

## Occasional Survey

# Mycoplasma pneumoniae Infection in the United Kingdom—1967-73\*

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### Summary

A widespread epidemic of *Mycoplasma pneumoniae* infection in the United Kingdom occurred over a 30-month period in 1970-72. A small epidemic may also have occurred in 1967-68. Though the incidence of *M. pneumoniae* infection is known to change from year to year in small communities, a varying epidemicity in the population of a country has not previously been demonstrated.

As expected, lower respiratory tract infection was the most common manifestation of infection; and the highest attack rates were in children aged 5-9 years. Elderly persons appear to be affected uncommonly.

### Introduction

*Mycoplasma pneumoniae* is known to be endemic in some communities and to cause localized outbreaks of respiratory tract infection. Transmission of infection occurs more readily after prolonged contact in close communities: thus outbreaks have been reported in military recruits,<sup>1</sup> schools,<sup>2,3</sup> universities,<sup>4,5</sup> and families.<sup>6,7</sup> In the general population, schoolchildren are probably most important in spreading the infection,<sup>7</sup> and in outbreaks that have been described in civilians,<sup>8-12</sup> the organism was probably transmitted by schoolchildren to their families rather than by direct spread between families.<sup>13</sup>

Recurrent peaks of infection have been shown in a large group practice in Seattle<sup>14</sup> and a four-five year cyclic pattern in the incidence of *M. pneumoniae* pneumonia was noted in students at a university.<sup>4</sup> Nevertheless, the full epidemiological pattern of infection in larger communities, as, for example, in the population of a country, is not known, though reference has been made to the occurrence of a greater prevalence recently in the United Kingdom.<sup>15</sup> In this paper, reports of proved cases of *M. pneumoniae* infection, as shown by returns to the Public Health Laboratory Service, have been analysed to examine the periodicity of infections from this organism in the United Kingdom.

### Sources

The reports of *M. pneumoniae* that have been analysed are those sent routinely to the Epidemiological Research Laboratory since

\*An analysis of routine reports from laboratories of the Public Health Laboratory Service and Hospital Laboratories.

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May 1967 from Public Health and hospital laboratories. *M. pneumoniae* infection was confirmed either by isolation of the organism from the patient or by a fourfold rise in titre to the specific antibody, but in some cases only one serum specimen was available and in these an antibody titre of 1/160 or more was associated with a recognized clinical manifestation of infection, such as pneumonia.<sup>16</sup> These criteria for reporting *M. pneumoniae* infection have not changed since 1967. Infections in Scotland are reported to us through the Communicable Diseases, Scotland unit in Glasgow. The criteria for accepting cases are the same.

These reports are analysed in the Epidemiological Research Laboratory according to the week they were reported, and not by the date of receipt of the first specimen in the diagnostic laboratory. As a consequence, the dates shown in the figure will not correspond exactly with the dates of the illnesses. On average, infection was reported eleven days after the first specimen was received in the laboratory.

Included with each report of infection with *M. pneumoniae* are the age and sex of the patient; the main clinical features; laboratory details of the mode of identification of the organism; and other relevant epidemiological information about outbreaks.

### Results

The numbers of *M. pneumoniae* infection reported from laboratories in the United Kingdom in four-weekly periods since May 1967 are shown in the figure. This shows two periods

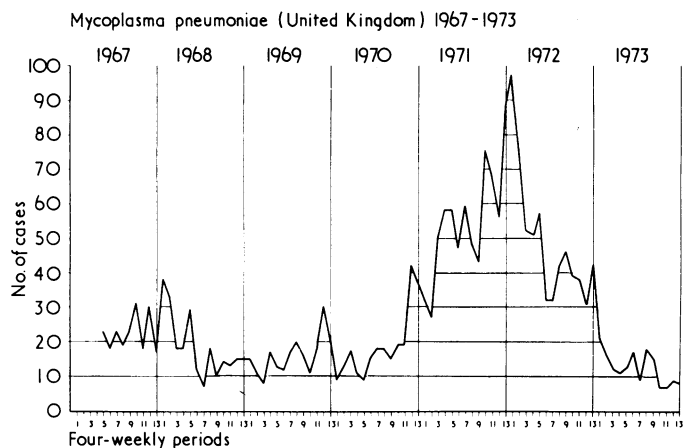


TABLE 1—*M. pneumoniae* reports in four-weekly periods, United Kingdom 1967-73

	Four-weekly periods												
	1	2	3	4	5	6	7	8	9	10	11	12	13
Average 1967-73	37	32	28	29	30	23	25	27	25	32	29	31	37

TABLE II—*M. pneumoniae* Infections 1971-2: Age and Sex

	Sex			Age Groups (years)											Total		
	Male	Female	Not stated	<1	1-4	5-9	10-14	"Child"	Total Children	15-24	25-44	45-64	65+	"Adult"		All Adults	Not stated
Cases	368	330	2	14	47	93	85	1	240	108	206	95	22	5	436	24	700
Per cent.	53	47	—	2	7	14	13	—	36	16	31	14	3	—	64	—	100

TABLE III—*M. pneumoniae* 1971-2: Main Clinical Features

	Resp. Upper	Resp. Lower	Resp. Other/Unspec.	Cardiac	Glandular	C.N.S.	General	No Symptoms	Other	No Information	Total
Cases	55	427	67	7	9	16	74	2	31	12	700
Per cent.	8	61	10	1	1	2	11	—	5	2	100

C.N.S. = Central Nervous System.

of increase, the first in 1967-8 and a much greater and more sustained increase in 1971-2. In this latter period, the number of reports began to increase at the end of 1970 and continued, with brief interruptions, throughout 1971; the smaller number reported early in the year was probably due to the postal strike. The peak was reached in January 1972. Thereafter the number of cases declined, somewhat steeply at first. The data for Scotland alone show that the epidemic periods correspond approximately, though the peak of the 1970-2 epidemic occurred about six months earlier in Scotland than in England and Wales. Nevertheless, an analysis of the reports from England and Wales by laboratory area did not indicate that the epidemic progressed on a geographical basis; indeed, from the start of the epidemic, reports were received from laboratories in widely separated areas in England and Wales.

Though no definite seasonal incidence in reported cases was noted, the peaks during both periods of increased numbers of reports were in winter. Table I shows the average number of cases reported during each of the four-weekly periods from 1967-73 inclusive, and between weeks 21 and 36 (corresponding to the months June to August) about 30% fewer cases were reported.

Deaths from respiratory infections published in the Registrar General's quarterly returns did not show an increase in numbers during the periods of increased incidence of *M. pneumoniae* infection.

The age and sex distribution of the 700 cases reported during 1971 and 1972 and diagnosed by isolation or by a four-fold rise in antibody titre are shown in table II, and the main clinical features in table III. Patients diagnosed on the basis of a single high antibody titre have not been recorded in these tables because they are reported only if supporting clinical evidence of infection is present. A slight preponderance of males over females is present; school-age children, especially those aged 5-9, have the highest attack rates; and manifest infection is uncommon in adults over 65 years (table II).

The respiratory tract was the main system affected in 549 of the 700 patients (78%) reported in this period, and most of these (78%) were lower respiratory infections (table III). *M. pneumoniae* infection is associated with central nervous system disease,<sup>17 18</sup> and in 16 patients (2%) this was the main system affected; the diagnosis was meningitis in three patients, encephalitis in one, and myelitis in one, but the other nervous system manifestations were less serious and were recorded as convulsions or "meningism." Seven patients (1%) were reported to have cardiac abnormalities and a further 74 patients (11%) had non-specific symptoms of a febrile illness.

Twenty-one outbreaks were reported in 1971 and 1972. Eighteen of these were in families, two were in boarding school, and one was in a nurses' home.

## Discussion

The true incidence of *M. pneumoniae* infection in Britain is not known, because many infections are subclinical, especially in adults aged over 40, and the incidence of pneumonia in those affected with *M. pneumoniae* is small, both experimentally<sup>19</sup> and in practice.<sup>1</sup> Moreover, patients with quite extensive *M. pneumoniae* pneumonia may have minimal clinical signs; many probably never seek medical advice and among those who do the empirical use of tetracyclines or erythromycin for many respiratory or pyrexial illnesses must further diminish the likelihood of establishing a full diagnosis. Since only cases in which the diagnosis is confirmed by laboratory examination are included, several diagnosed presumptively on clinical and epidemiological grounds must go unreported. Hence the real incidence of *M. pneumoniae* infection is likely to be considerably greater than numbers reported by laboratories. On the other hand, the reports provide an indication of the relative frequency of *M. pneumoniae* infection at different times, and of the age and sex distribution of clinical cases.

In discussing the trends in incidence, it must be remembered that the number of laboratories reporting during this period 1967-73 has risen at a rate of about 1% a year since 1967, and the total number of reports of respiratory viruses and related organisms (excluding influenza) has gradually increased by about 6% a year since 1967. Nevertheless, these factors are clearly insufficient to account for the peaks in the curve in the figure. These peaks are also unlikely to be caused by a greater awareness and interest in *M. pneumoniae* infection because this would have produced a slower rise since 1967 without the sharp fall in the number of cases reported since January 1971.

The duration of the epidemic (about 30 months) probably reflects the long incubation period in this infection, which has been estimated to be about three weeks<sup>3 7</sup> and of the close and prolonged contact required for transmission of infection. For these reactions, epidemics of *M. pneumoniae* are unlikely to resemble the sharp epidemics of short duration found for example in influenza. These factors may also account for the irregularities in the graph.

Cases were reported slightly less frequently in the summer months. This was not because the laboratories made fewer virus reports in summer because, if the established winter viruses such as influenza and respiratory syncytial virus are excluded, no such trend has been noted. Seasonal variation in *M. pneumoniae* infection has not been noted before.<sup>20 21</sup> Probably the slightly fewer reports in summer were a manifestation of epidemic rather than seasonal variation.

The lack of a noticeable effect of these epidemics on the deaths from respiratory infections as recorded in the Registrar General's returns is to be expected, because *M. pneumoniae* infection usually causes a benign and treatable illness in healthy children and young adults.

Probably the clinical data provided by the reports received is not entirely representative of the spectrum of illness in the general population because of the tendency for severe illnesses to be investigated. The age and sex distribution of the 700 cases analysed is similar to that reported in North America.<sup>20 22 23</sup>

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# New Invention

## Hayman Perching Stool

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The Hayman Perching Stool was originated at the Royal National Hospital for Rheumatic Diseases, Bath, by collaboration between a senior occupational therapist (Mrs. J. L. B. Freeman) and a research technician (Mr. D. Hayward) with the aim of producing a stool to meet the specific needs of the disabled in the home. Early development work was undertaken as a research project by the A.R.C. Experimental Workshop. Final development work and the clinical trials were carried out in collaboration with the Bath Institute of Medical Engineering, through which funding, patents, and manufacturing were arranged.

The perching stool is intended to improve the independence mobility, and comfort of the user. (see figs. 1 and 2). There are many routine actions which require standing for short or comparatively lengthy periods. Preparing food, washing up, answering the telephone, standing at the wash-basin, are all normal functions of the average housewife's life. For the many thousands of them disabled, however mildly, by rheumatoid arthritis of hips, knees or feet, osteoarthritis, spasticity of any other chronic limb disability, the ordinary household stool is an inadequate aid. For the man similarly afflicted there are many jobs in which the need for some simple but effective aid is obvious: at the work bench, the desk or drawing board, the switchboard or counter.

To 1½ million disabled people in Britain who are the potential users of such an aid may be added the frail elderly—some 6.5 million over 65.

