

(f) The following facts suggest that when individuals come unscathed through an outbreak of poliomyelitis, the primary factor is *not* (as has generally been assumed) immunity gained in a previous epidemic:—

- (1) During this widespread and moderately severe epidemic less than one in four in any age group of the general population was affected in any way.
- (2) Amongst those in closest contact with positive cases, significant numbers of young people could be found who, after searching inquiry, appeared to have escaped completely.
- (3) Between boys and girls of the same age there appeared to be a notable difference in susceptibility in favour of the latter.
- (4) In rural areas, although the incidence was much higher than in the city, the percentage of cases aged 15 years or over was lower.

(g) Of equal, or greater, importance may be the degree of exposure to infection, and possibly the stage of the epidemic at which infection is first encountered. It seems that infection may not be acquired so easily as is generally believed, and that mode of life and personal habits may be deciding factors. Some immunity appears to have been conferred by minimal infections early in the epidemic—*e.g.*, amongst older schoolboys and possibly adults. See next paragraph, and (k) below.

(h) The epidemic was preceded by an increase of illnesses of the type mentioned in (a) above, at first mainly of short duration (under 4 days), the chief prevalence being amongst adults.* As the epidemic approached its peak, however, “suspect” illnesses showed their highest prevalence in school-children, especially in the vicinity of positive cases, and there was a marked increase in the duration of illness and in the number of suggestive symptoms observed.

(i) Serial spot maps of positive cases showed no indication of spread from any particular focus. It must be presumed, therefore, that in the form of “suspect” illnesses the disease had already established itself widely before the appearance of positive cases revealed its presence. Investigation showed that this unobtrusive spread of “suspect” illnesses had occupied a period of some weeks at least, during which only a single positive case occurred, date of onset 25th October; yet so widespread had the infection become by the middle of November that a very large number of individuals must already have been involved. In the first four weeks of the overt epidemic (9th November to 6th December), 30 positive cases occurred in the Auckland urban area, and the peak of the epidemic was reached in the fourth week. These facts would be consistent with an increase in the virulence of the organism during October and November.

(j) A very high percentage of the household contacts of positive cases had a “suspect” illness during the period of observation. Before, or concurrent with, the onset of the positive case, 50 per cent. of two age groups (males aged 10–15 years, females aged 5–10 years) in the affected households had a “suspect” illness. School-children, particularly boys aged 10–15 years, were most frequently responsible for introducing the infection into the family. Amongst children the age groups most affected by “suspect” illnesses beforehand produced fewest positive cases, but females, on the whole, suffered less than males, and adults very much less than children.

(k) The intervals between the dates of onset of successive illnesses (suspect or positive) in the same household ranged from 1 day to as much as 110 days. Half of them ranged from 1 to 10 days, half were of 12 days or more. A tendency to grouping about the fifth day and the eighteenth day was noted. The facts pointed either to a comparatively poor capacity of the organism to pass from person to person in the home, or to a remarkable degree of variation in the incubation period. The former was considered to be the more likely.

(l) “Suspect” illnesses in the general population followed the usual poliomyelitis pattern in their age and sex incidence. Males under the age of 15 were more affected than females of the same age, the preponderance being more marked after school entry

* For reasons mentioned on page 69, however, least reliance can be placed in this investigation on records of illness amongst adults in childless families.