Pertussis Disease and Vaccine Recommendations

Dr Brenda Corcoran

Vaccine Preventable Disease Conference

April 2013

www.immunisation.ie

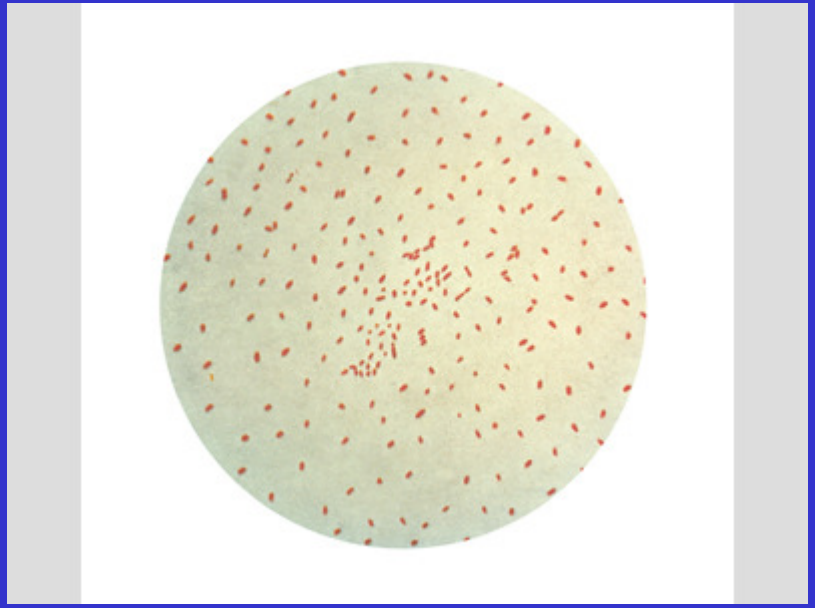
Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive

Outline

- Epidemiology
- Reasons for resurgence
- Updated NIAC guidelines
- Public Health management guidelines
- Summary

Pertussis Disease

- Toxin-mediated disease
  - Bacteria attach to respiratory cilia, toxin paralyse cilia
  - This + inflammation interferes with clearing of secretions
- Highly infectious
  - 90% of susceptible household contacts develop disease
- Young infants most at risk
  - 70% infected by family
- Disease does not guarantee lifelong protection



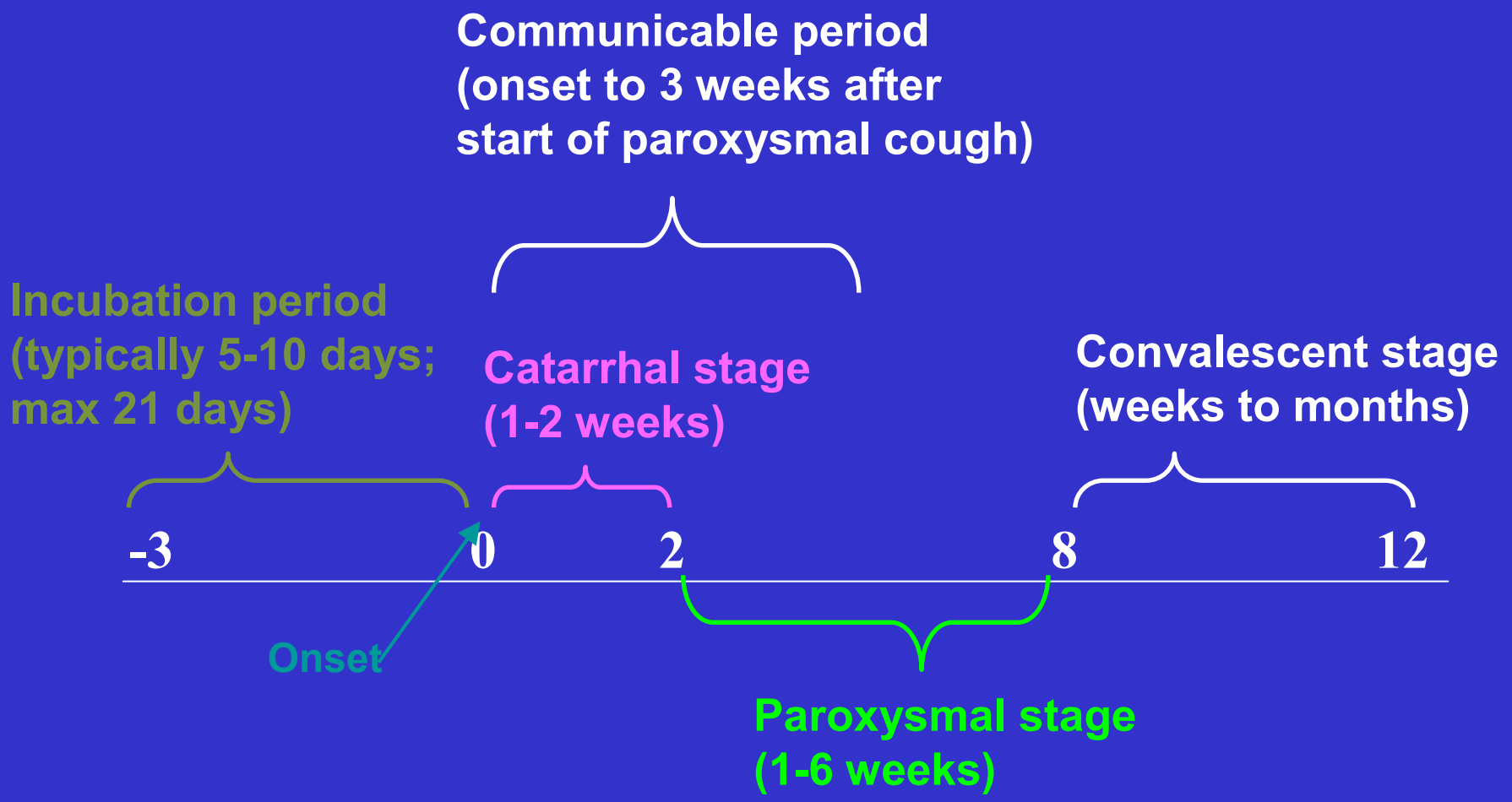
Centers for Disease Control and Prevention
Bordetella pertussis bacteria

Clinical Complications among Infants

- Hospitalisation common in < 6 months of age
- Among infants hospitalised :
  - 50% will have apnoea
  - 20% get pneumonia
  - 1% will have seizures
  - 1% will die

    (refractory pulmonary hypertension & encephalopathy)

Clinical Course (in weeks)



Source: ACIP May 2012. Stacey Martin.
http://www.cdc.gov/vaccines/ed/ciinc/Pertussis.htm

Pertussis

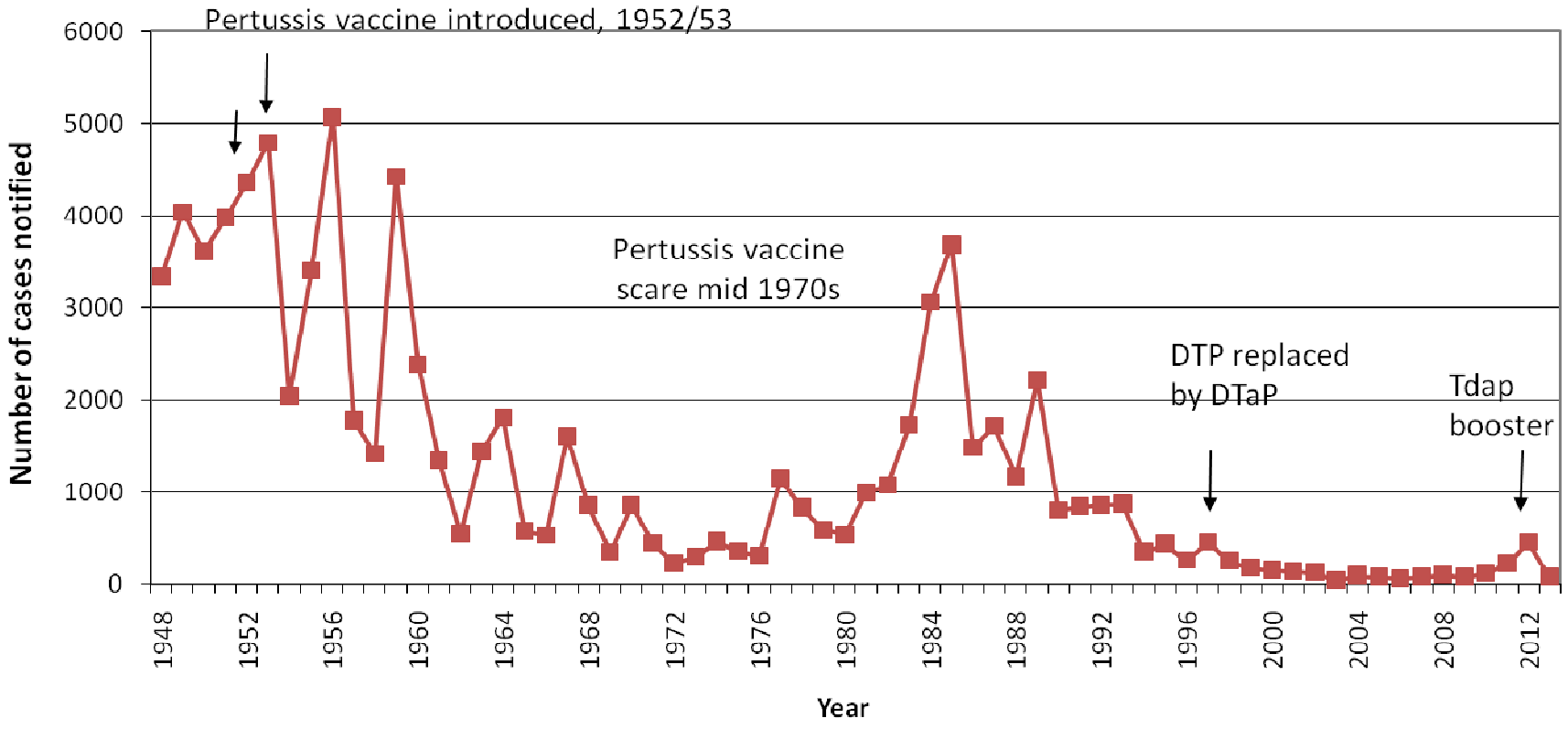
Pertussis is not only a paediatric disease.

It can affect humans of all ages and at several times in their lives

Epidemiology

- Pertussis cyclical –peaks every 3-5 years
- Increase in cases Ireland 2011 - 2012
- 50 million cases/yr worldwide 300,000 deaths
- Recent increases in many developed countries
  - Australia 2009-2011
  - US 2010 – 2012
  - UK 2011- 2012
  - New Zealand 2012 - 2013

Pertussis notifications, Ireland 1948- 2013*



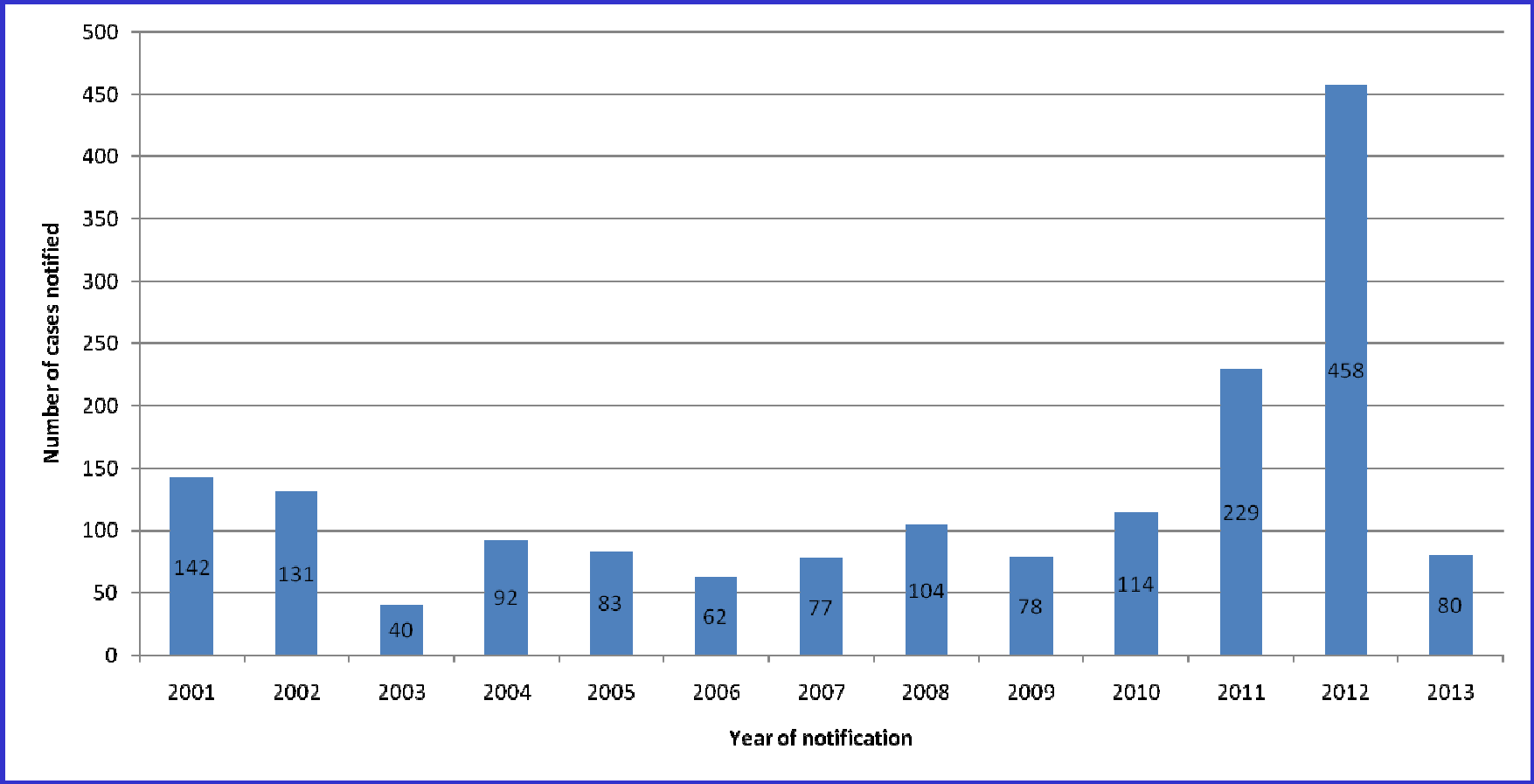
*2013 data up to 12/04/2013

Source: HPSC

www.immunisation.ie

Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive

Pertussis notifications, 2001-2013*



*2013 data up to 12/04/2013

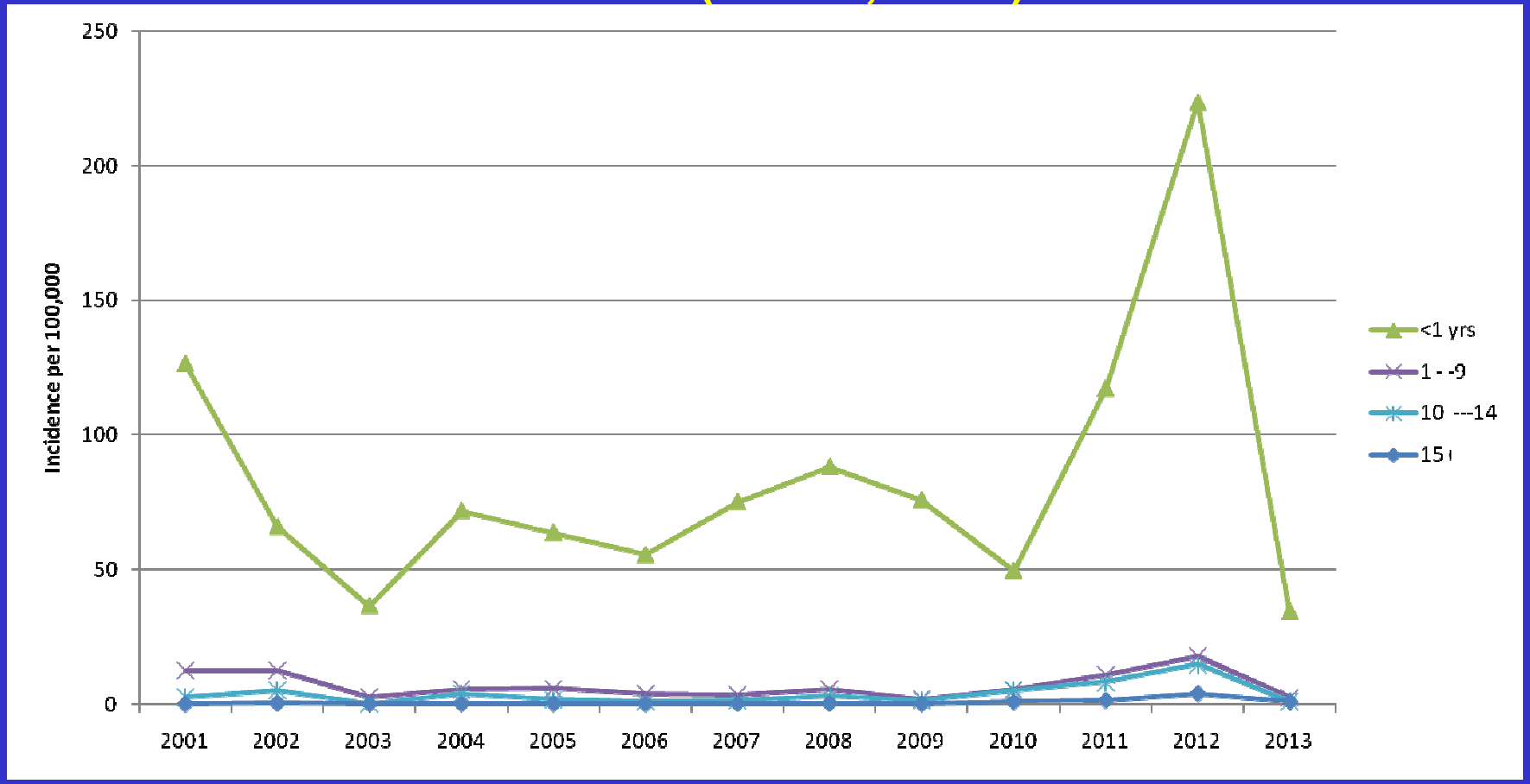
Source: HPSC

www.immunisation.ie

PROTECT HEALTH IMMUNISE

Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive

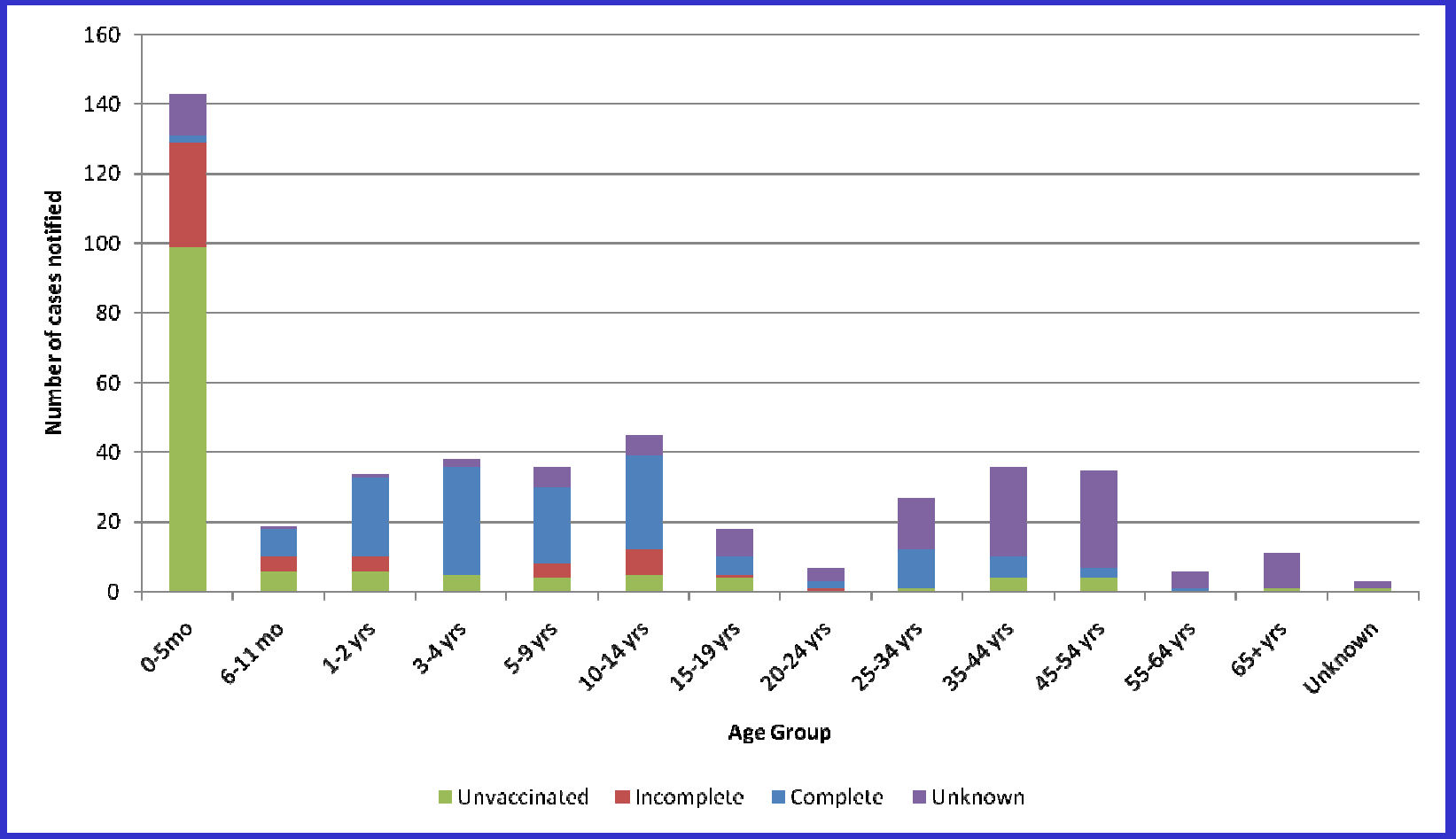
Pertussis notifications, 2001-2013*
ASIR (/100,000)



* 2013 data up to 12/04/2013
Source: HPSC

www.immunisation.ie

Notifications by age group and vaccination status 2012 (n=458)



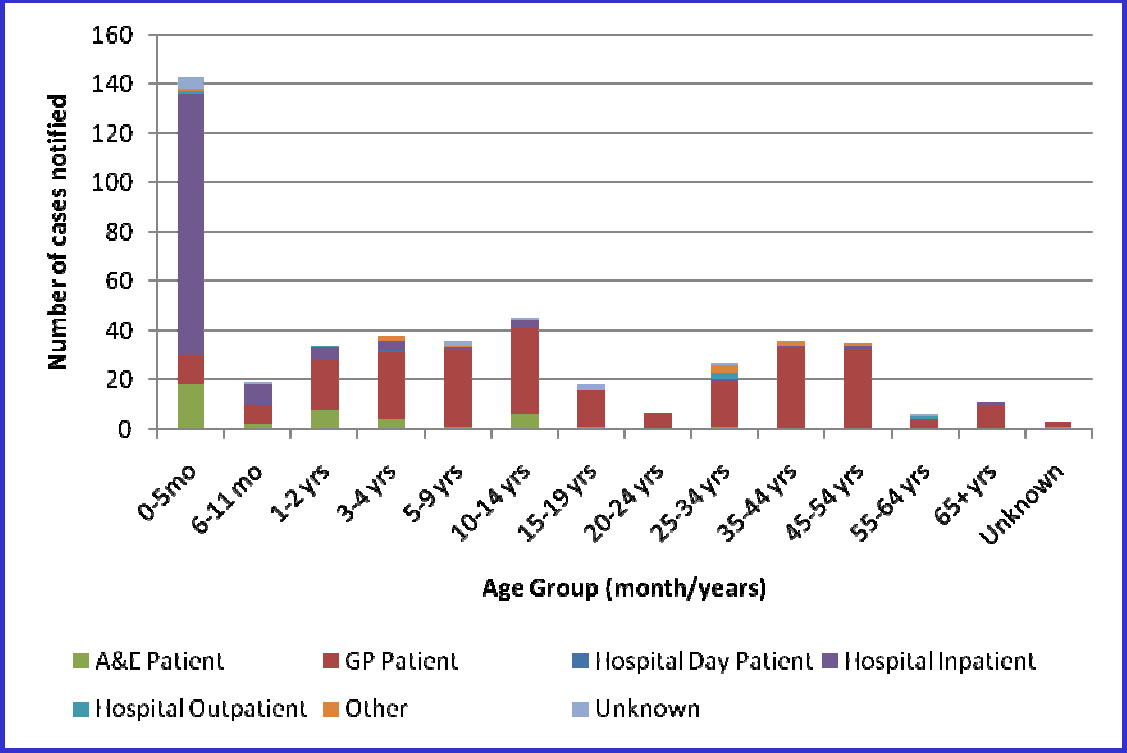
*2012 data are provisional

Source: HPSC

www.immunisation.ie

Patient type 2012 (n=458)

Hospitalised: 132/458 cases (29%)
Of which: 106/132 (80%) aged 0-5 months



*2012 are provisional
Source: HPSC

www.immunisation.ie

Reasons for Outbreaks of Pertussis

- Very contagious for up to 3 weeks
- Difficult for doctors to recognise and diagnose
- Even after starting treatment contagious for up to 5 days
- Immunity from prior vaccination or disease wanes over time so people become susceptible again

THE IRISH Sun

Date 12 January 2012
Page 34,35

eclips
newspaper licensing agency

Why killer infection whooping cough is back

WHOOPING cough was virtually wiped out in the Fifties when a nationwide vaccination programme was introduced – but now it's back.

The number of cases more than DOUBLED last year – to 1,040 in England and Wales, compared to just 421 in 2010, say experts at the Health Protection Agency. Official Irish figures are still to be released.

But it's not the only Victorian disease to make a comeback. Mumps, measles, typhoid and scarlet fever are also on the rise. The increase is being blamed on a fall in the number of parents getting their kids immunised. But these diseases don't only affect children but teens and adults too. Whooping cough spreads easily and in the worst cases, can be fatal.

Booster

Health chiefs are urging parents to ensure their children are vaccinated and the HPA has written to GPs to remind them of the signs and symptoms of whooping cough and to report cases quickly. Dr Mary Ramsay, head of immunisation at the HPA, said: "Parents should ensure their children are up-to-date with their vaccinations.

"The pre-school booster is also important, not only to boost protection in that child but also to help prevent them passing the infection on to vulnerable babies, as those under four months cannot be fully protected by the vaccine."

Here, LYNSEY HAYWOOD speaks to a mum and daughter, who picked up whooping cough and a lecturer who is still coughing two-and-a-half months after falling ill.

www.immunisation.ie

Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive

Why the increase?
Vaccine issues

- 1970s/1980s vaccine concerns & low uptake
- wP vaccine
  - About 3000 immunological components
  - Highly immunogenic
  - Difficult side effect profile
- aP vaccine
  - replaced wP vaccine in 1996
  - Purer vaccine
  - Much improved side effect profile
  - Not as effective – waning immunity

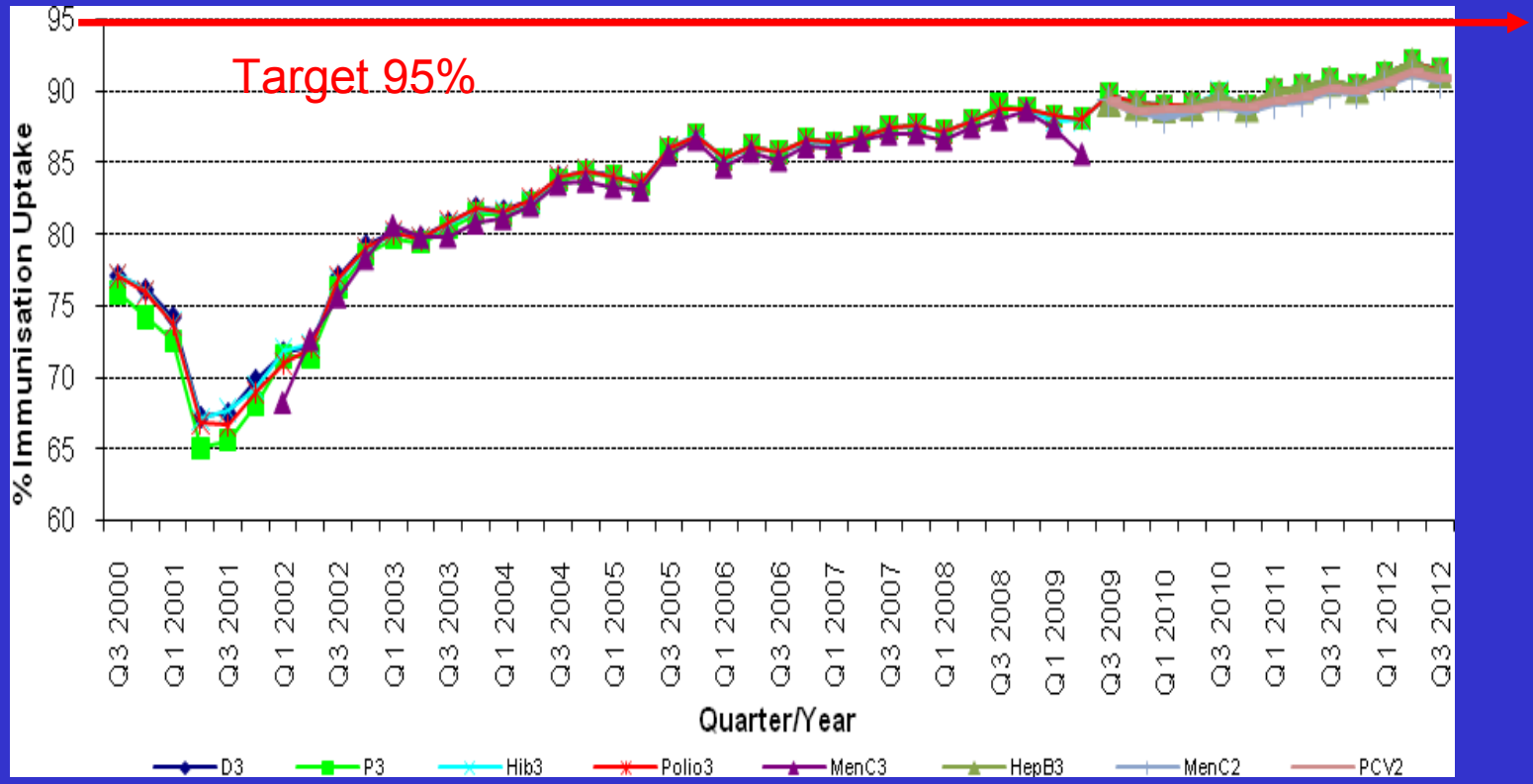
Why the increase?
Waning immunity

- Disease immunity wanes after 4-20 years
- Vaccine immunity wanes after 4-12 years
- Australian study looked at those born changeover (wP to aP) year (1998)
  - 3 X aP higher rates of disease versus 3 X wP
  - Mixed aP and wP higher rate if aP first dose
- 2 yrs post aP 95% - 5 yrs 70% (CDC)

Why the increase?
Changes in the organism?

- Limited evidence
- May be some adaptations – strains with small genetic changes.
- Compound effect of pathogen adaptation and waning immunity?
- Selection for strains which are more efficiently transmitted by hosts in which immunity has waned? (Mooi Infection, Genetics and Evolution 2010)

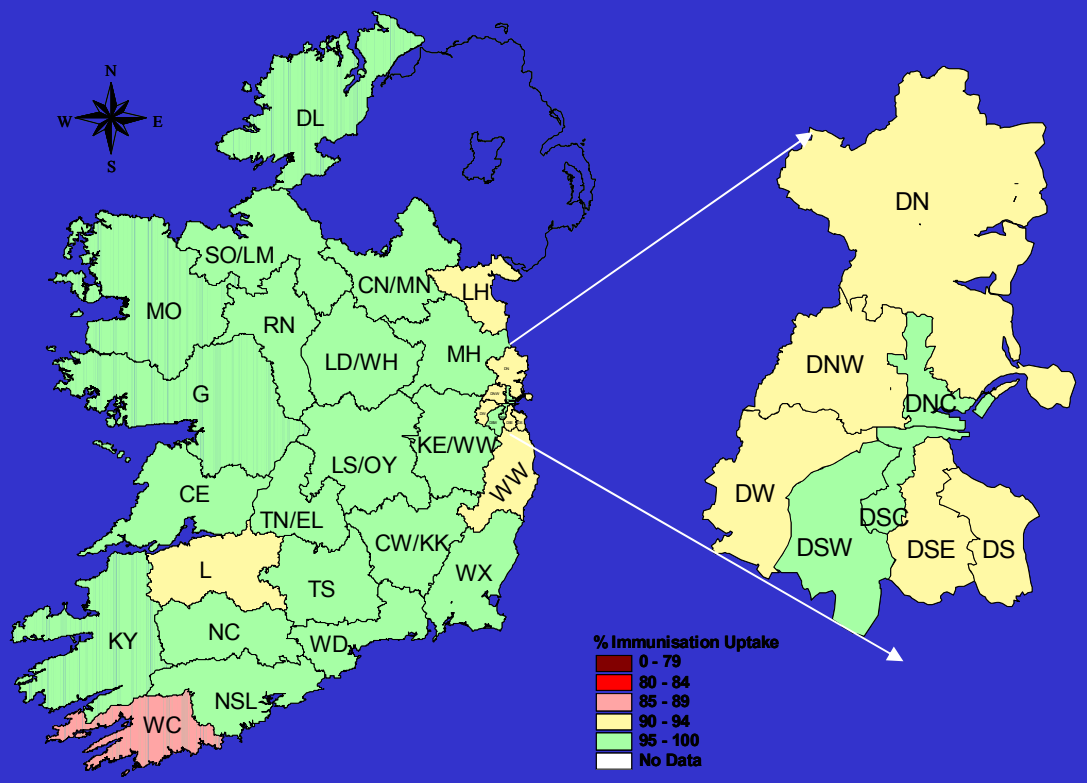
Quarterly immunisation uptake, 12 months of age, Q2 2000- Q3 2012



Source: HPSC

www.immunisation.ie

Quarter 3 2012 DTP 3 immunisation uptake rates (%) by LHO, in those 24 months of age in Ireland and Dublin
(source HPSC)



Source: HPSC

www.immunisation.ie

PROTECT HEALTH IMMUNISE

Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive

Vaccine recommendations

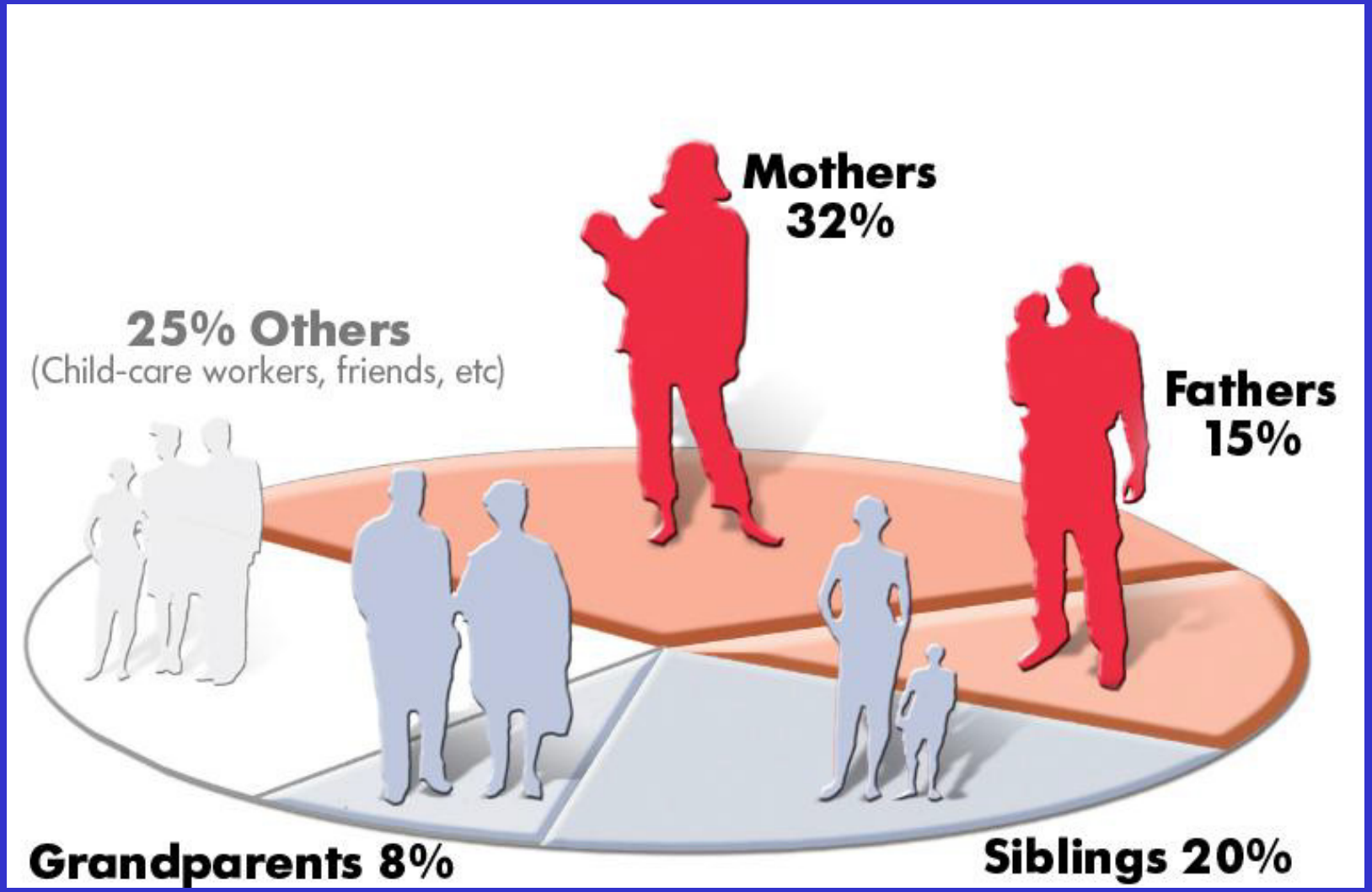
- Primary vaccination
  - at 2, 4 & 6 months
    - 6 in 1 (DTaP/IPV/Hib/HepB)
- Boosters
  - at 4-5 years
    - 4 in 1 (DTaP/IPV)
  - 11-14 years
    - Tdap

www.immunisation.ie

Vaccine recommendations

- **HCWs**
  - in contact with infants, pregnant women, immunocompromised
  - every 10 years
- **Pregnant women**
  - between 28-32 weeks gestation
  - can be given later or in 1st week post partum (may not be as effective)

Source of Pertussis Infection in Infants



www.immunisation.ie

Bisgard, K. *PIDJ.* 2004;23:985-9.

Pertussis vaccination

Cocooning

- for close contacts of infants born before 32 weeks gestation
  - age appropriate vaccinations
  - older adolescents and adults ideally 2 weeks before beginning contact with the infant
- consider for close contacts in community outbreaks, 2 weeks before contact

Pertussis vaccination

- **Adults**
  - from 20 years of age booster every 10 years **may be considered**
    (to decrease risk to self and infants)
- **Contacts of cases**
  - Vaccinate un- or under-vaccinated
  - Booster dose if no booster in last 10 years

*** No interval required between previous DT containing vaccine ***

Primary care advice

- Vaccinate
  - all children on time

  (especially from families who have just had or are expecting a new baby).
  - all general practice staff
  - pregnant women (Funding)
- Encourage other adults to have booster vaccinations
- Consider pertussis in patients with a suspicious persistent cough
- Advise pregnant women, mothers & young babies to avoid people with a cough until their child has had their 2nd dose of vaccine at 4 months of age

PROTECT HEALTH IMMUNISE

Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive

Guidelines Public Health Management of Pertussis August 2012

- Available on HPSC website
- Background information & evidence review
- Recommendations cases & contacts
  - When and what treatment, exclusion, infection control, vaccination
- Treat contacts only when
  - Onset of disease in index case within preceding 21 days
  - Vulnerable close contact present

http://www.hpsc.ie/hpsc/A-Z/VaccinePreventable/PertussisWhoopingCough/InformationforHealthcareWorkers/File,13577,en.pdf

Pertussis Vulnerable Contacts

- Newborn infants
  - born to mothers with suspected or confirmed pertussis, who are still infectious at delivery (i.e. within 21 days of onset or <5 days treatment)
- Infants
  - under one year who have received less than 3 doses of a pertussis containing vaccine
- Children
  - under ten years who are not age appropriately immunised
- Women
  - in the last month of pregnancy
- Adults
  - who work in a healthcare, social care* or childcare facility and have contact with vulnerable individuals
- Immunocompromised individuals
- Presence of other chronic illnesses which may predispose to more severe pertussis infection

Summary

- Recent increase in pertussis in Ireland and internationally
- All ages affected – severe illness infants too young to be fully protected
- Updated NIAC guidelines
- Importance of recommended vaccination at the recommended time
- Awareness of pertussis and need to keep young infants away from those with cough