Pertussis in Ireland - emerging trends

Update 1/11/2012
Pertussis (Whooping cough)

- Bacterial infection caused by *Bordetella pertussis*
- Highly contagious respiratory disease
- Severe, debilitating cough illness (“100 day cough”) classically seen
  - Other manifestations include inspiratory “whoop” or vomiting and exhaustion after coughing, apnoeic episodes in infants
- Highest morbidity and mortality among infants
- Estimated worldwide deaths > 300,000/yr
- Following introduction of vaccines good control achieved, but recent emergence of disease in many countries
Pertussis vaccines and schedule in Ireland - historic

Pertussis-containing vaccines
- 1952-1996; whole cell pertussis vaccine (wP)
- 1996 – current; acellular pertussis vaccine (aP)

Schedule
- Primary series 2,4,6 months of age
- Booster doses preschool (4-5 years of age)
  adolescent booster (NIAC*2008)

*NIAC: National Immunisation Advisory Committee, RCPI 2008
Pertussis - Clinical Course (in weeks)

**Communicable period**
(onset to 3 weeks after start of paroxysmal cough)

**Incubation period**
(typically 5-10 days; max 21 days)

**Catarrhal stage**
(1-2 weeks)

**Paroxysmal stage**
(1-6 weeks)

**Convalescent stage**
(weeks to months)

http://www.cdc.gov/vaccines/ed/ciinc/Pertussis.htm
Surveillance of Pertussis in Ireland

- Infectious Disease Reporting: Legal framework
- Notifiable since 1948 (1947 Health Act)
- Case definitions used since 2004
- Clinicians/laboratory directors required to notify to Medical officer of health
- Timely notification is important to facilitate timely public health action
Infectious disease notification

Standard case notifications forms

Available at http://www.hpsc.ie/hpsc/NotifiableDiseases
Notification process

- Who notifies?
  - A medical practitioner and a clinical director of a diagnostic laboratory

- Role of case definitions
  - The notifier should have regard to the case definitions for infectious diseases circulated by the Health Protection Surveillance Centre (HPSC).
Pertussis (*Bordetella pertussis*)

**Case definition**

**Clinical criteria**

Any person with a cough lasting at least two weeks

AND at least one of the following three:

- Paroxysms of coughing
- Inspiratory “whooping”
- Post-tussive vomiting

OR

Any person diagnosed as pertussis by physician

OR

Apnoeic episodes in infants

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Pertussis (*Bordetella pertussis*) case definition (continued)

**Laboratory criteria**

At least one of the following:
- Isolation of *Bordetella pertussis* from a clinical specimen
- Detection of *Bordetella pertussis* nucleic acid in a clinical specimen
- *Bordetella pertussis* specific antibody response

**Epidemiological criteria**

An epidemiological link by human to human transmission

**Case classification**

**Possible case** - clinical criteria

**Probable case** - clinical criteria and epidemiological link

**Confirmed case** - clinical and laboratory criteria

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Trends Pertussis notifications, Ireland 1948-2012*

Source: DOH (historic data) and HPSC data
*2012 data weeks 1-39
Pertussis notifications, 2001-2012*

Source CIDR data
*2012 data weeks 1-39
Pertussis notifications by week, 2009-2012*

Source CIDR data
*2012 data weeks 1-39
Pertussis notifications by HSE area and laboratory test status, 2012* (n=370)

Source CIDR data
*2012 data weeks 1-39
Pertussis notifications, Ireland by age group and case classification, 2012*(n=370)

Source CIDR data
*2012 data weeks 1-39
Pertussis notifications, Ireland ASIR (/100,000) 2001-2012* (n=370)

*2012 data weeks 1-39
Pertussis notifications Ireland, 2012* by age group and vaccination status (n=370)

*2012 data weeks 1-39
Pertussis cases <1 year of age, by age (weeks) and number pertussis vaccine doses received, at disease onset date (n=138)

*2012 data weeks 1-39. Onset date available for 98 of 138 events < 1 year
Pertussis notifications, 2012* according to level of healthcare

Hospitalised: 116/373 cases (31%)
Of which: 92/116 (79%) aged 0-5 months

*2012 data weeks 1-39, (n=370)
Pertussis fatalities, Ireland 2011-2012*

• 2012 – 2 infant deaths < 8 weeks of age
  – Infant 1
    • Premature infant
    • Onset at 2 weeks of age
  – Infant 2
    • Premature infant
    • Onset at 7 weeks of age

• 2011 – 1 infant death
  • Onset at 7 weeks of age

• None of the above infants were vaccinated – too young for vaccination (which starts at 2 months of age)

*2012 data weeks 1-39
Quarterly immunisation uptake, Ireland by vaccine type at 12 months of age, Q2 2000- Q1 2012

Source: HSE HPSC data
Proportion of children at 12 months of age who have received 3\textsuperscript{rd} dose of pertussis vaccine, by LHO, Q1 2012

Source: HSE HPSC data
Quarterly immunisation uptake, 24 months of age, Q1 1999- Q1 2012

Source: HSE HPSC data
Proportion of children at 24 months of age who have received 3rd dose of pertussis vaccine, by LHO, Q1 2012

Source: HSE HPSC data
volume 13 issue 10 October 2012

Summary of “Guidelines - public health management of pertussis” (August 2012)

Available at http://www.hpsc.ie/hpsc/A-Z/VaccinePreventable/PertussisWhoopingCough/Guidance/File,13577,en.pdf
Pertussis vaccination guidance

- National Immunisation Advisory Committee (NIAC)
- Pertussis Chapter
  - Updated August 2012
  - Available at http://www.immunisation.ie/en/
Summary

• Marked increase in pertussis since 2011
• Predominantly affecting infants
• Incidence highest in first 8 weeks of life
• Hospitalisations highest in 0-5 months age
• 3 deaths in infants in past two years
• Recent updated
  – NIAC vaccination recommendations
  – Public Health guidance
Acknowledgements

• Departments of Public Health in each HSE area
• Hospital laboratories
• HSE Immunisation staff