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National Influenza Experience in the USA, 1968–69

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An extensive outbreak of Hong Kong influenza occurred in the USA during the autumn and early winter of 1968–69. Introduction and seeding of the virus occurred in September and early October as individuals returned from the Far East. Civilian outbreaks did not develop until late October and November. By 28 December, all States had experienced influenza outbreaks. Limited information concerning age- and sex-specific attack rates indicates that all age segments of the population were equally involved. Significant excess pneumonia–influenza mortality occurred in all 9 geographical areas of the country and followed influenza activity by several weeks. Influenza B activity was documented in 37 States during the winter.

The first Hong Kong influenza virus to be isolated in the USA was obtained in Atlanta, Ga., on 2 September 1968 from a Marine Corps major who had just returned from Viet-Nam. The night before his departure from Viet-Nam he had shared a bunker with a friend who had just returned from Hong Kong. During that same week an outbreak of influenza occurred in a Marine Corps Drill Instructors' School in San Diego, Calif. Of 49 students, 22 had an influenza-like illness, as did 9 contacts in 4 families. Hong Kong virus was isolated from 9 of the throat washings from 21 students. The source of the virus in this outbreak was not determined. In mid-September 3 additional outbreaks among military personnel, traced to persons returning from South-East Asia, developed in Alaska and Hawaii.

On 6 September a letter was sent to all State health officers, epidemiologists, and laboratory directors asking their co-operation in " monitoring the importation of the virus and in conducting surveillance for influenza ". The author was given the responsibility of collating the data submitted. Summaries of the many reports received were published regularly in the *Morbidity and Mortality Weekly Report*. This paper presents a consolidation of those data.

Throughout September isolated cases, with little evidence of secondary spread, continued to occur in the civilian population. By mid-October, 16 widely scattered States had documented individual cases indicating that extensive seeding of the virus had taken place. Most of these patients had recently returned from the Far East. As shown in the upper left map of Fig. 1, most of these cases occurred in the eastern part of the country.

The first outbreaks in the civilian population developed in Puerto Rico and Alaska in late September and early October. The first outbreak in a civilian population in the continental USA did not develop until the third week of October, when the small desert city of Needles, Calif., reported an influenza-like illness involving 35%–40% of the population. The situation at this time is shown in the upper right map of Fig. 1. The remaining maps of Fig. 1 trace the spread of influenza outbreaks in the civilian population during the ensuing weeks, the shading indicating the week during which an outbreak first occurred in each State. (The solid lines on the maps divide the country into the 9 principal geographical areas.) Between 19 October and 9 November, outbreaks developed in 4 additional western States and Hawaii. Outbreaks did not occur on the East Coast until 1 month after the Needles outbreak, and were first reported from Pennsylvania and New Jersey during the week ending 16 November. The left-hand map in the third row of Fig. 1 shows the 21 geographically scattered States that reported influenza activity by 23 November. The remaining maps trace the development of outbreaks during December. Note that the Southeastern and South Central areas were the last to experience outbreaks. By 28 December, the influenza epidemic had involved all 50 States.

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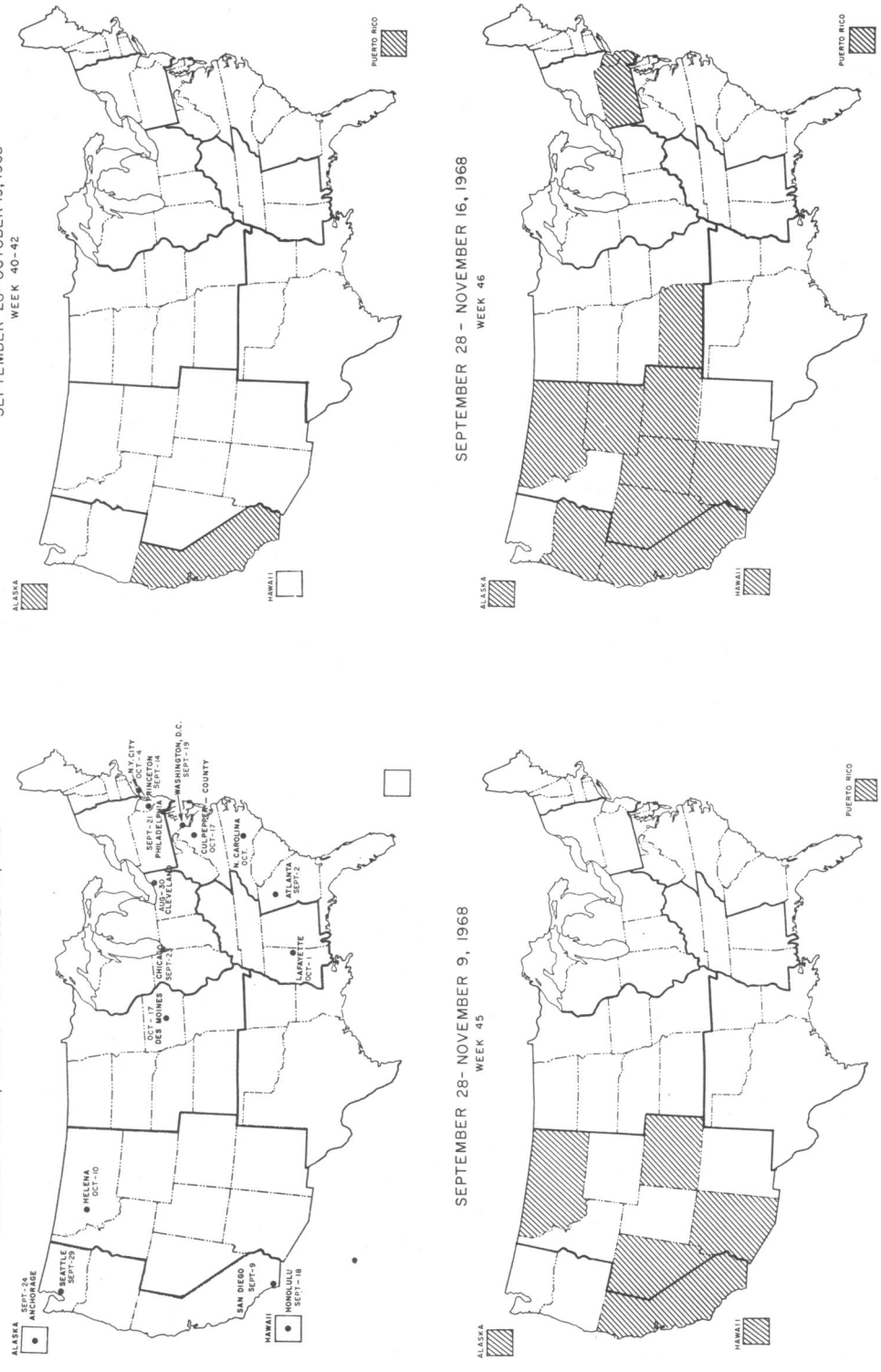
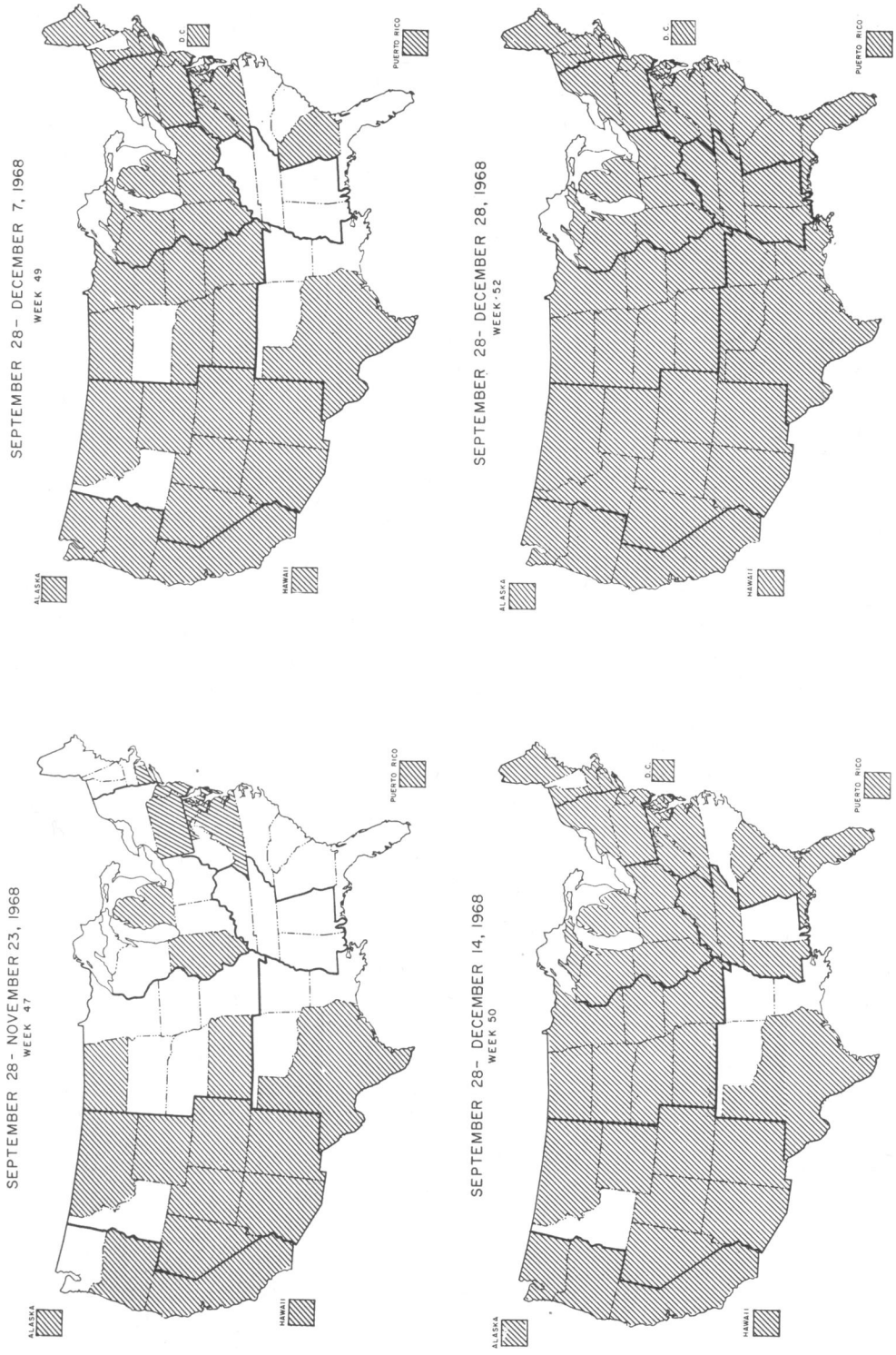
FIG. 1
OUTBREAKS OF INFLUENZA-LIKE ILLNESS IN THE USA, 1968 [a]





[a] It should be noted that these maps are cumulative in that they show the situation from the beginning of the epidemic up to the week beginning with the second date specified—e.g., the first map in the second row shows all outbreaks that had occurred up to the end of the week beginning 9 November 1968.

A number of different indices were used to determine the progression of the epidemic and the extent of influenza activity. These indices include data on school and industrial absenteeism, school closings, hospital admissions, out-patient visits, and reported cases and outbreaks. During this epidemic telephone surveys, establishing direct communication with the state epidemiologists in all 50 States, were performed on 3 separate occasions. Each epidemiologist was specifically asked for information on the 4 indices of influenza activity listed in the accompanying table. On 20 December school absenteeism was elevated in 37 States and industrial absenteeism in 25 States. A few public or parochial schools in 17 States and 1 or more colleges or universities in 22 States had dismissed students early for Christmas vacation. Surveillance based on school and industrial absenteeism data was useless during the Christmas holidays. State surveys conducted on 11 and 25 January showed a marked decline in the indices of influenza activity. During the entire epidemic all 50 States reported elevated school absenteeism, and 31 States reported elevated industrial absenteeism. Schools and colleges closed because of influenza in 23 States.

STATES WITH ABSENTEEISM AND CLOSED SCHOOLS DUE TO HONG KONG INFLUENZA, USA, 1968–69

Date	States with elevated school absenteeism	States with elevated industrial absenteeism	States with closed schools	States with closed colleges
Surveys:				
20 Dec. 1968	37	25	17	22
11 Jan. 1969	20	12	2	2
25 Jan. 1969	17	7	0	0
Over-all totals for Oct. 1968 to March 1969	50	31	23	23

The state epidemiologists were also asked when peak influenza activity occurred in their States. Fig. 2 shows the week of peak activity for 48 States, Puerto Rico, and the District of Columbia. It was reported by 29 States and the District of Columbia that peak activity probably occurred between 15 December and 4 January, but it was impossible to determine the exact week because of the Christmas

FIG. 2

PEAK INFLUENZA ACTIVITY IN THE USA BY STATE AND WEEK, 1968–69

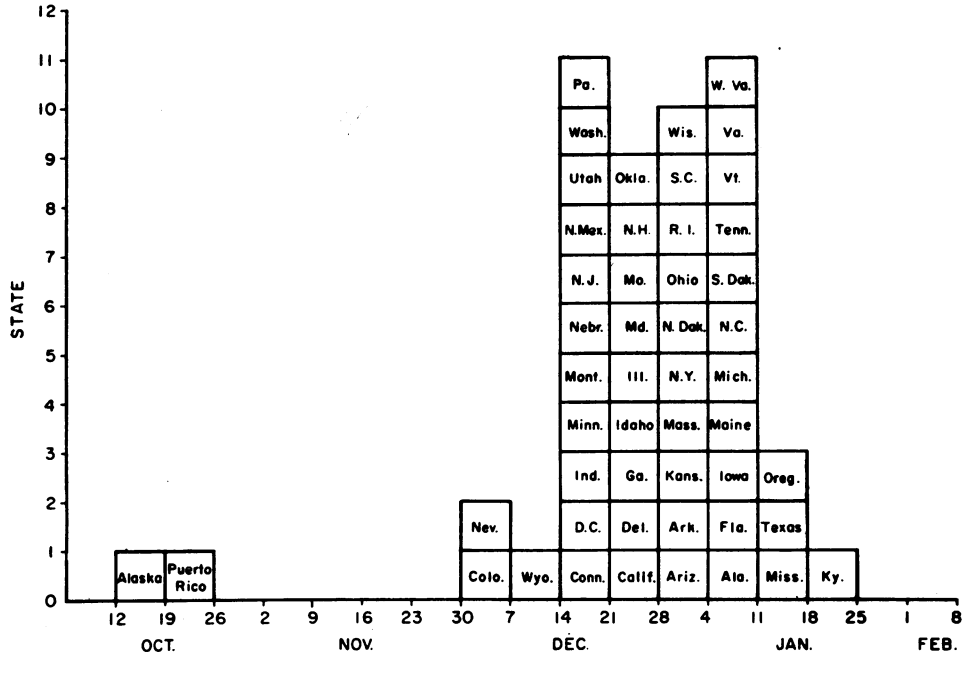
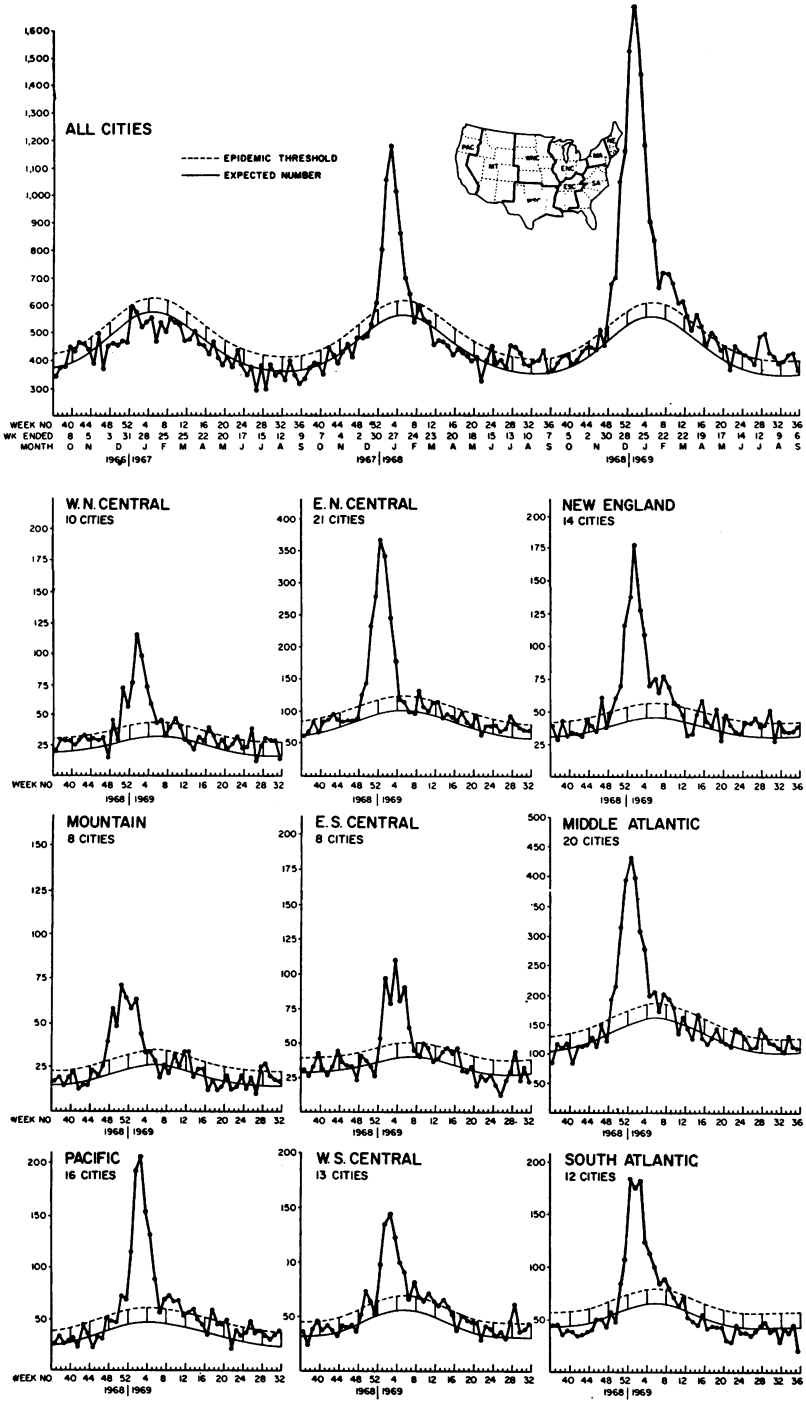


FIG. 3

PNEUMONIA-INFLUENZA DEATHS IN 122 US CITIES, 1968–69



holidays. During the month of January influenza activity was on the decline except for isolated sporadic outbreaks in rural areas or in populations not previously involved. No second wave of A2 influenza occurred.

Isolated cases of influenza B occurred in November and December; however, there were no outbreaks until late January, and they continued to occur until the latter part of March. The reported illness involved predominantly elementary-school children and caused absenteeism rates of 25%–45% in some areas. There were reports of 1 or more outbreaks in 20 States, and some influenza B activity was reported in 37 States. The most widespread B activity occurred in 8 contiguous States in the Midwest.

Another index of influenza activity is excess pneumonia–influenza mortality. In our experience this has been shown to be one of the best indices for measuring the severity and extent of influenza in large population groups. In general, this index rises 3–4 weeks after influenza outbreaks are first recognized. Fig. 3 shows the pneumonia–influenza mortality curve for 122 selected US cities, based on data that are collected weekly. Pneumonia–influenza mortality for the nation first exceeded the epidemic threshold during the week ending 7 December. The number of deaths attributed to pneumonia–influenza rose rapidly over the following 5 weeks, reaching a peak during the week ending 11 January, when 1688 deaths were reported. Excess mortality then declined progressively over the following 5 weeks to almost base-line levels, but did not return to normal until late March. In general, excess pneumonia–influenza mortality in the 9 geographical areas followed reported influenza activity by 3–4 weeks.

Detailed reports describing the clinical and epidemiological characteristics of the Hong Kong virus have not yet been published. However, it is possible to get a general impression of the disease from the surveillance data submitted.

The clinical illness was typical of influenza in that the predominant findings were malaise, fever, myalgia, cough, headache, coryza, and sore throat. The acute illness lasted 3–7 days, but the cough and prostration lingered in some cases for several weeks. A telephone survey of medical centres throughout the country indicated that the predominant bacterial complication was pneumococcal pneumonia. Some staphylococcal and Gram-negative pneumonias were reported, but cases of influenza viral pneumonia without secondary bacterial infections were uncommon.

It is the general consensus of state epidemiologists that all age segments of the population were equally affected, although few studies to measure the age- and sex-specific attack rates were carried out. The group of Dr Tom Chin at the NCDC Kansas City Field Station surveyed 6900 school-age children and their families; the over-all attack rate for this group was 39.3 per 100 with a range of 35–43 per 100 in different age-groups.

One approach to obtaining a crude estimate of the over-all attack rate can be obtained from the data collected by the National Health Survey. This survey, which has been conducted by the National Center for Health Statistics for the past 12 years, regularly collects data concerning the occurrence of influenza-like illness in 800 households interviewed per week. The survey indicated that 53.5 million cases of influenza-like illness occurred during the last 3 months of 1968; during the last 3 months of the years 1967, 1966 and 1965 this figure was 26.1, 16.6, and 24.0 million, respectively. Since 1966 and 1965 were years of little influenza activity, the data indicate that a base-line of approximately 20 million cases of an acute febrile respiratory disease would normally occur from October to December. Therefore, it can be estimated that an additional 30 million cases due to the Hong Kong influenza epidemic occurred during the last quarter of 1968. These data, related to a population of approximately 200 million, suggest an approximate attack rate of 15%. However, attack rates based on school absenteeism data and limited epidemic investigations show attack rates as high as 50%. Data on the occurrence of an influenza-like disease for the first quarter of 1969 are not available.