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MINISTRY OF HEALTH

MEMORANDUM ON INFLUENZA

(REVISED EDITION)

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MINISTRY OF HEALTH

MEMORANDUM ON INFLUENZA

I.—INTRODUCTION.

Since the pandemic of 1918-9 influenza epidemics in England and Wales have shown a decided preference for the first quarter of the year. In the 52 quarters from mid-1920 to mid-1933, the deaths assigned to influenza in England and Wales ranged from 2,306 to 23,927 in the first quarters, but never exceeded 4,013 in the second, 705 in the third and 2,362 in the fourth. Only in 1923 and 1926 were the first quarter's deaths exceeded by those in any other quarter.*

The accompanying chart shows the number of deaths from influenza and from all forms of pneumonia during the period 1913-37. The devastating mortality in 1918-9 may be explained by a change either in the virulence of the influenza virus or in the type and frequency of bacteria co-operative in producing respiratory complications. Whatever condition was responsible, it was perhaps not new; there were clinical features suggestive of its presence, though to a much less extent, in 1916 and 1917, but since 1919 it has fortunately not recurred in man.†

Apart from its severity, the most noteworthy feature of the 1918-9 pandemic of influenza was the change in the age incidence of the deaths from the extremes to the middle years of life. Young adults were specially affected, not only in this country, but also in France and in America. The largest proportion of deaths occurred in persons under 45 years of age. This characteristic has been absent in subsequent outbreaks.

Deaths attributed to influenza are generally due to pulmonary or cardiac complications, and not to influenza itself; influenza, if uncomplicated, produces a short, sharp illness from which recovery is usually rapid. In severe and fatal cases the intervention of some organism has usually been demonstrated. This invasion has doubtless been facilitated by a lowering of resistance produced by the influenza virus. The occurrence of pneumonia, or other respiratory disease, is one of the commonest effects of such an invasion, particularly in the autumn and in the spring. On an average, respiratory complications are recorded in 70 per cent. of fatal illnesses classified as influenza.

* Stocks, Percy. *Lancet*. Lond. 1935 II, 386.

† A few cases recalling in appearance the dreaded "heliotrope" form of the 1918-1919 epidemic were, however, reported during the influenza prevalence of 1933.

Influenza passes very rapidly through a community and the fact must be accepted that in epidemic periods most members of the community who go about their ordinary vocations must expect to be exposed to infection and many to have the illness in some form or other, all scientific investigations notwithstanding. Nevertheless, it is the duty of the individual not only to do the best for himself in case of attack, but, as much depends on the intensity and dose of the infection, to do his best also to avoid infecting others. It is likewise the duty of public health authorities to take any practicable steps, (a) to lessen the opportunities of infection, (b) to assist in the treatment and nursing of individual cases, and (c) to help to mitigate the hardships and risks which often result when several members of a household are simultaneously attacked.

In these circumstances it will be convenient here, first, to restate for public information some of the principal known facts regarding influenza and, secondly, to review the experience of local authorities.

II.—GENERAL OBSERVATIONS ON INFLUENZA, AND THE INDIVIDUAL ACTION REQUIRED WHEN THE DISEASE IS PREVALENT.

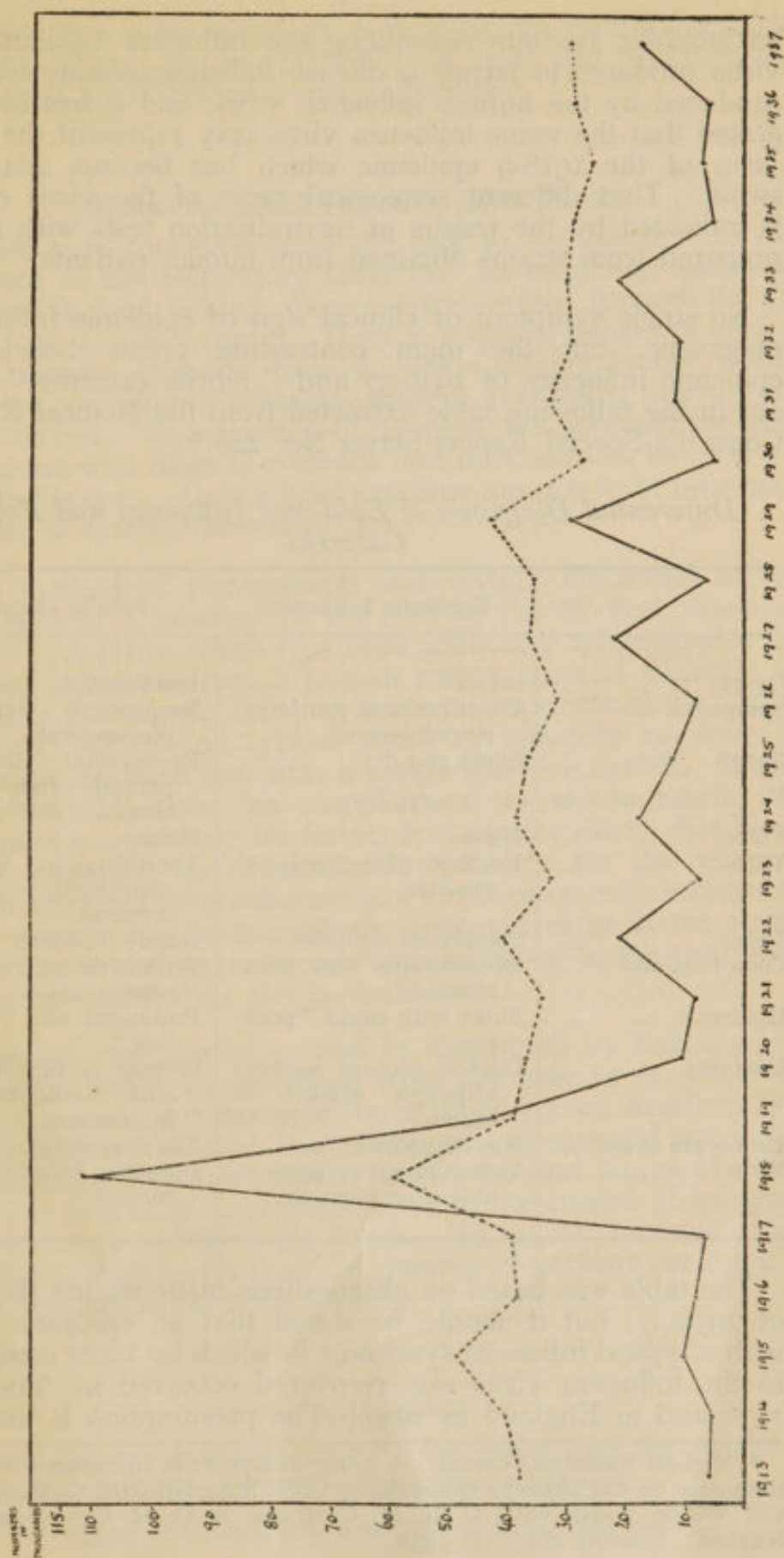
The Report on Influenza* published by the Ministry in 1920 reviewed and brought up to date our knowledge of the epidemiology of the disease. Since then other investigations have been initiated under the auspices of the Ministry, and a comprehensive study has been made of the flora of the nose and throat with particular reference to the organisms associated with the complications of influenza and the possibility of correlating changes in their distribution with the occurrence of epidemics. It is hoped shortly to publish the results of this investigation. The question of the relationship of associated organisms, including the bacillus of Pfeiffer, to influenza has, however, taken a secondary place since the discovery, in 1933, by the staff of the National Institute for Medical Research, of a filtrable virus in the nasopharyngeal washings of patients.

One of the chief difficulties in accepting Pfeiffer's bacillus as the essential causal factor in influenza was the absence of this organism from a large proportion of patients in the summer outbreak of 1918. This observation supported the view that the bacilli, when present, were, like pneumococci and streptococci, secondary invaders in a disease primarily caused by an unknown virus. Prior to the discovery of the presence of a virus, it had been shown by Shope that an influenza-like disease in swine was caused by a filtrable virus acting in association with a

* Reports on Public Health and Medical Subjects No. 4.

ENGLAND AND WALES.
INFLUENZA AND PNEUMONIA DEATHS, 1913-1937.

— INFLUENZA - - - - - PNEUMONIA



haemophilic bacillus resembling the influenza bacillus. This virus produces in ferrets a disease indistinguishable from that produced by the human influenza virus, and it has been suggested that the swine influenza virus may represent the human virus of the 1918-9 epidemic which has become adapted to swine. That different serological races of the virus do exist is indicated by the results of neutralisation tests with antisera prepared from strains obtained from human patients.

No single symptom or clinical sign of epidemic influenza is diagnostic, but the main contrasting points between the epidemic influenza of 1936-37 and "febrile catarrhs" are set out in the following table extracted from the Medical Research Council's Special Report Series No. 228.*

Differential Diagnosis of Epidemic Influenza and Febrile Catarrhs.

	Epidemic Influenza.	Febrile catarrhs.
Onset	Sudden.	Insidious.
Symptoms	Constitutional symptoms preponderate.	Respiratory symptoms preponderate.
Cough	Short and dry.	Paroxysmal, irritating, painful, often productive.
Voice	Husky.	Hoarse.
Throat	Posterior pharyngitis; no exudate.	Tonsillitis as well as pharyngitis; exudate common.
Fever	Sometimes diphasic.	Rarely diphasic.
Complications	Bronchiolitis and pneumonia.	Bronchitis or bronchopneumonia.
Epidemic	Short with rapid "peaking".	Prolonged and "grumbling".
Contacts	Clinical picture uniform although graded in severity.	Clinical picture variable with frank tonsillitis in contacts.
Leucocyte count	Not diagnostic	Not diagnostic.
Virus	Influenza virus recoverable from pharynx.	Influenza virus not concerned.

The table was based on observations made during the winter of 1936-37, but it should be stated that an epidemic disease with a typical influenza syndrome in which no virus comparable to the influenza virus was recovered occurred in America in 1936 and in England in 1939. The presumption is that there

* Medical Research Council. A Study of Epidemic Influenza with Special Reference to the 1936-37 epidemic by C. H. Stuart-Harris, C. H. Andrewes and Wilson Smith with D. K. M. Chalmers, E. G. H. Cowen and D. L. Hughes. London, H.M.S.O. 1938.

are other infections which may be clinically indistinguishable from that due to the known influenza virus and in which the aetiological agent remains still unidentified.

Means by which Infection takes Place.

Infection is conveyed from the sick to the healthy by the secretions of the respiratory surfaces. In coughing, sneezing, and even in loud talking, these are transmitted through the air in the form of a fine spray. There is a special danger of receiving a massive infection from a person talking loudly within 4 feet, or coughing or sneezing, without interposing any screen, within 10 feet. The channels of reception are normally the nose and throat, and there is evidence that infection can be received through the eyes. Only a brief exposure appears to be necessary in order to contract infection.

The method of transmission was vividly illustrated in the experience of a member of the staff of the Medical Research Council. A ferret which had been artificially infected with the virus of influenza from a human source sneezed violently as he was examining it. After 45 hours he experienced the abrupt onset of a sharp and typical attack of influenza reaching its climax on the third day with a temperature of 102° F. Washings obtainable from his nasopharynx up to the fourth day were infective not only for ferrets but also for mice. His blood serum contained no demonstrable antibody for the virus of human influenza before the incident but subsequently indications of the presence of such antibody appeared early in the course of the attack and were strongly developed up to the thirty-first day, after which they slowly declined.*

Infection can also be carried to the mouth by hands which have been soiled by secretions from the nose or throat of an infected person; for example, by a soiled pocket handkerchief. It appears probable that, in everyday life, intense and temporary overcrowding in trains, trams, omnibuses and places of entertainment is a more important factor in the spread of influenza than is overcrowding in the home. No regular increase of the attack rate with increase of the number of persons per room in urban tenements has been proved.

Incubation.

The available evidence favours the belief that the period of incubation is about 48 hours or even somewhat less.

* Report of Medical Research Council, 1935-1936, page 14.

Immunity after Attack.

There is evidence that an attack of influenza may, for a few months at least, confer some degree of immunity against a second attack.

Persons attacked by influenza in the summer of 1918 suffered less than the rest of the population in the following autumn epidemic. Relatively, there were also fewer severe and fatal cases in the autumn among those who had previously been affected in the summer. This rule has, however, been subject to a sufficient number of exceptions to make it probable that some strains of the virus do not protect against second attacks; or possibly they only protect against the same strain.

Measures of Personal Protection.

The dangers of influenza are greatly increased by complications which may develop without previous signs of severe illness.

Ventilation.—Well-ventilated airy rooms promote physical well-being and fresh air dilutes and dissipates infective material.

Gargles.—Gargling has been recommended as a preventive measure, though its importance should not be over-rated. It may be employed with advantage after exposure to infection in a crowd or close contact with an infected person. Various antiseptics have been recommended, and a simple and agreeable gargle is made by adding a tablespoonful of compound glycerine of thymol to a tumbler of warm water or by adding sufficient permanganate of potash to give the water a pink colour (1 part of permanganate in 5,000).

Face Masks.—The public are not advised to make use of face masks. By hindering the free circulation of air through the nasal passages they cause congestion of the mucous membrane and thus may induce greater liability to attack. Temporary use of surgical masks by those in attendance on the sick may, however, be occasionally desirable.

Protection by Vaccines.—The inoculation of human beings with an inactivated preparation of the virus which is believed to be the cause of influenza has been attempted and is in the experimental stage. Whatever may be the view with regard to the aetiological significance of the bacillus of Pfeiffer there is no question as to its almost constant association with influenza and of its being an important factor in the production of fatal sequelae. Of the other secondary invaders, pneumococci and haemolytic streptococci are the most important.

Such direct evidence as the Ministry has been able to obtain of the prophylactic value of vaccines made from killed emulsions of these organisms is not favourable but, on the other hand, we have the testimony of a number of competent observers which seems to show that such vaccines may be of service in certain cases in diminishing the severity of the attack and in warding off or minimising the gravity of complications.

Protection by drugs.—No drug has proved to have any specific influence as a preventive of influenza.

Needless exposure.—It is evident that during influenza prevalence, the risks of contracting the disease may be diminished appreciably by abstaining, wherever possible, from attendance at social or other gatherings at which a large number of persons are to be present.

Precautions when Attacked.

At the first feeling of illness, the patient should *go to bed in a room by himself, keep warm, and seek medical treatment.* The doctor, if called in immediately, is afforded the opportunity of giving advice or treatment which may ward off the more dangerous complications. Relapses and complications are much less likely to occur if the patient goes to bed at once and remains there for two or three days after his temperature is normal; much harm may be done by getting up too early.

The secretions of the patient are most infectious in the early stages, but isolation should be maintained until the temperature has been normal for 24 hours.

The liability of nurses to infection may be diminished by adequate ventilation of the patient's bedroom and by avoiding inhalation of his breath, particularly when he is coughing, sneezing or talking. The risk of conveyance of infection by the fingers must be constantly guarded against, and the hands should be washed at once after contact with the patient or with his secretions.

The virus of influenza is easily destroyed, and extensive measures of disinfection are not called for. Sputum should be received in a suitable receptacle in which is a solution of chloride of lime or other disinfectant. Discarded handkerchiefs should be immediately placed in disinfectant or, if of paper, burnt.

The patient's recovery should be fully established before he returns to work.

III.—ACTION BY SANITARY AUTHORITIES TO COMBAT INFLUENZA OUTBREAKS.

It is desirable that authorities should make widely known full information respecting the local facilities which are available in the district. Thus:—

How to apply for nursing assistance.

Special arrangements, if any, for the provision of domiciliary medical attendance.

How to apply for "home help".

Special arrangements made during an epidemic at public kitchens, crèches, etc.

Hospitals available.

Ambulance service or first aid available.

Other necessary local information.

Notification.—Under the Public Health (Pneumonia, Malaria, Dysentery, etc.) Regulations, Acute Primary Pneumonia and Acute Influenzal Pneumonia are compulsorily notifiable in all districts in England and Wales, but it has not been thought advisable to make influenza a disease which is compulsorily notifiable throughout the country. Regarded merely from the statistical standpoint, the value of influenza notification returns is limited, both on account of the numberless unnoticed cases not seen by a doctor, and of the uncertainties often attaching to the significance of the term "influenza". Better prevention of this disease cannot be expected as a result of its notification; while the notification of all "influenza" does not help local authorities to the knowledge of those cases where assistance to the individual patient or his household is most needed.

It may be possible to make a useful arrangement with local medical practitioners whereby all cases in which the assistance of the local authority is required, in the form of nursing, home help, or institutional treatment, are notified voluntarily to the Medical Officer of Health.

Closure of Schools.—This measure may sometimes be employed with advantage, particularly in rural and small urban districts where the excluded children have few opportunities of coming in contact with each other outside the school; it is of little utility in densely populated urban areas. Where the closure of day schools is resolved upon, the Sunday schools should also be closed. Children showing symptoms of influenza should be excluded from school.

Public places of entertainment are justifiably regarded as important centres of the spread of the disease. By the terms of their licence the proprietors of many cinema theatres are

compelled to exclude in certain circumstances from their performances children of school age and to provide intervals for the efficient perfilation and ventilation of the building.

Disinfection.—The routine disinfection of premises and articles after use by influenza patients is not called for, but a thorough washing and cleansing of rooms and their contents and of washable articles, bedding or apparel is desirable. The practice of spraying halls and places of public resort with a disinfectant fluid is of doubtful utility.

Provision of institutional treatment.—A local authority will find it helpful to use one or more wards of the Isolation hospital to supplement the accommodation provided by the General Hospitals and Public Assistance Hospitals, but care is required in the selection of cases for removal to hospital. It should be remembered that, as a rule, patients with pulmonary complications bear removal badly and, therefore, it should only be attempted with the concurrence of the medical practitioner in attendance. In hospital, the patient should be isolated by screening or otherwise, and ambulance and nursing attendants should observe all precautions usual in treating an acutely infectious respiratory disease.

Ministry of Health,
Whitehall, S.W.1.

November, 1939.

