The Mab014 data product

Original number of samples	3,000
Number of samples (per 27.11.2023)	2,993
Number of unique participants	2,974
Biological sample type	Urine
Participant type(s)	MoBa mothers
Collection timepoint	Gestational week ~17
Case-control selection criteria	None
Biomarker type(s)	Iodine
Original reference article	Abel *et al*. 2018
Analytical method(s)	ICP-MS
Related MoBaBIO product(s)	Mab011, Mab012, Mab013, Pro003, Pro004
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 monitors 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 Mab014 biomarker data source is based on urine from **2,981 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)

Iodine (**Conc.ugl**)

Biological sampling and processing

Urine samples were collected in urine cups at volumes of 8 ml from pregnant mothers and transferred to urine transport tubes (Becton-Dickinson (BD), Franklin Lakes, NJ, USA). Samples collected prior to 2003 were shipped in tubes without any bacteriostatic additive

(BD, Plymouth, UK), while samples collected in 2003 and after were shipped in urine tubes containing chlorhexidine (UAP Vacutainers, BD, Franklin Lakes, NJ, USA).

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

Urinary iodine concentration (UIC) was determined by **inductively coupled plasma–mass spectrometry (ICP-MS)** using an Agilent 7800 ICP-MS system (Agilent Technologies Inc., Santa Clara, CA).

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:

Iodine (Conc.ugl): µg/L

Limit of quantification (LOQ):

Iodine (Conc.ugl): 2 µg/L

Published articles using Mab014

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

- Brantsæter AL, Garthus-Niegel S, Brandlistuen RE, Caspersen IH, Meltzer HM, Abel MH. Mild-to-moderate iodine deficiency and symptoms of emotional distress and depression in pregnancy and six months postpartum - Results from a large pregnancy cohort. J Affect Disord. 2022 Dec 1;318:347-356.
- Abel MH, Caspersen IH, Sengpiel V, et al. Insufficient maternal iodine intake is associated with subfecundity, reduced foetal growth, and adverse pregnancy outcomes in the Norwegian Mother, Father and Child Cohort Study. BMC Med. 2020 Aug 11;18(1):211.
- Abel MH, Brandlistuen RE, Caspersen IH, et al. Language delay and poorer school performance in children of mothers with inadequate iodine intake in pregnancy: results from follow-up at 8 years in the Norwegian Mother and Child Cohort Study. Eur J Nutr. 2019 Dec;58(8):3047-3058.
- 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.

- Abel MH, Korevaar TIM, Erlund I, et al. Iodine Intake is Associated with Thyroid Function in Mild to Moderately Iodine Deficient Pregnant Women. Thyroid. 2018 Oct;28(10):1359-1371.
- Abel MH, Ystrom E, Caspersen IH, et al. Maternal Iodine Intake and Offspring Attention-Deficit/Hyperactivity Disorder: Results from a Large Prospective Cohort Study. Nutrients. 2017 Nov 13;9(11):1239.

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:

Abel MH, Korevaar TIM, Erlund I, et al. Iodine Intake is Associated with Thyroid Function in Mild to Moderately Iodine Deficient Pregnant Women. Thyroid. 2018 Oct;28(10):1359-1371.

Disclaimer

The data in Mab014 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.