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Laboratory confirmed cases of measles, rubella and mumps, England: January to March 2020

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Measles, rubella and mumps are notifiable diseases and healthcare professionals are legally required to inform their **local Health Protection Team (HPT)** of all suspected cases. National enhanced surveillance including oral fluid (OF) testing of all suspected cases is provided through the Virus Reference Department (VRD) at Colindale to support and monitor progress towards WHO measles and rubella elimination targets.

The two key WHO indicators for measuring the performance of national measles and rubella surveillance systems are the rate of laboratory investigations (at least 80% of suspected cases) and the rate of discarded cases (at least 2 per 100,000 population). In order to achieve these targets our focus is on ensuring that all suspected cases are appropriately tested. IgM serology testing and oral fluid testing are the only two tests considered adequate by WHO for confirming and importantly discarding suspected measles and rubella cases. Recent infection is confirmed by measuring the presence of IgM antibodies or detecting viral RNA (by PCR) in these samples.

Samples that have been confirmed positive for measles or rubella are further sequenced and entered on the WHO global Measles Nucleotide Surveillance (MeaNS) or the Rubella Nucleotide Surveillance (RubeNS) system respectively which are hosted at the National Reference Laboratory. Genotyping and further characterisation of measles and rubella is used to support investigation of transmission pathways and sources of infection.

Data presented here are for the first quarter of 2020 (ie January to March). Analyses are done by date of onset of rash/symptoms and regional breakdown figures relate to Government Office Regions.

Historical annual and quarterly measles, rubella and mumps epidemiological data are available here from 2013 onwards:

<https://www.gov.uk/government/publications/measles-confirmed-cases>

<https://www.gov.uk/government/publications/mumps-confirmed-cases>

<https://www.gov.uk/government/publications/rubella-confirmed-cases>

Results from all samples tested at Colindale are reported on the MOLIS/LIMS system and reported back to the patient’s GP and local HPT. HPTs can also access the results of samples which have been processed by the VRD in the previous 100 days through the [MRep site](#).

Table 1: Total suspected cases of measles, rubella and mumps reported to Health Protection Teams with breakdown of: a) proportion tested by Oral Fluid (OF); b) cases confirmed (all tests) nationally at the Virus Reference Department (VRD), Colindale; and at local NHS hospital and private laboratories; c) discard rate (all tests): weeks 1-13/2020

	Total suspected cases*	Number (%) tested by OF Target: 80%	Number of confirmed infections					** Discard rate based on negative tests per 100,000 population (all samples)
			Samples tested at VRD			Samples tested locally	Total	
			OF IgM positive samples	OF PCR positive samples	All other positive samples			
Measles	801	517 (65%)	53	18	6	2	79	1.2
Rubella	99	77(77%)	0	0	0	0	0	0.1
Mumps	11349	5123 (45%)	2556	294	195	43	3088^	N/A

* This represents all cases reported to HPTs in England, ie possible, probable, confirmed and discarded cases on HPZone.

** The rate of suspected measles or rubella cases investigated and discarded as non-measles or non-rubella cases using laboratory testing in a proficient laboratory. The annual discard rate target set by WHO is 2 cases per 100,000 population. We present quarterly rates here with an equivalent target of 0.5 per 100,000 population.

^ In the first quarter of 2020 some HPTs did not have the capacity to send out oral fluid kits to all suspected mumps cases.

Measles

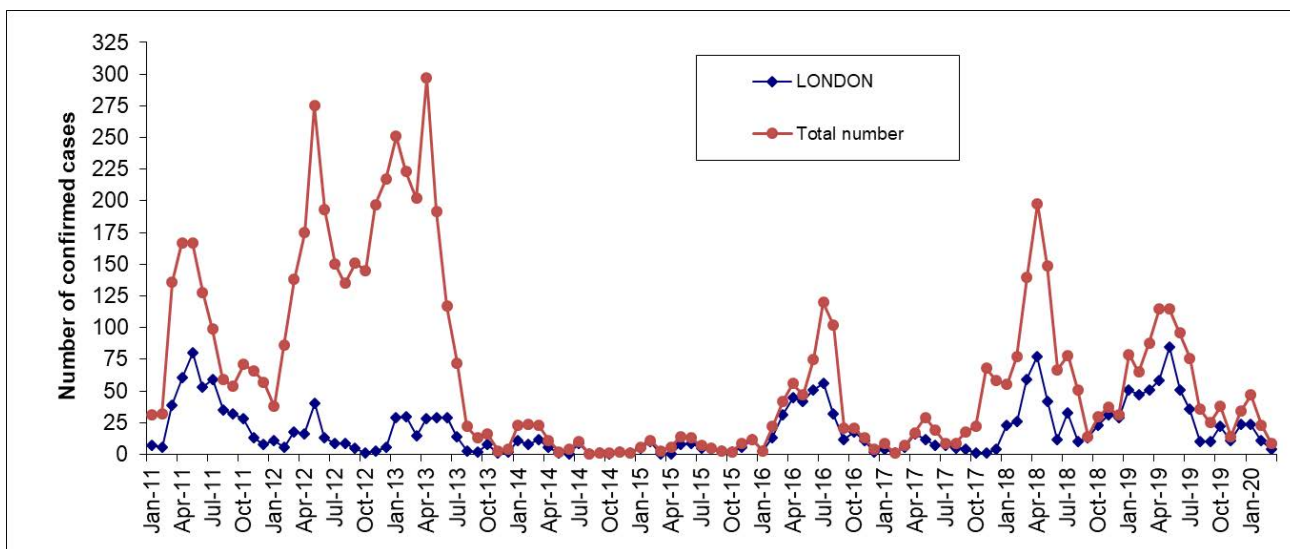
In England, 79 new measles infections were confirmed in the first three months of 2020 compared to 86 in the last quarter of 2019 [1] (Figure1). Most cases were reported in January (47 cases) and February (23 cases).

Fifty percent of the measles cases confirmed in 2020 were in London.

In total this quarter there were 6 (8%) cases associated with recent travel abroad: 2 were associated with recent travel to France and 1 each travelled to Romania, Lithuania, Qatar and the Maldives.

Most of the laboratory confirmed cases this quarter were in adults (58%; 46/79) over the age of 18 with a hospitalisation rate of 35%. Ninety percent of cases were unimmunised, 4 cases reported receiving one dose of a measles containing vaccine and 3 individuals reported receiving two doses. Two individuals reported being vaccinated abroad but their vaccination status could not be confirmed. All the measles cases that had genotyping information available (49/79, 62%) this quarter were either B3 or D8.

Figure 1. Laboratory confirmed cases of measles by month of onset of rash/symptoms reported, London and England: Jan 2011 – Mar 2020



In April 2020 ECDC published the Measles Annual Epidemiological report for 2019 [2]. Each of the 30 EU/EEA countries reported measles cases in 2019 with a total of 13,200 cases of measles for the region, of which 10,561 (80%) were laboratory confirmed. Five countries (France, Romania, Italy, Poland and Bulgaria) accounted for 65% of all notified cases, although

their combined populations only represent approximately 37% of the EU/EEA population. Across the EU/EEA 10 deaths were reported in 2019 attributable to measles (case–fatality 0.09%).

In order to monitor importations and chains of transmission it is essential that every suspected case undergoes an Oral Fluid Test (OFT); this includes cases that are confirmed locally. This quarter an oral fluid sample was taken on 65% of all suspected measles cases, below the 80% WHO target (Table 1).

Wales, Scotland and Northern Ireland did not report any new cases.

Table 2. Laboratory confirmed cases of measles by age group and region, England: weeks 1-13 / 2020

Region	Under 1 year	1 - 4 years	5 - 9 years	10 - 14 years	15 - 19 years	20 - 24 years	25 - 29 years	30 -34 years	Over 35 years	Total
East Midlands	–	–	–	–	–	–	3	–	1	4
East of England	–	1	2	–	–	–	–	–	2	5
London	–	7	3	4	6	5	2	3	9	39
North East	–	–	–	–	–	–	–	–	–	0
North West	–	–	–	–	1	1	–	1	6	9
South East	1	6	2	2	1	1	3	1	2	19
South West	–	–	–	–	–	–	–	–	2	2
West Midlands	–	–	–	–	–	–	–	–	1	1
Yorks. & Humber	–	–	–	–	–	–	–	–	–	0
Total	1	14	7	6	8	7	8	5	23	79

Rubella

In the period between January and March 2020 in England there were no new rubella cases confirmed in the UK.

Mumps

In England, there were 3,088 laboratory confirmed mumps infections between January and March 2020 compared to 1,315 in the period between October and December 2019 and 5042 mumps cases for the entire year [1]. Mumps activity in 2019 was the highest observed in a decade in England and the number of laboratory confirmed cases remained very high in the first quarter of 2020 leading to PHE declaring a National Mumps Incident [3] (Figure 2).

Mumps cases were reported in all regions of England (Table 3), predominantly in young adults aged 15 to 34 years (2533/3088, 82%) and driven by outbreaks linked to Universities and colleges. Almost two thirds (1989/3088, 64%) of the cases this quarter were unvaccinated.

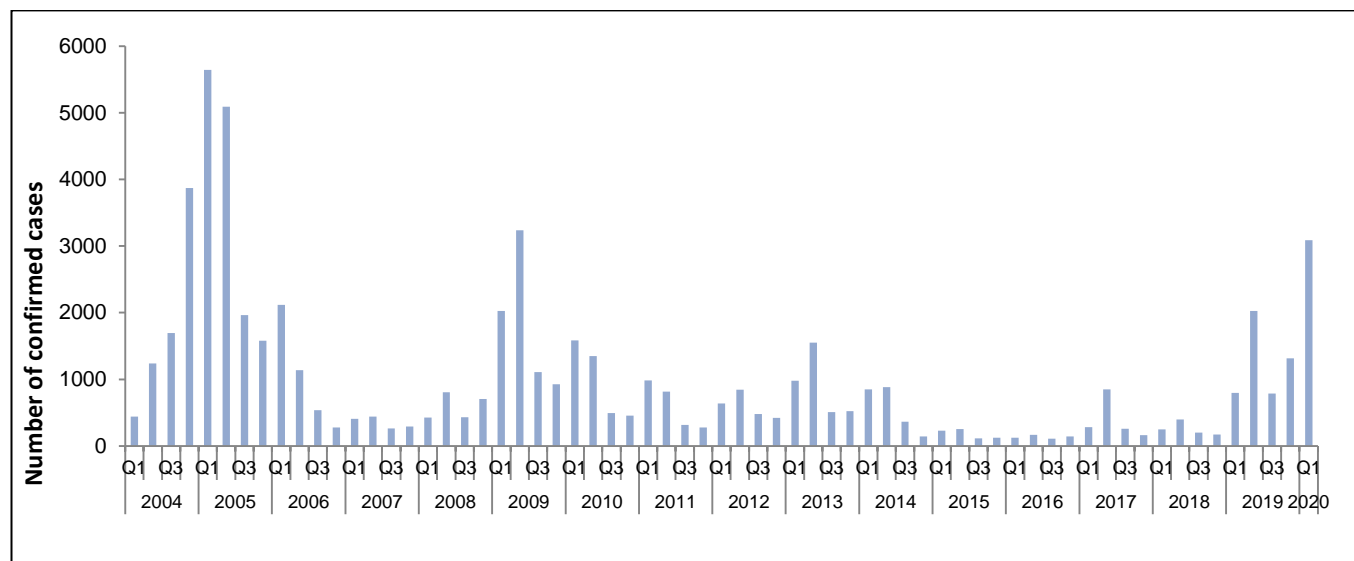
Although mumps in fully vaccinated individuals can occur, due to secondary vaccine failure, it is less likely to lead to complications requiring hospitalisation such as orchitis and meningitis.

Table 3. Laboratory confirmed cases of mumps by age group and region, England: weeks 1-13 / 2020

Region	Under 1 year	1-4 yrs	5-9 yrs	10-14 yrs	15-19 yrs	20-24 yrs	25 - 29 years	30 -34 years	> 35 years	NK	Total
North East	1	3	6	19	175	236	99	77	113	–	729
North West	1	2	2	13	65	97	37	31	48	–	296
Yorks. & Humber	–	–	1	7	113	147	33	20	26	–	347
East Midlands	–	–	1	6	83	118	21	16	11	–	256
West Midlands	–	–	4	17	59	85	32	15	42	–	254
East of England	–	3	2	3	31	33	14	13	25	–	124
London	–	1		5	46	80	39	40	54	–	265
South East	–	3	1	7	113	156	31	31	59	–	401
South West	1	1	4	9	99	165	52	31	54	–	416
Total	3	13	21	86	784	1117	358	274	432	–	3088

In the first quarter of 2020 some of the HPTs experiencing the highest mumps activity and positivity rates did not have the capacity to send out oral fluid kits to all suspected mumps cases. In addition, from March, the COVID-19 response may also have affected the ability of some HPTs to send out mumps OFKs. Therefore, the total number of laboratory confirmed mumps cases in the first quarter of 2020 is likely to be an underestimate.

Figure 2. Laboratory confirmed cases of mumps by quarter, England: 2003-2020



Impact of the COVID-19 pandemic on measles, mumps and rubella surveillance and epidemiology

The COVID-19 pandemic and the implementation of social distancing measures and lockdown across the UK, including the closure of schools and universities from 23 March (week 13) has impacted both the routine surveillance and epidemiology of measles, mumps and rubella in a number of ways:

- the significant reduction in international travel will have reduced the number of measles and rubella importations to the UK providing fewer opportunities for new chains of transmission
- social distancing and lockdown will have had a limited impact on measles transmission which is many times more infectious than SARS-CoV-2 [4]. However there has been a significant impact on health seeking behaviour making it more likely that people with mild symptoms did not present to healthcare services. A fall in measles and mumps notifications (Notifications of Infectious Diseases, NOIDS) made to PHE was observed from week 12 and is more pronounced from week 13, the first week of COVID lockdown (see Figures 4 and 5). This drop continued into the next quarter
- the closure of universities in particular will have interrupted mumps transmission linked to outbreaks in these settings.
- some Health Protection Teams (HPTs) have had to stop sending out mumps Oral Fluid Kits (OFKs) due to capacity being diverted to the COVID-19 response. Home working has also impacted on the ability of some HPTs to send out MMR Oral Fluid Kits and so the National Immunisation Division has set up a centralised MMR OFK distribution service to ensure all suspected cases are tested. HPTs can see full details [here](#) [5] A [new video](#) that explains how to take an oral fluid swab has also been published
- mumps testing at the Virology Reference Department, PHE Colindale has been partially interrupted since the end of March 2020 as laboratory resources were diverted to support COVID-19 testing. It is expected that this will impact on the reporting of laboratory confirmed mumps cases from the second quarter of 2020

Finally, a PHE evaluation [6] on the early impact of the COVID-19 pandemic and social distancing measures on the routine childhood vaccinations in England shows that MMR vaccination counts fell from February 2020, and in the three weeks after introduction of social distancing measures were 19.8% lower (95% CI -20.7 to -18.9%) than the same period in 2019, before improving in mid-April. PHE is working closely with partners on a recovery plan to catch-up any children who missed out on MMR and other vaccines in order to prevent outbreaks occurring as social distancing measures are gradually eased.

Figure 3. Measles notifications, England, weeks 1-13, 2020 (Source: NOIDS)

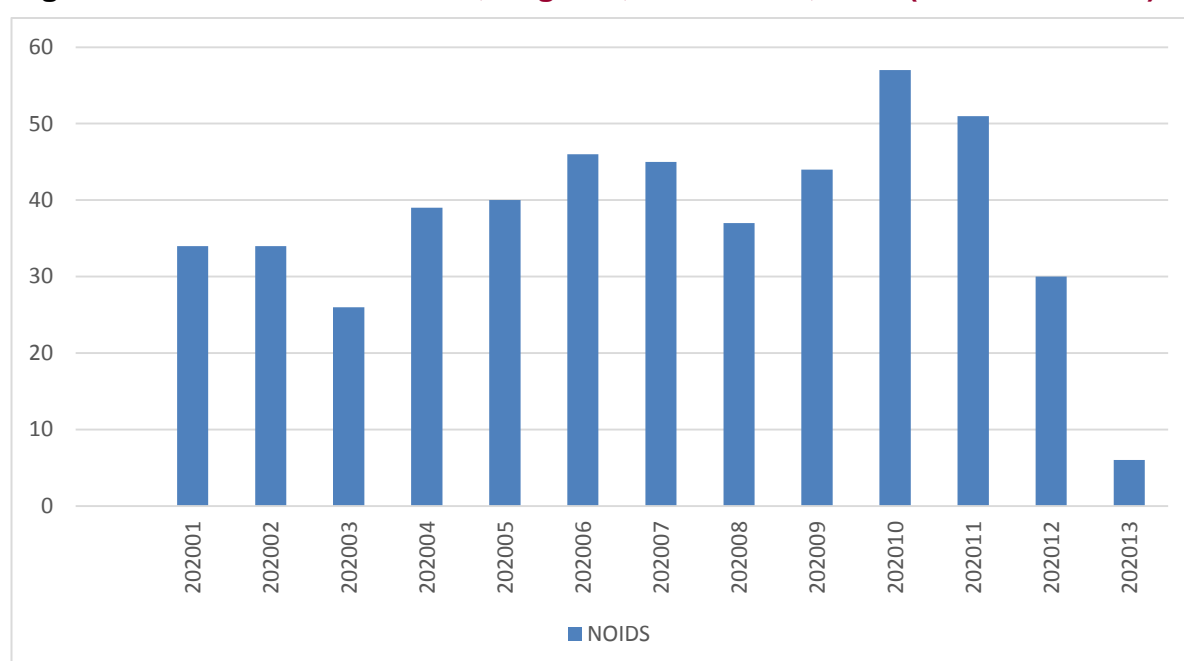
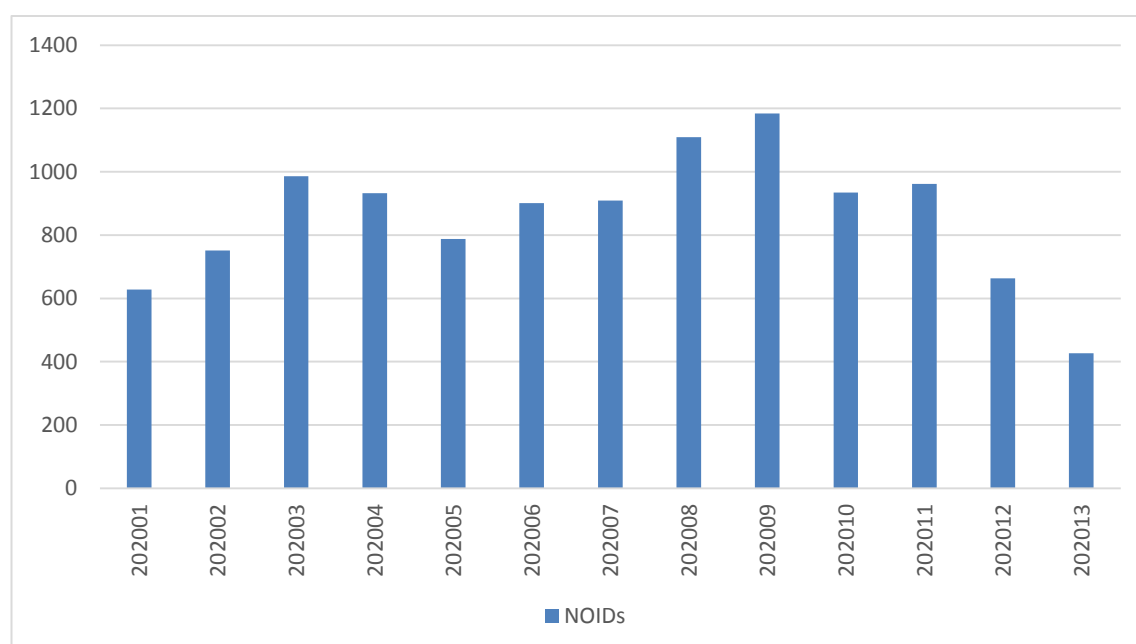


Figure 4. Mumps notifications, England, weeks 1-13, 2020 (Source: NOIDS)



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Health Protection Report is a national public health bulletin for England and Wales, published by Public Health England. It is PHE's principal channel for the dissemination of laboratory data relating to pathogens and infections/communicable diseases of public health significance and of reports on outbreaks, incidents and ongoing investigations.

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