

# ***Pertussis Outbreak Co Leitrim 2010***



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# Pertussis Outbreak in Co. Leitrim 2010

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- In April 2010, a GP in Co Leitrim phoned the Public Health Department to say that he had been seeing a lot of pertussis-like illnesses in recent weeks
- One case was confirmed as pertussis on serology
- OCT established : Public Health, HPSC and Microbiology Lab in Crumlin Children's Hospital
- Guidelines:
  - Immunisation Guidelines for Ireland
  - CDC Guidelines
- Local GPs were asked to:
  - Vaccinate children who are not up-to-date
  - Low threshold of suspicion for diagnosis of pertussis
  - Treat with macrolide and consider prophylaxis in vulnerable household contacts
  - Send a swab/blood sample and notify Public Health

# Pertussis Epidemiology

- Whooping cough affects 16 million people worldwide each year and results in ~195,000 deaths (WHO)
- 104 cases were notified in Ireland in 2008
- Case-fatality rate ~1/1000 in developed countries
- The incidence in adolescents and adults is increasing due to waning immunity and a reduction in natural boosting
- Most infectious during the catarrhal stage and the first two weeks after cough onset
- Secondary attack rates of 80-90% in non-immune household contacts



The “one hundred day cough”: 30% of adults with cough >2 weeks may have pertussis (Immunisation Guidelines)

# Epidemiological Investigation: Case Definition

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**Clinical description:** clinical picture compatible with pertussis i.e. a cough lasting at least 2 weeks with one of the following:

- paroxysms of coughing,
- inspiratory “whoop”, or
- post-tussive vomiting

## **Laboratory criteria for diagnosis**

- Serology, PCR, culture

## **Case classification**

- Possible: A case that meets the clinical case definition
- Probable: A case that meets the clinical case definition and has an epidemiological link
- Confirmed: A case that is laboratory confirmed

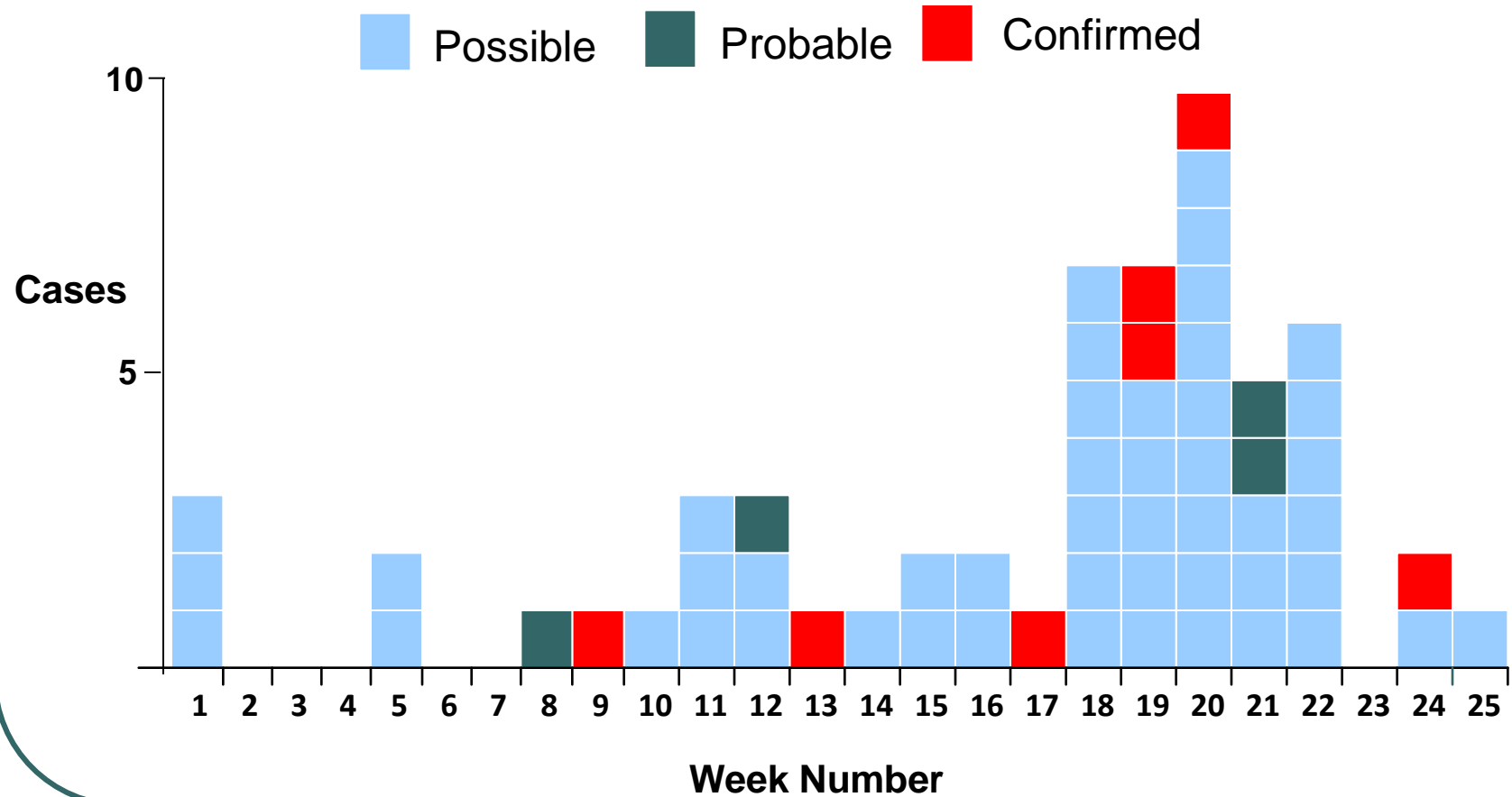
**Outbreak definition:** “any person of any age who had been diagnosed with pertussis (possible/probable/confirmed) from January 2010 forward; and who had an epidemiological link with Ballinamore or with the immediately neighbouring areas”

# Epidemiological Investigation

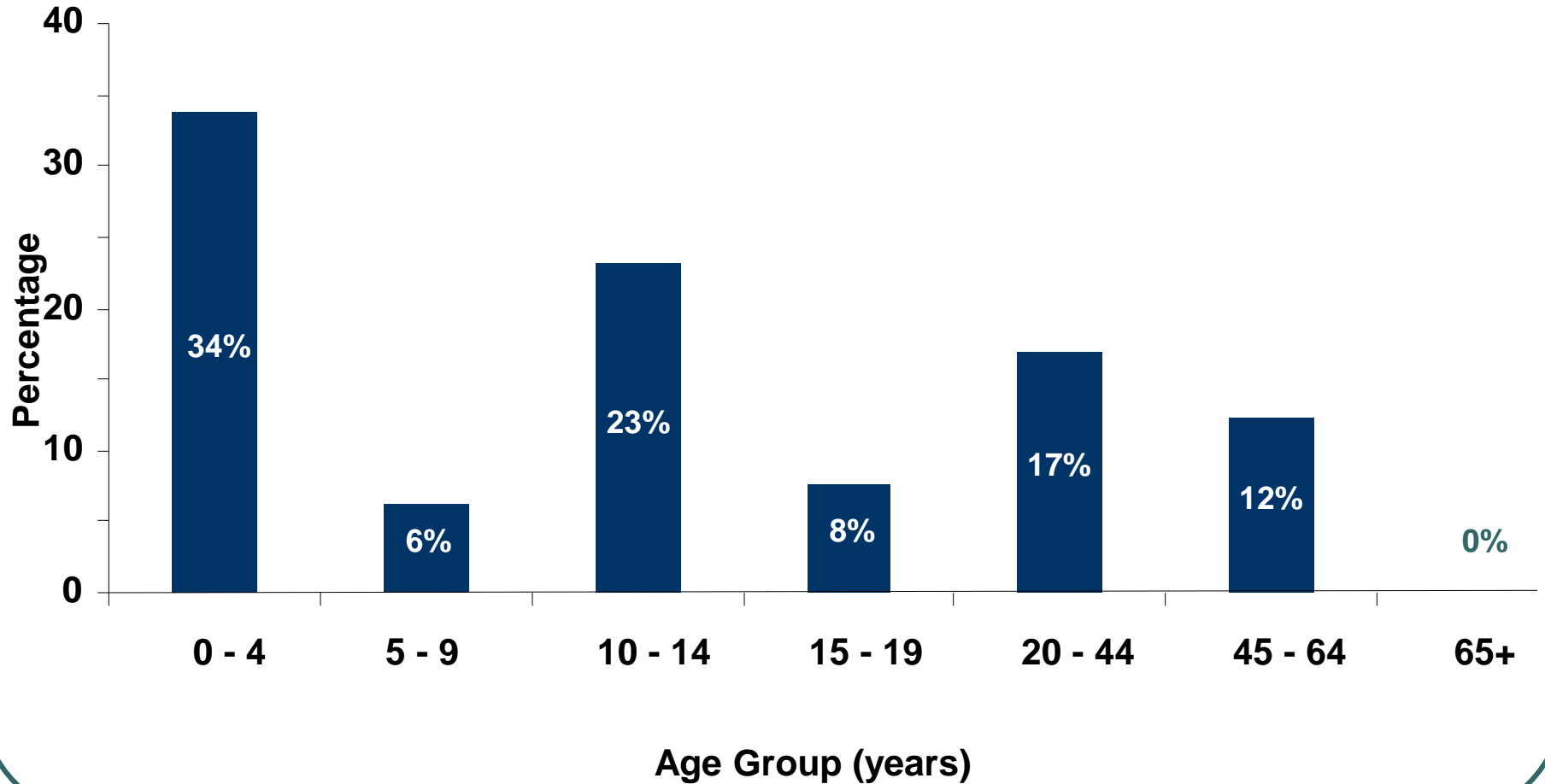
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- Case finding
  - Local GPs were asked to notify retrospectively
  - Local hospital informed (paediatrics, maternity, emergency dept, ante-natal clinics)
  - Public Health in neighbouring areas informed
  - Schools and creches were advised
- Data gathering
  - Cases were interviewed using a modified pilot enhanced surveillance form from the HPSC
  - Vaccination records were obtained from LHO

# Epidemic Curve (n=60)

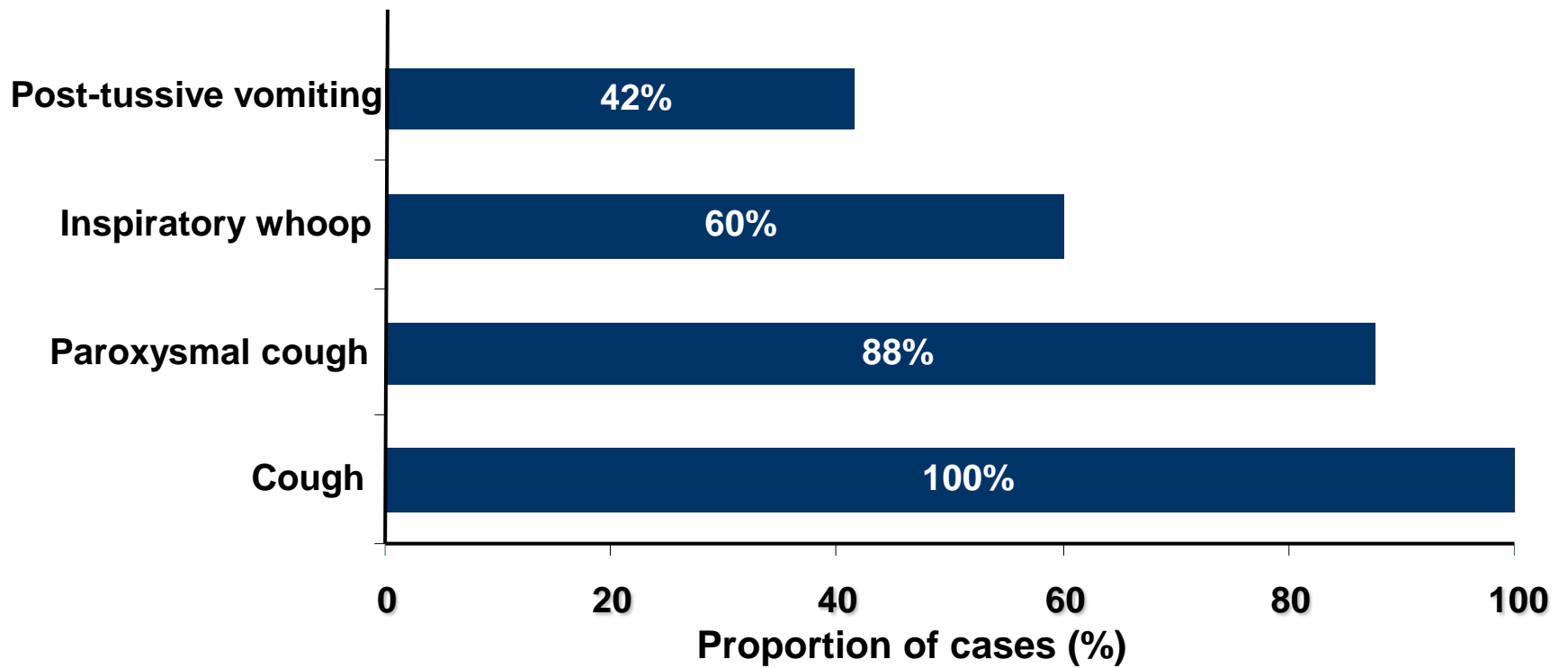


# Age Distribution (n=65)

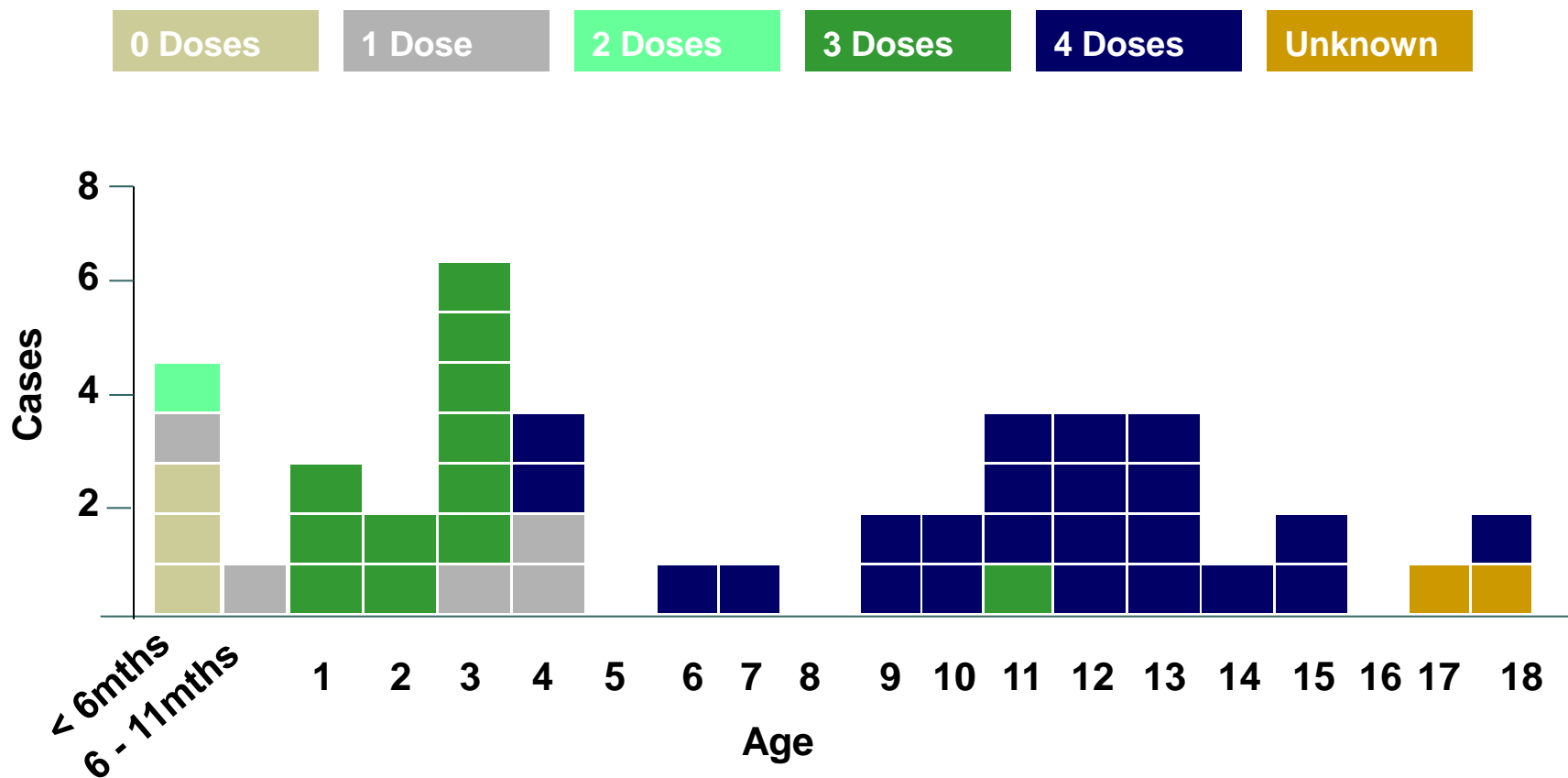


# Symptoms (n=65)

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# Distribution of Cases Under 18 years by Vaccination Status (n=46)



# Laboratory Investigations

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	<b>Culture</b>	<b>PCR</b>	<b>Serology</b>
<b>Positive</b>	1	0	6
<b>Negative</b>	8	4	10
<b>Total Tests</b>	9	4	16
<b>% Positive</b>	<b>11%</b>	<b>0%</b>	<b>38%</b>

# Limitations of Epidemiological Investigation

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- Delay in identifying outbreak
- Clinically under-diagnosed- anecdotal evidence
- Limited laboratory confirmation- particular difficulty with naso-pharyngeal swabs:
  - Swabs must be taken early in the illness
  - Swabs not usually kept in GP surgery
  - Difficult and uncomfortable to take
  - Swabs must be in the lab within 24 hours
- It is likely that another organism was also circulating in the population

# Hypothesis

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- Waning immunity
  - 4-12 years post vaccination (Wendelboe)
  - Paradoxical effect of high vaccine uptake
- Other factors that have been implicated in outbreaks in other countries:
  - Changes in the organism
    - Serotype is awaited
  - Vaccination programme delivery
    - Vaccination uptake rates – high in NW
    - Cold chain failure – unlikely in this outbreak

# Implications for the Vaccination Policy

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- A booster at 11-14 years has been recommended by NIAC, but has not been implemented yet
- Some countries schedule a booster in second year of life instead
- Considerations:
  - Why did this outbreak occur at this time, in these persons and in this place?
  - What would have prevented this outbreak from occurring?
  - How best to protect those who are most at risk?
  - What impact would other measures have?

# Acknowledgements

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  - Public Health Department HSE-NW: Dr Anthony Breslin; Louise Cullen; Amanda Murray; Dr Peter Wright
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