

# Global Health Cast 45

August 9<sup>th</sup>, 2023

**Every Week**

12.00 noon - CET



**Dr. Melvin Sanicas**

 @Vaccinologist



**Prof. Dr. Joe Schmitt**

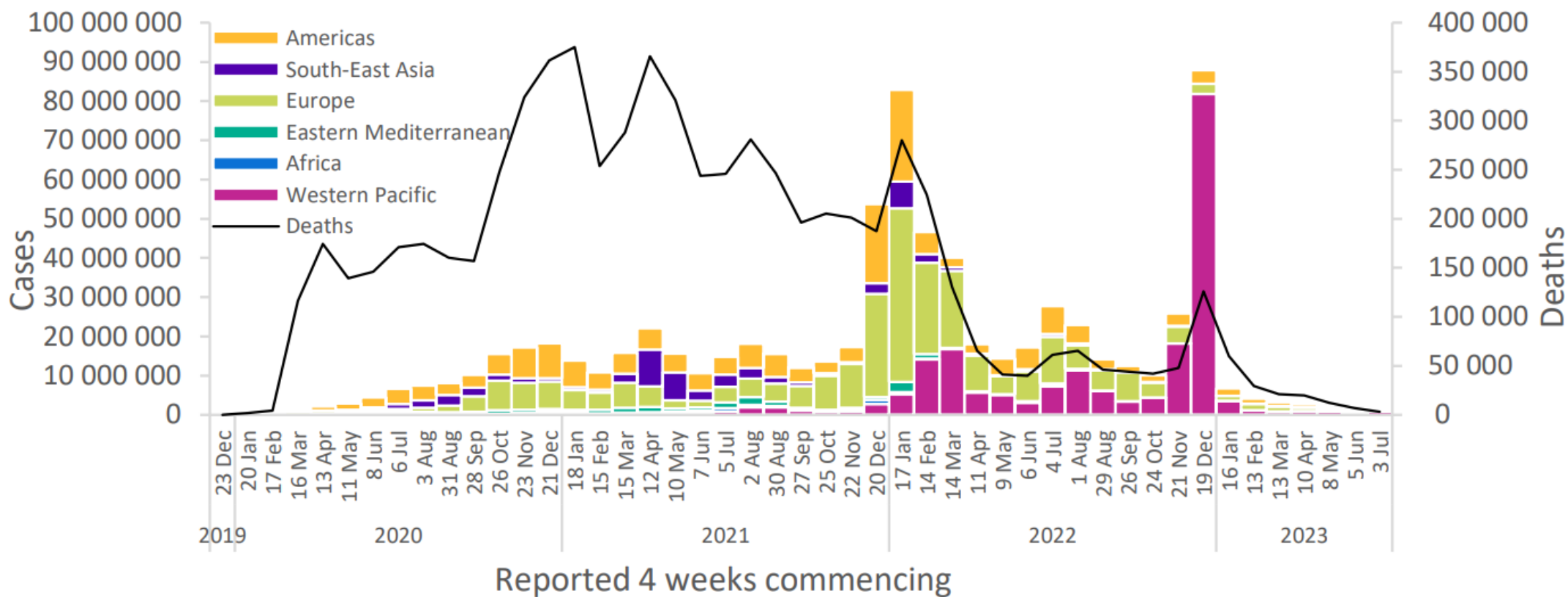
 @Prof\_Schmitt

# What we talk about today

- **COVID-19 global epidemiology**
- **Your frequently asked questions on COVID-19**
- **Vaccination in Pregnancy (ViP) – 1: Basics**

**Figure 1. COVID-19 cases reported by WHO Region, and global deaths by 28-day intervals, as of 30 July 2023 (A); 16 January to 30 July 2023 (B)\*\***

**A**



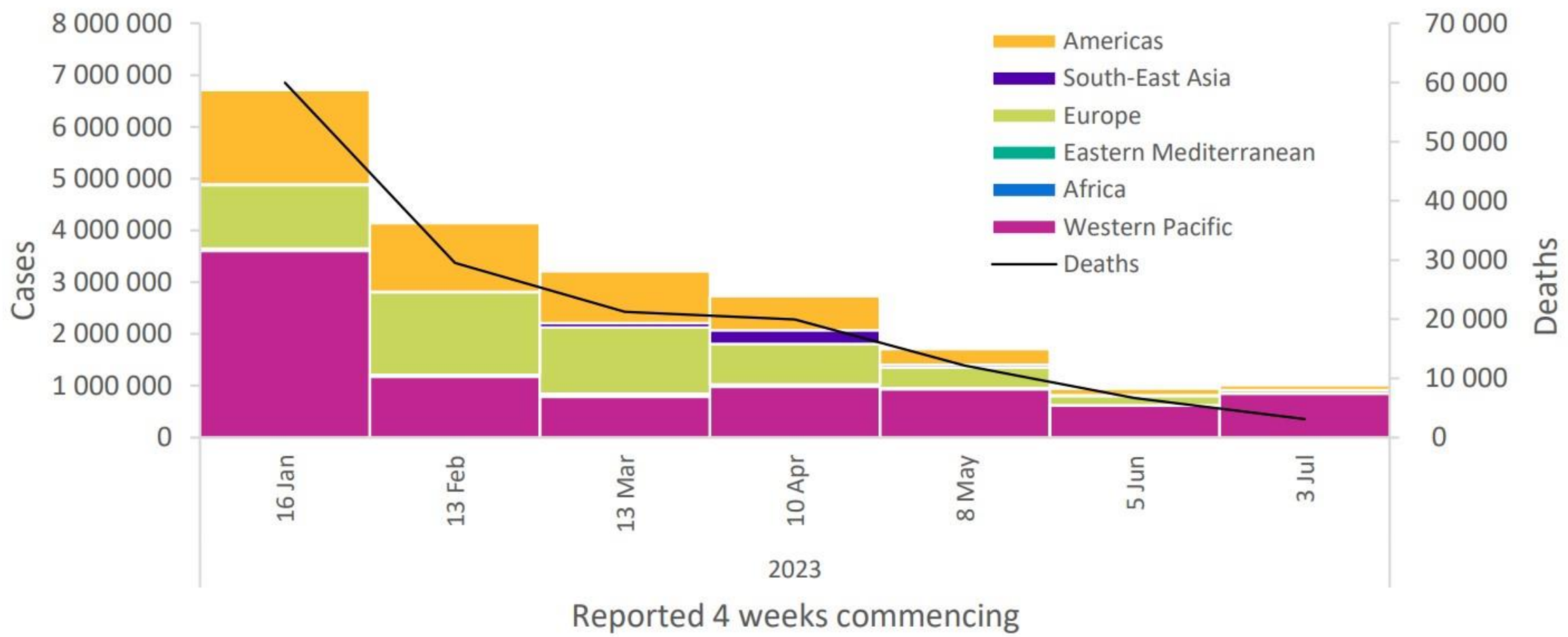
**B**

Figure 2. Percentage change in confirmed COVID-19 cases over the last 28 days relative to the previous 28 days, as of 30 July 2023\*\*

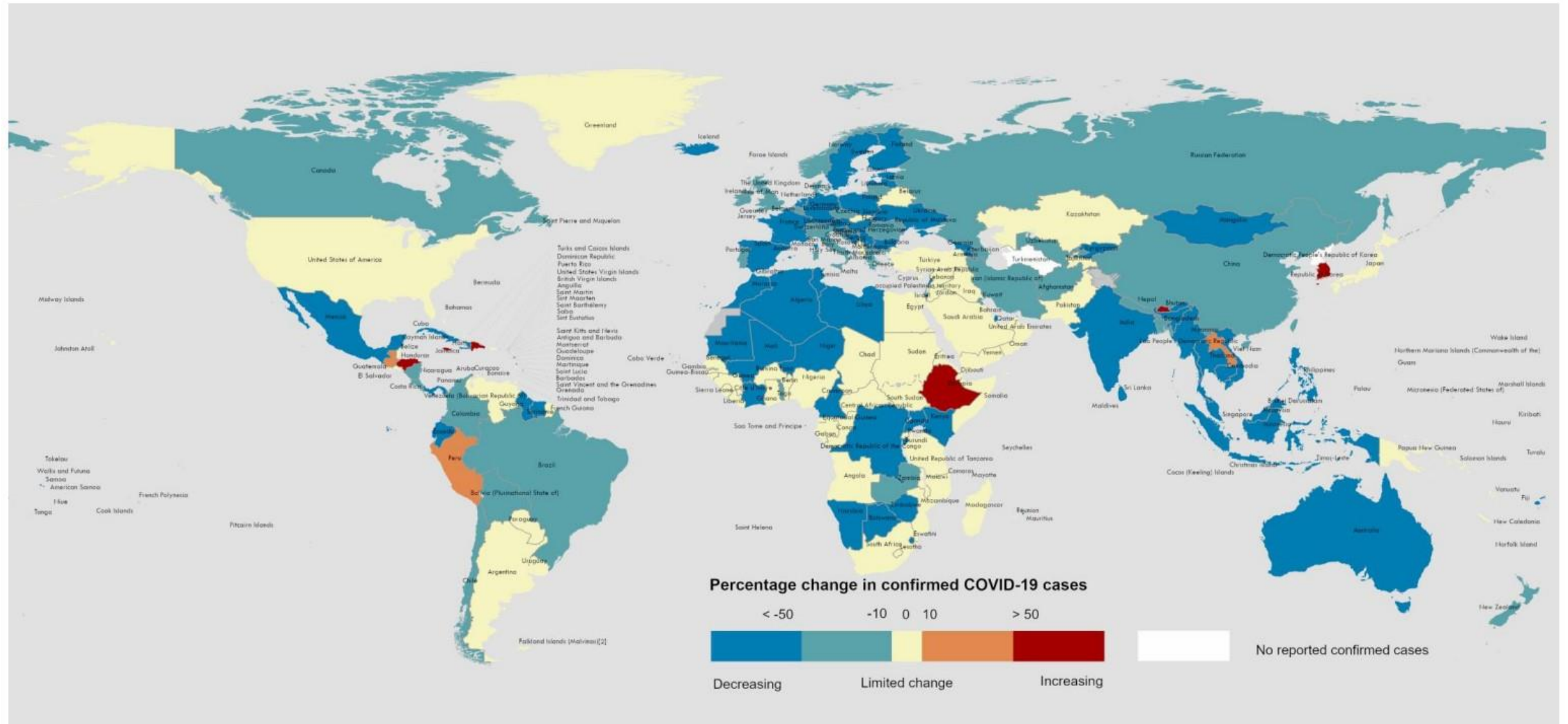
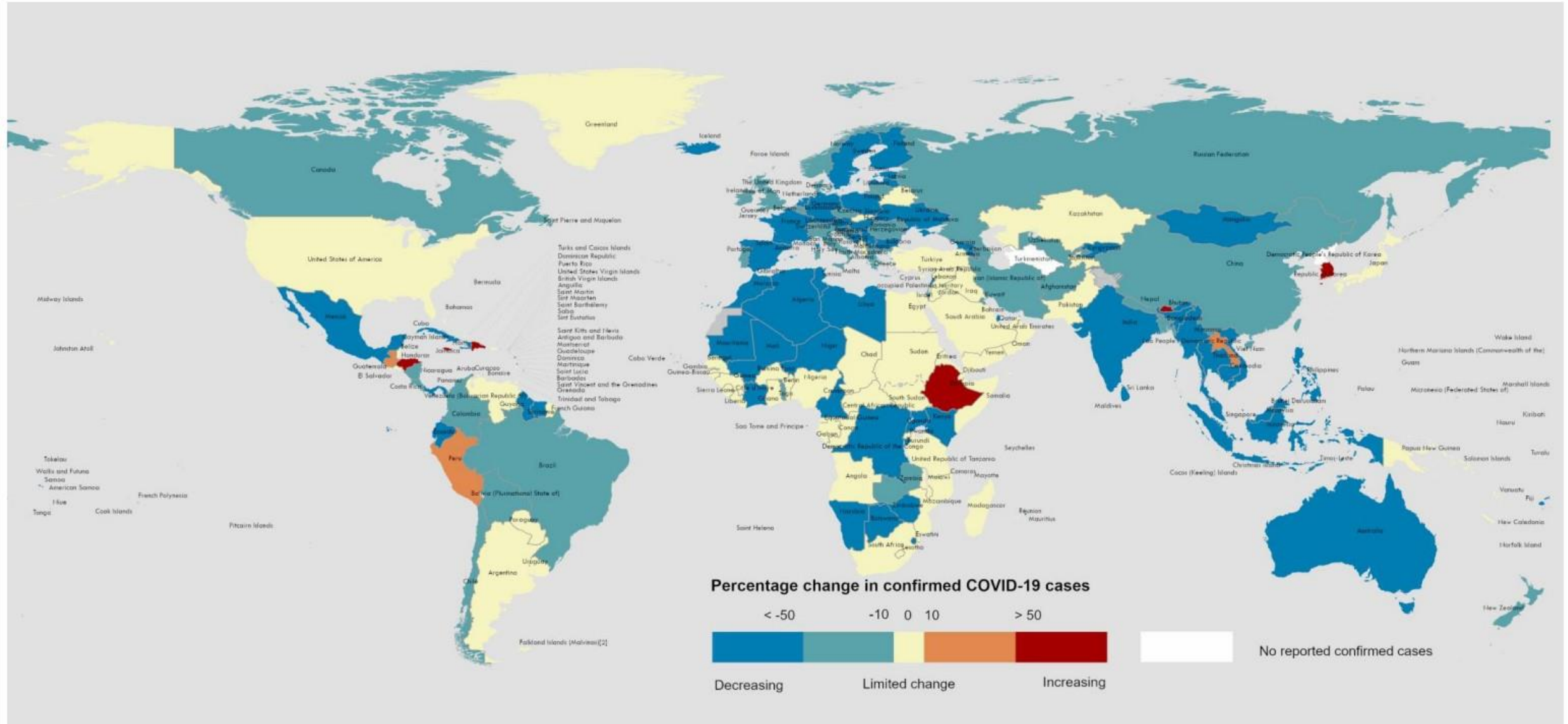




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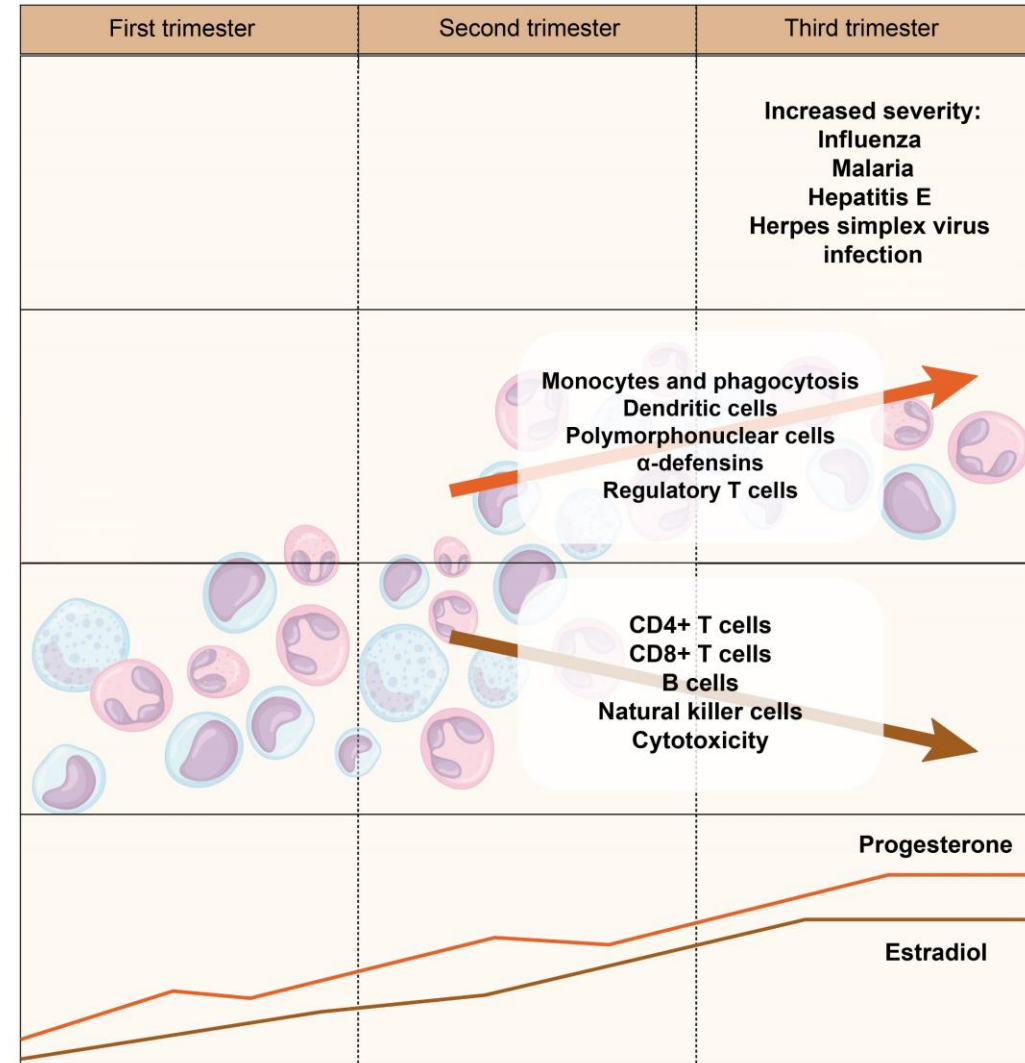


# **Your most frequently asked questions on COVID-19**

- **How long do COVID symptoms last?**
- **Who should take Paxlovid, and how do you get it?**
- **How long are you contagious with COVID?**
- **How long are you immune after having COVID?**
- **Is there any way to avoid or prevent long COVID?**

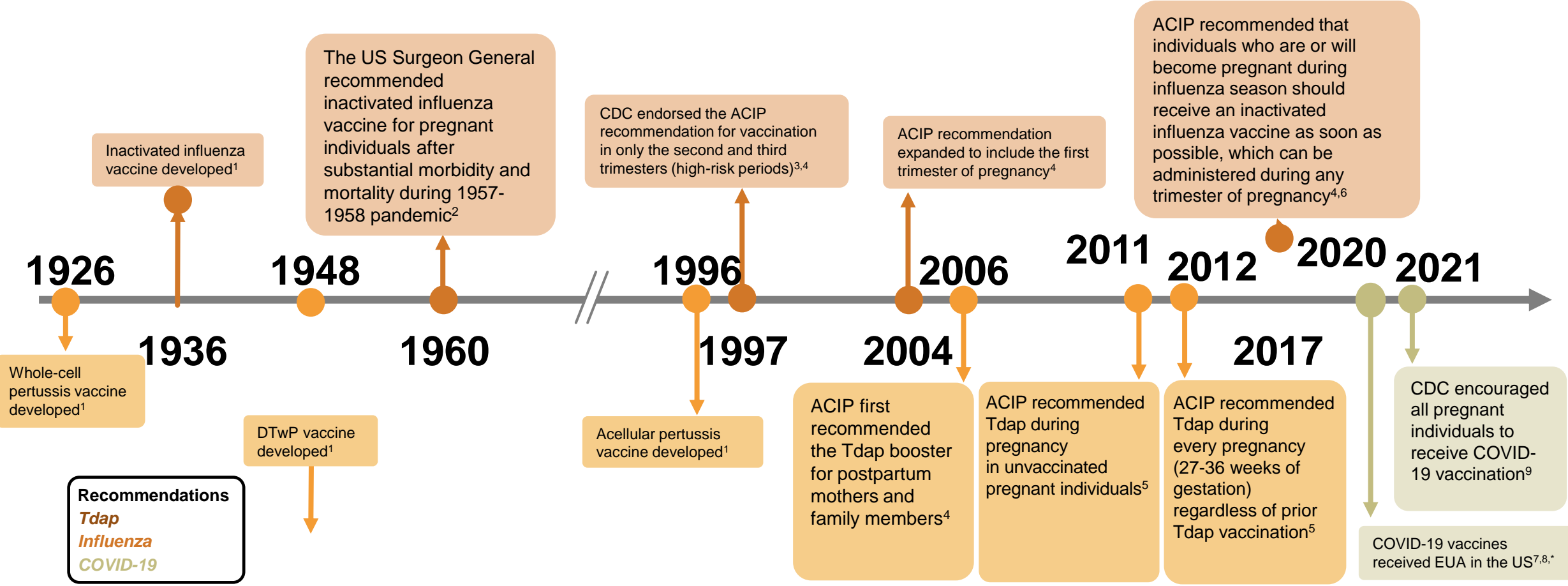
# Changes in Hormone Levels and Immune-System Characteristics During Pregnancy

Adaptation for fetal (i.e.: non-self) antigens result in increased susceptibility and more severe infections.





# ViP Is Not New: US History of Routine ViP Recommendations



# Infections with Increased Susceptibility/Severity in Pregnant Women, and Clinical Guidance

| Infection   | Increased Susceptibility | Increased Severity | Prevention Strategies  |
|---|--------------------------|--------------------|--|
| <b>Stronger evidence</b>                                |                          |                    |  |
| <b>Influenza</b>  | No                       | <b>Yes</b>         | Vaccination, antiviral prophylactic medication                   |
| <b>COVID19</b>  | ?                        | <b>Yes</b>         | Vaccination, antivirals  |
| HEV infection   | No                       | <b>Yes</b>         | Sanitation programs  |
| HSV infection<br>(Dissemination with primary infection) | No                       | <b>Yes</b>         | Protection from STIs during pregnancy                            |
| Malaria<br>(Mainly due to Plasmodium falciparum)        | Yes                      | <b>Yes</b>         | Intermittent preventive therapy, Bed nets, Travelers prophylaxis |
| Listeriosis   | <b>Yes</b>               | No                 | Dietary guidance   |
| <b>More limited evidence</b>                            |                          |                    |  |
| <b>Measles</b>  | No                       | <b>Yes</b>         | Vaccination  |
| <b>Smallpox</b>   | No                       | <b>Yes</b>         | Vaccination  |
| HIV type 1 infection                                    | <b>Yes</b>               | No                 | Consistent/correct condom use in pregnancy                       |
| <b>Varicella</b>  | No                       | <b>Yes</b>         | Vaccination  |
| Coccidioidomycosis                                      | No                       | <b>Yes</b>         | No proven methods of prevention                                  |

# Prevalence of Major Malformations by Organ Categories: Mainz and EUROCAT

| Organ categories (/10,000 infants)   | Mainz<br>1990–1998 | EUROCAT<br>1980–1994 |
|--|--------------------|----------------------|
| Musculoskeletal system   | 239                | 74                   |
| Internal urogenital system   | 162                | 33                   |
| Cardiovascular system  | 113                | 59                   |
| Digestive system   | 71                 | 27                   |
| Central nervous system   | 68                 | 22                   |
| External urogenital system   | 58                 | 15                   |
| Facial clefts  | 44                 | 15                   |
| Chromosome aberrations   | 42                 | 29                   |
| Ear  | 13                 | 5                    |
| Eye  | 12                 | 6                    |
| <b>Study population: 30,940 infants, Mainz, 1990–1998; 2,144 (6.9%) infants with major malformations</b> |                    |                      |

# The Safety of ViP Is Continuously Monitored, as Seen in Select Monitoring Programs Within the US and Elsewhere

## General Population, Including Pregnant Individuals

### VAERS (Vaccine Adverse Event Reporting System)

An early warning system that helps the CDC and FDA monitor new safety concerns<sup>1</sup>

### VSD

#### (Vaccine Safety Datalink)

A collaboration between the CDC and several health care organizations that allows for ongoing monitoring and proactive searches of vaccine-related data<sup>1</sup>

## Specific to Pregnancy

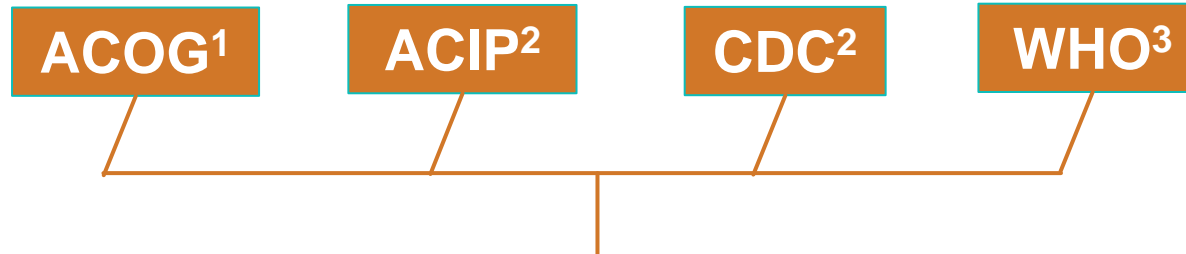
### VAMPSS (Vaccines and Medications in Pregnancy Surveillance System)

Prospective surveillance system in which participants are enrolled in the first trimester, including a case-control surveillance<sup>1,a</sup>

### Vaccine Registries

Established to monitor vaccine safety after introduction (eg, industry-led vaccine pregnancy exposure registries or active surveillance programs such as the CDC's V-safe COVID-19 Vaccine Pregnancy Registry)<sup>1,2</sup>

# Examples for Organizations Recommending ViP as a Method to Protect Pregnant Individuals and/or Their Infants

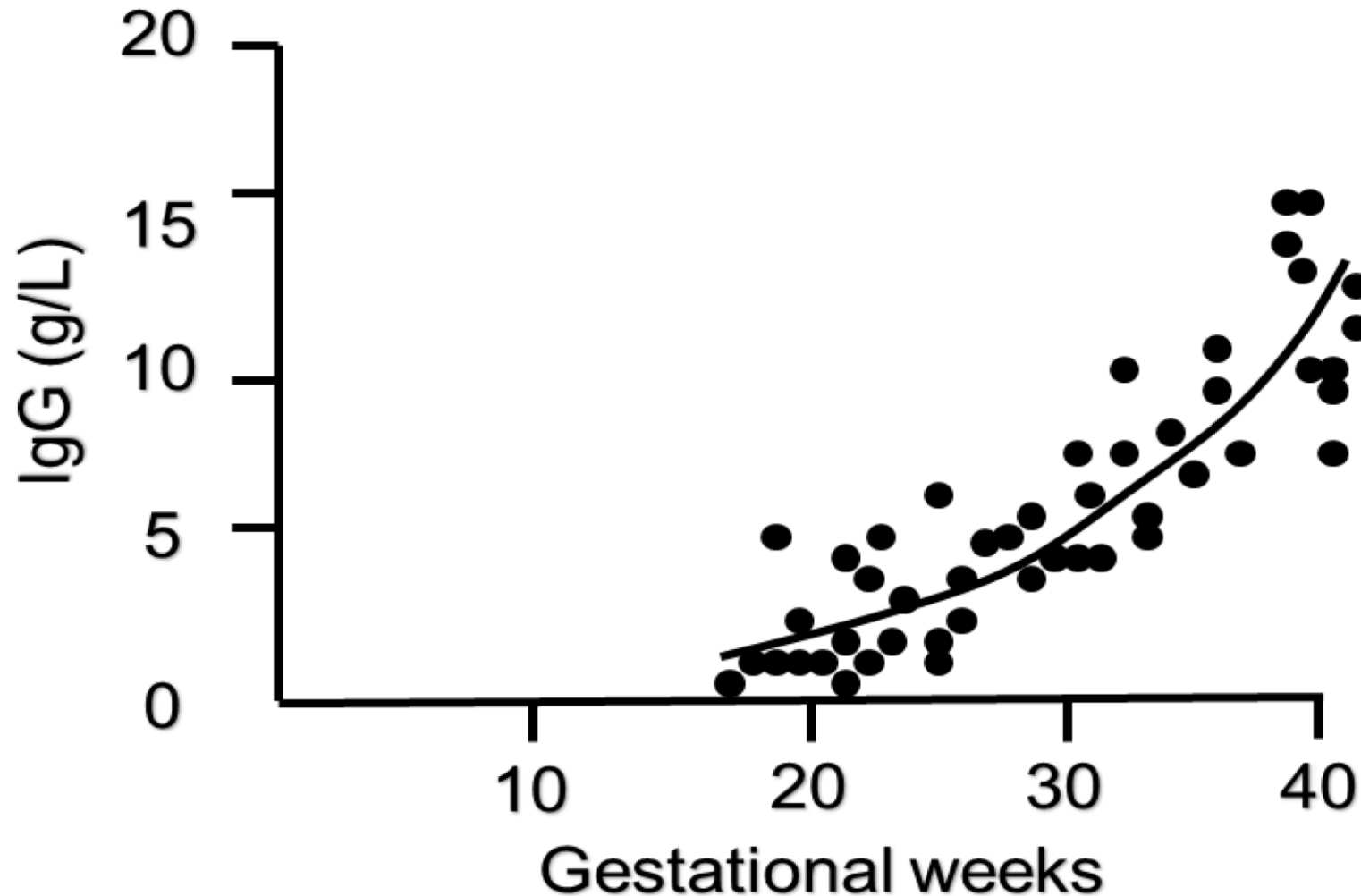


Currently, there is no evidence of any increased risk of adverse pregnancy, fetal, or infant outcomes following vaccination of pregnant individuals with inactivated influenza vaccines, pertussis-containing vaccines, or COVID-19 vaccines<sup>1-3</sup>

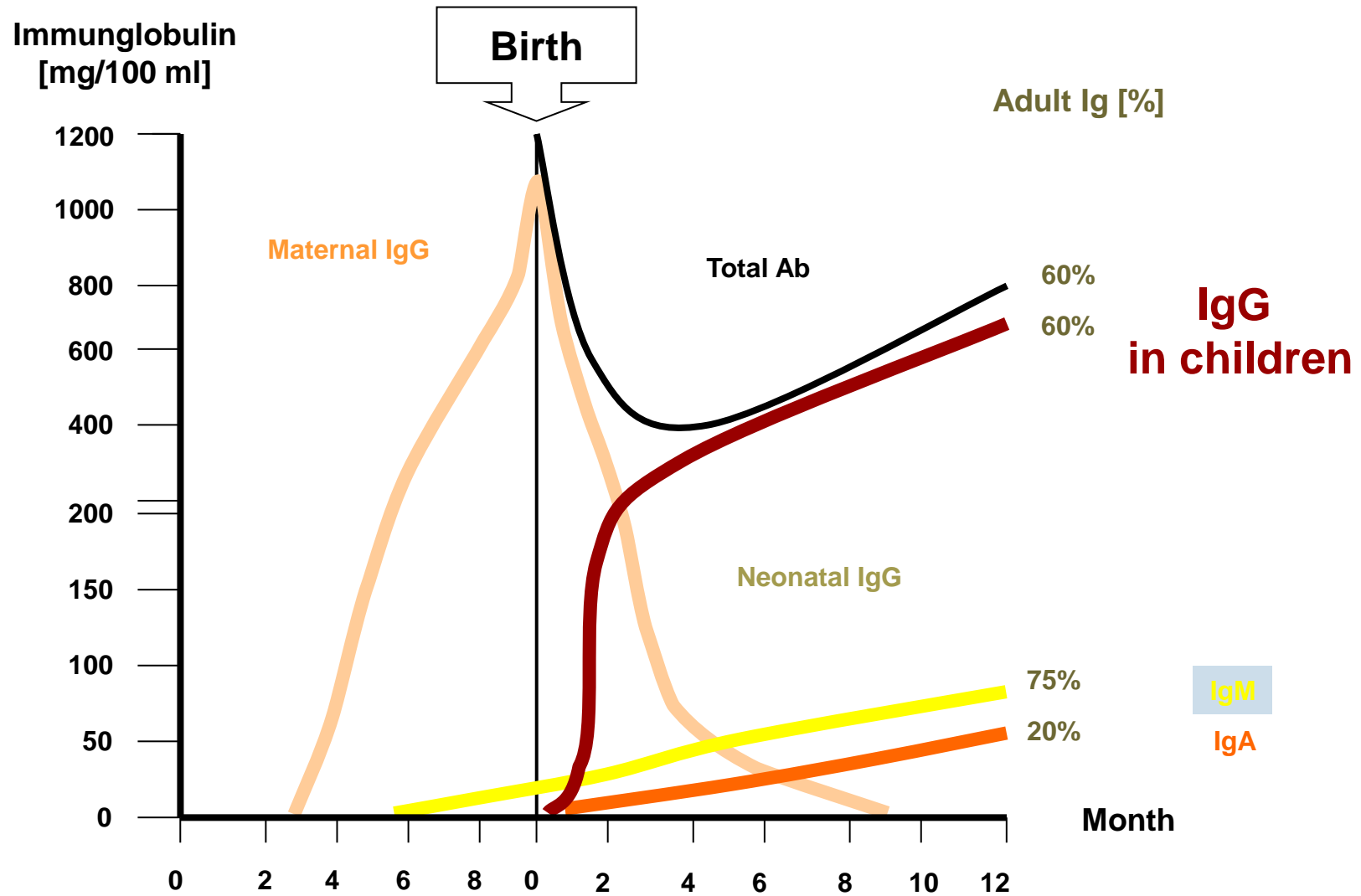
Detail to follow in the review of each of the 4 vaccines mentioned here



# Maternal Antibody Transfer Increases with GA



# Active and passive immunity before birth and during infancy



# Tdap Effectiveness in Pregnant Women, UK

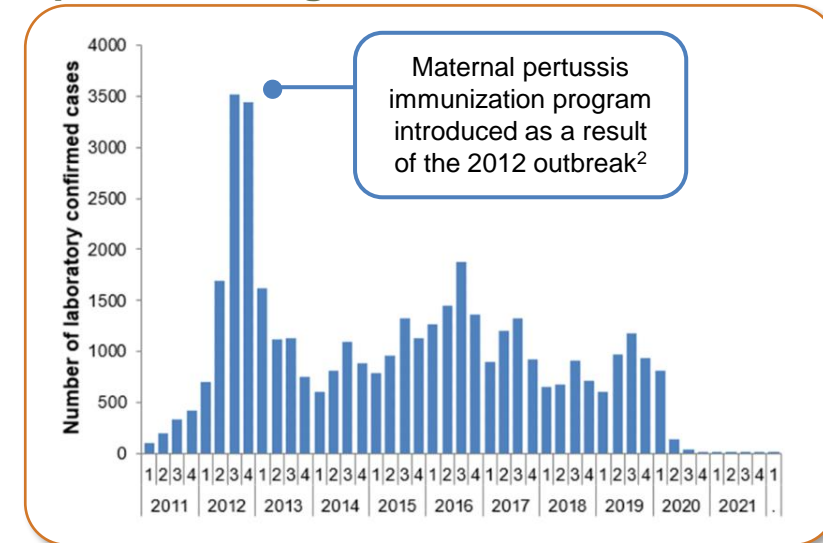
## Study Design

- ▶ An observational study in England evaluated vaccine effectiveness of pertussis vaccine in pregnant individuals from 2008 to 2013<sup>1</sup>
- ▶ In September 2012, the UK Department of Health recommended a temporary program to offer all pregnant individuals (between 28 to 38 weeks of gestation) the dTdap/IPV vaccine<sup>1</sup>

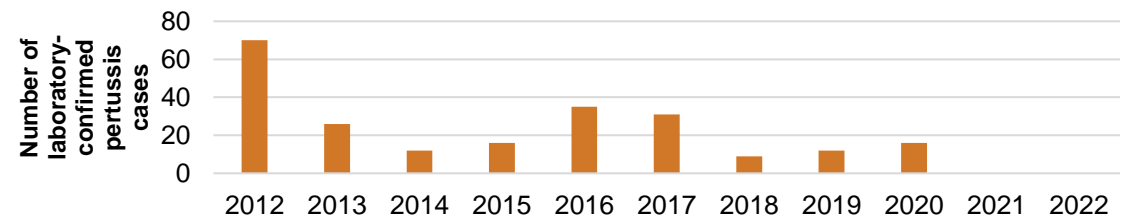
## Results

- ▶ **Observed vaccine effectiveness was 91%** (95% CI, 84%-95%) in infants born from October 1, 2012, and <3 months of age at onset<sup>1</sup>

## Laboratory-confirmed pertussis cases per quarter in England from 2011 to 2022<sup>2</sup>

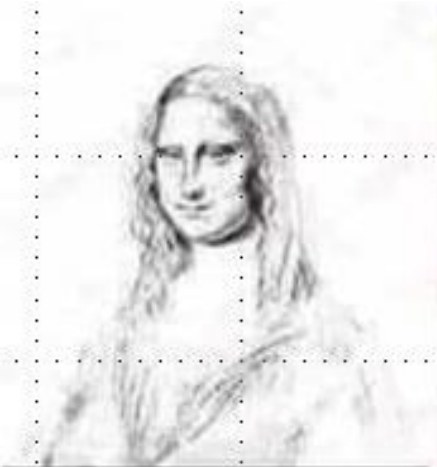


While the total number of pertussis cases fluctuates per year, the number of cases in infants <3 months of age has declined over time<sup>2</sup>



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**Conceptualized  
in PI's mind**



**Described in  
grant proposal**



**Actual goal  
after funded**



**Understood  
by RA**



**Observed in  
first experiment**



**Observed in repeat  
experiment**



**Presented  
in conference**



**Submitted  
to journal**



**Actual publication  
after addressing  
reviewer comments**