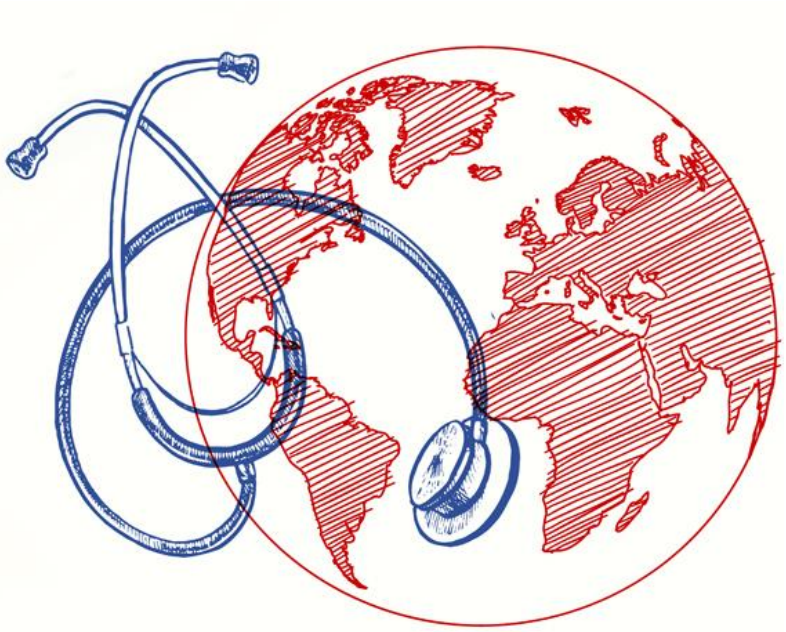
Global Health Cast 66

May 10, 2024



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What we talk about today

- **H5N1 UPDATE: Cows could be the mixing vessel**
- **Study strengthens case to treat COVID-19 with metformin**
- **First effective treatment found for spitting cobra snakebite**
- **AGAIN: What COVID19 vaccines can and cannot accomplish**
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- **Effect of vaccination on global survival**

H5N1 in the USA (CDC, May 9th, 2024)

Wild Birds

Wild Birds Detected

9,349

as of 5/8/2024 | Full Report >

Jurisdictions with Bird Flu in Wild Birds

50

Poultry

Poultry Affected

90,891,636

as of 5/7/2024 | Full Report >

States with Poultry Outbreaks

48

Dairy Cattle

States with Outbreaks in Cattle

9

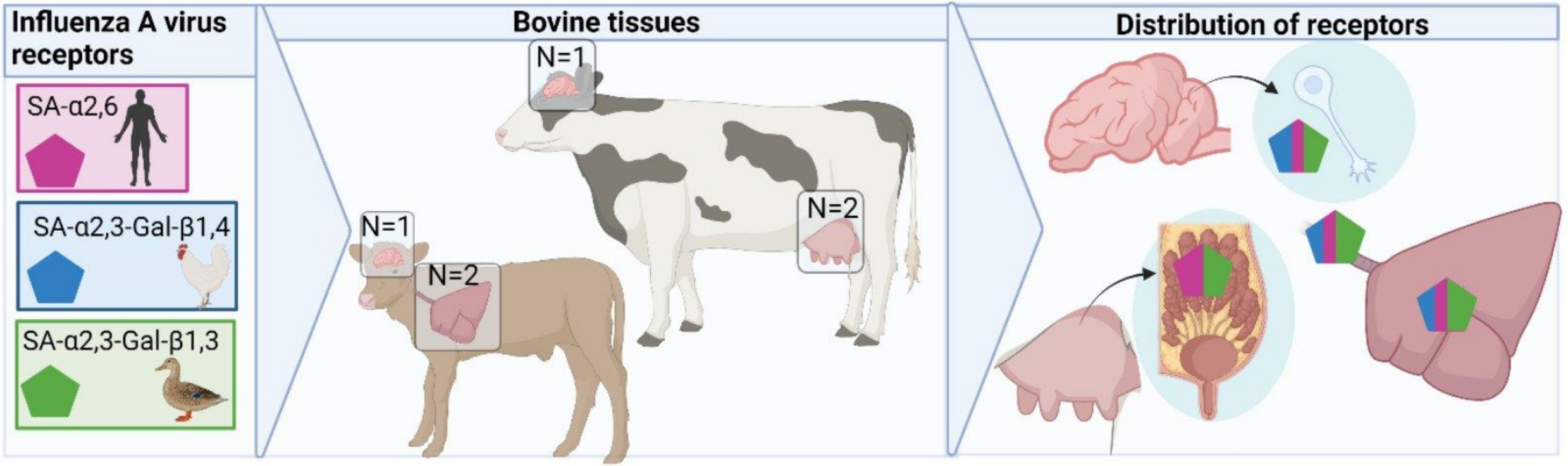
as of 5/9/2024 | Full Report >

Dairy Herds Affected

36

as of 5/9/2024 | Full Report >

H5N1 UPDATE: Cows could be mixing vessel

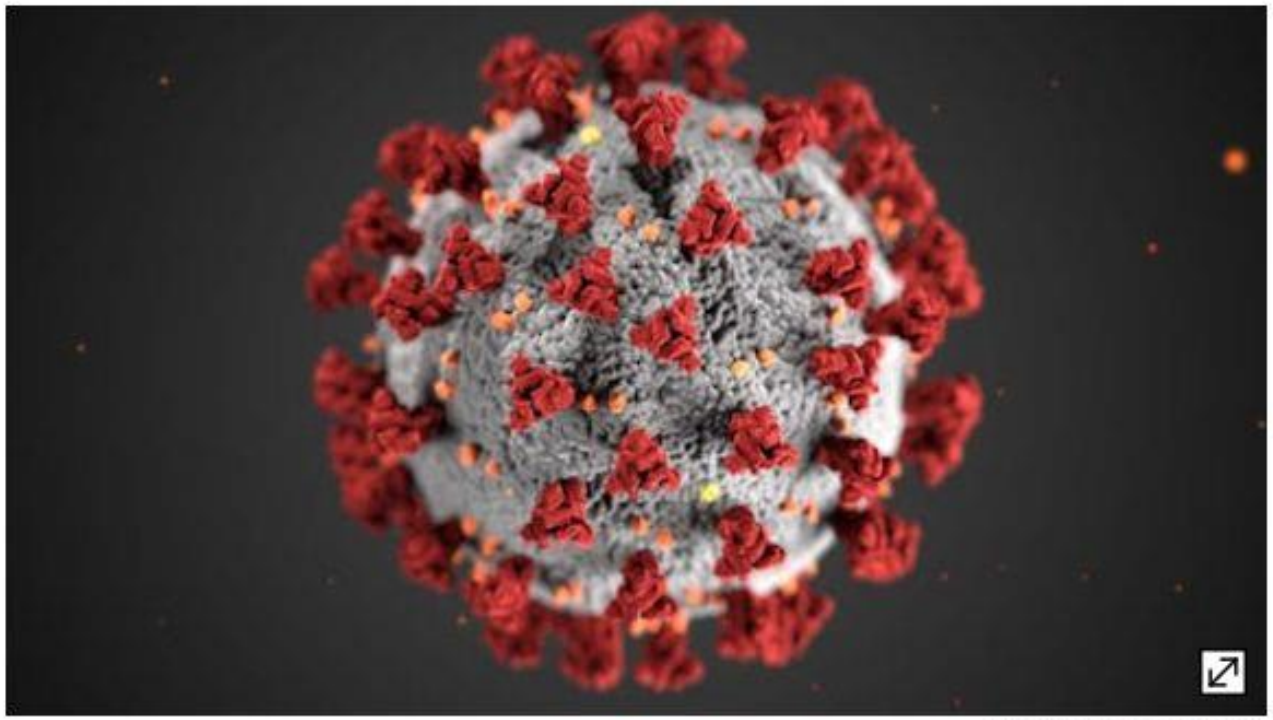


Researchers found that cow mammary glands contain the same kind of mixed flu receptors seen in pigs. This mix of receptors is why scientists call pigs *"evolutionary labs for flu host switching"*

University of Minnesota strengthens case to treat COVID-19 with metformin, not ivermectin

The common anti-diabetes drug lowered viral loads and reduced risks of a second wave of COVID-19 illness in patients.

By Jeremy Olson Star Tribune | MAY 2, 2024 — 3:48PM



VIA TNS, STAR TRIBUNE

The study results also showed that metformin users were less likely to see a rebound in 10 days of their viral loads, which also can be a proxy for the development of post-COVID complications, or long COVID. Researchers of the trial, named COVID-OUT, found no statistically significant evidence of lower viral loads in participants who took ivermectin, an anti-parasitic drug that has been championed by some doctors, politicians and vaccine skeptics. A third drug, fluvoxamine, also showed no benefit.

All 3 drugs had been identified early in the pandemic as promising targets, but a computer simulation singled out metformin for its potential to disrupt the life cycle of SARS-CoV-2.

First effective treatment found for spitting cobra snakebite

NEWS ARTICLE 1 MAY 2024

From: Centre for Snakebite Research & Interventions

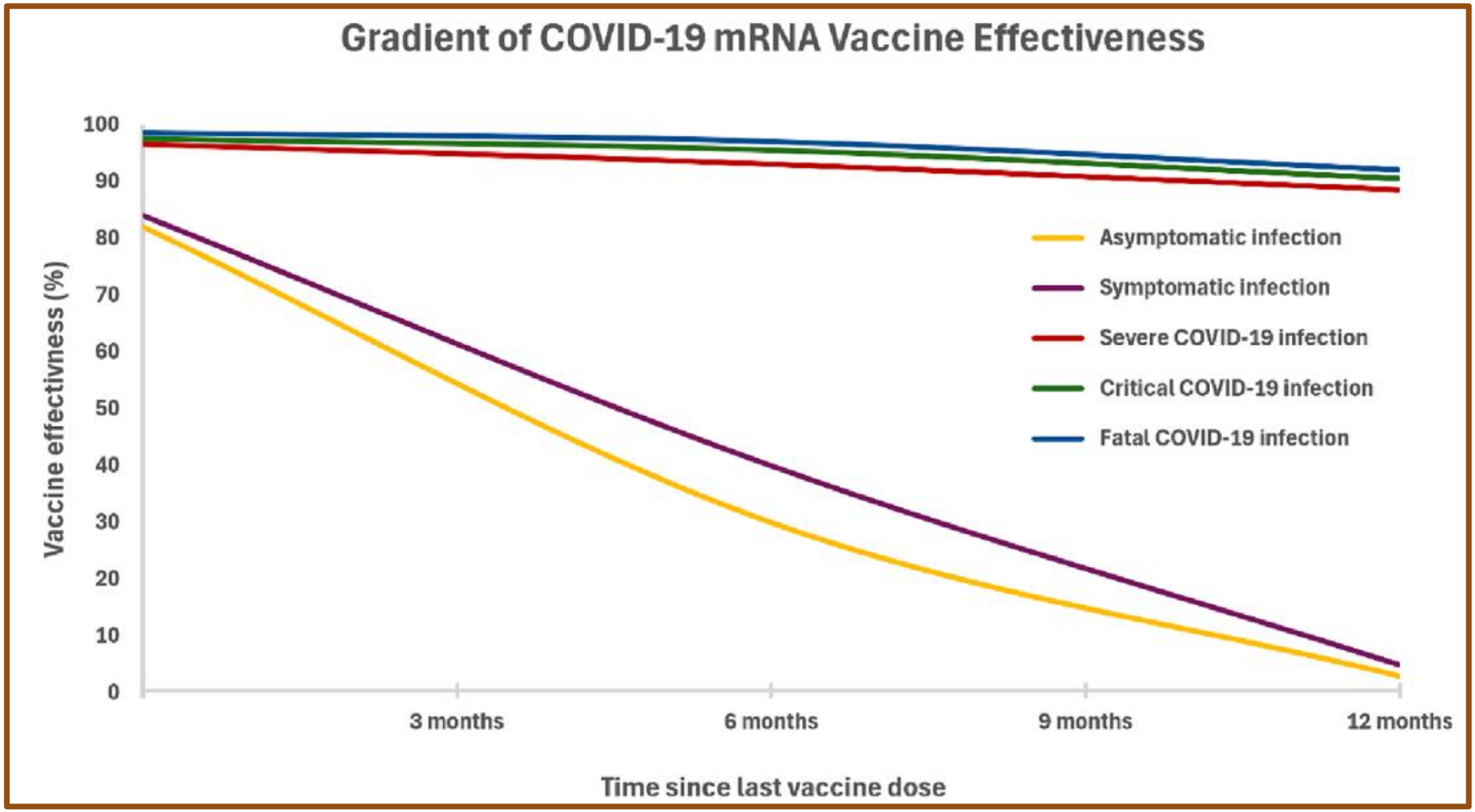
Scientists at Liverpool School of Tropical Medicine have discovered a groundbreaking new snakebite treatment to prevent the devastating tissue damage caused by African spitting cobra venom.

Professor Casewell's team, led by PhD student Keirah Bartlett and Dr Steven Hall, then of LSTM and now of Lancaster University, and also involving researchers from Canada, Denmark, Costa Rica and the USA, first analysed spitting cobra venom to identify the toxins responsible for causing venom-induced dermonecrosis.

The results showed that cytotoxic three-finger toxins (CTx) are largely responsible but that phospholipases A2 (PLA_2) toxins play a critical role in the process. Local injection of the PLA_2-inhibiting drug varespladib reduced the extent of dermonecrosis, even when delivered up to an hour after the venom, and the protection conferred by the drug also extended to venom-induced muscle toxicity.

GLOBAL HEALTH PRESS

Illustrative schematic highlighting the concept of the observed gradient effect in COVID-19 mRNA vaccine effectiveness.

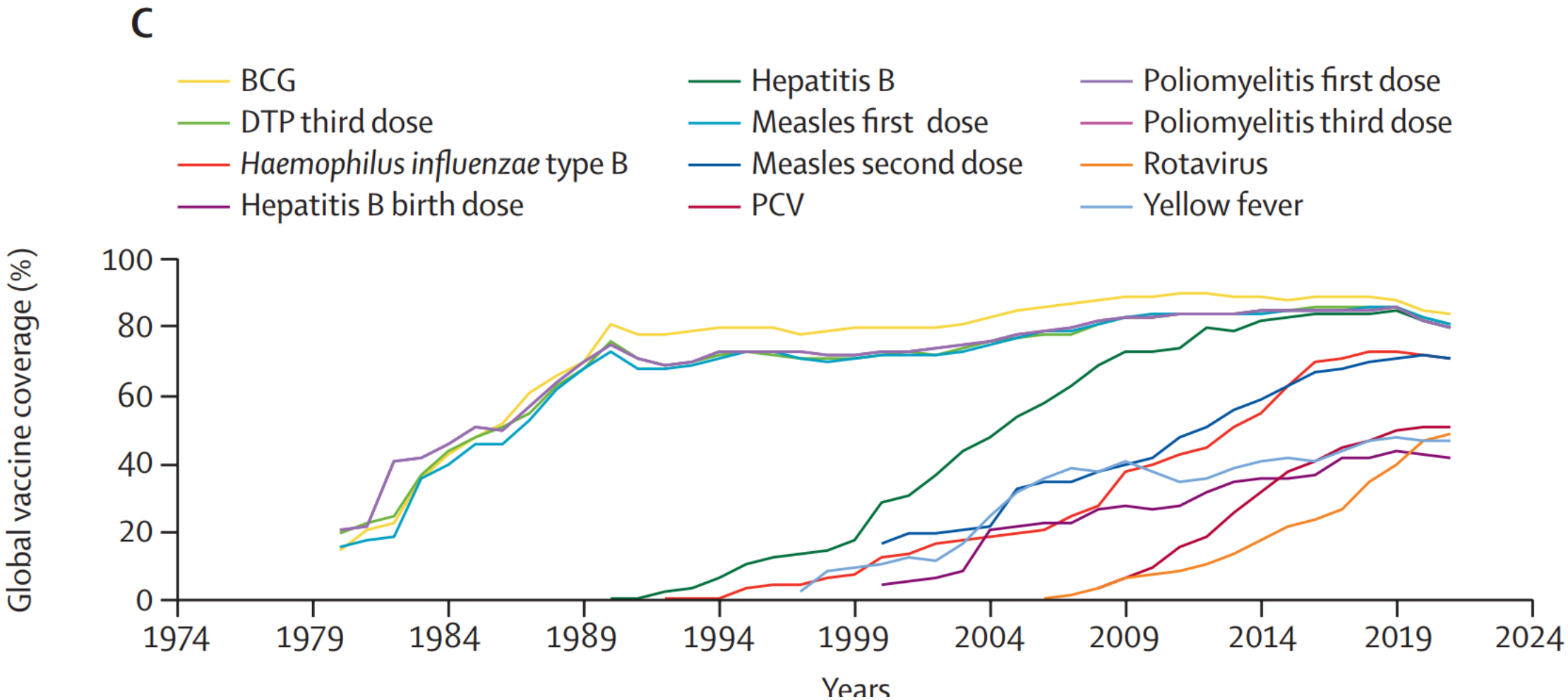


Efficacy of infecting male *Aedes* mosquitos with *Wolbachia* to reduce Dengue infections

- **Background:** Matings between male *Aedes aegypti* mosquitoes infected with the *w*AlbB strain of *Wolbachia* and wildtype females yield non-viable eggs. What is the efficacy of releasing *w*AlbB-infected *A aegypti* male mosquitoes to suppress dengue incidence.
- **Methods:** Large-scale field trials in Singapore involving release of *w*AlbB-infected *A aegypti* male mosquitoes for dengue control. Two large towns (Yishun and Tampines) to adopt an expanding release strategy and two smaller towns (Bukit Batok and Choa Chu Kang) to adopt a targeted-release approach. Releases were conducted two times a week in high-rise public housing estates.
- **Findings:** At-risk population of 607 872 individuals in intervention sites and 3 894 544 individuals living in control sites. Interventions demonstrated up to 77·28% (121/156, 95% CI 75·81–78·58) intervention efficacy despite incomplete coverage across all towns. Intervention efficacies increased as release coverage increased across all intervention sites (2242 (95% CI 2092–2391) fewer cases per 100 000 people. Secondary analysis showed that these intervention effects were replicated across all age groups and both sexes for intervention sites.
- **Interpretation:** Our results demonstrated the potential of *Wolbachia*-mediated incompatible insect technique for strengthening dengue control in tropical cities, where dengue burden is the greatest.

Lim JT et al., 2024, Lancet Microbe: https://doi.org/10.1016/S2666-5247(23)00397-X

Vaccine Uptake Globally



Shattock et al., The Lancet 2024: DOI:https://doi.org/10.1016/S0140-6736(24)00850-X

Benefits of Vaccination on Survival Globally 1974-2024

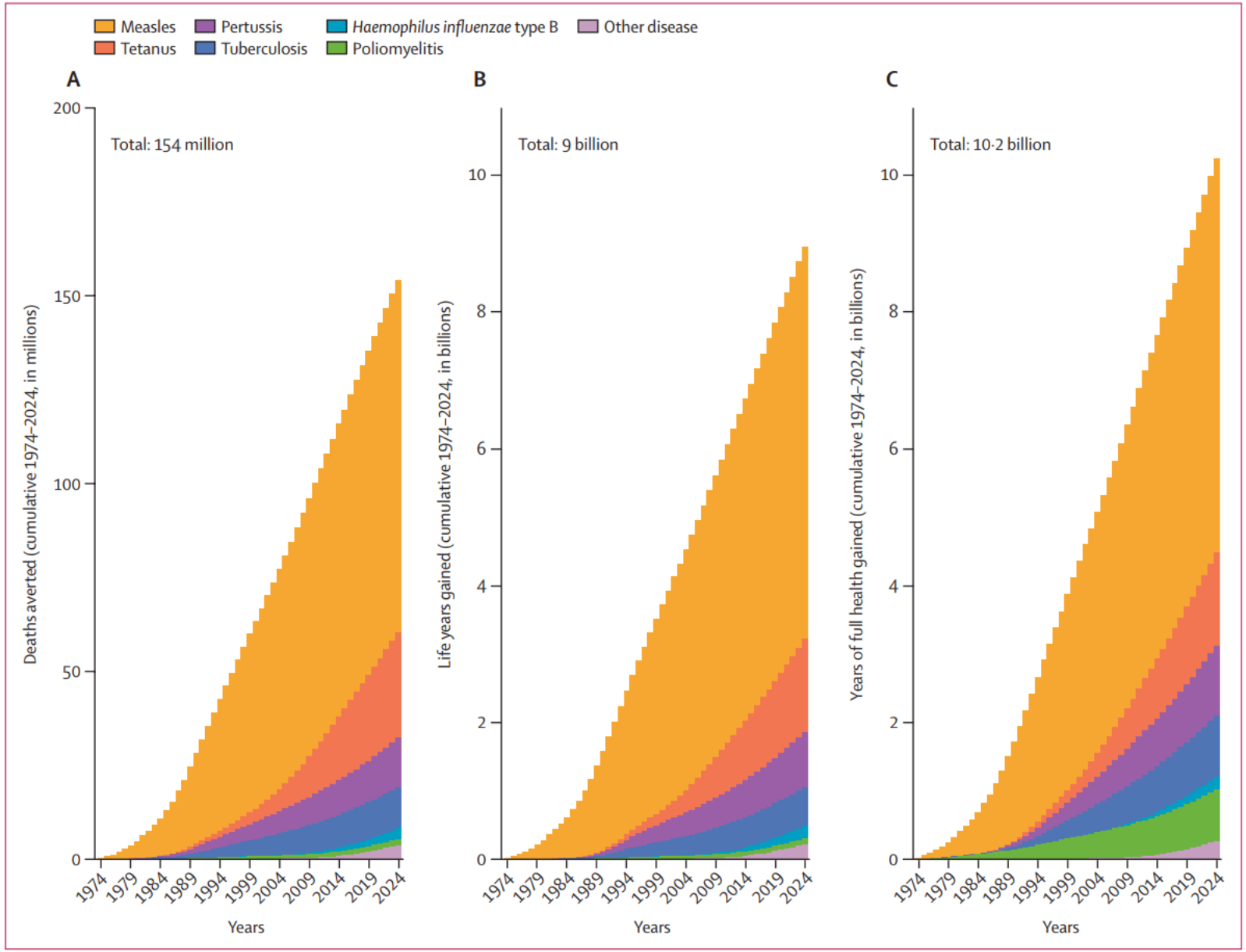


Figure 1: **Deaths averted, years of life saved, and years of full health gained due to vaccination**
Data are cumulative 1974–2024. Measles: deaths averted: 93·7 million; years of life saved: 5·7 billion; years of full health gained: 5·8 billion. Tetanus: deaths averted: 27·9 million; years of life saved: 1·4 billion; years of full health gained: 1·4 billion. Pertussis: deaths averted: 13·2 million; years of life saved: 0·8 billion; years of full health gained: 1 billion. Tuberculosis: deaths averted: 10·9 million; years of life saved: 0·6 billion; years of full health gained: 0·9 billion. Haemophilus influenzae type B: deaths averted: 2·8 million; years of life saved: 0·2 billion; years of full health gained: 0·2 billion. Poliomyelitis: deaths averted: 1·6 million; years of life saved: 0·1 billion; years of full health gained: 0·8 billion. Other diseases: deaths averted: 3·8 million; years of life saved: 0·2 billion; years of full health gained: 0·3 billion.

Shattock et al., The Lancet 2024: DOI:https://doi.org/10.1016/S0140-6736(24)00850-X

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