

## AIMS: The last baby celebration

This past January, the last AIMS baby was born. Since the first birth in September 2019, we have welcomed babies into our study for five and a half years. While the youngest child's life is just beginning, the oldest AIMS child is already in second grade.



## First Publication Using AIMS Data



Photo: Nicholas Pucci, Researcher at Amsterdam UMC.

At birth, a baby's intestines contain very few bacteria. Immediately afterward, the gut microbiome begins to develop through contact with the mother, feeding, and the environment. A key bacterium in this process is *Bifidobacterium longum* (B. longum), which aids in digesting breast milk and supports the baby's gut health. Researcher Nicholas Pucci from Amsterdam UMC studied the microbiome of babies at 1 and 6 months and examined the role of this bacterium. This study marks the first publication based on AIMS data, a valuable contribution made possible by participants' willingness to provide samples.

Research by Nicholas Pucci (Amsterdam UMC) and colleagues shows that the composition of *Bifidobacterium longum* changes during the first six months of a baby's life. There are two key subspecies of

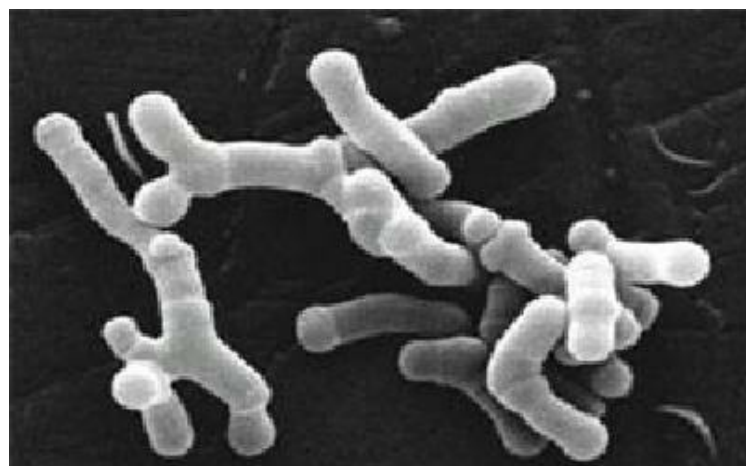
B. longum:

- **B. longum 'longum'** – This subspecies is most common in one-month-old babies.
- **B. longum 'infantis'** – This subspecies typically becomes dominant around six months, especially in breastfed babies.

Pucci explains: "We observed that *infantis* increased compared to *longum* in babies who were breastfed for up to six months. The transition between these bacterial strains is linked to feeding. Breast milk contains specific sugars that these bacteria can break down, and one subspecies is better at this than the other.



Breastfeeding a baby. Source: Pixabay



This is what B. Longum looks like under a microscope

### Formula-fed

Our research shows that in breastfed babies, *infantis* becomes dominant in the gut after six months, whereas in formula-fed babies, *longum* remains present for a longer period. Nicholas adds: "The type of feeding a baby receives plays a key role, but we also found that different bacterial genes influence this process. Some bacteria were better at digesting breast milk than others."

### Why Is This Important?

The gut microbiome plays a crucial role in a baby's health. Nicholas and his colleagues studied how different bacterial species function and what factors influence their growth. While the study has not yet established direct links to health outcomes, it may help us better understand the role of gut bacteria in disease and early development. Pucci states: "We don't yet fully understand what these bacteria do in the long term, but we are already seeing clear patterns within the first six months."

### Follow-up Research

The researchers are also working on identifying previously unknown bacterial species and their role in the gut microbiome. "We have found two dominant species that had not been described before," Nicholas says about another study he plans to complete in April.

**Nicholas: 'We found two dominant bacteria species that were not described before.'**

"This offers exciting opportunities to gain new insights into how bacteria interact in the infant gut. Thanks to all the AIMS participants, we now have data covering a three-year period, which allows us to learn more about children's health. We hope this research will provide a better understanding of how nutrition and other factors contribute to a healthy start in life."

### Source:

Pucci N, Ujčić-Voortman J, Verhoeff AP, Mende DR. 2025. Priority effects, nutrition, and milk glycan-metabolic potential drive *Bifidobacterium longum* subspecies dynamics in the infant gut microbiome. *PeerJ* 13:e18602. <https://doi.org/10.7717/peerj.1860>

### Questions

Do you have questions for the researcher or AIMS? Email them to: [aims@sarphati.amsterdam](mailto:aims@sarphati.amsterdam)



## Hip Hip Hooray!

Did you know that all AIMS children together are now older than the city of Amsterdam? In total, more than 750 birthday candles have been blown out at your children's birthday celebrations!



## AIMS in numbers

- 5 sets of twins
- 134 three-year-olds
- 503 births
- 1,169 food diaries
- 3,871 questionnaires
- 37,465 stored (bio)samples

## Tijdslijn

- October 2024 – AIMS recruitment ends
- November 2024 – Last AIMS family joins the study
- January 2025 – Last AIMS baby born & first publication released

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### Thank You, Participants

On behalf of GGD Amsterdam and the AIMS researchers, we sincerely thank you for taking part in our study. Your participation is invaluable—our research would not be possible without your dedication. As a participant, you are contributing to the health and well-being of all children in Amsterdam.

If you have any questions or would like more information, please feel free to contact us. You can reach us at 020 5555 495 or [aims@sarphati.amsterdam](mailto:aims@sarphati.amsterdam), and we will get back to you as soon as possible.

### About AIMS

As part of the AIMS study by GGD Amsterdam, biological samples are collected from around 500 families until their child reaches the age of three. By participating in the AIMS study, you provide samples for microbiome analysis.

AIMS is a research initiative by GGD Amsterdam. We hope this letter has sparked your enthusiasm for our study and that you will share information about it with your friends, family, and acquaintances in Amsterdam.