

# Amsterdam Infant Microbiome Study (AIMS): Study design

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## Aim

The general objective of AIMS is to establish an infrastructure that allows for (explorative) research on the development of the microbiome in relation to healthy growth and development.

There will be a special focus on growth trajectories and oral health, and special attention for the role of nutrition and other lifestyle factors in children aged 0 – 3 years old from the ethnically diverse population of Amsterdam.

## Background & scope

Childhood overweight and obesity is an epidemic public health problem worldwide.

In Amsterdam 19% of the children are currently overweight or obese.

Interestingly, increasing evidence points to a dysbalance in the microbiome as a potential explanatory factor.

Another, yet related public health problem is dental caries. Globally, dental caries is the most common chronic disease in children. In the Netherlands, this disease affects 41% of the five-year-old children. Dental caries has substantial health effects, and shared risk factors with overweight and obesity.

A dysbalance in the microbiome may also play a role in the onset of caries.

Understanding the fixed and modifiable factors that determine the early life microbiota and the development of the microbiome may provide strategies for the acquisition of a health-promoting microbiome.

## AIMS:

In current scientific literature there is increasing attention for the microbiome and its effect on (adverse) health outcomes. We aim to study the development of the microbiome in relation to healthy growth and development (i.e. growth trajectories) as well as oral health in young children.

- We will focus mainly on the gut and oral microbiota.
- We will collect different biosamples from children, their mothers, other caregivers and siblings.
- We will specifically focus on the role of nutrition and other lifestyle factors.
- We will conduct the study in the ethnically diverse population of Amsterdam.
- We will also set up the Sarphati Biobank to enable additional exploratory research in the field of microbiota.

## Data collection:

AIMS is a substudy of the Sarphati Cohort. This means that we will use some of the information that is collected by Youth Health Care (JGZ), as well as data from the Sarphati Cohort questionnaires. For AIMS we will use data on the child's height and weight, nutrition, exercise, and sleep.

## Biosamples

AIMS is a multi-ethnic, prospective birth cohort study in 1,000 children, their mothers and other family members. Data will be collected according to the scheme in Fig 1. We will collect biosamples from birth until the baby is 3 years old. Samples will be collected at home by participants themselves with self-collection kits, and will be picked up by courier.

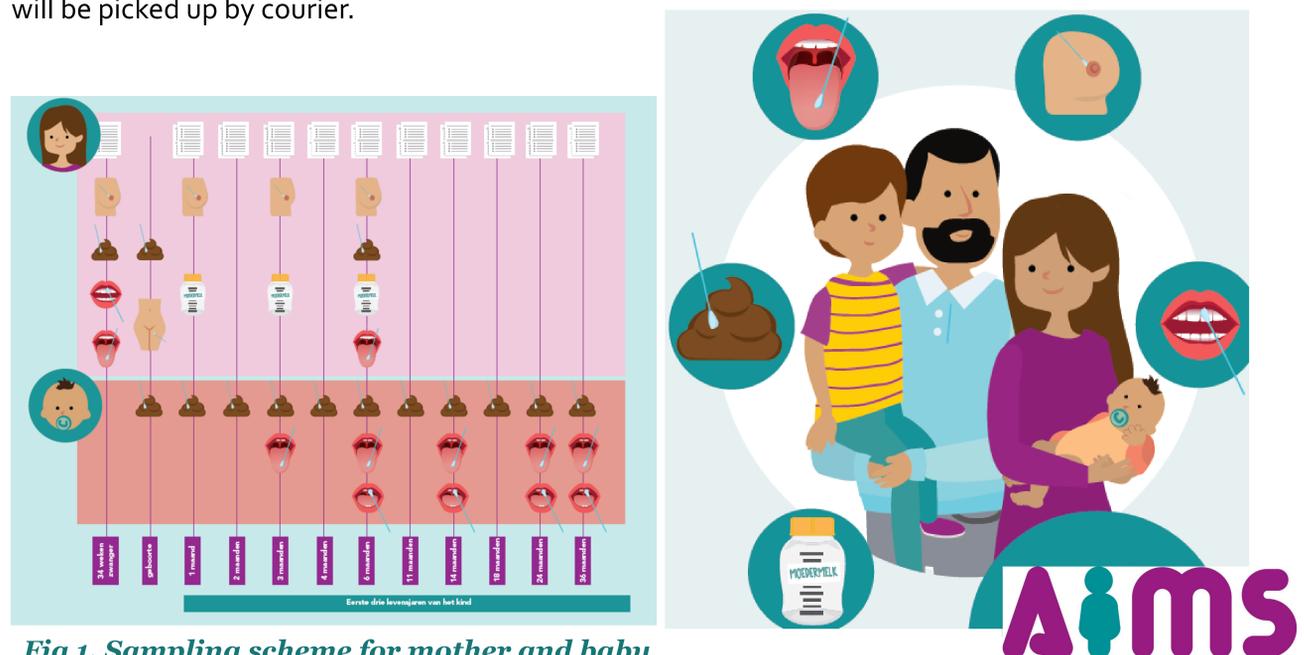


Fig 1. Sampling scheme for mother and baby

## Questionnaires

The questionnaires assess (oral) health status, nutrition, and other data relevant to growth and development, oral health, and/or changes in the microbiota. The questionnaires cover topics such as: course of the pregnancy and birth, antibiotic and probiotic intake, oral hygiene, nutrition, visit of day care, and demographic factors.

## Pilot studies

We performed two pilot studies that revealed important insights to optimize the data collection. We tested our questionnaires with 14 mothers, and tested our instruction materials (video's and leaflets) with 14 families.

## Start inclusion

We aim to start including participants in spring 2019 in city district Amsterdam Noord. After that we will continue in city district Amsterdam Nieuw-West and Oost. We will include participants in collaboration with the midwife practices.