Measles in Ireland, 2005

Key Points

- **There were 93 measles notifications in 2005**
- **The crude incidence rate of measles per 100,000 population in 2005 was 2.4 compared to 8.4 in 2004 and 14.6 in 2003**
- **Of the 93 measles notifications 12% were classified as confirmed, 82% were classified as possible and six percent had no case classification assigned**

Introduction

Measles is an acute viral infectious disease characterised by high fever, cough, conjunctivitis, runny nose and rash. Complications of measles include otitis media, pneumonia, croup, diarrhoea and encephalitis. Measles results in death in approximately one to two cases per 1,000 population. In Ireland, three measles deaths were reported during 2000. Two of these deaths were as a result of pneumonia complicating measles and one was due to post-measles encephalitis.

Measles is highly contagious but can be prevented by vaccination. Measles vaccine in Ireland is currently available as part of the combined measles-mumps-rubella (MMR) vaccine. More than 99% of individuals who receive two MMR doses (provided the first dose is given after their first birthday) develop immunity to measles. Two doses of MMR are required to ensure protection, as two to five percent of children fail to respond to one dose of MMR. In Ireland, vaccination with the first dose of MMR (MMR_1) is recommended at twelve to fifteen months of age and the second dose (MMR_2) at four to five years of age.

The number of measles notifications, in Ireland, by year since 1948 is shown in figure 1. The highest number of notifications was in 1959, with 15,134 cases reported. In the 1970s an average of 2,327 cases of measles were notified each year with an average of seven deaths every year from measles. In 1985 there were nearly 10,000 measles notifications, this was the same year a measles vaccine was

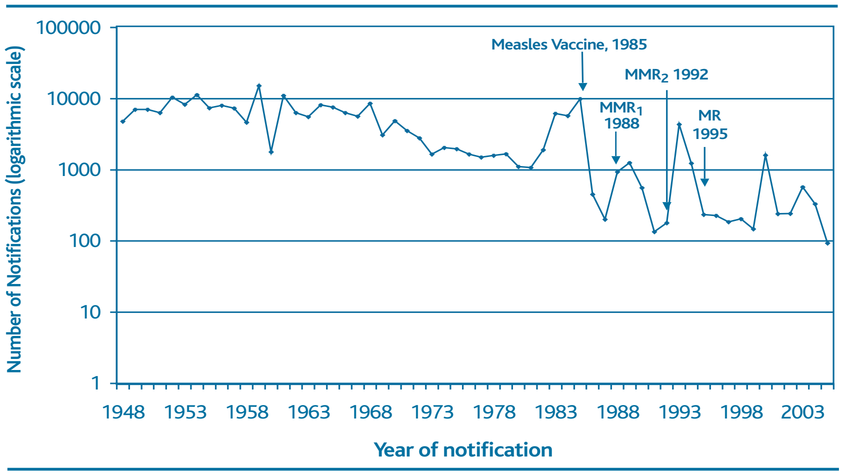

Figure 1. Annual number (log scale) of measles notifications in Ireland 1948-2005 and year of introduction of measles and MMR vaccine. (A measles and rubella campaign for primary school-age children was conducted in 1995).

first introduced into Ireland. By 1991 the number of measles notifications had dropped to 135.

Since 2000 measles is notified weekly to HPSC. HPSC routinely publishes a national measles report that is distributed to those involved in measles control and surveillance in Ireland. HPSC also forwards the measles notification data to the EU measles surveillance network EUVAC.NET and to the World Health Organisation (WHO) on a monthly basis.

This review summarises the 2005 measles notification data.

Materials and Methods

During 2005, for HSE Areas using the CIDR system, measles notifications were inputted 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 using CIDR, anonymous notifications were sent to HPSC and these data were inputted on CIDR by HPSC. Measles data presented in this report were taken from the CIDR system on the 19th September 2006. These figures may differ from those published previously, due to ongoing updating of notification data in CIDR.

Case classifications are assigned to measles notifications as per the Case Definitions for Notifiable Diseases.[1] Analysis of measles data was carried out using Business Objects and Microsoft Excel. Incidence rates were calculated based on population data taken from the 2002 census.

Results

Incidence

A total of 93 measles cases were notified during 2005, giving a crude incidence rate of 2.4 per 100,000 population. In contrast, the crude incidence rate was 8.4 per 100,000 in 2004 and 14.6 per 100,000 in 2003. The annual number of notifications in 2005 is the lowest since 1948 when measles was specified as a notifiable disease under the Health Act, 1947 (figure 1).

The breakdown of measles cases by HSE Area and the crude incidence rates by HSE Area during 2005 are presented in table 1. The highest number of notifications was in the HSE-E (n=52, 56%) followed by the HSE-NE (n=9, 10%). The highest crude incidence rate in 2005 was in the HSE-E (3.7/100,000) followed by the HSE-M (3.5/100,000).

There were on average two notifications each week during 2005. No outbreaks of measles were notified during 2005.

Case classification

Case classification was provided for 94% (n=87) of measles notifications in 2005. Of the 93 notifications in 2005, 11 (12%) were classified as confirmed, 76 (82%) as possible while case classification was not provided for six (6%) notifications. All 11 notifications classified as confirmed were laboratory confirmed.

Age and sex distribution

A breakdown of measles notifications by age group and the

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

HSE Area	Number	CIR
HSE-E	52	3.7
HSE-M	8	3.5
HSE-MW	6	1.8
HSE-NE	9	2.6
HSE-NW	4	1.8
HSE-SE	7	1.7
HSE-S	1	0.2
HSE-W	6	1.6
Total	**93**	**2.4**

Table 2. Number of measles notifications by age group and age specific incidence rate per 100,000 population (ASIR) in 2005

Age group (years)	Number	ASIR
<1	27	49.5
1-2	41	36.7
3-4	8	7.2
5-9	10	3.8
10-14	3	1.1
15-19	1	0.3
20-24	0	0.0
25+	0	0.0
Unknown	3	-
Total	**93**	**2.4**

age specific incidence rates per 100,000 population in 2005 are presented in table 2. All measles notifications, where age was reported, were aged less than 20 years. The highest number of notifications (n=41, 44%) in 2005 was in those aged 1-2 years followed by those aged less than one year (n=27, 29%) and those aged 5-9 years (n=10, 11%). The highest incidence rates in 2005 were in those aged less than one year (49.5/100,000) and 1-2 years (36.7 /100,000). Of the 93 measles notifications, 52 were male, 40 were female, while sex was not reported for one notification.

Laboratory data

Laboratory results were provided to HPSC for 24 (24/93, 26%) measles notifications. Eleven of these were laboratory positive for measles while 13 were negative for measles (table 3).

Oral fluid specimens should be obtained between one and five weeks following the appearance of the rash. Samples obtained less than one week after rash onset may lead to a false negative result. Of the 13 laboratory negative measles cases, 12 had oral fluid specimens sent for laboratory testing. Four of these negative oral fluid specimens were taken less than seven days after onset while five had no specimen date reported. The remaining negative oral fluid specimens were taken greater than one week following onset.

As measles vaccine induces a positive measles IgM response a positive IgM test cannot be used to confirm the diagnosis of measles in individuals who received measles vaccine six to 45 days before rash onset. Of the 11 laboratory positive measles notifications two had received at least one dose of vaccine. The date of vaccination in relation to onset of disease was not provided for one of these while the second case was vaccinated two years prior to onset.

Vaccination data

Vaccination status was reported for 59 (63%) of the 93 notifications. Thirty-six cases (36/59, 61%) were unvaccinated. Seventeen percent (6/36) of those unvaccinated were aged greater than 15 months and therefore, were potentially eligible for vaccination with MMR_1 (assuming there were no contraindications to vaccination).

Five cases (5/59, 8%) were vaccinated with MMR_1 only. All five cases were aged less than six years. Of the five cases vaccinated with MMR_1; one received the vaccine less than 18 days prior to onset suggesting the possibility they may have been incubating measles at the time of vaccination; three were vaccinated greater than six months prior to onset; the date of vaccination in relation to disease onset was not reported for one case. An additional 12 cases received at least one dose of MMR. The MMR_1 vaccination dates were reported for six of these notifications; all six were vaccinated greater than three months prior to onset.

Six cases received MMR_2. The dates of vaccination were only reported for three of the six cases. None of these cases were reported as laboratory confirmed; therefore, none of these six

Table 3. Measles laboratory test results (n=24).

	Laboratory Result		
Specimen type	Positive	Negative	Total
Oral fluid sample	4	12 *	16
Serum sample	6	1 †	7
Oral fluid and serum samples	1	0	1
Total	11	13	24 ‡

** specimen date in relation to onset date not reported for 5 cases, and for 4 cases the specimen was taken <7 days after onset*
†specimen taken <7 days after onset
‡laboratory results were only provided for 24 of the 93 notifications

Table 4. Number of measles notifications in Ireland by age group and hospitalisation status during 2005

Age group (years)	Hospitalised	Not hospitalised	Not reported/unknown	Total
<1	3	10	14	27
1-2	2	17	22	41
3-4	0	1	7	8
5-9	0	5	5	10
10-14	0	0	3	3
15-19	0	0	1	1
20-24	0	0	0	0
25+	0	0	0	0
Unknown	0	0	3	3
Total	**5**	**33**	**55**	**93**

cases are known to be, or can be, classified as vaccine failures based on the data provided.

Hospitalisation data & complications of measles

Information on hospitalisation status was available for 38 cases (38/93, 41%). Five cases were hospitalised representing 13% (n=5/38) of all cases with known hospitalisation status (table 4). The length of hospital stay was only reported for two notifications, with the length of stay ranging from seven to nine days. The hospitalised cases ranged in age from 8 to 18 months.

Three of the hospitalised cases were unvaccinated; all three were aged less than 15 months. One hospitalised case, aged 18 months, had received one dose of MMR (date of vaccination was not provided). Vaccination status was not provided for the remaining hospitalised case.

Information on measles associated complications was reported for 10 (10/93, 11%) notifications. One case was reported to have a lower respiratory tract infection. The nine remaining cases were reported to have no complications. No measles deaths were reported among the 93 measles notifications. However, the Central Statistics Office reported one measles death in 2005 in a case in the age group 25-34 years.

Discussion

During 2005, there were only 93 measles notifications in Ireland. This is a 3.5-fold decrease compared to 2004 (n=330) and a six-fold decrease compared to 2003 (n=572) and is the lowest number of measles notifications recorded since 1948 when measles was specified as a notifiable disease under the Health Act, 1947 (figure 1). The WHO has targeted 2010 for eliminating measles and reducing the incidence of congenital rubella infection to less than one case of congenital rubella syndrome per 100,000 live births in the WHO European Region. In order to achieve measles elimination in Ireland it is essential that all suspected measles cases are notified. Strengthening of measles surveillance will be a critical component in the control and elimination of this disease. Measles surveillance is required to detect cases and to understand the reasons for the occurrence of this disease so that appropriate and timely control measures can be implemented.

Measles can be difficult to diagnose clinically. It is important that follow-up laboratory information is provided for accurate surveillance. For elimination it is also essential that all suspected cases have specimens sent for laboratory testing. Of the 93 measles notifications in 2005, 74% (n=69/93) either had no specimen sent for laboratory testing or had no laboratory results reported. Laboratory testing is a very important part of measles surveillance. Good surveillance and laboratory data provide evidence, where there is low incidence, that the absence of notifications is attributable to the absence of disease rather than to inadequate detection and reporting.

For Ireland to achieve the WHO target, of measles elimination and preventing congenital rubella infection, it is also essential that all rubella and congenital rubella cases are notified. It is again important to have follow-up laboratory information as rubella can also be difficult to diagnose clinically and often measles and rubella are clinically indistinguishable. During 2005 only 17 rubella cases were notified; 15 of these were classified as possible while two had no case classification assigned. This low number suggests rubella is underreported in Ireland. (Rubella data are described in the infectious disease chapter in this document.)

The incompleteness of measles surveillance data provided to HPSC continues to be a major limitation. For example, vaccination status was not provided for over a third of notifications. Also, for a number of cases, where vaccination status was provided, the date of vaccination in relation to disease onset was not reported, making interpretation of the vaccination data difficult. Good vaccination data allow informed decisions to be made about where vaccination coverage should be improved. To prevent outbreaks occurring it is important to monitor what populations are unvaccinated.

As measles surveillance and data quality are improved so to will the ability to control and prevent measles cases thereby aiding elimination of measles in Ireland.

Acknowledgements
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References
1. Case Definitions for Notifiable Diseases. Available at http://www.hpsc.ie