then, if we look back to see what changes have occurred in the last few decades, consider the extent to which we have succeeded in reducing premature mortality, the extent to which we have failed, and what are now the most important

killing diseases. We can next examine such data as are available about the incidence of disease and ill-health as distinct from the causes of death. It might then be salutary to consider how our national health scheme is attaining or is likely to attain our objective. I regret that it is impossible to avoid the consideration of a large number of figures, which are shown in the tables or illustrated by diagrams.

Measures of Health—Mortality

Though it would be more logical to take morbidity before mortality, there is more and better information about deaths than about disease, so we should consider

first the death rate. Some of my figures will be for the administrative County of London, others for England and Wales. I have taken whichever are the more readily available to me. London has a population approximately one-tenth that of England and Wales, and the trends of mortality are the same. Fig. 1 shows the death rate of London for the past 112 years. It shows a reduction from 28.4 in 1838 to 11.7 in 1949. Cholera

caused 14,137 deaths in 1849 and 5,596 in 1866. We must remember, however, that cholera in the pre-bacteriological era was ill-defined, and that "diarrhoeal diseases" are included under the same heading. Smallpox caused 1,314 deaths in 1902 and influenza 13,085 in 1918. Scarlet fever was responsible for 3,651 deaths in 1875 and typhus fever for 3,598 in 1862.

Over a hundred years' span from 1847, when the death rate was 26.8 per 1,000, to 1947, and taking into account the difference in the age composition of

FIG. 1.—The conquest of pestilence in London (A. C.). General death rate since 1838.

the two populations, had the 1847 death rate applied to to-day's population there would have been something like 106,000 deaths in London instead of the 41,000 which actually occurred—a saving of some 65,000 lives in a single year.

Table I gives the principal vital statistics for England and Wales for 1847, 1897, and 1947. Compared with a century ago, the striking features are: (1) the population has more than doubled; (2) the crude death rate is less than half; (3) typhus fever and cholera have disappeared entirely and smallpox virtually so; (4) as causes of death scarlet fever, diphtheria, and typhoid fever are becoming rare and measles and whooping-cough much less virulent; (5) syphilis, which includes locomotor ataxia, general paralysis of the insane, and aneurysm of the

*The Purvis Oration delivered to the West Kent Medico-Chirurgical Society on December 8, 1950.

TABLE I.—*England and Wales—Vital Statistics—1847, 1897, 1947. Rate per 1,000 Population, Except for Infantile and Maternal Deaths (see Note (c))*

	1847		1897		1947	
	No.	Rate	No.	Rate	No.	Rate
Population	(a) 17,150,018		(a) 31,055,355		(h) 41,786,000	
Live births	539,965	31.5	921,693	29.7	886,820	(k) 20.5
Illegitimacy %	6.7		4.2		5.3	
Deaths:						
All causes	423,304	24.7	541,487	17.4	(e) 515,591	12.3
Diphtheria	(d) 3,338	0.19	7,654	0.25	242	0.006
Enteric fever	(b) 4,851	0.16	4,851	0.16	29	0.0007
Scarlet fever	14,697	0.86	4,577	0.15	42	0.001
Whooping-cough	9,260	0.54	11,431	0.37	905	0.02
Measles	8,690	0.51	12,711	0.41	644	0.02
Influenza	4,881	0.28	6,088	0.20	3,303	0.08
Typhus	30,320	1.77	49	0.002	1	—
Smallpox	4,227	0.25	25	0.0008	15	0.0004
Cholera	788	0.05	952	0.03	—	—
Syphilis	565	0.033	1,879	0.06	2,302	0.06
Tuberculosis:						
Pulmonary	53,317	3.11	41,642	1.34	19,753	0.47
Other forms	14,647	0.85	12,044	0.39	3,322	0.08
Pneumonia	23,447	1.37	34,835	1.12	22,658	0.54
A. Bronchitis	16,499	0.96	46,839	1.51	31,469	0.75
Other respiratory	11,169	0.65	10,064	0.32	6,611	0.16
B. Heart disease	9,704	0.57	12,109	0.39	144,570	3.46
C. Other circulatory	259	0.02	38,134	1.23	19,445	0.47
D. Intracranial lesions of vascular origin	(f) 14,952	0.87	(g) 26,860	0.86	58,224	1.39
E. Nephritis	416	0.02	10,500	0.34	12,639	0.30
A+B+C+D+E	41,830	2.44	134,442	4.33	266,348	6.37
Diabetes	383	0.02	2,426	0.08	3,528	0.08
Cancer	4,586	0.27	24,443	0.79	77,649	1.86
Violence	12,917	0.75	20,608	0.66	19,826	0.47
(c) { Deaths under 1	88,784	164	143,589	156	36,849	42*
Diarrhoea 0-2	8,306	15.38	33,340	36.17	4,790	5.44
Maternal deaths:						
Sepsis	(b) —	—	1,836	1.99	233	0.26
Other	(b) —	—	2,414	2.62	825	0.93
Total	2,442	4.52	4,250	4.61	1,058	1.19

(a) Estimated. (b) Not known. (c) Rates per 1,000 live births. (d) Croup. (e) Based on civil population. (f) Apoplexy, paralysis. (g) Apoplexy, softening of brain, hemiplegia. (h) Estimated civil population. (k) Based on total population. * The rate for 1949 is 27.

aorta, has a heavier death rate now than a century ago and there has been no reduction in the last 50 years; many of those dying now, of course, are persons treated twenty years or more ago with less effective means than are now available; (6) the tuberculosis death rate, though still very heavy, is only a quarter of what it was 50 years ago and only one-seventh of that of a century ago; (7) on the other hand, the degenerative diseases are taking a much heavier toll. The cancer death rate has more than doubled in 50 years and is seven times greater than in 1847. In a group of cardiac and vascular diseases, taken together with bronchitis and nephritis so as to overcome the changes in classification of deaths introduced by the Registrar-General in 1940, the death rate has more than doubled in a century and increased by some 40% in the last fifty years.

We must remember, however, that these are crude figures—not broken down into age groups—and some, but by no means all, of the increase is due to the ageing of the population and some is due to more accurate diagnosis and death certification.

The rate of infantile mortality, which showed little reduction between 1847 and 1897, is now only one quarter of what it was in the latter year, and the same applies to maternal mortality.

Mortality at Different Ages

In our quest for information on what are the great killing diseases, it is illuminating to find out what are the most important causes of death in the several age groups. Fig. 2 shows the general death rate, separately for each sex, by age groups in England and Wales in 1947.

Female death rates are consistently lower than male, and the lowest death rate is at age 13. It is not until 70 that the death rate rises to that of infants. Fig. 3 shows the loss of infant life, including stillbirths, up to 1 year of age for the past twenty years. In the last ten years there has been a reduction in stillbirths from 38 per

FIG. 2.—Death rates by age and sex. England and Wales, 1947.

FIG. 3.—Loss of life under 1 year. England and Wales, 1928-48.

CAUSE	DEATHS	RATE PER 1000 POP. AT THESE AGES	UNDER 1 YEAR
CONG. MALF'NS, BIRTH INJURY ETC.	11,493	12.9	
PREMATURITY	8,433	9.5	
RESPIRATORY DISEASES	7,085	7.9	
ENTERITIS & DIARRHOEA	4,606	5.2	
INFECTIVE DISEASES	1,451	1.6	
OTHER CAUSES	3,781	4.3	
ALL CAUSES	36,849	41.4	

1-4 YEARS			
PNEUMONIA	944	0.4	
TUBERCULOSIS	904	0.3	
VIOLENCE	786	0.3	
MEASLES	324	0.1	
WHOOPING COUGH	319	0.1	
CONG. MALF'NS	317	0.1	
OTHER CAUSES	2,171	0.9	
ALL CAUSES	5,765	2.2	

5-14 YEARS			
VIOLENCE	1,180	0.2	
TUBERCULOSIS	714	0.1	
DIGESTIVE DISEASES	344	0.06	
PNEUMONIA	193	0.03	
CONG. MALF'NS	188	0.03	
POLIOMYELITIS	168	0.03	
OTHER CAUSES	1,683	0.3	
ALL CAUSES	4,470	0.8	

15-44 YEARS			
TUBERCULOSIS	12,224	0.7	
CANCER	5,365	0.3	
VIOLENCE	4,935	0.3	
HEART DISEASE	4,625	0.3	
DIGESTIVE DISEASES	2,051	0.1	
NEPHRITIS	1,481	0.08	
OTHER CAUSES	11,237	0.6	
ALL CAUSES	41,918	2.3	

45-64 YEARS			
CANCER	29,391	2.9	
HEART DISEASE	27,324	2.7	
INTRA CRANIAL VASC. LES.	11,659	1.2	
BRONCHITIS	7,974	0.8	
TUBERCULOSIS	6,975	0.7	
DIGESTIVE DISEASES	5,455	0.5	
OTHER CAUSES	29,113	3.0	
ALL CAUSES	117,891	11.8	

65 YEARS & OVER			
HEART DISEASE	112,439	24.9	
INTRA CRANIAL VASC. LES.	45,613	10.1	
CANCER	42,546	9.4	
BRONCHITIS	21,456	4.7	
OTHER CIRCULATORY DIS.	15,801	3.5	
PNEUMONIA	10,011	2.2	
OTHER CAUSES	60,832	13.5	
ALL CAUSES	308,698	68.3	

FIG. 4.—Leading causes of death by age groups. England and Wales, 1947.

1,000 total births (live and still) to 23, but, nevertheless, they now equal two-thirds the number of children born alive who die in the first year of life. There are no accurate figures of the incidence of abortion, but it is fairly certain that there are more dead foetuses—that is, abortions plus stillbirths—than children who die within a year of birth. The principal killing diseases and their relative importance as a rate per 1,000 of the principal age groups are shown in Fig. 4. During the first year of life the principal cause of death is from congenital malformations and birth injuries, the rate of which has been fairly steady for some years. The next is prematurity, which at last shows a reduction compared with previous years. These three causes, which are maximal in the first few days of life, have yielded less to progress than the common infections operating later in the first year; for this reason neonatal mortality has declined much more slowly than mortality between 1 month and 1 year of age. Next in importance come pneumonia

and bronchitis, the death rate from which is substantially less than a few years ago. In the 1-4 age group the total number of deaths is greatly reduced; but pneumonia heads the list, followed by tuberculosis, mainly tuberculous meningitis, and by violence, mostly accidents in the home.

In children of school age (5-14) the highest cause of death is violence, accidents in the home being slightly commoner than road traffic accidents, and boys being involved three times more frequently than girls. It will probably surprise you to learn that the next highest cause is tuberculosis, two-thirds being non-pulmonary.

In our next age group, the first three-fifths of working life (15-44), the actual numbers of deaths are naturally over a span of years much larger than in the preceding groups, and by far the most important killing disease is pulmonary tuberculosis, followed by cancer and then violence. Heart disease now makes its appearance, causing 4,625 deaths out of 41,918.

In the remaining two-fifths of working life (45-64) pulmonary tuberculosis sinks to fifth place—actually the fourth for men and the sixth for women, though in the case of men the absolute number of deaths in this age group is not dissimilar from that in the 15-44 age group. For both men and, particularly, women cancer stands well at the top of the list, followed in each sex by heart disease. In the aged (over 65) heart disease is well at the top, followed by intracranial vascular lesions and cancer.

Morbidity

Though death certification is by no means accurate about the real cause of death, we are on even less certain ground when we consider illnesses. There are, however, several sources of information. First, there are the notifications of infectious diseases. These follow broadly

the death rates from the notifiable diseases, except that the case mortalities from scarlet fever, cerebrospinal fever, measles, and whooping-cough are much less than they were, and therefore the fall in incidence is much less than the fall in deaths. Another exception is that the incidence of notified pulmonary tuberculosis is increasing while the death rate is declining. This is no doubt associated with better case-finding by mass radiography and other means.

Hospital Records

The number of admissions to hospital and the reasons therefor are another method of ascertaining the serious

TABLE II.—*Nuffield Provincial Hospitals Trust. Summary of Stirlingshire and Ayrshire Findings, 1948*

Clinical Group	Per 1,000 of Population		
	In-patients	Patient Bed-days	Out-patients
Infective diseases	5.7	433	2.4
Neoplasms	3.0	75	2.9
General diseases	1.1	30	1.5
Diseases of nervous system and sense organs	3.3	741	11.6
Disease of circulatory system ..	2.2	112	3.0
Disease of respiratory system ..	2.8	65	3.4
Disease of digestive system ..	14.3	173	11.1
Disease of genito-urinary system and breast ..	4.2	68	5.1
Disease of skin and cellular tissue ..	1.5	33	6.9
Disease of bones and organs of movement ..	1.7	55	7.2
Ill-defined conditions and symptoms ..	1.5	28	13.5
Injuries and acute poisoning ..	5.0	109	32.8
Other defined diseases	2.5	62	8.0
Total	48.8	1,984	109.4
Pregnancy, childbirth, and complications	14.0	186	1.2
Infants born in hospital	10.1	105	—
Total	24.1	291	1.2
Grand total ..	72.9	2,275	110.6

diseases from which we suffer. Table II is based on a careful analysis in the counties of Stirlingshire and Ayrshire made by the Nuffield Provincial Hospitals Trust.¹ The number of hospital admissions in one year per 1,000 of the population, was 72.9 and the number of patient bed-days was 2,275 per 1,000 population. The figure of 72.9 includes 14.0 for admissions to maternity wards and 10.1 for babies born there. Of the remaining 48.8, 14.3 admissions per 1,000 of the population are for diseases of the digestive tract, nearly half being for acute or chronic tonsillitis, which, perhaps strangely, are included in this group; and most of the rest were for appendicitis and peptic ulcer, showing how important these diseases are when morbidity, as distinct from mortality, is under consideration. The next highest group, 5.7 per 1,000, is "infective diseases," including tuberculosis, followed by diseases of the genito-urinary tract and breast, 4.2, diseases of the nervous system and sense organs, 3.3, and neoplasms, 3.0. Injuries and acute poisoning were responsible for 5.0 per 1,000 and diseases of the bones and organs of movement only 1.7. Rheumatoid arthritis and fibrositis figure very little in the in-patient lists, though their calls on out-patient treatment are much more substantial.

The most common class of out-patients are casualties—injuries, poisonings—32.8 per 1,000 population. Ear and eye diseases and digestive diseases make up a large fraction of the remainder, while another large proportion is, as one would expect, made up of ill-defined diseases or symptoms incompletely diagnosed.

Health Insurance Statistics

When we examine the analysis of certificates for sickness benefit under the National Insurance Act, as was done by Sir George Newman in 1933,² we get a completely different picture. The number at risk was not adequately indicated, so that it was not possible to calculate rates of morbidity but only to compare the relative frequency of different diseases as a proportion of all illnesses. The five principal conditions were respiratory diseases, 25.0%; influenza, 11.8%; digestive system, 11.0%; lumbago and rheumatism, 9.0%; and injuries and accidents, 8.6%. The chief mortal diseases show comparatively low figures as certified causes of claim for sickness benefit—namely, malignant disease, 0.18%; tuberculosis, 0.72%; and organic heart disease, 1.26%.

National Morbidity Survey

Another source of information on illness is the "Social Survey" which started in 1944. The trained workers of the survey interview, at the beginning of each month, different samples of the civilian population aged 16 and over, and record the illnesses and injuries said to have been experienced during each of the two preceding months. The size of each monthly sample was initially about 3,000, but has since been raised to 4,000 (1949). The results are vitiated by faults of memory, and as they are not checked by reference to the doctor or hospital they do not purport to reflect exact diagnosis. They are, however, in several ways revealing. During the year ended September, 1947,³ the average number of persons ill in each month was 619 men and 713 women per 1,000 interviewed. The days of incapacity per year averaged 12.9 per head for men and 11.7 for women. For men up to 45 it was about 10 days, increasing to 17 at ages 55–65, and 18 at ages over 75.

The number of medical consultations in the year averaged about 4 per head for each sex up to 45, was 6 at ages 55–65, and over 7 at advanced ages. Only 23% of all people recording an illness or injury during a month had consulted a doctor during that month. The rates of prevalence of different illnesses are of considerable interest and quite different from any we have examined so far. The *monthly* prevalence rates per 1,000 of the population during the year ended April, 1947, were: colds and febrile catarrhs, 136; psychoneuroses, 126; dyspepsia, 77; constipation, 54; muscular rheumatism and lumbago, 161; headache, 112. These are, in effect, the disabling conditions of which people complain rather than a diagnosis of the cause of the disability. As perhaps might be expected, the largest number of medical consultations a month was for a psychoneurosis.

The most recent comparative information from the Social Survey appears in the *Monthly Bulletin of the Ministry of Health* for October, 1950, and relates to the first quarter of 1950. The figures are in slightly different form from those for the year 1946–7 and are for a quarter of the year when illness is most prevalent. The figures for the working age group 16–64 are: out of every 1,000 interviewed, 684 on the average during each month of the quarter had suffered from some illness or injury, and among the 1,000 there had been each month an average of 1,120* days of incapacity. An interesting point is that each month there were, among every 1,000 interviewed, 480 consultations with their doctors, and

*Some of the figures given are rounded to the nearest ten, as the published rates are per 100 instead of per 1,000.

this compares with approximately 400 in the first quarter of 1948 before there was a medical service free to all at the time of the illness.

For those over 65, the figures per 1,000 interviewed were, monthly: sickness 848 compared with 684 in those under 65; incapacity 2,150 days compared with 1,120; and medical consultations 790 against 480. In the 16-64 age group, "serious, moderate, or mild" illnesses, monthly, were 52 for men and 74 for women among 1,000 interviewed and 346 and 422 "minor or ill-defined" for men and women respectively. There is no detailed analysis, available for this quarter of the nature of the illnesses, but each month 182 per 1,000 of those aged 16-64 interviewed had developed a "cold or influenza" and 49 per 1,000 of the men and 82 per 1,000 of the women some form of rheumatism.

An interesting check on these figures is from a survey in the Eastern Health District of Baltimore, Maryland, U.S.A., during the years 1938-43.⁴ The total recorded illnesses for persons of all ages was 1,379 a year per 1,000 interviewed. Non-disabling illnesses accounted for 729 and those necessitating confinement to home or bed were 650. The annual average-number of days of disablement was 15.8 each, which is not dissimilar from our own figures of 10 days under 45 and 17 at ages 55-65. Minor respiratory cases account for 47% of all cases of illness and accident and for 41% of the cases confined to bed for one or more days, but only 13% of the number of actual days spent in bed of the total so confined. The next largest group are the minor digestive diseases, including diarrhoea and enteritis. A special study of the chronic cases included in this survey showed that the five most prevalent in order of frequency were: arthritis, heart disease (not rheumatic), rheumatic fever and rheumatic heart disease, hypertension, and psychoneurosis.

Disabled Persons

In considering the burden of disease and accident on the community the last set of figures we need to consider is the national register of disabled persons. You will remember that under recent legislation certain types of work are reserved for those on the register and that every large employer must employ disabled persons. The percentage of his total employees is prescribed, and is now

TABLE III.—*Disabled Persons Register: Nature of Disablement (From Ministry of Labour Gazette, May, 1950)*

Nature of Disablement	Ex-Service		Non-exservice		Total	
	No.	%	No.	%	No.	%
Amputations	43,164	8.0	32,904	8.3	76,068	8.1
Arthritis and rheumatism	23,659	4.4	15,517	3.9	39,176	4.2
Congenital malformations	836	0.2	14,518	3.7	15,354	1.6
Diseases of digestive system	51,825	9.6	23,924	6.1	75,749	8.1
Diseases of heart, etc.	33,142	6.1	26,111	6.6	59,253	6.3
Diseases of the lung (not tuberculosis)	44,625	8.2	29,044	7.4	73,669	7.9
Ear defects	18,756	3.5	23,918	6.1	42,674	4.6
Eye defects	28,727	5.3	32,804	8.3	61,531	6.6
Injuries of head, face, neck, thorax, abdomen, pelvis, and trunk	37,503	6.9	10,293	2.6	47,796	5.1
Injuries and diseases of lower limb*	79,007	14.6	51,137	12.9	130,144	13.9
Injuries and diseases of upper limb*	60,085	11.1	28,406	7.2	88,491	9.4
Injuries and diseases of spine*	13,386	2.5	14,575	3.7	27,961	3.0
Nervous and mental disorders	45,200	8.3	40,275	10.2	85,475	9.1
Tuberculosis	32,175	5.9	26,637	6.7	58,812	6.3
Other diseases and disabilities	29,361	5.4	24,682	6.3	54,043	5.8
Total	541,451	100.0	394,745	100.0	936,196	100.0

* Except tuberculosis.

3%. Figures published by the Ministry of Labour⁵ and shown in Table III show that the register contains 936,196 names; 13.9% are because of injuries and diseases of the lower, and 9.4% of the upper, limb; 9.1% nervous and mental disorders; 8.1% amputations; 8.1% diseases of the digestive system; 7.9% non-tuberculous diseases of the lung; 6.6% eye defects; 6.3% tuberculosis; 6.3% heart disease; and 4.2% arthritis and rheumatism.

Before leaving the subject of disabling illness, I would quote the words of Mr. Arthur Blenkinsop, M.P. (unpublished), when speaking at a centenary meeting of the Friern Mental Hospital. He reminded his audience that over a quarter of all loss of work is due to mental disturbance and that 48% of the hospital beds in the country are devoted to these illnesses.

Cost of Health Services

It is perfectly clear from the information I have been able to collect that there is an immense amount of ill-health and disability in this country, as indeed in any country. It has a crippling effect upon our national economy. The cash payments to the sick and injured by employers and by the Ministry of National Insurance must be staggering. No precise figures have been issued, but from answers to Parliamentary questions it appears that the latter are of the order of £70,000,000 in a year. The estimates for the cost of the National Health Service⁶ for 1950-1 are £405,000,000. Hospital treatment amounts to £238,000,000 and has risen steeply; dental services cost £40,000,000; ophthalmic services £24,000,000; medicines £26,000,000; general practitioner services £43,000,000—proportionately, I think we would all agree, too low.

Local health authority services under the National Health Service Act cost £34,000,000. This is a mixed bag, and only a small fraction is for real preventive services. The ambulance service takes £8,000,000 of it. I cannot give national figures for the domestic help and home nursing services, but the total budget of the Public Health Department of the London County Council for the National Health Service Act is £3,631,200,⁷ of which the ambulance service costs £632,200, the domiciliary midwifery service £223,500, day nurseries £841,700, care and aftercare services £992,900, including domestic helps £458,000, and home nursing £170,000. Some preventive services are in this total of £3,631,200: they include vaccination and immunization (£31,300 in London), health visiting and infant welfare clinics, health education, and the preventive side of chest-clinic work. I have not included day nurseries, which absorb about one-fifth of the expenditure of the London Public Health Department, as they are not provided primarily for keeping healthy children healthy but because of the socioeconomic circumstances of the mother. I agree, however, that it might be argued that they do help to keep fit a particularly vulnerable section of the child population. Probably, in all, the cost of direct preventive services does not amount to more than about 17.6% of the total cost of the local health services in London. If, however, the cost of the local health services in London is multiplied by ten to give an estimate for England and Wales, and if this latter figure is set against the total cost of the Health Service, it will be seen that only about 1.5% of the total expenditure is for direct preventive work. There must be mention, however, of other local authority services which are preventive in character. I refer to the school health service, costing £666,000 in

London, housing, drainage, collection and disposal of refuse, and the provision of open spaces. But most of these, except the first, are long-term.

It must, of course, be borne in mind that, as school and industrial medical officers are well aware, diagnosis and treatment when carried out early are, in fact, preventive in the sense that they prevent the development of more serious illness. This is an important aspect for clinicians to appreciate.

Discussion

What I have endeavoured to demonstrate up to now may perhaps be put into perspective and commented upon:

1. The total burden of ill-health and disability is enormous despite the fact that it is probably much less now than it was in former years.

2. Probably few who are working in one or other branch of curative medicine realize the relative contribution, great or small as it may be, of their own particular work to the alleviation of the total volume of human sickness.

3. The diseases which figure most in the work of an acute general hospital and in the Bills of Mortality are by no means in all cases those which are most important from the point of view of the national health.

4. In considering disease from the point of view of the national economy we must have regard to (a) its total incidence; (b) its average duration; (c) the period of life at which its incidence is highest; and (d) its preventability.

5. We must consider for each disease its aetiology and the means of preventing it. If the aetiology of any common disease is not definitely known every encouragement must be given to those who seek to find it. When it is known, preventive measures must be devised and be applied vigorously. In this connexion I would make an earnest plea to clinicians to think more and more about means of prevention and to take any ideas which occur to them to their public health colleagues, who will be only too willing to carry out further investigations and endeavour to apply preventive measures.

6. With regard to the individual patients, it is doubtful whether sufficient attention is paid by their medical attendants to inquiry into exactly why they fell ill at that particular time and to the giving of advice on how the patients can, in future, prevent a further breakdown in health.

7. The most important diseases from the national point of view are: minor catarrhal and respiratory infections; nervous and mental diseases; rheumatic manifestations—acute and chronic; tuberculosis; and heart and digestive disorders. If consideration is given to diseases which cause loss of working years of life by prolonged illness or death, tuberculosis is much more important than cancer.⁹ Lives saved in early manhood are much more important than prolongation of life of the aged.

8. Accidents are a fruitful cause of impaired capacity and loss of public money. More should be done to forewarn the public and inform them of how accidents both at home and in the street can be avoided.

9. The lag between a discovery in preventive medicine and its application should be reduced. B.C.G. vaccination against tuberculosis was discovered 30 years ago. In this country it is only now being applied. Immunization against diphtheria was also discovered over 30 years ago, but only from 1941 has it been vigorously commended to the public of this country. In the years before 1941 the deaths from diphtheria numbered about 2,500 a year and the cases 45,000. Deaths now number 200 in a year and cases 4,000. The saving of hospital beds amounts to about 5,000 and, assuming the low cost of £14 per patient a week and an average duration of stay of seven weeks, the annual saving is nearly £4,000,000. The cost of immunization is proportionately almost negligible.

10. Preventive medicine often involves the discovery of early failures to maintain good health so that a chain of disease which may have serious consequences may be broken at the beginning. Mass radiography of the chest and contact examinations at chest clinics are examples, but they are more or less futile if, when the early case of tuberculosis is found, those who need admission to a hospital have to wait months. Routine medical inspections of school-children are another method of discovering the beginnings of disease. One of the fruits of this has been the L.C.C. scheme for dealing with juvenile rheumatism, with, as its objective, a reduction in the incidence of and mortality from rheumatic heart disease.

11. The psychoses and psychosomatic illnesses are probably the greatest single group of causes of unhappiness and inefficiency. Increasing attention is being given to preventive psychiatry, but, beyond a realization that many cases of juvenile maladjustment and adult mental illness arise from wrong handling of the infant and young child, little is yet known, and even that which is known is seldom applied.

The above are but a few examples of the reflections which occur to me on considering the facts included in the first part of this address. It must be clear to all that a considerable proportion of the man- and woman-power and of the wealth of this country is being used in an endeavour to make our people healthier. We have a great National Health Service, but it is mainly for the cure of disease, and more and more money is required for this purpose. It is for administrative purposes divided into three sections: (1) the hospitals and specialist service; (2) the general practitioner, general dental, pharmaceutical, and supplementary ophthalmic services; and (3) the local health authority services. I wish, however, to emphasize that there is only *one* health service, not *three*, and each must play its proper part in both the curative and the preventive services.

The hospital and general-practitioner sides have important parts to play in the preventive services by the giving of advice on aftercare and prevention to their individual patients,⁸ and by endeavouring to fathom the reasons why particular diseases are specially prevalent in any locality or group of people. Often this can best be done by keeping good records and calling upon the local health officer to help to solve the problem. As already mentioned, the local health authorities' services include some which belong to the curative field—for example, home nursing and aftercare—and, in these, close co-operation with the other two branches is required, but the essential part of the work of local health authorities is to employ experts in the preventive field.

I plead for a much closer relationship between the health officer and his staff and those engaged primarily on the curative side. If for no other reason than the mounting cost of the curative services, more and more attention will have to be paid to prevention. The health officer cannot, however, attempt to apply general preventive measures unless he has accurate knowledge of the incidence of disease in his area, and this means the keeping of records in such a form that they can be analysed by districts, places of work, occupations, etc. Much useful information can be obtained and thoughts formulated by general conversation in the nature of "shop." One of the great values of comprehensive health centres, where both general practitioners and public health doctors will work in the same building, will be this close personal contact between the two groups so that each can call upon the other to help solve either problems relating to individual patients or more general problems relating to the prevention of disease in the locality.

Similarly, it would help to facilitate this exchange of views and a realization that both sides form a team if the local health officer could have some attachment to his local hospital and be welcomed in their common-rooms and committees as one of themselves.

I must apologize for presenting so many figures, but it was essential to a proper understanding of what is the burden of ill-health which it is the duty of our National Health Service to try to reduce. My main thesis is that it is only by a "teaming-up," as they say in America, of the curative and preventive sides that progress can be made.

I wish to express my indebtedness to Mr. Benjamin and Mr. Gore, of the Statistical Section, and to Mr. Trendell, of the Library and Information Section of the Public Health Department of the London County Council, for valuable help with the figures and references.

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USE OF CORTISONE IN DISEASES OF THE EYE*

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The dramatic results obtained by Hench *et al.* (1950) in the treatment of rheumatoid arthritis by the systemic use of cortisone gave rise to the hope that cortisone would be a helpful therapeutic agent in those ophthalmic conditions that seem to have an allergic origin. It had also been found that certain ophthalmic diseases were benefited in patients who were being treated for rheumatoid arthritis with systemic cortisone (Moore *et al.*, 1951).

When this investigation was begun (July, 1950) there were no publications available to us dealing with the local use of cortisone in the treatment of ophthalmic lesions. It was therefore necessary, in the first place, to find out by clinical trial the optimum dosage and the most suitable method of administration. We found that the instillation of a drop of cortisone acetate suspension into the conjunctival sac did not produce any irritative reaction. As a number of therapeutic agents which are used in the local treatment of ophthalmic conditions

have their maximum therapeutic effect when injected subconjunctivally this method of administration was next tried, and likewise produced no irritative symptoms when administered in the concentration and volume mentioned below.

The cortisone used was generously given free by Dr. James M. Carlisle, Medical Director of Messrs. Merck & Co., to the Medical Research Council of Ireland through Professor Henry Moore; for this investigation it was in the form of cortisone acetate ointment (25 mg. per g.) and a 2.5% suspension in saline (25 mg. per ml.) for instillation, both being bland when introduced into the conjunctival sac.

Parallel Work

It is of interest that other investigators, working independently, have come to similar conclusions about dosage and mode of administration and adjudge the therapeutic value of cortisone, in the main, much as we do. The first report was by Henderson (1950). Steffensen *et al.* (1950) record the use of a saline suspension of cortisone administered topically (4 volumes of isotonic saline to 1 volume of the original crystalline cortisone suspension) in four ophthalmic cases. These cases had, in addition, received systemic treatment with A.C.T.H. and cortisone. One of these, a case of luetic interstitial keratitis, showed continued improvement with the use of cortisone topically after the systemic treatment with cortisone had been suspended. Woods (1950) reports upon the use of cortisone locally in eight cases. Only one of these received systemic cortisone in addition. He concludes that cortisone administered locally in the conjunctival sac has a profound effect in the control of external ocular inflammation, the beneficial effect being uniformly observed after two to four days' intensive treatment, but that it has not yet been demonstrated that cortisone has any effect on the exudation in the vitreous. Koff *et al.* (1950) report that, out of nine patients with acute or acute recurrent iritis treated with subconjunctival injections of cortisone, eight were decidedly improved. They injected 0.2 to 0.4 ml. (25 mg./ml.), the injections being repeated in 48 to 72 hours where necessary.

Present Investigation

As our investigation was a clinical one, and as most of the cases were being treated by the local use of cortisone, it was considered that laboratory tests would not be of assistance in helping to regulate the dosage.

The use of cortisone locally in ophthalmic conditions has advantages. When used locally, such small quantities are required that the cost of the hormone is not a serious obstacle and no side-effects need be feared. The impression gained was that the method of choice is in the first instance by subconjunctival injection followed

*Third Report of the Cortisone Clinical Subcommittee (Professor Henry Moore, Chairman and Clinical Director, Professor W. J. E. Jessop, and Dr. D. K. O'Donovan) to the Medical Research Council of Ireland. Three circumstances led to this work being undertaken: (a) the first case of rheumatoid arthritis treated by our cortisone team also suffered from severe episcleritis; on the fifth day of intramuscular cortisone treatment the episcleritis had completely disappeared; (b) a short time after that observation Henderson's work in the Mayo Clinic on the use of cortisone in ophthalmic diseases became known to us; and (c) the free gift of cortisone preparations for use in ophthalmic diseases became available to us. Consequently, the Cortisone Clinical Subcommittee of the Medical Research Council of Ireland requested Drs. Lavery, Werner, O'Donoghue, Guinan, and Macdougald to undertake the study described in this article under its general direction.