Vaccine Preventable Disease Epidemiology in Ireland and recent outbreaks

Suzanne Cotter, SPHM, National Immunisation Conference, RCPI, 23rd May 2019
Impact of vaccines on Irish population, 1948-2019*

- **Successes**
  - Eliminated, well controlled, for elimination/eradication
    - Smallpox, Hib, measles, **rubella and polio**
  - Impact newer vaccines
    - **pneumococcal, meningococcal C (+B),** rotavirus
- **Successes and re-emergence**
  - Pertussis, **mumps, meningococcal**
- **New vaccines in the pipeline**
  - **Influenza (universal),** Respiratory Syncytial Virus, Group B Streptococcus….

*2019 provisional data 22/5/2019
National Immunisation Guidelines regularly updated

Only available online

National Immunisation Office:
http://www.hse.ie/eng/health/immunisation/hcpinfo/guidelines/

* Regular changes to online chapters of 2013 Immunisation Guidelines
New Primary Childhood Immunisation Schedule
December 2016

- Two new vaccines added to childhood immunisation schedule. Meningococcal B and rotavirus

<table>
<thead>
<tr>
<th>Age</th>
<th>Visit</th>
<th>Vaccination</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 months</td>
<td>Visit 1</td>
<td>6 in 1</td>
</tr>
<tr>
<td></td>
<td>3 Injections</td>
<td>MenB (new)</td>
</tr>
<tr>
<td></td>
<td>1 Oral drops</td>
<td>PCV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rotavirus (new)</td>
</tr>
<tr>
<td>4 months</td>
<td>Visit 2</td>
<td>6 in 1</td>
</tr>
<tr>
<td></td>
<td>2 Injections</td>
<td>MenB</td>
</tr>
<tr>
<td></td>
<td>1 Oral drops</td>
<td>Rotavirus</td>
</tr>
<tr>
<td>6 months</td>
<td>Visit 3</td>
<td>6 in 1</td>
</tr>
<tr>
<td></td>
<td>3 Injections</td>
<td>PCV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MenC</td>
</tr>
</tbody>
</table>

No Rotavirus vaccine on or after 8 months 0 days

- Visit 4: MMR
- MenB

- Visit 5: Hib/MenC
- PCV

For children born on or after 1 October 2016

www.imunisation.ie
An introduction to Your Child’s Immunisations

www.immunisation.ie

For babies born on or after 1 October 2018

Age Vaccination

2 months Visit 1 6 in 1+PCV+MenB+Rotavirus
3 Injections+Oral Drops

4 months Visit 2 6 in 1+MenB+Rotavirus
2 Injections+Oral Drops

6 months Visit 3 6 in 1+PCV+MenC
3 Injections

No Rotavirus vaccine on or after 8 months 0 days

12 months Visit 4 MMR+MenB
2 Injections

13 months Visit 5 Hib/MenC+PCV
2 Injections

6 in 1 Diphtheria, Haemophilus influenzae
  b (Hib), Hepatitis B, Pertussis
  (whooping cough), Polio and Tetanus
PCV Pneumococcal conjugate vaccine
MenB Meningococcal B
MenC Meningococcal C
Rotavirus Rotavirus oral vaccine
MMR Measles, Mumps, Rubella
Hib/MenC Haemophilus influenzae b +
  Meningococcal C combined vaccine

For more information see www.immunisation.ie
Reporting of National Immunisation Statistics

• Statistics calculated at the HSE regional level

• Quarterly Reports collated at HPSC
  • http://www.hpsc.ie/
Immunisation Uptake Statistics at 12 and 24 months – National, Q1 2000- Q3 2018

Uptake (%) at **12 months of age**

Uptake (%) at **24 months of age**

Uptake (6in1 vaccine), Q3 2018

Source: local immunisation offices, collated by HPSC
A hospital room in the US with patients in iron lungs in 1952*

Polio endgame strategy

Ending Polio

Humanity is on the verge of one of the greatest public health achievements in history – eradicating polio. The Global Polio Eradication Initiative (GPEI) has reduced polio cases by 99.9% since 1988, bringing the world closer than ever before to ending polio for good. This means a world in which every child would be safe from the paralysis caused by the virus, and no family would ever have to bear the emotional and financial costs of polio again. With sustained political and financial commitment to protect every last child, we can seize this chance to end the virus forever.
Polio notifications, Ireland, 1948-2018

Number of Cases Notified

Year


Polio vaccine, 1957

Last case reported, 1984
Rubella notifications and rubella programme, by year 1948-2018

1971, Rubella vaccine for girls,

1988 MMR₁

1992 MMR₂

MR campaign, 1995

MMR₂, 4-5 yoa, 1999

*MMR vaccination campaign started in April 2009 for students in 4th, 5th and 6th year of second level schools

*MMR catch-up campaign 2012-2014
Impact of vaccination on measles, Ireland, 1948-2018

Number of notifications

Year


Measles vaccine, introduced in 1985

MMR1 introduced in 1988

MMR2 introduced in 1992

MR campaign 1995

MMR campaigns* 2009, 2012-2014

*MMR vaccination campaign started in April 2009 for students in 4th, 5th and 6th year of second level schools
*MMR catch-up campaign 2012-2014
Measles elimination status

2016: interrupted
2017: eliminated

Source: European Regional Verification Commission for Measles and Rubella Elimination (RVC) meeting report: www.euro.who.int/7thrvc

Rubella elimination status

2016: eliminated
2017: eliminated

Source: European Regional Verification Commission for Measles and Rubella Elimination (RVC) meeting report: www.euro.who.int/7thrvc

http://www.euro.who.int/__data/assets/pdf_file/0014/401117/IRL.pdf?ua=1
Pneumococcal Conjugate Vaccines (PCV), impact and changes in serotypes, by age group, 2008-2017

PCV7 serotypes

PCV13 serotypes
Emergence of Non PCV 13 serotypes by age group, 2008-2017
Meningococcal cases by year and serogroup, 1999-2019*

MenC introduced, plus catch up (< 23 years)

MenC booster for adolescents Sept 2014

MenB vaccine from Oct 2016, at 2,3,12 months

*CIDR: 19/02/2019
Meningococcal serogroup B notifications, < 5 y.o.a. and total, 2012-2019*

MenB vaccine at 2, 4 and 12 months
Mumps notifications in Ireland, 2018-2019 (weeks 1-12 2019)
Mumps notifications, 1988-2019*

*CIDR: 22/05/2019
Mumps notifications, by age group and year (1988-2019*)

Age group begins to be reported, 2000

*CIDR: 22/05/2019
MMR doses† as % notifications by age group
Week 20, 2018- week 22 2019*

*CIDR: 22/05/2019  †MMR doses includes self reported and some validated
Notified influenza outbreaks and predominant influenza type/subtype by season, 2009/2010 to 2017/2018, in Ireland

Source: HPSC Influenza AER 2018
ASIR* confirmed influenza cases hospitalised and admitted to critical care during the 2017/2018 influenza season, in Ireland

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Hospitalised</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Age specific rate per 100,000 pop.</td>
<td>Number</td>
<td>Age specific rate per 100,000 pop.</td>
<td></td>
</tr>
<tr>
<td>0-4</td>
<td>652</td>
<td>196.7</td>
<td>19</td>
<td>5.7</td>
<td></td>
</tr>
<tr>
<td>5-14</td>
<td>451</td>
<td>66.8</td>
<td>20</td>
<td>3.0</td>
<td></td>
</tr>
<tr>
<td>15-24</td>
<td>157</td>
<td>27.2</td>
<td>4</td>
<td>0.7</td>
<td></td>
</tr>
<tr>
<td>25-34</td>
<td>178</td>
<td>27.0</td>
<td>4</td>
<td>0.6</td>
<td></td>
</tr>
<tr>
<td>35-44</td>
<td>298</td>
<td>45.2</td>
<td>16</td>
<td>2.1</td>
<td></td>
</tr>
<tr>
<td>45-54</td>
<td>288</td>
<td>46.0</td>
<td>12</td>
<td>1.9</td>
<td></td>
</tr>
<tr>
<td>55-64</td>
<td>443</td>
<td>87.0</td>
<td>31</td>
<td>6.1</td>
<td></td>
</tr>
<tr>
<td>≥65</td>
<td>2245</td>
<td>352.1</td>
<td>85</td>
<td>13.3</td>
<td></td>
</tr>
<tr>
<td>Unknown Age</td>
<td>1</td>
<td></td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>4713</strong></td>
<td><strong>99.0</strong></td>
<td><strong>191</strong></td>
<td><strong>4.0</strong></td>
<td></td>
</tr>
</tbody>
</table>

*Age specific rate, based on CSO 2016 data

Source: HPSC Influenza AER 2018
**ASIR* confirmed influenza cases hospitalised and admitted to critical care during the 2017/2018 influenza season, in Ireland**

| Age (years) | Hospitalised | | Admitted to ICU | |
|-------------|---------------|----------------|----------------|
| Age (years) | Number | Age specific rate per 100,000 pop. | Number | Age specific rate per 100,000 pop. | |
| 0-4         | 652 | 196.7 | 19 | 5.7 | |
| 5-14        | 451 | 66.8 | 20 | 3.0 | |
| 15-24       | 157 | 27.2 | 4 | 0.7 | |
| 25-34       | 178 | 27.0 | 4 | 0.6 | |
| 35-44       | 298 | 45.2 | 16 | 2.1 | |
| 45-54       | 288 | 46.0 | 12 | 1.9 | |
| 55-64       | 443 | 87.0 | 31 | 6.1 | |
| ≥65         | 2245 | 352.1 | 85 | 13.3 | |
| Unknown Age | 1 | 0 | 0 | 0 | |
| Total       | 4713 | 99.0 | 191 | 4.0 | |

*Age specific rate, based on CSO 2016 data

Source: HPSC Influenza AER 2018
Uptake of seasonal flu vaccine in acute hospitals and long term care facilities in Ireland in 2017-2018

Flu vaccine uptake rates amongst healthcare workers in Ireland are at highest ever levels.

[ FULL TEXT ]

Monkeypox cases in the UK

Public Health England has identified two separately imported cases of monkeypox to the UK and a case of monkeypox in a healthcare worker involved in the care of an imported case.

[ FULL TEXT ]

Safe Patient Care: Infection Prevention & Control Course, September 2018

Representatives from around 50 hospitals attended HPSC/RCSI Safe Patient Care course, which is now in its ninth year.
HCW influenza vaccine uptake, public hospitals, by HSE grade category and influenza season, Ireland*

Overall % Uptake

HSE Staff Category

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>General Support Staff</td>
<td>22.4</td>
<td>25.3</td>
<td>25.3</td>
<td>23.3</td>
<td>21.9</td>
<td>19.7</td>
<td>17.6</td>
</tr>
<tr>
<td>Health &amp; Social Care Professionals</td>
<td>27.6</td>
<td>30.2</td>
<td>25.3</td>
<td>24.8</td>
<td>30.1</td>
<td>31.3</td>
<td>35.9</td>
</tr>
<tr>
<td>Management &amp; Admin</td>
<td>21.0</td>
<td>25.3</td>
<td>25.3</td>
<td>30.6</td>
<td>40.3</td>
<td>36.6</td>
<td>44.8</td>
</tr>
<tr>
<td>Medical &amp; Dental</td>
<td>54.4</td>
<td>41.0</td>
<td>33.4</td>
<td>41.0</td>
<td>54.7</td>
<td>66.4</td>
<td>54.4</td>
</tr>
<tr>
<td>Nursing</td>
<td>12.4</td>
<td>15.6</td>
<td>17.2</td>
<td>17.5</td>
<td>19.7</td>
<td>21.7</td>
<td>21.7</td>
</tr>
<tr>
<td>Other Patient &amp; Client Care</td>
<td>19.7</td>
<td>21.7</td>
<td>18.4</td>
<td>24.2</td>
<td>23.3</td>
<td>31.3</td>
<td>42.5</td>
</tr>
<tr>
<td>All Staff</td>
<td>18.1</td>
<td>24.1</td>
<td>23.2</td>
<td>34.0</td>
<td>41.0</td>
<td>39.6</td>
<td>43.1</td>
</tr>
</tbody>
</table>
Key points

- Vaccines have had a major **positive** impact on decreasing incidence VPDs in Ireland
- Vaccination policy and programme informed and influenced by
  - New information
  - Changes in epidemiology (Ireland and internationally)
  - New vaccines (products)
- Constant need to monitor epidemiology
- Need to understand and address reasons for non-vaccination and missed opportunities
- HCWs most important and trusted sources of VPD information for public
  - Being up-to-date invaluable!
Thank you

Acknowledgements

• All those involved in diagnosis, surveillance, control, prevention
  – Clinicians/GPs/nurses
  – CHO staff (PMOs, PHNs, SMOs, IT and admin staff, management)
  – Infection control nurses and teams
  – Occupational health
  – Departments of Public health
  – Laboratories/NVRL/IMSPR, NPSRL
  – HPSC staff
  – NIO