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England

Epidemiology and Control of Pertussis in England: Impact of Maternal Immunisation

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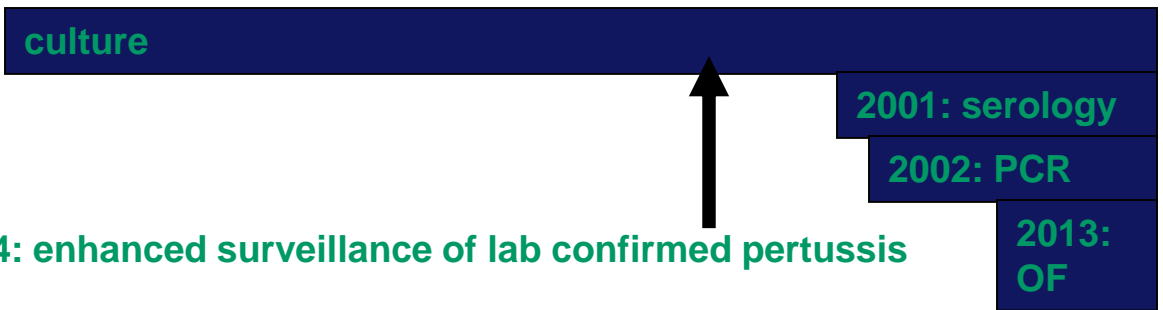
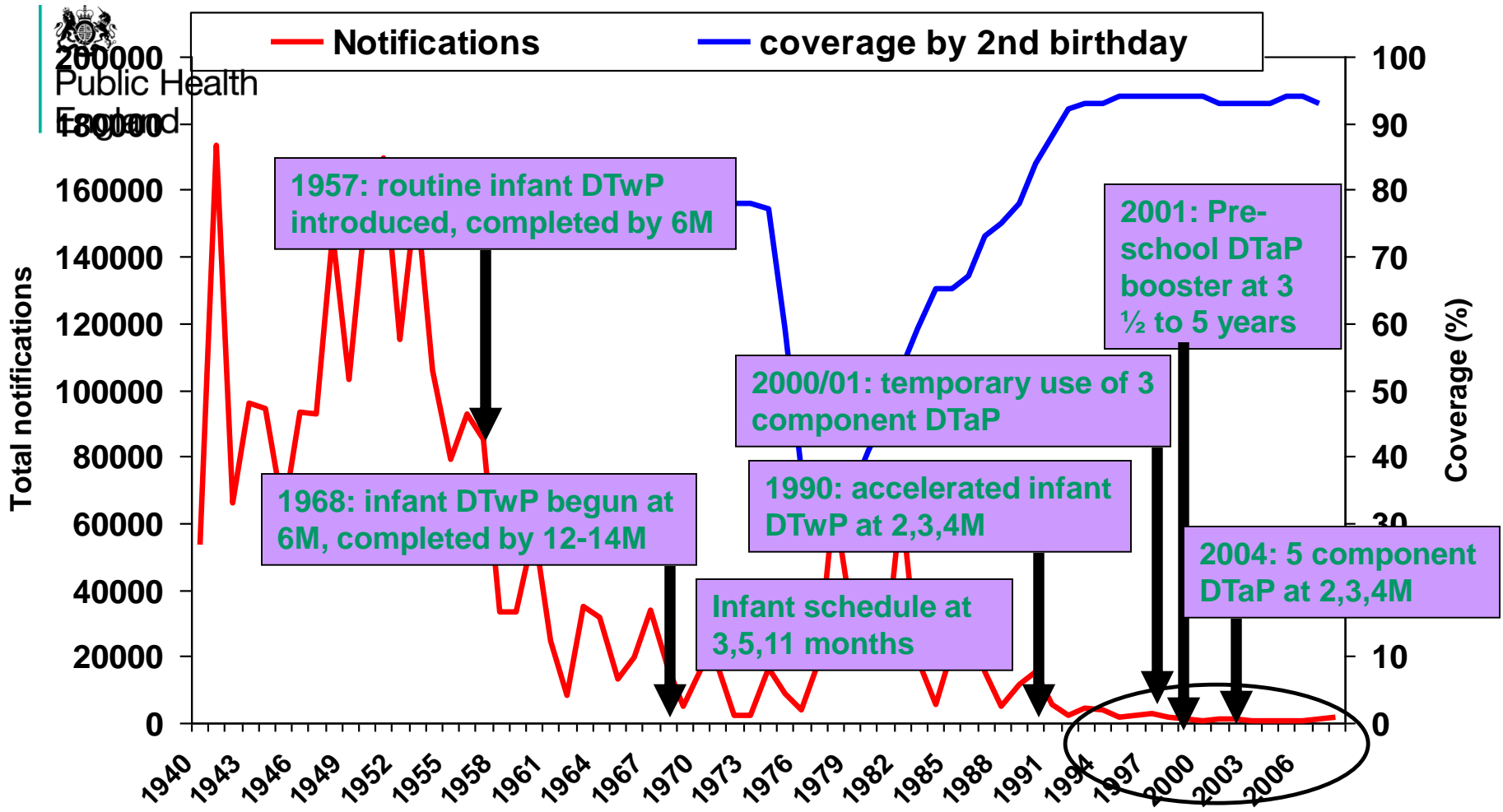
12th November 2015





Session Outline

- Pertussis immunisation programme in England
- Recent epidemiology
- Evaluation of pertussis vaccination programme for pregnant women
 - *Vaccine Coverage*
 - *Vaccine Effectiveness*
 - *Programme Impact*
 - *Impact of passive antibodies on infant immune response*



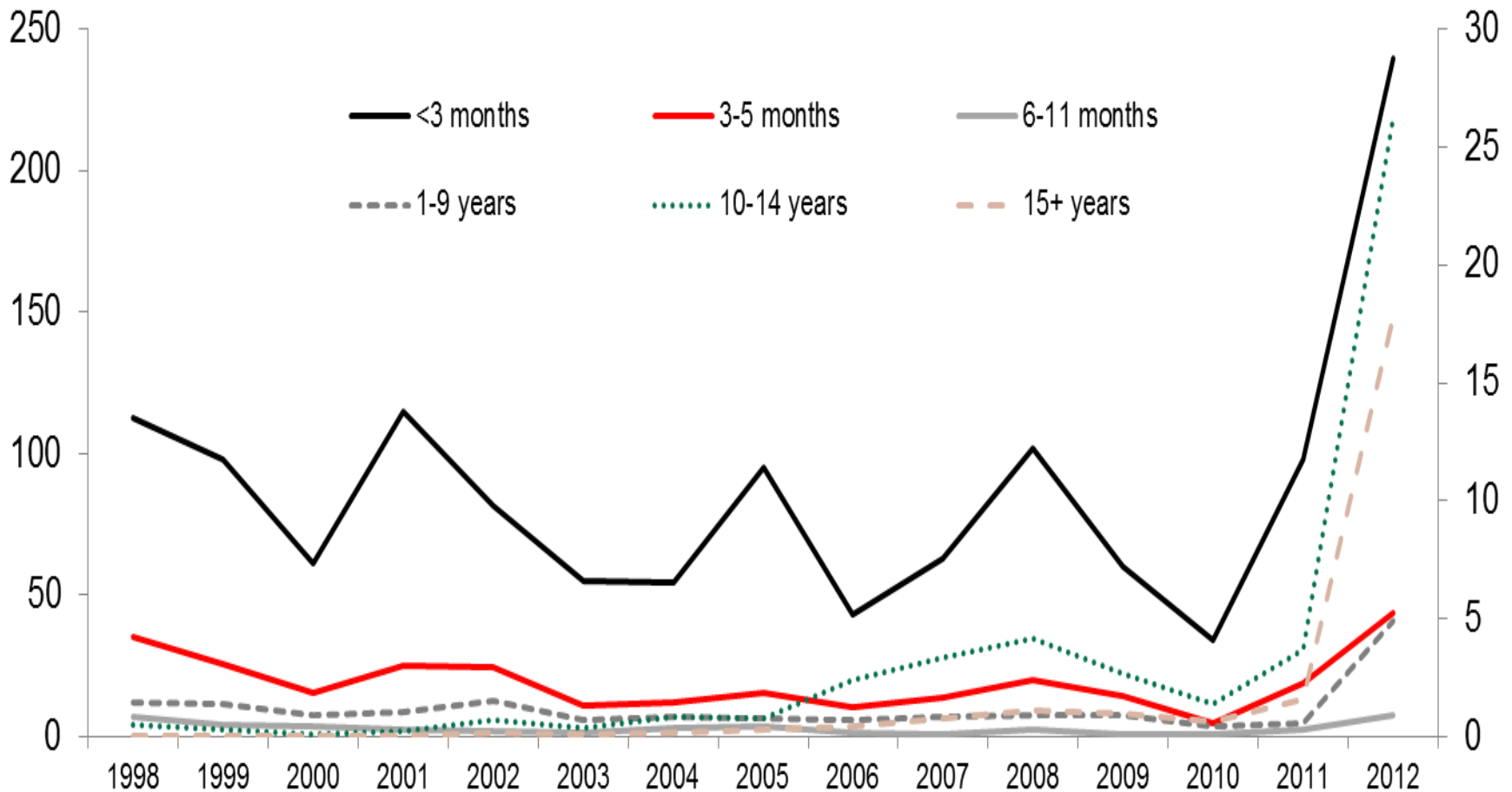


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Annual age specific pertussis incidence rates, England, 1998-2012

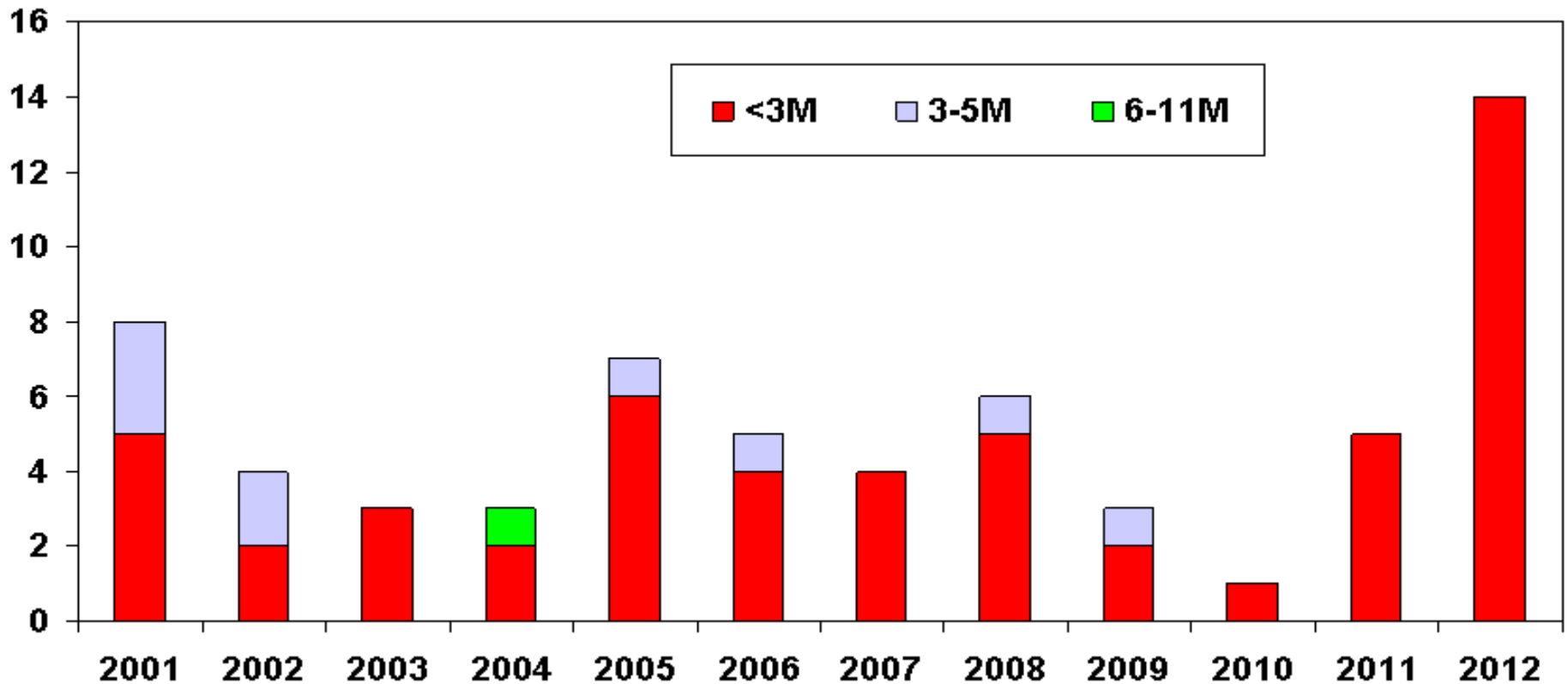
Incidence per 100,000 (<1
year age groups)

Incidence per 100,000
(≥ 1 year age groups)





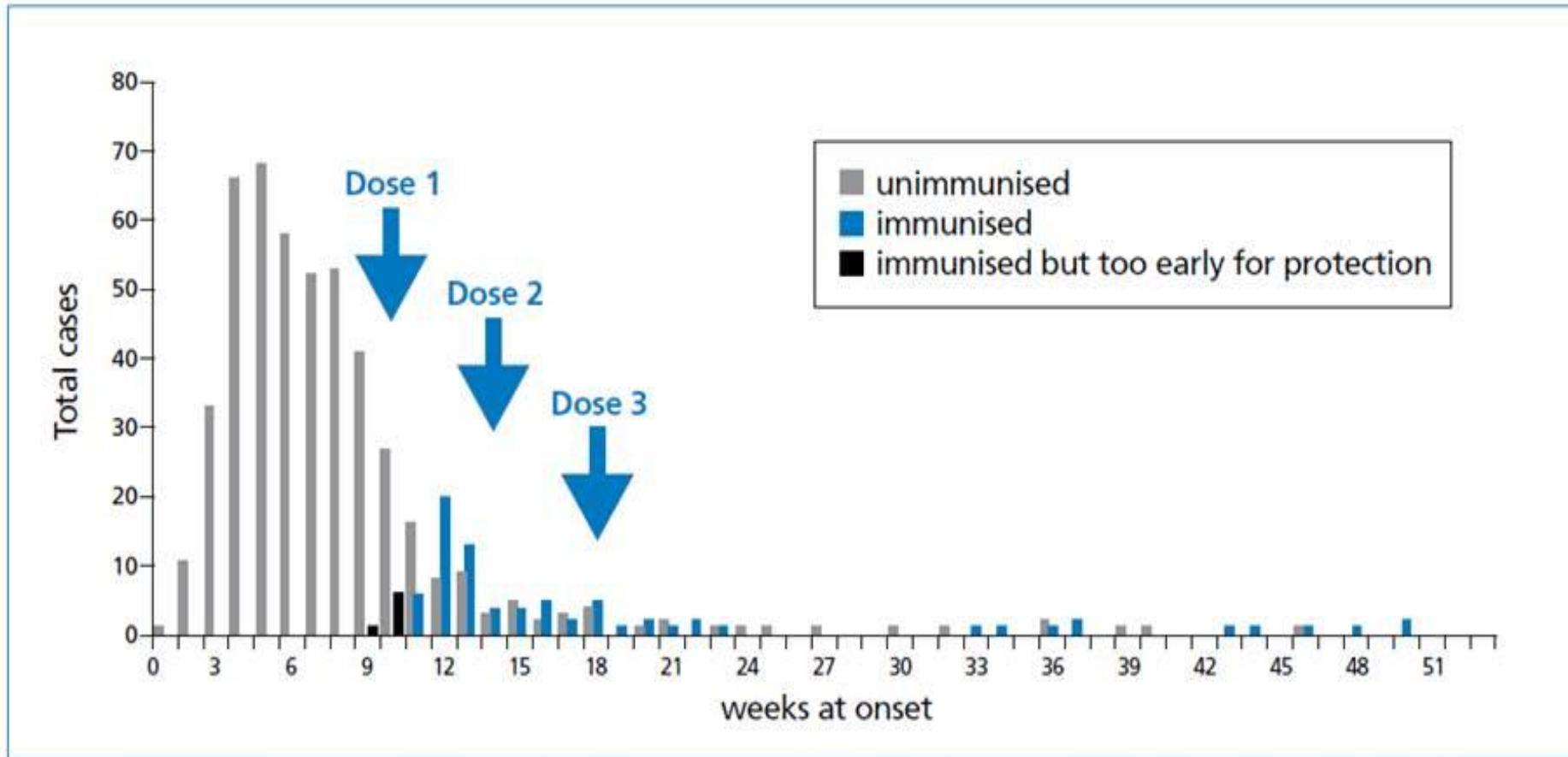
Number of deaths from whooping cough in infants, England, 2001-2012



Sources: lab confirmed cases, certified deaths, Hospital episode statistics, GP registration details



Onset age of laboratory confirmed pertussis cases in infants



Confirmed cases in infants aged under one year, by week of age at onset (2011- August 2012). Protection is assumed to accrue within the two weeks following immunisation.



Pertussis Immunisation in Pregnancy

Recommendation: From 1st October 2012

- Offer a single dose of Repevax® (dTaP₅/IPV) ideally between 28-32 weeks pregnancy, up to 38 weeks
- Offer in every pregnancy
- Outbreak response measure
- Since July 2014, programme using Boostrix-IPV® (dTaP₃/IPV)





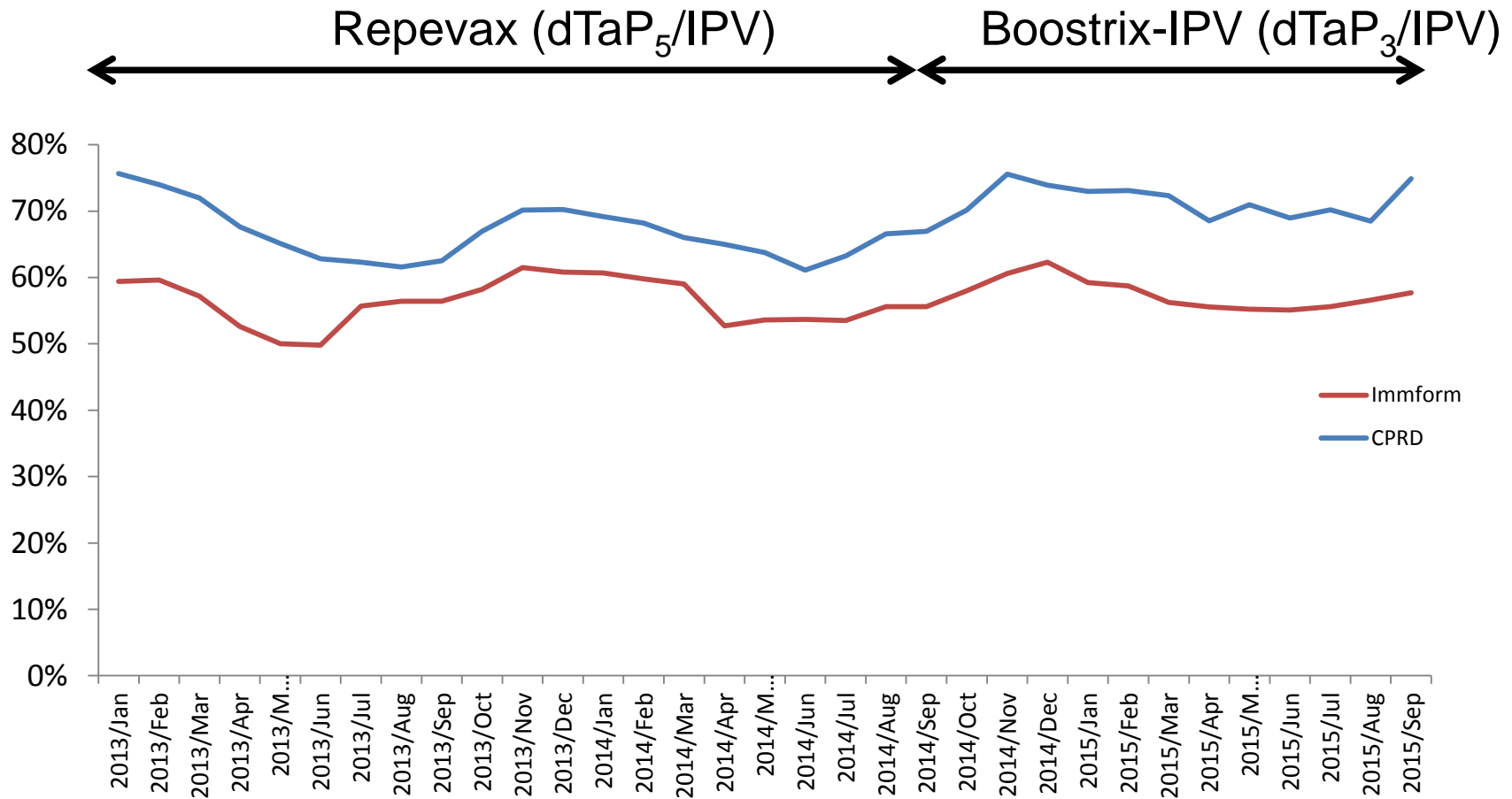
Evaluation of pregnancy vaccination programme

- Vaccine coverage
- Vaccine effectiveness
- Programme impact
- Impact of passive antibodies on infant immune response



Vaccine Coverage

January 2013- September 2015





Evaluation of pregnancy vaccination programme

- Vaccine coverage
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Pertussis programme effectiveness measured by two methods

(1) Amirthalingam G et al. Lancet 2014

(2) Dabrera G et al. Clinical Infectious Diseases 2014

Analysis <2M age	Cases vaccinated / total	Matched / control coverage	Adjusted VE (95% CI)
Screening method (1)	11/81 (15%)	61%	90% (82% to 95%)
Case-control study (2)	10/58 (17%)	39/55 (71%)	93% (81% to 97%)

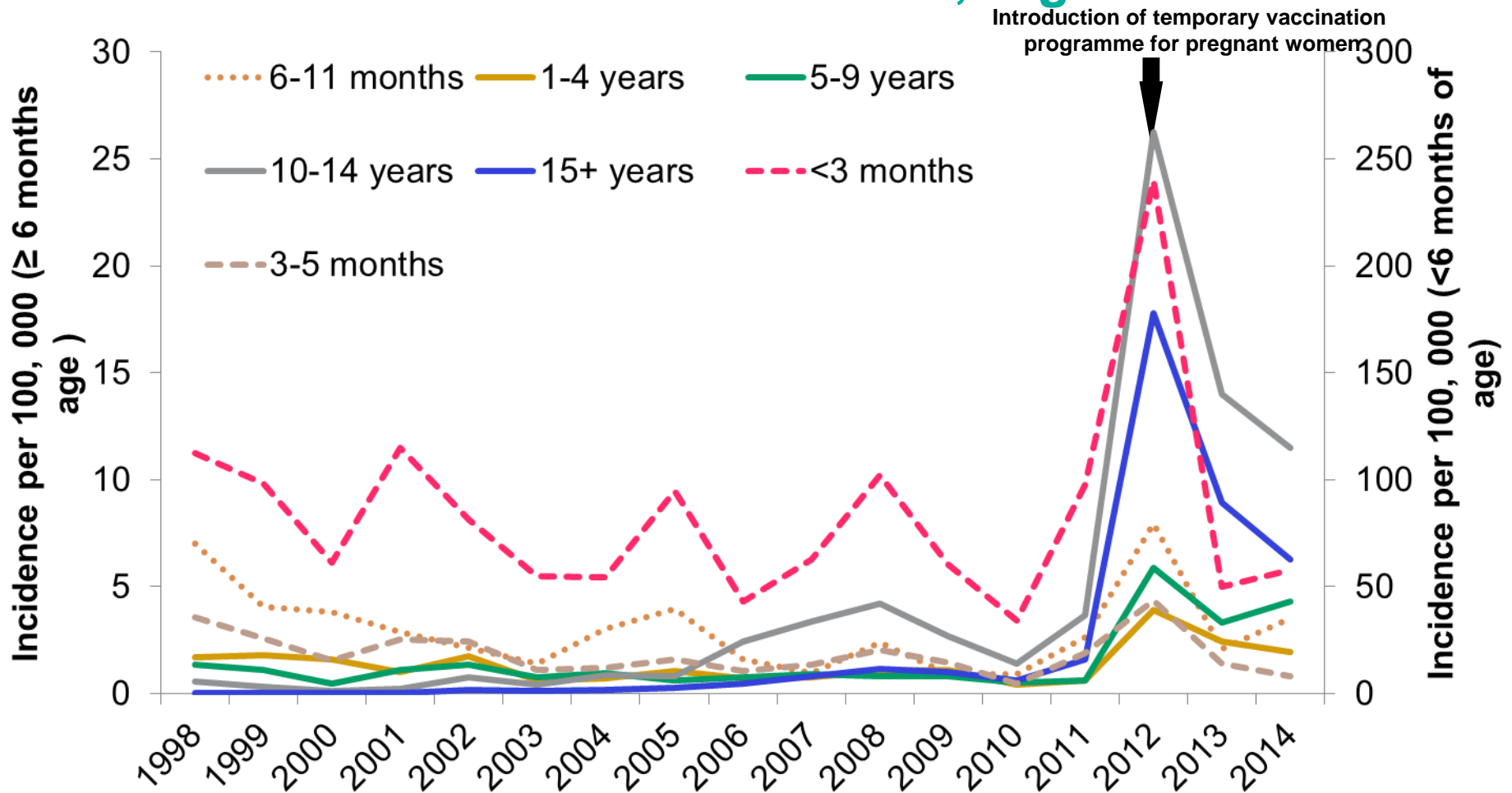


Evaluation of pregnancy vaccination programme

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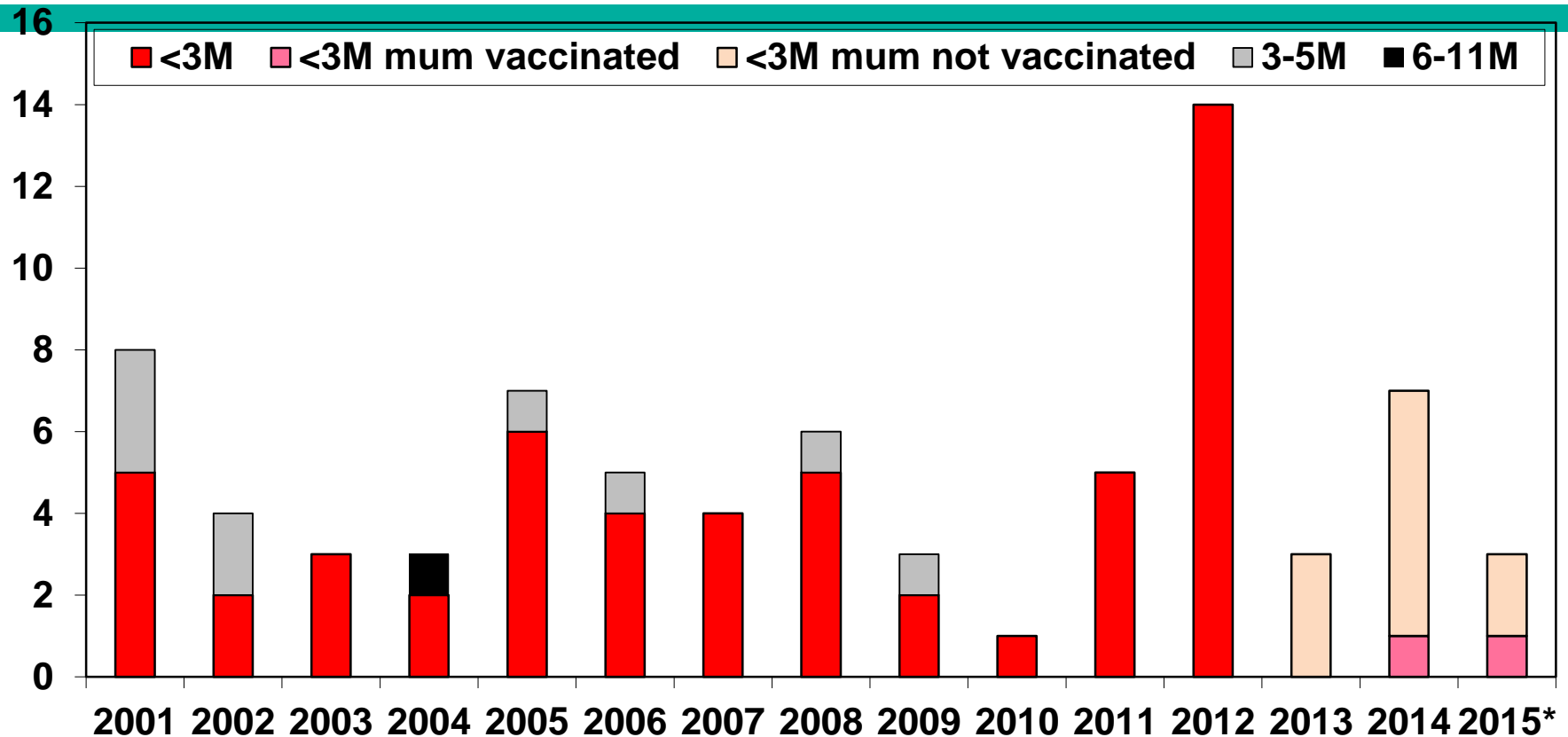


Annual age specific laboratory confirmed pertussis incidence rates, 1998 – 2014, England





Reconciled deaths from pertussis in infants, England



Sources: lab confirmed cases, certified deaths, Hospital episode statistics, GP registration details, HPZone

*reported by 21/9/2015



Summary

- Pertussis remains the most common vaccine preventable disease in <1s in England
- Current outbreak highlights burden of infant disease prior to routine vaccination
- Evaluation of the pregnancy vaccination programme in England is encouraging
 - *Vaccine programme well received*
 - *High vaccine coverage*
 - *Programme impact – cases in infants <3 months have been held at low levels since introduction of programme; activity in older age groups remains high*
 - *Vaccine effectiveness – calculated to be high & provide first evidence of protection against disease*
 - *Programme evaluation with respect to blunting is ongoing*



Key Questions

1. How do we improve maternal vaccine coverage and ensure vaccines are delivered at the optimal stage in pregnancy?
2. Should the programme for pregnant women in England become routine?

Introduced without CEA as a temporary outbreak control measure.

- a. If it is to be continued as a routine vaccination then must be shown to be cost effective*
- b. If not, under what circumstances can the programme be stopped?*

3. Should the vaccine continue to be offered in every pregnancy?
4. Are there any differences in the potential blunting of the infant immune response between the two currently available vaccines?



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