

# Global Health Cast 33

April 11, 2023



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**Every Week**

12.00 noon - CET

# What we talk about today

- **COVID-19 update**
- **SARS-CoV-2 Variants**
- **Most infectious diseases the WHO has identified to date**
- **Nipah Virus**
- **Pandemic potential of avian influenza (H5N1)**
- **Efficacy of bivalent RSVpreF vaccine to prevent RSV in infants**

**Figure 1. COVID-19 cases reported by WHO Region, and global deaths by 28-day intervals, as of 26 March 2023\*\***

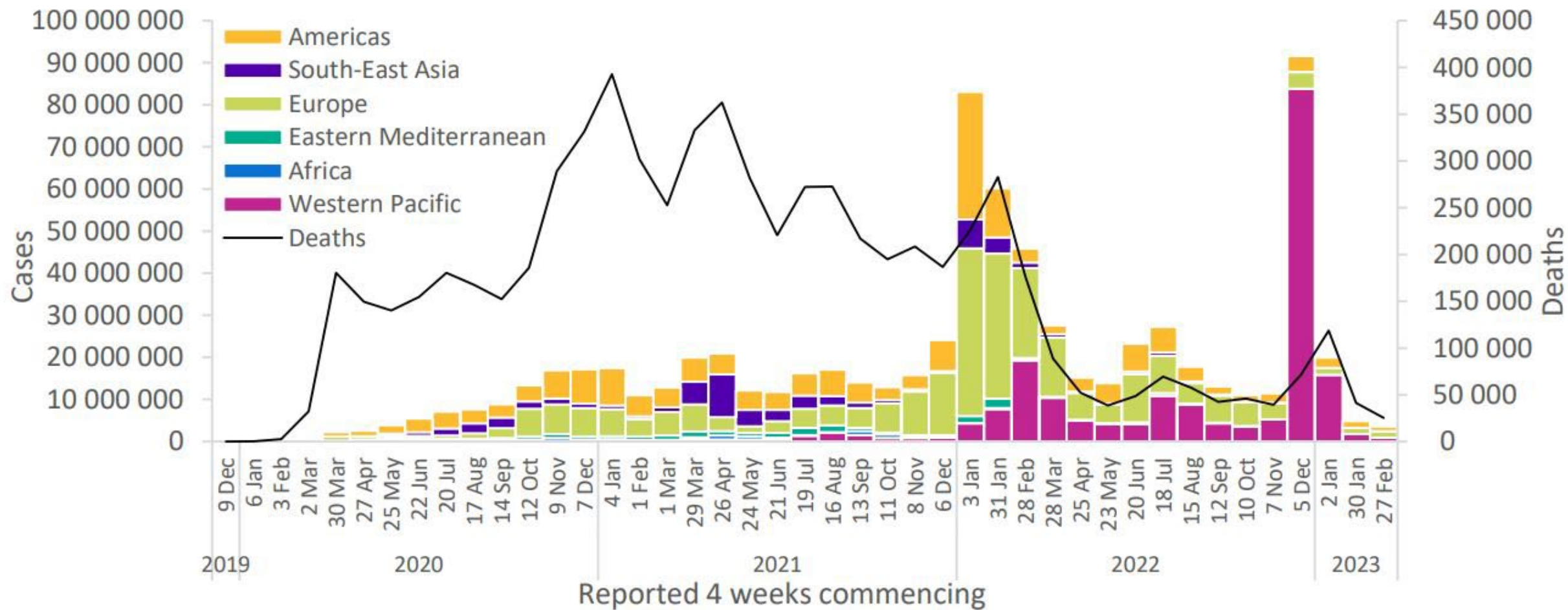


Figure 2. Percentage change in confirmed COVID-19 cases over the last 28 days relative to the previous 28 days, as of 26 March 2023\*\*

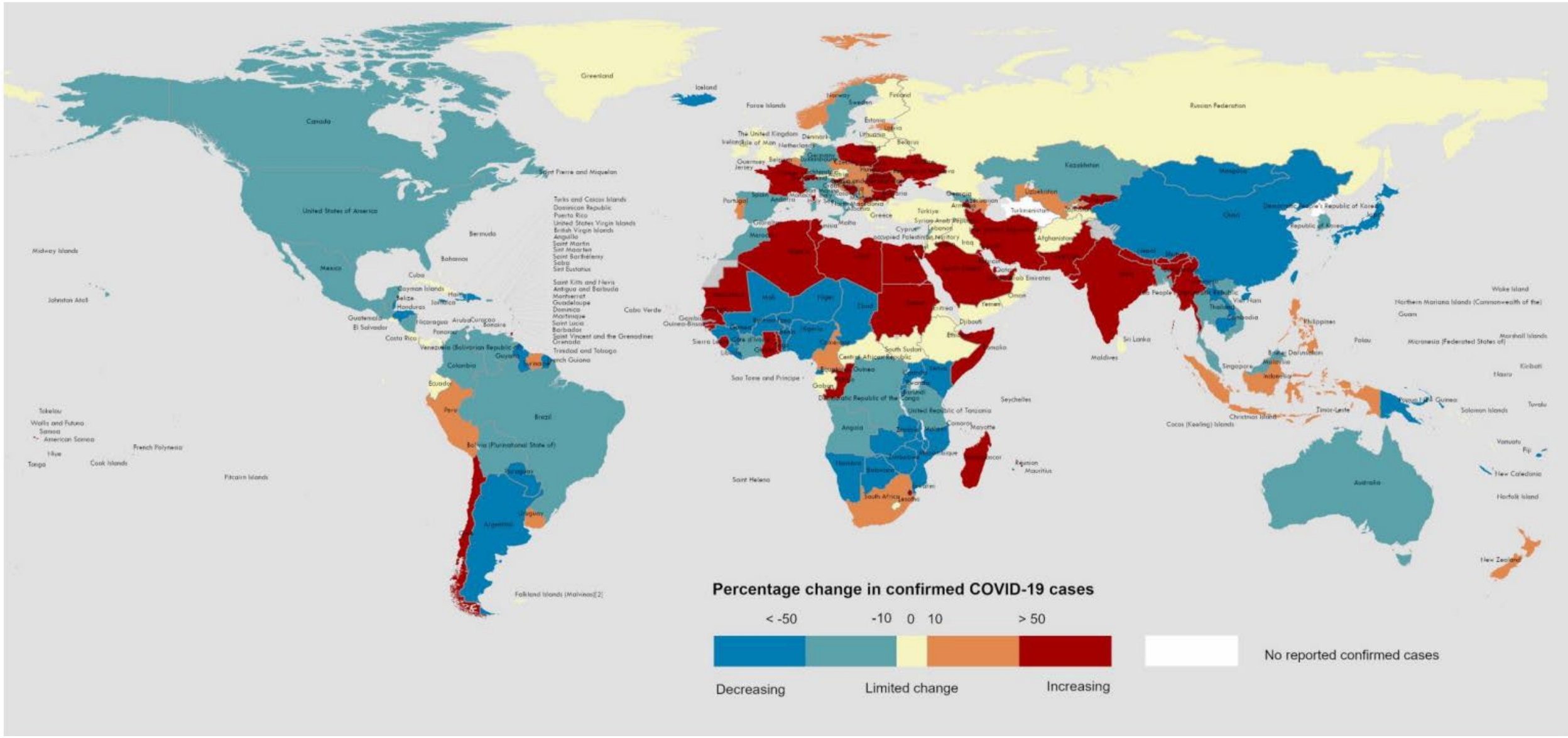
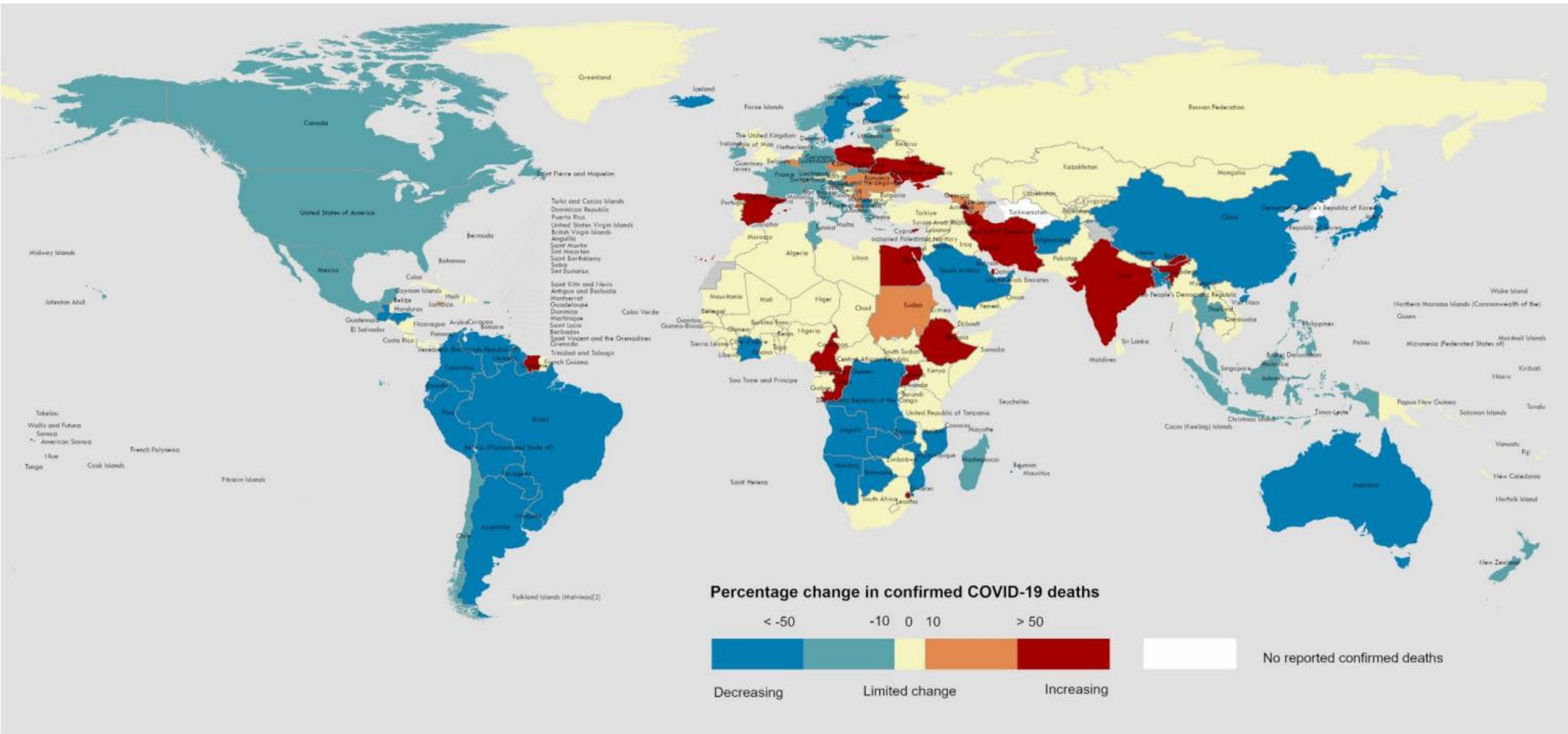


Figure 3. Percentage change in confirmed COVID-19 deaths over the last 28 days relative to the previous 28 days, as of 26 March 2023\*\*



**Table 2. Weekly prevalence of SARS-CoV-2 VOIs and VUMs, week 6 to week 10 of 2023**

Lineage	Countries	Sequences	2023-06	2023-07	2023-08	2023-09	2023-10
XBB.1.5*	90	115 426	35.63	39.27	42.97	46.99	45.06
BQ.1*	141	399 188	22.68	18.40	14.18	10.73	8.37
BA.2.75*	119	100 181	7.09	6.20	6.00	2.94	1.71
CH.1.1*	85	36 425	7.17	7.12	7.02	6.89	6.43
XBB*	119	73 147	6.15	7.40	9.63	12.88	19.73
XBF*	47	8063	1.40	1.29	1.25	1.19	1.40
Other <sup>†</sup>	207	6 685 701	1.07	1.32	1.16	1.16	4.89
Unassigned	95	286 544	7.23	9.61	9.81	11.74	11.87

\* Denotes descendent lineages. The prevalence XBB.1.16\* is included in XBB\*. <sup>†</sup>Others are other circulating lineages excluding the VOI, VUMs, BA.1\*, BA.2\*, BA.3\*, BA.4\*, BA.5\*

Currently, WHO is closely tracking **one variant of interest (VOI)**, XBB.1.5, and **six variants under monitoring (VUMs)**. The VUMs are BQ.1, BA.2.75, CH.1.1, XBB, XBF and XBB.1.16; XBB.1.16 was added to this list on 22 March 2023. XBB.1.16 is a recombinant of BA.2.10.1 and BA.2.75 and has three additional mutations in the SARS-CoV-2 spike protein (E180V, F486P and K478R) compared to its parent lineage XBB.

## 9 of the most infectious diseases the WHO has identified to date:

- Nipah virus
- Crimean-Congo hemorrhagic fever
- Lassa fever
- Rift Valley fever
- Zika
- Ebola and Marburg
- Middle East respiratory syndrome (MERS)
- Severe acute respiratory syndrome (SARS)

Disease X (any unknown pathogen that could cause a future outbreak)

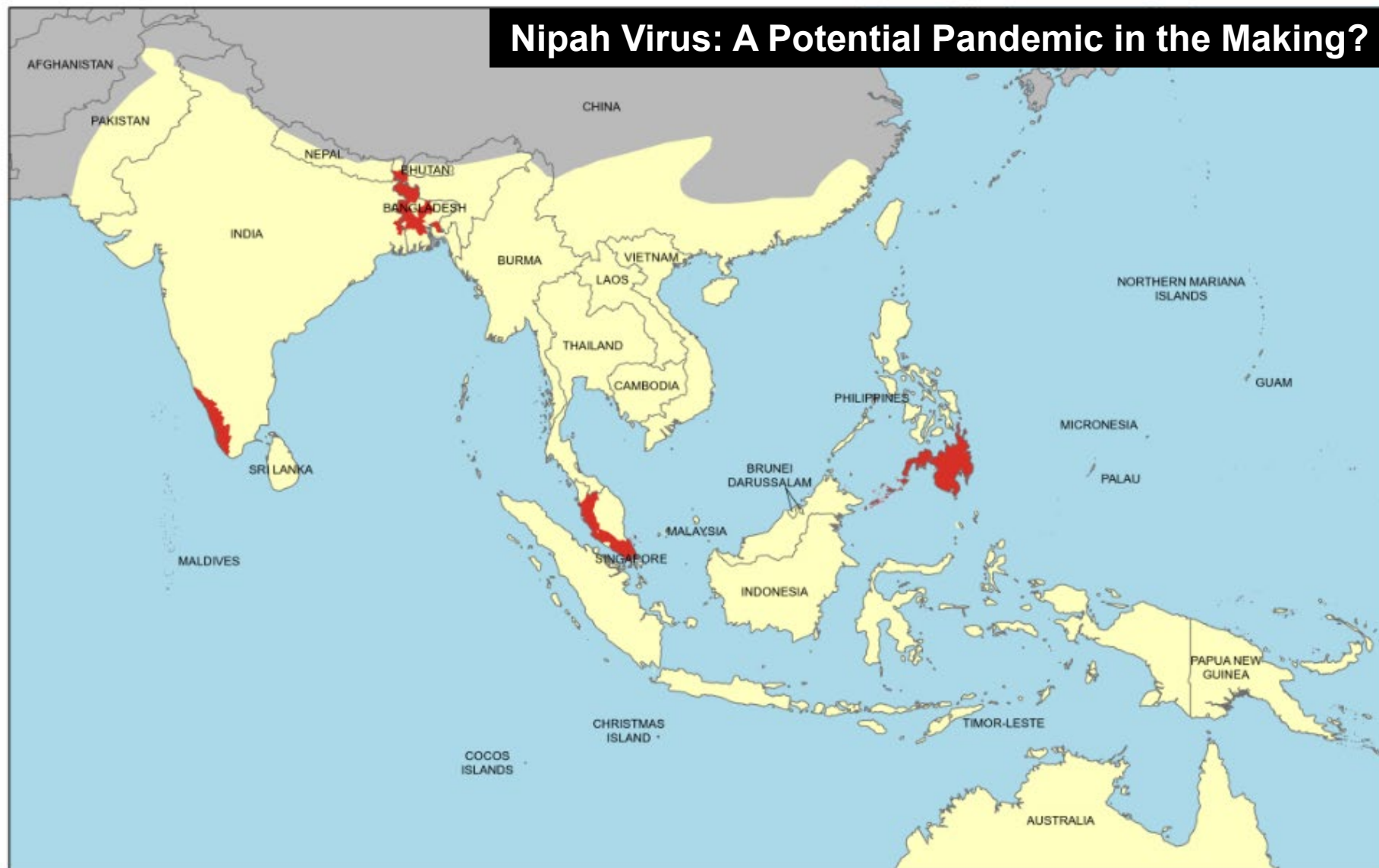
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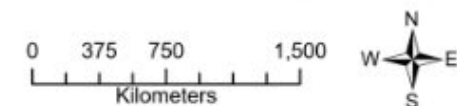
# Nipah Virus: A Potential Pandemic in the Making?



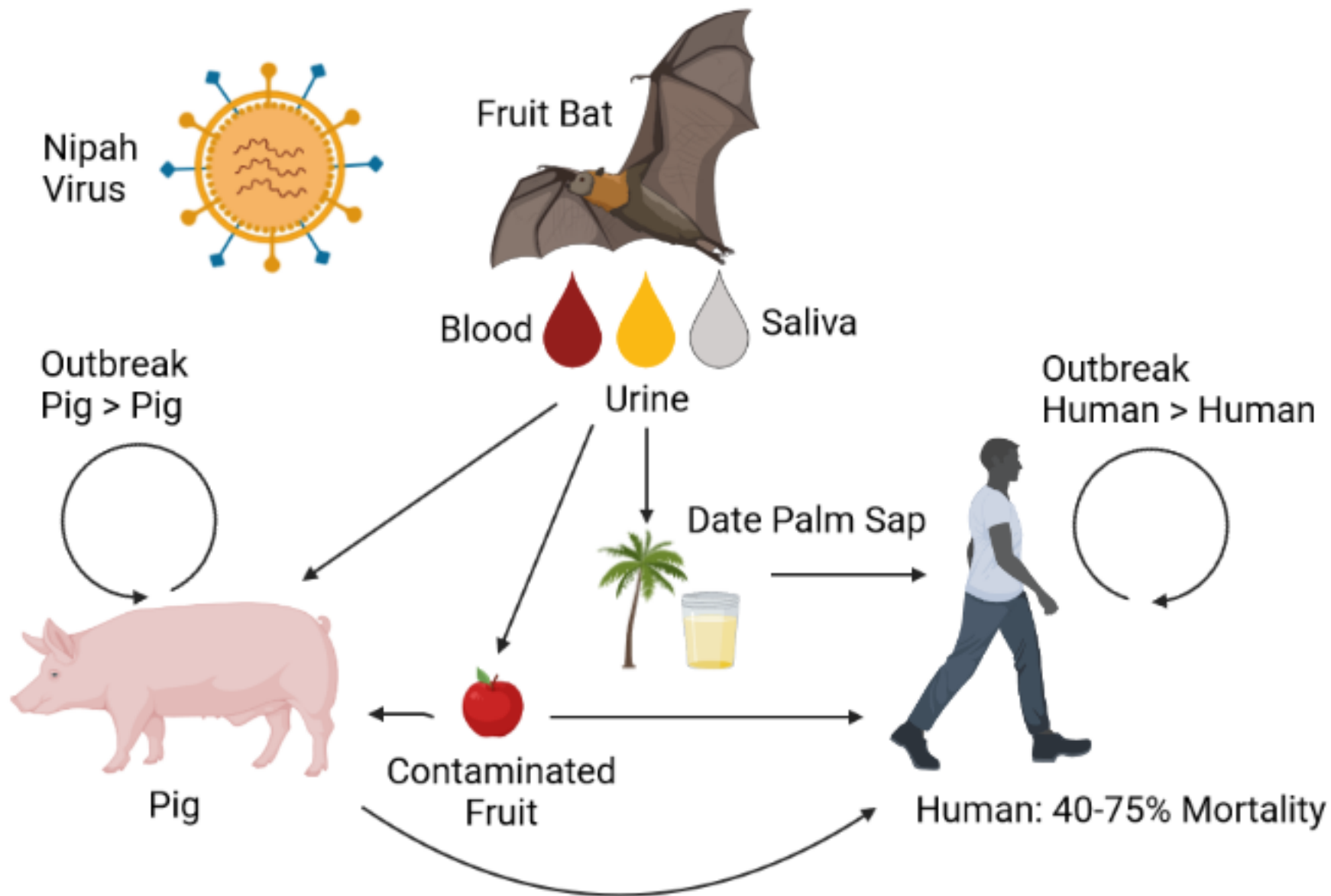
## *Pteropus* Bats Presence and Nipah Virus Outbreaks

■ Nipah virus infections in people

■ Known or likely presence of *Pteropus* bats in the Asia, South Pacific, and Australia region



# Nipah Virus Transmission and Mortality



# Impact of Nipah Virus

- Fatality rate among those infected ranges from 40% to 70%.
- 200 lives lost in Bangladesh in the last 20 years due to yearly outbreaks.
- Since the first reported case in 1999 in Malaysia, there have been 300 human cases and more than 100 deaths.
- Substantial economic impact as more than 1 million pigs were euthanized to contain the outbreak.
- Outbreaks have been recorded annually in some parts of Asia since then - primarily in Bangladesh and India.

# How to prevent Nipah Virus infection

**Avoid consuming raw date palm sap or fruits contaminated or partly eaten by bats**



**Wash hands regularly with soap and clean water**

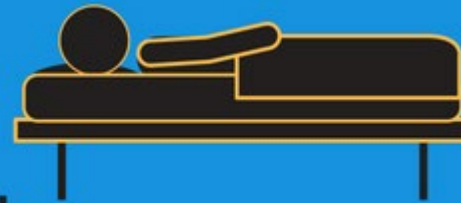


## With patients

**Try to avoid coming into close contact with the patient**

**Cover nose and mouth when going near to the patient**

**Wash hands with soap and water after handling the patient**



**Healthcare workers need to follow strict infection control measures with suspected or confirmed cases**

# Next influenza pandemic: H5N1?

## Dangerous steps

For the H5N1 avian influenza virus to spark a human pandemic, its genome must acquire mutations that alter several of its proteins.

### Hemagglutinin

Mutations can improve this protein's ability to bind to the species-specific carbohydrates on mammalian cells. Other mutations can stabilize it so the virus can be transmitted in aerosols.

### Neuraminidase

### Ion channel

### Nucleoprotein

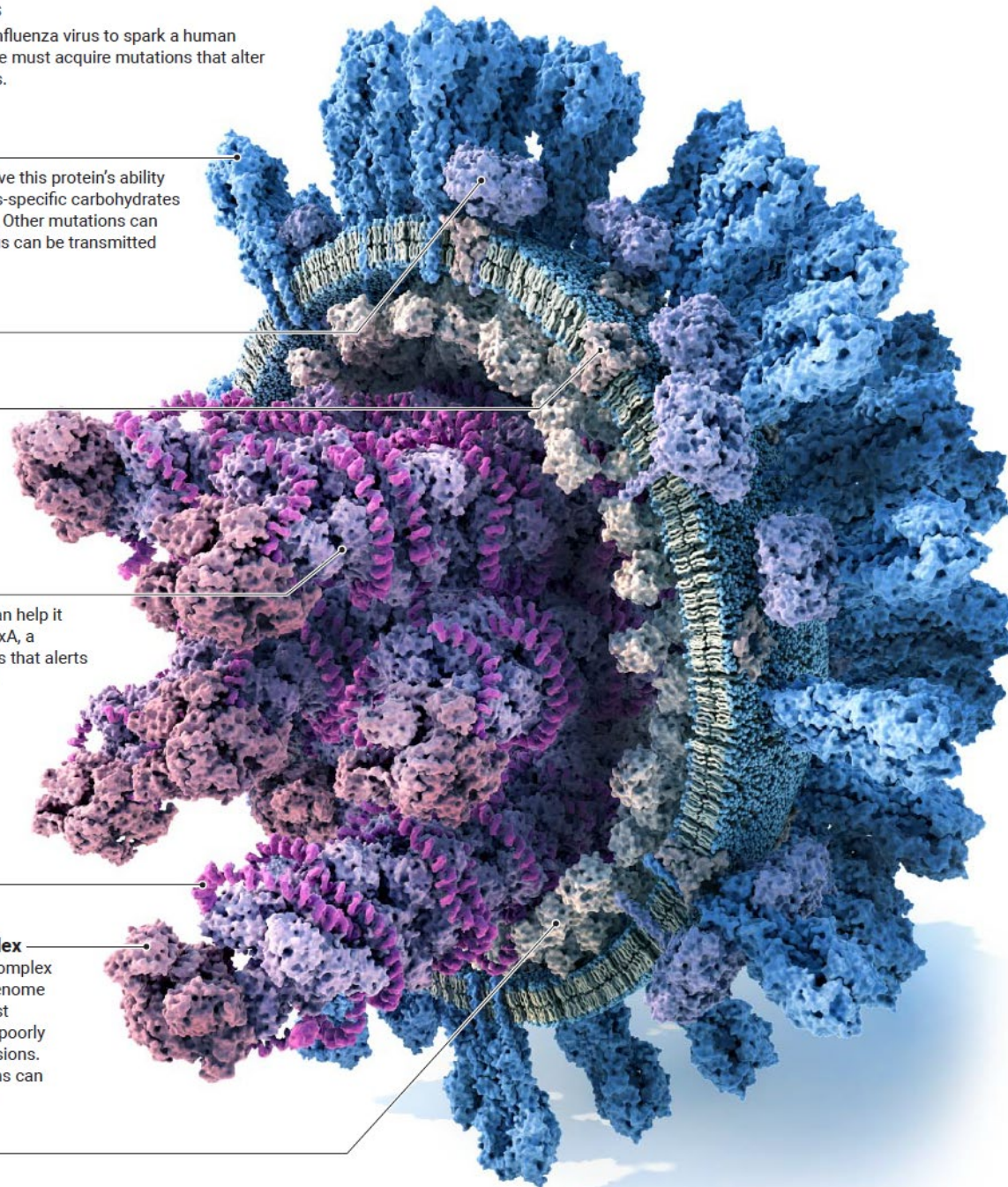
A change in shape can help it avoid detection by MxA, a sensor in human cells that alerts the immune system.

### RNA

### Polymerase complex

The enzyme in this complex replicates the viral genome with the help of a host protein, and it works poorly with mammalian versions. Polymerase mutations can improve the match.

### Matrix protein



# Does active bivalent preF-RSV RSV vaccination during pregnancy reduce the burden (RSV)-associated lower respiratory tract illness in infants?

## METHODS

Double-blind- 1:1-randomized, 18 countries, pregnant women at 24 through 36 weeks' gestation

1 single intramuscular injection of 120 µg of a bivalent (RSVpreF) vaccine or placebo.

Endpoints at days 90, 120, 150, 180 after birth

- medically attended severe RSV-associated LRTI (MAS-RSV)

- medically attended RSV-associated LRTI (MA-RSV)

## RESULTS

3682 / 3676 pregnant women received vaccine / placebo; 3570 / 3558 infants were evaluated.

MAS-RSV 90 days: 6 vaccine group infants versus 33 infants placebo group: VE: **81.8%**; 99.5% CI, 40.6 to 96.3);

180 days: 19 cases versus 62 cases: VE: **69.4%**; 97.58% CI, 44.3 to 84.1).

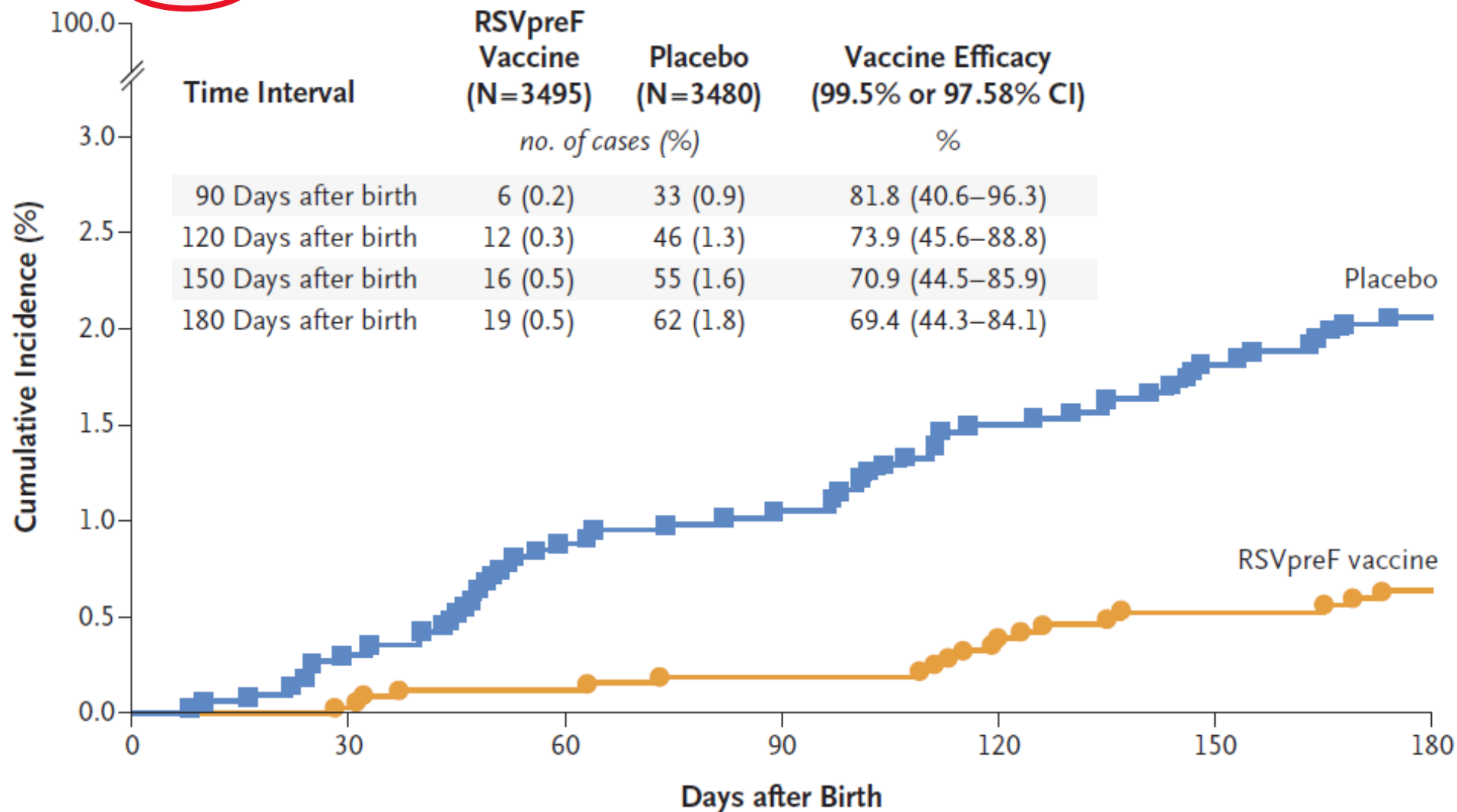
MA-RSV 90 days: 24 vaccine group infants versus 56 infants placebo group VE: **57.1%**; 99.5% CI, 14.7 to 79.8); (n.s.)

Reported AE within 1 month after injection or within 1 month after birth were similar in the vaccine group (13.8% of women and 37.1% of infants) and the placebo group (13.1% and 34.5%, respectively).

## CONCLUSIONS

RSVpreF during pregnancy was effective against medically attended severe RSV-associated LRTI in infants, no safety concerns were identified. (Funded by Pfizer; MATISSE ClinicalTrials.gov number, NCT04424316.)

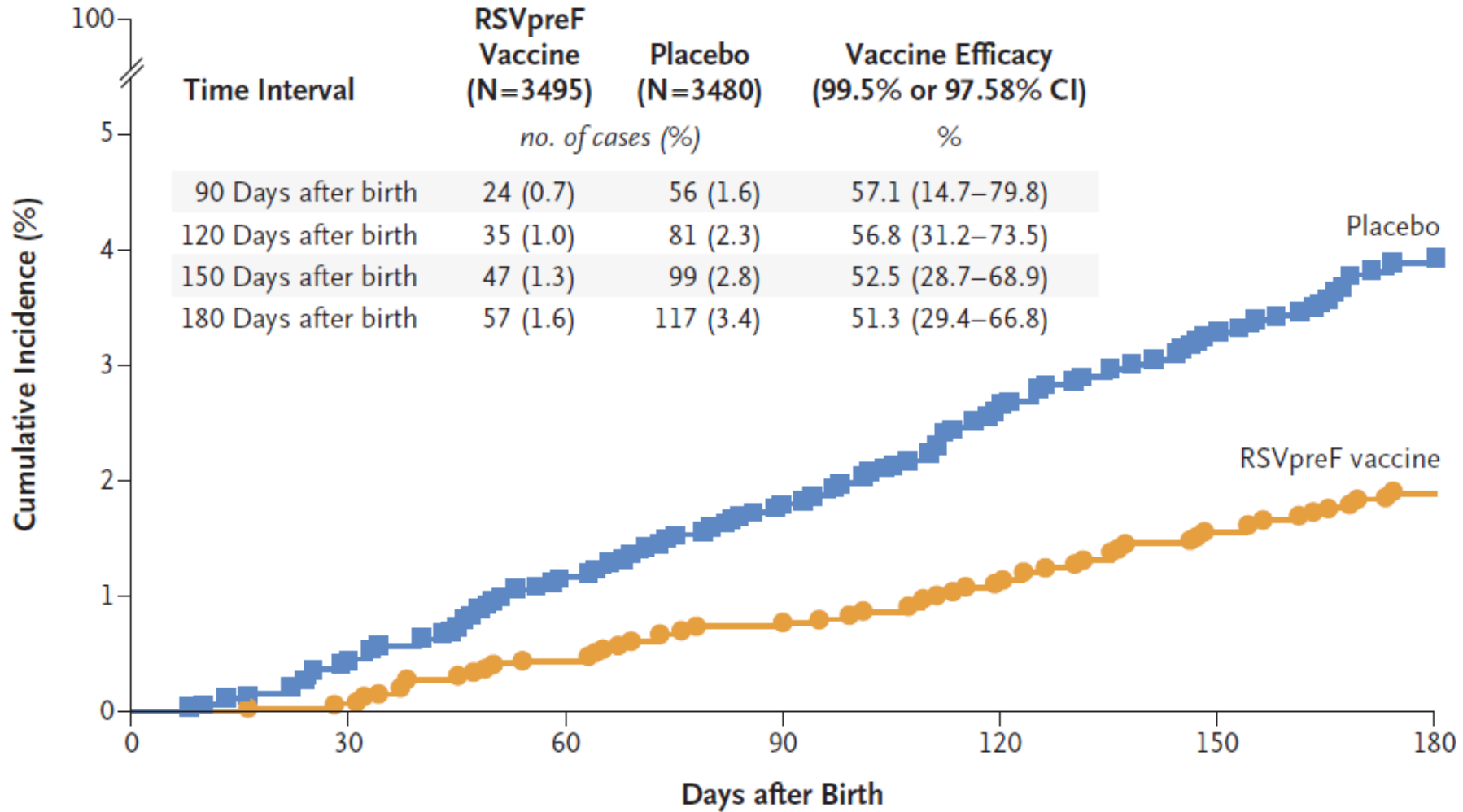
**A Medically Attended Severe RSV-Associated Lower Respiratory Tract Illness**



**No. at Risk**

Placebo	3480	3292	2973	2899	2833	2776	2749
RSVpreF vaccine	3495	3349	3042	2981	2916	2867	2820

## B Medically Attended RSV-Associated Lower Respiratory Tract Illness



### No. at Risk

Placebo	3480	3288	2964	2879	2804	2738	2700
RSVpreF vaccine	3495	3348	3035	2968	2898	2845	2792



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