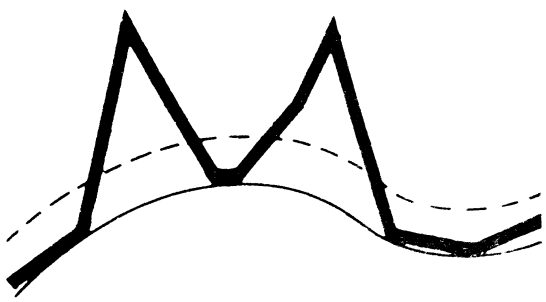
1966 -- 1967

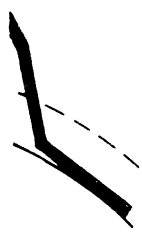
REPORT NO. 83
JUNE 30, 1967

NATIONAL COMMUNICABLE DISEASE CENTER

INFLUENZA - RESPIRATORY DISEASE SURVEILLANCE

TABLE OF CONTENTS



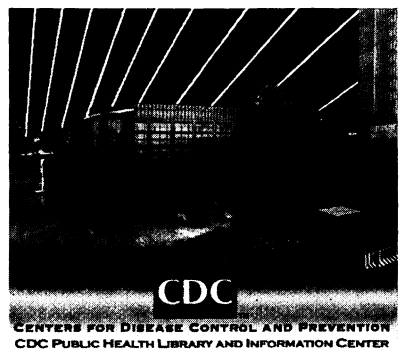


U. S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE

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: National Communicable Disease Center, At[illegible] [illegible]tory Viral Diseases Unit, Epidemiology Program.



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INTRODUCTION

As in previous years, the regularly published Morbidity and Mortality Weekly Reports have included pertinent epidemiological data regarding influenza. This present publication is designed as a summary of the year's experience and includes: 1) a review of the 1966-67 influenza experience in the United States; 2) an international summary; 3) a laboratory report; and 4) epidemic investigation report.

I. U.S. SUMMARY

The data used in this report are derived from a number of sources. Weekly correspondence with each of the State Health Departments and weekly review of Pneumonia-Influenza Mortality from 122 U.S. Cities provided the major portion of the information. Supplementing this regularly received data is an "influenza Appraisal Summary", in which each State epidemiologist summarized his State's experience, indicating initial appearance of influenza, peak incidence, laboratory studies, age groups involved, and epidemic indices most affected. Table 1 and Figures 1 and 2 present this information complete through May 30, 1967. Categories of "Geographic Extent" are approximated: a) Isolated - individual cases of influenza recognized in only a limited number of small, well defined population units; b) Regional - influenza recognized in counties comprising less than 50 percent of the State's population.

Based on these data, certain generalities regarding the 1966-67 influenza season may be drawn:

1. The presence of influenza was identified clinically and epidemiologically in 26 of the 50 States and confirmed by laboratory means in all but three of these (Arkansas, Delaware, and Nebraska). See Table 1 - complete through May 30, 1967.

2. Strains of A2 virus were isolated in 8 States and serologically confirmed in 11 others (19 in all). Strains of influenza B were isolated in 3 States and serologically confirmed in 8 others (11 in all). Only 6 States confirmed the presence of both types A and B.

3. Influenza A2 was the predominant type recognized in the eastern half of the country. Only one State, Georgia, had regional involvement with influenza A2; the others with influenza A2 had only isolated cases or limited outbreaks.

4. Influenza B was the predominant type recognized in the western half of the country. Only two States, Arizona and California, had regional involvement with influenza B; the others with influenza B had only isolated cases or limited outbreaks.

5. At no time did national pneumonia-influenza mortality reported to NCDC by 122 cooperating cities show an excursion above the epidemic threshold. (Figure 3). Further, in no single division of the country did mortality exceed the epidemic threshold for more than one week.

6. A decrease in total deaths and in deaths attributed to pneumonia and influenza (when compared to 1965-66 season) is also revealed in a 10 percent systematic sample of all death certificates performed by the National Center for Health Statistics in Washington. (Table 2). [Data beyond February 1967 are not yet available].

Table 1

UNITED STATES INFLUENZA SUMMARY

1966-67*

STATE	GEOGRAPHIC EXTENT**			PEAK*** OCCURRENCE	LABORATORY CONFIRMATION	
	Not Recog.'d	Isolated	Regional		Serology	Isolation
Alabama	. . . . .	A2, B	. . . . .	. . . . .	A2, B	. . . . .
Alaska	–	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Arizona	. . . . .	. . . . .	B	May	B	B
Arkansas	–	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
California	. . . . .	A2	B	Feb.-March	B, A2	B, A2
Colorado	. . . . .	B	. . . . .	. . . . .	B	. . . . .
Connecticut	. . . . .	A2	. . . . .	. . . . .	. . . . .	A2
Delaware	–	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
District of Columbia	–	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Florida	. . . . .	A2, B	. . . . .	. . . . .	A2,B	. . . . .
Georgia	. . . . .	. . . . .	A2	Feb.	A2	A2
Hawaii	–	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Idaho	–	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Illinois	–	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Indiana	–	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Iowa	–	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Kansas	–	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Kentucky	. . . . .	A2	. . . . .	. . . . .	A2	. . . . .
Louisiana	–	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Maine	–	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Maryland	–	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Massachusetts	–	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Michigan	. . . . .	A2, B	. . . . .	. . . . .	A2, B	A2
Minnesota	. . . . .	A2	. . . . .	. . . . .	. . . . .	A2
Mississippi	–	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Missouri	–	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Montana	–	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Nebraska	–	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Nevada	–	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
New Hampshire	. . . . .	B	. . . . .	. . . . .	B	. . . . .
New Jersey	. . . . .	A2	. . . . .	. . . . .	A2	A2
New Mexico	–	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
New York	. . . . .	A2	. . . . .	. . . . .	A2	A2
North Carolina	–	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
North Dakota	. . . . .	A2	. . . . .	. . . . .	A2	. . . . .
Ohio	. . . . .	A2	. . . . .	. . . . .	A2	. . . . .
Oklahoma	. . . . .	A2	. . . . .	. . . . .	A2	. . . . .
Oregon	. . . . .	A2, B	. . . . .	. . . . .	A2, B	B
Pennsylvania	. . . . .	A2	. . . . .	. . . . .	A2	. . . . .
Rhode Island	–	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
South Carolina	–	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
South Dakota	–	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Tennessee	–	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Texas	. . . . .	A2	. . . . .	. . . . .	A2	. . . . .
Utah	. . . . .	A2, B	. . . . .	. . . . .	B	A2
Vermont	–	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Virginia	–	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Washington	. . . . .	B	. . . . .	. . . . .	B	. . . . .
West Virginia	. . . . .	A2, B	. . . . .	. . . . .	A2, B	. . . . .
Wisconsin	. . . . .	A2	. . . . .	. . . . .	A2	. . . . .
Wyoming	–	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .

*Information from State Health Department Influenza Appraisal Summary, Research Institutions, University Centers and NCDC Respirovirus Laboratory. Only laboratory confirmed disease included.

**Terms "Isolated", "Regional", and "Widespread" are defined in text, see p. 1

***Only shown for states with more than isolated cases.

Figure 1

DISTRIBUTION OF INFLUENZA A, UNITED STATES
1966-1967

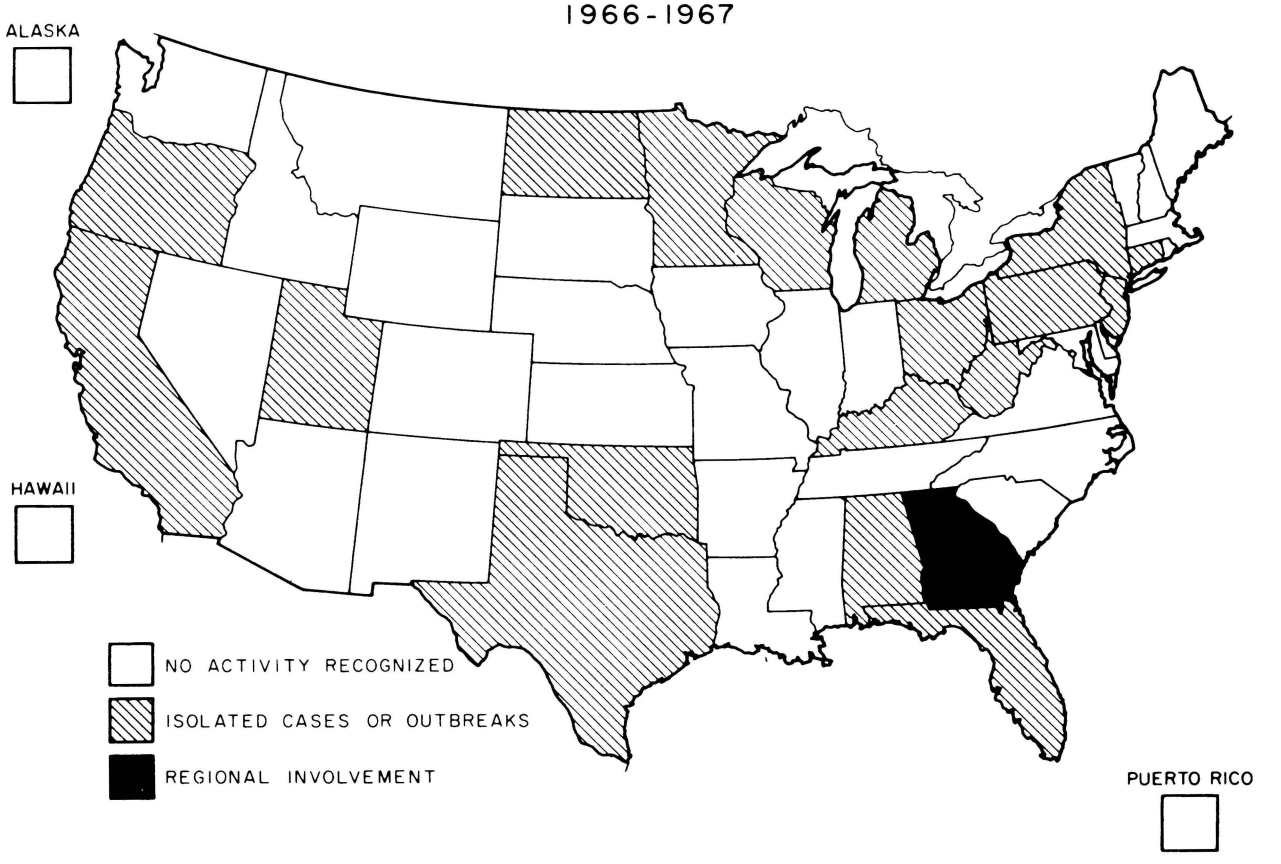
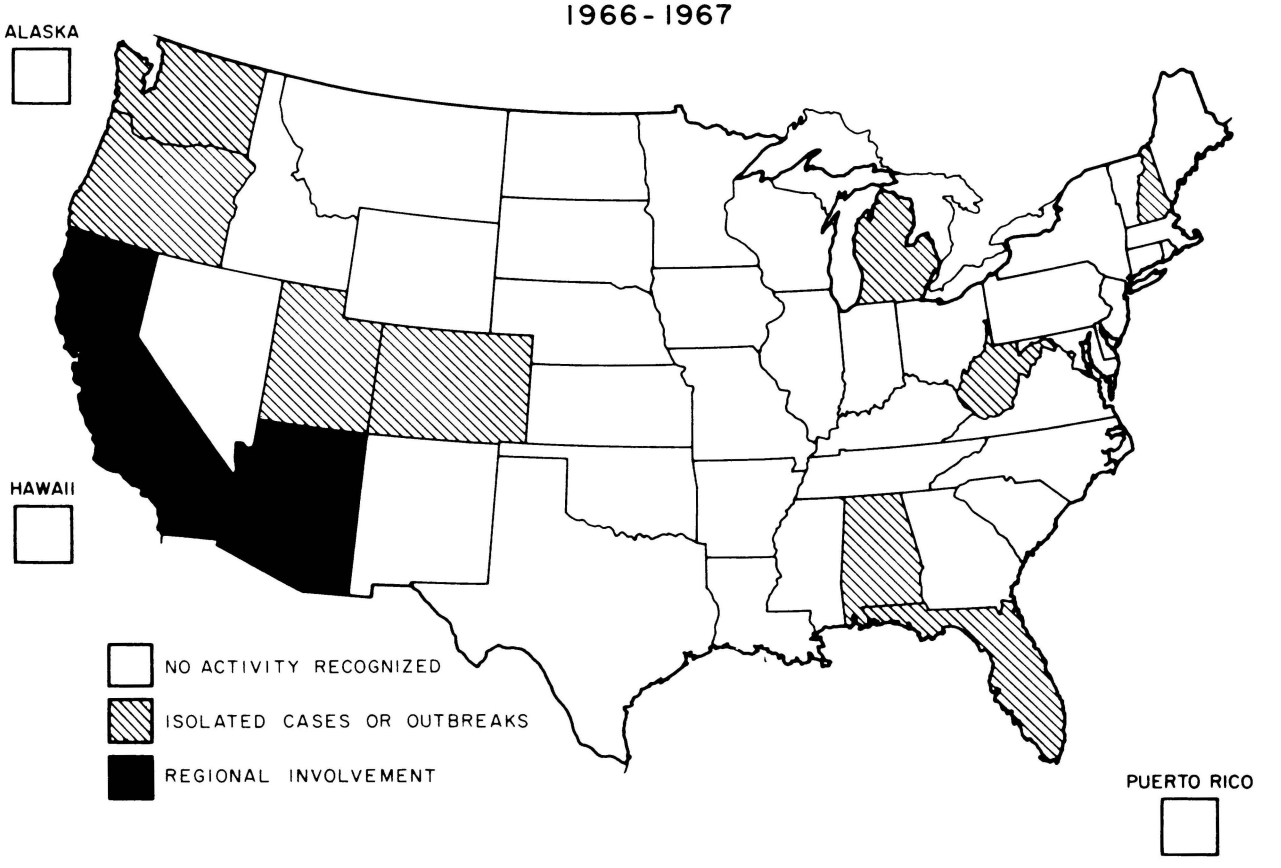


Figure 2

DISTRIBUTION OF INFLUENZA B, UNITED STATES
1966-1967



PNEUMONIA-INFLUENZA DEATHS IN 122 UNITED STATES CITIES

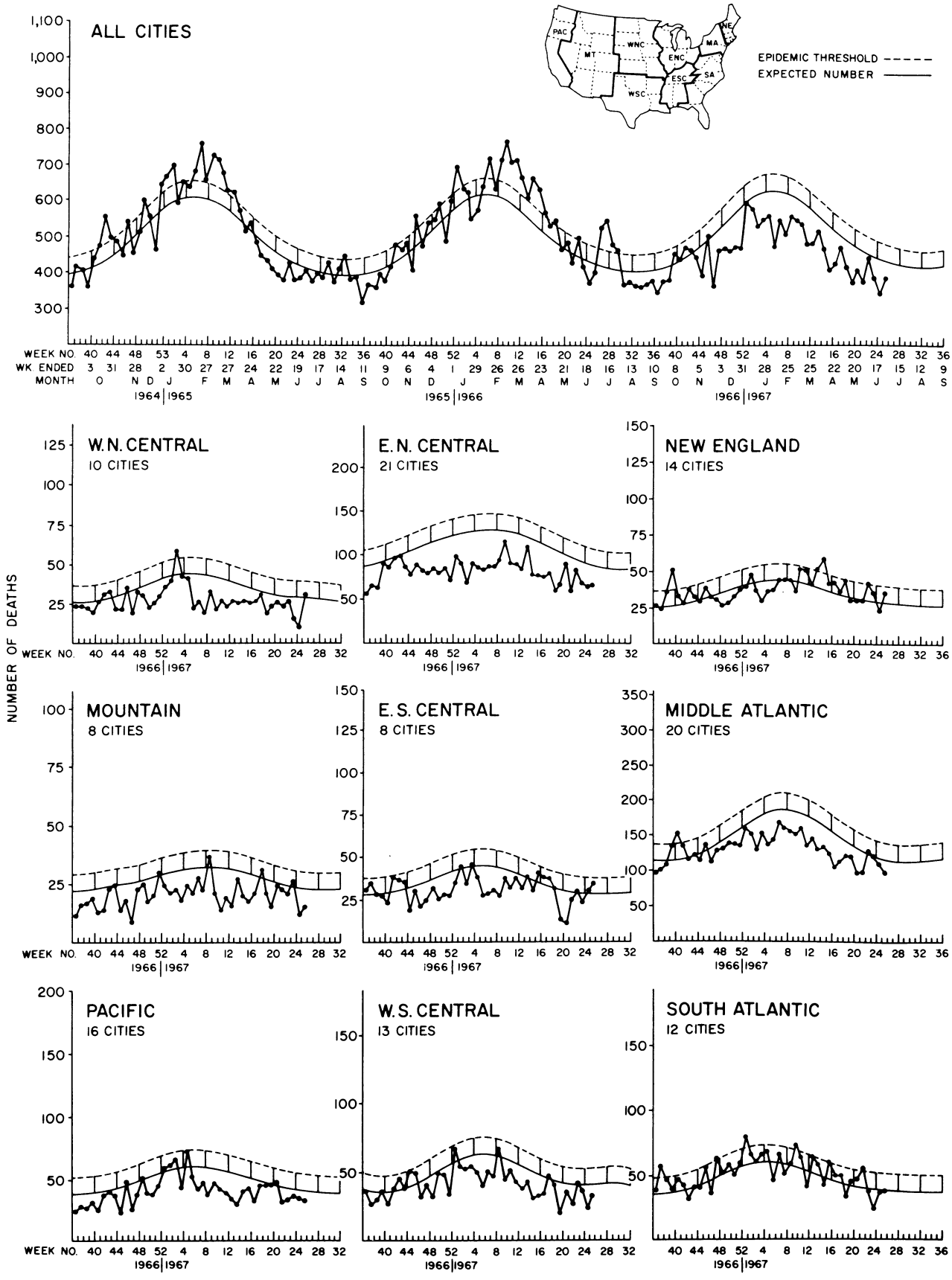


Table 2

A. Deaths due to all causes by month, September-February 1965-67 based on a 10 percent sample of death certificates by the National Center for Health Statistics, Washington, D.C.*

Month	1965 No. of deaths	1965 Rates on an annual basis per 100,000	1966 No. of deaths	1966 Rates on an annual basis per 100,000
Sept.	14,400	885.9	14,063	872.7
Oct.	14,842	912.9	15,235	915.8
Nov.	15,036	964.0	15,010	922.0
Dec.	16,252	961.1	16,372	971.5
	1966		1967	
Jan.	16,584	1027.5	16,054	988.8
Feb.	15,400	1018.4	14,431	979.1

B. Pneumonia and influenza deaths for all ages by month, September-February 1965-67 based on a 10 percent sample of death certificates by the National Center for Health Statistics, Washington, D.C.*

Month	1965 No. of deaths	1965 Rates on an annual basis per 100,000	1966 No. of deaths	1966 Rates on an annual basis per 100,000
Sept.	374	23.0	325	20.2
Oct.	485	29.8	459	27.6
Nov.	490	31.4	450	27.6
Dec.	608	36.0	531	31.5
	1966		1967	
Jan.	646	40.0	603	37.1
Feb.	635	42.0	525	35.5

*Source of data: Monthly Vital Statistics Report
National Vital Statistics Division
National Center for Health Statistics

II. INTERNATIONAL SUMMARY

Reports published in the WHO Weekly Epidemiological Record and received by the WHO Influenza Center for the Americas at NCDC form the basis for the 1966-67 International Influenza Summary. (See Table 3). These data give only a general appraisal, since omissions and minor inconsistencies may represent as yet unpublished data and incomplete reports.

Of the 14 countries reporting identification of influenza outbreaks, 10 reported Type A2 virus activity, 6 reported Type B virus activity, and 2 reported both types. In Europe, where the most consistent reporting was available, Type A2 influenza appeared first in southeastern regions in late autumn and spread to northern and western parts of the continent through the winter. Only the U.S.S.R. and Italy had extensive influenza B outbreaks this season. In both of these countries, all age groups were affected.

Table 3

INTERNATIONAL INFLUENZA SUMMARY
1966 - 67

Country	Peak Occurrence	Predominant Virus Type
EUROPE		
Czechoslovakia	Nov - Jan	A2
Poland	Dec - Jan	A2
Bulgaria	Dec - Jan	A2
Yugoslavia	Jan - Feb	A2
France	Jan - Feb	A2
U.S.S.R.	Jan - Feb	B
Italy	Jan - Feb	B
Roumania	March	A2
Finland	April	A2
Germany	--	B
Switzerland	--	A & B
ASIA		
Japan	February	B
NORTH AMERICA		
U.S.A.	Feb - April	A & B
Canada	Jan - Feb	A

III. LABORATORY REPORT

A detailed antigenic analysis of the Type A and B influenza viruses isolated during 1966-67 "influenza season" is shown in Tables 1 and 2. The strains selected for complete examination were considered representative of the total received at the World Health Organization International Influenza Center for the Americas and were chosen on the basis of their reactions in preliminary tests and their geographic origin.

The values (r) shown in Tables 1 and 2 represent the antigenic difference between any two virus strains when both viruses and their antisera are compared in cross hemagglutination inhibition tests. The value of r is calculated according to the formula of Archetti and Horsfall and is given by the function:

$$r = \sqrt{r_1 \times r_2}, \text{ where } r_1 = \frac{\text{titer of serum 1 with strain 2}}{\text{titer of serum 1 with strain 1}} \text{ and}$$

$$r_2 = \frac{\text{titer of serum 2 with strain 1}}{\text{titer of serum 2 with strain 2}}$$

The values of r were calculated from the geometric mean titers obtained from three reciprocal hemagglutination inhibition tests using RDE-treated immune chicken sera and allantoic fluid antigens. For purpose of analysis and discussion, reciprocal antigenic differences greater than 8 fold ($r > 2.8$) are regarded as evidence of dissimilarity and are indicated by open areas in the tables; closely related strains are indicated by shaded areas.

It may be seen from Table 1 that Type A_2 influenza viruses isolated during 1966-67 appear to be closely related to the isolants obtained during 1965-66. It may be observed that the current isolants are generally related to A2/Japan/170/62, but less so to A2/Taiwan/1/64. The A2/Albany/3/65 strain which was representative of the 1964-65 strains of A_2 virus from the eastern part of the United States does not resemble the isolants obtained in the succeeding three years. However, it appears that most of the A_2 isolants obtained since 1962 form a rather homogenous group and that significant antigenic shifts, such as can be shown between A2/Jap/305/57 virus and contemporary strains, have not occurred in recent years.

The data shown in Table 2 indicate that Type B influenza viruses isolated during the 1966-67 "influenza season" are closely related to some isolants obtained during 1965-66. Most contemporary strains are no longer closely related to B/Maryland/1/59 influenza virus.

It appears that among the strains isolated in recent years one can distinguish a "B/Maryland-group" comprised of B/Philippines/1/65, B/Roumania/1/66, and B/Cordoba/125/66. The B/Georgia and B/Oregon isolants obtained during the 1965-66 influenza season appear to represent a "transitional group."

Considering the almost identical reactions given by B/Maryland/1/59 and B/Cordoba/125/66 it was interesting to learn that the latter virus was isolated from a laboratory technician who had been working with B/Maryland virus and whose illness came at a time when influenza was not occurring in Argentina.

The data shown in Table 2 support the recent decision to change the Type B components in 1967-68 civilian influenza vaccines from B/Maryland/1/59 to B/Massachusetts/3/66.

TABLE 1
STRAIN RELATIONSHIPS OF TYPE A INFLUENZA VIRUSES

	A/PR/8	A1/FM1	A2/Jap/305	A2/Jap/170	A2/Tw	A2/Alb	A2/Cal	A2/Mont	A2/Trin	A2/Pan	A2/Ga	A2/NJ	A2/Penn
A/PR/8/34	1.0*												
A1/FM/1/47	>100	1.0											
A2/Japan/305/57	>100	>100	1.0										
A2/Japan/170/62	>100	>100	1.1	1.0									
A2/Taiwan/1/64	>100	>100	4.4	4.0	1.0								
A2/Albany/3/65	>100	>100	3.2	2.0	1.1	1.0							
A2/California/1/66	>100	>100	4.3	1.2	2.4	3.5	1.0						
A2/Montana/1/66	>100	>100	3.5	1.6	2.2	2.4	0.9	1.0					
A2/Trinidad/1/66	>100	>100	6.3	3.5	1.7	3.2	0.9	1.1	1.0				
A2/Panama/1/66	>100	>100	3.9	2.2	3.2	2.4	1.4	2.0	2.0	1.0			
A2/Georgia/1/67	>100	>100	3.5	2.0	2.2	3.2	0.8	1.3	0.8	1.7	1.0		
A2/New Jersey/1/67	>100	>100	7.1	2.4	6.2	5.6	0.9	1.2	1.0	1.6	1.4	1.0	
A2/Pennsylvania/1/67	>100	>100	13.3	4.2	4.2	2.8	1.4	3.5	2.4	3.3	2.8	1.2	1.0

*Values of r according to the formula of Archetti and Horsfall, J. Exp. Med. 92:441, 1950.

TABLE 2
STRAIN RELATIONSHIPS OF TYPE B INFLUENZA VIRUSES

	B/Lee/40	B/GL/54	B/Md/1/59	B/Tw/2/62	B/Colo/2/65	B/Phil/1/65	B/Rum/1/66	B/Cor/125/66	B/Ga/1/66	B/Ore/1/66	B/Wash/1/66	B/Mass/3/66	B/Cor/156/66	B/Roma/1/67	B/Cal/1/67	B/Ariz/1/67
B/Lee/40	1.0*															
B/Great Lakes/1739/54	14.1	1.0														
B/Maryland/1/59	25.0	10.0	1.0													
B/Taiwan/2/62	35.8	12.6	22.6	1.0												
B/Colorado/2/65	21.9	5.6	14.0	3.3	1.0											
B/Philippines/1/65	113.1	10.0	1.7	17.7	6.1	1.0										
B/Rumania/1/66	21.6	3.6	2.2	25.3	7.7	2.0	1.0									
B/Cordoba/125/66	28.3	3.5	1.1	16.3	10.0	1.4	1.4	1.0								
B/Georgia/1/66	40.0	7.1	5.7	5.6	3.5	2.2	2.8	3.9	1.0							
B/Oregon/1/66	145.3	10.3	5.7	16.2	8.6	2.4	4.5	4.0	0.8	1.0						
B/Washington/1/66	40.0	4.5	3.2	4.0	3.16	2.8	4.0	5.6	1.7	4.5	1.0					
B/Massachusetts/3/66	71.6	5.7	7.1	10.1	6.8	5.0	5.6	4.5	5.6	8.0	1.4	1.0				
B/Cordoba/156/66	28.3	15.8	12.6	11.4	5.5	10.0	7.1	10.0	10.0	14.0	1.4	1.4	1.0			
B/Roma/1/67	20.0	25.3	5.6	8.9	3.9	2.8	4.6	3.6	3.3	4.1	0.9	1.4	1.7	1.0		
B/California/1/67	63.2	36.1	8.7	11.2	6.1	3.5	8.2	5.6	3.2	5.6	1.4	1.4	1.4	1.1	1.0	
B/Arizona/1/67	56.6	28.3	4.5	8.9	3.9	2.4	3.5	4.0	4.5	5.6	1.0	1.4	1.4	1.0	1.4	1.0

*Values of r according to the formula of Archetti and Horsfall, J. Exp. Med. 92:441, 1950.

IV. SPECIAL REPORT

INFLUENZA EPIDEMIC AT A DENTAL SCHOOL

In early February 1967, several Emory University (Georgia) dental students who complained of febrile respiratory illnesses were seen at the student health service. Throat swabs submitted to the NCDC yielded A2 influenza virus. Records in the Dean's Office revealed an increase in student absenteeism. These observations were reported to the Georgia State Health Department and plans for a complete investigation were made.

Method of Study

Late in February, a simple hand count of students with illness was taken at the Dental School to determine the extent of the outbreak; 53.1 percent of the sophomores, juniors, and seniors polled reported having had an acute respiratory illness during the month of February. Questionnaires were distributed to all members (306) of the student body; 206 of these (70%) were completed and returned. This study is based largely on the survey.

Setting

The Emory University School of Dentistry is located in downtown Atlanta. One large, three-story building provides both laboratory and clinical space for the students. Patients are seen on all three floors, but most clinical work is done in a single large room that accommodates 70 dental chairs and units. Junior and senior dental students spend almost all of their time in this building, mostly in the large clinic room, and mingle freely with each other. Freshman students spend most of their time at the main university campus in northeast Atlanta, and sophomore students spend time at both locations.

Results

The number of students with illness (by class) in the dental school is shown in Table 1.

Table 1

ACUTE RESPIRATORY ILLNESS AMONG EMORY DENTAL STUDENTS SURVEYED
(Jan. 26 -- Feb. 28, 1967)

Class	History of Illness	No History of Illness	Percent Ill
Freshman	22	22	50.0
Sophomore	40	24	62.5
Junior	29	15	65.9
Senior	30	23	56.6
Total	121	84	59.0

The attack rate of 59 percent determined by the returned questionnaires is not significantly different from the attack rate of 53 percent determined by the initial hand count.

Figure 1 shows by date of onset the cases of acute respiratory illness in the dental school. The shaded areas represent cases with a documented temperature of ≥ 100°F. or chills and sweats.* Categorically, the febrile and afebrile epidemic curves are almost identical.

The similarity in the senior and junior class curves in Figure 2, the delayed appearance of the peak of the freshman class curve, and the more diffuse nature of the epidemic curve for the sophomore class corresponds strikingly with what is known of the location of the students, as explained above.

The symptomatology of influenza A (as determined in previously studied outbreaks) was compared with the symptoms seen in the Emory Dental School epidemic. (See Table 2). The percentage frequency of symptoms noted during the dental school outbreak approaches closely the findings of those earlier studies.

Table 2

SYMPTOMATOLOGY OF INFLUENZA
(Percentage Frequency)

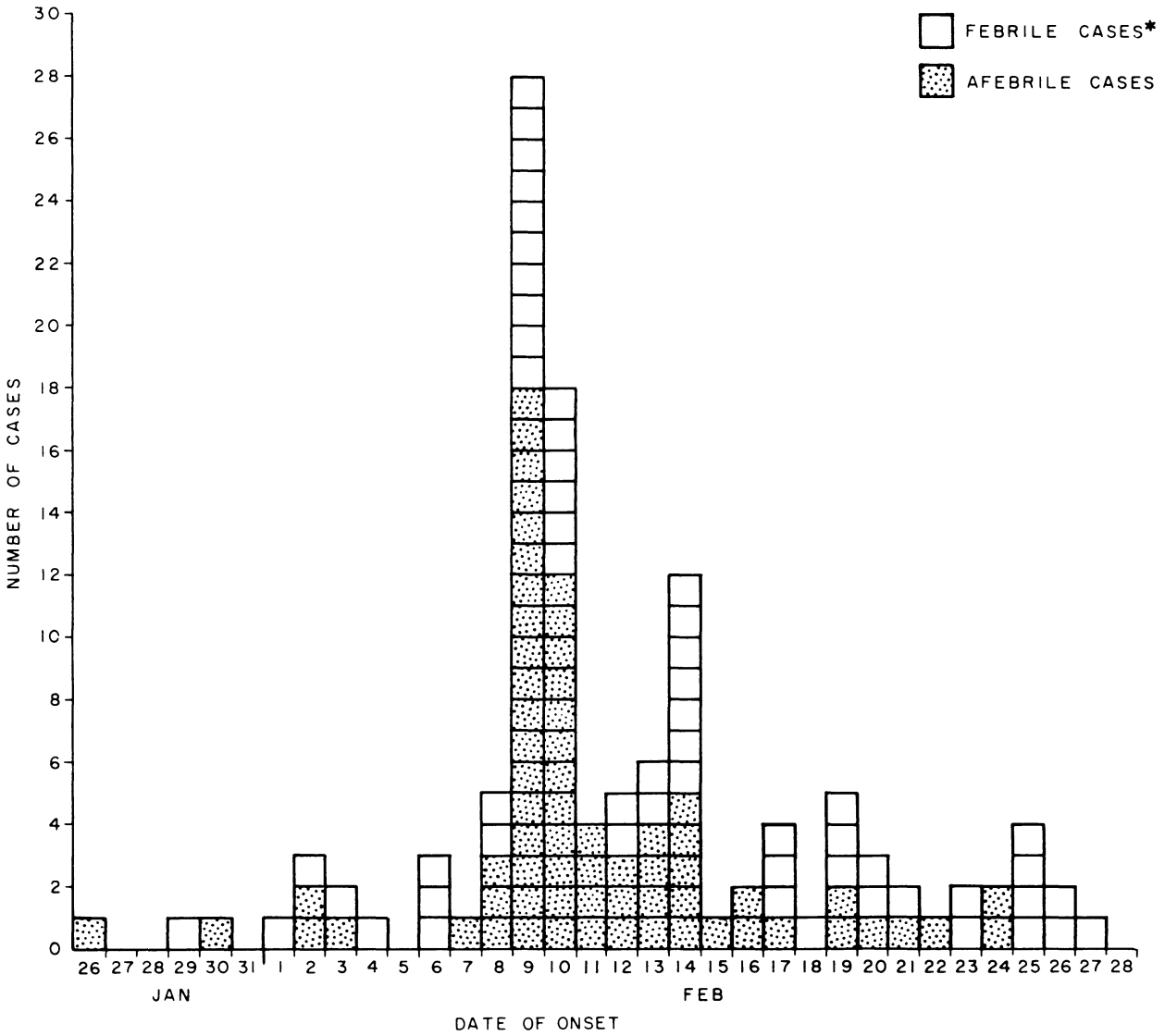
SYMPTOM	PERCENTAGE FREQUENCY			
	Emory Dental School 121 Cases	Previously Studied Outbreaks** A 84 Cases	B 79 Cases	C 76 Cases
Malaise	67	91	70	99
Headache	52	87	76	86
Shivering	44	74	77	87
Anorexia	17	77	75	-
Muscle pains	46	51	-	67
Dizziness	32	62	-	-
Sweating	47	31	-	-
Cough	71	71	84	97
Coryza	52	73	77	70
Sore throat	69	43	42	49
Expectoration	33	31	35	32
Chest pain	20	24	57	45
Hoarseness	42	6	53	-
Insomnia	14	32	-	-
Nausea	22	21	-	29
Vomiting	7	11	-	9
Abdl. pain	7	8	-	15
Diarrhea	24	-	-	4
Sudden onset	53	75	35	67

**From Stuart-Harris, Influenza, Edward Arnold & Co., London, 1953, p. 10.
Study A - Stuart-Harris et al., Lancet, 1939, I, p. 497.
Study B - Commission on Acute Respiratory Disease, American J. Hygiene, 1948, p. 48.
Study C - Kilbourne & Loge, Ann. Int. Med., 1950, 33, 371.

*Throughout this paper, patients with chills and sweats are counted with febrile patients unless the student in question documented no temperature elevation.

Figure 1.

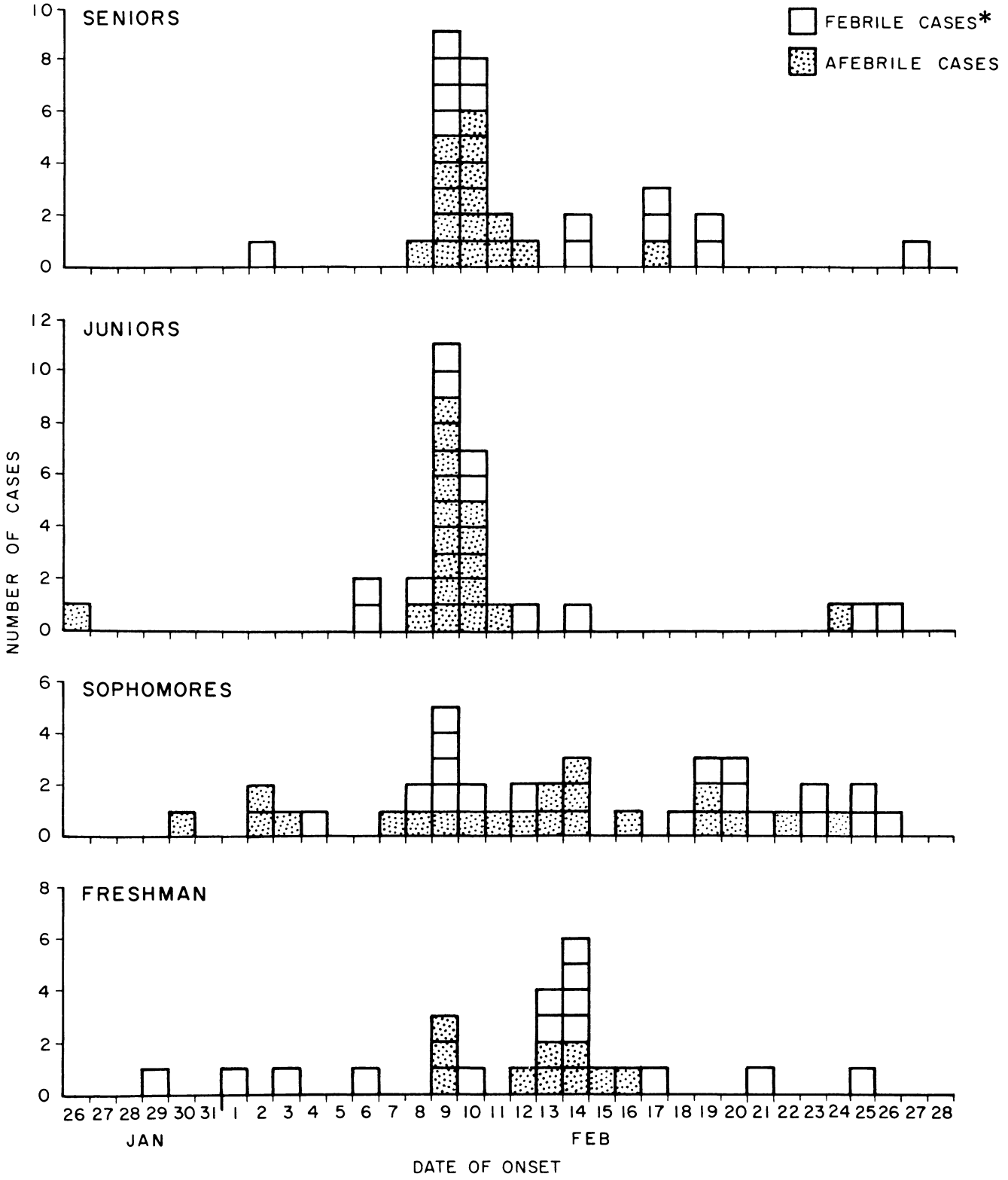
CASES OF ACUTE RESPIRATORY DISEASE BY DAY OF ONSET
EMORY DENTAL SCHOOL
1967



*INCLUDES THOSE WITH TEMP. OF ≥ 100°F OR CHILLS AND SWEATS

Figure 2.

CASES OF ACUTE RESPIRATORY DISEASE BY DAY OF ONSET AND BY EMORY DENTAL SCHOOL CLASSES 1967



*INCLUDES THOSE WITH TEMP. OF ≥100°F OR CHILLS AND SWEATS

Laboratory

Laboratory support for this investigation was provided by the Influenza Unit, Respirovirus Laboratory, Laboratory Program of the NCDC. Influenza virus A2 was isolated from the first 9 dental students to report to the Student Health Clinic during the epidemic. Serologic confirmation of A_2 infection was obtained from 5 of the 6 students studied.

Comment

The shape of the epidemic curve (Figure 1, Febrile and Afebrile Cases) suggests that a single agent was responsible for the dental school outbreak. The laboratory results support the clinical and epidemiologic evidence pointing to influenza A2. It is known that influenza virus infection is clinically variable.

Influenza Vaccine

Because many of the dental students gave a history of having received influenza vaccine, the epidemic presented an opportunity to observe the protection obtained through vaccination. Table 3 summarizes the results.

Table 3

INFLUENZA AND VACCINATION STATUS

STUDENTS	MOST RECENT VACCINATION				
	Never	1964 or Before	1965	1966-67	Total
Ill	49	44	16	12	121
Febrile*	25	30	9	2	66
Afebrile	24	14	7	10	55
Not Ill	41	26	4	13	74

*Or chills and sweats.

Table 3 indicates that, for all respiratory illness - febrile and afebrile - vaccination prior to 1966 offered little protection during this outbreak. Even those vaccinated in 1966-67 had an overall attack rate approaching that seen in the unvaccinated population. It could be argued that the vaccine reduced the fever of many potentially febrile cases or that afebrile cases represented another illness, but for reasons given above, it seems most likely that a single agent was responsible for this epidemic.

Clinic Patient Involvement

To evaluate the possibility that dental patients who had visited the dental school clinic might have had an increased risk of contracting influenza, telephone contact was made with 88 persons who had come to the clinic during the epidemic. They were not told that their names had been selected from the dental school patient registry. Nineteen of the 88 (21.5%) reported a flu-like illness* during the month of February. Of these, 13 placed the onset of illness within the 3-day period following a dental clinic visit.

*Flu-like illness characterized by at least 5 of the following symptoms: cough, chills, coryza, sore throat, muscular pains, headache, malaise, and anorexia.

Fifty persons whose names were chosen at random from the telephone directory were also called. Of these, 7 (14%) reported an influenza-like illness during the month of February; but as one might expect, there was no clustering of cases during any specific 3-day period.

DISCUSSION

Evidence in the literature is accumulating to point to the increased risk to dentists regarding their exposure to certain infectious diseases.[1] Direct manipulation of patients' mouths has been related to cases of hepatitis and non-veneral syphillis. Furthermore, in recent years, the question of airborne infection has been raised. In one study,[2-3] dental students had more respiratory infections (as measured by infirmary visits) than other graduate students living in the same dormitory. Also, this same group of dental students had a higher tuberculin skin test conversion rate than any other student group (including medical students).

The significance of microbial aerosolization produced by dental instrumentation has only recently been quantitatively examined. Work by Miller, et al.[2] clearly indicates that an entire dental suite can be contaminated by bacteria from a single source. Studies by Micik, et al.[3] have shown that certain dental procedures produce more aerosolization of infectious material than a sneeze.

The Emory Dental School is typical of many dental schools throughout the country in that the junior and senior students, each with his own dental chair, apparatus, and patients, work together in a single large clinic room. The epidemic curves of these upper classmen are almost identical, and by their shape, suggest a common source epidemic. Reports by 13 patients of having developed an influenza-like illness after a dental school visit are of interest in this regard. Nine of the 13 had been treated by students who did not themselves have a respiratory illness. A tempting hypothesis is that aerosolization of saliva infected with influenza A2 virus was responsible for the rapid spread of illness among persons present in the large clinic room.

SUMMARY

An outbreak of influenza A2, probably spread by microbial aerosolization, occurred in a dental school population in February 1967. In a survey of 222 students, 121 (59%) reported having been ill.

Dental clinic patients were questioned; 15 percent reported the onset of influenza-like illness within three days after a clinic visit.

References:

1. *Burton & Miller, "The Role of Aerobiology in Dentistry", Proc. First Int. Symp. Aerobiology, Berkeley, California, 1963.*

2. *Miller, Burton, and Spore, "Aerosols Produced by Dental Instrumentation", Proc. First Intern. Symp. Aerobiology, Berkeley, California, 1963.*

3. *Micik, Miller, Ryge, Mazzarella, "Microbial Aerosols Discharged from the Cavity of Dental Patients", presented at 45th Ann. Meeting of Intern. Assoc. for Dental Research and the N. Am. Div. of IADR., March 16-19, 1967, Washington, D.C.*

Key to all disease surveillance activities are those in each State who serve the function as State epidemiologists. Responsible for the collection, interpretation and transmission of data and epidemiological information from their individual States, the State epidemiologists perform a most vital role. Their major contributions to the evolution of this report are gratefully acknowledged.

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