



Takeda's overarching global health priorities with dengue

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For use on website: Tackling Emerging Infectious Threats through
Innovative Collaboration in the Era of Climate
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Disclaimers





- This presentation is intended to highlight Takeda's efforts to help address a key human health impacts of climate change. It provides a high level overview of Takeda's focus in dengue, including information about Takeda's dengue vaccine candidate as part of a comprehensive integrated strategy to combat dengue.
- Nothing contained herein should be considered a solicitation, promotion or advertisement for any prescription drugs including the ones under development. Takeda's Dengue vaccine candidate (TAK-003) has not been approved for any indication in Azerbaijan, including the indications under investigation in the trials or studies discussed herein and there is no guarantee it will be approved for such use in Azerbaijan.

The burden of dengue is significant and growing with climate change a contributing factor^{1,2}

Fastest-spreading vector-borne viral disease worldwide^{1,3}

 Incidence **increased 10-fold** in the last 20 years²

-  • **Climate change**^{5,6}
• **Urbanization and population growth**^{5,6}
• **Increased travel**⁶


 **Grade 3** WHO grade 3 multi-country emergency⁷




Considerable burden on individuals and healthcare systems^{1,2}

 Each year, up to an estimated:

390 million infections ⁴	500,000 hospitalizations ⁸	40,500 deaths ⁹
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 ~**25%** of cases are symptomatic,¹⁰ of which:
| ~**5% severe dengue**¹¹
| ~**30% have persistent dengue symptoms**¹²⁻¹⁴

 **Overwhelming healthcare systems** during outbreaks¹⁵

 **Disrupting travel plans**¹⁶

WHO, World Health Organization.

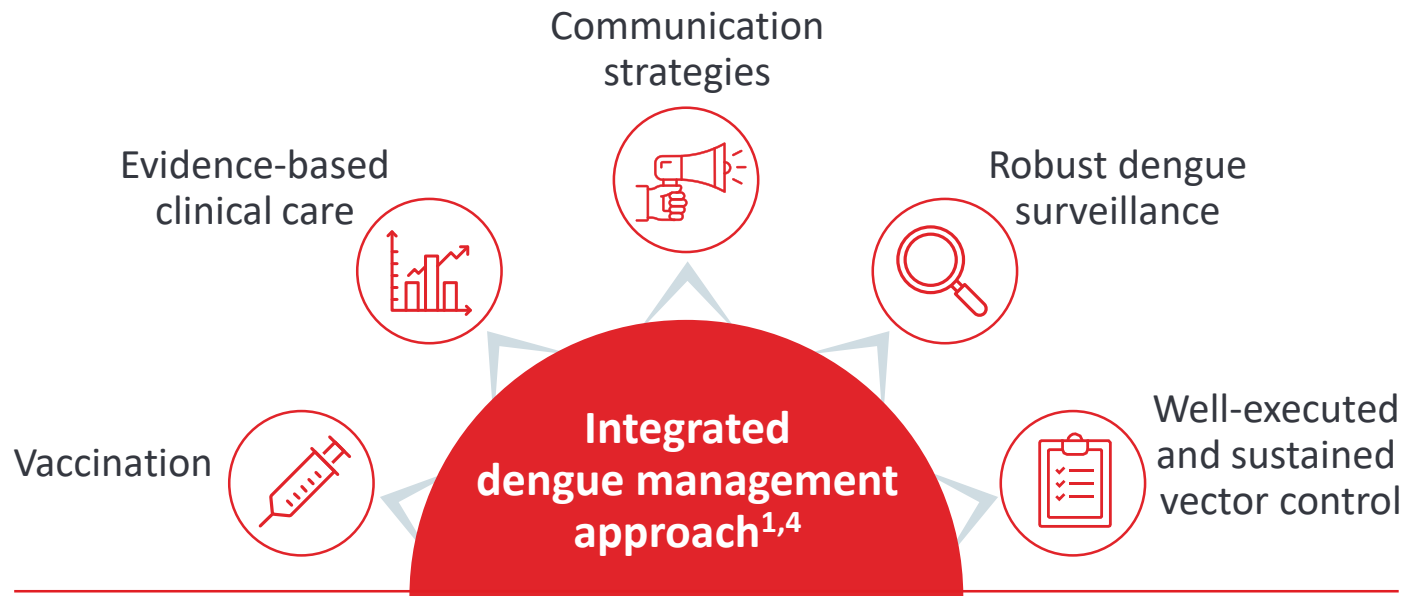
1. Jing Q, Wang M. *Glob Health J.* 2019;3:37-45; 2. WHO. Disease Outbreak News. Dengue – Global Situation. 2023. Available at: <https://www.who.int/emergencies/disease-outbreak-news/item/2023-DON498> (accessed March 2024); 3. Schaefer TJ, et al. Dengue Fever. 2019. Available at: <https://www.ncbi.nlm.nih.gov/books/NBK430732/> (accessed May 2024) 4. WHO. Dengue and severe dengue. 2024. Available at: <https://www.who.int/en/news-room/fact-sheets/detail/dengue-and-severe-dengue> (accessed March 2024); 5. Messina JP, et al. *Nat Microbiol.* 2019;4:1508-15; 6. Ebi KL, et al. *Environ Res.* 2016;151:115-23; 7. WHO. Message by the Director of the Department of Immunization, Vaccines and Biologicals at WHO. 2024. Available at: <https://www.who.int/news/item/31-01-2024-message-by-the-director-of-the-department-of-immunization-vaccines-and-biologicals-at-who---january-2024> (accessed April 2024); 8. Khan MB, et al. *J Infect Public Health.* 2023;16:1625-42; 9. GBD 2017 Causes of Death Collaborators. *Lancet.* 2018;392:1736-88; 10. Wilder-Smith A. *Curr Infect Dis Rep.* 2018;20:50; 11. CDC. Travel-related infectious diseases. In: *Dengue*, 2024. <https://wwwnc.cdc.gov/travel/yellowbook/2020/travel-related-infectious-diseases/dengue> (accessed April 2024); 12. Schulte A, et al. *Emerg Infect Dis.* 2020;26:751-5; 13. Zeng W, et al. *Am J Trop Med Hyg.* 2018;99:1458-65; 14. Tiga-Loza DC, et al. *Trans R Soc Trop Med Hyg.* 2020;114:355-64; 15. Leung XY, et al. *PLoS Negl Trop Dis.* 2023;17:e0010631; 16. Bulugahapitiya U, et al. *Eur J Intern Med.* 2007;18:185-92.

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An integrated approach to dengue management is recommended¹.

- **No proven curative treatments** for dengue; the focus is on managing symptoms^{2,3}
- Dengue **prevention is paramount** and the WHO calls for vaccination to be part of an **integrated strategy**^{1,2,4,5}



WHO critical actions to achieve 2030 targets in dengue control⁵

- Vaccines for all at-risk populations
- Evidence base for vector control strategies
- Reduced mosquito habitats
- Financial commitment

Takeda is contributing to the reduction in the burden of dengue through its innovation in vaccine development

WHO, World Health Organization.

1. WHO. Weekly epidemiological record. 2018;93:457–76; 2. Obi JO, et al. *Trop Med Infect Dis.* 2021;6:180; 3. Jasamai M, et al. *J Pharm Sci.* 2019;22:440–56; 4. WHO position paper on dengue vaccines – May 2024. Available at: <https://iris.who.int/bitstream/handle/10665/376641/WER9918-eng-fre.pdf> (accessed May 2024); 5. WHO. Ending the neglect to attain the Sustainable Development Goals. A road map for neglected tropical diseases 2021-2030. 2020. Available at: <https://www.who.int/publications/i/item/9789240010352> (accessed March 2024).

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Developing Takeda's TAK-003 has been a challenge that has taken many decades¹

Achieve **appropriate attenuation** (for live-attenuated vaccines)²



Induce **balanced immune response** against **all four serotypes**^{2,3}



Consider **epidemiological differences**⁴



Evaluate long-term safety and efficacy **regardless of prior dengue exposure**^{1,5}



Meet the **needs of immunization programs**³



Tackling health related impacts of climate change requires long term commitment and resourcing

1. Thomas SJ, *NPI Vaccines*. 2023;8:55; 2. Pollard AJ, and Bijker EM, *Nature Reviews Immunology* 2021;21.2:83-100; 3. WHO. Dengue guidelines for diagnosis, treatment, prevention and control. 2009. Available at [DHF_guidelines_COVER.indd \(who.int\)](#) (accessed May 2024); 4. WHO. Guidelines on the quality, safety and efficacy of dengue tetravalent vaccines (live,attenuated), Annex 2, TRS No 979. 2013. Available at: https://www.who.int/publications/m/item/TRS_979_annex-2-dengue (accessed March 2024); 5. Vannice KS, et al. *Vaccine*. 2018;36:3411–7.

Takeda's TAK-003 is registered in various countries with additional recommendations on use



Registered in over 40 countries*

- Use regardless of serostatus



WHO position recommends consideration for inclusion in public immunization programs¹

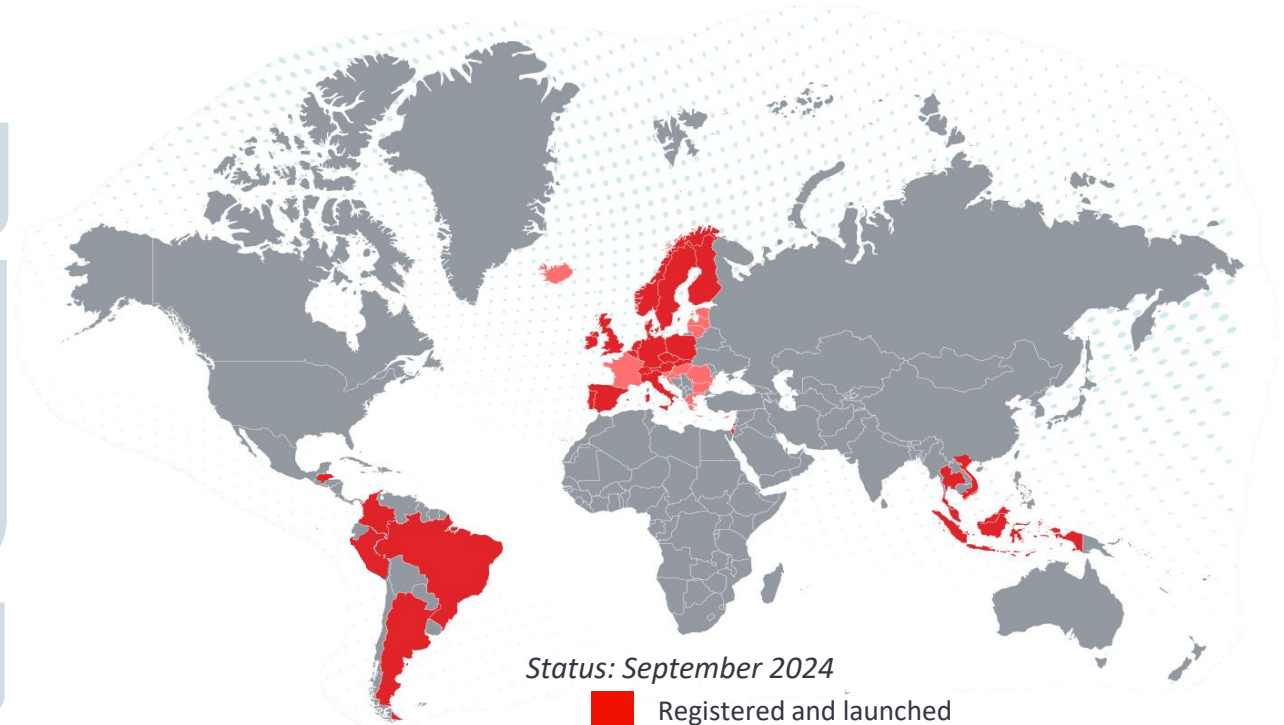
- High dengue transmission intensity
- 6–16 years of age
- No pre-screening
- Well-designed communication strategy



PAHO recommendation issued - March 2024²



WHO pre-qualification – May, 2024³



First public program in Brazil:
6 to 16 year of age- Feb 2024⁴



Argentina: Regional programs. Target population is 15 to 39 years old. Start with 15 to 19 year of age April, 2024⁵

*Indications and official recommendations for TAK -003 may vary in different countries/regions. Takeda's Dengue vaccine candidate (TAK-003) has not been approved for any indication in Azerbaijan, including the indications under investigation in the trials or studies discussed herein and there is no guarantee it will be approved for such use in Azerbaijan.

WHO, World Health Organization

1. WHO recommends R21/Matrix-M vaccine for malaria prevention in updated advice on immunization. Available at: <https://www.who.int/news/item/02-10-2023-who-recommends-r21-matrix-m-vaccine-for-malaria-prevention-in-updated-advice-on-immunization> (accessed February 2024); 2. <https://iris.paho.org/handle/10665.2/59314>; 3. <https://www.who.int/news/item/15-05-2024-who-prequalifies-new-dengue-vaccine>; 4. [https://www.thelancet.com/journals/laninf/article/PIIS1473-3099\(24\)00310-4/abstract?rss=yes](https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(24)00310-4/abstract?rss=yes); 5. https://www.argentina.gob.ar/sites/default/files/2024/03/07-05-acta-conain-11-04-2024_revison.pdf

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The commitment and broadening of access are the key priorities of Takeda in the near future. We will pursue these goals with restless efforts



Demonstrating Commitment

Partnerships and initiatives to **demonstrate Takeda's commitment to dengue prevention and public health**



Evidence Generation

Ongoing and post-licensure studies will **continue to generate evidence on TAK-003** and strengthen the overall footprint in the integrated strategy



Broadening access

We aim for broadening access. Takeda is committed to sustainable supply - **100 million doses/year by 2030** at the latest¹

1. <https://www.takeda.com/newsroom/newsreleases/2024/collaboration-to-accelerate-access-to-dengue-vaccine/>



Better Health, Brighter Future

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