

The Pro004 data product

Original number of samples	2,983
Number of samples (per 27.11.2023)	2,972
Number of unique participants	2,953
Biological sample type	Whole blood
Participant type(s)	MoBa mothers
Collection timepoint	Gestational week ~17
Case-control selection criteria	None
Biomarker measure(s)	Glycated hemoglobin
Original reference article	Carlsen <i>et al.</i> 2022
Analytical method(s)	Architect <i>ci8200</i>
Related MoBaBIO product(s)	Mab011, Mab012, Mab013, Mab014, Pro003
FHI Project number(s)	PDB1440

The project that generated these data

Norwegian Environmental Biobank, part I: The importance of nutritional status for the effect of heavy metals on the health of mothers and their children (MoBa-ETox)

Project lead: Line Småstuen Haug

This project formed the first part of the establishment of a Norwegian environmental biobank. The overarching goal of the Norwegian environmental biobank is to monitor levels of nutrients, environmental toxicants, and other unwanted substances in the body over time and examine how these substances affect our health. MoBa-ETox aims to obtain knowledge about nutritional and heavy metal status during pregnancy in the Norwegian Mother, Father and Child Cohort Study (MoBa), and to investigate what significance this may have for subsequent health outcomes in mothers and children. There will be a special focus on whether nutritional status can protect against the negative effects of unwanted environmental substances. The project uses biological samples and questionnaire data from the MoBa to analyze the amount of a selection of nutrients, essential elements and heavy metals in existing MoBa samples from the 2nd trimester of pregnancy, describe the results and assess these in relation to established recommendations and acceptable intakes, and investigate the importance of specific nutrients (vitamins and essential elements) and heavy metals for the risk of developing health problems in later life.

Study population

The original Pro004 biomarker data source is based on whole blood samples from **2,964 mothers** in MoBa who were pregnant in 2002-2008. Mothers were eligible for inclusion if they had completed questionnaires 1–6, if data were available from the father's questionnaire, if they had available blood and urine samples collected in pregnancy, and if they had genetic data available in MoBa. Mothers were ineligible for inclusion based on exclusion criteria applied for genotyping, which included participants who were not registered in the Medical Birth Registry, plural pregnancies, and pregnancies with children with autism, suspected autism, or symptoms of severe language delay. For a more detailed overview of the participant selection procedure in this study, refer to [Caspersen et al. 2019](#).

Available biomarker measures (variable names in bold)

Glycated hemoglobin A1c, percentage (**B-GHb-A1C**)

Glycated hemoglobin A1c (**B-HbA1c**)

Biological sampling and processing

Whole blood samples were collected from mothers at 17-18 weeks' gestation into 3 mL trace-free sampling tubes, and shipped from the collecting hospital overnight to MoBa's biobank at the Norwegian Institute of Public Health (NIPH). The samples most often arrived

at the biobank within 1–2 days of blood donation, and were placed in long-term storage at a temperature of –80 °C.

For more information on biological sampling, processing and storage, please refer to the original reference articles for NIPH's biobank by [Rønningen et al. 2006](#) and [Paltiel et al. 2014](#).

Analytical methodology

Glycated haemoglobin (HbA1c) was determined using the **Architect ci8200 System** (Abbott Laboratories, Abbott Park, IL). HbA1c was measured with an immunoturbidimetric method.

For more detailed information of the methods used in this study, you may refer to the specific methods description documentation developed by the project study group in MoBa-ETox. This will be provided to approved studies in accompaniment of biological datasets.

Measurement units:

Glycated hemoglobin A1c, percentage (%)

Glycated hemoglobin A1c (mmol/mol)

Limit of quantification (LOQ):

Glycated hemoglobin A1c (B-HbA1c): 22 mmol/mol

Published articles using Pro004

This section also includes articles related to study design, sampling, and data collection.

- ❖ Carlsen EØ, Harmon Q, Magnus MC, et al. Glycated haemoglobin (HbA1c) in mid-pregnancy and perinatal outcomes. *Int J Epidemiol.* 2022 Jun 13;51(3):759-768.
- ❖ Caspersen IH, Thomsen C, Haug LS, et al. Patterns and dietary determinants of essential and toxic elements in blood measured in mid-pregnancy: The Norwegian Environmental Biobank. *Sci Total Environ.* 2019 Jun 25;671:299-308.

Restrictions for use

None currently known.

Acknowledgements recommended for use

We recommend that any use of these data in analyses that are presented in peer-review publications acknowledges the original articles describing sampling and data collection:

Carlsen EØ, Harmon Q, Magnus MC, et al. Glycated haemoglobin (HbA1c) in mid-pregnancy and perinatal outcomes. *Int J Epidemiol.* 2022 Jun 13;51(3):759-768.

Disclaimer

The data in Pro004 that are available for use are provided by MoBa on an *as is* basis as they were received from the generating laboratory and have not been curated or quality controlled prior to release. FHI does not provide any guarantees related to data quality and assurance of the original dataset. We reserve the right to periodically remove samples from the dataset belonging to participants who have retracted their consent to participate in this cohort study, and may alter the contents of the associated documentation accordingly.