Public Health England

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Annual summary of *Mycoplasma pneumoniae* laboratory surveillance data, 2016, England and Wales

Summary

A total of 700 cases of *Mycoplasma pneumoniae* (Mpn) infection were reported to Public Health England (PHE) during 2016, an increase from 578 cases in 2015. The proportion of cases reported by genomic methods has increased from 28% in 2015 to 34% in 2016.

Background

Mycoplasma pneumoniae (Mpn) is a bacterium that causes acute respiratory illness ranging in severity from mild illness to severe pneumonia. It can be fatal in some cases and has rarely been associated with severe complications such as encephalitis. Further information can be found on the PHE Mycoplasma pneumoniae web page.

These analyses are based on laboratory reports of Mpn from January 2011 to December 2016 in England and Wales (EW), extracted from the PHE voluntary surveillance database Second Generation Surveillance System (SGSS).

Laboratory reports included were limited to the following methods and samples:

- serological methods (antibody detection, antibody rising titre, IgM detection, antigen detection) on blood, serum or plasma
- genomic methods, including polymerase chain reaction (PCR) on blood, serum, plasma, throat, nose/nasal, bronchial, upper respiratory tract, broncho-alveolar lavage (BAL), alveolar, naso-pharyngeal aspirate (NPA), endotracheal aspirate, trachea or sputum

Rates of laboratory detection were calculated using mid-year resident population estimates for the respective year from ONS [1]. Geographical analyses by region were based on location of the reporting laboratory.

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The data presented here may differ in some instances from those in earlier publications, partly due to the inclusion of late reports.

It is recommended that results from serological analyses are interpreted with caution, as genomic methods are considered to produce a more robust indication of acute infection.

Overall number of Mpn cases reported

Following relatively high case numbers in 2011/2012, the number of reported cases of Mpn appeared to decline over 2013 and 2014; case numbers and the overall population rate of detection appeared to increase again during 2015 and 2016 (Table 1 and figure 1).

Trends in reporting of Mpn cases (combined genomic and serological methods) can be observed in Figure 1, where 3-weekly moving average numbers of cases are displayed. Distinct peaks are observed in early 2012 and 2015, with smaller seasonal peaks in late 2010 and early 2013. A high peak is observed in late 2015/early 2016 and a smaller peak in late 2016, contributing to the total high case number and annual rate of infections reported in 2016. This trend is consistent with previously-observed epidemic peaks in Mpn incidence at 3-4 year intervals, interspersed with smaller seasonal peaks [2].

Traditionally, serological methods have been the mainstay of diagnosis (table 3). However, over the past three years, an increasing proportion of cases have been detected using genomic methods, ie PCR (Table 2). Two thirds of cases, however, are still reported by serological methods (Table 3).
Case numbers are similar in males and females, and this ratio has remained unchanged, despite fluctuation in overall case numbers during the last six years.

Table 1: Annual counts of Mpn cases reported by sex (all methods): 2011 – 2016

Year	Cases	Gender			Overall rate of detection/million population
		Male	**Female**	**Unknown**	
2011	574	272	293	9	10.21
2012	658	329	321	8	11.63
2013	470	234	234	2	8.25
2014	429	211	216	2	7.47
2015	578	288	289	1	9.98
2016	700	350	346	4	12.09

Table 2: Annual counts of Mpn cases reported by sex (genomic methods): 2011 – 2016

Year	Cases	Gender			Overall rate of detection/million population
		Male	Female	Unknown	
2011	10	8	0	2	0.18
2012	14	7	7	0	0.25
2013	8	4	4	0	0.14
2014	52	29	23	0	0.91
2015	161	78	83	0	2.78
2016	241	119	122	0	4.16

Table 3: Annual counts of Mpn cases reported by sex (serological methods): 2011 – 2016

Year	Cases	Gender			Overall rate of detection/million population
		Male	Female	Unknown	
2011	564	264	293	7	10.04
2012	644	322	314	8	11.38
2013	462	230	230	2	8.11
2014	377	182	193	2	6.57
2015	417	210	206	1	7.20
2016	459	231	224	4	7.93

Distribution of Mpn cases by age group, England and Wales, 2011-2016

The highest numbers of cases are observed in the 15-44 year age group (Tables 4 and 5); and this has remained consistent since 2011.
Case numbers diagnosed by genomic methods appear to have increased consistently up to 2016 in all age-groups under 65 years (table 4).

Table 4: Annual counts and proportions of Mpn cases by age group (genomic methods)

Year	Number of cases per age group in years (%)							Total cases
	0-4	5-9	10-14	15-44	45-64	65+	Unknown	
2011	1 (10.0)	2 (20.0)	0 (0.0)	4 (40.0)	3 (30.0)	0 (0.0)	0 (0.0)	10
2012	3 (21.4)	3 (21.4)	0 (0.0)	6 (42.9)	1 (7.1)	1 (7.1)	0 (0.0)	14
2013	2 (25.0)	0 (0.0)	1 (12.5)	3 (37.5)	2 (25.0)	0 (0.0)	0 (0.0)	8
2014	20 (38.5)	9 (17.3)	0 (0.0)	19 (36.5)	3 (5.8)	1 (1.9)	0 (0.0)	52
2015	53 (32.9)	17 (10.6)	6 (3.7)	58 (36.0)	16 (9.9)	11 (6.8)	0 (0.0)	161
2016	76 (31.5)	22 (9.1)	7 (2.9)	103 (42.7)	27 (11.2)	6 (2.5)	0 (0.0)	241

Table 5: Annual counts and proportions of Mpn Cases by age group (serological methods)

Year	Number of cases per age group in years (%)							Total cases
	0-4	**5-9**	**10-14**	**15-44**	**45-64**	**65+**	**Unknown**	
2011	63 (11.2)	101 (17.9)	65 (11.5)	216 (38.3)	69 (12.2)	49 (8.7)	1 (0.2)	564
2012	79 (12.5)	80 (12.4)	65 (10.1)	237 (36.8)	115 (17.9)	68 (10.6)	0 (0.0)	644
2013	33 (7.1)	54 (11.7)	41 (8.9)	151 (32.7)	102 (22.1)	81 (17.5)	0 (0.0)	462
2014	27 (7.2)	36 (9.5)	27 (7.2)	152 (40.3)	60 (15.9)	74 (19.6)	1 (0.3)	377
2015	26 (6.2)	49 (11.8)	32 (7.7)	162 (38.8)	87 (20.9)	60 (14.4)	1 (0.2)	417
2016	37 (8.1)	47 (10.2)	42 (9.2)	180 (39.2)	81 (17.6)	68 (14.8)	4 (0.9)	459

Distribution of Mpn cases by geographical region

Large regional differences in case numbers are noted, which may be due to presumed differences in testing algorithm. Overall, the highest proportion of Mpn cases has been reported in northern England, with decreasing serological reports over the past three years. Genomic reports have increased in the North, South and London regions in 2016 (Tables 6 and 7), which is likely due to increasing implementation of molecular testing. The overall proportions of cases reported have also increased in London and the Midlands/East, and decreased in Wales.

Table 6: Annual counts and proportions of total Mpn cases by England and Wales region (genomic methods), 2011-2016

Year	Cases per region (%)					Total cases
	London	**Midlands and East**	**North**	**South**	**Wales**	
2011	0 (0.0)	0 (0.0)	3 (30.0)	6 (60.0)	1 (10.0)	10
2012	1 (7.1)	1 (7.1)	2 (14.3)	9 (64.3)	1 (7.1)	14
2013	0 (0.0)	2 (25.0)	1 (12.5)	5 (62.5)	0 (0.0)	8
2014	11 (21.2)	5 (9.6)	10 (19.2)	24 (46.2)	2 (3.8)	52
2015	56 (34. 8)	1 (0.6)	59 (36.6)	45 (28.0)	0 (0.0)	161
2016	81 (33.6)	2 (0.8)	93 (38.6)	64 (26.6)	1 (0.4)	241

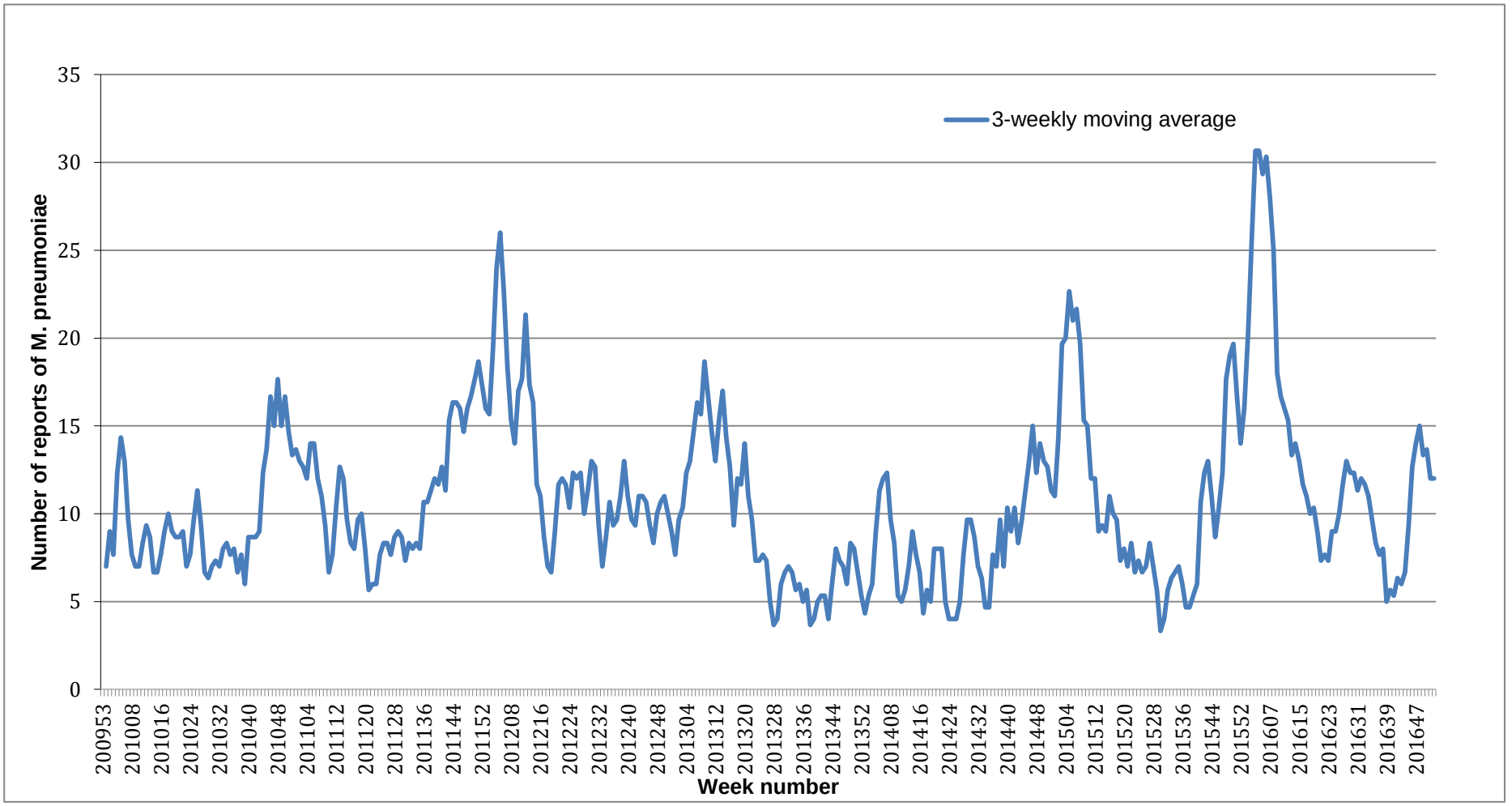
Table 7: Annual counts and proportions of total Mpn cases by England and Wales region (serological methods), 2011-2016

Year	Cases per region (%)					Total cases
	London	**Midlands and East**	**North**	**South**	**Wales**	
2011	4 (0.7)	162 (28.7)	245 (43.4)	109 (19.3)	44 (7.8)	564
2012	3 (0.5)	188 (29.2)	337 (52.3)	90 (14.0)	26 (4.0)	644
2013	0 (0.0)	142 (30.7)	240 (51.9)	57 (12.3)	23 (5.0)	462
2014	2 (0.5)	149 (39.5)	171 (45.4)	45 (11.9)	10 (2.7)	377
2015	5 (1.2)	190 (45.6)	139 (33.3)	79 (18.9)	4 (1.0)	417
2016	4 (0.9)	218 (47.5)	116 (25.3)	119 (25.9)	2 (0.4)	459

Note:

Colleagues are kindly requested to refer all positive specimens or DNA extracts for molecular detection of mutations associated with macrolide resistance to the reference laboratory, RVPBRU, BRD, PHE Colindale.

Figure 1: Laboratory detection of Mpn in England and Wales (all methods) from 2010 to 2016 (3-weekly moving average).



Acknowledgements

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References

1. Office for National Statistics (ONS) mid-year population estimates for England and Wales https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates
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