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Influenza: Its Control in Persons and Populations

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> It began with a roughness of the jaws, small cough, then a strong fever, with a pain of the head, back and legs; it felt as though there was a weight over the breast and at the stomach; all which continued to the third day at the farthest; there the fever went off with a sweat and bleeding at the nose. In some cases, it turned to pleurisy, or fatal peripneumony [1].

This case description is from what surely was an influenza epidemic in the year 1557 and is similar to influenzal illnesses seen currently. The pattern of occurrence of influenza is for millions of such cases to occur in epidemics. Hippocrates referred to an epidemic in the year 412 B.C., and history has recorded many influenza epidemics and pandemics since that time.

In 1974, an Influenza Research Center (IRC) was established at Baylor College of Medicine (Houston). It has been devoted primarily to obtaining answers to many of the epidemiological questions relating to influenza and to the evaluation of approaches to control. This presentation will summarize some of the major features of the epidemiology of influenza elucidated over the past 11 years and discuss the current status of options for influenza control. For this purpose, we shall draw primarily from data of studies conducted by the IRC.

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Informed consent was obtained from patients or their guardians, and guidelines for human experimentation of the U.S. Department of Human Health and Services and those of the Baylor Institutional Review Board for Human Studies were followed in the performance of clinical investigations.

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Epidemioligical Features of Influenza

The IRC has conducted a surveillance of the city of Houston for influenza by culturing specimens from persons seeking health care for febrile respiratory disease at sentinel public clinics and private physicians' offices throughout the community. Sampling of cases for influenza viruses has continued throughout the year for the 11 years since the IRC was established.

An epidemic of influenza occurred in each of the 11 years of surveillance (figure 1). Although comparable surveillance has not been conducted in other geographic areas in the United States, it seems unlikely that the Houston experience is unique; it is more reasonable to suggest that annual epidemics are a general feature of the current epidemiology of influenza. Thus, the previously proposed frequent occurrence of nonepidemic years does not appear to reflect the current experience.

The well-known peak of occurrence of respiratory disease in the winter and trough in the summer were features of each year of the surveillance, and the peak of illnesses each winter coincided with the peak of isolation of influenza viruses.

The viruses. A predominant virus or viruses was recovered in each epidemic; the distribution by type and subtype is shown in table 1. Type A (H3N2) viruses were the epidemic viruses in the first two years of surveillance and every two or three years thereafter. The type A (H1N1) viruses have been detected in every year since first appearing in 1977, but they predominated in only one year. Type B was detected in 10 of the 11 years and was dominant about every two or three years; these viruses shared dominance