REPORT NO. 71
MARCH 22, 1962

COMMUNICABLE DISEASE CENTER

INFLUENZA

SURVEILLANCE

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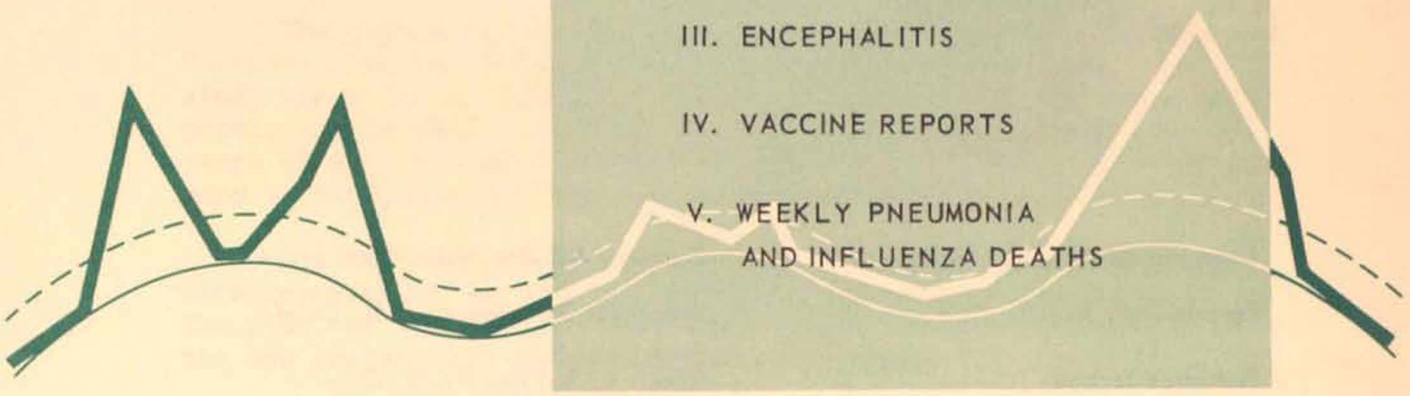

U. S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE

PREFACE

Summarized in this report is information received from State Health Departments, university investigators, virology laboratories and other pertinent sources, domestic and foreign. Much of the information is preliminary. It is intended primarily for the use of those with responsibility for disease control activities. Anyone desiring to quote this report should contact the original investigator for confirmation and interpretation.

Contributions to the Surveillance Report are most welcome. Please address to:
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I. SUMMARY

Reports of isolated outbreaks in Maine, Vermont, and Canada have been received. Although not identified virologically, they undoubtedly represent the northward extension of Influenza B.

New confirmations of Influenza B have been reported from Arkansas and Kentucky. The total number of States confirming Influenza B this season is 38.

Several cases of encephalitis, possibly secondary to influenza, are reported from North Carolina and Washington. Definitive proof of the etiologic relationship is lacking.

A 70 percent protection ratio for polyvalent influenza vaccine was obtained in a study of tuberculosis patients in Seattle, Washington. Those who accepted vaccine preceding the outbreak of Influenza B had a lower attack rate than those who did not.

The population immunized in Washington State between July and December 1960 was estimated by questionnaire survey. The same study was repeated for 1961. Results indicate that the immunized population doubled. However, the high risk groups (those over 65 years of age, the chronically ill, and pregnant women) received no more vaccine, proportionately, than the others.

Six hundred and twenty-eight pneumonia and influenza deaths were reported by the 108 cities during the week ending March 17. The rise was due mainly to increases above epidemic thresholds in the New England and East North Central States.

II. EPIDEMIC REPORTS

1. ARKANSAS

Serologic titer rises to Influenza B were obtained from patients in Pope and Pulaski Counties in January. Several of these patients were stationed at Little Rock Air Force Base.

(Dr. J. T. Herron, State Health Officer, Arkansas State Board of Health; Dr. Robert A. Crandell, Director, Department of Virology, Lackland Air Force Base, Texas)

2. CALIFORNIA

During February and March, the sera of 12 patients in 8 different counties have shown significant titer rises to Asian influenza. Asian virus was isolated from the trachea of a 78-year old male at post-mortem. The onset of his recent illness was February 25, and the diagnosis was viral pneumonia. None of the 13 cases was known to be associated with outbreaks of respiratory illness, with the possible exception of 5 paired sera submitted from a prison. One showed a significant titer rise to Influenza B, 3 to A_2, and 1 to both A_2 and B. The full extent of illness in the prison is not known. There have been no reports of outbreaks of respiratory illness in California during the past 6 weeks.

(Dr. Henry Renteln, Division of Preventive Medical Services, California State Department of Public Health; Dr. Edwin H. Lennette, Chief, Viral and Rickettsial Disease Laboratories; Dr. Harold Maller, EIS Officer, assigned to the California State Department of Public Health)

3. KENTUCKY

Serologic titer rises to Influenza B have been obtained from patients in Henderson, Jefferson, and Union Counties.

(Mr. Clifford Todd, State Epidemiologist, Kentucky State Department of Health; Dr. B. F. Brown, Director, Public Health Laboratories, Kentucky State Department of Health)

4. MAINE

A series of outbreaks of influenza-like illness during late February and early March have been reported from upper Penobscot County, Maine. On February 26, the elementary

school absenteeism in Patten, Maine was 70 percent, while the high school reported 30 percent. Lee and East Millinocket reported small outbreaks a week later. Outbreaks in Waldo and Aroostook Counties also resulted in high school absentee rates.

(Dr. Dean H. Fisher, Director, Communicable Disease Control, Maine Department of Health and Welfare)

5. MASSACHUSETTS

A limited outbreak of Influenza B, beginning in early February occurred primarily among students and also among faculty and employees of Harvard University, Cambridge, Massachusetts.

The University Health Service and Stillman Infirmary, which provide out-patient and hospital care respectively for the academic community, have observed more than a three-fold increase in illnesses diagnosed as "influenza" and "acute viral illness" (A.V.I.) - a term applied to febrile respiratory disease of presumed viral origin. While these two diagnoses do not include all respiratory syndromes being seen by the Health Service, they do provide the best sample of actual influenza.

The clinical illness is quite typical of influenza, being characterized by relatively sudden onset of chills, fever, myalgia, slight non-productive cough, and headache, particularly retro-orbital in location. The acute phase of the disease lasts for several days with resolution of fever and rapid convalescence. Laboratory findings include hematology consistent with viral infection and routine throat cultures negative for pathogenic bacteria.

Some of the illnesses have been severe enough to require short hospitalization although no serious complications have developed. College and graduate school students have been the primary groups affected, and because of the relative mildness of the illness have not missed an appreciable amount of their usual academic routine.

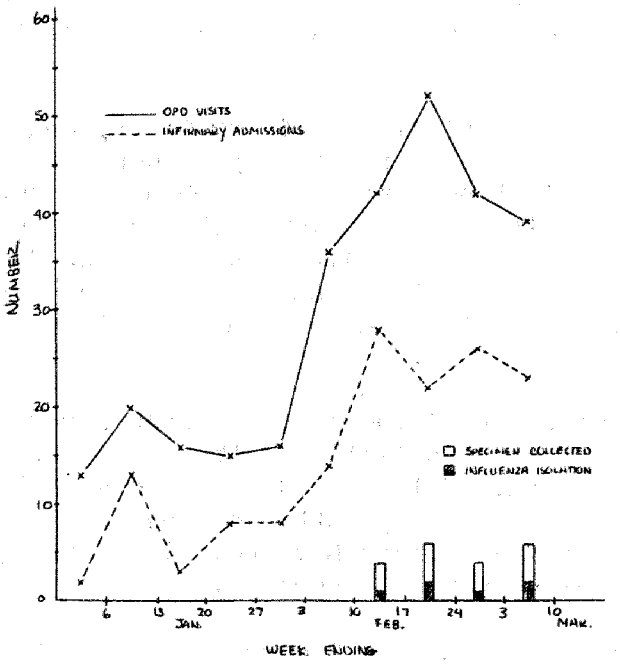
Figure 1 compares increases both in weekly out-patient visits and infirmary admissions for "influenza" and "A.V.I.", and shows proportionate rises in each. Maximum weekly numbers occurred in mid-February. Twenty throat washings for viral studies were collected during the course of the outbreak (Figure 1). Influenza B virus was isolated from 6 patients

(30 percent), at least one being obtained each week. No other agents were recovered. Paired sera, tested in 3 of the 6 patients from whom isolates were obtained, confirm infection by showing greater than four-fold rises in HI titers against Influenza B.

(This investigation was carried out by physicians from the Research Division of Infectious Diseases, Children's Hospital Medical Center, Boston, Dr. John F. Enders, Chief, in cooperation with the staff of the Harvard University Health Service and Stillman Infirmary, Cambridge)

FIGURE 1

OCCURRENCE OF "INFLUENZA" AND "ACUTE VIRAL ILLNESS", HARVARD UNIVERSITY HEALTH SERVICE AND STILLMAN INFIRMARY - WINTER 1962



6. VERMONT

School absenteeism reached 30% on March 9 in Woodstock (Windsor County). Symptomatology was typical of influenza except that pain on rotation of the eyeballs and on flexing the neck was noted in a few cases. Complications were rare.

(Dr. Linus J. Leavens, Director, Communicable Disease Control, Vermont Department of Health)

INTERNATIONAL

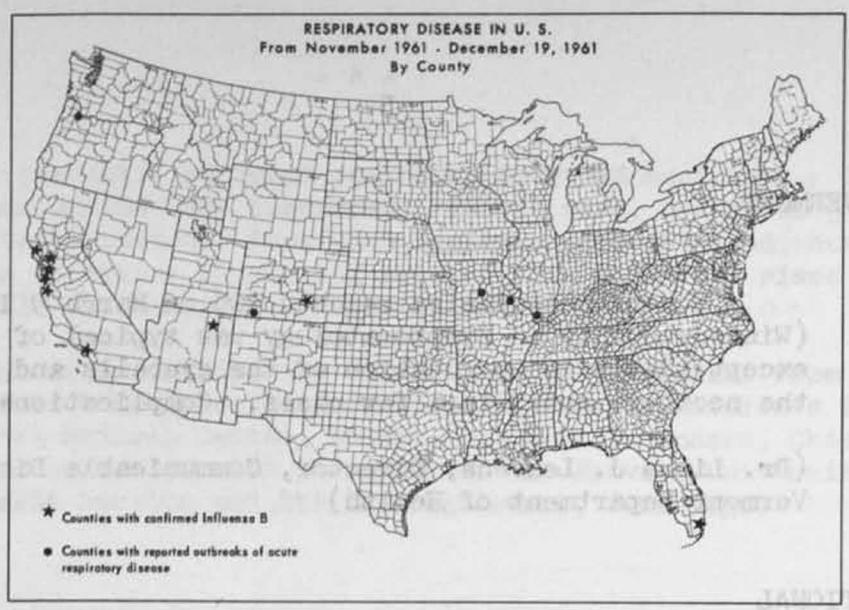
1. CANADA

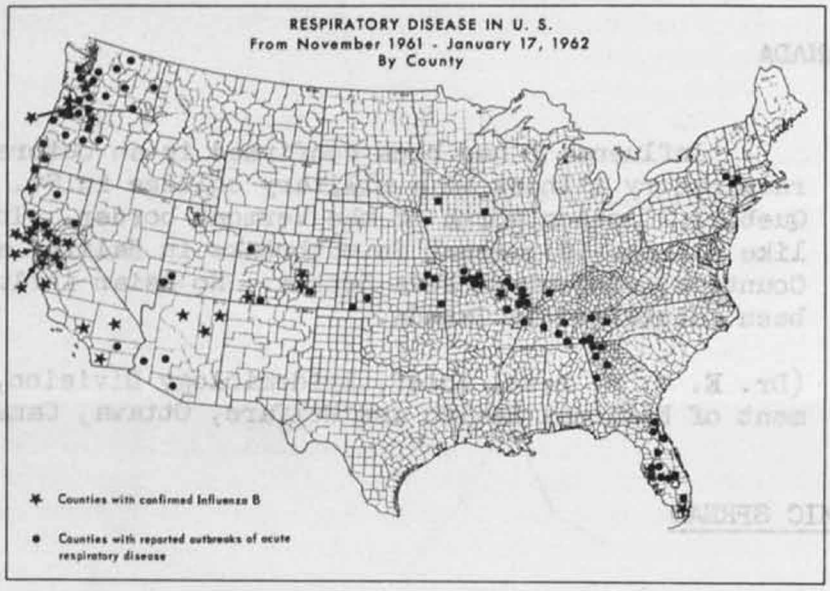
Influenza B has been confirmed in an outbreak of respiratory illness in a military college in St. Jean, Quebec, 20 miles north of the Vermont border. Influenza-like illness is present in outbreaks in Halifax and Hants Counties, in Central Nova Scotia. No Asian influenza has been identified in Canada.

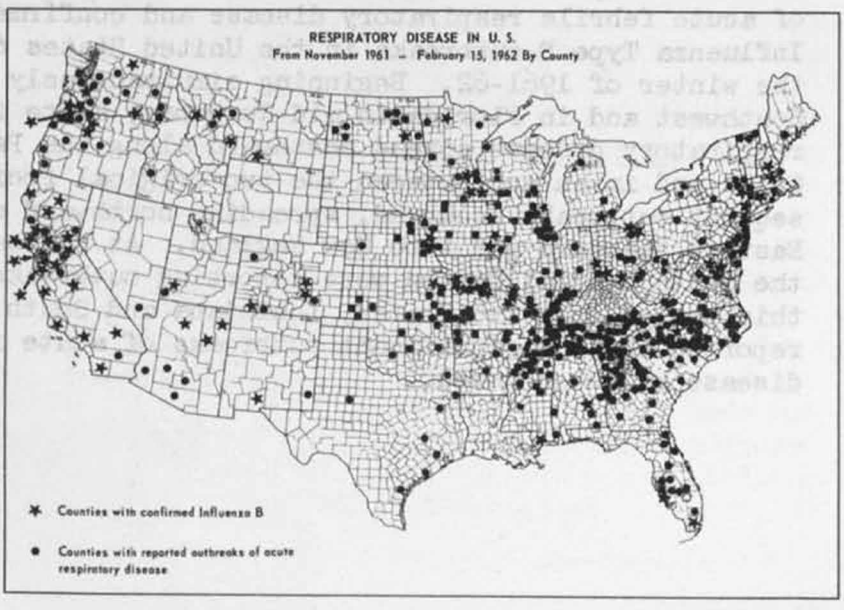
(Dr. E. W. R. Best, Chief, Epidemiology Division, Department of National Health and Welfare, Ottawa, Canada)

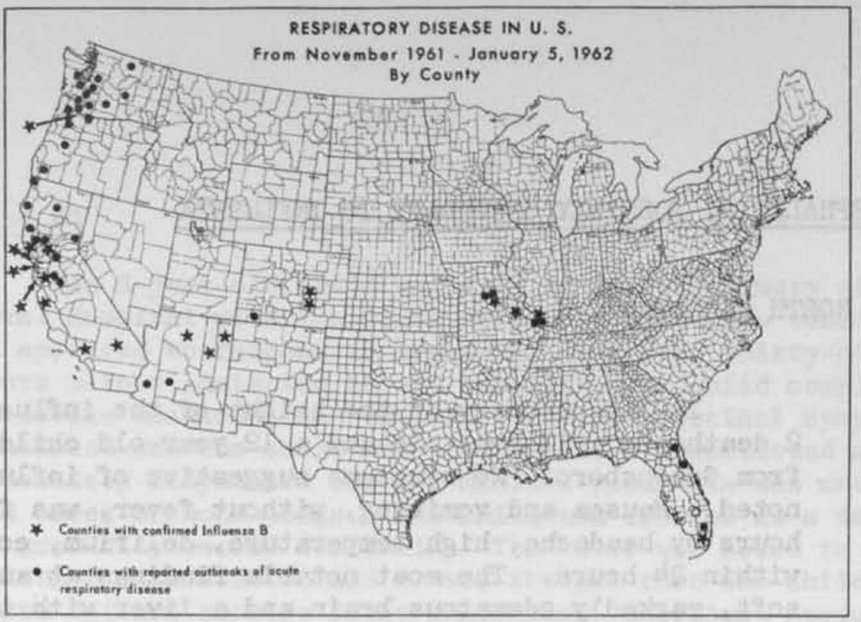
EPIDEMIC SPREAD

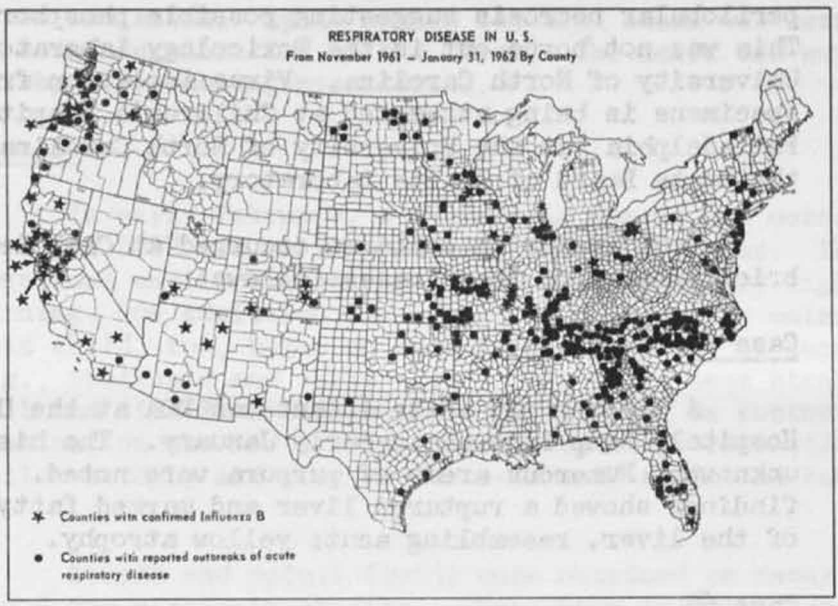
Six maps on the following pages depict the progress of acute febrile respiratory disease and confirmed Influenza Type B outbreaks in the United States during the winter of 1961-62. Beginning simultaneously in the Southwest and in Florida in mid-November, acute febrile respiratory disease spread northward along the Pacific Coast and in an arc between the two original foci. Subsequent outbreaks occurred, spreading northward along the Eastern Seaboard and into New England. At the same time, the North Central States were reporting outbreaks. During this period only two States, Louisiana and South Dakota, reported that no significant outbreaks of acute respiratory disease had been noted.

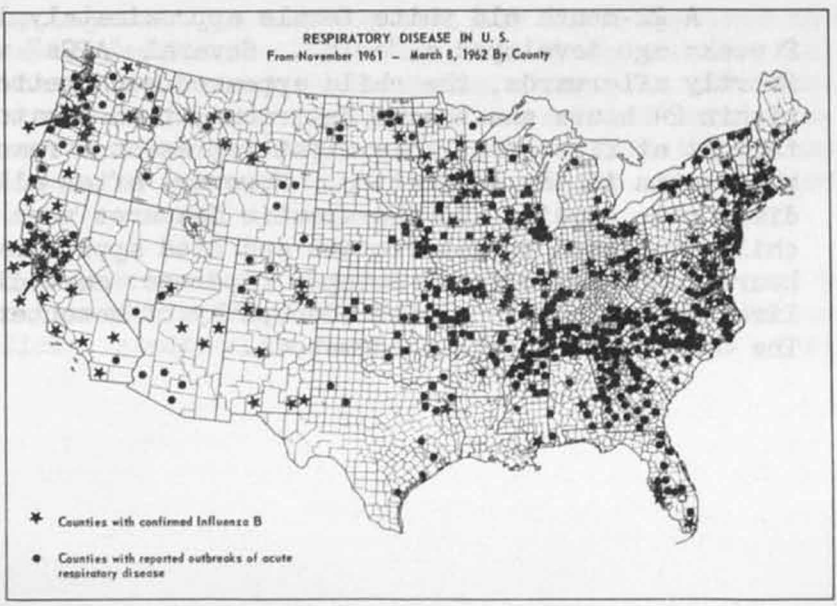

RESPIRATORY DISEASE IN U. S.
From November 1961 - December 19, 1961
By County
Counties with confirmed Influenza B
Counties with reported outbreaks of acute respiratory disease


RESPIRATORY DISEASE IN U. S.
From November 1961 - January 17, 1962
By County
Counties with confirmed Influenza B
Counties with reported outbreaks of acute respiratory disease


RESPIRATORY DISEASE IN U. S.
From November 1961 - February 15, 1962 By County
Counties with confirmed Influenza B
Counties with reported outbreaks of acute respiratory disease


RESPIRATORY DISEASE IN U. S.
From November 1961 - January 5, 1962
By County
Counties with confirmed Influenza B
Counties with reported outbreaks of acute respiratory disease


RESPIRATORY DISEASE IN U. S.
From November 1961 – January 31, 1962 By County
Counties with confirmed Influenza B
Counties with reported outbreaks of acute respiratory disease


RESPIRATORY DISEASE IN U. S.
From November 1961 – March 8, 1962 By County
Counties with confirmed Influenza B
Counties with reported outbreaks of acute respiratory disease

III. ENCEPHALITIS, POSSIBLY SECONDARY TO INFLUENZA

1. NORTH CAROLINA

In late January at the height of the influenza epidemic, 2 deaths in a 10 year old and a 12 year old child were reported from Greensboro. No symptoms suggestive of influenza had been noted. Nausea and vomiting, without fever, was followed in 48 hours by headache, high temperature, delirium, coma and death within 24 hours. The most notable findings at autopsy were a soft, markedly edematous brain and a liver with the appearance of acute yellow atrophy. Section of the liver revealed perilobular necrosis suggesting possible phosphorous poisoning. This was not borne out in the Toxicology Laboratory at the University of North Carolina. Virus isolation from tissue specimens is being attempted at Children's Hospital, Philadelphia; at the University of North Carolina; and at the State Board of Health Laboratory.

Four deaths in children occurred at Camp Lejeune. A brief summary of these cases follows:

Case #1

A 3-month old white infant was DOA at the U.S. Naval Hospital, Camp Lejeune in early January. The history was unknown. Numerous areas of purpura were noted. Autopsy findings showed a ruptured liver and marked fatty degeneration of the liver, resembling acute yellow atrophy.

Case #2

A 22-month old white female approximately 10 days to 2 weeks ago developed a "cold". Several "APCs" were given. Shortly afterwards, the child appeared much better. However within 24 hours she became delirious, then comatose. It was thought at first that this might represent a reaction to the phenacetin in the medication. However, after all possible diagnostic studies and therapeutic measures were taken, the child continued to deteriorate and died approximately 24 hours after admission. Autopsy findings: markedly yellow liver was noted along with adenopathy of mesenteric nodes. The brain was extremely edematous.

Case #3

An 8-year old child was seen in early February at the Naval Hospital with low grade fever and exudative tonsillitis. He appeared to respond to treatment at home. Thirty-six hours before admission to the hospital, the child complained of severe headache, and vomited. Gastrointestinal symptoms continued and the child was admitted in a disoriented and moderately dehydrated state. Minimal pneumonia was noted at the bases of both lungs. The child was treated as a dehydration. He gradually became areflexic. The liver was noted to be enlarged on admission and it was thought that the child was in heart failure shortly after admission. Heartbeat gradually became weaker despite digitalis and the child died 36 hours after admission. Again marked cerebral edema was seen as well as acute degeneration of the liver. The heart was extremely flabby - resembling myocarditis.

Case #4

In early February, a 6-year old female was noted to have fever of 102° and mild upper respiratory symptoms. This continued until chicken pox became evident Sunday night or Monday morning. On admission the liver was noted to be enlarged and this child, too, began to demonstrate symptoms of encephalitis, e.g., areflexia and early coma. This child went steadily downhill and died 24-36 hours after admission. On postmortem examination she had a very large fatty liver resembling acute yellow atrophy and also had an extremely edematous brain.

Bloods and spinal fluids were obtained on cases 2, 3, and 4 for virologic studies. These have been completely negative to the present time at the Virology Laboratory, Camp Lejeune. In all 4 cases, the liver appeared to have zones of perilobular necrosis. The brain showed little else other than neuronal degeneration along with the edema. There was no perivascular cuffing in the central nervous system. Also, the last 3 cases were thought clinically to have some elements of myocarditis. Only the heart of the third child seemed to reveal this picture.

(Dr. Jacob Koomen, Assistant State Health Director, North Carolina State Board of Health; Dr. George M. Johnson, EIS Officer, assigned to North Carolina State Board of Health)

2. WASHINGTON

A 16-year old white male was in good health until 7 days before admission when he developed "flu", manifested by coughing and mild stuffiness of the nose. On the morning before admission, he became blind. Increasing somnolence led to hospital admission. Physical examination revealed decerebrate rigidity with mid-position fixed pupils and deep coma. He remained comatose for 3 days; on 2 occasions, the spinal fluid opening pressure was elevated, but cell count and chemistries were normal. On discharge to his local hospital 6 days later, he still had no light perception, no pupil reaction, positive bilateral Babinski responses and a left 3d nerve paralysis. Two weeks later he was found to have a slight degree of light perception. A convalescent serum was negative for Western equine, St. Louis equine encephalitis, mumps, and adenovirus. Titer to Influenza B was >1:256.

(Dr. Ernest Ager, Communicable Disease Control, Washington State Department of Health)

IV. VACCINE REPORTS

1. VACCINE STUDY IN SEATTLE

An outbreak of influenza in a hospital population provided an opportunity to assess polyvalent influenza vaccine efficacy under a natural challenge of Influenza B. Thirteen cases of influenza-like illness occurred on one ward of a tuberculosis hospital within one week in late January. The syndrome was somewhat varied but included fever in every case. The most common symptoms were malaise, headache, sore throat, rhinorrhea and chest soreness. The illness varied in duration from a few days to one week. Eight of the 13 cases had significant serologic titer rises to Influenza B.

The involved ward has a census of 54 male tuberculosis patients. Approximately 50 percent of them could be characterized as alcoholics. All of them are partially ambulatory.

From September to December, patients in this hospital were offered polyvalent influenza vaccine. The table below shows the difference in attack rates between the immunized (one or two 1cc doses within the 4 months preceding the outbreak) and the unimmunized groups. Twenty-nine of the 40 immunized patients had 2 doses of the vaccine.

	Number	Ill	Attack Rate (Percent)
Immunized	40	6	15
Not immunized	14	7	50

(Chi square 6.95; 0.01 >P >0.005)

The protection ratio is 70%.

(Dr. Donald R. Peterson, Director, Division of Epidemiology, Seattle-King County Health Department, Washington)

2. VACCINATION STATUS

In January 1962, the Division of Epidemiology of the Washington State Department of Health conducted a survey of Washington physicians in order to obtain estimates of influenza immunizations administered between July 1, and December 1, 1961. The data obtained and estimates derived therefrom can be considered as suitable for comparison with results of a similar survey of December 1960, conducted by this department. The design of the survey and method of analysis are identical to that done in 1960 with one exception. The identical sample was used for both surveys, less 8 physicians in the second survey, determined from the first survey to be no longer in practice.

A slightly higher response rate was noted in the second survey. A total of 88 of the 132 surveyed physicians responded as compared with 83 of 140 in the first survey. Interesting, but not surprising, is the fact that the bulk of physicians who responded to the second survey are the same ones who responded to the first. Of the 83 who responded in 1960, 74 also responded in 1962. Fourteen who did not respond in 1960 did return completed questionnaires in 1962. That this slight difference in the sample did not have any significant effect on the estimates of immunizations performed by Washington physicians is clear from a perusal of returned questionnaires. No significant differences in the numbers of immunized persons could be found between physicians who responded in both surveys and those who responded in only the second. The rates of immunization for both groups were, in fact, very similar. Responses in 1962 are shown in Table 1.

Table 1

Response to Questionnaire
by Type of Practice

Type of Practice	Total Physicians	Sampled	No. Responding	Percent Responding	Percent of Tota
General Practice	831	80	48	60	5.8
Internal Medicine	284	26	19	73	6.7
Pediatrics	119	11	10	91	8.4
Obstetrics-Gynecology	147	15	11	73	7.5
Totals	1381	132	88	67	6.4

The estimates of the numbers of persons immunized by responding physicians are shown in Table 2.

Table 2

Numbers of Persons Immunized Against Influenza
by Aggregates of Responding Physicians in Four Types of Practice,
July 1, 1961 to December 1, 1961

Category of Patient	Type of Practice				
	G.P.	I.M.	Ped.	Obst.	Totals
Over age 65	1,691	717	14	174	2,596
Pregnant Women	458	12	10	560	1,040
With Chronic Disease*	1,065	598	60	27	1,750
All Others	4,995	474	970	881	7,320
Totals	8,209	1,801	1,054	1,642	12,706

*65 years of age and under

By the use of appropriate conversion factors, a table of projected numbers of persons immunized by the total of 1,381 physicians is developed.

Table 3

Projected Numbers of Persons Immunized Against Influenza
by Washington Physicians in Four Types of Practice
July 1, 1961 to December 1, 1961

Category of Patient	Type of Practice				
	G.P.	I.M.	Ped.	Obst.	Totals
Over Age 65	29,254	10,719	167	2,332	47,472
Pregnant Women	7,923	179	119	7,504	15,725
With Chronic Disease*	18,424	8,940	714	362	28,440
All Others	86,414 (61%)	7,086 (26%)	11,543 (92%)	11,805 (54%)	116,848 (57%)
Totals	142,015	26,924	12,543	22,003	203,485

*65 years of age and under

Employing the same population denominators as in the earlier survey, the following estimates are derived. Of 273,000 persons over age 65 in Washington, an estimated 42,472 were immunized against influenza between July 1, and December 1, 1961. This represents an immunization rate of 15.6 percent as compared with 8.8 percent estimated a year previously. Undoubtedly, many of these are the same persons, and have simply received booster doses of vaccine. However, an estimated minimum of 18,156 (6.7%) of them have been introduced to influenza vaccine in 1961. The immunization rate for pregnant women is estimated to have been 32 percent in 1961, a remarkable increase over the 11.9 percent estimated one year previously. It is possible, however, that this figure is substantially over-estimated since a single obstetrician provided almost one-third of all the immunizations reported to have been given to pregnant women by the aggregate of sampled physicians. It seems likely that he immunized virtually every pregnant woman in his practice and it is doubtful, judging from estimates made by other obstetricians and by general practitioners, that this is a common practice.

The remaining estimated 145,288 immunizations would have been distributed among some 2,508,000 persons, of whom an unknown number have a chronic illness which warrants their inclusion in the high risk group for which influenza immunization has been recommended. This over-all rate is 5.8 percent, as compared with 2.8 percent estimated by the 1960 survey.

An interesting comparison of 1960 and 1961 immunization rates for the four categories of persons is shown in Table 4.

Table 4

Comparison of 1960 and 1961 Estimates
of Influenza Immunizations
in Four Categories of Persons

Category	Estimated Numbers Immunized		Ratio $\frac{1961}{1960}$
	1960	1961	
Over age 65	24,316	42,472	1.75
Pregnant	5,827	15,725**	2.70***
With Chronic Disease*	13,543	28,440	2.10
All Others	57,225	116,848	2.04
Totals	100,911	203.485	2.02

* 65 years of age and under
** Probably overestimated by approximately 5,000
*** Probably overestimated by approximately 0.9

The similarity of the rate of increase in immunizations in the various categories from 1960 to 1961 (making all allowance for the cited probable overestimate) is remarkable. It would appear that the educational effort expended toward the goal of achieving routine immunization for the high risk group had the effect of a rather non-selective increase in immunization rates.

Internists appear to be considerably more selective than other types of physicians, having immunized mainly persons in the high risk groups. The data for obstetricians might well indicate considerable selection by that group as well, but for a marked distortion produced by data of one obstetrician who immunized very extensively, and did not appear to distinguish between high risk and other individuals. All physicians considered in aggregate, more than one-half of all available influenza vaccine would appear to have been given to persons not in the high risk population groups during the period under study.

The general increase in the use of influenza vaccine in this State in 1961 was undoubtedly related to the very considerable information made available to the public during the summer and fall of that year. In this State, numerous newspaper reports of threats of outbreaks of Type B and Type A_2 influenza during the hyperendemic season of 1961-62 appeared. Some of these were the result of news releases made by the Public Health Service, and others originated in this department. It is also probable that such information had the effect of stimulating industry to offer immunization to

employees without concern for their relative risk of severity of the disease or of complications. The net effect would seem to be a relative failure to achieve a significant immunization status of the high risk populations, although it must be admitted that an approximate doubling of the number of immunized persons in these groups is evidence of some progress. If the current trend is maintained (and it may be speculated that it will not be, in the absence of annual publicized threats of influenza outbreaks) it would appear that 5 to 10 years will be required to achieve a satisfactory immunization status of the high risk population groups in this State.

(Dr. Ernest Ager, Communicable Disease Control, Washington State Department of Health)

V. WEEKLY PNEUMONIA AND INFLUENZA DEATHS

through week ending March 17

Six hundred and twenty-eight pneumonia and influenza deaths were reported by the 108 cities during the week ending March 17 - an increase of 28 deaths over the preceding week. The rise was due mainly to increases above epidemic thresholds in the New England and East North Central States. The number of deaths in the Middle Atlantic States decreased slightly but remained above the epidemic threshold; the West South Central Division, after 2 weeks within normal ranges, also reported pneumonia and influenza deaths in excess of its epidemic threshold.

The New England States for the past 4 weeks have alternated between high and low reported figures but both the Middle Atlantic and East North Central States have continued at high levels for the past several weeks.

The West North Central States have been at expected levels for the past 2 weeks, the South Atlantic, East South Central, and Mountain States for the past 3 weeks, and the Pacific States for the past 8 weeks.

WEEKLY PNEUMONIA AND INFLUENZA DEATHS

NUMBER OF DEATHS

UNITED STATES
108 cities

EPIDEMIC THRESHOLD

NORMAL INCIDENCE

1959 1960 1960 1961 1962

W.N. CENTRAL
9 cities

E.N. CENTRAL
18 cities

NEW ENGLAND
14 cities

MOUNTAIN
8 cities

E.S. CENTRAL
8 cities

MIDDLE ATLANTIC
17 cities

PACIFIC
12 cities

W.S. CENTRAL
13 cities

S. ATLANTIC
9 cities

1961 1962