22. Murray, R., and Ratner, F.: Safety of immune serum globulin with respect to homologous serum hepatitis, Proc. Soc. Exper. Biol. and Med., 83:554, July 1953.

23. National Office of Vital Statistics: Morbidity and Mortality, 2:2, Jan. 11, 1954.

24. Neefe, J. R., and Stokes, J. Jr.: An epidemic of infectious hepatitis apparently due to a water-borne agent: Epidemiologic observations and transmission experiments in human volunteers, J.A.M.A., 128:1063, Aug. 11, 1945.

25. Owings, W. V. B.: Hypersensitivity to gamma globulin. A case report, J. Med. Assn. Alabama, 23:74, Sept. 1953.

26. Reed, M. R., Bancroft, H., Doull, J. A., and Parker, R. F.: Infectious hepatitis—presumably food-borne outbreak, Am. J. Pub. Health, 36:367, April 1946.

27. Stokes, J. Jr., Farquhar, J. A., Drake, M. E., Capps, R. B., Ward, C. S., Jr., and Mills, O.: The evaluation of the length of protection provided by immune serum globulin (gamma globulin) during epidemics, J.A.M.A., 147:714, Oct. 20, 1951.

28. Stokes, J., Jr., Maris, E. P., and Gellis, S. S.: Chemical, clinical and immunological studies on the products of blood fractionation. XI. The use of concentrated normal human serum gamma globulin (human immune serum globulin) in the prophylaxis and treatment of measles, J. Clin. Invest., 23:531, July 1944.

29. Stokes, J., Jr., and Neefe, J. R.: The prevention and attenuation of infectious hepatitis by gamma globulin, J.A.M.A., 127:144, Jan. 20, 1945.

30. Voegt, H.: Zur Aetiologie der Hepatitis epidemica, Munchen med. Wchnschr., 89:76, 1942.

31. Witts, L. J.: Some problems of infectious hepatitis, Brit. Med. J., 1:739, June 3, 1944.

Infectious Hepatitis

Report of an Outbreak of 24 Cases

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• In an epidemic of 24 cases of infectious hepatitis in a small lumbering community, the majority of cases occurred in children. Sixteen of them were pupils in one school. The school apparently was the focus for the spread of infection, which is thought to have been through contact between persons. Five multiple case households with eight secondary cases were observed. With one exception, gamma globulin was not used for the prophylaxis of infectious hepatitis in families in which one member had the disease.

THE PRESENT COMMUNICATION, an epidemiologic case report, describes a common pattern of occurrence of infectious hepatitis and cites an instance in which the prophylactic use of gamma globulin would have been desirable.

Because of a report of several cases of infectious hepatitis in Village "A," an investigation was undertaken by state and local health departments June 1 and 2, 1954. Village "A" is a community of approximately 500 persons situated in a rural area of Northern California. A lumber mill is located in the town and lumbering is the main industry. There are no physicians in Village "A" and medical care is obtained in Village "B," approximately 20 miles away.

Occurrence of Cases

Criteria for the diagnosis of infectious hepatitis were a characteristic history of illness accompanied by jaundice.

The first case of infectious hepatitis consistent with these criteria occurred in a 6-year-old girl (first grade pupil) in whom onset was on February 5, 1954. The patient's family had moved to Village "A" only 11 days before. There was no history of contact with a case of hepatitis in the patient's previous home in another state. The second case occurred on March 13 in a 6-year-old classmate of the girl in whom the disease was noted first. Four weeks later a third case occurred in a child in the same classroom and from that time up to the time this report was written (July 1954) at least one case occurred each week and there were 24 cases in all, 13 in males and 11 in females. The peak week of the epidemic was the week ended May 15 (Chart 1). During that week six

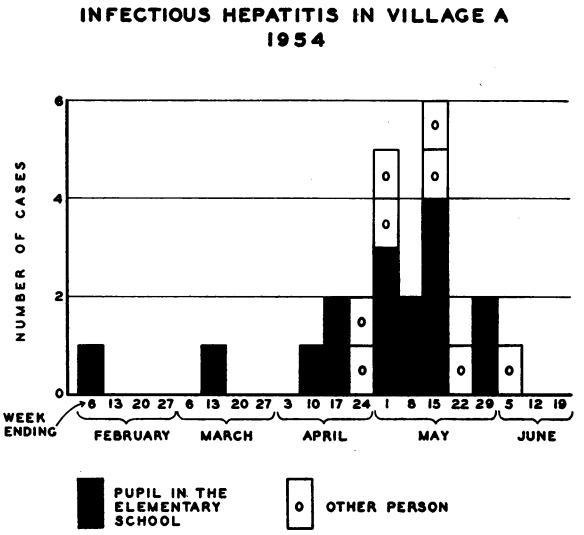

Chart 1

cases of infectious hepatitis occurred. There were no deaths.

The occurrence of cases in various age groups was:

Age Group	No. of Cases
0- 4	2
5- 9	9
10-14	7
15-19	1
20-24	1
25-29	2
30 and over	2
Total	24

Sixteen of the 24 persons ill were students in the Village "A" elementary school, which includes kindergarten through the eighth grade in a four-room, fairly new building. The various grades and rooms with the number of cases in each grade and room and the attack rate by room were as follows:

Room	Grades	No. Pupils	No. Cases	Rate Per Cent
1	Kindergarten	17	1	20.0
	First	23	7	
	Second	14	1	
2	Third	6	0	8.6
	Fourth	15	2	
3	Fifth	18	0	6.5
	Sixth	13	2	
4	Seventh	11	2	12.0
	Eighth	14	1	
	Total	131	16	12.2

It is evident that the highest incidence occurred in the first grade, which is the class in which the patient with the first case was enrolled.

Multiple Case Households

In five households more than one case occurred—13 in all. The interval between the onset of the initial and subsequent cases in each household was more than two weeks in all instances. It is felt that the eight subsequent cases can be considered as instances of secondary infection within the household.

Means of Spread

The first-grade pupil who had the first case almost certainly acquired the infection in the previous place of residence from which she had but recently come. Both the second and the third cases, each occurring approximately one incubation period from the preceding case, occurred in classmates of the first patient. The spread of infection thenceforward was less clear. The water supply in the village is obtained from private wells and it would appear unlikely that water could be the source of infection except in the school. It is possible that intermittent contamination of the school water supply could have occurred and this could be the source of infection in the school children. However, it is felt that the spread of infection in this outbreak can best be explained as having been due to contact between persons and not as being due to a common source. Every case can be related either directly or indirectly to the school and it is thought that this was the focus of infection.

Prophylaxis in Family Contacts

Gamma globulin was administered to the other members of the family of a patient in only one instance in the outbreak and it was necessary for that family to travel some distance to receive the immunization. Although gamma globulin was available in Village "B," the physicians there did not use it. Available evidence[1] suggests that the use of gamma globulin in household contacts of cases might have prevented the appearance of at least some of the eight secondary cases that occurred in familial groups.

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REFERENCE

1. Leftwich, C. I.: Prevention of infectious hepatitis by gamma globulin, Cal. Med., 81:226-229, Sept. 1954.