



### Introduction

The following preliminary mumps surveillance report aims to provide an overview of selected epidemiological characteristics of mumps at European level for the 8-year period 2000-07.

### Methods

We requested mumps epidemiological aggregated data for the years 2000-07 consisting of the number of cases in specified age-groups. Cases were categorised by number of vaccines received and diagnosis classification status i.e. clinical, laboratory-confirmed, and epidemiologically linked. Our assessment included countries' epidemiological data obtained through mandatory notification systems covering national populations for the 8-year period 2000-07. All reported mumps cases meeting the requirements for national surveillance were analysed.

Incidence was calculated with the number of reported mumps cases as the numerator and the country population obtained from Eurostat<sup>1</sup> as the denominator. We expressed incidence of disease as mumps cases per 100,000 inhabitants per year.

### Results

#### Mumps incidence

A total of 928,949 mumps cases was reported from 25 countries that provided epidemiological data based on mandatory notification systems covering total population for the 8-year period 2000-07 (table 1). During this period, most cases were reported

from Poland and Romania contributing to 42% and 32%, respectively. The highest annual incidence rates were reported in 2004 from Poland and Romania with 354 and 298 per 100,000 inhabitants, respectively (figure 1). Other countries reported their highest annual incidence rates in other years: in 2000, Lithuania (125), Malta (85), Portugal (64), and Italy (66); in 2001, Latvia (289); in 2005; Iceland (29), Ireland (26) and in the UK (77); in 2006, Czech Republic (50) and in 2007, Bulgaria (69). In Spain, the highest reported annual incidence was 23 per 100,000 inhabitants in 2000 and again in 2007.

#### Age distribution

Of the total, 894,536 cases (96%) had a known age-group. These were distributed between age-groups with 3,144 (0.4%) aged <1 year, 107,882 (12.1%) aged 1-4 years, 349,766 (39.1%) aged 5-9 years, 228,357 (25.5%) aged 10-14 years, 109,310 (12.2%) aged 15-19 years and 96,077 (10.7%) older than 20 years (figure 2).

#### Vaccination status

Of the total, 129,306 (14%) cases had a known vaccination status (table 2). Overall, 57,976 (45%) were unvaccinated, 21,030 (16%) were vaccinated with one dose, 14,590 (11%) were vaccinated with at least two doses, and 35,710 (28%) were vaccinated with an unspecified number of doses. Figure 3 shows the percentage of cases by vaccination status by age-group.

Figure 1. Trends in number of reported mumps cases, 2000-07

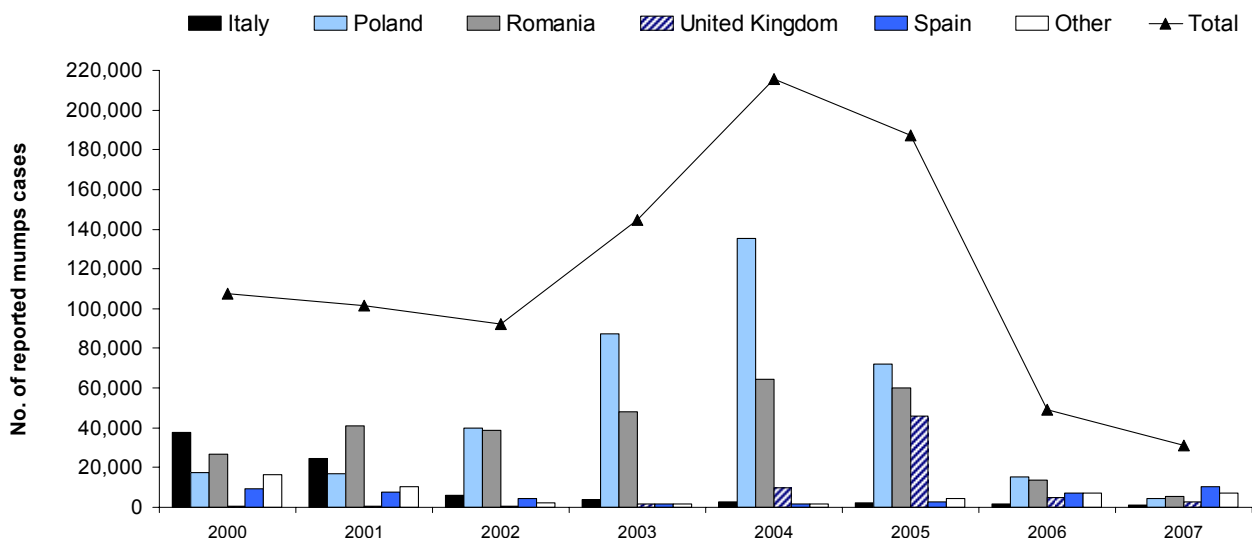
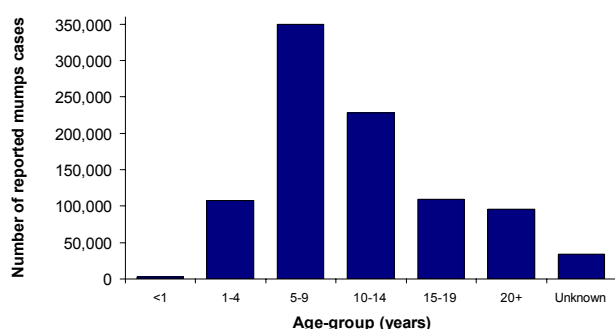


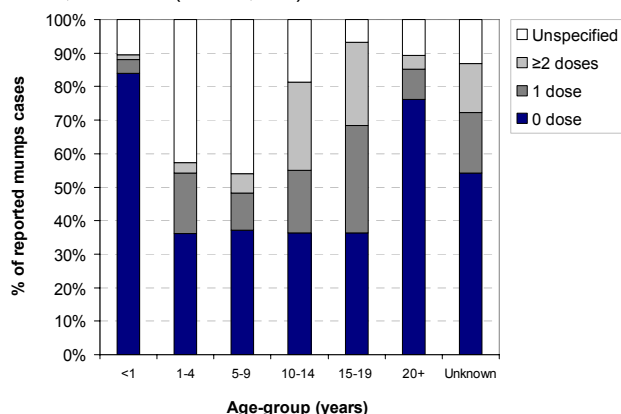
Figure 2. Mumps cases by age-group, 2000-07 (n=928,949)



### Hospitalisations and complications

Data on hospitalisation status was provided from 17 countries reporting (table 3) for the 8-year period, and Ireland for 2004-07. A total of 25,584 cases were hospitalised. Overall, 8,545 (33%) of hospitalisations were reported by age-groups. Of these, 39% were aged 20 years and above, followed by those in the 15-19 year age-group (28%).

Figure 3. Mumps cases by age-group and vaccination status, 2000-07 (n=928,949)



Information on number of cases with complications related to mumps was provided from 15 countries (table 4) that reported 4,269 cases in total. Overall, 95% of those with complications were reported by age-groups. Most cases were aged 20 years and above contributing to 49%, followed by those in the 15-19 years age-group (40%).

### Comments

The overall decline in the incidence of mumps reported at European level during 2000-07 could be attributed to a marked decrease in incidence rates reported from only a few countries. The largest drop in incidence was reported from Romania between 2005 and 2006. Nevertheless, despite the introduction of a mumps vaccine into national childhood vaccination programmes of most European countries since the 1980s, outbreaks of mumps still emerge. Outbreaks have been

documented in Austria,<sup>2</sup> Bulgaria,<sup>3</sup> Czech Republic,<sup>4</sup> Iceland,<sup>5</sup> Ireland,<sup>6</sup> Luxembourg,<sup>7</sup> the Netherlands,<sup>8,9</sup> Moldova<sup>10</sup> and Spain<sup>11,12</sup> and Sweden.<sup>13</sup>

Comparisons of the number of mumps cases between countries have to be made with caution because of different reporting procedures—some countries reported only laboratory-confirmed cases whereas others reported clinical cases without laboratory confirmation. The widely ranging incidence rates across European countries at different times is a reflection of the extent to which national mumps vaccination programmes were introduced and implemented over time. Mumps vaccine effectiveness and waning immunity probably also contributed to the occurrence of cases. However, deriving accurate conclusions related to vaccination status is limited when only 14% of cases of the total cases were reported with a known vaccination status. Indeed, a more accurate epidemiological assessment of mumps at European level depends on a complete set of surveillance data in case-based format and from all participating countries.

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*Table 1.* Number of reported mumps by year and percentage laboratory-confirmed of the sum of reported cases, 2000-07

	2000	2001	2002	2003	2004	2005	2006	2007	2000-07	Laboratory-confirmed
Bulgaria	2,358	1,446	334	107	91	608	911	5,299	11,154	12%
Croatia	152	116	101	72	84	155	66	76	822	0%
Cyprus	0	0	0	0	14	5	0	5	24	63%
Czech Republic	120	107	748	753	244	1,803	5,172	1,297	10,244	73%
Denmark	35	4	2	3	7	11	13	11	86	100%
Estonia	63	45	36	35	132	29	17	18	375	7%
Finland	1	2	4	1	1	6	8	6	29	100%
Greece	32	50	156	44	4	33	47	23	389	1%
Hungary	223	183	98	108	100	72	30	16	830	5%
Iceland	0	0	0	0	0	85	29	1	115	100%
Ireland	52	40	32	40	417	1,073	427	142	2,223	36%
Italy	37,446	24,743	5,744	3,777	2,604	2,453	1,455	1,312	79,534	0%
Latvia	1,949	6,834	231	107	72	37	6	4	9,240	16%
Lithuania	4,377	466	226	285	279	101	74	81	5,889	0%
Luxembourg	0	6	0	0	0	1	0	0	7	100%
Malta	325	7	9	5	7	9	1	2	365	0%
Norway	1	6	5	1	7	8	24	22	74	100%
Poland	17,548	16,724	39,978	87,336	135,179	71,945	15,115	4,147	387,972	0%
Portugal	6,493	735	298	231	219	227	192	191	8,586	1%
Romania	26,542	41,205	38,921	48,210	64,597	59,893	13,589	5,291	298,248	0%
Slovakia	32	20	11	24	14	10	19	5	135	2%
Slovenia	45	43	36	44	22	13	23	19	245	26%
Spain	9,282	7,767	4,515	1,677	1,526	2,458	6,885	10,343	44,453	15%
Sweden	37	22	15	8	30	82	57	47	298	62%
UK	738	796	569	1,708	10,025	45,948	5,138	2,690	67,612	59%
<i>Total</i>	107,851	101,367	92,069	144,576	215,675	187,065	49,298	31,048	928,949	6%

Table 2. Mumps cases by vaccination status, 2000-07

	<b>0 doses</b>		<b>1 dose</b>		<b>≥2 doses</b>		<b>Unspecified number of doses</b>		<b>Unknown vaccination status</b>	
Bulgaria	517	5%	3,364	30%	641	6%	2,198	20%	4,434	40%
Croatia	11	1%	23	3%	17	2.1%	0	0%	771	94%
Cyprus	5	21%	6	25%	13	54%	0	0%	0	0%
Czech Republic	3,462	34%	137	1%	6,494	63%	111	1%	40	0%
Denmark	40	47%	20	23%	2	2%	0	0%	24	28%
Estonia	86	23%	254	68%	22	6%	0	0%	13	3%
Finland	21	72%	4	14%	4	14%	0	0%	0	0%
Greece	0	0%	0	0%	0	0%	0	0%	389	100%
Hungary	460	55%	109	13%	3	0%	0	0%	258	31%
Iceland	1	1%	0	0%	0	0%	0	0%	114	99%
Ireland	270	12%	304	14%	191	9%	63	3%	1,395	63%
Italy	34,603	44%	0	0%	644	0.8%	31,291	39%	12,996	16%
Latvia	2,114	23%	3,801	41%	1,375	15%	0	0%	1,950	21%
Lithuania	375	7%	0	0%	0	0%	0	0%	5,514	94%
Luxembourg	0	0%	0	0%	0	0%	0	0%	7	100%
Malta	0	0%	0	0%	0	0%	0	0%	365	100%
Norway	17	23%	12	16%	2	3%	0	0%	43	58%
Poland	0	0%	0	0%	0	0%	0	0%	387,972	100%
Portugal	1,101	13%	3,986	46%	581	7%	31	0%	2,887	34%
Romania	0	0%	0	0%	0	0%	0	0%	298,248	100%
Slovakia	32	24%	9	7%	48	36%	0	0%	46	34%
Slovenia	84	34%	32	13%	103	42%	0	0%	26	11%
Spain	2,555	6%	2,782	6%	3,405	8%	2,011	5%	33,700	76%
Sweden	80	27%	69	23%	25	8%	5	2%	119	40%
UK	12,142	18%	6,118	9%	1,020	2%	0	0%	48,332	71%
<b>Total</b>	<b>57,976</b>	<b>6.2%</b>	<b>21,030</b>	<b>2.3%</b>	<b>14,590</b>	<b>1.6%</b>	<b>35,710</b>	<b>3.8%</b>	<b>799,643</b>	<b>86.1%</b>

Table 3. Number and percentage of the total of hospitalised mumps cases, 2000-07

	2000 (n=67,377)	2001 (n=51,695)	2002 (n=48,103)	2003 (n=94,240)	2004 (n=149,155)	2005 (n=124,342)	2006 (n=28,580)	2007 (n=15,187)	2000-07 (n=578,843)
Bulgaria	0	52	0	0	0	114	353	1,635	2,154
Croatia *	..	..	..	..	..	..	..	..	..
Cyprus	0	0	0	0	0	0	0	1	1
Czech Republic	14	12	163	145	49	401	1,000	156	1,940
Denmark	7	0	0	2	1	3	0	3	16
Estonia	2	3	4	4	11	2	1	0	27
Finland	1	0	0	0	0	0	0	1	2
Greece *	..	..	..	..	..	..	..	..	..
Hungary	14	12	4	8	5	3	0	1	47
Iceland	0	0	0	0	0	0	0	0	0
Ireland **	..	..	..	..	6	30	32	12	80
Italy	1,339	583	239	149	63	95	63	52	2,583
Latvia	0	921	24	24	26	11	3	2	1,011
Lithuania *	..	..	..	..	..	..	..	..	..
Luxembourg*	..	..	..	..	..	..	..	..	..
Malta	16	0	0	0	0	0	1	0	17
Norway	0	1	0	0	0	0	3	2	6
Poland	849	751	1,401	4,056	6,019	3,105	656	109	16,946
Portugal	80	15	4	5	5	1	5	1	116
Romania *	..	..	..	..	..	..	..	..	..
Slovakia	4	4	2	1	0	1	6	0	18
Slovenia	5	5	2	1	3	2	2	2	22
Spain									
Sweden *	..	..	..	..	..	..	..	..	..
UK	0	1	0	8	217	246	91	35	598
<b>Total</b>	<b>2,331</b>	<b>2,360</b>	<b>1,843</b>	<b>4,403</b>	<b>6,405</b>	<b>4,014</b>	<b>2,216</b>	<b>2,012</b>	<b>25,584</b>
(% hospitalised) <sup>†</sup>	(3%)	(5%)	(4%)	(5%)	(4%)	(3%)	(8%)	(13%)	(4%)

\*No reports on hospitalisation status for 2000-07. \*\* No reports on hospitalisation status for 2000-03.

<sup>†</sup>The denominator used to calculate the total proportion of hospitalised cases is given in first row.

Table 4. Number and percentage of the total of cases with mumps-related complications, 2000-07

	2000 (n=5,942)	2001 (n=9,533)	2002 (n=2,115)	2003 (n=2,936)	2004 (n=11,153)	2005 (n=49,717)	2006 (n=11,816)	2007 (n=9,526)	2000-07 (n=102,738)
Bulgaria	97	98	0	0	0	41	193	1,077	1,506
Croatia *	..	..	..	..	..	..	..	..	..
Cyprus	0	0	0	0	0	3	0	0	3
Czech Republic	6	7	140	121	38	298	736	118	1,464
Denmark	1	0	0	0	0	0	0	1	2
Estonia	0	0	0	0	1	0	0	1	2
Finland	1	0	0	0	0	0	0	1	2
Greece *	..	..	..	..	..	..	..	..	..
Hungary	0	0	0	0	0	0	0	0	0
Iceland	0	0	0	0	0	0	0	0	0
Ireland	..	..	..	..	25	30	26	17	98
Italy *	..	..	..	..	..	..	..	..	..
Latvia	0	400	11	9	29	7	2	1	459
Lithuania *	..	..	..	..	..	..	..	..	..
Luxembourg*	..	..	..	..	..	..	..	..	..
Malta	0	0	0	0	0	0	0	0	0
Norway	0	1	0	0	0	0	0	0	1
Poland*	..	..	..	..	..	..	..	..	..
Portugal *	..	..	..	..	..	..	..	..	..
Romania *	..	..	..	..	..	..	..	..	..
Slovakia	0	0	0	1	0	0	0	0	1
Slovenia	0	2	0	0	0	0	0	0	2
Spain *	..	..	..	..	..	..	..	..	..
Sweden *	..	..	..	..	..	..	..	..	..
UK	0	0	0	10	255	361	75	28	729
<b>Total</b>	<b>105</b>	<b>508</b>	<b>151</b>	<b>141</b>	<b>348</b>	<b>740</b>	<b>1,032</b>	<b>1,244</b>	<b>4,269</b>
(% with complications) <sup>†</sup>	(2%)	(5%)	(7%)	(5%)	(3%)	(1%)	(9%)	(13%)	(4%)

\*No reports on complications related to mumps for 2000-07

<sup>†</sup>The denominator used to calculate the total proportion of cases with mumps-related complications is given in first row.