

This is an important observation. It is seldom possible—in ordinary circumstances, never possible—to prove that a particular minor illness in a polio contact has any real connection with poliomyelitis. The relationship just described is, however, very strong evidence that the illnesses recorded in these contacts were definitely linked with the positive cases in their friends.

Up to this point in the investigation I must confess that I was often doubtful whether the whole basis of the inquiry was not fallacious. From here onwards one felt at liberty to discuss the behaviour of these contact illnesses with much more confidence than would have been justified by their clinical study above.

The next fact of importance shown in Fig. V is that there is no *general* correlation between positive cases and suspect illnesses, regardless of age and sex. If we arrange all the age/sex bars in Fig. V so that the left-hand portions (percentage of positive cases) are in order by lengths, the right-hand columns are thrown into confusion. To bring out the relationship described above it is necessary not only to consider "adults" separately from the rest, but to divide children under 15 into the two sex groups.*

The meaning of this appears to be that there is some fundamental difference between the effect on male children of a poliomyelitis risk as compared with female children. It is well known that in all large outbreaks there are more boy positives than girls. This has sometimes been attributed merely to a preponderance of males over females in the younger age groups (see, for example, Sydney Smith's report on the Wellington epidemic of 1916, page 21), but study of Fig. V will show that the pattern of positives and suspects is quite different in the two sexes. We will return to this question later.

Let us now see how this state of affairs developed. On the next page, in Fig. VI (see Appendix, Table VI), the progress of suspect illnesses amongst the different age groups is shown. Let us look, first, at the period up to seven days before the onset of the positive case. This should demonstrate which age group was most liable to introduce the infection into the family.

It will be seen that more than 4 weeks before the onset of the positive case, members of both school age groups in each sex developed suspect illnesses. Other groups were affected as time went on, but the most striking feature is the steady advance of suspect illnesses amongst male children aged 10–15 years, 50 per cent. of whom had already had an attack by the time the positive case commenced.

Now observe what happened at the time when the positive case fell ill. So far as suspect illnesses in male children are concerned, the situation is reversed. Schoolboys aged 10 or over developed no concurrent illnesses; pre-school males, least affected before, now had several. In females, however, concurrent illnesses followed the same pattern as before, presumably because the process of salting had not previously advanced so far as in males. Add concurrent illnesses to those already recorded, and the distribution of positive cases in children of either sex can be predicted by simply applying the rule that the less suspect illness there has been, the greater will be the incidence of positive cases. This is shown in Fig. VII.

Indeed, it would almost be possible to forecast the actual number of positive cases in each age group, because of the high proportion of male children aged 10–15 years and of females aged 5–10 who either have a suspect illness or become positive cases. This is shown in Fig. VIII, in which all suspect illnesses, including those occurring after the positive case, have been included.

It will be seen that the gap in each age group, representing the percentage of persons for whom nothing was recorded in the period covered, increases from male children (where it is small, 8 per cent. to 21 per cent.) through female children to adults.

* If, for example, we consider suspect illnesses before and concurrent, the coefficient of correlation is reduced from -0.88 for male children and -0.88 for females to 0.81 for both sexes combined. This is still a very high degree of correlation, but the reduction supports the view that there is some essential difference between male and female children in their response to the polio risk.