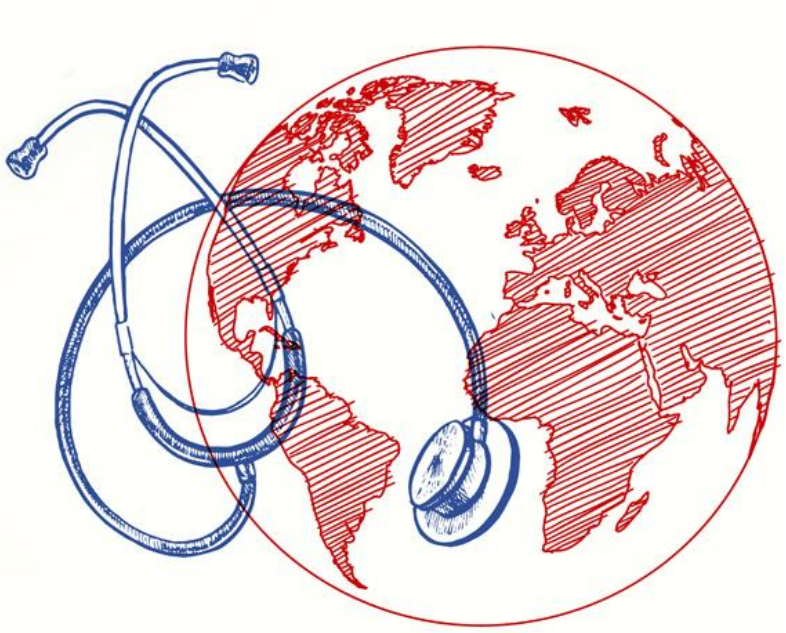
Global Health Cast 68

May 27, 2024



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What we talk about today

- Singing rehabilitates speech production in post-stroke aphasia
- Renewed hopes for an effective HIV vaccine
- Reminding travelers -
  - Global measles situation
  - *S. pyogenes* (group A streptococcus; "GAS") outbreaks
  - Outbreaks - and general recommendations

Singing rehabilitates speech production in post-stroke aphasia. Researchers at the University of Helsinki investigated the rehabilitative effect of singing on the brain.

Structural Neuroplasticity Effects of Singing in Chronic Aphasia

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Abstract

Singing-based treatments of aphasia can improve language outcomes, but the neural benefits of group-based singing in aphasia are unknown. Here, we set out to determine the structural neuroplasticity changes underpinning group-based singing-induced treatment effects in chronic aphasia. Twenty-eight patients with at least mild nonfluent poststroke aphasia were randomized into two groups that received a 4-month multicomponent singing intervention (singing group) or standard care (control group). High-resolution T1 images and multishell diffusion-weighted MRI data were collected in two time points (baseline/5 months). Structural gray matter (GM) and white matter (WM) neuroplasticity changes were assessed using language network region of interest-based voxel-based morphometry (VBM) and quantitative anisotropy-based connectometry, and their associations to improved language outcomes (Western Aphasia Battery Naming and Repetition) were evaluated. Connectometry analyses showed that the singing group enhanced structural WM connectivity in the left arcuate fasciculus (AF) and corpus callosum as well as in the frontal aslant tract (FAT), superior longitudinal fasciculus, and corticostriatal tract bilaterally compared with the control group. Moreover, in VBM, the singing group showed GM volume increase in the left inferior frontal cortex (Brodmann area 44) compared with the control group. The neuroplasticity effects in the left BA44, AF, and FAT correlated with improved naming abilities after the intervention. These findings suggest that in the poststroke aphasia group, singing can bring about structural neuroplasticity changes in left frontal language areas and in bilateral language pathways, which underpin treatment-induced improvement in speech production.

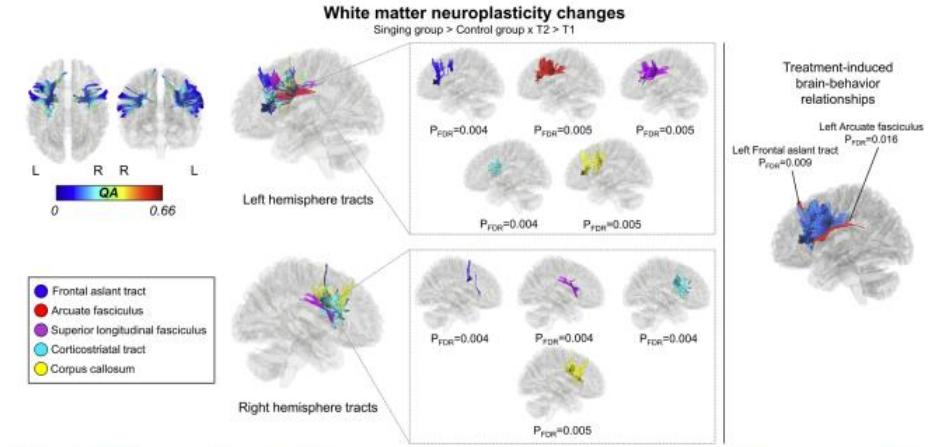


Figure 3. Treatment-induced WM neuroplasticity changes. Connectometry results displaying the significant segments of the tracts with longitudinal QA increases significantly associated with singing group versus control group between T1 and T2 (ΔT2–T1; left) and longitudinal QA change correlation with improved naming (right). FDR, false discovery rate; L, left; QA, quantitative anisotropy; R, right.

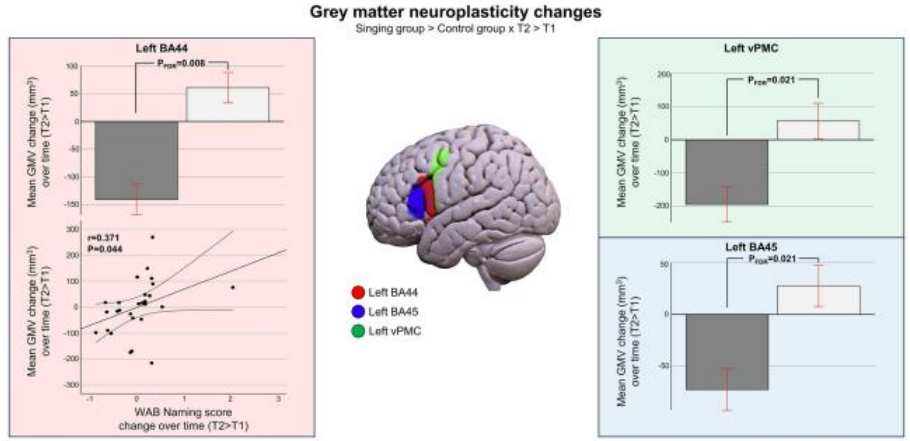
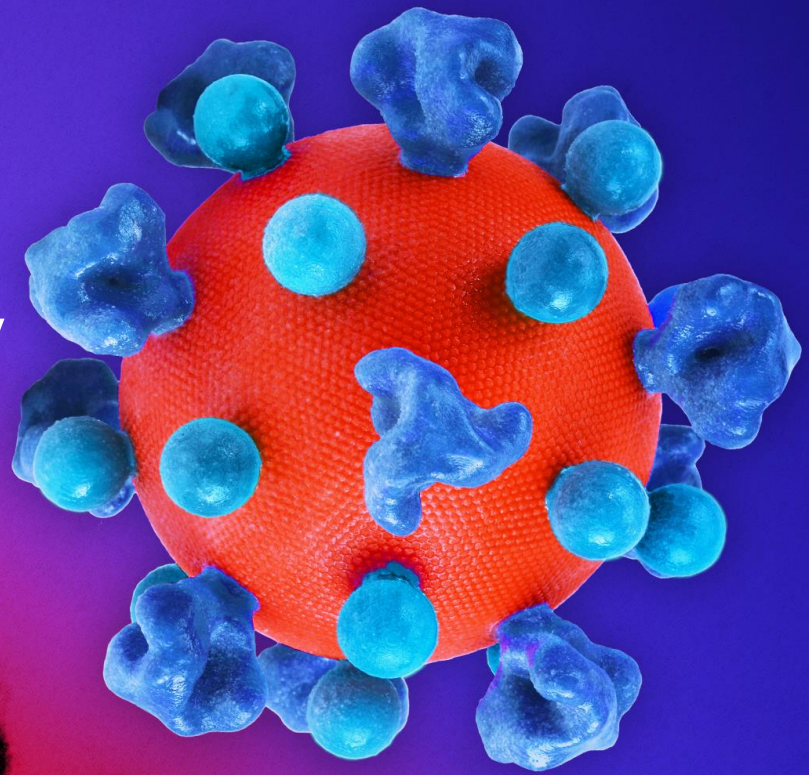


Figure 4. Treatment-induced GM neuroplasticity changes. Longitudinal GM volume increases (singing group > control group) in T2 > T1 and longitudinal GM volume change correlation with improved naming. Additional exploratory voxel-wise analyses are reported in Extended Data Figure 4-1. Bar plots for mean group GM volume changes are shown: bar, mean; error bar, standard error of mean. BA, Brodmann area; FDR, false discovery rate; vPMC, ventral premotor cortex.

HIV VACCINE AWARENESS DAY

MAY 18th



Despite 20 years of failures in major HIV vaccine trials — four this decade alone — researchers say recent scientific advances have likely, hopefully, put them on the right track to develop a highly effective vaccine against the insidious virus.

But probably not until the 2030s.

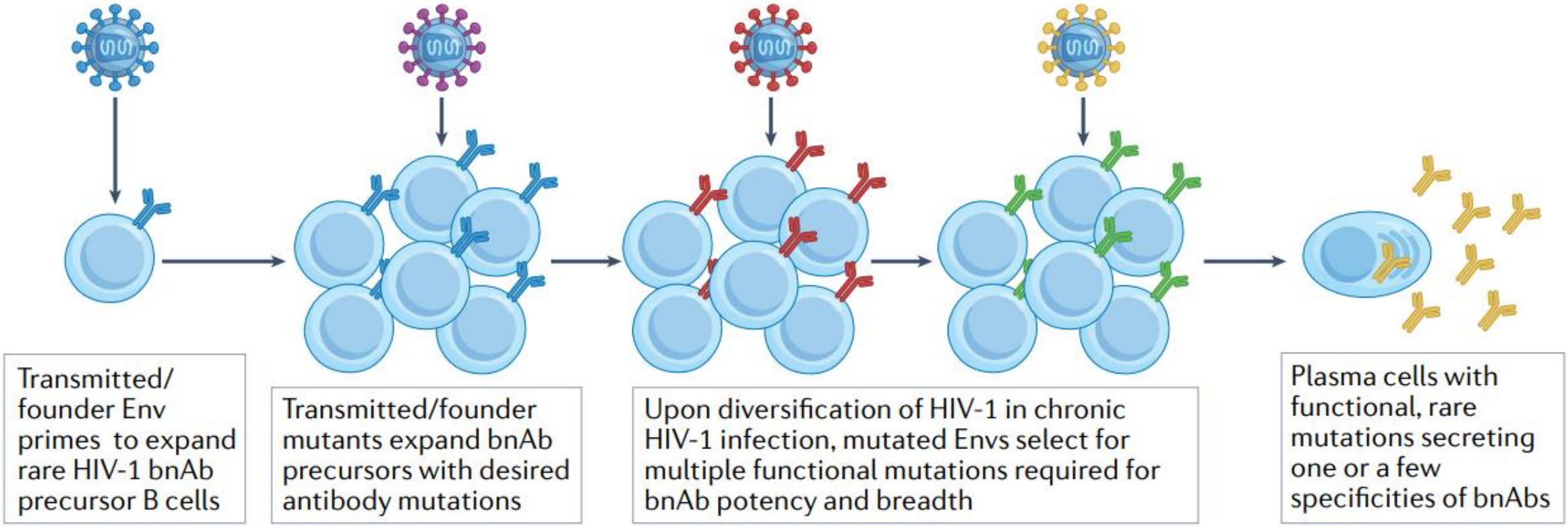
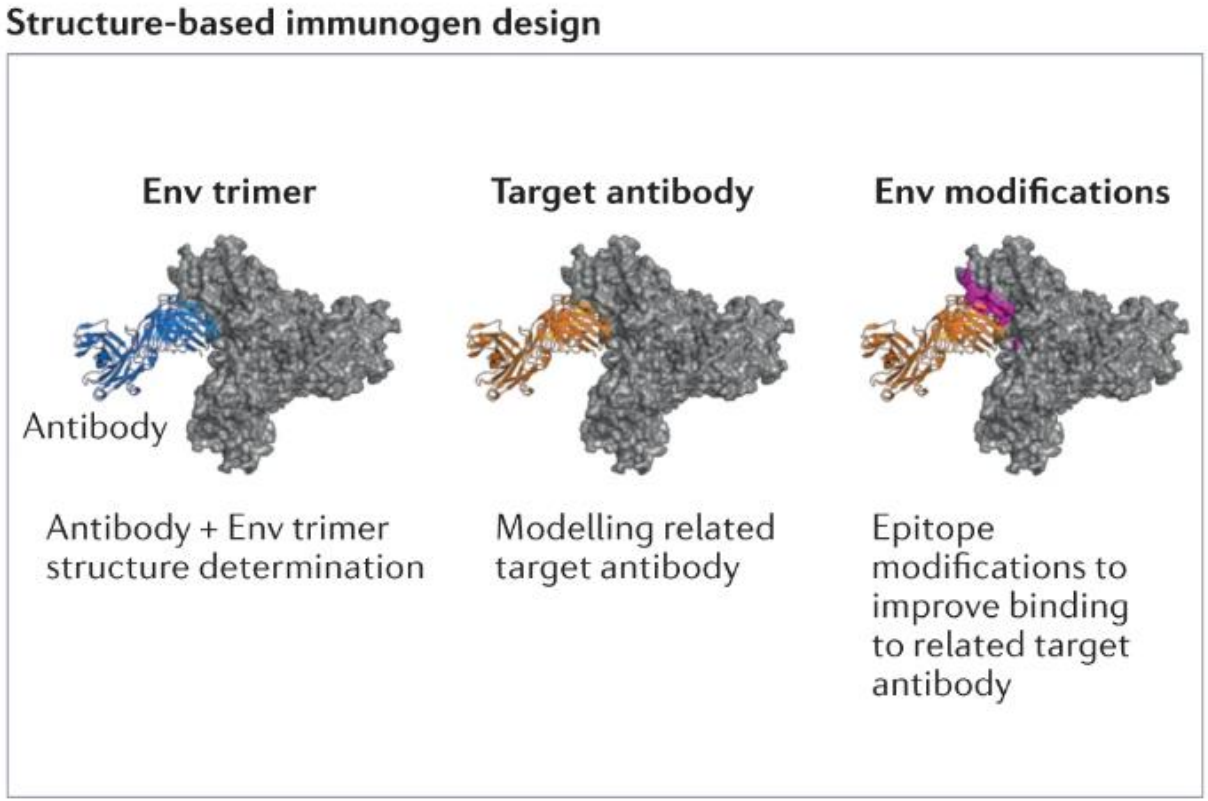
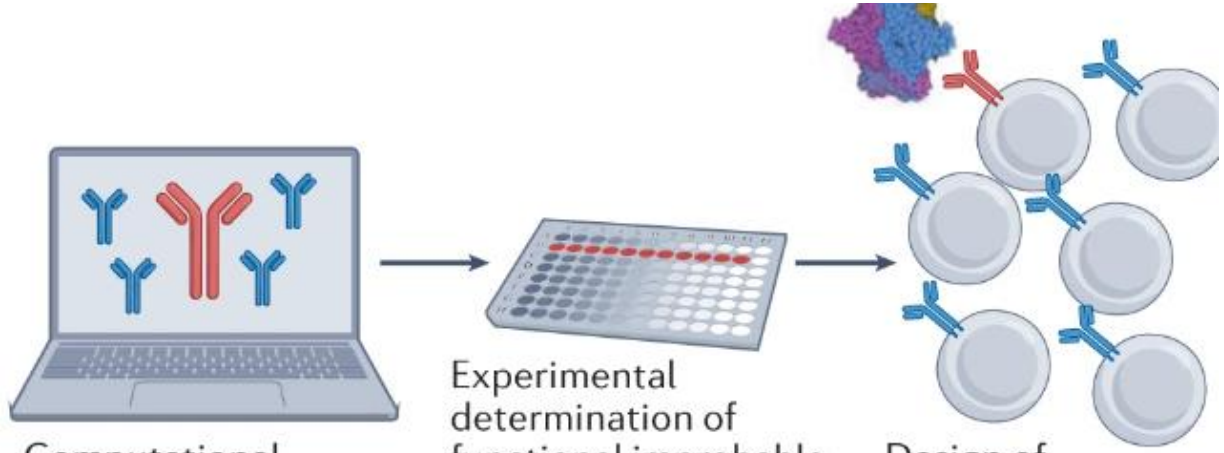


Fig. 1 | **Model of broadly neutralizing antibody development in humans.** In individuals infected with HIV-1, viral diversification of envelope (Env) sequences was found to be required for broadly neutralizing antibody (bnAb) development[33]. From this work came the concept of transmitted/founder Envs that initiate the infection and B cell lineage design whereby sequential immunogens are chosen from autologous evolved viruses that induced bnAbs, or are structurally designed to have affinity gradients across maturing lineage members and to select for desired mutations to favour bnAb development. bnAb development follows a 'jackpot effect', where each individual with HIV-1 who makes bnAbs has only one or very few bnAb B cell lineages that have made it through a tortuous bnAb maturation pathway requiring multiple rare events stimulated by evolving virus.



Structure-based immunogen design is based on the determination of bnAb–Env complexes that provide atomic-level information that is necessary to computationally model specific bnAbs as templates for immunogen design.

Mutation-guided immunogen design aims to identify the improbable mutations in bnAbs that are not routinely generated by somatic hypermutation but are critical for broad neutralization. These are then used to inform the design of immunogens that can specifically select for these mutations

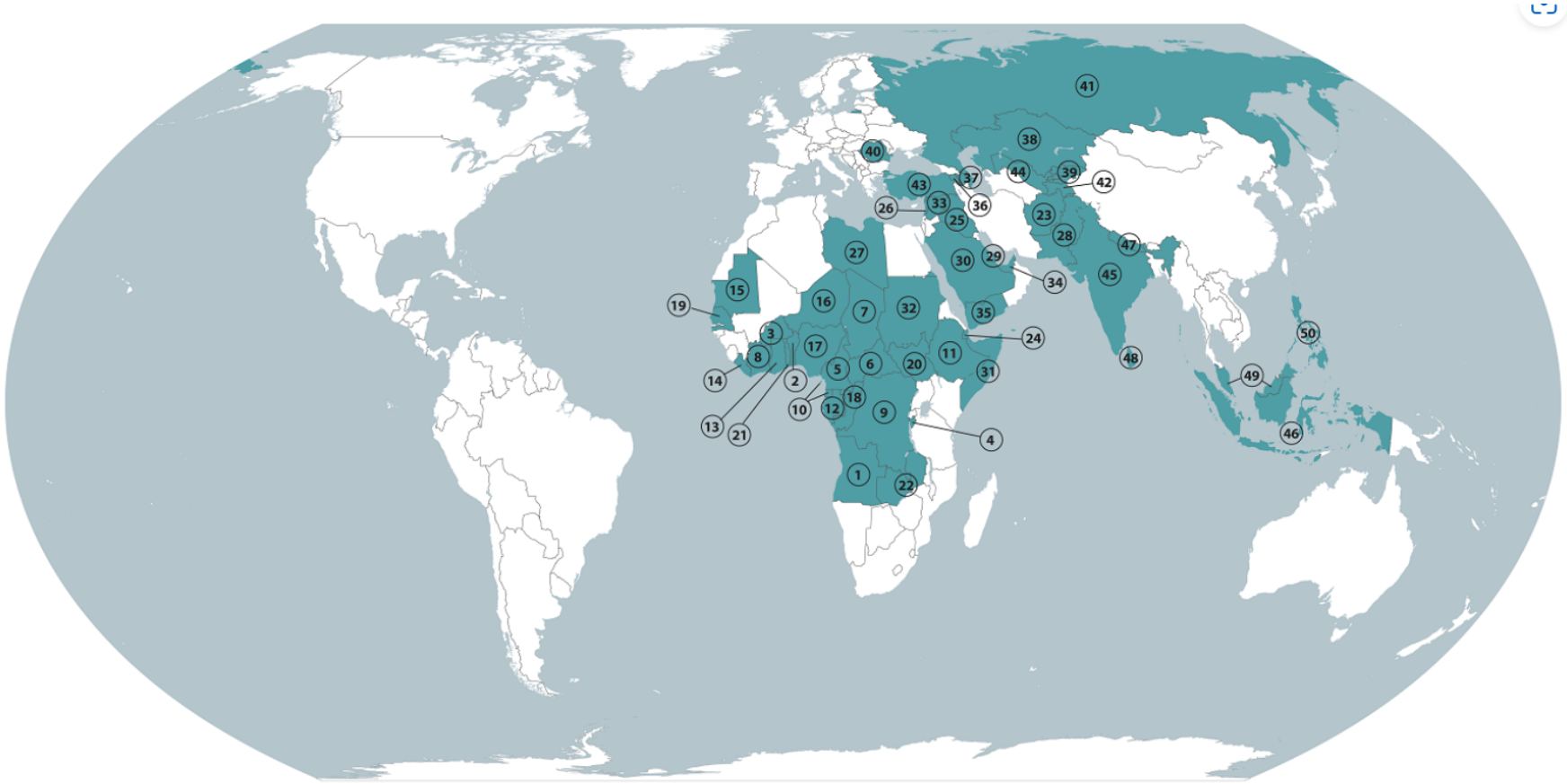


Measles outbreaks around the globe

- Destinations are reporting increased numbers of cases of measles.
- Travelers are at if they not been **fully vaccinated at least two weeks prior** to departure or have not had measles in the past and travel internationally.
- Majority of imported measles cases occur in unvaccinated U.S. residents infected during international travel.
- All international travelers should be fully vaccinated against measles with the measles-mumps-rubella (MMR) vaccine, including an early dose for infants 6–11 months, according to CDC's measles vaccination recommendations for international travel.
- Travelers should seek medical care if they develop a rash, high fever, cough, runny nose, or red, watery eyes. Measles is highly contagious. Travelers with suspected measles should **notify the healthcare facility before visiting** so staff can implement precautions to prevent spread within the facility. Case fatality is 1:1,000, higher in the immunosuppressed.

Measles around the globe

US cases shown next slide



Measles THN by WHO Region

AFRICA

1. Angola
2. Benin
3. Burkina Faso
4. Burundi
5. Cameroon
6. Central African Republic
7. Chad
8. Cote d'Ivoire
9. Dem. Rep. of the Congo
10. Equatorial Guinea
11. Ethiopia
12. Gabon
13. Ghana
14. Liberia
15. Mauritania
16. Niger
17. Nigeria
18. Rep. of the Congo
19. Senegal
20. South Sudan
21. Togo
22. Zambia

EASTERN MEDITERRANEAN

23. Afghanistan
24. Djibouti
25. Iraq
26. Lebanon
27. Libya
28. Pakistan
29. Qatar
30. Saudi Arabia
31. Somalia
32. Sudan
33. Syria
34. United Arab Emirates
35. Yemen

EUROPE

36. Armenia
37. Azerbaijan
38. Kazakhstan
39. Kyrgyzstan
40. Romania
41. Russia
42. Tajikistan
43. Turkey (Türkiye)
44. Uzbekistan

SOUTH-EAST ASIA

45. India
46. Indonesia
47. Nepal
48. Sri Lanka

WESTERN PACIFIC

49. Malaysia
50. Philippines

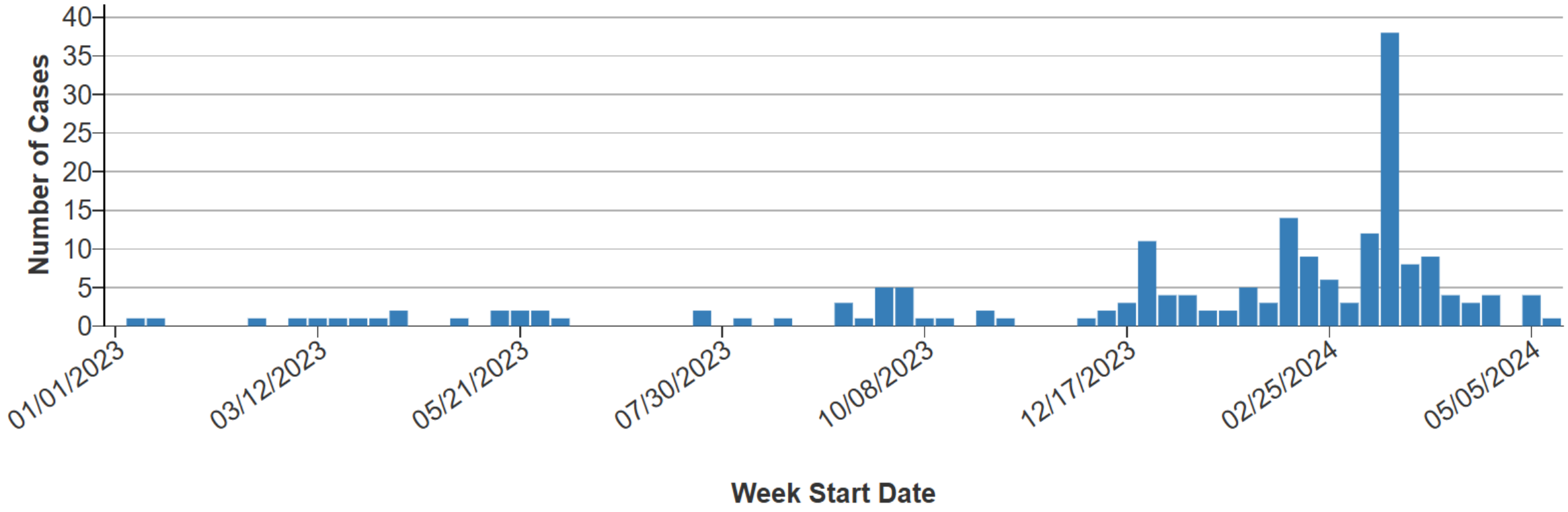
Measles Travel Health Notice

GLOBAL HEALTH PRESS

Measles in the USA, 2023 - 2024

Weekly Measles Cases by Rash Onset Date

2023-2024* (as of May 16, 2024)



INCREASE IN INVASIVE GROUP A STREPTOCOCCAL INFECTIONS IN NEW YORK STATE

New York City Health Advisory | April 7, 2023

In **December 2022**, the Centers for Disease Control and Prevention (CDC) issued a Health Alert Network (HAN) Health Advisory to notify clinicians and public health authorities of an increase in pediatric invasive group A streptococcal infections in **several states**. At that time, an increase in invasive group A streptococcal infections was not observed in New York State (NYS).

Recent surveillance data in NYS, and in New York City (NYC), demonstrate an increase in invasive group A streptococcal infections during **2023** compared to pre-pandemic years, **primarily among persons aged 65 and older, though small increases are being seen in children.**

Statewide, including NYC, there have been over **450 cases of invasive group A streptococcal infections** reported during the **first three months of 2023**. This is almost **twice as many as the average** for these same three months in the previous five years. Providers in NYS and NYC have reported severe outcomes of group A streptococcal infections, including:

- **Invasive: Necrotizing fasciitis; streptococcal toxic shock syndrome; death**
- **Also acute hypoxic respiratory failure; empyema; osteomyelitis, septic arthritis**

More to consider for travelers (an unsystematic summary)

- Yellow fever (Bolivia MoH)
- Flooding in Brazil
- Europe: Pertussis (ECDC)
- Australia: Ross River Fever (>2500 cases in Queensland) (Department of Health)
- India: West Nile Virus; Kyasanur Forest Disease
- Lebanon: HAV (MoH)
- Umrah und Hajj (see last GHC)
  - DPT, MMR_V, meningococcus, polio, COVID19, influenza, HAV, HBV,
    - follow KSA recommendations
- **Travel advice (who.int); Public Health Offices; Ministries of foreign affairs**

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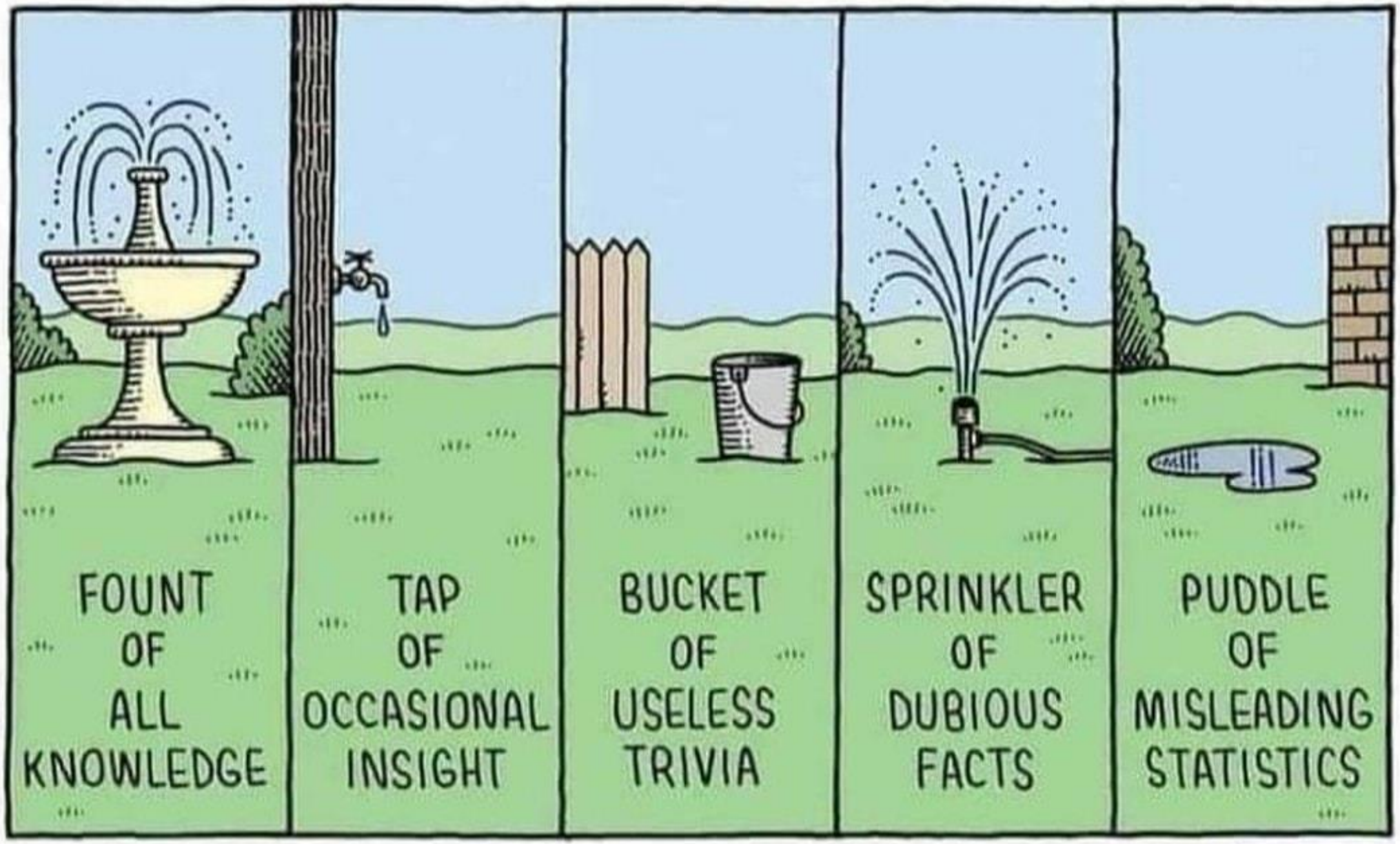
FOUNT OF ALL KNOWLEDGE
TAP OF OCCASIONAL INSIGHT
BUCKET OF USELESS TRIVIA
SPRINKLER OF DUBIOUS FACTS
PUDDLE OF MISLEADING STATISTICS