Vaccines work - decrease in cases of Pertussis

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Background - pertussis (whooping cough)

- Vaccine preventable disease – notifiable in Ireland since 1948

- Highly infectious bacterial disease involving the respiratory tract - caused by *Bordetella pertussis*

- Initially, symptoms may resemble common cold. Within 2 weeks, severe cough may develop characterised by episodes of rapid coughing followed by high-pitch whoop

- Spreads through droplets or direct contact with discharges from the nose and throat of infected individuals
Public health implications

• Potential for interruption of transmission through outbreak control measures such as antibiotics for close contacts of cases and vaccination

• Occurs at any age – most cases in children < 5 years old

• < 6 month old infants particularly vulnerable to pertussis and its complications – these may include pneumonia, middle ear infection, seizures, encephalopathy, apnoeic episodes and death

• Importance of vaccine in pregnant mothers to protect young infants – recommended between 16-36 weeks in each pregnancy
Methodology

• Historic pertussis notification data 1948-1997: provided by the Department of Health

• Pertussis notification data 1998-2019 (week 21) extracted from the Computerised Infectious Disease Reporting System (CIDR) in May 2019

• Data analysis using Microsoft Excel

• 2018 and 2019 data are provisional

• International data from relevant internet sources
Annual pertussis notifications in Ireland, 1948-2018

Pertussis vaccine (wP) 1952/53

Loss of confidence in pertussis vaccine mid-1970s

DTwP replaced by DTaP, 1996

Adolescent Tdap 2011/12

Antenatal Tdap recommended 2012

Source: CIDR/DoH
Incidence of laboratory confirmed pertussis cases per 100,000 population, by age group in England: 1998-2018

Source: Public Health England
Pertussis notifications in Ireland by age group, 2008-2019*

*2019 data as of week 21

Source: CIDR, extracted 21.05.2019
Pertussis notifications in Ireland by age group, 2008-2019*

Based on 2019 data, suggestion of greater reduction in 0-5 mo age group compared to other age groups.

*2019 data as of week 21.

Source: CIDR, extracted 21.05.2019
Pertussis vaccination status of mother in infant pertussis notifications (aged 0-5 months), and antenatal vaccination policy changes, 2009-2019*

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<th>Not vaccinated</th>
<th>Unknown</th>
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</tbody>
</table>

Source: CIDR, extracted 21.05.2019

- NIAC recommend antenatal Tdap booster - Dec 2012
- HSE provide antenatal Tdap vaccine free of charge - Sep 2013
- Enhanced surveillance of maternal vaccine status in infant cases - 2014
- Antenatal Tdap vaccine administration free of charge, Nov 2018

6,997 pertussis vaccines paid through outbreak code from Nov 2018-Feb 2019

Source: PCRS

*2019 data as of week 21
Discussion

• In Ireland, incidence of pertussis has decreased substantially since the introduction of pertussis vaccines in the 1950s

• Upsurge occurred in 2012 – indicating waning immunity, particularly in older children and adults. Similar findings in other countries at this time

• Most pertussis notifications occur in infants, particularly those < 6 months of age – vulnerable age group

• A number of positive changes in vaccine policy in recent years to address this issue – the vaccine is now free for pregnant women yet uptake remains inadequate to effectively prevent morbidity and mortality in young infants

• Provisional 2019 data suggest a positive impact on pertussis in the 0-5 month age group
Conclusions

• Pertussis notifications have substantially reduced since pertussis vaccines were first introduced

• Despite the availability of a safe and effective vaccine pertussis continues to pose serious risk to infants, particularly those less than 6 months of age

• Need to continue to encourage and facilitate pregnant women to get the vaccine

• Consideration needs to be given to providing pertussis vaccine to pregnant women on an ongoing basis through a funded national programme so that uptake can be sustained into the future
Acknowledgements

- Departments of Public Health
- Obstetricians/Midwives/Paediatricians/GPs
- Laboratories
- National Immunisation Office/immunisation teams
- Department of Health
- HPSC Vaccine Preventable Diseases team/staff
References

• HPSC. Pertussis (whooping cough) - Frequently Asked Questions. 2016
  https://www.hpsc.ie/a-z/vaccinepreventable/pertussiswhoopingcough/factsheets/pertussiswhoopingcoughfrequentlyaskedquestions/#d.en.1681

• ECDC. Disease factsheet about pertussis.


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