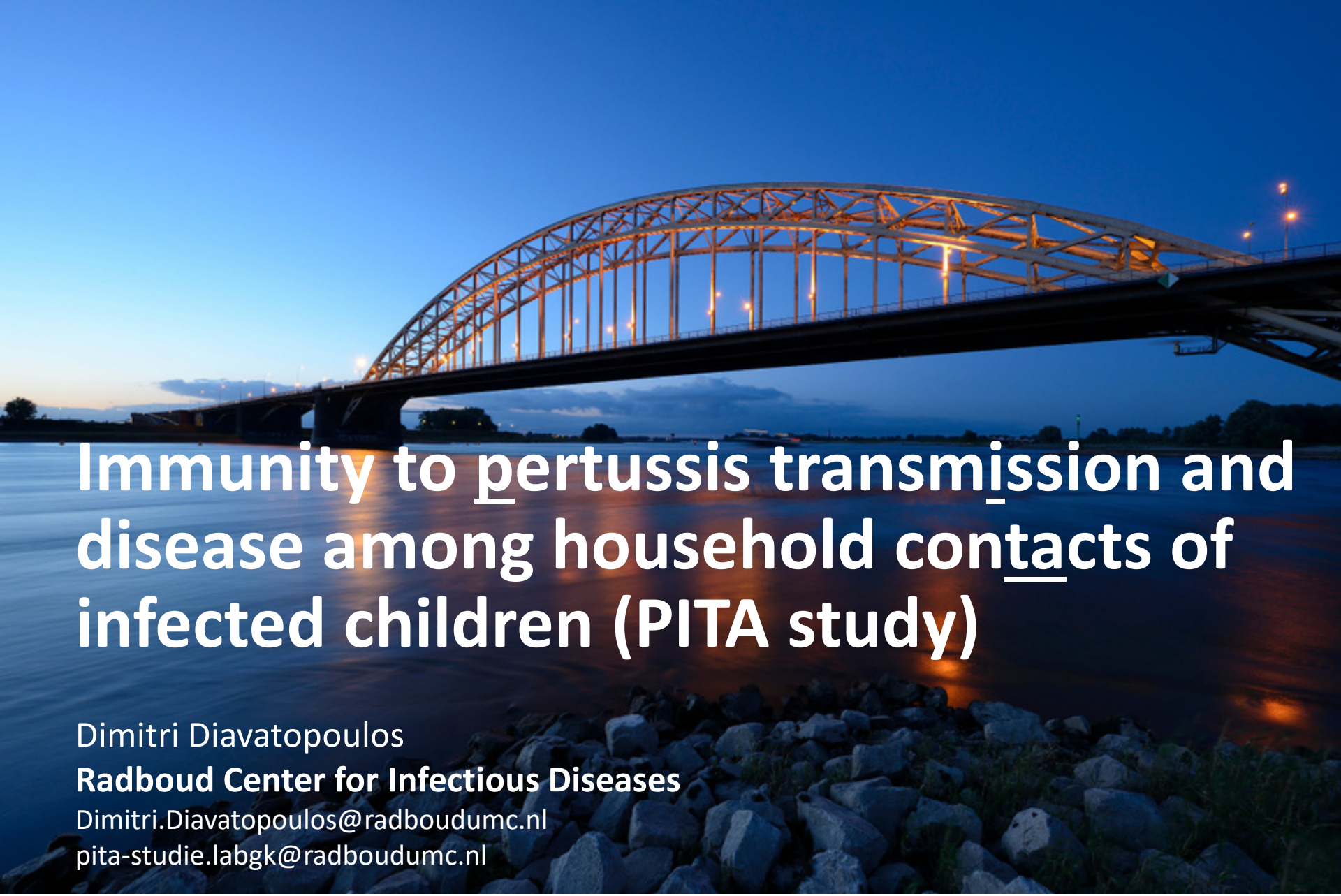

Immunity to pertussis transmission and disease among household contacts of infected children (PITA study)

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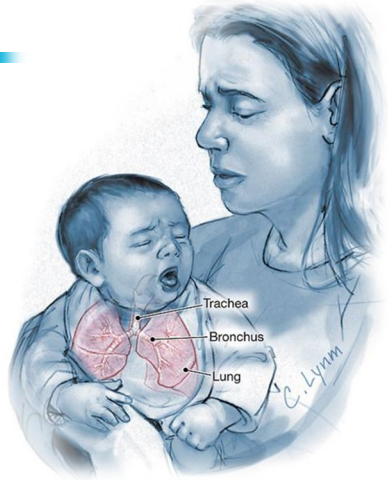
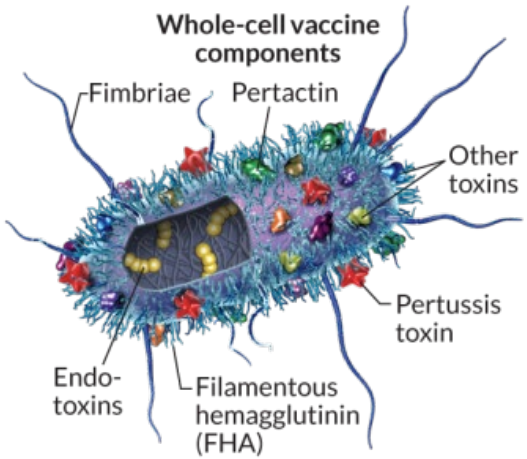
Pertussis

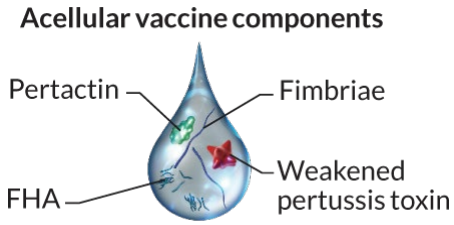
- *Bordetella pertussis*
- Uncontrollable coughing
- $R_0 \approx 10\text{-}17$
- Vaccine-preventable



jamanetwork.com

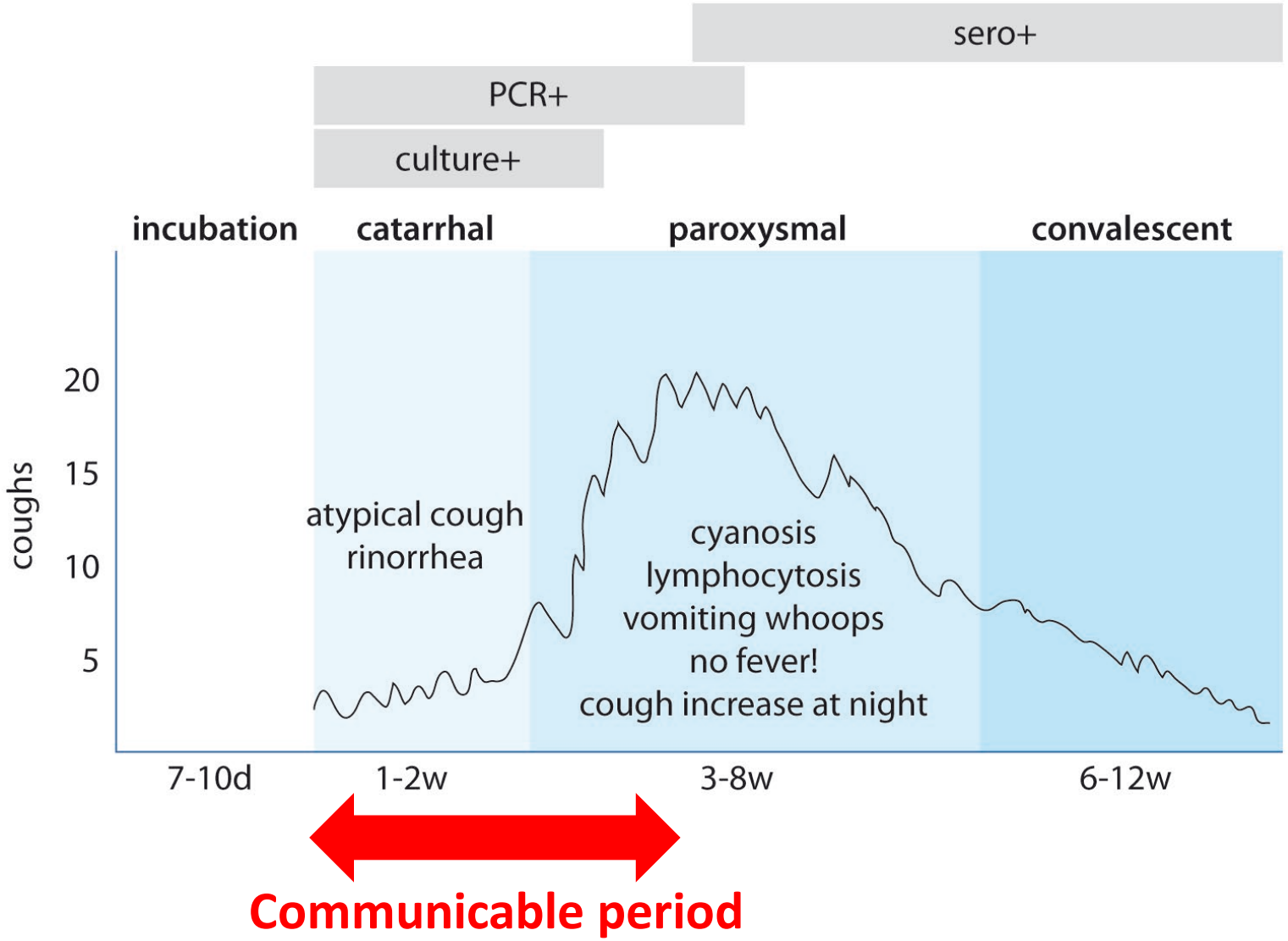


1957



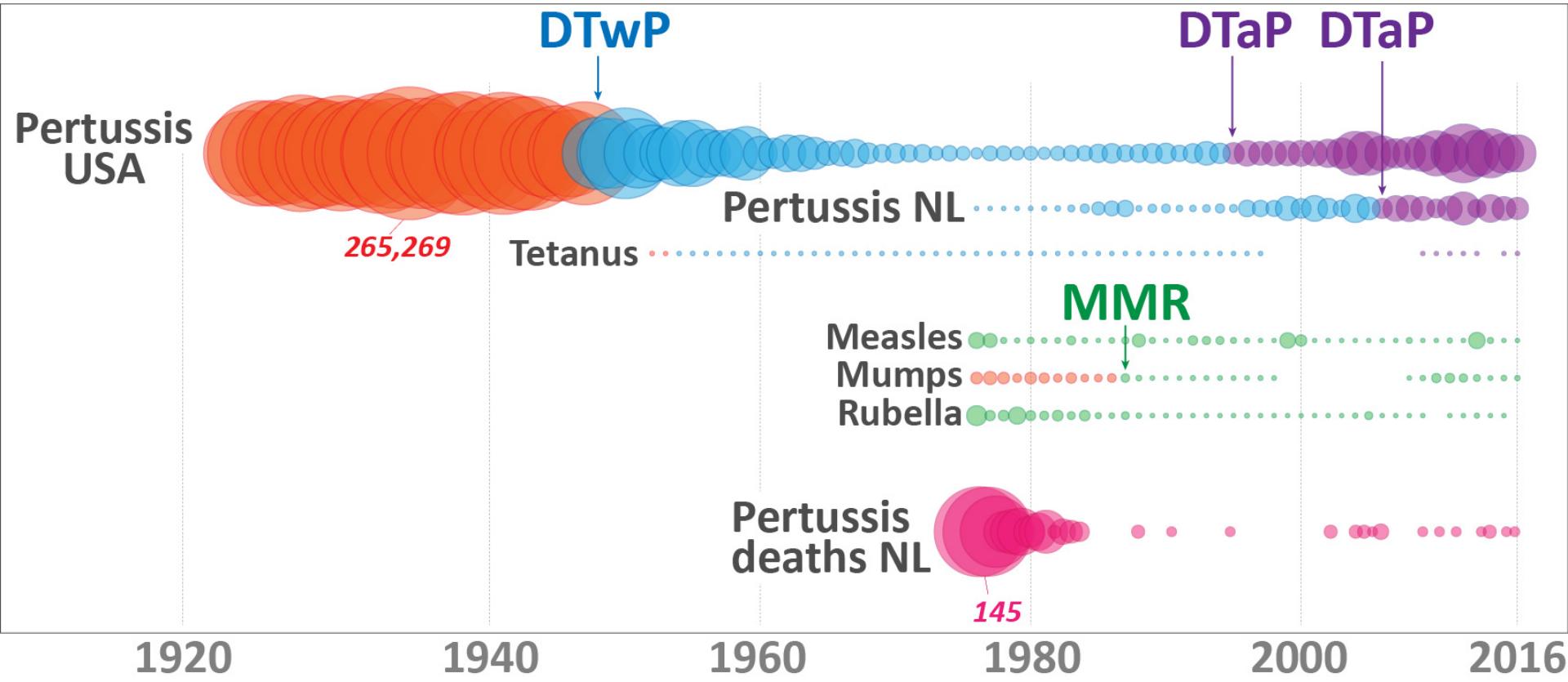
2005

Classical pertussis



Adapted from Von Konig (2013) Bordetella symposium, Dublin & www.cdc.gov

Vaccination history

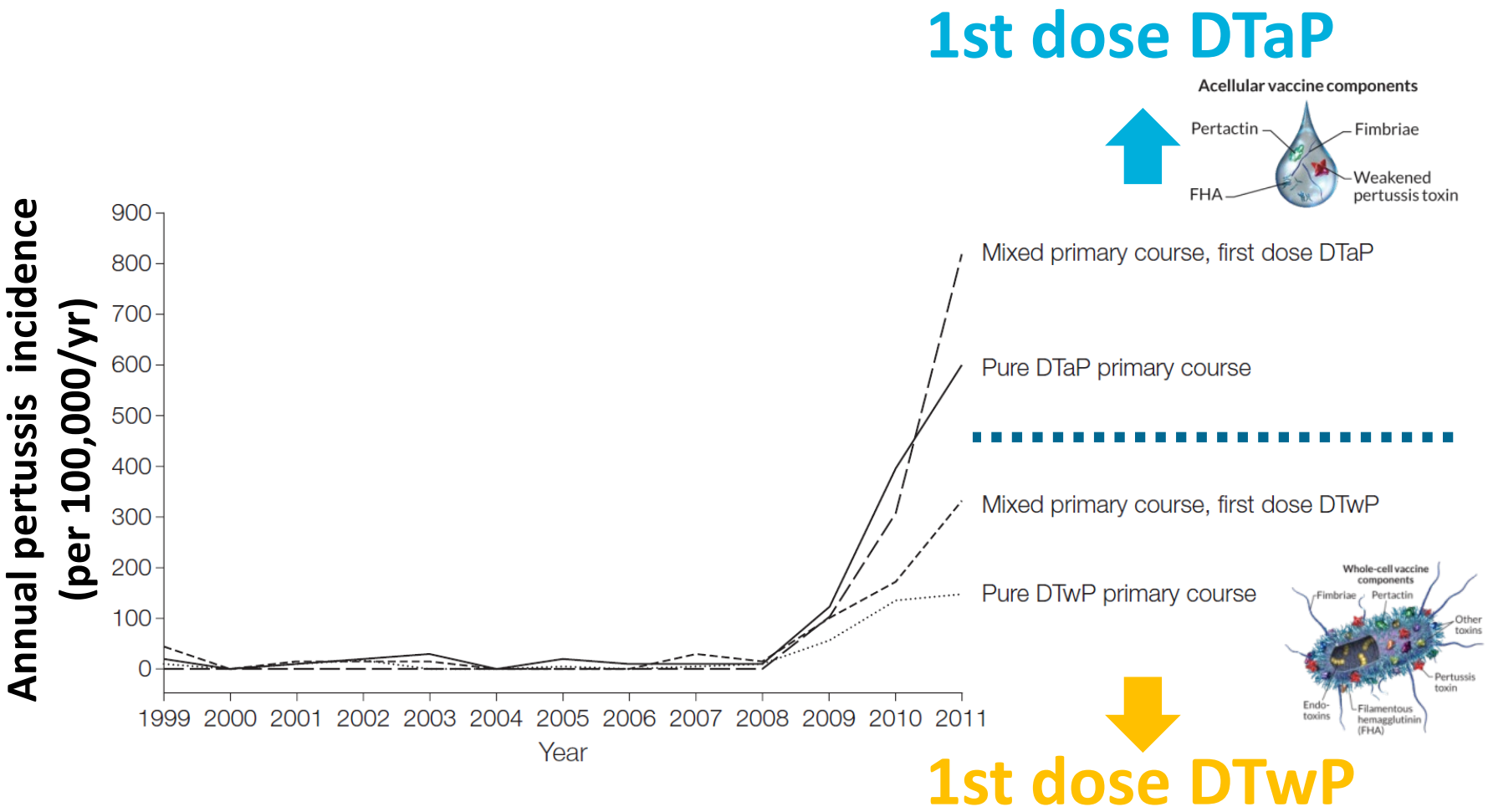


Adapted from www.cdc.gov & www.volksgezondheidenzorg.info/onderwerp/ziekten-het-rijksvaccinatieprogramma/

Explanations for the resurgence

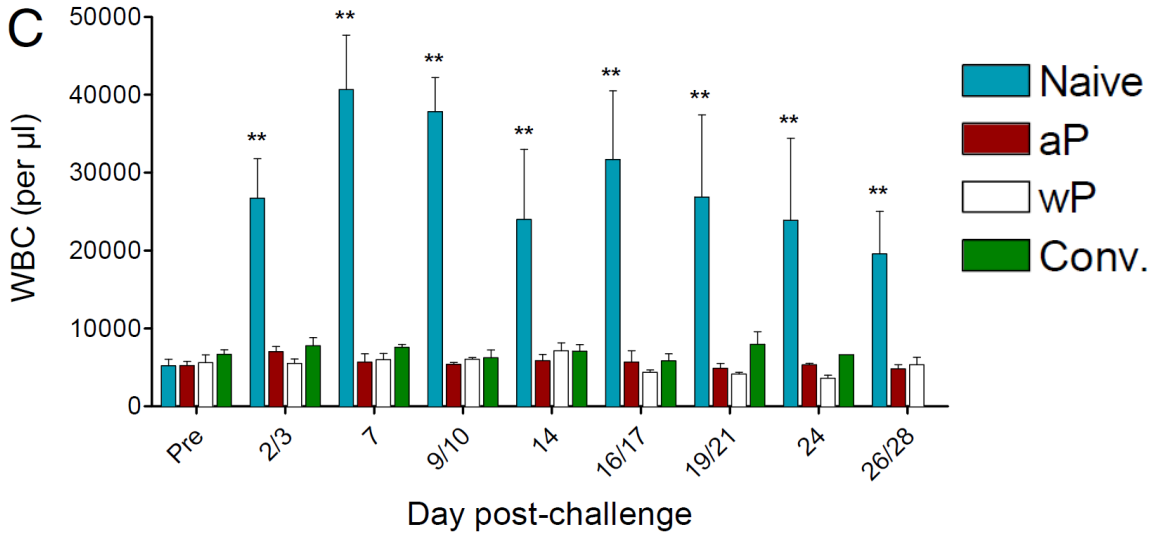
1. Improved awareness and molecular diagnostics
2. Pathogen adaptation
3. End-of-honeymoon
4. Switch to acellular vaccines
   a) Herd immunity – asymptomatic transmission
   b) Duration of protection

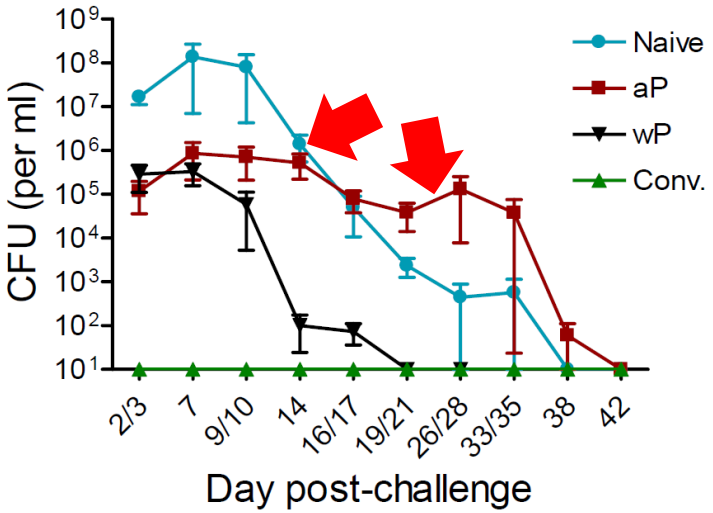
Impact of priming



JAMA **308**:5 (2012)
NEJM **368**, 581-582 (2013)

Effects of priming on disease & colonisation

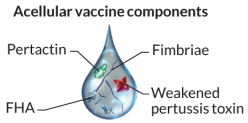


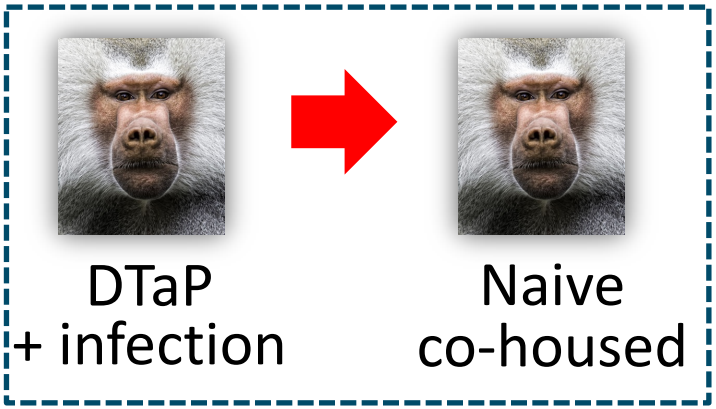


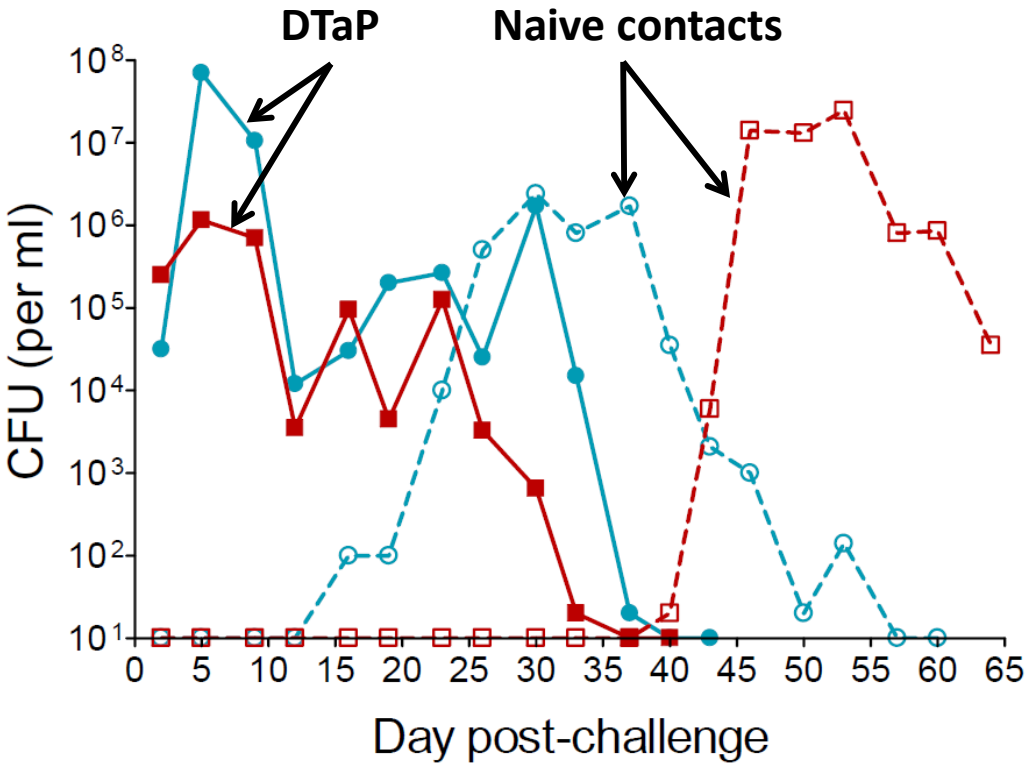
➡ Asymptomatic infection

PNAS. 2014 Jan 14;111(2):787-92

Transmission of pertussis







PNAS. 2014 Jan 14;111(2):787-92

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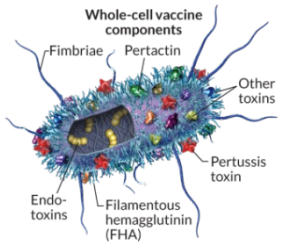
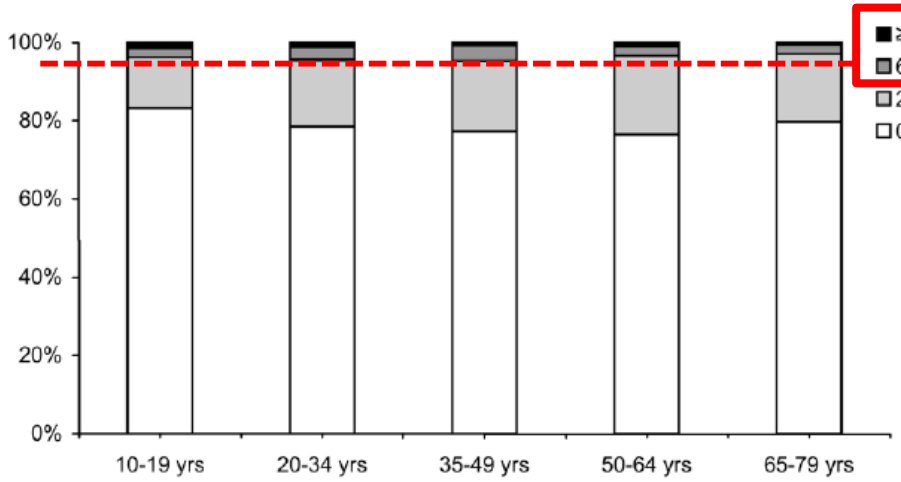
Increased circulation in the Netherlands

NL:

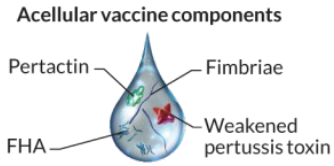
1995-1996

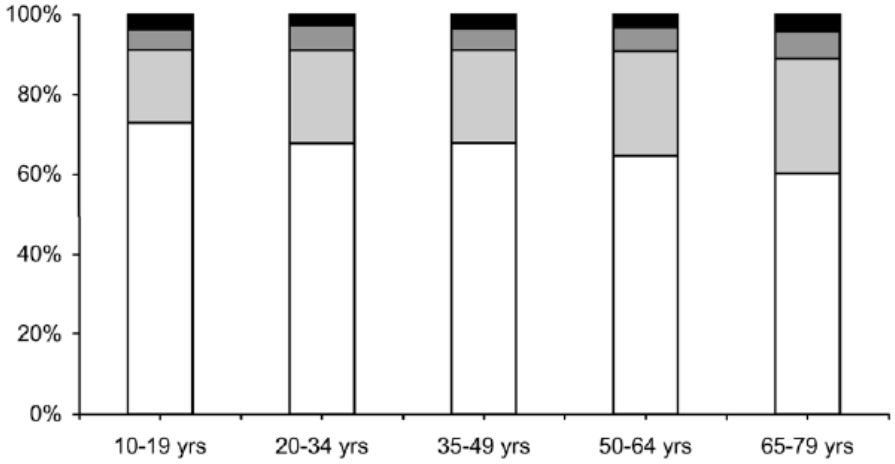




PT-IgG >62.5 & >1y since last vax indicates recent infection

2006-2007





9% of >9y exposed/infected each year!

de Greeff SC *et al*. PLoS One. 2010 Dec 1;5(12):e14183

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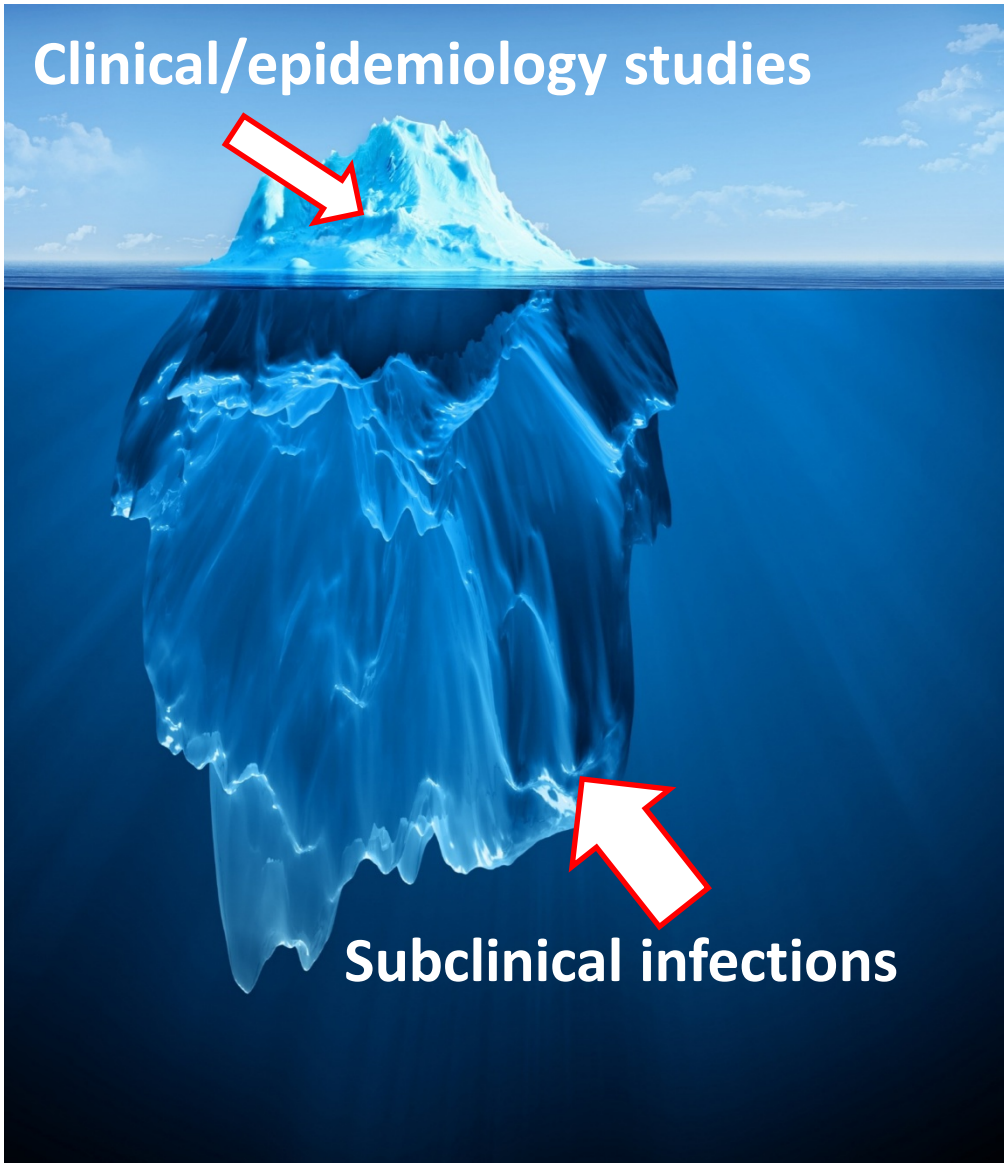
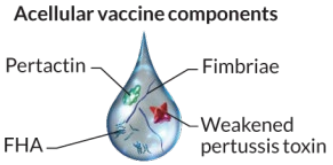
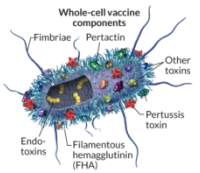
Correlates of protection?



Disease: lungs

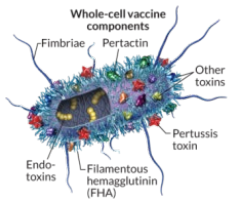
Mechanisms of protection





Colonization/ transmission

Mechanisms of protection?



www.periscope-project.eu

What is the PERISCOPE consortium ?

Public Partners (20)

RUMC (C)	UNIBAS
UOXF	UB
PHE	LUMC
TCD	USAL
UTU	ULB
CEA	CHUV
ICL	US
RIVM	QB
IMIC	MRC
	EURICE

EFPIA Partners (2)

Sanofi-Pasteur
GlaxoSmithKline

FINANCING

BMGF	€ 7M
EFPIA in-kind	€ 7M
IMI	€ 14M
Total	€ 28M

Strategic objectives

01 Foster expertise and increase capacity in Europe to evaluate new pertussis vaccines in (pre)clinical models

02 Identify (early) biomarkers of long-lasting protective immunity to pertussis in humans. This will accelerate and de-risk clinical development of next generation pertussis vaccines

03 Investigate the impact of maternal vaccination on the infant response to pertussis vaccination

Start: March '16
Duration: 60m

Transmission in humans

- Pertussis is very infectious in close settings like families and in schools

- Infection rate in families: **>80%**
  - **46%** of infected family members (vaccinated during childhood) **remain asymptomatic**
  - Attack rates highest in mothers and sibling 9-13y old

PITA study

Objective

To study the **spread of *B. pertussis*** and the **development of symptoms** in relation to **immunological biomarkers** in a family setting with high potential exposure to *B. pertussis*.

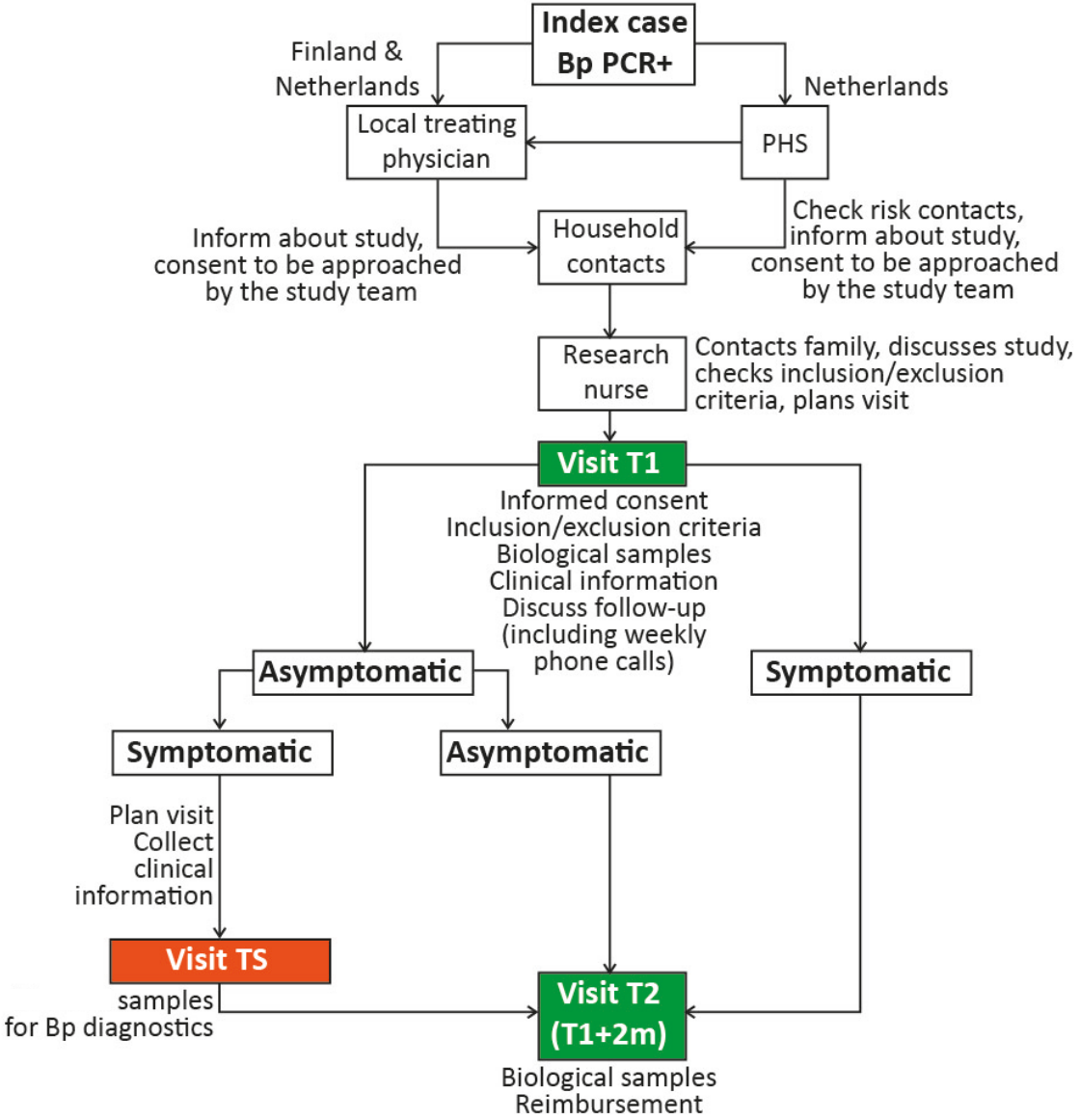
Study design

Household contact study in Finland and in the Netherlands

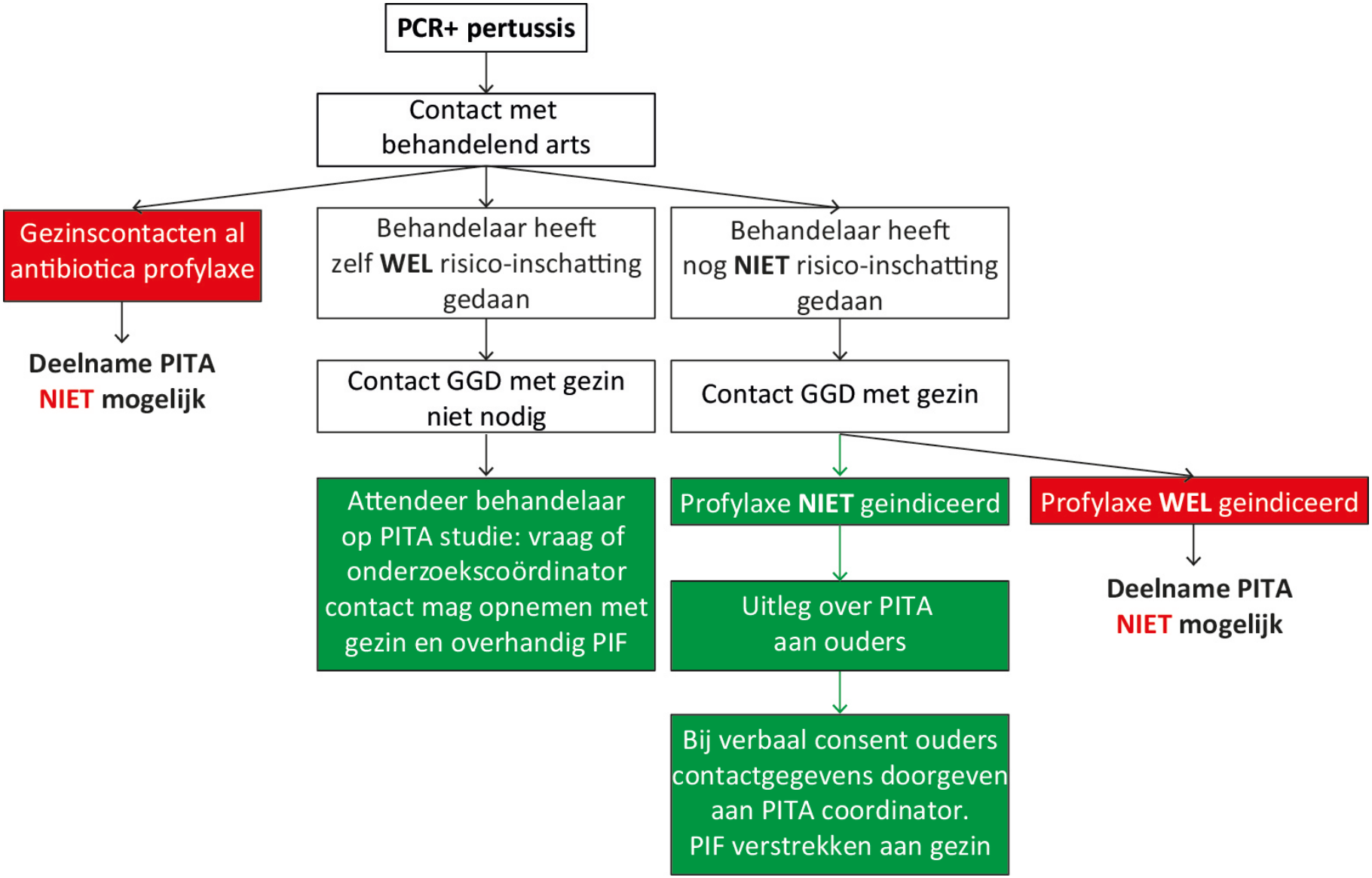
Study population

- **Index cases**: Children <16 diagnosed with pertussis (PCR)
- **Contacts**: All household contacts can be included (50 families in total)

Study flowchart



Contact index-casus



Screening

Inclusion criteria:

- index case <16 years old in the family with **PCR-proven pertussis (start with <1y old index cases)**
- ≥ **2 asymptomatic household** contacts who consent to participate at T1

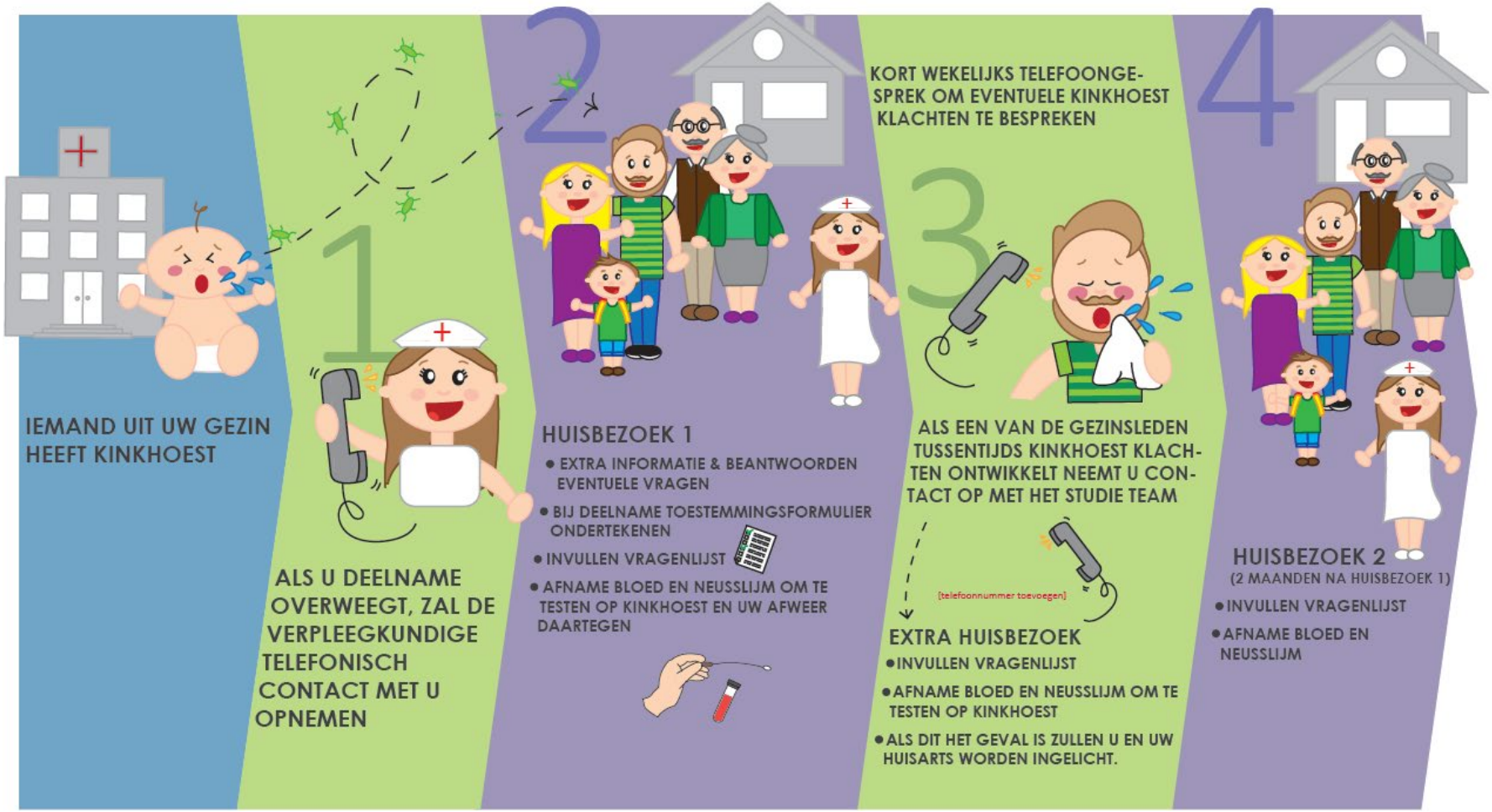
Exclusion criteria:

- Families with risk contacts → **indication for post exposition prophylactic treatment**
- Families for which it is **not possible to organize visit T1 within 5 days** after PHS or the treating physician has informed them about the study
- **Incapacitated household contacts**

DE PITA STUDIE

VERSPREIDING VAN KINKHOEST IN HUISELIJKE KRING

WE BESTUDEREN DE VERSPREIDING VAN KINKHOEST EN DE ONTWIKKELING VAN KINKHOEST KLACHTEN BINNEN HUISELIJKE KRING.
BIJ GEZINSLEDEN BESTUDEREN WE DE AFWEER TEGEN KINKHOEST OM HET HUIDIGE VACCIN TE VERBETEREN.



peri scope

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