

SURVEILLANCE REPORT

Annual Epidemiological Report for 2015

Mumps

Key facts

- In 2015, 13 519 cases of mumps were reported to ECDC by 28 EU/EEA Member States.
- The notification rate was 3.1 cases per 100 000 population.
- Young children and adolescents were the most affected age groups.
- More than two-fifths of the cases were vaccinated with two or more doses.
- The current epidemiology of mumps in Europe may be largely explained by waning immunity to the MMR vaccine in the absence of natural boosting.
- High vaccination coverage is of paramount importance to prevent mumps outbreaks.

Methods

This report is based on data for 2015 retrieved from The European Surveillance System (TESSy) on 26 October 2016. TESSy is a system for the collection, analysis and dissemination of data on communicable diseases.

For a detailed description of methods used to produce this report, please refer to the *Methods* chapter [1].

An overview of the national surveillance systems is available online [2].

A subset of the data used for this report is available through ECDC's online *Surveillance atlas of infectious diseases* [3].

ECDC has coordinated the surveillance of mumps at the European level since the transfer of EUVAC.NET (European surveillance network for selected vaccine-preventable diseases, hosted by Statens Serum Institut, Denmark) to ECDC in 2011.

Twenty-eight EU/EEA Member States routinely report mumps data to ECDC, the majority using the 2008 or 2012 EU case definition (Commission Implementing Decision 2012/506/EU of 8 August 2012 of the European Parliament and of the Council) and reporting data from comprehensive, passive surveillance systems with national coverage.

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Epidemiology

In 2015, 28 EU/EEA countries reported 13 519 cases of mumps, of which 5 521 (41%) were laboratory-confirmed. Luxembourg reported zero cases, while Austria, France and Lichtenstein did not report data. The notification rate of confirmed cases was 3.1 per 100 000 population, similar to the notification rate observed in 2014 (2.7), and notably lower than the notification rates observed in 2012 (5.4) and 2013 (5.9) (Table 1 and Figure 1).

Ireland reported the highest notification rate (43.5 cases per 100 000 population), followed by Slovakia (31.5), Iceland (20.7) and the Czech Republic (15.3) (Table 1 and Figure 2).

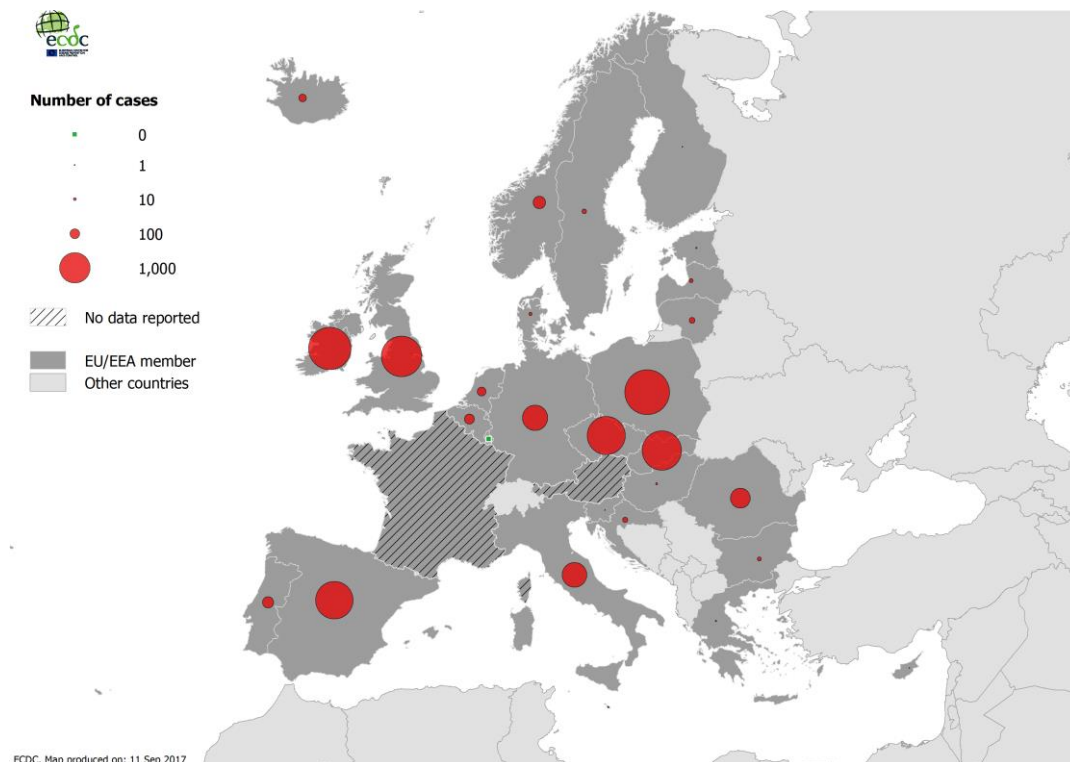
Since 2012, the notification rate in Ireland has increased consistently from 1.0 case per 100 000 (n=44) to 43.5 cases per 100 000 in 2015 (n=2 015). Since 2011, the notification rate in Slovakia has increased consistently from 0.04 cases per 100 000 (n=2) to 31.5 cases per 100 000 in 2015 (n=1 707). In the Czech Republic, the notification rate more than doubled in 2015 compared to 2014 (6.4), but was similar to the notification rate in 2013 (14.8) and notably lower than in 2011 (27.5) and 2012 (37.1). In Norway, the notification rate in 2015 was 3.5 cases per 100 000 population, compared to 0.3–0.7 between 2011 and 2014. Iceland reported 68 cases in 2015, corresponding to a notification rate of 20.7 cases per 100 000. From 2011–2014, only one mumps case was reported in Iceland. In the majority of other countries, there were small changes in the notification rate reported (Table 1).

Table 1. Reported mumps cases: number and rate per 100 000 population, EU/EEA, 2011–2015

Country	2011		2012		2013		2014		National coverage	2015			Confirmed cases
	Reported cases		Reported cases		Reported cases		Reported cases			Reported cases			
	Number	Rate	Number	Rate	Number	Rate	Number	Rate		Number	Rate	ASR	
Austria	25	0.3	17	0.2	.	.	.	.	.	.	.	.	.
Belgium	15	0.1	2684	24.2	4554	40.8	228	-	N	119	-	-	119
Bulgaria	139	1.9	58	0.8	25	0.3	31	0.4	Y	18	0.2	0.3	2
Croatia	.	.	0	0.0	32	0.8	32	0.8	Y	32	0.8	0.8	6
Cyprus	0	0.0	3	0.3	0	0.0	1	0.1	Y	2	0.2	-	2
Czech Republic	2885	27.5	3902	37.1	1553	14.8	677	6.4	Y	1616	15.3	17.5	526
Denmark	13	0.2	15	0.3	59	1.1	42	0.7	Y	15	0.3	0.3	15
Estonia	8	0.6	4	0.3	12	0.9	10	0.8	Y	3	0.2	0.2	2
Finland	2	0.0	3	0.1	1	0.0	2	0.0	Y	2	0.0	0.0	2
France	.	.	.	.	.	.	.	.	.	.	.	.	.
Germany	.	.	.	.	.	.	835	1.0	Y	699	0.9	1.0	422
Greece	1	0.0	2	0.0	0	0.0	1	0.0	Y	4	0.0	0.0	0
Hungary	5	0.1	4	0.0	8	0.1	2	0.0	Y	6	0.1	0.1	6
Ireland	73	1.6	44	1.0	222	4.8	739	16.0	Y	2015	43.5	45.2	998
Italy	965	1.6	975	1.6	808	1.4	821	1.4	Y	675	1.1	1.3	621
Latvia	10	0.5	41	2.0	15	0.7	11	0.5	Y	21	1.1	1.2	7
Lithuania	64	2.1	62	2.1	67	2.3	45	1.5	Y	39	1.3	1.4	39
Luxembourg	0	0.0	0	0.0	4	0.7	1	0.2	Y	0	0.0	0.0	0
Malta	0	0.0	2	0.5	2	0.5	3	0.7	Y	4	0.9	0.9	2
Netherlands	642	3.9	408	2.4	201	1.2	38	0.2	Y	87	0.5	0.6	71
Poland	2585	6.8	2779	7.3	2436	6.4	2508	6.6	Y	2208	5.8	-	0
Portugal	134	1.3	160	1.5	159	1.5	82	0.8	Y	146	1.4	1.6	1
Romania	202	1.0	163	0.8	98	0.5	107	0.5	Y	449	2.3	2.4	31
Slovakia	2	0.0	5	0.1	218	4.0	1559	28.8	Y	1707	31.5	33.5	224
Slovenia	4	0.2	8	0.4	1	0.0	1	0.0	Y	1	0.0	0.0	1
Spain	2027	4.3	5551	11.9	5813	12.4	959	2.1	Y	1579	3.4	3.7	511
Sweden	38	0.4	33	0.3	44	0.5	21	0.2	Y	23	0.2	0.2	20
United Kingdom	2714	4.3	2699	4.3	4568	7.1	2858	4.4	Y	1800	2.8	2.9	1800
EU	12553	3.6	19622	5.5	20900	6.0	11614	2.7	.	13270	3.1	3.3	5428
Iceland	0	0.0	0	0.0	1	0.3	0	0.0	Y	68	20.7	21.4	68
Liechtenstein	.	.	.	.	.	.	.	.	.	.	.	.	.
Norway	16	0.3	30	0.6	35	0.7	18	0.4	Y	181	3.5	3.5	25
EU/EEA	12569	3.5	19652	5.4	20936	5.9	11632	2.7	.	13519	3.1	3.3	5521

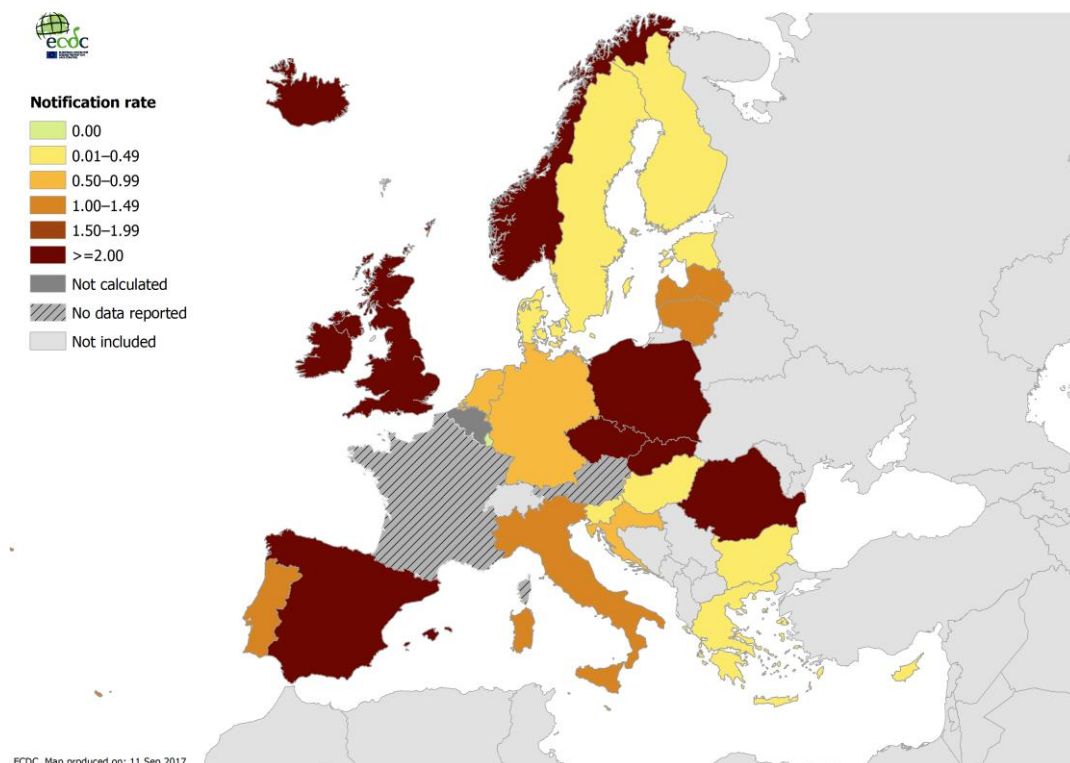
Source: Country reports. Legend: Y = yes, N = no, C = case based, A = aggregated, ASR: age-standardised rate, * = no data reported, - = no notification rate calculated

Figure 1. Distribution of reported cases of mumps, by country, EU/EEA, 2015



Source: Country reports from Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, the United Kingdom.

Figure 2. Distribution of reported cases of mumps per 100 000 population, by country, EU/EEA, 2015

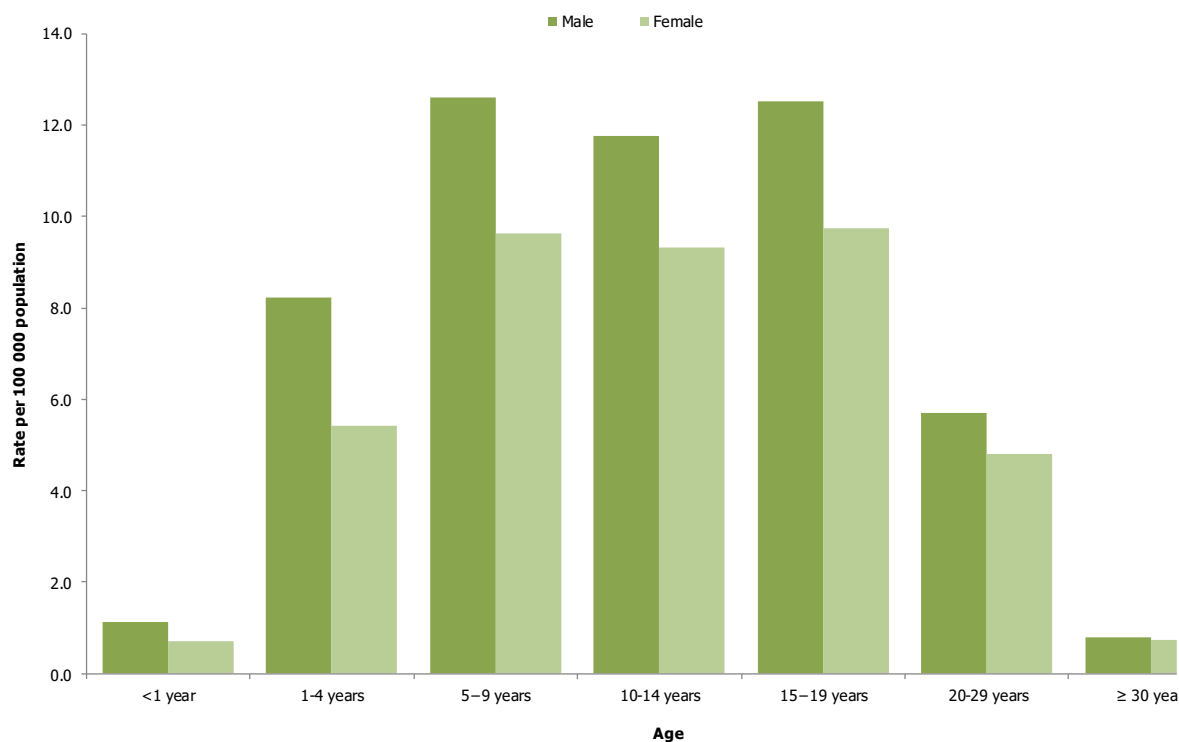


Source: Country reports from Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, the United Kingdom.

Age and gender distribution

In 2015, the most affected age group were the 5–9-year-olds and 15–19-year-olds, both of whom had a notification rate of 11.2 cases per 100 000 population (Figure 3). The next most affected age group was 10–14-year-olds (10.6 cases per 100 000). In Ireland, the most affected age group was 15–19-year-olds (223.6 cases per 100 000 population). Slovakia reported high rates among 5–9-year-olds (197.6), 10–14-year-olds (185.5) and 15–19-year-olds (115.4). In the Czech Republic, 10–14-year-olds had a notification rate of 124.3 per 100 000. In Iceland, the notification rate was highest among 20–29-year-olds (72.5). Males (3.5 cases per 100 000 population) were more often affected than females (2.7 per 100 000) in all age groups, with a male-to-female ratio of 1.3:1.

Figure 3. Rate per 100 000 of cases of mumps, by age and gender, EU/EEA, 2015

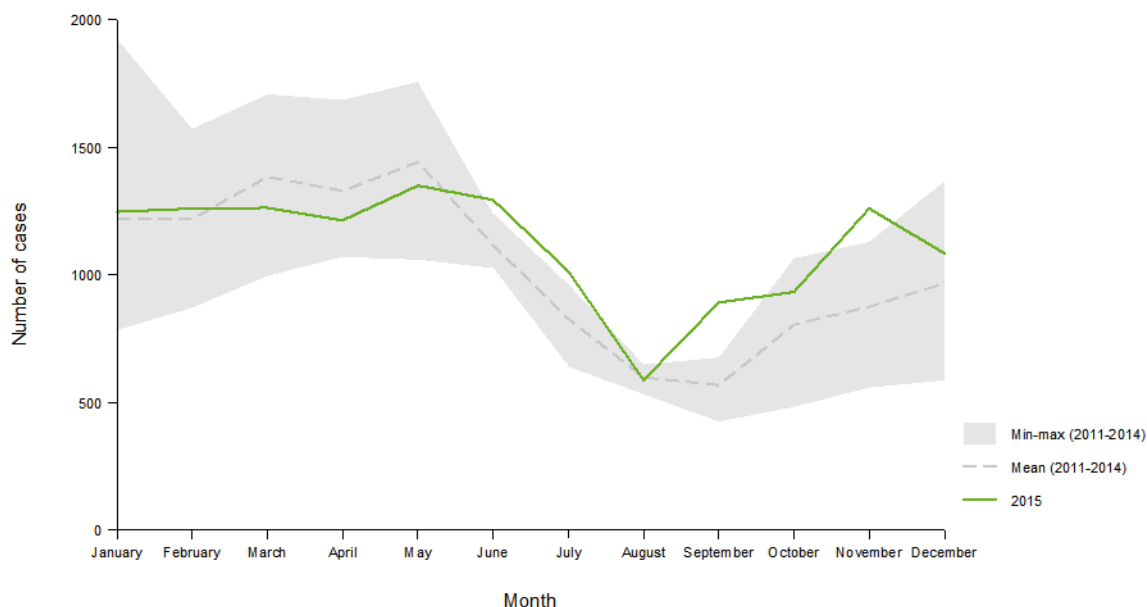


Source: Country reports from Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, the United Kingdom.

Seasonality

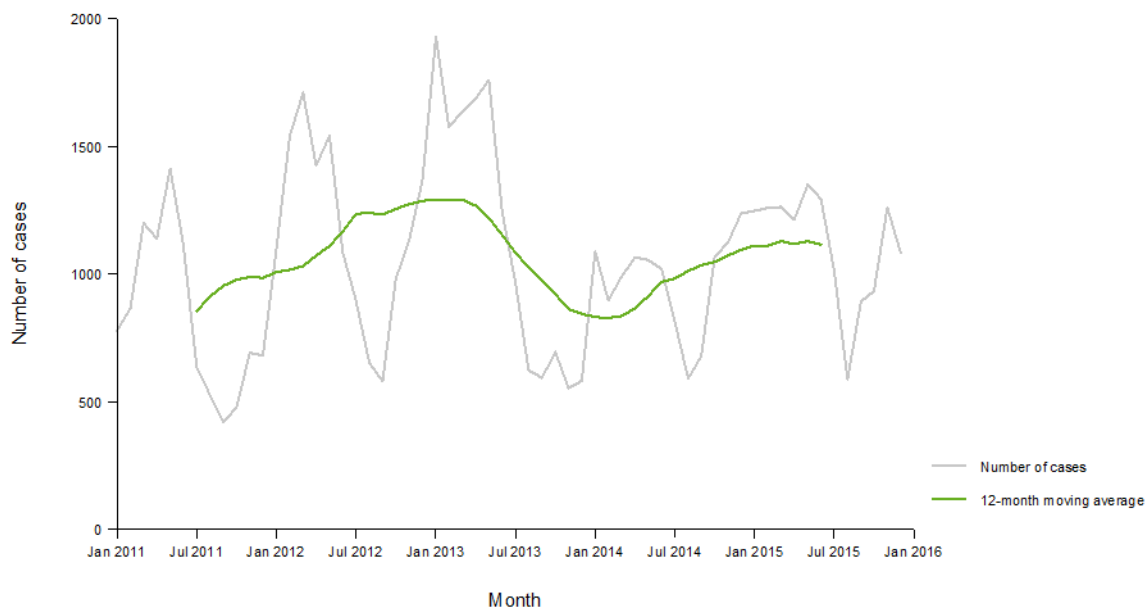
In 2015, the highest number of cases was reported in the first half of the year (Figures 4 and 5). More cases were observed in the second half of 2015 than in previous years.

Figure 4. Seasonal distribution of reported cases of mumps, EU/EEA, 2015 compared with 2011–2014



Source: Country reports from Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, the United Kingdom.

Figure 5. Distribution of reported cases of mumps, by month, EU/EEA, 2011–2015



Source: Country reports from Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, the United Kingdom.

Vaccination status

Data on vaccination status were available for 10 438 cases (78%). Of these cases, 2 538 (24%) were unvaccinated, 2 563 (25%) were vaccinated with one dose, 4 317 (41%) with two doses, and 53 (1%) with three or more doses. Nine hundred and sixty-seven cases (9%) had been vaccinated with an unknown number of doses. Among laboratory-confirmed cases, 34% were unvaccinated, compared with 15% and 24% of probable and possible cases, respectively.

Outcome

Outcome was known for 5 770 cases, 43% of all cases. No deaths were reported in 2015.

Hospitalisation and complications

Of 6 834 cases with known hospitalisation status, 610 (9%) were hospitalised. Data on complications were reported in 4 803 cases, of which 4 345 (90%) had no complication. There were 231 cases of orchitis, 54 cases of pancreatitis, 72 cases of meningitis and six cases of encephalitis. One case was complicated with both orchitis and pancreatitis, one with both meningitis and orchitis, and two with both meningitis and pancreatitis. Unspecified complications ('other') were reported for another 91 cases. Complications were more frequently reported in adolescents and young adults than in children.

Discussion

In 2015, the notification rate of mumps was similar to the notification rate observed in 2014 and lower than in 2012 and 2013. This decrease was predominantly driven by a decrease in the number of cases reported by Belgium and Spain. The decrease in Belgium is likely to be due to a switch from mandatory reporting back to a sentinel surveillance system at the end of 2013. Mandatory notification was introduced in 2012 because of a large outbreak [4].

Some Member States, for example Ireland and Slovakia, have reported consistent increases in the number of cases in recent years. The highest age-specific notification rates in Europe were observed in 5–9- and 15–19-year-olds, although the most affected age groups differed between Member States. Several factors may explain the observed differences in the epidemiology between Member States, including differences in surveillance systems, historical or current vaccination policies, and vaccination coverage levels.

The fact that all EU/EEA Member States have added mumps vaccination to their routine childhood immunisation schedules has significantly reduced the associated disease burden compared to the pre-vaccine period. Low vaccination coverage in some areas may still play a role, as it is associated with a higher risk of mumps outbreaks [9,13]. However, the majority of the 2015 mumps cases in Europe for which vaccination status was known were vaccinated – more than two-fifths of the cases had received at least two doses.

Several outbreaks in populations with high vaccination coverage were reported, particularly among populations of teenagers and young adults, both in Europe and globally [4–8]. This may be due to waning immunity in the absence of natural boosting. Studies have shown that the time between the first and second dose [6] and the time after vaccination [4,10] may play a role in susceptibility to mumps infection, while the immunogenicity and effectiveness varies according to the vaccine strain [11,12]. Also, social conditions that facilitate intense exposure, for example in universities, may increase the transmission of the virus [4,6,8].

In Europe, data are consistent with the understanding that complications are more frequently reported in adolescents and young adults than in children [16]. However, the risk of complications following mumps infection is lower in previously vaccinated persons than in non-vaccinated individuals [14,15].

Public health implications

Further research into waning immunity to mumps is needed in order to improve future immunisation programmes. Meanwhile, maintaining a high coverage with two doses of measles, mumps and rubella (MMR) vaccine is of paramount importance to prevent mumps outbreaks. The protective effect of vaccination on disease severity is critical and should be considered in current and future mumps prevention and control strategies. Administering a third dose of MMR to adolescents and young adults in an outbreak setting may be considered as a control measure [10,17].

Since all European countries use the MMR vaccine in their national childhood immunisation programmes, mumps prevention benefits indirectly from the efforts made to reach the goal of eliminating measles and rubella in Europe.

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