

# Mumps in Ireland, 2004-2005

## Key Points

- **A national mumps outbreak that commenced in November 2004 continued during 2005**
- **The outbreak was predominantly in those born before 1988, particularly those born between 1983 and 1986, who were not scheduled to receive two MMR doses during childhood as MMR was first introduced in 1988**
- **An outbreak control team was convened in November 2004 and control measures implemented**
- **As outbreaks were reported in a number of third level colleges all new entrants, in autumn 2005, were recommended MMR vaccine (if not previously vaccinated with two doses)**

## Introduction

Mumps is an acute viral infectious disease characterised by fever and swelling of one or more salivary glands, most commonly the parotid gland. Mumps infection can present with other symptoms such as meningitis or pancreatitis. Mumps infection may also cause inflammation of the ovaries, testicles or breast tissue. More serious problems include encephalitis and deafness, but these are rare.

Mumps virus is spread from person to person through airborne transmission, by droplet spread, such as from coughs and sneezes, and through kissing or other direct contact with saliva of an infected person.

In Ireland, mumps became a notifiable disease in 1988. Between 1988 and 2003, only clinicians were required to notify mumps cases. Since January 2004, laboratories are also required to notify cases identified.<sup>1</sup> Between 1988 and 2003 two mumps outbreaks occurred, the first in 1989 with 709 notifications, and the second during 1996/1997 with 707 notifications (figure 1). The number of mumps cases notified during the inter-epidemic period was low, with approximately 40 cases notified annually.

Mumps infection can be prevented by vaccination. Mumps vaccine in Ireland is available as part of the combined measles-mumps-rubella (MMR) vaccine. Vaccination with the first dose of MMR is recommended at twelve to fifteen months and the second dose at four to five years.<sup>2</sup> Mumps vaccine was first offered in Ireland in 1988, with the introduction of the MMR vaccine. In 1992, a second dose of MMR was recommended for children aged 10 to 14 years. As

Table 1. Number of mumps notifications and crude incidence rates (CIR) per 100,000 population by HSE Area, 2003-2005

HSE Area	2003		2004		2005	
	Number	CIR	Number	CIR	Number	CIR
HSE-E	20	1.4	96	6.9	225	16.1
HSE-M	4	1.8	109	48.4	55	24.4
HSE-MW	1	0.3	14	4.1	104	30.6
HSE-NE	4	1.2	13	3.8	82	23.8
HSE-NW	0	0.0	111	50.1	174	78.5
HSE-SE	4	0.9	9	2.1	29	6.8
HSE-S	5	0.9	16	2.8	125	21.5
HSE-W	2	0.5	55	14.5	289	76.0
<b>Total</b>	<b>40</b>	<b>1.0</b>	<b>423</b>	<b>10.8</b>	<b>1083</b>	<b>27.6</b>

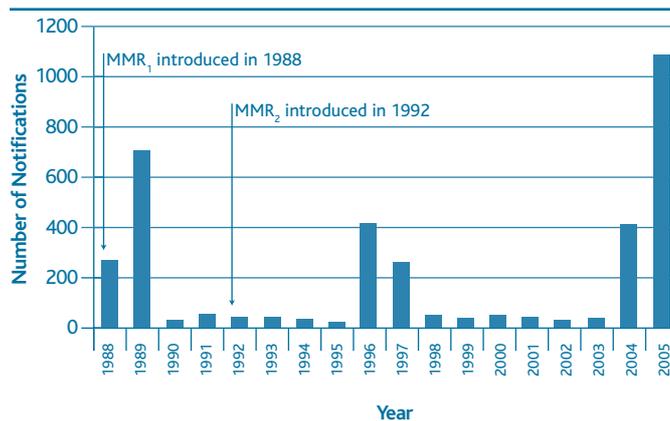


Figure 1. Number of mumps notifications by year and year of introduction of MMR vaccine in Ireland

a result of mumps outbreaks in 1996/1997, that predominantly affected primary school children, the age of the second dose was lowered to four to five years in 1999.

### Materials and Methods

Mumps data, obtained through the weekly infectious disease notification system, for 2004-2005 are presented here. During 2004, Medical Officers in the HSE Areas provided case based data to the Director of HPSC by the Wednesday of each week, on infectious diseases notified to them during the previous week, using an agreed dataset.<sup>3</sup> These notifications were inputted on a Microsoft Access database in HPSC. In 2005, HPSC commenced using the CIDR system. Historical notifiable infectious disease data since 1988 were migrated from the Microsoft Access system to CIDR. Four of the HSE Areas also commenced using CIDR during 2005 namely the HSE-M, HSE-NE, HSE-SE and HSE-S. For HSE Areas live on CIDR the infectious disease notifications are entered directly on CIDR at regional level. HPSC can view this data using the Business Objects reporting tool on CIDR (except for patient name and address). For HSE Areas not live on CIDR during 2005, Medical Officers in the HSE Areas continued to provide case based data to the Director of HPSC by the Wednesday of each week, on infectious diseases notified to them during the previous week. At HPSC, these data were migrated to the CIDR system on the Thursday of each week. The figures presented in this report are based on data on the CIDR system as of the 5th September 2006. These figures may differ from those published previously, due to ongoing updating of notification data in CIDR.

An enhanced surveillance system for mumps was established during 2004 to capture information on the mumps outbreak. Enhanced mumps data received at HPSC were entered on a Microsoft Access database. Please note the final cleaning and validation of the 2004 and 2005 data on the mumps enhanced database, with all the Departments of Public Health in the HSE Areas, was not completed at the time of writing of this report.

Case classifications were assigned to mumps notifications as per the Case Definitions for Notifiable Diseases.<sup>4</sup>

Analysis of mumps data was carried out using Business Objects, Microsoft Access and Excel. Incidence rates were calculated based on population data taken from the 2002 census.

### Results Epidemiology

A national mumps outbreak began in Ireland in 2004 and continued into 2005. In total, there were 423 (10.8/100,000) mumps notifications during 2004 and 1,083 (27.6/100,000) in 2005. In comparison, 40 (1.0/100,000) cases were notified during 2003. The increase in mumps notifications commenced at the beginning of November 2004 (Week 44 2004) peaking in the second week of November (Week 45 2004) with 81 notifications and again in mid-April (Week 16 2005) with 54 notifications (figure 2). Between Week 44 2004 (early November) and Week 52 2005 there were 1,433 notifications with on average 23 mumps notifications each week. In comparison, there was, on average, less than one mumps

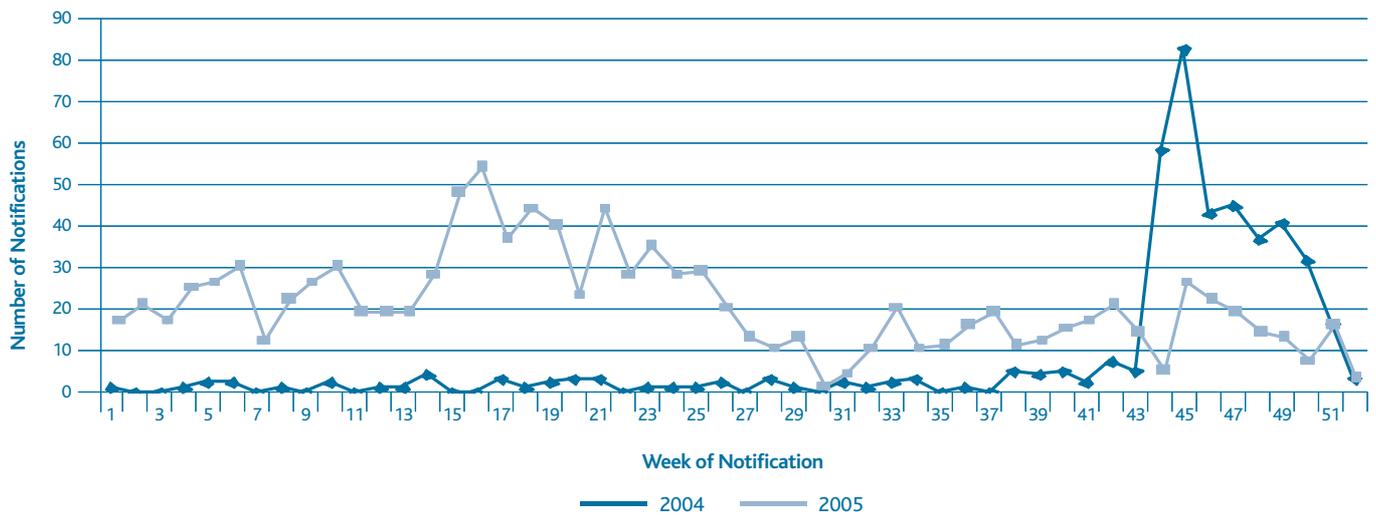


Figure 2. Number of mumps notifications by week and year, 2004-2005

notification each week in 2003. All HSE Areas reported more cases in 2004/2005 compared to 2003 (table 1). The highest crude incidence rates were in the HSE-NW and HSE-W during 2005. The outbreak was predominantly among those born before 1988 and, in particular, in those born between 1983 and 1986 (figure 3); many of this group were in third level education and were associated with outbreaks in colleges and universities. Of the 1,433 mumps notifications from Weeks 44 2004 to Week 52 2005; 505 (35%) were classified as confirmed; 94 (7%) as probable; 554 (39%) as possible. Case classification was not supplied for 280. Of the 1,433 notifications 809 were male, 616 were female while sex was not reported for eight notifications.

Mumps notifications declined during 2006. From June 2006 (Week 23) to late August 2006 (Week 35) there were on average six notifications (provisional data) each week.

#### Enhanced surveillance system

At the start of the outbreak in 2004 an enhanced surveillance system was established to collect information on risk factors for infection and reported vaccination status. This information helped identify appropriate control strategies to prevent ongoing transmission and to identify public health strategies needed. Mumps enhanced data were also used to determine the morbidity associated with mumps illness.

Enhanced data received at HPSC for 2004/2005 notifications are reported here. Please note the final cleaning and validation of these data on the mumps enhanced database, with all the Departments of Public Health in the HSE Areas, was not completed at the time of writing of this report.

The most likely place where the case acquired mumps was reported for 349 notifications; for 67% (n=234/349) of these mumps notifications university/college was reported as the place the infection was most likely acquired.

Of the 389 notifications where vaccination status was reported 28% (n=109/389) were unvaccinated, 43% (n=166/389) were reported to have received one dose of MMR (MMR<sub>1</sub>) and 29% (n=114/389) were reported to have received two doses of MMR (MMR<sub>2</sub>). Self reported vaccination status might be inaccurate. Of the cases reported to have received MMR<sub>1</sub> 61% (n=102/166) had no vaccination dates reported and 89% (n=148/166) had no MMR batch number reported. Both vaccination dates were only reported for 39% (n=45/114) of cases reported to have received MMR<sub>2</sub> and nine percent (n=4/45) of these were vaccinated with MMR<sub>2</sub> less than 18 days prior to onset of symptoms, this means they were probably exposed already. Only four percent (n=5/114) of cases that were reported to have received two doses of MMR had both MMR batch numbers reported.

Information on hospitalisation status was available for 467 notifications. Thirty-seven cases were hospitalised, representing eight percent of all cases with known hospitalisation status. Reported complications of mumps included orchitis (18%, n=44/243), pancreatitis (1.16%, n=4/345), meningitis (1%, n=4/400), deafness (0.76%, n=3/395), mastitis (0.29%, n=1/349) and encephalitis (0.25%, n=1/397).

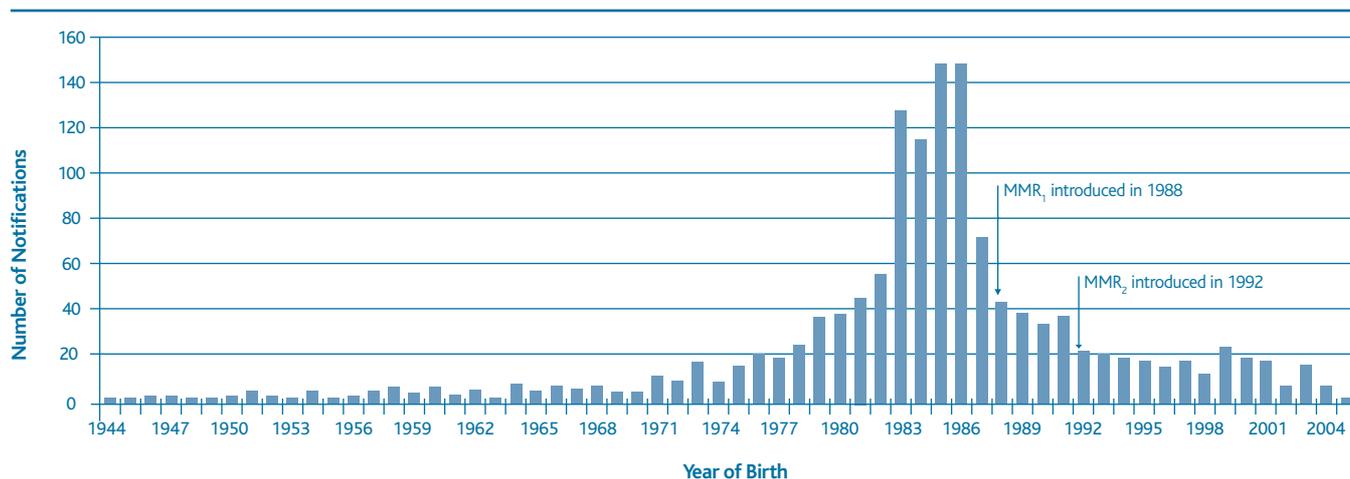


Figure 3. Mumps notifications (n=1,341) from Week 44 2004 to Week 52 2005 by year of birth and year of introduction of MMR in Ireland (year of birth not shown for 6 cases born before 1944)

**Public Health Strategies/Control Measures**

At the beginning of the outbreak a national outbreak control team was convened, bringing together health professionals from all HSE Areas, DoHC, NVRL and HPSC. This group agreed on public health strategies (vaccination and management of cases and close contacts) to control the outbreak at national and local level. Communication messages were standardised and control measures were implemented locally.

Because the outbreak predominantly affected third level colleges this population was targeted for a MMR vaccination programme. All students and staff under 25 years of age who had not received two doses of MMR were recommended vaccination. The vaccine was provided either by public health services, student health services, or by the student’s own GP. MMR vaccine was also provided for those at risk in the wider community through GP practices. Public health messages during the outbreak urged parents to make sure that their children were vaccinated with two doses of MMR by six years of age (i.e. routine vaccination schedule). Vaccine was provided free of charge by the HSE Areas.

To prevent ongoing transmission of mumps virus and ensure high levels of immunity among the college students the mumps outbreak control group also recommended that all new entrants to third level colleges for the academic year 2005/2006 (less than 25 years of age) should be fully vaccinated with two doses of MMR prior to commencing the academic year.

To increase awareness of the outbreak leaflets and information materials were developed and disseminated locally and made available on the HPSC Internet site and other HSE Internet sites. These materials included information about mumps, MMR vaccination and the control measures recommended.

**Discussion**

The number of mumps notifications increased dramatically during 2004 (n=423) and 2005 (n=1,083) compared to 2003 (n=40). The majority of notifications were in those born before 1988 and in particular in older teenagers and young adults born between 1983 and 1986, who were too old to have been routinely scheduled for two doses of MMR during childhood. Protection against mumps was first offered in Ireland in 1988, with the introduction of the MMR vaccine. In 1992, a second dose of MMR was recommended for children aged 10-14 years. In 1999 the age of the second dose was lowered to four to five years.

Other countries have also recently reported resurgence in mumps. During 2004 and 2005, the United Kingdom had an outbreak of mumps. During 2005, 56,390 (provisional figure) mumps cases were notified; the majority were in those aged 19-23 years and attending colleges or universities.<sup>5</sup> These cases were too old to be offered two doses of MMR routinely when it was introduced in the United Kingdom in 1988. These individuals would have missed the opportunity for mumps exposure during childhood because high MMR vaccination coverage in younger children had reduced circulation of mumps in the United Kingdom.<sup>6</sup>

In the United States an outbreak of mumps began in a college in Iowa in December 2005 and by May 2006 involved at least ten additional states.<sup>7</sup> The age group most affected was young adults aged 18-24 years, many of whom were college students.<sup>7</sup> In Iowa, preliminary vaccination data among 1,192 mumps cases indicated six percent were unvaccinated, 12% had received one dose of MMR vaccine, 51% had received two doses while vaccination status was unknown for 31% of cases (the majority of whom were adults).<sup>7</sup>

In studies in the United States mumps vaccination was shown to be between 78% and 91% effective.<sup>8</sup> However, a recent report by Harling *et al.* suggests that the effectiveness of one dose could be as low as 64%.<sup>9</sup> The same study documented vaccine effectiveness of 88% with two doses.<sup>9</sup> As mentioned above, preliminary data in the mumps outbreak in Iowa indicated a large proportion of cases had received one or two doses of MMR. A number of the mumps notifications in Ireland were also reported to have received one or two doses of MMR vaccine, however, for the majority of these cases the vaccination status was not confirmed, as most did not have complete vaccination dates or vaccination batch numbers reported. The HSE Area staff experienced great difficulty in determining the true vaccination status of cases, due to lack of immunisation records or difficulty accessing immunisation records. Accurate vaccination status is vital to determine the efficacy of the vaccine and to inform vaccination policy. This emphasises the importance, and need, for a national vaccination registry in Ireland.

Mumps notifications declined during 2006. It is anticipated that the mumps notifications will continue to decline in 2006. With MMR<sub>1</sub> uptake in those 24 months of age in 2005 approximately 11% below the target uptake of 95% it is vital that immunisation uptake rates improve if future mumps outbreaks are to be prevented.

#### Acknowledgements

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