menuCH KIDS

Swiss national nutrition survey in children and adolescents – report

Authors

Julia Vincentini (General project management, Unisanté)

Tanja Häusermann (Regional coordination, BFH and Food Specialist, UZH)

Loan Catalano (Dietician and Scientific Assistant, BFH)

Joëlle Schwitzguébel (Research intern, Unisanté)

Sandrine Estoppey (Biobank coordination, Unisanté)

Franziska Isler (Coordination, YouGov Schweiz formerly LINK Institute)

Massimo Sardi (Project coordination, YouGov Schweiz formerly LINK Institute)

Christine Brombach (Quality control, ZHAW)

Angéline Chatelan (Quality control, HES-SO)

Aziz Chaouch (statistics, Unisanté)

Julia Dratva (Quality control, ZHAW)

Grégory Martin (Data management, Unisanté)

Pascal Müller (St. Gallen centre management, OKS)

Lazar Pavicevic (Data management, Unisanté)

Serge Rezzi (Molecular Nutrition and Biomarkers, SNHf)

Franziska Righini-Grunder (Lucerne centre management, LUKS)

Sabine Rohrmann (Zurich centre management, UZH)

Christoph Saner (Bern centre co-management, Inselspital)

Renzo Scuderi (Data management, Unisanté)

Giacomo Simonetti (Ticino centre co-management, EOC)

Bastien Trachsel (Statistics, Unisanté)

Katja Uhlmann (Regional coordination, BFH)

Federica Vanoni (Ticino centre coordination, EOC)

Suzanne Suggs (Deputy direction, Ticino centre co-management, USI)

Klazine van der Horst (Co-direction, Bern centre co-management, BFH)

Murielle Bochud (Direction, Vaud centre management, Unisanté)

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Contact: Julia Vincentini – Project Manager – Unisanté

Murielle Bochud – Project Director – Unisanté

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Summary

The menuCH-Kids national survey was initiated to deliver the first comprehensive overview of the diet, health, and lifestyle of children and adolescents in Switzerland.

Commissioned and funded by the Federal Food Safety and Veterinary Office, the survey was conducted by a consortium of Swiss institutions under the coordination of Unisanté. Data collection for this population-based survey was carried out between 2023 and 2024 across six study centres located throughout Switzerland. Participants were randomly selected from population registries to ensure representation across the French-, German-, and Italian-speaking regions. In total, 1 852 children aged 6 to 17 years took part in the main survey (participation rate 11.9%).

Information was collected across four domains:

1) Sociodemographic characteristics and lifestyle factors, including physical activity, screen time, sleep patterns, dietary habits, and general health status, were assessed using standardised questionnaires.
2) Dietary intake was evaluated through two 24-hour dietary recalls/records complemented by a brief food propensity questionnaire.
3) Physical assessments were conducted at the study centres and included anthropometric, blood pressure, and body composition measurements.
4) Biological samples, including urine samples and voluntary blood specimens, were collected to assess nutritional status, measure metabolic biomarkers and contaminants, and contribute to the creation of a biobank.

First key findings show some positive dietary behaviours (like frequent breakfast, appropriate energy intake, infrequent lunches eaten out). Among the dietary behaviours to be improved are the low fruits and vegetables consumption, the high meat and protein intakes, and the frequent consumption of snacks and sugary drinks. Among 14-17-year-olds, 11.8% are regular or occasional smokers and 32.7% are occasional alcohol consumers, plus 5.5% of regular ones. Physical activity is insufficient (from 50% meeting the ≥60 min of physical activity each day in younger boys to 16% of older girls). The prevalence of overweight or obesity is 12.9%. Risk factors of cardiovascular and metabolic disease were assessed, such as elevated blood pressure (14.7% with systolic blood pressure >90th percentile), elevated glycated haemoglobin (10.4% with Hb1AC > 5.7% and 0% > 6.5%) or elevated cholesterol values (8.7% with total-cholesterol > 5.1mmol/l).

In conclusion, menuCH-Kids provides a unique and comprehensive dataset on the nutrition and lifestyle of children in Switzerland. It establishes a solid foundation for public health and nutrition research and will inform the development of evidence-based strategies and policies aimed at promoting healthy dietary behaviours, creating age-appropriate nutrition recommendations tailored to the Swiss youth, and guiding food safety and risk assessment of contaminants.

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Glossary

Glossary of abbreviations

ANOVA	Analysis of Variance
AOAC	Association of Official Analytical Chemists
BASEC	Business Administration System for Ethical Committees
BIA	Bioelectrical Impedance Analysis
CBC	Complete Blood Count
CDC	Centre for Disease Control and Prevention
CHOD-PAP	Cholesterol oxidase-Phenol + Aminophenazone
CODE INT	Code Interview
CRP	C-Reactive Protein
CV	Coefficient of Variation
DBP	Diastolic Blood Pressure
DC	Direct Current
EC	Erythrocytes Concentrates
EDTA	Ethylenediaminetetraacetic acid
EFSA	European Food Safety Authority
FPQ	Food Propensity Questionnaire
FW	Fieldworker/Fieldworkers
F2F	Face-to-Face
GD	GloboDiet® software
GPO-PAP	Glycerolphosphateoxidase- Phenol + Aminophenazone
HbA1c	Glycated Haemoglobin
HCT	Haematocrit
HDL	High-density lipoprotein
HEPA	Health Enhancing Physical Activity
HPLC	High-Performance Liquid Chromatography
HRO	Human Research Other than Clinical Trials
ICC	Intra Class Correlation
ID/IDs	Study Identifier Code(s)
ISO	International Organization for Standardization
IQR	Interquartile range
LC	Liquid-Chromatography
LC-MS/MS	Liquid-Chromatography Mass spectrometry/Mass spectrometry
LDCS	LINK Data Collection System (Web Application provided by YouGov)
LDL	Low-density lipoprotein
MCH	Mean Corpuscular Haemoglobin
MCHC	Mean Corpuscular Haemoglobin Concentration
MCV	Mean Corpuscular Volume
METAS	Federal Institute of Metrology
MPV	Mean Platelet Volume
N, n	Number
NGSP-DCCT	National Glycohemoglobin Standardisation Program-Diabetes Control and Complications Trial
NM-BAPTA	Chromophore5-nitro-5'-methyl-(1,2-bis(o-aminophenoxy) ethan-N, N, N', N'-tetraacetic acid
NRBC	Nucleated Red Blood Cells

OH	Hydroxy
PDW	Platelet Distribution Width
PI	Principal Investigator
PLT	Platelets
QC	Quality Control
RBC	Red Blood Cells
RC	Regional Coordinator
RDW	Red Cell Distribution Width
REDCap	Research Electronic Data Capture
REKA	Schweizer Reisekasse
SBP	Systolic Blood Pressure
SBP (2)	Swiss Biobanking Platform
SD	Standard Deviation
SFCDB	Swiss Food Composition Database
SEP	Socioeconomic position
SLS	Sodium Lauryl Sulfate
TC	Total Count
UV	Ultraviolet
WBC	White Blood Cells
24HDR/24HDRs	24hours Dietary Recall(s)

Names and locations of institutions

BE	Study Centre Bern
BFH	Berner Fachhochschule, Bern
CHUV	Centre Hospitalier Universitaire Vaudois, Lausanne
EOC	Ospedale Regionale di Bellinzona, Bellinzona
FSO	Federal Statistical Office, Neuchâtel
FSVO	Federal Food Safety and Veterinary Office, Bern-Liebefeld
HEdS	Haute Ecole de Santé, Geneva
IARC	International Agency for Research on Cancer
LBB	Liquid Biobank Bern, Bern
LU	Study Centre Lucerne, Lucerne
LUKS	Luzerner Kinderspital, Lucerne
METAS	Federal Institute of Metrology, Bern-Wabern
OKS	Ostschweizer Kinderspital, St. Gallen
SG	Study Centre St. Gallen
SNHf	Swiss Nutrition and Health Foundation, Epalinges
TI	Study Centre Ticino
USI	Università della Svizzera Italiana, Lugano
UZH	Universität Zürich, Zurich
VD	Study Centre Vaud
ZH	Study Centre Zurich
ZHAW	Zürich University of Applied Sciences, Zurich

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Lukas Abraham (Dietician, UZH)

Gentiana Ademi (Study nurse, OKS)

Mélisandre Anderson (Dietician and admin, Unisanté)

Ingrid Beck (Local study coordinator, OKS)

Deborah Beyli (Dietician, BFH)

Alessia Bergamaschi (Dietician, EOC)

Renata Bünter (Study nurse, Kinderklinik Inselspital)

Nadine Kaufmann-Chappuis (Dietician, LUKS)

Andrea Christe (Study nurse, UZH)

Laura Ciavarella (Study nurse, Unisanté)

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Michaela Filimon (Dietician, UZH)

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50+ recruiters from YouGov

1 Introduction

1.1 Background and rationale

Food consumption and dietary habits have a major impact on human health by influencing all-cause mortality, and the risk of cardiometabolic diseases, cancer and/or neurodegenerative diseases, among others[1,2]. Adopting healthy dietary habits during childhood and adolescence is particularly important as it influences current and future health.

Childhood and adolescence are marked by rapid growth, during which sufficient energy and nutrient intake are essential for achieving optimal development[3]. An unhealthy diet can affect body fat, weight, cardiovascular and liver functions, as well as cognitive development and performance[4–9]. During the critical developmental period of adolescence, dietary habits are changing, as nutritional needs evolve with biological maturation, greater independence shapes food choices, and eating behaviours are influenced by peers and social media[10,11] and lack of food literacy skills[12]. Establishing healthy dietary habits during childhood and adolescence is crucial, as behaviours can become deeply ingrained and persist into adulthood[10,13].

Furthermore, childhood obesity increases the risk of type 2 diabetes, cardiovascular disease, or cancer later in adulthood[14]. Childhood obesity is rising worldwide, especially in low- and middle-income countries[15]. In Europe, childhood and adolescent overweight and obesity are fairly high (between 10% and 35% depending on the country), but have mostly stabilized[16,17]. In Switzerland, about 15% of children are overweight or obese[18].

Diet not only provides nutrients but may also carry contaminants. Children are more at risk than adults, as the contaminant dose per kilo of body weight may be higher than in adults, and exposure occurs during a sensitive period[19]. Food contaminants may originate from food production and processing or environmental contamination. They affect health and can be found in many biological samples[20–22]. Although children and adolescents are among those most at risk of food contamination, little is known in Switzerland about their exposure to diet-related contaminants and their internal exposure, which highlights the importance of appropriate dietary intake data and biosamples analysis.

Most Western European countries have already conducted studies on the nutrition of children and adolescents[23,24], as recommended by the European Food Safety Authority (EFSA)[24,25]. These studies, for example in France (ESTEBAN[26], INCAs[27]), Italy (OKkio alla salute[28], INHES[29], HBSC[30]), or Germany (EsKiMo[31], KiESEL[32]), have primarily revealed imbalanced diets that fail to meet currently recommended dietary intake levels. They reveal consistent trends, including insufficient intakes of vegetables and certain micronutrients, as well as excessive intakes of meat, fat and sugar[23]. However, each country highlights its unique characteristics, partly influenced by its distinct food culture[33]. Regional variations in food culture also exist. Indeed, the first Swiss national nutrition survey, menuCH, (2014-2015), highlighted significant cultural differences in dietary habits among adults from different linguistic parts of the country[34]. It is therefore important to better characterise children's and adolescents' food consumption in Switzerland.

These observations underscore the need for a comprehensive assessment of food and nutrient intake, as well as the nutritional status, health and lifestyle of children and adolescents in Switzerland. This study will serve to guide nutrition-related public health policies and strategies, as well as foster nutrition research that takes the specificities of the Swiss context into account. Indeed, to address the diet-related risks for children and adolescents, both global and local action is needed, including promoting an affordable, healthy food environment and strengthening of diet-related public policies and strategies.

1.2 Aims and objectives of the study

The first Swiss national nutrition survey on children and adolescents was intended to compile representative data on food consumption, dietary habits, health behaviours and lifestyle, as well as physical measurements, blood and urine analyses, for the 6-17-year-old population from German-, French- and Italian-speaking regions.

The aims of this national population-based survey were to:

- characterise the diet, lifestyle and health behaviours of children and adolescents.
- determine the nutritional and health status of children and adolescents.
- deliver data allowing to estimate the daily intake of contaminants.
- gather data to derive population-based national reference values for selected micronutrients and vitamins.
- constitute a database and biobank, to guide the development of nutritional recommendations, conduct risk assessment, promote research and support policy development in Switzerland.

1.3 Study design overview

1.3.1 Reference population and study centres

The reference population for the menuCH-Kids survey was defined as households in Switzerland with children or adolescents aged 6 to 17 years.

Six study centres across three main linguistic regions were involved:

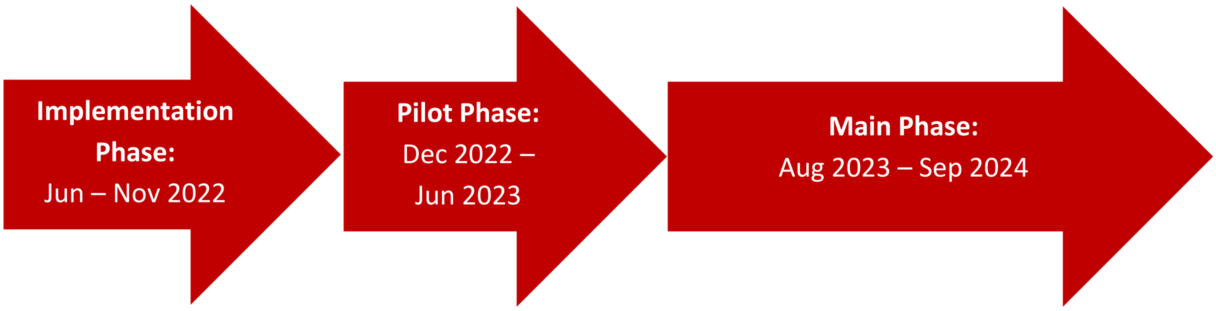
- Canton of Bern: Inselspital Kinderklinik, Bern
- Canton of Ticino: Ospedale Regionale di Bellinzona, Bellinzona
- Canton of Lucerne: Luzern Kinderspital, Lucerne
- Canton of St. Gallen: Ostschweizer Kinderspital, St. Gallen
- Canton of Vaud: Unisanté, Lausanne
- Canton of Zurich: Universität Zürich, Zurich

Participants were issued from a random representative sample drawn by the Federal Office of Statistics (FSO) based on the SRPH sampling frame. The targeted sample sizes were 200 participants in the pilot phase and 1 800 participants in the main phase of the study (for details of the sample see 3.1.1 *Survey objectives and sampling*).

1.3.2 Study timeline

After the call for tender from Federal Food Safety and Veterinary Office (FSVO) in July 2020 and the contract signature in June 2022, the study was divided into distinct phases. The implementation phase was executed from June 2022 to November 2022 (*2.2 Implementation phase*). The pilot phase then occurred between February and June 2023 (see 2.7 *Learnings from the pilot phase*). The main phase of data collection, which spanned from August 2023 to September 2024, encompassed the four seasons. Finally, data cleaning, analysis, and report writing were performed until September 2025. The timeline of the different phases can be seen in Figure 1.1.

Figure 1.1 Study Timeline



1.3.3 Data collection

An overview of the data collected can be seen in Figure 1.2. The food consumption data have been recorded using two 24-hour dietary recalls (24HDR) using the GloboDiet® (GD) software, during a face-to-face (F2F) visit and a telephone interview that took place on average 2.5 weeks later. Prior to the F2F-visit, online questionnaires on dietary, lifestyle and health behaviours, as well as socioeconomic status, were collected. Physical measurements were taken during the F2F visit. Additionally, biosamples (urine sample, and, for a voluntary sub-sample, venous blood) were collected during the F2F visit to better characterize nutritional and health status (e.g., several vitamins, minerals, haemoglobin, cholesterol, etc).

Figure 1.2 Overview of the collected data

Online questionnaire

- Dietary and health behaviors, incl. Food Propensity Questionnaire (FPQ)
- Lifestyle (sleep, screen time, physical activity...)
- Sociodemographic status of household

Food consumption data

- Two non-consecutive 24HDR using GloboDiet® and a food diary for children until the age of 13 years completed prior to the visit / telephone interview

  1. 24HDR visit

  2. Phone 24HDR

Physical measurements and additional questions

- Anthropometry (weight, height, waist/hip circumference)
- Blood pressure and heart rate
- Bioimpedance
- Puberty, skin color, dietary supplements, fish consumption in the last week, time spent outdoor in the last month

Biosamples

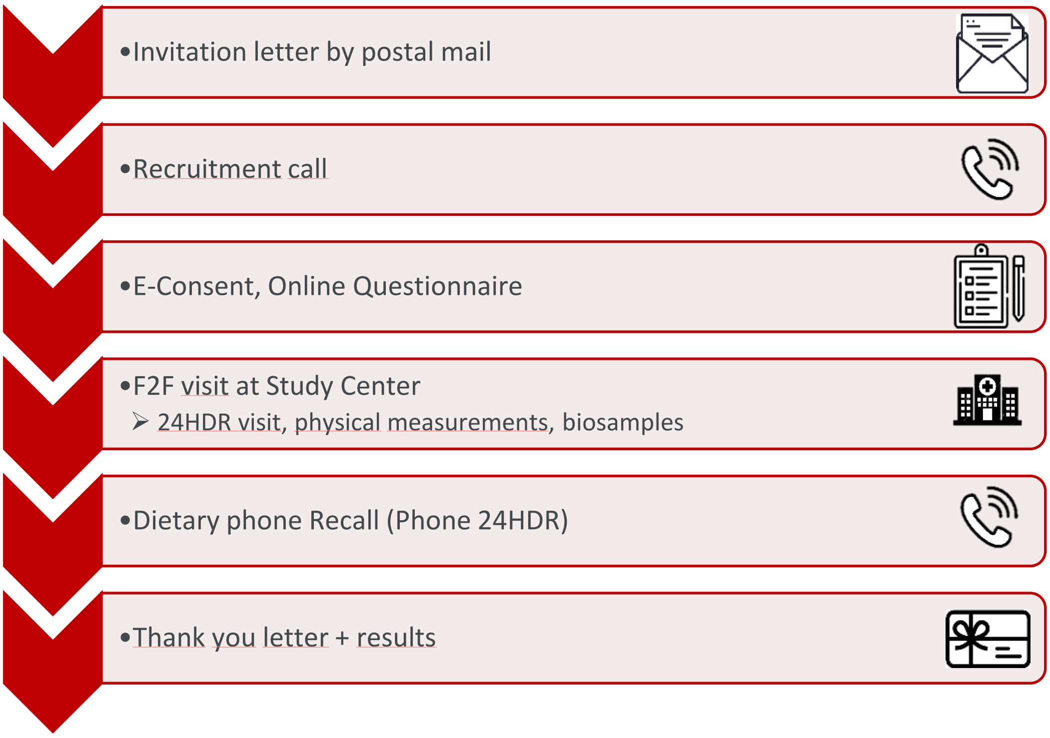
- Spot urine
- Voluntary venous blood

The details of the study procedures are described in the next chapters of this report. Quality controls were performed during the pilot and the main phases of the study to ensure that the correct procedure was used for data collection (see chapter2.8 *Quality control visits*).

1.3.4 Study steps for the participants

An overview of the different study steps that participants had to go through is displayed in Figure 1.3.

Figure 1.3 Participation steps



Participants received an invitation letter via mail, followed by a recruitment phone call to verify inclusion criteria, explain the study steps and, if agreed, schedule the visit (see 3.2 *Recruitment process*).

Before the visit at the study centres, participants filled in a short e-consent (see 2.2.1 *Ethical approval*), completed the online questionnaire (see 6 Online Questionnaires) and received material to prepare the F2F visit, including material for at home urine collection (see 3.2.4 *Preparation of the participant before the F2F visit*).

At the study centre, participants were checked for eligibility again and signed the informed consent form (see 2.2.1 *Ethical approval*). Questionnaire completion was verified, and a urine sample was retrieved (see 9.1 *Methods: biosamples collection procedures*). Then, the first part of the visit consisted of assessing food consumption using a 24HDR using GD (see 7.1 *Methods*). The second part of the visit included physical measurements (see 8 *Physical measurements)* and, in about one-third of the participants, an optional blood draw was taken (see 9.1 *Methods: biosamples collection procedures*).

Following the visit at the study centre, a phone 24HDR was conducted, on average 2.5 weeks later, to reassess food consumption with GD (7.1 *Methods*).

A few months after the F2F visit, the participants received a thank you letter, some of their individual results, and a leaflet with dietary recommendations and recipes. The leaflet on physical activity from Health Enhancing Physical Activity (HEPA)[35] was also included.

2 Study preparation

2.1 Overall organisation and resources

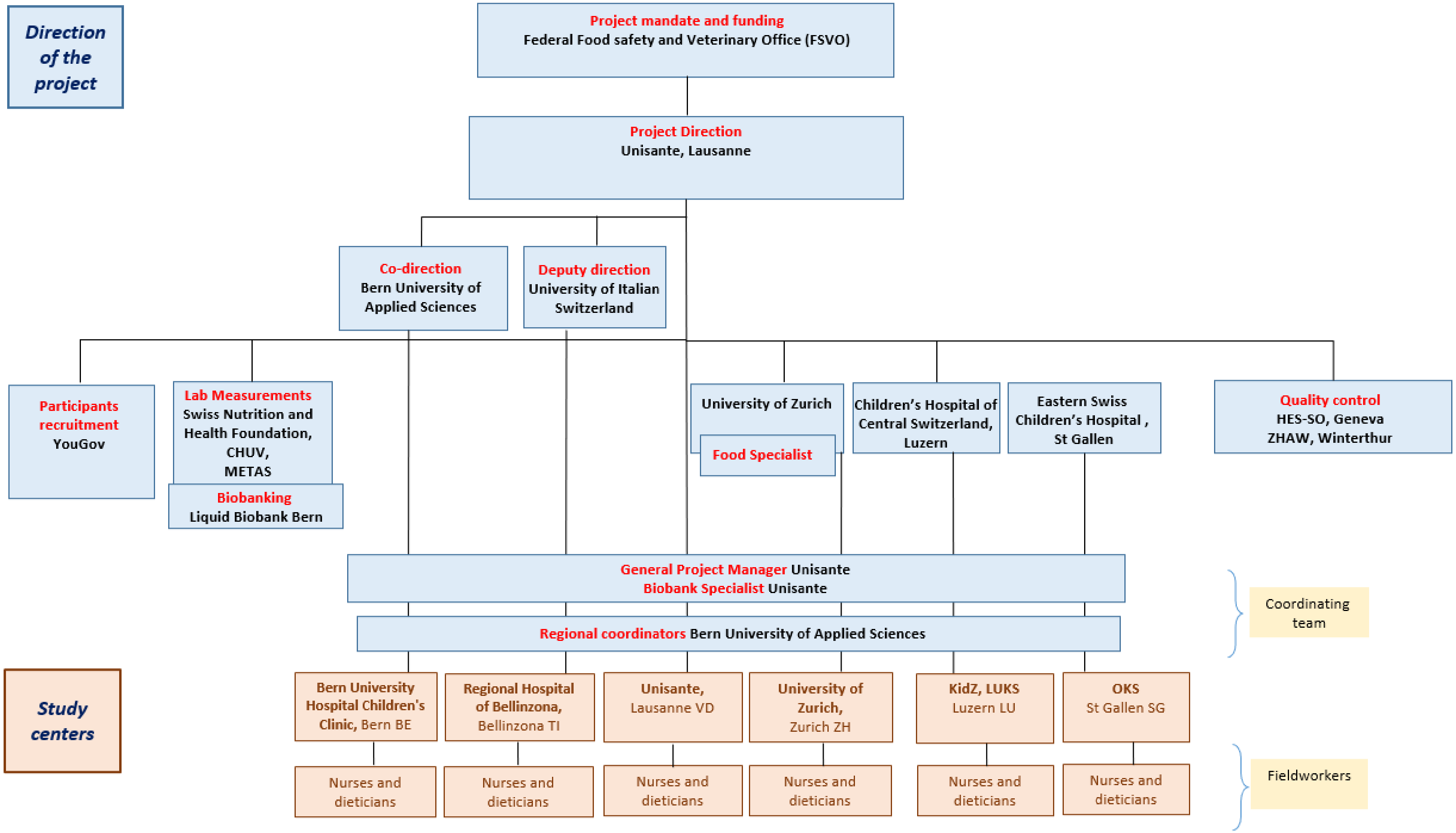
2.1.1 Involved institutions, roles and organisation chart

A consortium of institutions collaborated to perform the mandate of the FSVO:

- Unisanté – Centre universitaire de médecine générale et santé publique, Lausanne
- Università della Svizzera Italiana (USI), Lugano
- Ospedale Regionale di Bellinzona (EOC), Bellinzona
- Berner Fachhochschule (BFH), Bern
- Inselspital Universitätsspital Bern Kinderklinik, Bern
- Universität Zurich (UZH), Zurich
- Luzerner Kinderspital (LUKS), Lucerne
- Ostschweizer Kinderspital (OKS), St. Gallen
- Zürcher Hochschule für Angewandte Wissenschaften (ZHAW), Winterthur
- Swiss Nutrition and Health Foundation (SNHf), Epalinges
- HES-SO Haute école spécialisée de Suisse occidentale (HES-SO Geneva), Carouge
- YouGov Schweiz (former name LINK), Lucerne
- Centre hospitalier universitaire Vaudois (CHUV), Lausanne
- Liquid Biobank Bern (LBB), Bern

The complementary expertise of the different partners (public health doctors and epidemiologists, paediatricians, dieticians and other nutrition specialists, nutrition biomarkers specialists, social marketing experts, statisticians and data managers, etc.) allowed addressing the different facets of this complex multidisciplinary project. The organisational chart describing the partners and their roles is displayed in Figure 2.1.

Figure 2.1 Organisational chart



Project management and coordination

The project director (Unisanté), co-director (BFH) and deputy director (USI) were responsible for the general conduct of the study and overseeing its progression and issues. Within each partner institution, the principal investigators were designated as the responsible persons for their study centre or specific domain. They were updated and consulted about the ongoing questions through monthly meetings.

Unisanté was the leader of the study consortium, the central coordinating centre and the contact point for FSVO. A close collaboration between FSVO and the general project manager was essential, as FSVO oversaw the project on the Federal office side and important specific tasks influencing the course of the study, including the including developing the content of the questionnaire, the elaboration of the information flyer, postcards, website and videos with the communication agency, the relation with the media, the updates of the GD software for the dietary interviews, the first contact with the FSO, etc.

The coordinating team was responsible for the coordination and organisation of the study and included the general project manager, two regional coordinators (RC), a food specialist, and a biobank manager. The coordinating team maintained direct communication with the study centres and labs, overseeing the study setup, pilot and main phases implementation, fieldworkers (FW) training, recruitment statistics evaluation, and internal communication with partners, consortium members and FW. The food specialist was the designated contact person in case of inquiries related to the GD software and was responsible for its data management, including cleaning and assessment. The biobank specialist developed procedures, organised the set-up of the study, and conducted quality controls related to the biosamples.

Participants' recruitment

The recruitment of participants (mailing of invitation letters, telephone recruitment, hotline for questions, scheduling of appointments, sending of the study material before the interview) was organised by the YouGov® institute (formerly Link®). YouGov® also compiled weekly recruitment statistics, handled withdrawal forms during the study, and mailed the results and thank you letters to participants.

Study centres

The study was conducted in six study centres, covering three main language regions of Switzerland:

- Inselspital Universitätsspital Bern Kinderklinik – BE (Bern)
- Luzerner Kinderspital (LUKS) – LU (Lucerne)
- Ostschweizer Kinderspital (OKS) – SG (St Gallen)
- Ospedale Regionale di Bellinzona (EOC) – TI (Bellinzona)
- Unisanté – Centre universitaire de médecine générale et santé publique – VD (Lausanne)
- Universität Zürich (UZH) – ZH (Zurich)

Each study centre employed two registered dieticians and at least one paediatric nurse. To ensure good communication within the project and during training, the team members had to understand and speak English.

The **study centre leaders** were the contact persons for strategic issues related to the study centre itself, for study centre-related issues in case of problems or other urgent problems and for planning and scheduling study visits. A **medical doctor** (either the study centre leader or a colleague) had the medical responsibility for the study centre in the event of an emergency, adverse event or worrisome result that needed to be communicated to the participant. A study **centre's coordinator** was responsible for operational matters (e.g. rooms, stock management, supplies). **FW** conducted the study visits, including rechecking the eligibility of participants and the signing of the informed consent form. They documented fieldwork problems and reported them to the RC. **Lab technicians or nurses** processed biosamples and sent them to the central biobank (LBB). Maintaining close and regular contacts between the central coordinating centre and the recruitment centres (regular emails and phone exchanges, on-site visits, training, newsletter) enabled the study to run smoothly.

Blood and urine samples

The LBB team prepared the urine- and blood kits and sent them to the coordination centre for further distribution. They also received the biosamples from all study centres and centralised them for long-term storage in the biobank or shipment for analysis at CHUV, the SNHf or METAS. The SNHf analysed vitamins in blood samples and was responsible for quality control of the collected biospecimens. METAS was responsible for analysing specific micronutrients and contaminants in blood and urine. The CHUV's central laboratory performed the remaining analyses of blood and urine samples from all participants.

Quality control group

The quality control (QC) group was composed of three members from two institutions (HES-SO and ZHAW) with diverse and complementary expertise (GD and nutrition, data collection in young people and physical measurements, public health). The responsibilities of the QC group depended on the phase of the study. In the implementation phase, they proofread documents (e.g. Study Protocol, Roadmaps, training materials for FW), attended training sessions and checked for appropriateness based on the study protocol. During the data collection (pilot and main phase), they analysed the reports of the RC on-site visits and conducted unannounced on-site visits (main phase only). In addition, they evaluated the GD data according to the guidelines of the International Agency for Research on Cancer (IARC) (e.g. distribution of interviews over the seven days of the week, number of notes, interview duration, mean energy intake per dietician).

Data management

In collaboration with the general project manager, the food specialist and the biobank coordinator, the data manager created scripts to clean and check the coherence of the GD data, to export and translate the REDCap (Research Electronic Data Capture) comments left by the FW, and to match the biosample tubes with the results and their metadata.

The statistician performed descriptive statistical analyses of each blood and urine analysis, physical measurements, and lifestyle questions for quality control purposes, and prepared the results that were sent back to the participants. It was essential that the scripts were prepared in advance to enable continuous monitoring of the collected data and facilitate early, systematic identification of potential issues.

2.1.2 External communication

FSVO hired a communication agency (BOLD AG) to ensure high professional standards for the communication strategy, including study documents accessible to children aged six years and older and people with a moderate understanding of Swiss languages, as well as attractive layouts and a study logo.

The BOLD agency designed an information flyer to explain the study in a simple, attractive and illustrated way, as well as a postcard to invite children directly, in addition to the invitation letter for parents. Several postcards were designed, for each age group, for a girl and a boy, allowing for tailored communication. Each participant received a card specific to the corresponding age and sex group in an envelope addressed to his/her name, allowing the child to open an envelope directly addressed to him/her. This envelope was placed in the general envelope with the invitation letter addressed to the parents. The back of the card was used to directly inform and motivate the child to participate and to provide contact information (QR-Code and URL to the study website, e-mail and hotline phone number).

The communication agency, in close collaboration with FSVO, also designed the website and created informative videos: a video explaining the study and two instructional videos, one on the urine collection and the other on the use of the food diary. All external communication related to the study was coordinated and separately funded by FSVO.

At the end of the study, they were also mandated to layout a summary leaflet which highlighted the first results mentioned in this report and facilitated dissemination to the media, the stakeholders and the public.

2.1.3 Incentives for participants

Several measures were implemented to increase the participation rate:

- The invitation materials included a colourful explanatory flyer with an adapted language and a smaller envelope with the child’s name and a sex/age-specific invitation postcard, both designed by the professional communication agency. The full informed consent form was completed directly at the study centre and was not sent in advance to avoid an information overload for the participants and their caregivers, but was available for consultation at the beginning of the online questionnaire along with the shorter e-consent (see 2.2.1 *Ethical approval*). In addition, the consent form was available on the website and could be accessed any time throughout the study.

- Direct contact with YouGov operators, who are highly experienced in conducting surveys, ensured that participants understood the different steps of the study, its scope and had their questions answered. YouGov also sent a reminder text message 72 hours before the scheduled appointment (F2F visit) to reduce the rate of missed appointments. All operators received study-specific training (see 3.2.3 *Recruitment calls*).

- For their participation, the children and adolescents received a total compensation of CHF 80. After the visit to the study centre, they received a CHF 20 voucher to be used for books or cinema tickets. Cinema vouchers were preferred by participants – over the course of the entire study (pilot phase included), we gave out 1359 (66.2%) cinema vouchers and 695 (33.8%) book vouchers. Additionally, upon completion of the entire study process, YouGov sent the participants CHF 60 in the form of REKA (Schweizer Reisekasse) checks by post. Participants were also automatically entered into a lottery to win entries to an amusement park (10 prices) or a REKA holiday week for the family (1 price). The winners were randomly selected by Unisanté using a script.

- Personal results of the physical measurements (including mentioning if the value was within the normal ranges for body mass index (BMI) and blood pressure) and colour-coded results of the blood analyses (for blood volunteers) were also mailed to the participants and their parents (more details on the colour-coding can be found in chapter 9.1.4 *Laboratory analyses*). They also received a booklet with dietary recommendations and ideas for healthy seasonal recipes (made by the team), as well as a booklet with ideas for daily physical activities (from HEPA[35]).

- During their visit to the study centre, children were offered to colour a memory game developed for the study, which they could also take home afterwards. Some study centres also provided children's books or games in the waiting room.

- Participants received free snacks at the end of their visit, and FW reported that this was greatly appreciated.

2.2 Implementation phase

The implementation phase lasted from June 2022 to November 2022.

2.2.1 Ethical approval

Process

We defined all the main procedures in the study protocol submitted to the ethics committee, based on the experience of menuCH adults and the feasibility study for menuCH-Kids. The complementary expertise of the different partners allowed addressing the different facets of this complex multidisciplinary project.

The Study Protocol for Human research other than clinical trials (HRO) studies with the annexes in French was submitted to the Ethics Committee in Vaud in early September 2022, which was the principal ethics committee. The study was classified as a type A observational study. We received feedback three weeks later, to which we answered point-by-point. The modified protocol and the updated annexes in the three languages were submitted to the Vaud Ethics Committee, which forwarded them to the ethics committees of the other five study centres by mid-November 2022. The study received ethical clearance on 09.02.2023.

The study number in the BASEC (Business Administration System for Ethical Committees) database is **2022-01602**.

For the main phase, some small modifications had to be made to several documents, e.g., to clarify communication after feedback from the participants, to increase the duration of the visit of 15min (so a total of 1h 45min), suppress the skin scan, include skin colour assessment. The amendments were submitted on 21.07.2023 and received clearance on 08.08.2023.

For the additional sub-study designed to compare the results of the Bioelectrical Impedance Analysis (BIA) measurements on other participants, another submission to the Ethics Committee was made on 16.10.2024 and received clearance on 23.10.2024.

Content of the consent form

After recruitment by YouGov, participants were asked to sign an electronic consent. Participants were only able to complete the online questionnaire once they had signed the electronic consent form. The electronic consent included information about who could participate and how, the benefits and risks of participating in the study, and privacy and confidentiality issues.

During the F2F visit, participants were screened again for eligibility and provided verbal and written informed consent to participate in the study. The informed consent form was based on the templates of SwissEthics and included:

- General information about the study, such as the background of the study, the aim of the study, as well as the inclusion and exclusion criteria.
- Information about the study procedure, including the different steps of the study.
- Information about the voluntary nature of participation as well as about the benefits, risks, and burdens of participation. The benefits of participation were: i) contributing to advance knowledge on the nutritional status of Swiss children and adolescents and thus to public health research, ii) receiving individual and general results, iii) receiving general recommendations on nutrition and physical activity. The time required for participation was mentioned as a burden. Risks associated with the optional blood draw were described as mild pain, dizziness, and/or a hematoma at the injection site.
- Information on individual results after participation in the study with possible incidental findings (e.g. blood analysis) and the general results of the main study.
- Measures taken to ensure protection and confidentiality of data and biological samples were explained. For example, the coding of data and biosamples and the data protection procedures according to the Swiss data protection law were described. Participants were also informed that the coded data and biosamples would be forwarded to FSVO and could be used to answer future research questions in the field of health and nutrition. Access rights for controlling parties, e.g. Ethics Committee audits, were also explained.
- Right to withdraw from the study and management of the data that was already collected up to the point of withdrawal: all personal data would be deleted, but research data already collected would be retained.
- Compensation for participation, funding of the study, and liability for harm caused by participation in the study.

In accordance with the Human Research Act (HRA: articles 3, 22, 23)[36], two distinct informed consent form were used: one for adolescents aged 14 years or older, for which the signature of the parent was voluntary, and another one for children under 14 years of age, including the mandatory signature of the parent.

2.2.2 Management of documents

During the implementation phase, three main documents were created for the collection and handling of data and biosamples:

- Study Protocol for the Ethics Committee (high level of detail)
- Study Manual (medium level of detail on all procedures, for study partners)
- Roadmap for the FW (medium level of detail - and high level in its annexes- of fieldwork procedures)

The different study documents were shared with the team members on a secure web-based platform (Microsoft Teams), with access rights adapted to their roles and responsibilities in the project.

2.2.3 Study Material preparation

Prior to the pilot phase, the materials used for MenuCH adults (dishes, measuring tape, clothes pins, headsets, weight for regular calibration of the scale, scales etc.) were checked and, if necessary, replaced (e.g. headsets, new measuring tapes). The material was packed in large wooden boxes and shipped by a logistics company.

Scale and additional material

The bodyweight scales with an integrated stadiometer (Seca 704) were calibrated by Seca® before being sent in a wooden box to the different study centres. Seven scales were calibrated, and the maximum deviation that was corrected was 200g. According to Seca® specifications, the stadiometer did not need to be checked during the calibration service. The spacers and fixing screws that attach the stadiometer to the scale were all replaced before the start of the study. The FW were instructed to check the calibration of the stadiometer after the transport. If the deviation was more than 0.5cm, the spacers and fixing screws were to be changed again, but this did not occur. The Scale and stadiometer were regularly calibrated by the FW during the main phase and deviations were reported to the coordinating team.

For blood pressure measurement, clinically validated devices (OMRON HBP-1320) were purchased for the study to ensure that the same devices were used in all study centres. They were selected in consultation with the consortium specialists based on guidelines[37–39] for recommended devices for blood pressure measurement in children. Small cuffs (XS, S) had to be purchased to ensure that the cuff size was adapted to the arm circumference of the participating children, according to international guidelines.

Bio-impedance

No new device was purchased to measure body composition because of the high cost of such devices. The four study centres that already had a validated device used it, and the other two study centres (Lucerne, Ticino) did not perform this measurement. The study centres in Vaud and Bern had the Tanita® MC780; the study centres in St. Gallen and Zurich had the InBody® 770, both validated in children.

2.2.4 Handling of adverse events

In general, the procedure consisted of (1) informing the corresponding medical doctor in charge, (2) taking the necessary actions to minimize the consequences for the participant, (3) filling out the appropriate section in REDCap as well as the "Adverse Event Form" created for the study and (4) informing the general project manager. All documented adverse events were controlled by the general project manager, who was always required to be notified when such an event occurred and was responsible for the regulatory and administrative aspects related to the event.

Adverse events description

In the pilot phase, one child vomited during the blood draw, and one child fainted during the blood pressure measurement. In the main phase, we had 15 adverse events, mainly due to blood draw or the blood pressure measurement, and when participants were fasting and/or nervous. All participants recovered quickly and did not require follow-up care.

2.2.5 Time planning for face-to-face visits

Each study centre was responsible for planning the timeslots for the F2F visits and was advised by the project manager to consider all weekdays (except Sundays) and plan enough of them to have a safety margin for last-minute cancellations. Recruitment statistics and progress of data collection were shared with the study centre leaders after the end of each recruitment period to make necessary adjustments for the next package. Table 2.1 describes the duration of the different interview steps.

Table 2.1 Duration of the interview steps

Interview steps	Minutes
Welcoming	10’
24HDR visit	45’
Physical Measurements	30’
Blood Draw	15’
Goodbye + voucher	5’
TOTAL	**105’**

2.3 Satisfaction survey for participants

Methods

At the end of the study, a satisfaction survey was sent to the last 809 participants enrolled from end of April until the end of August 2024, from which 219 answered. The result of the questionnaire is intended to be used internally for improving further surveys.

Results

The satisfaction survey aimed to evaluate various aspects of the participants’ experience, namely: Overall study experience and organisation, interest in participation, invitation process, study process, compensation, preferences in the event of participation in a similar future study. An open feedback section was also available.

Participants were mostly very positive about their experience. A combined total of 208 (95%) of participants rated their overall experience either as “very good” (n=120; 54.8%) or “good” (n=88; 40.2%). A total of 10 participants rated their experience as “neutral” (4.6%) and one person rated it as “poor” (0.5%).

Overall, participants who completed the satisfaction questionnaire reported high levels of satisfaction with the menuCH-Kids study. Recruiting performance, staff performance, and the personal interactions provided at the study centre were consistently rated positively. At the same time, the results and open comments identify clear, actionable areas for improvement—primarily related to appointment scheduling, and the time burden in general or associated with the food consumption assessment.

2.4 Data management

During the implementation phase, the following software and platforms were prepared for data collection:

- REDCap (Research Electronic Data Capture), a secure web application for creating and managing online surveys and databases, was used to set up a data collection database, based on the chronological steps of the F2F visit, allowing the FW to follow the study steps and enter the data correctly. Minimum and maximum values were defined for numeric fields. Comments were also added, such as units of measurement, number of decimals, and notes about a specific study step to be performed at a specific time, such as applying or removing Emla® cream (local anaesthetic cream) for a later blood draw. In addition, open comment fields linked to the various measurements, allowed the FW to describe problems or information related to the collected data (e.g. the child was nervous during the blood pressure measurement).

- An extension of the LDCS (LINK Data Collection System) alpha platform was set up to give the FW access to the relevant information from the participants.

- The auto-administered online questionnaires were hosted in the LDCS alpha platform but separated from the personal data, with restricted access. Parents had a specific section about the child’s early life, diet and health, as well as socio-demographic and household characteristics. The rest of the online questionnaire was either addressed directly to the 14-17-year-old adolescent, without parental access, or included in the same online questionnaire as the first part, but with an indication that it should be completed together with the 6-13-year-old child, if possible. These online questionnaires were pre-tested during the implementation phase by YouGov, who invited 75 people from the three linguistic regions and from different age groups (with children aged 6-9, 10-13 years, and adolescents aged 14-17 years) to verify the understandability of the questions.

- The GD software, which collects food consumption data, was updated by FSVO (e.g. adding foods specific to children and specific foods according to current food trends, adapting warning messages that were still adapted to adults). Accounts were created for each dietician.

- Access accounts for all FW were created to store regular backups of the GD interviews and to save all consent forms for all FW on OwnCloud (internal drive of Unisanté).

- In study centres where a bioimpedance measurement was performed, FW had access to the specific software, and data were first saved locally and then transferred on OwnCloud. More details on the data management for this measurement can be found in chapter 8.1.4 *Body composition measurement*.

2.5 Biosamples management

2.5.1 Blood sampling

The blood collection procedure was designed by the biobank specialist in collaboration with a specialised and experienced research nurse. The procedure was designed to take into account all constraints related to the range of biomarkers of interest selected by the FSVO and the objective of storing biomaterial for further, yet unforeseen, analyses. To ensure the greatest possible diversity of stored material, several primary blood tubes were selected, and the order of sampling was determined by their specificity. In addition, special blood tubes and adapters had to be tested at the FSVO for possible contamination with trace metals and chemicals, as these were to be measured. The sampling of the tubes was arranged to meet all the requirements: blood for serum to be analysed for trace metals (Vacutainer model, as the 6mL tubes offer a 5mL of blood collection) before other tubes, followed by tubes containing anticoagulants (EDTA, lithium heparin), and tubes for direct on-site analysis.

For children, the ethical concern was to avoid taking too much blood. The Study Protocol clearly described the need and the benefits of collecting the chosen amount of blood, to protect children from excessive blood collection. SwissEthics (in its guide on research involving children and adolescents) recommends that a maximum of 25 ml of blood be drawn (at once) on children over the age of six in clinical research projects. After careful evaluation and several tests, the Study Consortium in agreement with FSVO decided to draw 21.8 ml of blood.

2.5.2 Processing of collected blood and urine

Blood

The processing conditions were decided by consulting the laboratories that would perform the biomarker measurements. The three laboratories communicated their conditions, and the procedure was chosen to allow compliance with the most restrictive conditions and applied to all biosamples.

For blood samples, time and temperature are critical factors affecting the quality and preservation of biomarkers within their matrix, until biosamples are frozen. Therefore, the interval between blood collection and processing (centrifugation, aliquoting, and freezing) was recorded as a key quality control variable in biobank management.

The interval between blood draw and centrifugation should ideally be kept around 30 minutes and freezing at -80°C in around 60 minutes, to guarantee quality even for unforeseen, yet possibly sensitive, biomarkers (as an indication, vitamin C quality, one of the most unstable vitamin, diminish after three hours at room temperature in the light[40]). The preservation temperature of -80°C from first deep freeze to final biobanking is the standard recommendation[41] for best practice in biobanking. Constant temperature monitoring was not always possible, but all freezers were connected to alarm systems.

The procedure setup entailed protecting blood tubes from light and keeping the whole process at 4°C (including in the centrifuge). Therefore, blood tubes had to be placed immediately in the ice pocket (except the serum tubes, which required 20 minutes at room temperature for coagulation and serum extraction[42,43]), in the dark. The centrifugation conditions were chosen among standard recommendations for centrifugation[44] to minimize the time of processing without risking haemolysis and altering the quality of biosamples and biomarkers: reduced speed 1700g for seven minutes at 4°C, as already used in other research projects at Unisanté.

Direct on-site analysis – of Glycated Haemoglobin (HbA1c) and blood formula – was performed on fresh blood samples on the day of collection, directly in each study centre. This approach implied considering all study centre-specific constraints (e.g. pre-registering of participant's information, transport, request for analyses). Measurement on fresh blood samples were carried out according to the requirements of each laboratory. Tubes for direct on-site analysis did not require stringent conditions, except being analysed in less than three hours after blood draw and staying at room temperature.

Batch analyses done at CHUV (lipids, ferritin, etc) required a certain number of aliquots to be thawed, transferred into specific tubes to be handled by the analytic robot and measured in less than two hours.

Of note, adding metaphosphoric acid to the cryotubes for vitamin C preservation would have been a nice step to stabilize vitamin C[40], but adding it either in the kit preparation or while processing the tubes was not considered as feasible in this study, thus abandoned.

Urine

For urine, this was less problematic as the quality of the samples was already influenced by the time interval between collection (first-morning urine and the time point of the F2F visit) and the varying temperature at which the sample was kept by the participant until the visit. Upon arrival at the study centre, the urine sample was placed directly in the refrigerator until processing.

For traceability, an online data capture tool linked to REDCap was implemented, along with paper versions of the same information when computers were not readily accessible in the lab.

Details about the collected and analysed urine samples can be found in chapter 9.2.1 *Urine samples.*

2.5.3 Biosamples storage and shipment

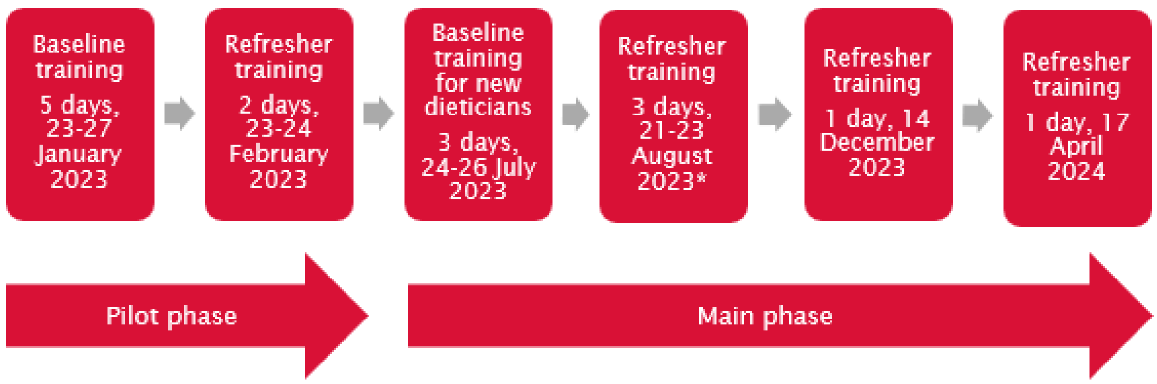
After aliquoting, frozen samples were stored at -80 °C in the laboratories of each study centre, which required finding sufficient space for intermediate storage at each location.

Once after the pilot and on the five dates (corresponding to five 'batches') planned by the coordination centre, the samples had to be transferred to the LBB facility. FedEx transported the frozen samples. The LBB has its own biospecimen database of stored cryotubes. A monthly Excel report on the storage situation was sent to the coordination centre and FSVO. Unisanté's IT team developed a script to integrate the LBB storage report into REDCap, enabling the centralisation of all data related to the project's biosamples in addition to the quality control processes. This integration established a link between the kit number - associated with each participant - and the corresponding tube number stored in the biobank and its database. The shipment of frozen samples from each study centre to the LBB was planned to allow measurement of biomarkers and distribution of results to the participants within three months following their visit, if possible.

2.6 Trainings

Several training sessions were held for the FW during the study. Figure 2.2 below provides an overview of the different sessions.

Figure 2.2 Overview of training sessions main phase



**First day only for new FW*

2.6.1 Trainings and dry run during the pilot phase

In January 2023, a one-week training (23-27.01.2023) was planned for the pilot phase. It included a presentation of the study scope and protocol, explanations about the organisation, recruitment process and YouGov platform, use of REDCap, and practical training in physical measurements including anthropometry and blood pressure. Dieticians and nurses were then divided into two groups. Nurses had one half-day of specific training (biosamples – with the biobank specialist) and dieticians had two and a half days of training mainly on GD.

One month later (23-24.02.2023), a 2-day refresher training was conducted, during which the FW were retrained in physical measurements on children and performed a mock F2F visit.

Between the first pilot training and the refresher training, the biobank specialist, the general project manager, and the assigned RC visited all study centres to meet with the FW and the study centre coordinator. They used a checklist to ensure that rooms and material storage were adequate, to verify access to all platforms, check that the protocol was clearly understood and that everything was set up for the start of the pilot phase.

2.6.2 Main phase trainings

Before the main phase, there was a three-day training for newly recruited dieticians (July 2023), which mainly included instructions on the use of GD and a three-day refresher training for all FW (August 2023). The first day of this refresher training was reserved solely for new staff joining the main phase (dieticians and study nurses) and included general information about the study, procedures, and use of the IT platforms. The other two days were used to inform all FW about updates, to retrain on physical measurements in adolescents, and to conduct a practice visit.

During the main phase, two one-day refresher trainings were conducted (December 2023 and April 2024). The refresher trainings were used to provide an update on the current status of the study, the data collected so far and their quality, to exchange experiences among the FW, to retrain the FW and to evaluate their performance in conducting the physical measurements.

2.7 Learnings from the pilot phase

The pilot phase aimed to test the feasibility of the study procedures. The pilot phase was important to test the procedures and to ensure an effective communication structure between the different project partners. It also allowed assessing the feasibility of the protocols from the participants' perspective, testing the communication between the study team and the participants, identifying study centre-specific organisational and logistical issues, testing and getting familiar with the various online platforms as well as testing the coordination between the different partner institutions.

The pilot phase of the project was conducted from December 2022 to early June 2023. In March and April 2023, 186 randomly selected children were participated in the six study centres to complete all the steps of the study. This was slightly lower than expected, as we aimed for 204 participants, but was still considered acceptable. The main reason for the lower number of participants was the limited timeframe for scheduling visits (six weeks), so some participants could not postpone their appointments.

2.7.2 Take home messages

The pilot phase demonstrated that the main study was feasible without major changes. Here are some key learnings and adjustments:

Organisation

- Increasing the duration of the F2F visit by approximately 15 min to a total of 1h45min.

Population sample and recruitment

- To ensure a good distribution of the available blood draws throughout the year, quotas per age group and study centre were introduced, but were kept flexible to be adapted according to the situation of each recruitment package.
- The pilot phase highlighted the importance of avoiding scheduling of recruitment periods during school vacation weeks, as it was more difficult to reach the households.

Communication to participants

As the information given to participants during the pilot phase was unclear on a few points leading to misunderstandings, minor adjustments were made for the main phase. These included the following aspects:

- Re-training of recruiters on study participation, inclusion/exclusion criteria, result letter, blood draw and instructions on recruitment material (e.g. flyer, appointment confirmation sheet, explanatory videos on FSVO website) with the aim of being able to correctly inform participants and answer questions more easily during recruitment and at the hotline.
- Adaption of the information on blood draw and fasting status in the recruitment questionnaire, confirmation letter, and web interface (LDCS) to avoid misunderstandings.

Data collection

Data collection was adapted as follows:

- Use of new urine cups for the main phase (leakage problem) and re-training on how to aliquot the urine to avoid overfilled aliquots.
- Adjustment of physical measurements: skin scan measurement for beta-carotene was removed due to validity concerns; assessment of skin colour assessment was added to help interpret vitamin D levels and FW were re-trained to remove tapes between each waist and hip circumference measurement.
- Adjustment of blood tube pre-processing: serum tubes were placed outside the cooler box to avoid problems with the coagulation process.

2.8 Quality control visits

2.8.1 General procedure quality control visits

Throughout the study, regular data quality assurance was performed through on-site visits to the study centres by the RC, QC, and the biobank manager.

The following topics were evaluated using a specific checklist (developed by the RC in collaboration with the QC team):

- Study Centre Premises: Access, room arrangement, operational equipment, storage of material, monitoring system, and access to IT platforms.

- F2F Visits: Interview preparation, welcoming, 24HDR visit, physical measurements, goodbye, interviewers' general interviewing techniques.

Each item in these categories was rated as adequate, could be improved, or insufficient, with an accompanying comment. For the phone 24HDR conducted by the dieticians, RC performed overall two evaluations per dietician. Each dietician recorded two phone 24HDR (the first one at the end of 2023, and the second one at the end of spring 2024), which were scored by the RC according to a predetermined checklist (developed using the same approach as for the F2F). Each on-site visit included the observation of at least one complete interview, from preparation through to closure and, if possible, blood sampling. During the last on-site visit, which was scheduled for the closure of each study centre (sorting and counting the material, organising the last shipment), an informal evaluation of the cooperation and communication between the FW (dietician-nurse teams), the RC, the general project manager, and the local Principal Investigator (PI) was also conducted.

2.8.2 Visits from the regional coordinators

The regional coordinators (RC) conducted a total of three announced on-site visits: the first one around October 2023 (1.5 – 2 months after the start of the main phase), the second one around February/March 2024 (about 6-7 months after the start) and the last one around May/June 2024 (about ten months after the start). RC planned the on-site visits to be able to observe each FW at least once.

After each on-site visit or evaluation of a visit, the RC provided direct oral and written feedback to each FW. Issues that were observed repeatedly were addressed in the next refresher training.

2.8.3 Visits from the quality control team

In addition to the RC visits, the quality control (QC) team conducted two unannounced visits to each study centre during the main phase of the study. The visits were scheduled prior to the two refresher training sessions (i.e., October/November 2023 and March/April 2024). These visits ensured the consistent application of quality standards, observed key interview processes, and assessed the study centres' set-up and alignment with study objectives. The QC team also observed the collaboration and communication between FW, RC, the general project manager, and the PI.

2.8.4 Visits from the biobank specialist

The biobank specialist visited each study centre at least once during the main phase and observed two blood collections carried out by the nurse. This included the entire procedure from the preparation of the blood collection to the end of the process, including aspects related to consent (ensuring that the child was fully informed and agreed to the blood collection) and the procedures after the blood samples were taken to the laboratory. Details of the items checked were recorded on a designated checklist.

3 Recruitment procedure

3.1 Reference population, objectives, sampling and survey planning

3.1.1 Survey objectives and sampling

The primary aim of the survey was to achieve a fixed number of participating households, both overall and for each region. In parallel, the goal was to achieve a consistent or even equivalent number of participating households for the different age categories of 6-9-, 10-13- and 14–17-years-old.

To limit travel constraints and encourage participation, households selected for the survey could not be more than a 30km road trip away from the study centre to which they were assigned. To do this, we first referenced all municipalities within this driving radius (N=950 municipalities), and then a stratified random sample was drawn based on the Swiss cantonal population registries using the FSO sampling frame, stratified by age categories, which were defined as 6-9, 10-13 and 14-17 years for all six study centres. This resulted in a total of 18 strata. The FSO provided the following information for each selected household: full name, date of birth, address, sex, household size, nationality, spoken language and if available, phone number. In the case of households with more than one target child, only the youngest child within each participant package was kept eligible. The reference date for calculating the child's age was the date on which the invitation letter was sent. For organisational reasons, the study centres were located in Swiss cities (i.e. in a university or hospital). Although the sample was belted to the study centres, the countryside was also covered because Swiss cities are small. In addition, 75% of Swiss citizens live in urban areas[45], keeping our drawn sample quite representative.

The sampling was based on a recruitment rate (willingness to participate in the study) of 14%, which was estimated for a survey of this type and validated by the pilot conducted at the beginning of 2023. When drawing the sample of addresses, a certain number of reserve addresses/households were included to compensate for any recruitment difficulties in the different regions, which ultimately occurred (see chapter 4.5 *Full participation*).

The following table shows:

- Total addresses = the number of household addresses available (based on the core and reserve samples).
- Activated addresses = the number of addresses activated (i.e. to which invitation was sent) to meet the target.
- Recruitment target = the targets set in terms of households recruited, based on a gross acceptance rate of 14%.
- Completion target = the projected number of participants expected to complete the full survey process (estimating a 13% renouncement rate).

The target recruitment numbers and activated addresses are shown in Table 3.1. It should be noted that reserve addresses were partly used, but the completion targets finally exceeded (for details see chapter 4.5 *Full participation*).

Table 3.1 Recruitment targets and activated addresses by study centre (N, %)

	BE	TI	LU	SG	VD	ZH	Total
Recruitment target	449	243	281	311	448	348	2 080
Completion target	390	210	240	270	390	300	1 800
Total addresses	3 825	2 114	2 356	2 642	3 919	3 022	17 878
Address base	2 600	1 396	1 605	1 799	2 598	2 003	12 001
Reserve addresses	1 225	718	751	843	1 321	1 019	5 877
Activated addresses	**3 253**	**1 963**	**2 009**	**2 248**	**3 803**	**2 947**	**16 223**
% distribution across regions	*20.1%*	*12.1%*	*12.4%*	*13.9%*	*23.4%*	*18.2%*	*100.0%*
% share of total addresses	*85.0%*	*92.9%*	*85.3%*	*85.1%*	*97.0%*	*97.5%*	*90.7%*

Table 3.1 shows that a greater share of addresses had to be activated in the cantons of Ticino, Vaud and Zurich to achieve the set targets. As a result, more use had to be made of reserve addresses in these cantons, as can be seen from the high percentage of addresses finally used in these regions (~97% in the cantons of Vaud and Zurich, and 93% in the canton of Ticino).

Age groups repartition

In addition, the samples were divided into 3 age categories. The breakdown of activated addresses by age group was as shown in Table 3.2.

Table 3.2 Activated addresses by age group (N, %)

	6-9 years	10-13 years	14-17 years	Total
Activated addresses	6 449	4 262	5 512	16 223
%	*39.8%*	*26.3%*	*34.0%*	*100%*

The activation across the three age categories is not exactly balanced, due to an initial misunderstanding with the FSO, regarding the definition of these categories. This resulted in a slight over-representation of 6-9-year-olds and an under-representation of 10-13-year-olds. The issue occurred when the age categories were misclassified: instead of the intended 6-9, 10-13, and 14-17-year-olds, the categories were incorrectly defined as 6-8, 9-13 and 14-17-year-olds. Thus, the participants in the 9-13 age range were divided into five age groups (9, 10, 11, 12, 13 years) resulting in fewer participants per age, while the 6-8 age range was divided into only three age groups (6, 7, 8 years), leading to a higher number of participants per age. The error was identified after two waves of data collection had already been completed. We had to decide whether to try to overcompensate for the variability, by inviting fewer younger participants and more from the 10-13 age group, or to proceed with the stratification that had already been implemented. Ultimately, we chose to continue with the current approach to avoid introducing any more variability.

Additionally, we were concerned that reducing the number of younger participants involved would prevent us from reaching the blood draw quota for that age group, as their acceptance rate of blood draw was lower (see chapter 4.6 *Blood draw acceptance*).

3.1.2 Organisation into packages

Four waves of addresses were received from the FSO during the main phase, as the FSO sampling frame is updated four times a year. This allowed us to have the most up-to-date addresses in our sample. Each wave was divided into two invitation packages; thus, eight sub-samples (named packages) were processed during the one-year main survey period from August 2023 to September 2024. Having eight packages allowed participants to be spread out over the year and avoided a long period between invitation and recruitment.

Each package was processed over 14 weeks, as shown in Table 3.3 which summarises the survey schedule:

- Phone recruitment: a period of four weeks
- Immediately after the phone recruitment, participants received an email with a direct link to access the online questionnaire.
- F2F visit at the study centre: a period of ~6-8 weeks. The F2F visit took place at least two weeks after the telephone recruitment.
- phone 24HDR by the study centre: ~6-8 weeks. The phone 24HDR ideally took place between two and four weeks after the F2F visit.

The exploitation of the various packages, starting with the four weeks dedicated to recruitment calls, was planned by considering the different school and holiday seasons in the different regions. The aim was to ensure that households were at home when they received the invitation letter and to encourage contact with households by calling them at times when they were most likely to be reached, i.e. not during the holidays. A new package was started at the same time in all study centres.

The survey was carried out over a period of a bit more than a year to take account of seasonal variations in children's eating habits. There was a gap of one or two weeks between the recruitment periods of the two packages, which was useful and, in some cases, necessary to extend the recruitment calls. As shown in Table 3.3 below, the total duration of the survey was 58 weeks. The F2F visits were spread over 52 weeks, so the recruitment process started three weeks before and the last phone 24HDR was conducted three weeks after the last F2F visit. This eight package-planning also set a specific target to be reached for each package and each region, both in terms of recruitment and full participation in the survey (estimating a 13% rate of renouncement/dropout).

Table 3.3 Organisation of the study: Timing of the different packages

2023		Week	Info Letter	Calling Start day	Start Appoint.	Week Field	P01 2259 addresses	P02 1497	P03 2004	P04 2042	P05 2065	P06 2005	P07 2063	P08 2288 addresses	HOTLINE Main Study	Online questionnaire
		33	Aug.17			1	17									
AUG	P01	34		Aug.21		2	21									
		35				3										
SEPT		36			Sept.4	4	4									
		37				5										
		38	Sept.21			6		21								
	P02	39		Sept.25		7		25								
OCT		40				8										
		41			Oct.9	9		9								
		42				10										
		43				11										
NOV		44	Nov.2			12			2							
	P03	45		Nov.6		13			6							
		46				14										
		47			Nov.20	15			20							
		48				16										
DEC		49				17										
		50				18										
		51				19										
		52				20										
2024		1				21										
JAN		2	Jan.11			22				11						
		3		Jan.15		23				15						
	P04	4				24										
		5			Jan.29	25				29						
FEB		6				26										
		7				27										
		8	Feb.22			28					22					
	P05	9		Feb.26		29					26					
MAR		10				30										
		11			Mar.11	31					11					
		12				32										
		13				33										
APR		14				34										
		15	Apr.11			35						11				
	P06	16		Apr.15		36						15				
		17				37										
		18			Apr.29	38						29				
MAY		19				39										
		20				40										
		21	May 23			41							23			
	P07	22		May 27		42							27			
JUNE		23				43										
		24			June 10	44							10			
		25				45										
		26	June 27			46								27		
JULY	P08	27		July 1		47										
		28				48										
		29			July 15	49								15		
		30				50										
AUG		31				51										
		32				52										
		33				53										
		34				54										
		35				55										
SEPT		36				56										
		37				57										
		38				58										

P01 and P08 sub-columns: Invitation Letter / Recruitment Call / Reminder Letter; Confirmation Shipment; F2F interview Study Center; Dietary Phone Recall; Thank you letter

- Recruitment calls + Reminder letter at end of second week according needs
- Appointment confirmation shipment: sent 1-2 days after recruitment call
- F2F interview in Study Centre: earliest 2 weeks after recruitment call
- Dietary Phone Recall: earliest 2 weeks after F2F interview
- Hotline during the whole survey period
- Thank you Letter after validation of complete participation (later: results letter)
- Online questionnaire access : possible immediately after succesfull recruitment call

3.2 Recruitment process

3.2.1 Invitation letter

For each package, the list of the random sample with addresses and added Study Identifier Codes (IDs) was sent to YouGov, which prepared the mailings to the participants. The invitation letter was addressed to the children's parents and was sent out by conventional mail on the Thursday before the package of addresses was processed for outbound calls (Monday). The invitation letter contained basic information about the study, a flyer explaining the survey and a personalised postcard for the child. Letters to households whose address was not associated with a telephone number (ALTEL addresses) included an additional appendix in the form of a postage-prepaid reply card that households could complete and return to YouGov with their contact telephone details and preferred day and time for contact. The letter also provided several channels for contacting and participating in the study: an email address, a free hotline number and a contact form on the FSVO website with QR-code access.

3.2.2 Reminder letter

If the package recruitment targets for some study centres were not met within approximately ten days, a reminder letter was sent to households for which no telephone contact had been established (addresses associated with a telephone number) or for which no response card had been received (ALTEL addresses). The reminder letter arrived about two weeks after the invitation letter. A total of 8 674 reminder letters were sent over the course of the survey (i.e. for about half the households).

3.2.3 Recruitment calls

Each household from the package activated for recruitment was called to present the study with a summary of the participation steps, to obtain consent to participate (from both the parent and the child), to validate the eligibility criteria, and to set the date for the visit to the study centre. In general, the recruitment period lasted four weeks. An extension of recruitment of one or two weeks was added for certain packages/regions if this was necessary to reach the recruitment target, or when a larger number of addresses had to be mobilised (activation of additional reserve addresses).

Interviewer-recruitment training

Interviewers were trained once before the start of the main phase and received regular refresher training sessions during the survey.

Checking eligibility criteria

During the recruitment call, the eligibility criteria were checked by the interviewer. To be included in the study, participants had to be healthy, free-living children, aged 6-17 years, with permanent residency in Switzerland. Additionally, both participants and their parents were required to understand (one of) the language(s) of the study centre. Participants also had to sign an informed consent form on the day of their visit to the study centre if they were aged 14-17 years, while parents of children aged 6-13 years had to sign on their behalf together with the child's oral consent.

Exclusion criteria were: having a known severe chronic disease (celiac disease, diabetes, chronic inflammatory diseases, cancer, renal disease, severe behavioural or cognitive disorders, cardiomyopathy, severe genetic disorders; overnight hospitalisation in the four weeks before the visit to the study centre; pregnancy/breastfeeding; inability to understand the study; inadequate language skills; inability to give informed consent; inability to travel to the study centre; refusal to be informed of any incidental findings of the study on the child. The exact date of birth of the child was required during the recruitment process to determine the exact age on the day of the visit at the study centre. Children aged at least six years and adolescents aged at most 17 years and ten months at the time of the visit were eligible to participate.

LDCS platform

Once the interviewer defined an appointment with the participant and/or parent, the appointment was entered into a dedicated web application developed by YouGov (LDCS). This platform was then accessible both to YouGov, in case participants called the hotline to report participation problems or to change appointments made during the recruitment call, and so the FW at the study centres (study nurses and dieticians) could see which time slots were booked with an appointment for each day, whether the participant had already agreed to a blood draw to prepare for the visits and control if the online questionnaire had already been completed.

The FW and the coordinating team logins were secured with two-factor authentication. The FW could only access participant data from their own study centre.

3.2.4 Preparation of the participant before the F2F visit

Once the appointment for the F2F visit had been arranged and the households had provided their e-mail address, an e-mail message was immediately dispatched with a direct personal link to the online questionnaire (for detailed information see chapter 6.1 *Online questionnaires*). The online questionnaire started with an e-consent form (an abbreviated version of the informed consent form to be signed at the study centre, covering mainly the questionnaire part) and the possibility of receiving a refund for the transport costs when travelling to study centre, by entering an International Bank Account Number (IBAN).

One or two days after the household was recruited, a parcel containing all survey material needed to prepare for the visit to the study centre was sent to the household:

- A letter containing the time and date of the visit, an access plan to the study centre, with a telephone number of the study centre (in case of last-minute problems or appointment postponements) and a checklist with tasks to be done before the visit and items to bring.

- A kit for collecting the first-morning spot urine on the day of the visit to the study centre, with a written instruction sheet, including a QR code to the instruction video (see chapter 9.1 *Methods: biosamples collection procedures).*

- The child's envelope with the pubertal development assessment sheet (see chapter 8.1.7 *Puberty stages assessment*).

- A food diary to record and describe all food consumed during the day preceding the day of the visit (only for children aged 6 to 13) (see chapter 7.1 *Methods*).

- A reminder text message was sent to the household 72 hours prior to the F2F visit including the date, time and location of the visit.

4 Recruitment and participation results

4.1 General recruitment results

A visual overview of the achieved numbers of recruitment, visits, blood draws and phone 24HDR compared to the targets is shown in Figure 4.1 and Table 4.1.

Figure 4.1 Flowchart general recruitment results

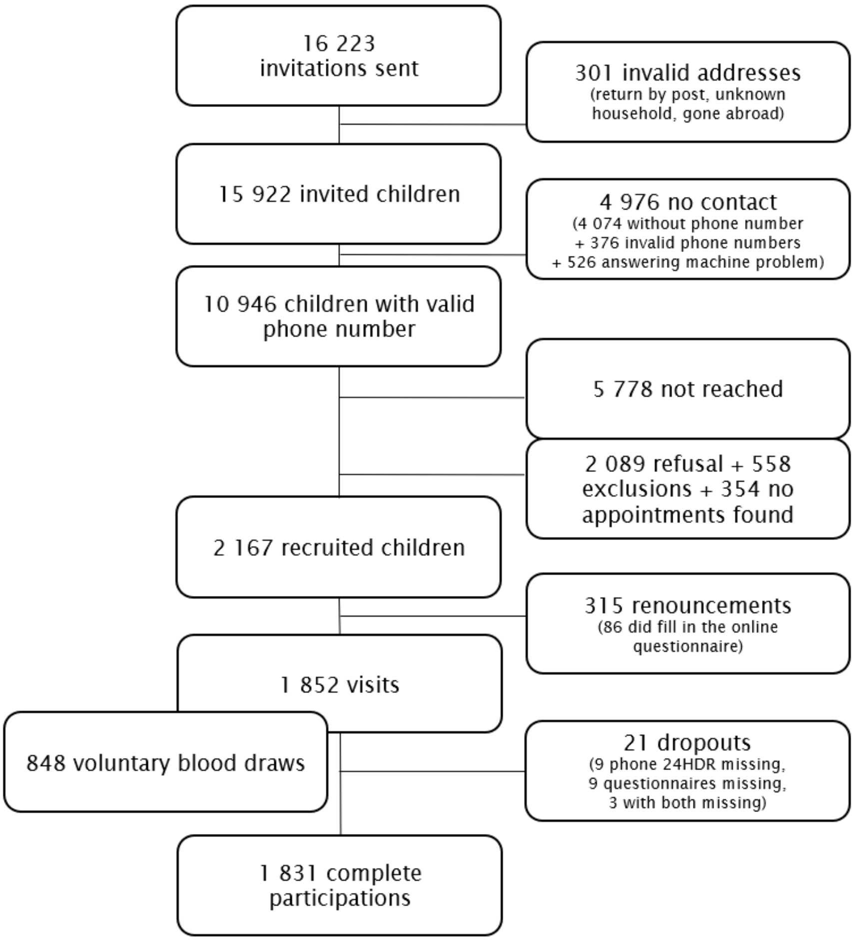


Table 4.1 Results completed visits and blood draws compared to target (N)

	BE	TI	LU	SG	VD	ZH	Total
Visits	**394**	**214**	**242**	**277**	**408**	**317**	**1 852**
Complete participations	**391**	**213**	**240**	**275**	**400**	**312**	**1 831**
Target complete participations	*390*	*210*	*240*	*270*	*390*	*300*	*1 800*
Blood draws	**186**	**98**	**111**	**125**	**186**	**142**	**848**
Target for blood draw	*174*	*93*	*107*	*120*	*174*	*133*	*801*

Figure 4.1 shows the recruitment flowchart: form the 16 223 invitations, there were 15 364 eligible households (301 invalid addresses, 558 meeting the exclusion criteria) and 1 831 complete participations, resulting in a participation rate of 11.9%.

Table 4.1.shows the obtained results the end of the survey. The objectives set and described in chapter 3.1.1 *Survey objectives and sampling* were achieved, thanks to the inclusion of 90% of the reserve addresses, and the working hypotheses on which they were based (initial sample size, participation rate, dropout rate, etc.) were globally met. However, the recruitment-to-visit rate (and therefore the full participation in the survey (F2F visit + online questionnaires completion + phone 24HDR)) was lower than expected (16% of renouncement/dropout instead of 13% planed), which meant that a larger number of households had to be recruited than the target initially set.

In the following chapters, we review and evaluate the different phases and stages of the survey process and analyse the final results in more details. An overview of the results of the participation rates by study centre is shown in Table 4.2.

It must be noted that a few participants having a disease were included and might need to be excluded for specific analyses. More details can be found in chapter 8.3.9 *Additional questions.*

Table 4.2 Results by study centre (N, %)

	BE	TI	LU	SG	VD	ZH	Total	Rate
Activated addresses	3 253	1 963	2 008	2 249	3 803	2 947	**16 223**	
Recruited households	462	260	268	308	491	378	**2 167**	**13.3%**
Completed recruitment interview (participant: 6-13-year-old child)	413	227	252	285	413	333	1937	
Completed recruitment interview (participant: adolescent)	133	56	80	78	144	92	583	
F2F-visit to study centre	394	214	242	277	408	317	**1 852**	**11.4%**
Completed phone 24HDR	392	213	242	275	403	315	1 840	
Completed (F2F visit + phone 24HDR +online questionnaires filled in)	391	213	240	275	400	312	**1 831**	**11.2%**

The rate in % is calculated based on the number of activated addresses

4.1.1 Number of households recruited

Recruitment rate by study centre and age group

Table 4.3 shows the numbers of households recruited in comparison to the targeted numbers, both overall and for each study centre.

Table 4.3 Address exploitation by study centre (N, %)

		BE	TI	LU	SG	VD	ZH	Total
Activated addresses	n	**3 253**	**1 963**	**2 008**	**2 249**	**3 803**	**2 947**	**16 223**
	% region	*20.1%*	*12.1%*	*12.4%*	*13.9%*	*23.4%*	*18.2%*	*100.0%*
Recruitment target	n	449	243	281	311	448	348	2 080
	% region	*21.6%*	*11.7%*	*13.5%*	*15.0%*	*21.5%*	*16.7%*	*100.0%*
Recruitments	n	**462**	**260**	**268**	**308**	**491**	**378**	**2 167**
	% region	*21.3%*	*12.0%*	*12.4%*	*14.2%*	*22.7%*	*17.4%*	*100.0%*
	on basis of activated addresses	14.2%	13.2%	13.3%	13.7%	12.9%	12.8%	**13.4%**

Table 4.3 also shows that the recruitment was slightly lower than the expected 14 to 15%. This is due to the slightly greater recruitment difficulties encountered in the cantons of Ticino, Vaud and Zurich, which necessitated the use of more addresses to achieve the target (activation of reserve addresses, see 3.1.1 *Survey objectives and sampling*). Due to the higher retention rate in the study centres of Lucerne and St. Gallen, fewer recruitment than expected were needed to achieve the completion targets, which explains why the absolute recruitment target was not reached in these study centres.

The results of recruitment by age group are shown in the Table 4.4:

Table 4.4 Recruitment by age group (N, %)

	6-9 years	10-13 years	14-17 years	Total
Activated addresses	6 449	4 262	5 512	16 223
Recruited	875	646	646	2 167
%	*13.6%*	*15.2%*	*11.7%*	*13.4%*

Overall, the gross recruitment rate by age group, shows a lower acceptance rate in the 14-17 age group and a higher rate in the 10-13 age group, as measured by recruitment success. Of note, the differences between the number of activated addresses are explained in 3.1.1 *Survey objectives and sampling*.

Recruitment rate based on timepoint of recruitment

Overall, more than 50% of recruitments took place in the first week of operation, with most recruitments being made during the first three days of the week (33% to 49%).

4.1.2 Contact and refusal reason

ALTEL addresses represented 29.5% of the activated addresses (n=4 792), with similar proportions in the different packages. The additional feedback card included in the invitation letter for these households enabled them to make contact to participate in the survey. However, only a small proportion of these households provided feedback (12%, n=583). Of the households that returned the feedback card, 328 were recruited for the study (recruitment rate of 57%). This demonstrates the strong willingness of these households to participate.

Out of all households contacted, 19% (N=2 089) refused to participate (the most common stated reasons for refusal were lack of interest in the study topic or lack of time (42.78% and 28.2% respectively). For 8% (N=912) of the households contacted, participation in the study was not possible (no time slots could be found). 53% (N=5 778) of the households remained unreachable during the recruitment periods, as all contact attempts were unsuccessful. 20% of the contacted households could be recruited to participate in the study.

4.2 Centre appointments and postponements

4.2.1 Appointment postponement and cancellation

Most appointments scheduled during the recruitment interview were kept, with 1 681 households visiting the study centres on the originally agreed date (77.6%). The rate of renouncement (renounced participation between recruitment call and F2F-visit, inability or refusal, see 4.55 *Full participation*) and rescheduled appointments depended on the number of available time slots. Usually, by the time the participant wanted to reschedule the original appointment, most of the time slots for their package had already been booked. This made it difficult to find an alternative time slot and often resulted in a cancellation followed by a renouncement rather than a new appointment. Of all participants recruited, 7.9% changed or postponed their appointments, and 14.5% of appointments were cancelled.

Renouncement

In total, 14.5% of recruited households renounced participation before the F2F visit. As shown in Table 4.5, more than half of the renouncements involved a request to reschedule, but there was either no more appointment available (30.8%) or no suitable appointment available (25.1%) anymore. About 30% of all reasons are categorised as other problems, which includes a wide range of individual problems, such as the appointment takes too long or other personal reasons. Illness was also a minor reason for renouncement, accounting for 5.7% of all cases.

Table 4.5 Distribution of renouncement reasons by package, Face-to-Face visit (N, %)

Renouncement Reasons	Package								Total
	1	2	3	4	5	6	7	8	
No more appointments	14 (42.4%)	7 (26.9%)	20 (39.2%)	12 (29.3%)	9 (21.4%)	16 (33.3%)	9 (21.4%)	10 (31.3%)	97 (30.8%)
No suitable appointment	5 (15.2%)	4 (15.4%)	9 (17.6%)	11 (26.8%)	13 (31.0%)	16 (33.3%)	16 (38.1%)	5 (15.6%)	79 (25.1%)
Child is ill	2 (6.1%)	3 (11.5%)	3 (5.9%)	3 (7.3%)	4 (9.5%)	3 (6.3%)	-	-	18 (5.7%)
Opening hours unsuitable	1 (3.0%)		-	1 (2.4%)	4 (9.5%)	-	5 (11.9%)	1 (3.1%)	12 (3.8%)
Child chronic illness	1 (3.0%)	2 (7.7%)	2 (3.9%)	-	-	1 (2.1%)	-	2 (6.3%)	8 (2.5%)
Not interested anymore	-	-	-	-	1 (2.4%)	-	-	2 (6.3%)	3 (1.0%)
Language problem	-	-	1 (2.0%)	1 (2.4%)	-	-	1 (2.4%)	-	3 (1.0%)
Child immobilised	-	1 (3.8%)	-	-	-	-	-	-	1 (0.3%)
Other problem	10 (30.3%)	9 (34.6%)	16 (31.4%)	13 (31.7%)	11 (26.2%)	12 (25.0%)	11 (26.2%)	12 (37.5%)	94 (29.8%)
Total	33 (100%)	26 (100%)	51 (100%)	41 (100%)	42 (100%)	48 (100%)	42 (100%)	32 (100%)	315 (100%)

4.3 Phone 24-hour dietary recall (24HDR)

Two non-consecutive 24HDR were planned to assess the diet of participants: one during the visit and another by phone. During the F2F visit, the dietician scheduled the subsequent phone 24HDR. Further details regarding 24HDR and results are presented in chapter 7 *Dietary assessment*.

The following table is based on the 1 852 households who participated in the F2F appointment, including cases where phone 24HDR could not take place.

The dropout rate after a complete F2F visit was very low with 12 cases unable to participate in the phone 24HDR (see chapter 4.5 *Full participation*). Packages 1 and 7 had the most dropouts with three cases, followed by packages 4 and 5 with two cases each, and packages 2 and 3 with one case each.

4.4 Completion of Online Questionnaire

The development of the online questionnaire and the detailed results are presented in 6 *Online Questionnaires*. The online questionnaire could be accessed by the FW via the LDCS platform, with the aim that FW could verify its completion and/or to be able to complete, clarify or correct certain information with the participant if any gaps or issues were identified or observed. Once completed, the participant couldn't re-enter the online questionnaire to modify it, but the study centre staff could do this during the F2F visit if the participant noticed missing or incorrect information. The role of the FW was not to verify the accuracy of each information with the participant.

The online questionnaire(s) had to be completed ideally before the visit at the study centre and at the latest before the phone 24HDR with the dietician. If the online questionnaire(s) was/were not completed on the day before the visit at the study centre, the FW could click on sending a reminder e-mail message stating the date and time of the appointment and the need to complete the online questionnaires directly via the LDCS web application.

Almost all participants (96% to 98%) completed the online questionnaire before visiting the study centre, as requested. It is also worth noting that, among the contacted households that didn't take the first step of visiting the study centres, about a quarter of people still completed the online questionnaire (n=87 of fully completed online questionnaires, i.e. by a child’s parent or by the adolescent’s parent + the adolescent), plus a few incomplete ones.

All questionnaires had an automatic check for completeness included, activated when participants arrived at the end of the questionnaire. Nevertheless, participants could ignore a question: they just received a warning in case an answer was missing but could still proceed to the next question.

4.5 Full participation

This chapter analyses and reports on the full participation rate, defined as household participation in all phases of the survey (completion of online questionnaire, F2F-visit to the study centre and phone 24HDR).

The aim here is not to analyse in detail the reasons and conditions that helped or hindered full participation, as these aspects are detailed and analysed in chapter 4.1.2 *Contact and refusal reason*, but rather to give a more general account of the evolution of this participation by looking at both the retention rate (staying in the survey) and the loss rate (dropping out) based on the main characteristics of the participants, i.e. study centre, period of operation (package) or age group of the target child.

4.5.1 Retention and loss rates by age group and study centre

The following two tables give an overview of the participation and retention rates by age group and by study centre. These results are presented according to the gross rate, i.e. participation or retention rates calculated based on the basis of all activated addresses, and not according to a net rate calculated on the basis of addresses with valid phone numbers, as presented in chapter 4.1.2 *Contact and refusal reason*.

Table 4.6 Retention and loss rates by age group (N, %)

		6-9 years	10-13 years	14-17 years	Total
Activated addresses	n	**6 449**	**4 262**	**5 512**	**16 223**
Recruited	n	875	646	646	2 167
	On basis of activated addresses	*13.6%*	*15.2%*	*11.7%*	*13.4%*
F2F	n	**748**	**560**	**544**	**1 852**
	On basis of activated addresses	*11.6%*	*13.1%*	*9.9%*	*11.4%*
	On basis of recruited	*85.5%*	*86.7%*	*84.2%*	*85.5%*
Completed participation	n	**740**	**559**	**532**	**1 831**
	On basis of activated addresses	*11.5%*	*13.1%*	*9.6%*	***11.3%***
	On basis of recruited	*84.6%*	*86.5%*	*82.3%*	*84.5%*
	On basis of F2F-visits	*98.9%*	*99.8%*	*97.8%*	*98.9%*

Table 4.7 Retention and loss rates by study centre (N, %)

		BE	TI	LU	SG	VD	ZH	Total
Activated addresses	n	**3 253**	**1 963**	**2 008**	**2 249**	**3 803**	**2 947**	**16 223**
Recruited	n	**462**	**260**	**268**	**308**	**491**	**378**	**2 167**
	On basis of activated addresses	*14.2%*	*13.2%*	*13.3%*	*13.7%*	*12.9%*	*12.8%*	*13.4%*
F2F	n	**394**	**214**	**242**	**277**	**408**	**317**	**1 852**
	On basis of activated addresses	*12.1%*	*10.9%*	*12.1%*	*12.3%*	*10.7%*	*10.8%*	*11.4%*
	On basis of recruited	*85.3%*	*82.3%*	*90.3%*	*89.9%*	*83.1%*	*83.9%*	*85.5%*
Completed participation	n	**391**	**213**	**240**	**275**	**400**	**312**	**1 831**
	On basis of activated addresses	*12.0%*	*10.9%*	*11.9%*	*12.2%*	*10.5%*	*10.6%*	***11.3%***
	On basis of recruited	*84.6%*	*81.9%*	*89.5%*	*89.3%*	*81.5%*	*85.2%*	*84.5%*
	On basis of F2F-visits	*99.2%*	*99.5%*	*99.2%*	*99.3%*	*98.0%*	*98.4%*	*98.9%*

Different terms are used to distinguish the stage at which a participant chose to withdraw from the study:

- Renouncement: renunciation after the recruitment call (but before the visit) – refusal or inability.
- Dropout: renunciation after F2F visit (if online questionnaire was not entirely filled in or the phone 24HDR missing) without request for deletion of nominal data – refusal or inability.
- Withdrawal: renunciation after F2F visit with request to delete nominal data. This request entailed the destruction of all nominal data, and the study centre was informed to add a

comment to the consent form.

Based on these tables, the following points can be made:

- For the oldest age group there is a lower rate of recruitment, F2F-visits and complete participation, whereas the middle age group has the highest rates.
- a slightly lower recruitment rate was achieved than initially estimated, as already noted in the previous chapters, particularly in the cantons of Vaud, Zurich and Ticino (highlighted in red)
- Renouncements: a lower retention rate than estimated before the start of the study, between recruitment, i.e. the agreement to participate in the study, and the first stage, i.e. the F2F-visit to the study centre. We had indeed expected a higher retention rate of 87-88%, i.e. a loss of 12-13% of the households recruited. However, this loss was higher and affected ~15-16% of the recruited households, with an even higher proportion in the cantons of Ticino, Vaud and Zurich. In our view, there were two main reasons for this drop-out of households recruited after they had agreed to participate. The first is that some households decided not to take part in the study once they had received the survey material and realised the investment required. The second is discussed in chapter 4.2.1 *Appointment postponement and cancellation*, and is related to the difficulty or impossibility of finding a new appointment date following calls from households wishing to reschedule the visit date originally scheduled at the time of recruitment.
- Dropout: Finally, the dropout rate during the last step, which consisted of not answering the phone 24HDR on a given day or not completing the online questionnaire, was very low (0.55% to 1.5%), which shows that the last step as not considered as a major hurdle and did not affect one or more specific cantons. The fact that most of the reward was sent after complete participation might have helped.
  Looking at the dropout rate by age group, the 10-13 age group had the lowest dropout rate with 0.2%, while the other two categories were higher at 1.1% for the youngest and 1.8% for the oldest age group. The dropouts amount to 21 cases in total, of which 3 did not complete the phone 24HDR and the online questionnaire, 9 did not participate in the phone 24HDR and 9 didn't (entirely) complete the online questionnaire. Further analysis of the lifestyle questionnaire is presented in chapter 6 *Online Questionnaires*.
- Withdrawals: No withdrawal from the study including deletion of all data were requested.

4.5.2 Comparison actual to ideal quotas

Figure 4.2 below shows the cumulative number of actual quotas compared to the ideal (calculated) quotas for recruitment, F2F-visits, blood draws and phone 24HDR.

Figure 4.2 Cumulative overview of actual quotas compared to ideal quotas

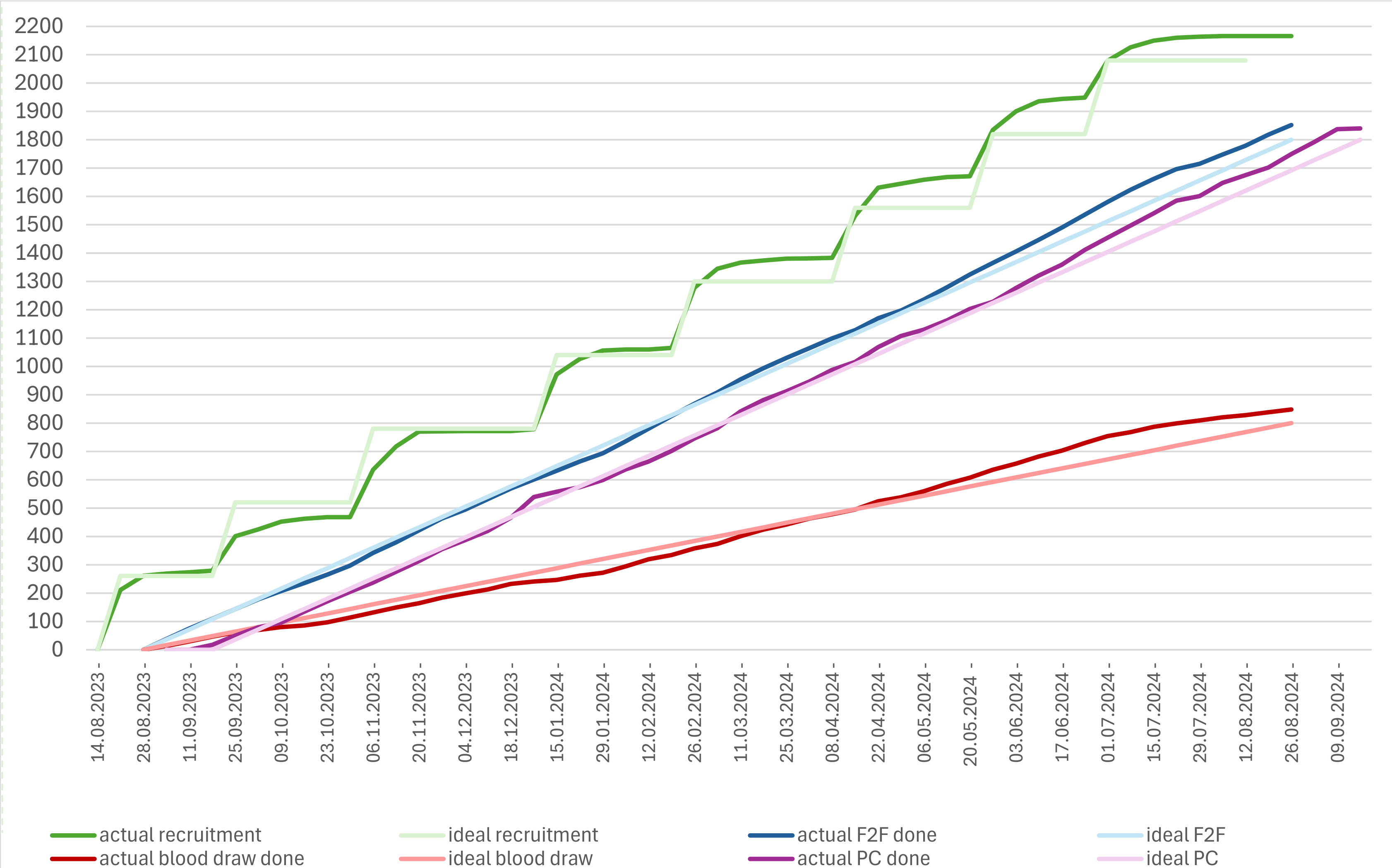


Figure 4.2 shows that the actual recruitment rate was lower than the ideal in P02, and then increased and exceeded the ideal numbers for P04-P08 (for a detailed explanation of this phenomenon, see chapter 4.1.1 *Number of households recruited*). Having fewer participants also impacted phone 24HDR, and blood draws, which were caught up around P05.

The rate for F2F-visits is close to the ideal number, but finally also exceeds the target in the last packages. During P06, we could have reduced the reserves included for the last packages, but the delay between the decision on what to include in a package and the first actual visit numbers is long (~two months). Therefore, to ensure the initial targets were met, it was decided to include enough reserves, and to allow for more participants than originally planned (up to 50), and up to 50 additional blood draws too.

About the phone 24HDR, there is a short peak around Christmas/New Year, when some dieticians took the chance to perform phone 24HDR during the two weeks with less daily business.

Table 4.8 Overview of face-to-face visits, phone recalls and blood draws performed in each centre by package (N)

Study Centre	Item	P1	P2	P3	P4	P5	P6	P7	P8	Total
BE	F2F	55	41	56	48	59	44	50	41	**394**
	PC	55	41	56	47	58	44	50	41	**392**
	BD	20	19	22	26	39	23	26	11	**186**
TI	F2F	30	18	24	24	32	35	24	26	**214**
	PC	30	18	24	24	32	35	23	26	**212**
	BD	12	10	11	10	16	20	14	5	**98**
LU	F2F	30	23	40	34	43	35	27	10	**242**
	PC	30	23	40	34	43	35	27	10	**242**
	BD	10	10	15	19	25	19	12	1	**111**
SG	F2F	42	30	42	33	41	32	30	27	**277**
	PC	41	30	42	32	41	32	30	27	**273**
	BD	13	12	20	17	21	20	11	11	**125**
VD	F2F	43	39	51	57	59	56	57	46	**408**
	PC	42	38	51	57	58	56	55	46	**403**
	BD	15	15	15	19	36	34	29	23	**186**
ZH	F2F	42	19	38	51	46	38	43	40	**317**
	PC	41	19	37	51	46	38	43	40	**315**
	BD	14	9	17	25	24	21	22	10	**142**

F2F=F2F-visits, PC=phone recalls, BD=blood draws

4.6 Blood draw acceptance

Because the total number of blood draws was limited to 800 in total (for cost reasons), and because blood draws could not take place in all time slots (due to lab or nurse availability), the participating household and the target child had to indicate whether they thought the child would consent to a blood sampling before the appointment was scheduled. This preliminary agreement was necessary to schedule the appointment with the household at a time when the blood sample could be taken. To control the number of blood draw agreements and to ensure a good distribution throughout the whole study, a quota plan was drawn up to distribute the number of planned blood draws across all age groups and study centres (Table 4.9). Based on pilot data, a 29% gap was calculated between acceptance of the blood draw and a successful blood draw at the appointment. Once the target number of participants with a planned blood draw (who gave consent and booked an appointment with the possibility of a blood draw) was reached for that specific subgroup, the quota was closed and the subsequent recruited participants in that subgroup were not asked for consent to a blood draw.

Table 4.9 Quota plan for planned blood draws by study centre and age group (N)

Study centre	Age group	Blood draw quota per package							
		1	2	3	4	5	6	7	8
BE	**6-9 years**	9	9	11	13	-	-	11	4
LU		6	6	7	8	-	-	7	1
SG		7	7	9	10	-	-	9	4
TI		5	5	6	7	-	-	6	2
VD		9	9	11	18	-	-	16	11
ZH		7	7	9	13	-	-	12	3
BE	**10-13 years**	9	9	11	11	11	11	11	3
LU		6	6	7	7	7	7	7	1
SG		7	7	9	9	9	9	9	4
TI		5	5	6	6	6	6	6	2
VD		9	9	11	16	16	16	16	11
ZH		7	7	9	12	12	12	12	3
BE	**14-17 years**	9	9	11	11	11	11	11	3
LU		6	6	7	7	7	7	7	1
SG		7	7	9	9	9	9	9	3
TI		5	5	6	6	6	6	6	2
VD		9	9	11	16	16	16	16	11
ZH		7	7	9	12	12	12	12	3

The quota plan was regularly reviewed. As a result, the number of planned blood draws was increased for packages 3 and 4. Due to a lower acceptance rate for the youngest age group, there was no longer a limiting quota during packages 5 to 6 to catch up. For package 8, the targets were set to achieve a number as close to the target as possible. To do this, an individual acceptance rate was calculated for each study centre (based on the results from packages 1-6). As a result, study centres with higher acceptance rates (e.g. BE and LU) had lower target numbers than study centres with lower acceptance rates (e.g. VD).

Table 4.10 below shows the acceptance rate for blood draw, looking only at participants who were asked during the recruitment interview.

Table 4.10 Acceptance rates for blood draw by age group (N, %)

Blood draw consent	6-9 years	10-13 years	14-17 years	Total
accepted	435 (68.3%)	355 (75.4%)	353 (78.8%)	1 143 (73.5%)
NOT accepted	202 (31.7%)	116 (24.6%)	95 (21.2%)	413 (26.5%)
Total	637 (100%)	471 (100%)	448 (100%)	1 556 (100%)

Table 4.11 Overview of acceptance rates for blood draw by study centre (N, %)

Blood draw consent	BE	TI	LU	SG	VD	ZH	Total
accepted	233 (79.0%)	127 (77.0%)	144 (68.9%)	162 (72.0%)	268 (70.2%)	209 (74.6%)	1 143 (73.5%)
NOT accepted	62 (21.0%)	38 (23.0%)	65 (31.1%)	63 (28.0%)	114 (29.8%)	71 (25.4%)	413 (26.5%)
Total	295 (100%)	165 (100%)	209 (100%)	225 (100%)	382 (100%)	280 (100%)	1 556 (100%)

Most of the asked households (73.5%) gave their consent for a blood sample to be taken during the visit at the study centre. In terms of age group, acceptance was highest in households with an adolescent aged 14-17 (78.9%) and in the study centres of Bern and Ticino (79.0% and 77.0% respectively), but lowest in the study centre of Lucerne (68.9%), as shown in Table 4.11.

5 Participants description

5.1 Sociodemographic characteristics and lifestyle of the participants

5.1.1 Characteristics

Table 5.1 below displays a comparison of participants versus non-participants. Various socio-demographic characteristics differed significantly between participants and non-participants, like age, nationality, socioeconomic status or living place, as explained below the table.

Table 5.1 Characteristics of the sample by participation status (N, %)

Characteristic	Participants n = 1 852	Non-participants n = 14 371	p-value[1]
Age group			**<0.001**
6-9 years	748 (40%)	5 701 (40%)	
10-13 years	560 (30%)	3 702 (26%)	
14-17 years	544 (29%)	4 968 (35%)	
Study centre			**0.17**
BE	394 (21%)	2 859 (20%)	
LU	242 (13%)	1 767 (12%)	
SG	277 (15%)	1 971 (14%)	
TI	214 (12%)	1 749 (12%)	
VD	408 (22%)	3 395 (24%)	
ZH	317 (17%)	2 630 (18%)	
Biological sex			**0.029**
Females	942 (51%)	6 923 (48%)	
Males	910 (49%)	7 448 (52%)	
Nationality			**<0.001**
Swiss	1 600 (86%)	10 592 (74%)	
Other	252 (14%)	3 779 (26%)	
Socioeconomic level quintiles			**<0.001**
1 (lowest)	283 (15%)	3 314 (23%)	
2	351 (19%)	2 945 (20%)	
3	404 (22%)	2 841 (20%)	
4	404 (22%)	2 800 (19%)	
5 (highest)	410 (22%)	2 471 (17%)	
Household size			**<0.001**
2	41 (2.2%)	656 (4.6%)	
3	260 (14%)	2 518 (18%)	
4	918 (50%)	6 688 (47%)	
5	471 (25%)	3 163 (22%)	
6+	162 (8.7%)	1 346 (9.4%)	
Urban Typology			**<0.001**
Urban	1 143 (62%)	9 512 (66%)	
Suburban	442 (24%)	3 219 (22%)	
Rural	267 (14%)	1 640 (11%)	

[1]*Pearson's Chi-squared test*

Sex

Although the ratio between males and females is nearly balanced, the sample was not stratified by sex. This decision was based on the expectation that parental consent for participation would not be influenced by the child's sex—an assumption that was ultimately supported by the data. Nonetheless, it is noteworthy that a greater proportion of mothers enrolled their children, with mothers accounting for 80% of the parental participants (see 6.3 *Descriptive sociodemographic results (unweighted)*).

Age repartition

The age repartition is not fully balanced. This imbalance results from a higher number of invitations being sent to children aged 6–9 years, due to a miscommunication with the FSO at the beginning of the project. The error was identified around the midpoint of the main phase. At this stage, it was decided to maintain the same design throughout all seasons to guarantee consistency. Additionally, since younger children showed lower acceptance rates for blood sample collection, this approach helped secure enough samples from the 6–9-year age group. Notably, the participation rate was higher among children aged 10–13 years, which was advantageous for overall sample representativeness.

Household size

Half of the participating households is composed of four members. While the average household size in Switzerland is 2.18, this number is influenced by the fact that 37% of households comprise only one adult person. Therefore, in the context of a study focused on children, a larger average household size is expected[46].

Participation rate is influenced by household size. Lower participation was observed among smaller households (e.g., two-person households, consisting of one parent and one child) and larger households with multiple children. Smaller households (two to three members) also tended to have lower availability for phone numbers, making them less reachable. In larger households (six or more members), language barriers were more frequently encountered (reported in 0.9% of non-participating families compared to 0.4% of all invited families). However, no correlation was found between household size and the distribution of refusal reasons (mainly lack of time or interest in the study).

Administrative region

Participation rates are similar across all study centres. The various regions of Switzerland were well represented, except Northwestern Switzerland (between Basel and Zurich) in which there was no study centre, but which accounts for only 5.6% of the eligible population. An equal number of participants across study centres was not expected, as the sampling strategy was designed to reflect regional population densities and to ensure sufficient representation within each linguistic region. The over-representation of Ticino was intentional, aimed at securing enough participants from this smaller region to allow for more robust statistical analyses. To achieve this, the number of participants from the Zurich region — home to the largest proportion of eligible children and adolescents — was intentionally reduced.

Nationality

Participants of non-Swiss nationality made up 14% of the sample, compared to approximately 27% in the general population[47]. This indicates an underrepresentation of non-Swiss participants, who were less likely to take part in the study. This may be explained by the requirement that both the child and one parent had to be able to speak one of the three national languages to complete all steps of the study. Additionally, all study materials were mailed exclusively in one of these three languages, which may have represented an additional barrier to participation for non-Swiss families and/or recently immigrated families.

Residential area

A small but significant under-participation was observed among families residing in urban areas. This was unexpected, as proximity to study centres was expected to facilitate participation. However, given the belted sampling approach used, this assumption may not apply. The data also indicated that families in rural areas were more likely to have a lower socioeconomic position (SEP), but they were also more likely to be of Swiss nationality—factors that may have had a greater influence on participation than geographic distance. Urban families were also found to be slightly less reachable compared to those in other areas. Among families who were reached, rural and peri-urban households were more likely than urban ones to cite “no interest in the study,” “time required to participate,” and “unsuitable appointment times” as reasons for refusal.

Socioeconomic position quintiles

The estimation of the socioeconomic position (SEP) was performed using the Swiss-SEP index, which is based on the neighbourhood of the participant’s home address[48]. To protect participants' privacy, the index was divided into quintiles, with 1 representing the lowest SEP quintile and 5 the highest.

Participation was lower among families in the lowest quintile. While the reasons for non-participation did not differ substantially between participants and non-participants, people from the lowest quintile were generally less reachable. This was due to a higher frequency of invalid addresses, missing phone numbers, and more instances of families not responding despite having a valid contact number.

Table 5.2 presents the distribution of participants across study centres. The sex distribution varies slightly by study centre, with some study centres including more males and others more females, showing deviations up to 7% from the ideal 50/50 balance. Age group distribution also differs between study centres: while the 6-9-years-old group is consistently the largest one, greater variation is observed among the two older age groups. In all study centres, a bell-shaped distribution is observed for household size, with medium-sized households being more likely to participate. However, the proportion of extremes values varies across study centres. The proportion of Swiss nationals is similar across study centres. As expected, study centres are highly correlated with administrative regions, and the urbanisation landscape surrounding each study centre strongly influences distribution of participants in across typology categories. Similarly, the distribution across SEP quintiles varies substantially, as the index is calculated at the neighbourhood level, including the median rent price per m^2, which can vary considerably depending on the region.

Table 5.2: Characteristics of the participants study by centre (N, %)

Characteristic	BE n = 394	TI n = 214	LU n = 242	SG n = 277	VD n = 408	ZH n = 317	Overall n = 1 852
Gender							
Males	174 (44%)	115 (54%)	132 (55%)	119 (43%)	209 (51%)	161 (51%)	910 (49%)
Females	220 (56%)	99 (46%)	110 (45%)	158 (57%)	199 (49%)	156 (49%)	942 (51%)
Age group							
6-9 years	155 (39%)	92 (43%)	100 (41%)	119 (43%)	170 (42%)	112 (35%)	748 (40%)
10-13 years	121 (31%)	69 (32%)	69 (29%)	83 (30%)	105 (26%)	113 (36%)	560 (30%)
14-17 years	118 (30%)	53 (25%)	73 (30%)	75 (27%)	133 (33%)	92 (29%)	544 (29%)
Household size							
2 people	6 (1.5%)	6 (2.8%)	1 (0.4%)	7 (2.5%)	11 (2.7%)	10 (3.2%)	41 (2.2%)
3 people	54 (14%)	41 (19%)	30 (12%)	24 (8.7%)	62 (15%)	49 (15%)	260 (14%)
4 people	191 (48%)	102 (48%)	128 (53%)	136 (49%)	202 (50%)	159 (50%)	918 (50%)
5 people	117 (30%)	36 (17%)	70 (29%)	70 (25%)	102 (25%)	76 (24%)	471 (25%)
6+ people	26 (6.6%)	29 (14%)	13 (5.4%)	40 (14%)	31 (7.6%)	23 (7.3%)	162 (8.7%)
Administrative region							
Lake Geneva region	3 (0.8%)	0 (0%)	0 (0%)	0 (0%)	384 (94%)	0 (0%)	387 (21%)
Swiss Plateau	391 (99%)	0 (0%)	0 (0%)	0 (0%)	24 (5.9%)	0 (0%)	415 (22%)
Northwestern Switzerland	0 (0%)	0 (0%)	12 (5.0%)	0 (0%)	0 (0%)	34 (11%)	46 (2.5%)
Zurich region	0 (0%)	0 (0%)	2 (0.8%)	0 (0%)	0 (0%)	279 (88%)	281 (15%)
Eastern Switzerland	0 (0%)	8 (3.7%)	0 (0%)	277 (100%)	0 (0%)	1 (0.3%)	286 (15%)
Central Switzerland	0 (0%)	0 (0%)	228 (94%)	0 (0%)	0 (0%)	3 (0.9%)	231 (12%)
Ticino	0 (0%)	206 (96%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	206 (11%)
Nationality							
Foreign	43 (11%)	37 (17%)	27 (11%)	25 (9.0%)	72 (18%)	48 (15%)	252 (14%)
Swiss	351 (89%)	177 (83%)	215 (89%)	252 (91%)	336 (82%)	269 (85%)	1 600 (86%)
Residential area							
Urban	218 (55%)	163 (76%)	137 (57%)	149 (54%)	222 (54%)	254 (80%)	1 143 (62%)
Suburban	126 (32%)	46 (21%)	51 (21%)	78 (28%)	83 (20%)	58 (18%)	442 (24%)
Rural	50 (13%)	5 (2.3%)	54 (22%)	50 (18%)	103 (25%)	5 (1.6%)	267 (14%)
SEP							
1 (lowest)	45 (11%)	70 (33%)	48 (20%)	41 (15%)	68 (17%)	11 (3.5%)	283 (15%)
2	76 (19%)	46 (21%)	55 (23%)	72 (26%)	77 (19%)	25 (7.9%)	351 (19%)
3	87 (22%)	67 (31%)	39 (16%)	79 (29%)	88 (22%)	44 (14%)	404 (22%)
4	98 (25%)	22 (10%)	53 (22%)	58 (21%)	85 (21%)	88 (28%)	404 (22%)
5 (highest)	88 (22%)	9 (4.2%)	47 (19%)	27 (9.7%)	90 (22%)	149 (47%)	410 (22%)

5.2 Weighting strategy

Three sets of sampling weights were constructed using inverse probability weighting to align the participant sample with the Swiss population: one for the on-site visit sample (n = 1 852), one for the blood sample subgroup (n = 848) and one for all questionnaires, including those without a visit (n=1 935). All sets were corrected for non-response and calibrated to population margins using sampling strata (study centre and age group), sex, household size, nationality, Swiss-SEP quintiles, and season (defined as 3-month periods from September 2023 with autumn, using the date of the visit). On-site visit weights were further adjusted to reflect weekday distribution of 24HDRs (two 24HDRs during weekdays [Mon-Thurs], two during weekends [Fri-Sun], one of each). A few participants with only one 24HDR were allocated to either the week or weekend category based on the day of their interview.

All margins except Swiss-SEP, seasons, and weekdays were obtained by averaging the FSO sampling frames of the four invitation waves. Swiss-SEP margins used the FSO counts of 6–17-year-olds per building, linked via EGID to the Swiss-SEP register (version 3[48,49]). Seasonal margins split the sampling frame into four equal parts; weekday distribution followed a 16/49 (week), 9/49 (weekend), and 24/49 (mixed) ratio, corresponding to the combinations of ordered pairs of days of the two weeks falling into each category. Extreme weights, defined as >5 × the median plus interquartile range, were trimmed to this limit. Variance estimation used a rescaling bootstrap (1,000 replicates per weight set).

Additional details on the weighting strategy can be found in Annex *11.1 Weighting strategy details*.

5.2.1 Missing data handling

The amount of missing data is relatively low: for physical measurements, all data have less than 1% of missing values, except blood pressure for which 1.9% do not have the three measurements (with the exception of optional BIA which did not take place in two of the six centres); for blood analysis, a few measures have up to 5.9% of missing values, but most are around 3% missing, with a few down to 1.6%. To apply weights and get weighted means for the different measurements, those missing data were imputed, using multiple imputation by chained equations (MICE)[50], chosen for its flexibility in handling different variable types and its ability to account for complex interdependencies among variables. The imputation model included 56 variables (see Annex *11.2 Variables used for imputation*) capturing relevant socio-demographic and health information. Ten complete datasets were generated, and final estimates were pooled using Rubin’s rules to incorporate uncertainty from both the imputation process and sampling variability.

6 Online Questionnaires

6.1 Online questionnaires – General overview

Prior to the visit, but after an appointment had been scheduled, the recruited household was asked to complete an online questionnaire on the child's lifestyle and eating habits. Participants needed approximately 20-30 minutes to fill out the questionnaire. The questionnaire was divided into two parts, and the modalities differed according to the age of the target child.

- The first part was about the household situation and was always filled in by the parents.
- The second (and main) part was about the lifestyle and eating habits of the child.
    - If the child was under 14, this second part was followed the first one, but with a comment encouraging the parent to complete it with the child.
    - If the adolescent was 14 or older, this second part was sent separately to the adolescent by email, without access from the parent, to favour reliable answers. It contained a few additional questions (e.g. about alcohol or smoking) compared to the child version.

During the recruitment interview, either the parent's email address, or both the parent's and the adolescent's (if aged 14 or older) were registered. This way, immediately after the call, an email was sent, containing a personalised link on which the participant could click and directly access the online questionnaire (without the need to insert personalised access codes). The appointment confirmation letter received a few days after the call contained personalised access codes and the general link to access the online questionnaire. It was also a way to remind them to complete the questionnaire before coming to the study centre.

Table 6.1 shows an overview of the topics contained in the online questionnaire and by whom the questions were answered.

Table 6.1 Overview of domains included in the online questionnaire

Topic	Questionnaire for parents	Questionnaire for 6-13-year-olds (filled in by parents ideally with the child)	Questionnaire for 14-17-year-olds
Socio-demographic characteristics	X		
Early life	X		
Food insecurity and healthy eating	X		X
Dietary habits		X	X
Food allergies and special dietary regimens		X	X
Dietary supplements		X	X
Physical activity		X	X
Screen time		X	X
Sleep		X	X
General health		X	X
Cigarettes/pocket money			X
Food Propensity Questionnaire (FPQ)		X	X

6.1.1 Pre-test of the online questionnaire

The questionnaire was pre-tested before the study by ~25 households in each language, covering the three age-groups, to test the understandability of questions. Most questions were inspired from previous surveys, mainly HBSC[51,52], menuCH-Kids feasibility study, menuCH adults[53], BNFCS (Belgium)[54], KIGGS (Germany)[31], aha! Foundation on allergies, FSVO Survey on Food supplements[55] and Promotion Santé Suisse-Gesundheitsförderung Schweiz[56]. It was also used and validated in the pilot phase. Detailed questionnaires are provided on the data repository (https://www.studydata.blv.admin.ch/catalog/12).

6.2 Numbers of online questionnaires

Overall, the number of completed questionnaires (N = 1 935) is higher than the number of F2F-visits (N = 1 852). This discrepancy is explained by the fact that some recruited households completed the questionnaires (N=87) but did not attend a visit at the study centre (for details, see chapter 4.4 *Completion of Online Questionnaire*). Additional data from those 87 questionnaires are available in a specific dataset. Furthermore, four questionnaires are completely missing for participants with a visit, and some questionnaires are incomplete (three with only the adolescent parent's part, five with only the adolescent's part) but those were included in the dataset. The following results are based on the 1 848 questionnaires with a visit (1 852-4). Of note, participants could skip some questions, so there might be missing answers even in complete questionnaires.

Results in the following parts are either descriptive of our participants, thus unweighted (6.3 *Descriptive sociodemographic results (unweighted)*) or weighted to represent the Swiss target population (6.4 Weighted results of the online questionnaire). The weighting procedure is detailed in chapter 5.2 *Weighting strategy.* General note: Rounding was limited to one digit after the comma; hence, the percentages do not always add up to 100%.

6.3 Descriptive sociodemographic results (unweighted)

The following results are descriptive results and are not weighted to match the population margins.

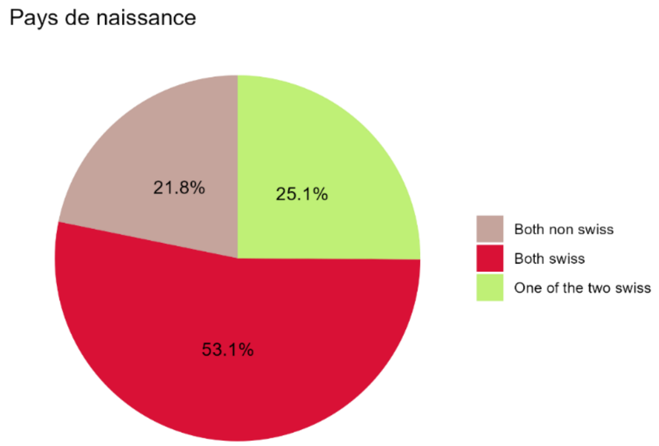
Children

- The number of siblings permanently living with the target child suggests that, on average, 2.3 children live together in a single household. For detailed results, 12.1 *Descriptive sociodemographic results (unweighted)*.
- Out of all participants, 91.1% are born in Switzerland, and 8.9% are born abroad. For detailed results,12.1.2 *Children: Country of birth*.
- Among all study participants, 30.3% were delivered by caesarean section, while 69.7% had a natural birth.
- Overall, 1.1% of all participants identify themselves as a sex other than the one they were assigned at birth. For detailed results, see 12.1.3 *Sex/Gender of participants*.

Parents

- Of all parents who completed the online questionnaire, 80.3% are the biological mothers of the participants. For detailed results, see 12.1.4 *Household's parental status*.
- In 53.1% of the households, both the parent and their partner/spouse are Swiss nationals, in 25.1% one of them is Swiss, and in 21.8% neither of them is a Swiss national, as shown in Figure 6.1 below. For detailed results, see 12.1.5 *Parents: Place of birth.*

Figure 6.1 Percentage distribution of nationality of parent and partner/spouse



Question: In which country were you born? In which country was your spouse/partner born? Question was exclusively answered by parents. Number of answers= 1 838. Missing answers: 18.

- In 79.4% of households, at least one parent has attained tertiary education. Overall, the average parental education score per household is 2.6 out of 3, based on the FSO classification scale (1 = lowest, 3= highest level of education)[57]. This score is calculated by summing the education levels of both parents, as shown in Table 6.2, and dividing by two. For detailed results, see 12.1.6 *Parents: Education.*

Table 6.2 Score of education (FSO classification)

Score	Description
1	I did not go to school or complete compulsory schooling
1	I completed compulsory schooling, 10th school year, pre-apprenticeship or internship
2	Apprenticeship / Federal Diploma of Vocational Education and Training or vocational school (no Federal Vocational Baccalaureate)
2	Baccalaureate, Federal Vocational Baccalaureate after a Federal Diploma of Vocational Education and Training, upper-secondary level commercial school or upper-secondary specialized school
3	Professional education with Advanced Federal Diploma of Higher Education or Federal Diploma of Higher Education
3	University of teacher education or university of applied sciences
3	University or institute of technology: Bachelor’s, Master’s, Doctorate

- Overall, 97.7% of households reported that at least one member (either parent or a partner/spouse) is engaged in one or more paid, regular professional activities. For detailed results, see 12.1.7 Parents: *Paid profession, professional status and situation*.

- Mean parent BMI was 24.65 kg/m^2, with 57.1% having a normal body weight and around 40% were overweight or obese. For detailed results, see 12.1.8 *Parents: BMI*

6.4 Weighted results of the online questionnaire

The following results were weighted to match the population margins (weighting procedure is detailed in chapter 5.2 *Weighting strategy*).

6.4.1 Early life

The average birth weight and length is 3.308 g and 49.6 cm, respectively. For detailed results, see12.2.1 *Early life: Weight and height at birth.*

Overall, 89.7% of children are breastfed – either exclusively with breast milk or in combination with infant formula, liquids, or solid foods. On average, children are exclusively breastfed with breastmilk for 4.8 months and receive breastmilk along with supplemental feeding for a total of 9.8 months.

6.4.2 Food insecurity and healthy eating

Barriers to healthy eating

Table 6.3 Percentage distribution of factors influencing healthy eating

	Yes completely	Rather yes	Rather not	Not at all	YES total	NO total
I'm worried about having enough money to feed my family enough to eat	1.9%	4.6%	18.9%	74.5%	6.6%	93.4%
I can't buy enough fruit and vegetables because it would take up too much of my food budget	1.5%	3.3%	16.7%	78.5%	4.8%	95.2%
I'm worried about having enough money to feed my family in a way that is balanced	1.7%	5.2%	19.6%	73.5%	6.9%	93.1%
I don't have enough time to prepare balanced meals	1.6%	15.5%	43.8%	39.1%	17.1%	82.9%
I don't know how to prepare balanced meals	0.8%	3.5%	18.1%	77.6%	4.3%	95.7%

Question: Please indicate how well the following statements correspond to your situation: completely, rather yes, rather not or not at all. Question was exclusively answered by parents.

Table 6.3 shows that most parents consider themselves knowledgeable about what a balanced meal is, and though monetary problems are present, lack of time is reported as the most limiting factor.

Diet perception

Table 6.4 Percentage distribution of self-evaluation of diet quality, stratified by parents' and adolescents' opinion

	Balanced	Fairly balanced	Fairly unbalanced	Unbalanced
Parents' opinion (all ages)	28.0%	56.5%	13.8%	1.7%
Adolescent's opinion	22.7%	52.6%	21.0%	3.7%

Question: In general, do you think [FIRST NAME CHILD]'s/your diet is… Question was answered by parents for children aged 6-17 years. Question was additionally answered by adolescent aged 14-17 years.

Table 6.4 shows that most parents and adolescents perceive eating habits as fairly balanced, with parents tending to view their child's diet slightly more positively than the adolescents themselves. For detailed results, *12.2.2 Food insecurity and healthy eating.*

Body image

Parents and adolescents both stated their perception on the body image of their children / their own body image.

Table 6.5 Percentage distribution of body image perception of the child / adolescent, overall and stratified by parents' and adolescents' opinion, sex, age group and linguistic region

	Much too thin	Slightly too thin	Just about the right weight	Overweight	Obese
Parents' opinion					
6-9 years					
Females	0%	14.2%	80.5%	5.3%	0%
Males	1.9%	15.6%	76.8%	5.6%	0.1%
10-13 years					
Females	0.3%	12.1%	84.2%	3.2%	0.3%
Male	1.4%	18%	72.2%	8.4%	0%
14-17 years					
Females	0%	10.3%	82.1%	6.9%	0.8%
Males	0%	19.7%	75.1%	5.2%	0%
Regions					
DE	0.7%	16%	77.8%	5.2%	0.2%
FR	0.1%	12.6%	79.4%	7.8%	0.1%
IT	1.1%	8.4%	82.9%	7%	0.6%
Overall	0.6%	15%	78.4%	5.8%	0.2%
Adolescent's opinion					
Females					
14-17 years	0.1%	6.1%	81%	11.9%	0.8%
Males					
14-17 years	2.4%	24.2%	63.7%	8.6%	1.1%
Region					
DE	0.9%	17%	72.9%	9%	0.3%
FR	2.1%	12.6%	70.1%	11.5%	3.8%
IT	4%	4.4%	69.8%	21.8%	0%
Overall	**1.3%**	15.4%	72.1%	10.2%	1%

Question: Do you think that [FIRST NAME CHILD] is…. /Do you think that you are… Question was answered by parent for children aged 6-13 years. Question was answered by both parents and adolescent for children aged 14-17 years.

Table 6.5 shows that most parents estimate the weight of their child as "just about right" (78.4%), followed by "slightly too thin" (15%) and "overweight" (5.8%). Adolescents show a similar distribution in their responses; however, they tend to be slightly more self-critical – males more often perceiving themselves as "slightly too thin" and females as "overweight". Italian-speaking adolescents perceive themselves more often as “overweight” and less often as “slightly too thin”, compared to the other linguistic regions.

6.4.3 Dietary habits

Breakfast

Table 6.6 Percentage distribution of breakfast habits on weekdays, overall and stratified by age group

	During the week, he/she never eats breakfast	1 day	2 days	3 days	4 days	5 days
6-9 years	5.4%	1.8%	1.8%	4.3%	2.3%	84.4%
10-13 years	10.6%	5.3%	5.8%	6.2%	3.4%	68.8%
14-17 years	25.5%	3.6%	8.3%	5.8%	6.2%	50.6%
Overall	**13.3%**	**3.6%**	**5.1%**	**5.4%**	**3.9%**	**68.8%**

Question: In general, how many times does [FIRST NAME CHILD]/do you eat breakfast on weekdays (more than a glass of milk or fruit juice)? Question was answered by the parent for children aged 6-13 years. Question was answered by the adolescent for children aged 14-17 years.

Table 6.6 shows that most young people eat breakfast regularly during the week (68.8%), followed by those who never eat breakfast during the week (13.3%). A comparison of the age groups shows that the youngest eat breakfast most regularly (84.4%), whereas adolescents have the highest percentage of never eating breakfast (25.5%).

Table 6.7 Percentage distribution of breakfast habits at weekends, overall and stratified by age group

	Never	on one of the days (Saturday or Sunday)	on both days (Saturday and Sunday)
6-9 years	0.6%	7.7%	91.7%
10-13 years	3%	14.3%	82.7%
14-17 years	9.7%	23.1%	67.3%
Overall	**4.2%**	**14.6%**	**81.2%**

Question: In general, how many times does [FIRST NAME CHILD]/do you eat breakfast at the weekend (more than a glass of milk or fruit juice)? Question was answered by parent for children aged 6-13 years. Question was answered by adolescent for children aged 14-17 years.

Table 6.7 shows that most of the youth (81.2%) eat breakfast regularly on weekends, followed by 14.6% who eat breakfast on only one weekend day. A comparison across age groups reveals that younger children are more consistent in eating breakfast on weekends (91.7%), whereas adolescents have the highest proportion of those who never eat breakfast on weekends (9.7%).

Snacking

Table 6.8 Percentage distribution of snacking on weekdays, overall and stratified by age group

	No Total	Never	Rarely	Yes Total	Some-times	Fre-quently	Always
Between breakfast and lunch							
6-9 years	**10.4%**	3.9%	6.6%	**89.6%**	7.8%	24.8%	57%
10-13 years	**31.2%**	10.6%	20.6%	**68.8%**	15.6%	20.3%	32.9%
14-17 years	**44.2%**	19.7%	24.4%	**55.8%**	23.9%	20.4%	11.5%
Overall	**27.8%**	**11%**	**16.9%**	**72.2%**	**15.4%**	**21.9%**	**34.9%**
Between lunch and dinner							
6-9 years	**2.4%**	0.2%	2.2%	**97.6%**	10.6%	28.9%	58.1%
10-13 years	**5.6%**	0.6%	5.1%	**94.4%**	17.1%	37.6%	39.6%
14-17 years	**10.4%**	2.9%	7.5%	**89.6%**	27%	39.1%	23.4%
Overall	**5.9%**	**1.1%**	**4.8%**	**94.1%**	**17.8%**	**35%**	**41.2%**
After dinner							
6-9 years	**78.6%**	50.5%	28.1%	**21.4%**	12.9%	4.7%	3.8%
10-13 years	**66.6%**	27.9%	38.7%	**33.4%**	20%	8.7%	4.7%
14-17 years	**57.8%**	20.2%	37.6%	**42.2%**	22.3%	16.9%	3%
Overall	**68.1%**	**33.5%**	**34.6%**	**31.9%**	**18.2%**	**9.8%**	**3.9%**
In the middle of the night							
6-9 years	**NA**	NA	NA	**NA**	NA	NA	NA
10-13 years	**NA**	NA	NA	**NA**	NA	NA	NA
14-17 years	**90.2%**	73.5%	16.7%	**9.8%**	6.6%	2%	1.1%
Overall	**90.2%**	**73.5%**	**16.7%**	**9.8%**	**6.6%**	**2%**	**1.1%**

Question: Over the course of a typical weekday, how often does [FIRST NAME CHILD]/do you eat between main meals (breakfast, lunch, dinner)? Include all types of food (including treats, sweet or savoury snacks, fruits, etc. but not drinks). Question was answered by parent for children aged 6-13 years. Question was answered by adolescent for children aged 14-17 years.

Table 6.9 Percentage distribution of snacking on weekends, overall and stratified by age group

	No Total	Never	Rarely	Yes Total	Sometimes	Frequently	Always
Between breakfast and lunch							
6-9 years	**51%**	21.3%	29.7%	**49%**	19.6%	17.4%	12%
10-13 years	**69.3%**	31.3%	38%	**30.7%**	15.6%	8.9%	6.3%
14-17 years	**67.3%**	36%	31.3%	**32.7%**	20.3%	10.2%	2.2%
Overall	**62.3%**	**29.2%**	**33.1%**	**37.7%**	**18.4%**	**12.2%**	**7.1%**
Between lunch and dinner							
6-9 years	**5.6%**	0.8%	4.8%	**94.4%**	19.9%	37.4%	37.2%
10-13 years	**8.8%**	0.9%	7.9%	**91.2%**	28.2%	39%	24%
14-17 years	**13.8%**	2.5%	11.2%	**86.2%**	29.5%	36.6%	20.1%
Overall	**9.2%**	**1.3%**	**7.8%**	**90.8%**	**25.7%**	**37.7%**	**27.4%**
After dinner							
6-9 years	**74.4%**	43.9%	30.6%	**25.6%**	13.8%	9.1%	2.6%
10-13 years	**57.9%**	24.5%	33.5%	**42.1%**	24.3%	12.2%	5.6%
14-17 years	**44.7%**	17.5%	27.3%	**55.3%**	29.4%	20.8%	5%
Overall	**59.7%**	**29.1%**	**30.6%**	**40.3%**	**22.2%**	**13.7%**	**4.4%**
In the middle of the night							
6-9 years	**NA**	NA	NA	**NA**	NA	NA	NA
10-13 years	**NA**	NA	NA	**NA**	NA	NA	NA
14-17 years	**82.5%**	67.4%	15.2%	**17.5%**	9%	6.8%	1.7%
Overall	**82.5%**	**67.4%**	**15.2%**	**17.5%**	**9%**	**6.8%**	**1.7%**

Question: Over the course of a typical weekend day, how often does [FIRST NAME CHILD]/do you eat between main meals (breakfast, lunch, dinner)? Include all types of food (including treats, sweet or savoury snacks, fruits, etc. but not drinks). Question was answered by parent for children aged 6-13 years. Question was answered by adolescent for children aged 14-17 years. Question for snacking in the middle of the night was asked exclusively for age group 14-17.

Table 6.8 shows that the majority of young people consume snacks on weekdays, primarily between breakfast and lunch (72.2%) and between lunch and dinner (94.1%). Snacking after dinner and during the night is less common (31.9% and 9.8%, respectively). A comparison of the age groups shows that younger children snack more regularly during the morning and afternoon, whereas adolescents are more likely to snack in the evening.

Table 6.9 shows that morning is less common on weekends compared to weekdays (37.7% vs 72.2%), while most young people still have a snack in the afternoon (90.8%). Snacking after dinner and during the night is still low but more frequent during the weekend (40.3% and 17.5%, vs 31.9% and 9.8% respectively).

Eating meals in company of adults

Table 6.10 Percentage distribution of eating meals in company of adults, overall and stratified by age group

	Every day	Several times a week	Around once a week	Less frequently
Breakfast with an adult				
6-9 years	61.2%	25%	0%	5.8%
10-13 years	40.6%	32%	0.1%	10.3%
14-17 years	16.3%	32.3%	24.4%	26.8%
Overall	**40.5%**	**29.7%**	**7.4%**	**13.7%**
Lunch with an adult				
6-9 years	82%	15.9%	0%	0.9%
10-13 years	64.9%	27.2%	0.2%	3%
14-17 years	25.3%	41.6%	20.8%	12.4%
Overall	**59%**	**27.6%**	**6.3%**	**5.1%**
Dinner with an adult				
6-9 years	87.7%	10.3%	0%	1.3%
10-13 years	79.8%	17.7%	0%	1.7%
14-17 years	58.8%	34%	3.6%	3.3%
Overall	**76.3%**	**20%**	**1.1%**	**2.1%**

Question: How frequently does [FIRST NAME CHILD]/do you have breakfast/lunch/dinner with at least one adult? Question was answered by parents for children aged 6-13 years. Question was answered by adolescent for children aged 14-17 years.

Table 6.10 shows that the majority of young people regularly eat in the company of adults. Dinner is the most frequently shared meal (76.3% every day), followed by lunch (59% every day). For breakfast, only 40.5% of young people eat it daily with an adult, and 20% rarely. Age group comparison reveals that younger children are more likely to eat with adults than adolescents.

Place of consumption: Lunch

Table 6.11 Percentage distribution of weekday lunch consumption settings, overall and stratified by age group

	Percentage
at home (your house or that of a close relative)	
6-9 years	64.8%
10-13 years	64.8%
14-17 years	37.2%
Overall	**55.6%**
at someone else's house	
6-9 years	4.0%
10-13 years	4.4%
14-17 years	3.0%
Overall	**3.8%**
at the school canteen (e.g.: school meals)	
6-9 years	25.3%
10-13 years	17.9%
14-17 years	20.8%
Overall	**21.3%**
during cookery lessons at school	
6-9 years	0.0%
10-13 years	1.8%
14-17 years	2.6%
Overall	**1.5%**
by eating out*	
6-9 years	1.5%
10-13 years	3.2%
14-17 years	16.3%
Overall	**7%**
by eating a packed lunch brought from home	
6-9 years	3.7%
10-13 years	6.6%
14-17 years	18.4%
Overall	**9.5%**
Other, please specify:	
6-9 years	0.5%
10-13 years	1.3%
14-17 years	1.6%
Overall	**1.1%**

*Question: On weekdays, how often does [FIRST NAME CHILD]/do you have lunch… *something purchased from a take-away, a restaurant, supermarket, baker's, fast food outlet or food truck. Question was answered by parents for children aged 6-13 years. Question was answered by adolescent for children aged 14-17 years.*

Table 6.11 shows that the majority of young people eat lunch at home on weekdays (55.6%), followed by those who eat at the school canteen (21.3%) and those who bring lunch from home to school (9.5%). Age group comparison reveals that younger children are more likely to eat lunch at home, whereas adolescents more frequently bring food from home, eat at the school canteen or eat out. For detailed results, 12.2.3 *Dietary habits*.

Child cooking habit

Only one quarter of children regularly assist in the preparation of meals, more often adolescents than younger children. For detailed results, 12.2.3 *Dietary habits*.

6.4.4 Food allergies and special dietary regimens

Food allergies

Overall, 11.6% report avoiding certain foods due to allergies or intolerances, mainly dairy, nuts and certain fruits. Of these cases, 41.5% are medically diagnosed by a doctor. For detailed results, see 12.2.4 *Food allergies and special dietary regimens*.

Vegetarian and vegan diets

Table 6.12 Percentage distribution of vegetarian and vegan diet, overall and stratified by sex

	Yes	No
Vegetarian		
Females	6.4%	93.6%
Males	2.6%	97.4%
Overall	**4.4%**	**95.6%**
Vegan		
Females	1.3%	98.7%
Males	0.8%	99.2%
Overall	**1%**	**99%**

Question: Is [FIRST NAME CHILD]/Are you vegan (diet that does not contain any products of animal origin such as eggs, meat, fish, dairy products, honey)? Is [FIRST NAME CHILD]/are you vegetarian (meaning the diet does not include any meat, poultry or fish but contains dairy products and/or eggs)? Question was answered by parents for children aged 6-13 years. Question was answered by adolescent for children aged 14-17 years.

Table 6.12 shows that a minority of young people follow a vegetarian (4.4%) or vegan (1%) diet. These dietary patterns are more common among females, with 6.4% identifying as vegetarian and 1.3% as vegan, compared to 2.6% and 0.8%, respectively, for males. Those behaviours generally increase with age. For detailed results, see 12.2.4 *Food allergies and special dietary regimens*.

Weight loss diet

Among adolescents, 8.8% report following a specific diet aimed at losing weight over the past 12 months, both males and females. For detailed results, see 12.2.4 *Food allergies and special dietary regimens.* For detailed results about intake of medication influencing appetite and/or body weight, 12.2.4 *Food allergies and special dietary regimens*.

6.4.5 Dietary supplements and medication influencing appetite and/or body weight

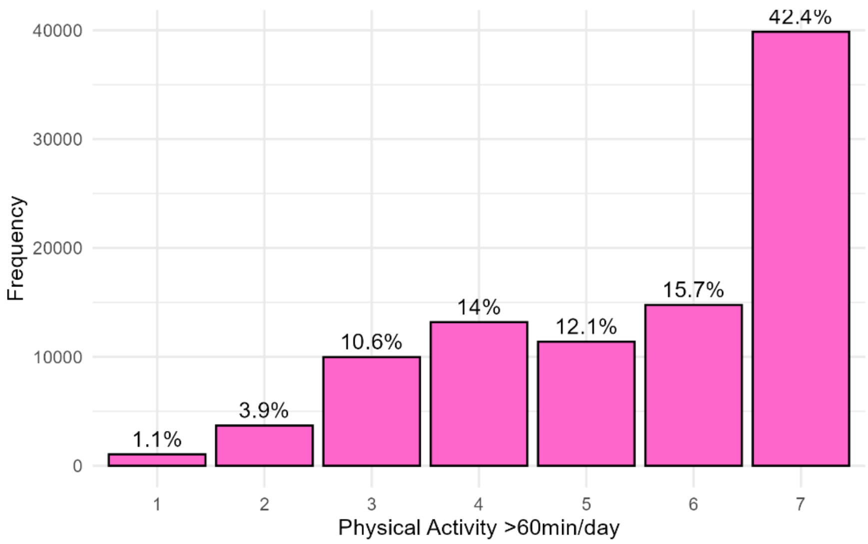
Overall, 24.4% took dietary supplements in the last month, and 27.5% had done so over the past winter. The most often consumed products overall are vitamins, minerals and preparations combining vitamins and minerals. For detailed results, 12.2.5 *Dietary supplements*.

6.4.6 Physical activity

Number of days per week with at least one hour of physical activity

The following graphs show the results of reported physical activity of the past seven days (for a total of at least 60 minutes per day), stratified by sex and age group.

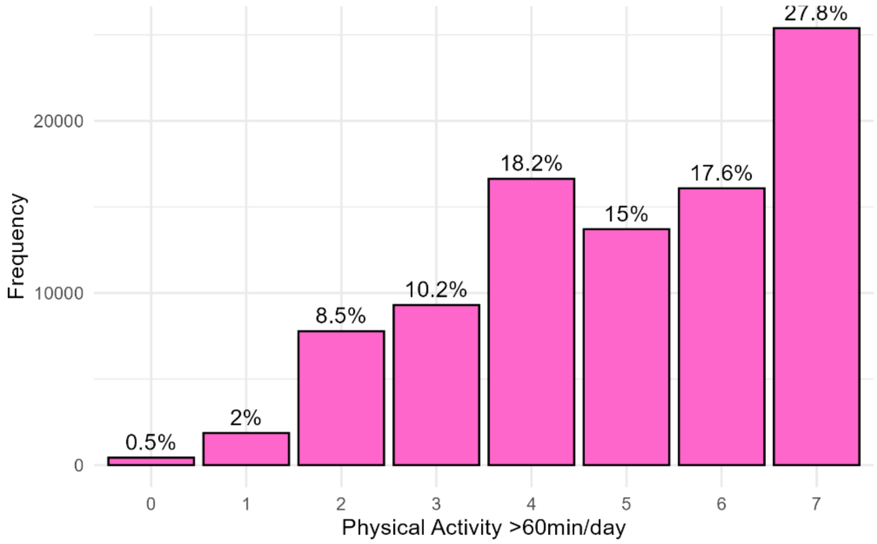
Figure 6.2 Number of days with physical activity among 6-9-year-old females



Question: Over the past 7 days, on how many days did [FIRST NAME CHILD] practice some sort of physical activity for a total of at least 60 minutes per day? Question was answered by parents.

Figure 6.2 shows that about 42% of the 6-9-year-old girls respect the WHO recommendations of one hour of activity every day.[58] They have a mean of 5.5 days and a median of 6 days during the week with more than 60min of physical activity.

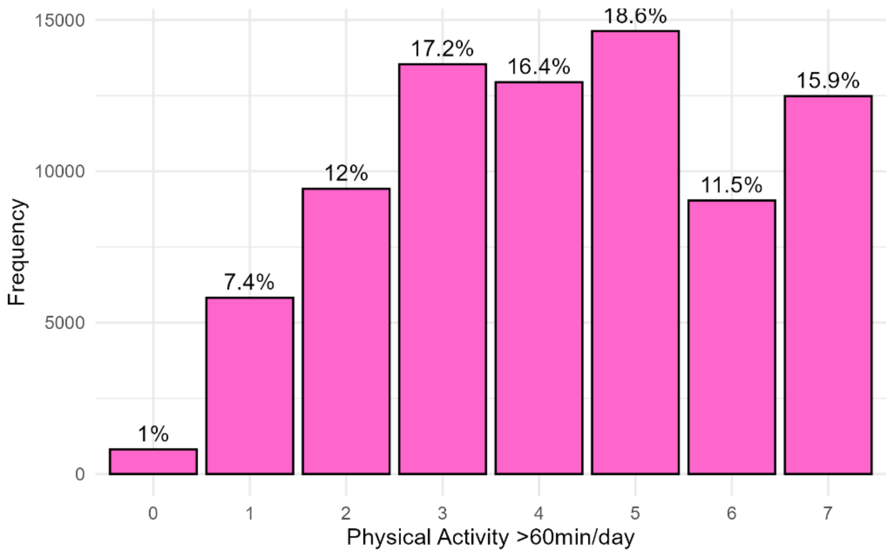
Figure 6.3 Number of days with physical activity among 10-13-year-old females



Question: Over the past 7 days, on how many days did [FIRST NAME CHILD] practice some sort of physical activity for a total of at least 60 minutes per day? Question was answered by parents.

Figure 6.3 shows that about 28% of the 10-13-year-old girls respect the WHO recommendations of one hour of activity every day.[58] They have a mean of 5.0 days and a median of 5 days during the week with more than 60min of physical activity.

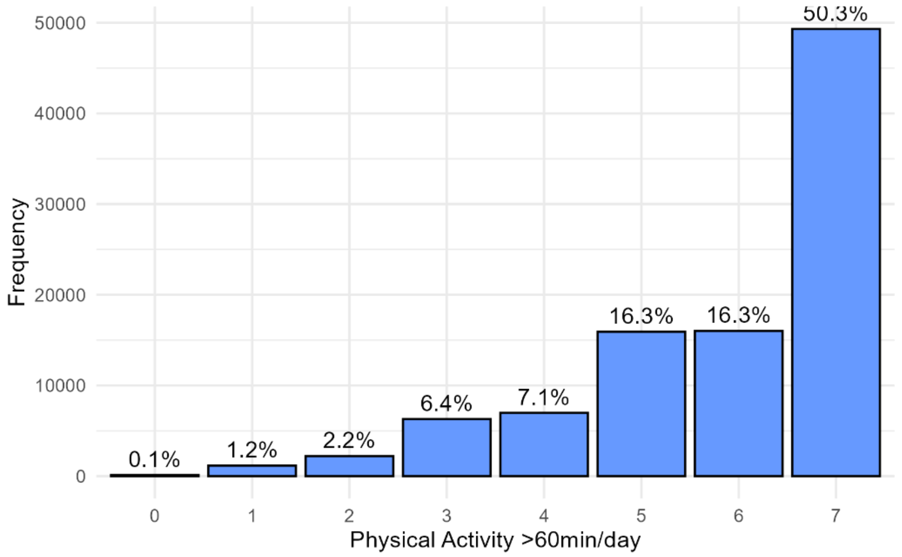
Figure 6.4 Number of days with physical activity among 14-17-year-old females



Question: Over the past 7 days, on how many days were you physically active for a total of at least 60 minutes per day? Question was answered by adolescents.

Figure 6.4 shows that about 16% of the 14-17-year-old girls respect the WHO recommendations of one hour of activity every day.[58] They have a mean of 4.2 days and a median of 4 days during the week with more than 60min of physical activity.

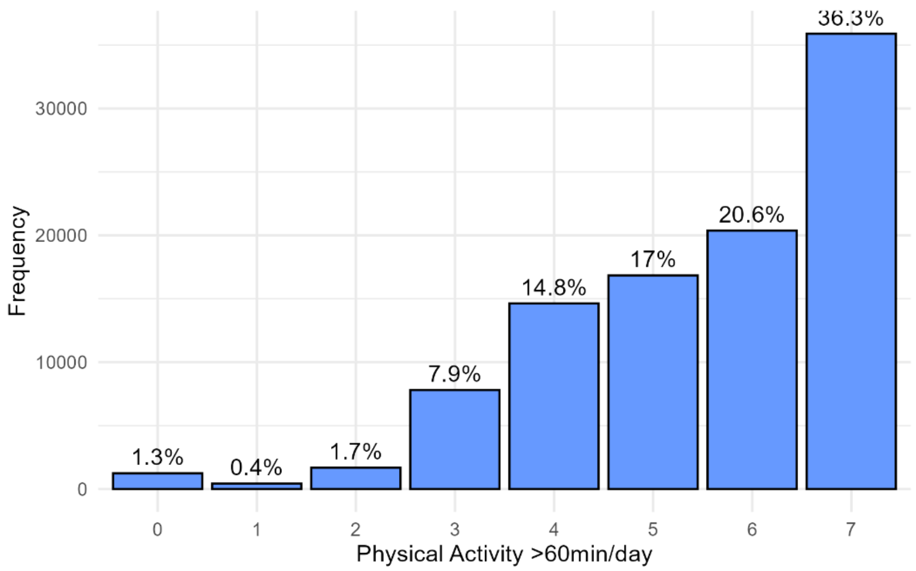
Figure 6.5 Number of days with physical activity among 6-9-year-old males



Question: Over the past 7 days, on how many days did [FIRST NAME CHILD] practice some sort of physical activity for a total of at least 60 minutes per day? Question was answered by parents.

Figure 6.5 shows that about 50% of the 6-9-year-old boys respect the WHO recommendations of one hour of activity every day.[58] They have a mean of 5.8 days and a median of 7 days during the week with more than 60min of physical activity.

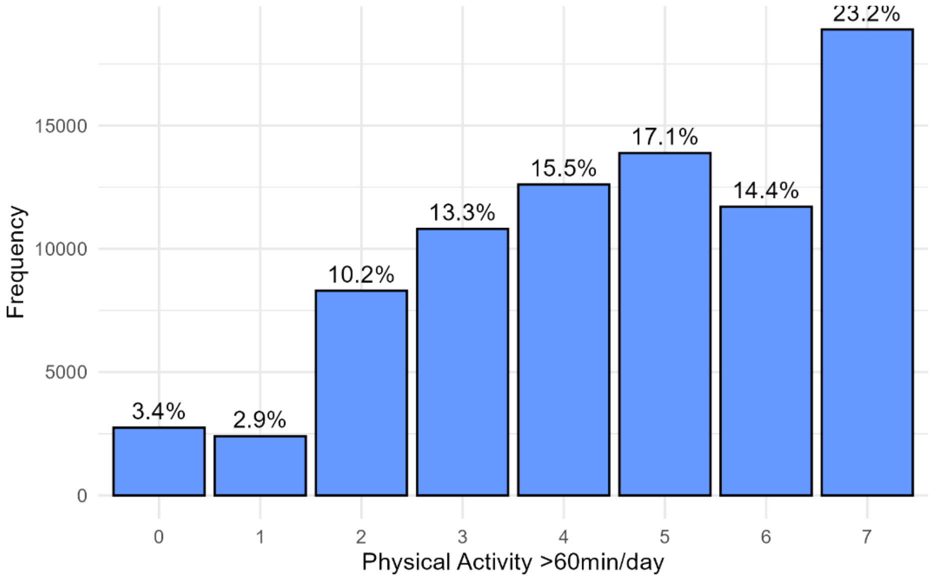
Figure 6.6 Number of days with physical activity among 10-13-year-old males



Question: Over the past 7 days, on how many days did [FIRST NAME CHILD] practice some sort of physical activity for a total of at least 60 minutes per day? Question was answered by parents.

Figure 6.6 shows that about 36% of the 10-13-year-old boys respect the WHO recommendations of one hour of activity every day.[58] They have a mean of 5.5 days and a median of 6 days during the week with more than 60min of physical activity.

Figure 6.7 Number of days with physical activity among 14-17-year-old males



Question: Over the past 7 days, on how many days were you physically active for a total of at least 60 minutes per day? Question was answered by adolescents. The dashed vertical bar represents the mean value.

Figure 6.7 shows that about 23% of the 14-17-year-old boys respect the WHO recommendations of one hour of activity every day.[58] They have a mean of 4.6 days and a median of 5 days during the week with more than 60min of physical activity.

Overall, the graphs indicate that the younger children as well as the boys record the highest number of days with at least one hour of physical activity.

Mean amount of physical activity per day

Table 6.13 Mean and median values (minutes) of physical activity per day, overall and stratified by sex and age group

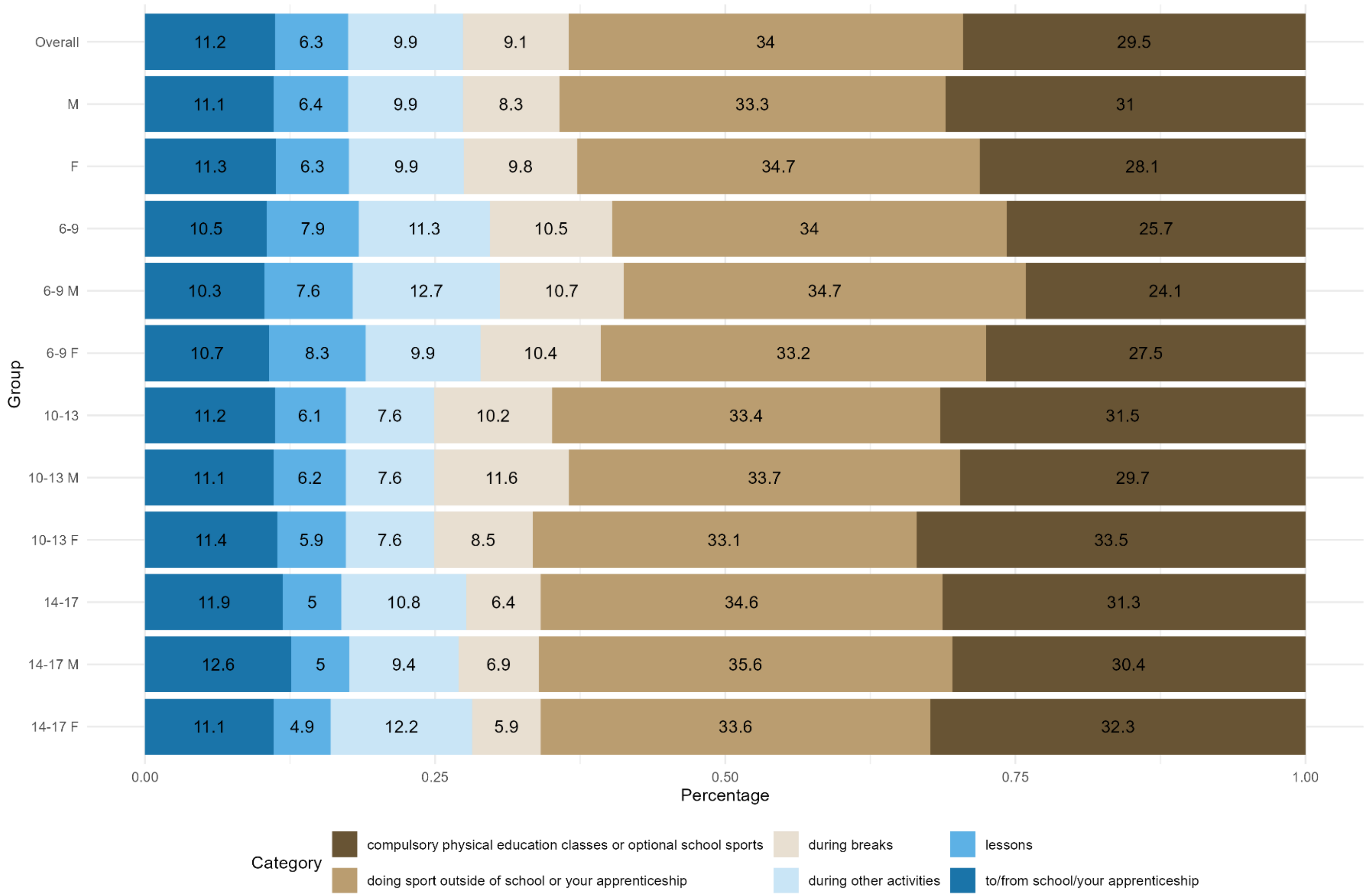
	Mean time of physical activity per day (min)	Median time of physical activity per day (min)
6-9 years	**197.3**	**175.5**
Males	200.4	182.5
Females	194.0	168
10-13 years	**195.4**	**168**
Males	201.2	175
Females	189.0	168
14-17 years	**218.1**	**212**
Males	224.5	212
Females	211.7	204
All Males	**197.7**	**182**
All Females	**207.8**	**190**
Overall	**202.9**	**183**

Six subcategories of physical activity were assessed (e.g. going to school, school break, sport club … - see Figure 6.8), and the time spent on each activity during a school day was recorded using predefined time slots: 0 minutes, 1-15 minutes, 16-30 minutes, 31-60 minutes, 61-120 minutes, 121-180 minutes and more than 180 minutes. Table 6.13 shows the mean and median values (in minutes) of physical activity calculated by summing the midpoint of each selected time slot. The data show that adolescents report spending more time being physically active than younger children (mean of 218.1 minutes compared to 195.4 and 197.3 minutes, respectively). Additionally, females report slightly more physical activity (mean of 207.8 minutes per day) than males (mean of 197.7 minutes per day). The distribution of median values follows a similar pattern.

When comparing this table with the previous graphs (Figures 6.2-6.7), we see that younger children and males declare being more consistent in engaging in at least one hour of physical activity per day. However, older adolescents and females report to spending more minutes being active during a typical school day.

Figure 6.8 shows that, across all subgroups, the largest share of physical activity comes from sports practiced outside of school or apprenticeship (34%) and compulsory physical education classes (29.5%), together accounting for more than half of total physical activity. Commuting to and from school during school breaks, and other informal activities contribute approximately another 30%. Physical activity during regular lessons (excluding physical education lessons), plays a minor role. A comparison across age groups reveals a similar distribution pattern. For detailed results, see 12.2.6 *Physical activity*.

Figure 6.8 Percentage distribution of physical activity per type of physical activity, overall and stratified by sex and age group



6.4.7 Screen time

Screen time per week

Table 6.14 Screen time during weekdays and weekends (hours), overall and stratified by sex and age group

	Mean time (h) weekdays	Mean time (h) weekends
Females		
6-9 years	1.7	1.8
10-13 years	2.6	3.0
14-17 years	4.8	4.6
Males		
6-9 years	1.7	2.1
10-13 years	2.4	3.0
14-17 years	4.4	4.2
Overall	**3.1**	**3.1**

Question: On weekdays/on weekends, how many hours per day does [FIRST NAME CHILD]/do you generally spend in front of a screen (meaning smartphone, television, computer, tablet, games console) during his/her/your free time, at school/apprenticeship and to do the homework? Question was answered by parents for children aged 6-13 years. Question was answered by adolescent for children aged 14-17 years.

Table 6.14 shows that, on weekdays and weekends, young people spend approximately 3.1 hours per day in front of a screen (during free time, at school/apprenticeship and for homework). Adolescents tend to spend more time in front of screens than younger children. For the younger and the middle age group, no notable differences are observed between sexes; however, among adolescents, females report slightly higher screen time than males. For detailed results, 12.2.7 *Screen time*.

Meals in front of a screen

The following Table 6.15 shows the number of mentions and percentage of people who eating in front of a screen.

Table 6.15 Percentage distribution of meals eaten in front of a screen, stratified by type of meal

	Rarely or never (less than 1 meal out of 7)	Sometimes (1 to 3 meals out of 7)	Frequently (4 to 6 meals out of 7)	Always (7 meals out of 7)
Breakfast	85%	8.2%	4.9%	1.9%
Lunch	80.7%	12.8%	5.1%	1.4%
Diner	78%	13.2%	6.2%	2.6%

Question: How often does [FIRST NAME CHILD]/do you watch a screen while he/she/you eat (e.g.: smartphone, tablet, television, computer, games console)? Question was answered by parents for children aged 6-13 years. Question was answered by adolescent for children aged 14-17 years.

Most of the youth rarely eat meals while watching screens. Breakfast is the meal least associated with screen use, while dinner is the most eaten while watching screens. The proportion of meals in front of a screen generally increases with age. For detailed results, 12.2.7 *Screen time*.

6.4.8 Sleep

Table 6.16 provides an overview of the mean values of hours of sleep by age group, for weekdays and weekends.

Table 6.16 Mean values of sleep on weekdays and weekends (hours), stratified by age group

	Mean time (h) weekdays	Mean time (h) weekends
6-9 years	10.3	10.7
10-13 years	9.4	10.3
14-17 years	7.9	9.7

Question: Typically, at what time does [FIRST NAME CHILD]/do you fall asleep when he/she/you have school or your apprenticeship the next day? Typically, at what time does [FIRST NAME CHILD]/do you wake up when you have school or your apprenticeship? Typically, at the weekend, at what time does [FIRST NAME CHILD]/do you fall asleep when he/she/you do/do not have school or your apprenticeship the next day? Typically, at the weekend, at what time does [FIRST NAME CHILD]/do you wake up when you do not have school or your apprenticeship? Question was answered by parents for children aged 6-13 years. Question was answered by adolescent for children aged 14-17 years.

The mean sleep duration varies between weekdays and weekends, slightly for the youngest age group but more noticeably among adolescents. Overall, adolescents report shorter sleep durations compared to younger children. There are no notable differences between males and females. For detailed results, see 12.2.8 *Sleep*.

6.4.9 General health

Perceived general health

Table 6.17 Percentage distribution of perceived general health, overall and stratified by sex and age group

	Very good	Good	Average	Poor	Very poor
Females					
6-9 years	68.8%	28.7%	2.5%	0%	0%
10-13 years	54.8%	42.3%	3%	0%	0%
14-17 years	26.5%	51.4%	21.2%	0.9%	0%
Males					
6-9 years	64.6%	30.7%	4.6%	0%	0%
10-13 years	56.8%	38.5%	4.8%	0%	0%
14-17 years	32.7%	50.3%	15.2%	1.7%	0%
Overall	**51.7%**	**39.8%**	**8.1%**	**0.4%**	**0%**

Question: How would you rate [FIRST NAME CHILD]'s/your state of health in general? Question was answered by parents for children aged 6-13 years. Question was answered by adolescent for children aged 14-17 years.

Table 6.17 shows that overall, the majority of young people rate their general health status as either "very good" (51.7%) or "good" (39.8%). However, differences emerge among adolescents, who are more likely to rate their health as "average" compared to the responses given by parents of younger children.

Pains or issues of past six months

Table 6.18 Percentage distribution of experienced pains or selected health issues over the past six months

	Regularly
Stomach ache	16.8%
Headache	17.5%
Back pain	13.1%
Stress	35.1%
Difficulty falling asleep	28.5%
Being tired without any known cause	18.3%
Loss of appetite for no reason	6.7%
Hunger pangs (cravings)	19.3%

Question: Over the past 6 months, how often has [FIRST NAME CHILD] had/did you have any of the following pains or issues? Question was answered by parents for children aged 6-13 years. Question was answered by adolescent for children aged 14-17 years.

Table 6.18 shows that the pains or issues frequently felt ("between once a day and several times a week") or fairly often ("several times a month") are stress (35.1%), difficulties falling asleep (28.5%) or hunger pangs (cravings) (19.3%). For detailed results,12.2.9 *General health*.

6.4.10 Cigarettes and pocket money (adolescents only)

Smoking habits

Table 6.19 Percentage distribution of adolescents' smoking habits

	Every day	Several times a week, but not every day	Less than once a week	I don't smoke
Overall, %	2.6%	2.3%	6.9%	88.2%

Question: Currently, how often do you smoke cigarettes (including e-cigarettes)? Question was answered by adolescent for children aged 14-17 years and exclusively asked to this age group.

Table 6.19 shows that the majority of adolescents do not smoke (88.2%): 6.9% smoke less than once a week, and 2.3% smoke several times a week and 2.6% daily. For detailed results, see 12.2.10 *Cigarettes and pocket money*.

Pocket money

Table 6.20 Percentage distribution of adolescents receiving pocket money, median, min and max values

	No, %	Yes, %	Mean	min (CHF)	max (CHF)
Do you get pocket money? How much pocket money do you get each month?	30.7%	69.3%	64	0	575
Do you receive money for activities for which you are paid (small jobs, apprenticeship, etc.)? How much do you get on average per month for these activities?	54.7%	45.3%	71.5	0	999
On top of your pocket money, are you given money for food (e.g.: meals outside of the home, lunch)? Roughly how much are you given per month for food (on top of your pocket money)?	53.7%	46.3%	32.3	0	600

Question was answered by adolescent for children aged 14-17 years and exclusively asked to this age group.

Table 6.20 shows that the majority of adolescents receive pocket money (69.3%) with a mean value of 64 CHF per month and a median of 40 CHF. A smaller proportion receive money for leisure activities (45.3%) with a mean amount of 71.5 CHF per month and for food (46.3%) with a mean of CHF 32.3 per month.

Table 6.21 Percentage distribution of adolescents receiving money for food

	My pocket money includes meals	My canteen meals are already paid	I take a packed lunch from home	I go home to eat
Why do you not get money for food on top of your pocket money?	32.7%	5.5%	35.3%	26.4%

Question was answered by adolescent for children aged 14-17 years and exclusively asked to this age group (only if they answered with No to question if they receive money for food on top of pocket money).

Table 6.21 shows that for the adolescents who indicate not to receive money for food on top of their pocket money, the majority takes a packed lunch from home (35.3%), goes home to eat (26.4%), or their pocket money already includes money for food (32.7%).

6.4.11 Food Propensity Questionnaire (FPQ)

Table 6.22 shows an overview of the results of the Food Frequency Questionnaire, which included the self-reported consumption of 30 food and drink categories. This table includes the percentage of weekly and daily consumption, after weighting to align to the population margins. Tables in Annex 12.2.11 *Results FPQ* show the detailed reported consumption frequency for each subgroup.

Table 6.22 Food Propensity Questionnaire: Percentage distribution of regular consumption of food groups

	Weekly	Daily
Water (e.g.: tap water, sparkling water)	99.7%	96.1%
Tea, coffee, matcha, mate	32.1%	15.4%
Vegetables (potatoes do not count as vegetables; not including vegetable juice)	95.7%	53.7%
Fruit (not including juice)	93.3%	46.0%
Fruit and vegetable juice (100% pure)	36.5%	6.9%
Wholegrain cereals (e.g.: wholegrain rice, wholegrain pasta, wholegrain bread)	53.0%	7.6%
Sweetened breakfast cereals (e.g.: cornflakes, crunchy muesli, cereals with chocolate)	48.3%	7.0%
Meat (e.g.: chicken, rib steak)	84.9%	9.1%
Processed meat, cold meats (e.g.: sausage, ham)	66.7%	4.4%
Fish (e.g.: salmon, breaded fish)	23.0%	0.0%
Seafood (e.g.: prawns, fried squid rings)	2.6%	0.2%
Pulses (e.g.: hummus, lentils, kidney beans)	19.7%	0.4%
Plant-based meat substitutes (e.g.: beyond® burger, Planted-chicken®, tofu)	9.9%	0.3%
Milk	72.0%	31.5%
Cheese (e.g.: Gruyère, mozzarella, feta)	75.4%	8.7%
Sweetened dairy products (e.g.: yoghurts, chocolate drinks)	58.6%	10.1%
Plant-based drinks or plant-based milk substitutes (e.g.: drinks based on soya, oats, almonds)	6.8%	1.6%
Non-salted/non-sweetened seeds or nuts (e.g.: hazelnuts, almonds)	29.0%	2.1%
Chocolate, chocolate bars (e.g.: Snickers®, Kinder®, Toblerone®)	75.4%	12.2%
Candy/sweets (e.g.: Haribo®, lollipops, Trolli®)	59.4%	6.3%
Baked goods and pastries (e.g.: croissants, doughnuts, cakes)	47.6%	1.4%
Savoury snacks (e.g.: crisps, pretzel sticks, salted bread sticks)	61.7%	2.6%
Fast foods (e.g.: hamburgers, hot dogs, chips, kebabs, pizza, chicken nuggets)	21.3%	0.1%
Sweetened drinks (e.g.: Coca-Cola®, Capri Sun®, Fanta®, Iced Tea)	40.4%	3.4%
Artificially sweetened drinks (e.g.: Coca-Cola zero® or light®, Rivella bleu®)	15.4%	0.7%
Energy drinks (e.g.: Red Bull®, Monster®)	7.2%	1.5%
Liquid or powdered sports drinks (e.g.: Isostar®, Sponser®)	3.9%	0.5%
Beer (with alcohol)*	3.9%	0.0%
Wine (red, white, rosé, prosecco, Champagne)*	1.9%	0.0%
Spirits, cocktails (e.g.: whiskey and cola, vodka and orange, Aperol® spritz, mojito), alcopops (= mix of a soft drink and alcohol, e.g.: Smirnoff Ice®, Eve®)*	2.7%	0.1%

*Question: In general, how often does [FIRST NAME CHILD]/do you eat the following foods? Question was answered by parents for children aged 6-13 years. Question was answered by adolescent for children aged 14-17 years. *Questions about alcoholic beverages were exclusively asked to age group 14-17.*

Of note, some food groups, like “Tea, coffee, matcha, mate” and “Energy drinks” are consumed much more by older adolescents, while they indicate to consume less fruits, for example. Some differences can also be seen by sex, especially in adolescents, like with meat, soft drinks or alcohol consumption.

Foods and beverages

Water is consumed by almost all children and adolescents regularly. Fruits and vegetables are consumed weekly for almost all of them, but only about half report to consumed them daily. Meat is consumed by most of the youth weekly, and around 10% consume it daily. About one quarter of them eat fish weekly, seafood is rare, and pulses and plant-based substitutes have a small place in the weekly consumption (20% and 10% respectively). Dairy are consumed by most people weekly and even daily (one third is consuming milk daily, and 10% for cheese or yoghurt daily), plant-based drinks represent a small proportion. Nuts are consumed by one third of them weekly, but only 2% report to consume them daily. Chocolate is the most consumed snack (three quarters of children and adolescents report it weekly, and 12% daily). Candy, pastries, salty snacks are consumed by half of the population weekly, but only few report it daily. Fast foods are consumed by 20% weekly, but almost never daily. Sweet drinks are consumed weekly by almost half of them, including 3% of them consuming them daily, artificially sweetened drinks, energy drinks and sport drinks are less consumed.

Alcohol

Table 6.23 Percentage distribution of adolescents consuming alcoholic beverages (three categories together)

	Never	Occasionally (less than 3x/month)	Regularly (once a week or more)
14-17 years	61.8%	32.7%	5.5%

Question was exclusively asked to age group 14-17.

Table 6.23 shows that, when putting all alcoholic beverages categories together, the majority of adolescents never consume alcoholic beverages (61.8%), approximately one third consumes them a few times a month (32.7%), and a small percentage consumes them weekly (5.5%).

Fruits and vegetables servings

Table 6.24 Percentage distribution of fruits and vegetable portions consumed per day, overall and stratified by sex, age group and linguistic region

	number of portions fruits + vegetables combined (per day)					
	0	1	2	3	4	5 or more
Females						
6-9 years	5.6%	8%	20.5%	20.8%	24.2%	20.8%
10-13 years	3.8%	11%	16%	29.3%	22.7%	17.1%
14-17 years	6.2%	12.9%	17.5%	21.4%	19.7%	22.3%
Males						
6-9 years	2.3%	10.3%	20.7%	23.4%	25.3%	18%
10-13 years	11.7%	16.8%	18.3%	20.9%	19.8%	12.6%
14-17 years	11.4%	12.2%	21.6%	22%	15.1%	17.7%
Regions						
DE	7%	13%	19.5%	22.9%	20.9%	16.7%
FR	5.8%	6.8%	17.5%	23.2%	23%	23.7%
IT	7.8%	12.5%	19.4%	23.2%	21%	16%
Overall	**6.8%**	**11.9%**	**19.1%**	**23%**	**21.3%**	**17.9%**

Question: How many fruit/vegetables does [FIRST NAME CHILD]/do you eat per day? One portion corresponds to one handful of fruit/vegetable. Please note: Fruit/vegetable juice does not count! Question was answered by parents for children aged 6-13 years. Question was answered by adolescent for children aged 14-17 years.

Table 6.24 shows that 39.2% of children and adolescents consume four or more portions of fruits and vegetables per day, while 23% consume three portions. Among females, adolescents report the highest intake (22.3% consume five or more portions), compared to 17.1% in the middle age group and 20.8% in the youngest age group. For males, the youngest age group reports the highest intake (18%), followed by adolescents (17.7%) and the middle age group (12.6%). A comparison across linguistic regions shows that French-speaking people are more likely to consume five or more portions (23.7%), than those from the German-speaking (16.7%) and Italian-speaking (16%) regions.

7 Dietary assessment

7.1 Methods

Dietary assessments were conducted by trained dieticians using the 24HDR recall method. Each dietary assessment was set at approximately 45 minutes and was performed twice for each participant. The first recall took place at the study centre and covered the participant's dietary intake on the day prior to the visit. The second recall was conducted via telephone, ideally two to three weeks after the visit in study centre. Both recalls typically assessed the diet on the day before the visit or phone call. However, for 24HDRs conducted on Mondays during odd calendar weeks, the assessment focused on the preceding Saturday while during even calendar weeks the assessment focused on the preceding Sunday. This adjustment was made to also capture dietary habits on Saturdays, as 24HDRs were never conducted on Sundays.

Of note: For simplification we refer in the following chapters to 24HDR; however, for participants aged 6-13 years, the dietary assessment was in fact a dietary record, since it was supported by the use of a food diary (see 7.1.1 *Material*).

7.1.1 Material

Food Diary

One day before the visit at the study centre, the participants aged 6-13 years and/or their parent had to fill in the food diary received with the study material parcel. This was then discussed with the dietician during the visit.

The development of the food diary was previously described. It contains 27 pages, first instructions and examples, some specific information about the recorded day to fill in, then a double-page for each time of the day (7 moments), with 17 lines for foods and beverages and seven columns (for hour, name of the food, place of consumption, home-based or brought food, cooking method, quantity and comment), and finally a double page if some more place was needed for details about a recipe or comments. Lastly, there is one page that can be cut off to take notes by anyone being with the child.

The European Food Safety Agency (EFSA) recommends dietary data collection using 24h-records (food diaries followed by an interview) for children from 3 month until 9 years old. For 10-15-years-old children either 24h-recalls or 24h-records can be used.[24] The menuCH-Kids feasibility study[59], found that participants younger than 14 years generally required caregiver assistance to complete the 24HDR, whereas older adolescents did not. For this reason, it was decided to use a food diary to complete a 24h-record for participants until 13 years of age. Setting the age cut-off at 14 years was additionally justified as it aligns with the SwissEthics definition that considers adolescents aged 14 and above as adults[59,60]. However, feedback from dieticians during the main study suggested that allowing adolescents to write down their food intake in advance would have been beneficial.

Some adolescents came to the study centre with a list of foods consumed to help them. On the other side, parents of participants aged up to 13 reported the food diary to be burdensome. Therefore, it is a trade-off between reducing participant burden and maintaining sufficient participation rates.

Picture book/Dishes

In cases where food quantities (weight or household measure) were not directly recorded in the food diary - or to assist adolescents aged 14-17 who did not complete a food diary - various tools were used at the study centre to support portion size estimation. The picture book[61] contains 110 series of different dishes with four to six portion-size pictures, 19 bread shapes, as well as a thickness chart, a two-dimensional ruler and 12 series of household measures with filling level indication. Content was the same than in the menuCH picture book[62], but pictures order was changed to be grouped by food type. In the centre, ~60 different types of real dishes to help participants visually assess the quantities they had consumed. The dishes shown in the picture book[61] matched those displayed at the study centre to ensure consistency and comparability between real life and photographic references. During the dietary interviews, dieticians were instructed to link the real dishes and the picture book[61] images with the participants' reports, particularly to support consistency when participants later used the picture book at home during the phone 24HDR. When participants mentioned specific branded food items, dieticians also consulted the internet to ensure accurate identification and entry of the correct product into the dietary assessment software.

At the conclusion of the initial dietary assessment, dieticians scheduled the follow-up phone 24HDR with participants. To support this second assessment, picture books were provided to children aged 6-13 years and their caregivers, as well as to adolescents aged 14-17 years. In addition, participants aged 6-13 years received a new food diary to record their dietary intake on the day prior to the phone 24HDR (or two days before the phone 24HDR in special cases, as described above).

7.1.2 Dietary Assessment software GloboDiet®

Dieticians entered participants' dietary intake using computers equipped with the GD software. GD (formerly EPIC-Soft®), developed by IARC, collects 24HDR data using a standardized multiple-pass method. To meet specific Swiss requirements, the software was adapted by the FSVO. This included the integration of foods and dishes commonly available on the Swiss market, as well as traditional Swiss specialities, into the built-in food and recipe lists. The entire software interface was translated into German, French and Italian to accommodate Switzerland's multilingual population.

GD was used to complete the 24HDR with participants aged 14-17 years, and a specific version called DataEntry® for participants aged 6-13 years. The difference between the two program versions is that the dietary assessment in GD starts with a quick list, which provides an overview of meals and foods consumed without detailed information or quantification. Since adolescents did not complete a food diary in advance, the quick-list step played a crucial role in helping them recall what they had eaten the day preceding the visit to the study centre. As food diaries were completed for younger children, the information could be entered directly into DataEntry® without the need for a quick list.

Updates GloboDiet® Software

Based on the menuCH adult version of the software, the FSVO continuously amended GD, in the menuCH-Kids 1.2023.01.06 version. A total of six updates were made over the course of the whole project (before and after the collection phase too), approximately every five months. The built-in food list was amended with 308 new foods sold in Switzerland. These included children's specific foods (cookies, sweets…), new foods compared to 2015 (e.g. gluten- and lactose-free products, protein-enriched foods, new sodas, wholemeal products…), or vegetables and fruit which were not previously sold in Switzerland. More than 500 new brand names, than 600 new commercial food portions ("Standard units") and almost 60 new descriptors for foods (e.g. new flavours) were also added to allow for precise descriptions.

During the survey, it happened that sometimes dieticians couldn't find a reported food on the GD built-in food list, either because it was listed under a different name that the dietician didn't know, or because it was missing and no suitable other food that was similar enough could be found. In such cases the new food could be described in a specific note, which was flagged "NEW_F". All "NEW_F" were regularly checked by the food specialist. Reported foods, which couldn't be described with an adequate food already on the built-in list were submitted to the FSVO and recommended to be added (e.g. some vegetables such as zucchini flowers or salsify; specific cereal products, such as spelt pasta or black rice; and several savoury or sweet snacks (specific branded foods, such as Kinder chocolate products). In addition, the dieticians could recommend new foods or additional descriptors (mainly flavours) in a logbook, which the food specialist sent to the FSVO periodically. Because writing notes in GD is time consuming, the FSVO amended the GD built-in food list with most of the recommendations to guarantee a data collection as smooth as possible.

To allow all reported foods to be properly described, a last round of adding new descriptors and new foods was performed at the end of the data collection phase. At the same time, last corrections could be done on coefficients such as "density", and proportions of "edible part", "raw-cooked" and "fat, sauce and sweeteners". All cleaned GD interviews (24h recalls as well as 24h records) were passed in the last version of the software (recomputing), so all new foods and adaptations were implemented in all interviews and consumed amounts recalculated with corrected coefficients. A final data cleaning was also carried out during this time, as some issues related to the data linkage with FoodCase (program used to add food composition information, see below) could not be resolved in the first cleaning process. In addition, some new recipes created by dieticians had to be converted into composed recipes.

7.1.3 Dietary data Management

Data related to the participant

The participants' unique ID, initials and date of birth were entered into GD. At the first visit, as the dietary assessment preceded the anthropometric measurements, participants estimated their height and weight. For the phone 24HDR, these data were retrieved from the measurements entered in REDCap during the F2F visit. When the data were exported, the self-reported height and weight data from the first visit were added into REDCap, and only the measured values kept in the GD dataset. In addition, the date of birth was adapted to the following format for all participants: 01. Month. Year (the actual day of birth was replaced by 01). It was decided to keep the actual month in the date of birth, as a few months have a greater impact on a child's physical development than on an adult.

Securing and checking data

At the end of the day, the dietary data from all centres were uploaded to Unisanté's internal drive (ownCloud), which required a login and was password protected. Dieticians saved a copy of the GD backup locally on their computer and then imported it. This usually consisted of five csv-files and one bak-file.

The data were then checked once a week by a data manager to ensure the correct upload to ownCloud. This was followed by an initial data check and cleaning of the data (e.g. typing errors, checking the participant ID, verifying the week-database number, merging of the different files to prepare the data for review by the food specialist). The data manager then uploaded the checked data back to ownCloud.

In order to check that all planned and completed interviews were also uploaded to OwnCloud and were correctly identified as 24HDR visit (interview number 1) or phone 24HDR (interview number 2), the food specialist carried out a check after each completed data collection package. To do this, the food specialist compared the list of all visits made with the merged INTGI-file. Interview type and day could thus be corrected if needed.

Data cleaning

The food specialist also carried out weekly data cleaning, , using the same approach as for menuCH adults[63]. The backup files, uploaded to OwnCloud by the dieticians and checked by the data manager, were downloaded and restored in GD. During the data cleaning process, the food specialist systematically reviewed each interview along with the associated notes (generated automatically by the program and manually by the dieticians) to ensure data accuracy and completeness.

The process and the decisions made by the food specialist were documented in a merged Excel file (xlsx) created by the data manager. Following the cleaning process, the food specialist exported the cleaned data from GD. Each export generated five CSV files, one BAK file and one XML file per dietician per week.

The dieticians were able to make suggestions to the food specialist for new foods to be added to the FoodList. In collaboration with the FSVO, these suggestions were reviewed and possibly added to the parameter database (see 7.1.2 *Dietary Assessment software GloboDiet®*). In addition, the food specialist provided feedback to the dieticians as needed after each week of data cleaning. This consisted of general recommendations for future data collection and questions for the dietician in case anything needed clarification.

Monitoring and quality controls

This cleaned data was used to assess data quality after each package. The data manager provided the QC team and the food specialist with tables showing some criteria/indicators, recommended by IARC[64] and used in menuCH adults[63]. Based on these data quality observations, the dieticians were retrained in the refresher training if necessary, or individually by the food specialist.

For results of the data quality check, see chapter 7.1.4 *Data quality (GloboDiet® tables*).

Missing data

In 12 cases, the follow-up phone 24HDR could not be collected, despite successful completion of the 24HDR visit and multiple reminders from dieticians.

Linkage to the food composition database

As, GD contains only limited food composition information, all reported foods and recipes needed to be matched with the closest generic foods or recipes of the Swiss Food Composition Database, version 6.5.3, using the matching wizard of the FoodCase data management system[66]. This allowed to estimate energy, macronutrients and micronutrients intakes. Matching accounted for the name of the food/ingredient/recipe, but also its characteristics (e.g. the descriptors used for preservation, preparation and cooking methods, physical form, sugar or fat content, brand). Previous matching, including with pilot data, was used to pre-match foods, allowing a semi-automatic matching of the consumption data and the Swiss Food Composition Database. All pre-matching were controlled and items without were matched manually, based on a complex decision tree. This matching process was conducted by several dieticians (from the Swiss Society of Nutrition) and a food database specialist (from the FSVO), all with comprehensive knowledge of the Swiss Food Composition database.

Classification according to the Swiss Food Pyramid 2024

To conduct analyses using food groups, all foods and beverages were classified according to the updated Swiss Food Pyramid 2024[67]. The classification scheme is based on the system originally developed for the menuCH 2014–2015 study. It was revised to align with the 2024 dietary recommendations[67] and newly available or previously uncommon foods were incorporated. The revised scheme retained the hierarchical structure used in menuCH2014-15 while adapting the coding system: the highest level is denoted by a letter (A–I) corresponding to the level of the Swiss Food Pyramid 2024[67]. A category Z named “others” was added for foods which did not fit into a defined category of the food pyramid. Then each level of the pyramid (letter code) was subdivided into numbered subgroups (for example, D= “Dairy products” and D01 = “Milk and milk products”), and most subgroups were further divided into sub-subgroups (for example, D0101 = “milk without added sugars”, D0102 = “milk with added sugars”. Some subgroups such as “Eggs” do not have a sub-subgroup). This way, every food item in the updated system is represented by a composite code that encodes all three classification levels.

Categories from the previous classification were either directly mapped, merged for simplification (e.g. pure chocolate and chocolate product were put together), or subdivided based on the updated nutrition recommendation or group of growing interests (e.g. energy drinks separated from other sweet drinks). New categories were created for emerging food groups such as plant-based meat and dairy product substitutes. Certain foods, such as soups, were not included in the pyramid structure but put in the “other” category for analytical clarity. The classification scheme was updated by a group of three FSVO experts including one registered dietician. The classification of each food was performed independently by three experts, and discrepancies were resolved by consensus. Items were classified into the 78 categories using their name but also all facets and descriptors available giving relevant information for classification, e.g. using brand names for more accurate classification. After classification, some categories were grouped as a supplement for additional analyses: e.g. the Swiss Food Pyramid[67] basis level “beverage” was summed up with all other type of beverages like soft drinks (last level of the Swiss Food Pyramid[67]) to calculate the overall daily liquid consumption. Additional categories were also created with specific food items, like product soy-based products. Detailed category definitions are provided in 13.2 *Categorisation of food items based on the Food Pyramid 2024*.

7.1.4 Data quality (GloboDiet® tables)

The following tables rely on the GD data, before it was matched to the Swiss Food Composition Database (SFCDB).

Explanations about special values or a comparison with menuCH-data is added below the table if necessary. The Total Line is calculated on the whole data set. To simplify the reading, we wrote “Sum” when it corresponds to a quantification of the number of occurrences of a certain parameter (column title), or “Avg” (average) when we looked at the mean distribution of certain parameters.

Interview distribution by study centre

Table 7.1 Total number of interviews by study centre

Study centre	24HDR VISIT	PHONE 24HDR	Dropouts	TOTAL
Bern	394	392	2	786
Lucerne	242	242	0	484
St. Gallen	277	275	2	552
Ticino	214	213	1	427
Vaud	408	403	5	811
Zurich	317	315	2	632
Sum	**1 852**	**1 840**	**12**	**3 692**

Table 7.1 shows that 1 852 24HDR visit and 1 840 phone 24HDR were performed. We had 12 participants who completed 24HDR visits, but never completed the phone 24HDR, despite many reminders from the dieticians. The total number of 24HDR per study centre shows the number of interviews performed by study centre. The number of interviews varied across study centres, as the planned number of participants differed from one centre to another.

Table 7.2 Number of interviews (24HDR visit) per weekday (by study centre)

Interview day	Mon		Tue		Wed		Thu		Fri		Sat	
Recall day	**Thu**	**Sun**	**Mon**	**Wed**	**Mon**	**Tue**	**Tue**	**Wed**	**Wed**	**Thu**	**Thu**	**Fri**
Bern	0	94	112	0	0	79	0	67	0	27	0	28
Lucerne	0	94	20	0	0	7	0	25	0	57	1	38
St. Gallen	1	58	41	0	0	38	1	54	1	42	0	41
Zurich	0	59	52	0	0	55	0	45	0	46	1	48
Vaud	0	74	74	1	0	73	0	60	0	65	0	59
Ticino	0	48	34	0	1*	40	0	40	0	39	0	12
Sum	**1**	**427**	**333**	**1**	**1**	**292**	**1**	**291**	**1**	**276**	**2**	**226**

Table 7.2 shows the distribution of the 24HDR over the weekdays and by study centre for 24 HDR visits. In a few cases, it was not possible to conduct a 24HDR as defined by the protocol. The reasons are grouped by colour. This might influence the associations between blood results and food intakes, but only one of these seven participants happened to have a blood draw (*).

Lilac (n=6): Some parents chose to complete the Food Diary on different day, as they felt the day prior to the interview was not ideal to conduct the Food Diary (child in daycare, parents at work,…).

Pink (n=1): Participants misunderstood the information from YouGov recruiter and conducted the food diary on the wrong day.

Table 7.3 Number of interviews (phone 24HDR) per weekday (by study centre)

Interview day	Mon					Tue					Wed				Thu				Fri					Sat		
Recall day	**Mon**	**Wed**	**Fri**	**Sat**	**Sun**	**Mon**	**Wed**	**Fri**	**Sat**	**Sun**	**Mon**	**Tue**	**Sat**	**Sun**	**Mon**	**Tue**	**Wed**	**Sun**	**Tue**	**Wed**	**Thu**	**Sat**	**Sun**	**Wed**	**Thu**	**Fri**
Bern	0	0	0	33	49	75	0	0	0	0	1+1*+1	88	0	0	0	0	88	0	0	0	59	0	0	0	0	14
Lucerne	0	1	1	22	17	49	0	1*	0	0	1	57	1	0	1	0	43	0	0	0	43	0	0	0	0	5
St. Gallen	0	0	1	25	35	68	0	0	0	1*	2*	39	0	0	0	0	56	0	0	1	43	0	0	0	0	3
Zurich	1	0	1+1	37	45	45	0	1	1	0	0	43	0	1	0	0	42	0	0	2	42	0	1	1	1	38
Vaud	0	0	1	45	57	63	0	0	1	0	1	46	1	0	0	0	53	1	1	1+1	75	1	0	0	0	51
Ticino	0	1	0	16	15	39	1	0	1	1	0	40	0	0	0	2	38	0	0	3	46	0	0	0	0	10
Sum	**1**	**2**	**5**	**178**	**218**	**339**	**1**	**2**	**3**	**2**	**7**	**313**	**2**	**1**	**1**	**2**	**320**	**1**	**1**	**8**	**308**	**1**	**1**	**1**	**1**	**121**

Table 7.3 shows the distribution of the 24HDR over the weekdays and by study centre for the phone 24HDR. In some cases (n=43), it was not possible to conduct a 24HDR on the day defined by the protocol. The reasons are grouped by colour.

Lilac (n=23): Phone 24HDR was rescheduled, and parents of participants refused to re-conduct the food diary again for the new appointment.

Brown (n=2): Participants misunderstood the instruction of the dietician about when to conduct the food diary.

Pink (n=17): Parents of participants chose to conduct the Food Diary on another day, as they felt the day prior to the interview was not ideal to conduct the Food Diary (child in daycare, parents at work,…).

* For five specific cases, this decision was taken in agreement with the dietician, because no other appointment could be found.

The goal was to approach a balanced repartition of 24HDR per days of the week, to avoid creating any bias by over-representing certain weekdays, where nutrition might be handled differently by participants (e.g. weekends). Overall, for both 24HDR visit and phone 24HDR, Mondays were strong days, where many interviews were performed. Phone 24HDR that were planned on Monday were meant to cover both days of the weekend, but Saturdays are still underrepresented. The quantity of interviews then decreased over the week. Phone 24HDR collecting dietary intake data on Fridays (i.e. done on Saturday) were difficult to include. Statistical weighting will be applied to minimize the impact of the unbalanced distribution across weekdays.

Table 7.4 Number of interviews (24HDR visit) per month (by study centre)

Study Centre	2023				2024							
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Bern	38	41	39	23	31	32	33	33	37	41	27	32
Lucerne	19	15	31	19	11	25	29	21	19	28	20	5
St. Gallen	29	16	34	19	20	22	32	14	29	20	20	22
Zurich	13	26	17	19	18	39	23	29	30	29	33	30
Vaud	28	27	32	24	25	45	33	34	39	43	43	33
Ticino	18	17	17	10	10	22	11	23	26	20	22	18
Total	**145**	**142**	**170**	**114**	**115**	**185**	**161**	**154**	**180**	**181**	**165**	**140**

Table 7.5 Number of interviews (phone 24HDR) per month (by study centre)

Study Centre	2023				2024								
	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Bern	12	34	48	26	27	33	34	39	29	36	45	21	25
Lucerne	9	21	17	25	16	18	23	27	15	34	16	21	0
St. Gallen	11	21	24	21	26	19	27	33	13	20	24	21	14
Zurich	4	20	22	13	15	32	33	26	30	26	34	33	15
Vaud	7	24	34	21	25	36	39	38	30	44	43	33	25
Ticino	8	17	21	8	16	10	16	18	17	32	19	23	8
Total	**51**	**137**	**166**	**114**	**125**	**148**	**172**	**181**	**134**	**192**	**181**	**152**	**87**

Table 7.4 and Table 7.5 show the number of 24HDR conducted per month, by study centre for 24HDR visit and phone 24HDR, respectively. The number of interviews is slightly lower in December and January, due to holidays, during which all study centres were closed. The statistical weighting strategy will also consider seasons.

Table 7.6 Number of interviews per season (by study centre)

Study Centre	Sep-Nov 2023		Dec-Feb 2024		Mar-May 2024		Jun-Sep 2024	
	24HDR VISIT	PHONE 24HDR	24HDR VISIT	PHONE 24HDR	24HDR VISIT	PHONE 24HDR	24HDR VISIT	PHONE 24HDR
Bern	105	82	86	84	103	102	100	124
Lucerne	65	47	55	59	69	65	53	71
St. Gallen	79	56	61	66	75	73	62	80
Ticino	52	46	42	34	60	51	60	82
Vaud	89	67	94	84	106	107	119	145
Zurich	67	56	76	60	82	89	92	110
Sum	**457**	**354**	**414**	**387**	**495**	**487**	**486**	**612**

There is typically a delay of 2-3 weeks between the 24HDR visit and the phone 24HDR. As a result, some phone 24HDR may fall into the next reporting period compared to their corresponding 24HDR visit. In the first period, fewer phone 24HDR were conducted, as these interviews started in mid-September. In contrast, the final period includes a higher number of phone 24HDR. This is because it covers not only those linked to visits in the last week of May, but also those associated with visits in the final weeks of August (as shown in Table 7.6).

Table 7.7 Distribution of the number of days between 24HDR visit and phone 24HDR interview (by dietician)

CODE INT	Mean	Min	P25	P50	P75	max	<14d	>30d
BE_101	23	11	17	19	31	35	1	7
BE_102	20	20	20	20	20	20	0	0
BE_103	20	10	15	19	22	47	13	18
BE_104	21	9	15	20	25	43	6	3
BE_105	19	4	16	20	21	35	6	1
BE_106	24	6	17	22	30	53	3	9
LU_501	19	11	15	18	23	42	8	8
LU_502	18	11	15	17	20	30	16	0
SG_601	22	15	17	20	24	43	0	10
SG_602	21	6	17	20	23	41	9	9
TI_1101	20	10	15	18	22	46	14	10
TI_1102	NA	NA	NA	NA	NA	NA	NA	NA
VD_903	19	4	14	18	21	65	46	18
VD_904	21	8	15	20	23	60	24	18
ZH_703	18	9	15	18	21	35	20	2
ZH_704	19	9	16	18	21	42	3	2
Avg	**19**	**4**	**15**	**18**	**22**	**65**	**169 (Sum)**	**115 (Sum)**

NA, not applicable. This dietician never performed both 24HDR visit and phone 24HDR for the same participant.

Table 7.7 shows the distribution of the number of days between the 24HDR visit and phone 24HDR for each dietician. According to protocol, the recommended interval was 2-3 weeks (i.e. 14-30 days). The means and medians indicate that this guideline was generally well respected.

However, in some cases (n = 284, 15%), the interval either fell short of or exceeded the recommended range. Shorter intervals were often chosen to avoid school holidays or extended absences of participants. Longer intervals typically resulted from multiple postponements of the phone 24HDR appointments.

Dieticians with more interviews, such as VD_903, VD_904, BE_103, had a higher probability of having outliers. Calculating the percentage of outliers for each dietician in relation to her total number of interviews it reaches from 2.3 – 13.2%, whereas the high percentage applies to one of the dieticians who performed many interviews.

Special days and diet

Table 7.8 Number and proportions of special-day interviews by type of special day

Special day	24HDR VISIT + PHONE 24HDR	24HDR VISIT		PHONE 24HDR	
	n	n	%	n	%
None	2 401	1 146	58.9%	1 255	65.8%
Feast-day (religious holiday/celebration)	165	84	4.3%	81	4.2%
Travel / On trip	72	42	2.2%	30	1.6%
Illness / Tiredness	99	46	2.4%	53	2.8%
Holidays / Vacations	471	237	12.2%	234	12.3%
Fasting day (including religious)	6	3	0.2%	3	0.2%
Extreme weather conditions (very hot/cold)	22	12	0.6%	10	0.5%
Very busy / Away from home a lot	115	57	2.9%	58	3.0%
Other	502	320	16.4%	182	9.5%
Sum special days (without None)	**1 452**	**801**	**41.1%**	**651**	**34.2%**

Table 7.8 the number and proportions of special days, categorised by reason, for both 24HDR visit and phone 24HDR interviews. Special days are defined as days affected by circumstances such as sickness, feast day, travel, holidays, extreme weather conditions, very busy, or other (with an open field comment).

The total column corresponds to the total number of occurrences of the given special day in both 24HDR visit and phone 24HDR. The “n” in 24HDR visit and phone 24HDR columns corresponds to the number of 24HDR and percentage that contain the reason for the special day in relation to the total number of the given 24HDR type (e.g., out of 1 852 conducted 24HDR visit 84 indicated a feast-day, which corresponds to 4.3% of all 24HDR visit).

For a single 24HDR, several special day reasons can be selected, e.g. vacations + extreme weather conditions. That is why the addition of the “Sum” line and the “None” line is higher than the total number of performed 24HDR.

Table 7.9 Number and proportions of special-day interviews by type of special day

Special day	24HDR VISIT + PHONE 24HDR	24HDR VISIT		PHONE 24HDR	
	n	n	%	n	%
None	2 401	1 146	58.9%	1 255	65.8%
Feast-day (religious holiday/celebration)	165	84	4.3%	81	4.2%
Travel / On trip	72	42	2.2%	30	1.6%
Illness / Tiredness	99	46	2.4%	53	2.8%
Holidays / Vacations	471	237	12.2%	234	12.3%
Fasting day (including religious)	6	3	0.2%	3	0.2%
Extreme weather conditions (very hot/cold)	22	12	0.6%	10	0.5%
Very busy / Away from home a lot	115	57	2.9%	58	3.0%
Other	502	320	16.4%	182	9.5%
Sum special days (without None)	**1 452**	**801**	**41.1%**	**651**	**34.2%**

Table 7.9 shows the numbers and proportions of special days, categorised by reason, for both 24HDR visit and phone 24HDR interviews. Special days are defined as days affected by circumstances such as sickness, feast day, travel, holidays, extreme weather conditions, very busy, or other (with an open field comment).

The total column corresponds to the total number of occurrences of the given special day in both 24HDR visit and phone 24HDR. The "n" in 24HDR visit and phone 24HDR columns corresponds to the number of 24HDR and percentage that contain the reason for the special day in relation to the total number of the given 24HDR type (e.g., out of 1 852 conducted 24HDR visit 84 indicated a feast-day, which corresponds to 4.3% of all 24HDR visit).

For a single 24HDR, several special day reasons can be selected, e.g. vacations + extreme weather conditions. That is why the addition of the "Sum" line and the "None" line is higher than the total number of performed 24HDR.

Table 7.10 Number and proportions of interviews with a special diet by type of special diets

Special diet	24HDR VISIT + PHONE 24HDR	24HDR VISIT		PHONE 24HDR	
	n	n	%	n	%
None	3 200	1 554	82.7%	1 646	89.0%
Energy restricted (doctor's order)	1	0	0.0%	1	0.1%
Energy restricted (own initiative)	7	4	0.2%	3	0.2%
Food Allergy: cow's milk protein free	6	4	0.2%	2	0.1%
Food Allergy: chicken egg protein free	1	1	0.1%	0	0.0%
Gluten free	14	8	0.4%	6	0.3%
Lactose restricted	61	34	1.8%	27	1.5%
Other food intolerance/allergy	20	15	0.8%	5	0.3%
Vegetarian: no meat/no fish	116	60	3.2%	56	3.0%
Little meat (less than once a week)	23	17	0.9%	6	0.3%
No meat/with fish	35	19	1.0%	16	0.9%
Veganism: no animal products at all	4	3	0.2%	1	0.1%
Islamic diet	1	0	0.0%	1	0.1%
High protein diet	20	13	0.7%	7	0.4%
Low carbohydrate diet	1	1	0.1%	0	0.0%
Other	219	147	7.8%	72	3.9%
Sum (without None)	**529**	**326**	**17.3%**	**203**	**11.0%**

Table 7.10 shows the numbers and proportions of special diet by dietician for 24HDR visit and phone 24HDR. Special diets are defined as dietary restrictions in energy, protein, cholesterol, sodium, or other substances like lactose, gluten or allergens. In addition, dietary patterns such as

vegetarianism, veganism and few others are also considered special diets in GD. Dieticians have the option to select “other” and provide further details using an open comment field.

The total column corresponds to the total number of occurrences of the given special diet in both 24HDR visit and phone 24HDR. The “n” in 24HDR visit and phone 24HDR columns corresponds to the number of 24HDR and percentage that contain the reason for the special diet in relation to the total number of the given 24HDR type (e.g., out of 1 852 conducted 24HDR visit 34 indicated a lactose restricted diet, which corresponds to 1.8% of all 24HDR visit).

For a single 24HDR, several reasons for a special diet can be selected, e.g. gluten free + vegetarian. That is why the addition of the “Sum” line and the “None” line is higher than the total number of performed 24HDR.

Overall, the number of special diets is lower in the phone 24HDR. Possible explanations are that they were either not recorded by the dieticians or not mentioned by the participant, despite repeated retraining to ensure that dieticians specifically probe for special diets during phone interviews.

7.2 Results Dietary Assessment

The following results of the dietary assessment are weighted to match the population margins (weighting procedure is detailed in chapter 5.2 *Weighting strategy*).

7.2.1 Daily energy intake and macronutrients contribution

The following table shows the total daily energy intake in kcal/day and the macronutrients consumption in g/day for each age group and sex. The results of daily energy intake and macronutrients contribution in kcal/day is presented in Table 13.4. For this, the conversion from grams to kilocalories was done using specific conversions factors (Atwater system — carbohydrates: x4, fibres: x2, fat: x9, protein: x4, alcohol: x7)[68,69].

Table 7.11 Daily energy intake (kcal/day) and macronutrients, fibre, alcohol contribution (g/day) by age group and sex

Age group and sex		Total (kcal/day)				Macronutrients (g/d)																			
						Proteins (g/day)				Carbohydrates (g/day)				Fibres (g/day)				Fats (g/day)				Alcohol (g/day) *			
Age	Sex	Mean	P25	Median	P75	Mean	P25	Median	P75	Mean	P25	Median	P75	Mean	P25	Median	P75	Mean	P25	Median	P75	Mean	P25	Median	P75
6-9 years	F	1652	1416	1643	1827	58	44	55	66	201	170	198	224	17	13	16	20	65	51	63	75	0.1	0	0	0
6-9 years	M	1938	1600	1858	2153	67	52	63	80	238	195	228	266	20	15	19	22	75	60	72	85	0.1	0	0	0
10-13 years	F	1882	1568	1840	2149	66	53	65	75	225	178	221	267	18	14	17	22	75	60	73	88	0.1	0	0	0
10-13 years	M	2108	1759	2047	2314	74	59	70	85	256	213	245	290	20	15	19	23	82	66	80	95	0.2	0	0	0
14-17 years	F	1821	1485	1791	2157	64	50	62	74	216	166	215	252	18	13	17	22	73	55	68	87	0.6	0	0	0
14-17 years	M	2422	1945	2282	2866	96	73	90	117	278	212	268	319	21	15	20	26	96	72	91	116	1.9	0	0	0
All females		1782	1488	1750	2060	62	49	60	73	214	174	208	248	18	14	17	21	71	55	68	84	0.2	0	0	0
All males		2142	1734	2046	2391	78	58	73	91	256	203	243	291	20	15	19	23	84	64	79	98	0.6	0	0	0
Total		1967	1589	1889	2245	70	53	65	83	235	185	226	273	19	14	18	22	77	59	74	90	0.5	0	0	0

**The proportion of alcohol in the macronutrients composition accounts for contributions from all foods and beverages; therefore, the values are very low (for specific data on alcoholic beverages consumption, see FPQ Table 6.23).*

Table 7.11 shows that the daily energy intake, as well as all macronutrient intakes, increase with age for males and increase then stagnate for females. Across all age groups, males have higher intakes than females. The same trends are observed for each of the two interviews (24HDR visit and phone 24HDR). However, the mean energy intake as well as macronutrient intakes are lower for the phone 24HDRs (see 13.1.2 *Daily energy intake (kcal/day) and macronutrients contribution (g/day) in 24HDR visit and* 13.1.3*Daily energy intake (kcal/day) and macronutrients contribution (g/day) in phone 24HDR*).

Mean energy intake is close to age-specific recommendations[70] for all groups, except for female adolescents (14-17-year-olds), who are below the recommended 2228 - 2277 kcal/day range. Fibre intake is in the recommended 16-21g/day[69]. For carbohydrates and lipids, EFSA (2010)[69] and the FSVO[70] recommendations are expressed as a percentage of total kcal intake: carbohydrates should provide 45%-65% of total energy intake (see calculation in Table 13.4 in chapter 13.1.4 *Relative Contribution of Macronutrients to Daily Energy Intake vs. Recommendations)*. This recommendation is met by all groups, with means ranging from 45.7% to 49.1%. Lipids should provide 20% to 35% of total energy intake; all group means are towards the upper limit (34.8% to 36.6%) and consumption is slightly higher in females.

For proteins, the recommendations are expressed in grams of protein per kilogram of body weight, according to sex and age (ranging from 0.83-0.85g/kg for older male adolescents to 0.91-0.92g/kg for younger children)[71]. Using the mean body weight for each age group (see Table 13.4), the recommended protein intake ranges from 25 to 54g/day. All groups exceed these recommendations, with intakes between 55 – 90g, with a marked peak in male adolescents. In most Western countries, protein intake is two to three times higher than the recommended intake[72], within a similar range to that observed in our study, likely because children and adolescents consume adult-sized portions, despite lower body weight. Some have suggested that new methods of protein quantification indicate that protein recommendations should be higher in children (up to 1.55g/kg of body weight/day)[72]. However, an intake of around 0.9g/kg/day remains the commonly used value and is considered sufficient for child development. Some other countries express recommendations for protein intake as a percentage of total energy intake; France[73] has a range of 7 to 20% (depending on age) whereas the USA[74] have a range of 10 to 35%, with a mean consumption around 15%. In our study, values ranged from 13.7% to 15.7% and fall within those recommended ranges.

7.2.2 Daily amount of consumed food for each food group

The following tables show the daily amount (g/day) of consumed food for each food group and subgroup of the pyramid (detailed category definitions are provided in 13.2 *Categorisation of food items based on the Food Pyramid 2024*), stratified by age group and sex. In addition to the food groups from the Swiss food pyramid[67], some "special categories" have been created grouping subgroups or specific food items to better fit the Swiss food pyramid recommendations[67] or answer specific research question on hot topics. The special categories have been put at the end of the table which fitted the most. All amounts include non-consumers, defined as participants having a mean intake of 0g/day in a given category for one or both recorded days. As such, these values represent the mean consumption for the entire population, including non-consumers, and do not reflect the portion size of a consumed product.

Beverages

Table 7.12 Amount consumed in food group beverages (g/day) by sex, age group and number of consumers and recall days with consumption (N, %)

Food group: **Beverages (g/day)**	All ages			6-9 years			10-13 years			14-17 years			Consumers N (%)	Recall days with consumption N (%)
	Females	Males	Total	Females	Males	Total	Females	Males	Total	Females	Males	Total		
Water	993 [625, 900, 1285]	1098 [675, 988, 1400]	1047 [650, 950, 1350]	765 [503, 737, 969]	890 [600, 844, 1100]	829 [532, 800, 1019]	1054 [675, 975, 1405]	1006 [650, 930, 1300]	1029 [662, 950, 1325]	1188 [725, 1150, 1575]	1455 [885, 1345, 1878]	1323 [800, 1235, 1675]	1844 (99.6%)	3609 (97.8%)
Coffee, tea, flavoured water without sugar	68 [0, 0, 75]	51 [0, 0, 0]	59 [0, 0, 50]	34 [0, 0, 0]	40 [0, 0, 0]	37 [0, 0, 0]	67 [0, 0, 75]	64 [0, 0, 0]	65 [0, 0, 35]	110 [0, 0, 125]	48 [0, 0, 0]	79 [0, 0, 125]	460 (24.8%)	610 (16.5%)
Total	**1062 [668, 975, 1360]**	**1149 [725, 1005, 1450]**	**1107 [700, 1000, 1403]**	**799 [532, 775, 1000]**	**929 [671, 900, 1157]**	**865 [581, 825, 1070]**	**1121 [780, 1088, 1430]**	**1070 [706, 980, 1350]**	**1094 [725, 1015, 1400]**	**1299 [842, 1235, 1613]**	**1503 [911, 1400, 1928]**	**1402 [885, 1320, 1765]**	**1848 (99.8%)**	**3633 (98.4%)**
Special category: All beverages, without soups (incl. sweetened)	1391 [1000, 1305, 1694]	1621 [1119, 1475, 1975]	**1509 [1058, 1385, 1820]**	1080 [831, 1035, 1255]	1261 [978, 1198, 1528]	**1172 [885, 1124, 1375]**	1468 [1150, 1415, 1727]	1529 [1133, 1425, 1875]	**1500 [1133, 1416, 1800]**	1664 [1213, 1575, 2000]	2155 [1608, 2050, 2514]	**1912 [1401, 1770, 2289]**	**1852 (100.0%)**	**3691 (100.0%)**

mean [P25, P50, P75]

Table 7.12 shows that consumption of **water** increases with age and is usually higher in males (except in the 10-13 years age group). Consumption of coffee, tea or flavoured water without sugar increases with age, is clearly higher in females in the oldest age group. Overall beverage consumption (including water, teas, sweet drinks...) is in line with the daily recommendations of 9 dl for 7-9-year-olds, 1 L for 10-12year-olds, and 1-2 L for 13-18year-olds.[75,76]

Fruits and vegetables

Table 7.13 Amount consumed in food group fruits and vegetables (g/day) by sex, age group and number of consumers and recall days with consumption (N, %)

Food group: **Fruits and vegetables,** without juices and soups **(g/day)**	All ages			6-9 years			10-13 years			14-17 years			Consumers N (%)	Recall days with consumption N (%)
	Females	Males	Total	Females	Males	Total	Females	Males	Total	Females	Males	Total		
Fruits	144 [53, 129, 207]	140 [26, 116, 209]	142 [45, 123, 207]	170 [87, 154, 234]	184 [97, 169, 248]	177 [90, 160, 244]	134 [44, 118, 207]	125 [13, 104, 190]	129 [25, 112, 197]	124 [25, 104, 181]	106 [0, 69, 154]	115 [0, 93, 173]	1588 (85.7%)	2663 (72.1%)
Vegetables	138 [68, 121, 188]	137 [63, 115, 189]	137 [66, 117, 189]	140 [66, 121, 190]	136 [69, 121, 185]	138 [67, 121, 188]	131 [69, 120, 179]	134 [56, 112, 191]	133 [65, 115, 182]	142 [66, 125, 196]	142 [62, 107, 191]	142 [63, 116, 196]	1818 (98.2%)	3366 (91.2%)
Total (without veg. soups)	282 [170, 263, 370]	277 [136, 248, 382]	**279 [151, 254, 375]**	311 [201, 288, 397]	320 [183, 311, 414]	**315 [194, 291, 408]**	266 [147, 245, 355]	259 [119, 243, 357]	**262 [141, 243, 357]**	266 [141, 249, 343]	247 [104, 201, 344]	**257 [121, 223, 344]**	**1840 (99.4%)**	**3537 (95.8%)**
Special category: Vegetables with vegetable soups	146 [69, 124, 199]	142 [72, 126, 203]	144 [70, 126, 203]	146 [69, 124, 199]	142 [72, 126, 203]	144 [70, 126, 203]	140 [74, 122, 191]	138 [57, 114, 201]	139 [66, 117, 193]	149 [70, 126, 206]	148 [67, 116, 206]	149 [68, 121, 206]	1818 (98.2%)	3376 (91.4%)

mean [P25, P50, P75]

Table 7.13 shows that the total consumption of **fruits and vegetables** is higher in younger children and is lowest in older male adolescents. No consistent differences are observed between sexes. Fruit consumption decreases with age in both sexes. There is no consistent difference between sexes, but older girls consume more fruit than older boys. Fruit intake is below the daily recommendation of 220-240g (two daily portions). Consumption of vegetables is relatively stable, with a slight increase in older adolescents. Vegetable consumption is below the recommended 210g-360g (three daily portions of 70 g for 7-9-years-olds and of 120 g for 15-18-years-olds)[75,76].

Cereal products and potatoes

Table 7.14 Amount consumed in food group cereal products and potatoes (g/day) by sex, age group and number of consumers and recall days with consumption (N, %)

Food group: **Cereal products and potatoes (g/day)**	All ages			6-9 years			10-13 years			14-17 years			Consumers N (%)	Recall days with consumption N (%)
	Females	Males	Total	Females	Males	Total	Females	Males	Total	Females	Males	Total		
Bread and bread products	89 [43, 77, 123]	111 [55, 93, 147]	100 [48, 86, 133]	83 [46, 75, 109]	99 [53, 84, 130]	91 [49, 79, 120]	94 [43, 87, 132]	112 [62, 104, 147]	104 [53, 93, 140]	90 [37, 77, 130]	123 [53, 95, 164]	106 [42, 88, 143]	1770 (95.6%)	3103 (84.0%)
Cereal flakes and breakfast cereals	12 [0, 0, 20]	20 [0, 0, 30]	16 [0, 0, 25]	13 [0, 4, 20]	19 [0, 8, 30]	16 [0, 6, 25]	13 [0, 0, 20]	19 [0, 0, 38]	16 [0, 0, 27]	9 [0, 0, 14]	20 [0, 1, 30]	15 [0, 0, 25]	880 (47.5%)	1186 (32.1%)
Cereal products	131 [60, 119, 177]	156 [70, 140, 214]	144 [64, 125, 200]	114 [54, 104, 163]	145 [63, 135, 199]	130 [60, 119, 181]	131 [60, 120, 179]	151 [80, 132, 213]	141 [63, 121, 194]	152 [84, 127, 208]	175 [73, 159, 245]	164 [79, 142, 223]	1768 (95.5%)	2980 (80.7%)
Tubers and tuber products	44 [0, 20, 71]	57 [0, 31, 86]	50 [0, 29, 80]	37 [0, 16, 59]	42 [0, 25, 62]	40 [0, 22, 60]	46 [0, 27, 80]	59 [0, 31, 90]	53 [0, 31, 86]	48 [0, 12, 86]	71 [0, 31, 110]	60 [0, 26, 95]	1014 (54.8%)	1258 (34.1%)
Total	276 [200, 265, 343]	343 [243, 322, 409]	**310 [221, 292, 372]**	246 [188, 243, 298]	305 [226, 292, 367]	**276 [204, 263, 332]**	285 [201, 274, 353]	341 [255, 323, 397]	**314 [228, 296, 372]**	299 [208, 301, 374]	388 [253, 362, 500]	**344 [230, 331, 419]**	**1850 (99.9%)**	**3674 (99.5%)**

mean [P25, P50, P75]

Table 7.14 shows that consumption of **cereals and tubers** increases with age and is consistently higher in males than in females. Across all subcategories (bread, breakfast cereals, cereal products, tubers), consumption is higher in males than in females and increases with age, except for breakfast cereals, which remains mostly stable.

Dairy products

Table 7.15 Amount consumed in food group dairy products (g/day) by sex, age group and number of consumers and recall days with consumption (N, %)

Food group: **Dairy products, without desserts and butters (g/day)**	All ages			6-9 years			10-13 years			14-17 years			Consumers N (%)	Recall days with consumption N (%)
	Females	Males	Total	Females	Males	Total	Females	Males	Total	Females	Males	Total		
Cheese	35 [5, 24, 49]	37 [8, 24, 52]	36 [6, 24, 50]	32 [5, 25, 48]	30 [7, 23, 44]	31 [5, 25, 45]	34 [8, 25, 50]	35 [10, 21,51]	34 [9, 23, 50]	39 [5, 22, 50]	49 [7, 33, 75]	44 [5, 25, 61]	1563 (84.4%)	2354 (63.8%)
Milk and milk products	108 [0, 67, 175]	163 [19, 125, 232]	136 [2, 100, 206]	110 [12, 75, 160]	149 [35, 114, 224]	130 [17, 100, 193]	114 [0, 68, 180]	154 [9, 116, 227]	135 [0, 100, 215]	98 [0, 50, 163]	190 [22, 133, 322]	145 [0, 100, 224]	1399 (75.5%)	2205 (59.7%)
Yoghurt and yoghurt products	28 [0, 0, 46]	38 [0, 0, 63]	33 [0, 0, 62]	34 [0, 0, 63]	43 [0, 0, 76]	39 [0, 0, 70]	23 [0, 0, 20]	33 [0, 0, 63]	28 [0, 0, 41]	27 [0, 0, 51]	38 [0, 0, 31]	33 [0, 0, 47]	718 (38.8%)	898 (24.3%)
Total	171 [62, 141, 248]	238 [103, 202, 329]	**205 [79, 175, 298]**	176 [67, 143, 268]	222 [110, 198, 315]	**200 [98, 176, 293]**	170 [64, 145, 258]	221 [86, 189, 316]	**197 [69, 169, 285]**	164 [50, 128, 235]	277 [88, 236, 417]	**221 [69, 179, 325]**	**1797 (97.0%)**	**3259 (88.3%)**

mean [P25, P50, P75]

Table 7.15 shows that consumption of **dairy products** is higher in males and especially high for older adolescent males. **Cheese** consumption is broadly stable across age groups and with sex, except for an increase in older males. **Milk and milk products** consumption is higher in males, but quite stable across age groups, except for the higher intake of older males. **Yoghurt und yoghurt products** consumption appears stable with age but are higher in males.

Milk and yoghurt substitutes

Table 7.16 Amount consumed in food group milk and yoghurt substitutes (g/day), by sex, age group and number of consumers and recall days with consumption (N, %)

Food group: **Milk and yoghurt substitutes (g/day)**	All ages			6-9 years			10-13 years			14-17 years			Consumers N (%)	Recall days with consumption N (%)
	Females	Males	Total	Females	Males	Total	Females	Males	Total	Females	Males	Total		
Milk substitute	5 [0, 0, 0]	6 [0, 0, 0]	6 [0, 0, 0]	6 [0, 0, 0]	4 [0, 0, 0]	5 [0, 0, 0]	3 [0, 0, 0]	5 [0, 0, 0]	4 [0, 0, 0]	7 [0, 0, 0]	11 [0, 0, 0]	9 [0, 0, 0]	100 (5.4%)	129 (3.5%)
Yoghurt substitute	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	0 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	0 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	0 [0, 0, 0]	1 [0, 0, 0]	16 (0.9%)	18 (0.5%)
Total	6 [0, 0, 0]	7 [0, 0, 0]	**6 [0, 0, 0]**	6 [0, 0, 0]	5 [0, 0, 0]	**5 [0, 0, 0]**	3 [0, 0, 0]	6 [0, 0, 0]	**5 [0, 0, 0]**	8 [0, 0, 0]	11 [0, 0, 0]	**10 [0, 0, 0]**	**112 (6.0%)**	**143 (3.9%)**

mean [P25, P50, P75]

Table 7.16 shows that **total milk and yoghurt substitutes** are overall rarely consumed and there are no clear differences between sexes or age groups.

Pulses, eggs, meat and others

Table 7.17 Amount consumed in food group pulses, eggs, meat and others (g/day), by sex, age group and number of consumers and recall days with consumption (N, %)

Food group: **Pulses, eggs, meat and others (g/day)** and **Special category: Soy products (g/day)**	All ages			6-9 years			10-13 years			14-17 years			Consumers N (%)	Recall days with consumption N (%)
	Females	Males	Total	Females	Males	Total	Females	Males	Total	Females	Males	Total		
Eggs	11 [0, 0, 16]	16 [0, 0, 24]	13 [0, 0, 23]	11 [0, 0, 22]	14 [0, 0, 23]	13 [0, 0, 23]	13 [0, 0, 18]	15 [0, 0, 24]	14 [0, 0, 23]	8 [0, 0, 11]	19 [0, 0, 24]	14 [0, 0, 20]	830 (44.8%)	982 (26.6%)
Fish and seafood	9 [0, 0, 0]	12 [0, 0, 0]	11 [0, 0, 0]	10 [0, 0, 11]	13 [0, 0, 0]	11 [0, 0, 8]	9 [0, 0, 0]	13 [0, 0, 7]	11 [0, 0, 0]	10 [0, 0, 0]	11 [0, 0, 0]	10 [0, 0, 0]	475 (25.6%)	536 (14.5%)
Meat alternatives, pulses and soy	10 [0, 0, 0]	8 [0, 0, 0]	9 [0, 0, 0]	7 [0, 0, 0]	6 [0, 0, 0]	7 [0, 0, 0]	15 [0, 0, 0]	6 [0, 0, 0]	11 [0, 0, 0]	9 [0, 0, 0]	13 [0, 0, 0]	11 [0, 0, 0]	288 (15.6%)	333 (9.0%)
Processed meat	30 [0, 20, 47]	44 [4, 30, 65]	37 [0, 24, 54]	29 [2, 20, 47]	37 [5, 25, 55]	33 [3, 23, 48]	35 [0, 24, 54]	46 [8, 30, 70]	41 [4, 25, 62]	27 [0, 15, 44]	50 [0, 32, 75]	39 [0, 23, 52]	1372 (74.1%)	1933 (52.4%)
Unprocessed meat	44 [0, 22, 71]	56 [0, 37, 87]	50 [0, 29, 79]	38 [0, 20, 60]	40 [0, 25, 60]	39 [0, 24, 60]	47 [0, 26, 81]	48 [0, 34, 77]	48 [0, 30, 79]	47 [0, 19, 75]	84 [0, 71, 137]	66 [0, 43, 109]	1173 (63.3%)	1592 (43.1%)
Dietary + Sports Suppl., High protein bars	1 [0, 0, 0]	3 [0, 0, 0]	2 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	2 [0, 0, 0]	8 [0, 0, 0]	5 [0, 0, 0]	39 (2.1%)	45 (1.2%)
Total	106 [54, 96, 143]	139 [75, 120, 183]	**123 [64, 106, 164]**	95 [52, 88, 127]	110 [58, 95, 147]	**103 [54, 92, 141]**	119 [65, 106, 153]	129 [74, 117, 169]	**124 [68, 109, 162]**	103 [47, 90, 142]	185 [103, 170, 246]	**144 [71, 119, 197]**	1814 (97.9%)	3292 (89.2%)
Special category: All meat and meat products[1]	74 [25, 64, 111]	100 [39, 84, 145]	88 [32, 75, 126]	67 [21, 58, 97]	77 [30, 68, 113]	72 [26, 62, 105]	82 [37, 78, 123]	94 [42, 77, 131]	88 [38, 78, 125]	74 [18, 59, 116]	135 [64, 118, 183]	105 [36, 88, 153]	1649 (89.0%)	2780 (75.3%)

Special category: Liquid soy products	1 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	2 [0, 0, 0]	5 [0, 0, 0]	4 [0, 0, 0]	152 (8.2%)	160 (4.3%)
Special category: Solid soy products²	2 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	1 [0, 0, 0]	2 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	3 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	77 (4.2%)	84 (2.3%)
Special category: All soy products	3 [0, 0, 0]	4 [0, 0, 0]	**3 [0, 0, 0]**	4 [0, 0, 0]	2 [0, 0, 0]	**3 [0, 0, 0]**	1 [0, 0, 0]	2 [0, 0, 0]	**1 [0, 0, 0]**	5 [0, 0, 0]	7 [0, 0, 0]	**6 [0, 0, 0]**	206 (11.1%)	224 (6.1%)

mean [P25, P50, P75], ¹without meat substitute, without soups containing meat, ² without soy oils/margarines and without mixed products

Table 7.17 shows that **overall protein-rich foods** consumption increases with age and is consistently higher in males. Consumption of all **meat**, unprocessed meat and processed meat follows the same pattern: increase with age and higher in boys, except for processed meat with a decreased intake of in older girls and a peak intake for older boys less prominent. Consumption of **fish and seafood** remains stable across age groups and is slightly higher in males. Consumption of **eggs** appears stable with age, except for an increase in older males and a decrease in older females. Consumption of **meat alternatives and pulses** increases slightly with age. **Dietary and sports supplements** consumption is low, except for a marked peak in males aged 14-17 years. **Soy** products are overall rarely consumed and there are no clear differences between sexes or age groups.

Nuts, seeds, olives, avocados

Table 7.18 Amount consumed in food group nuts, seeds, olives, avocados (g/day), by sex, age group and number of consumers and recall days with consumption (N, %)

Food group: **nuts, seeds, olives, avocados (g/day)**	All ages			6-9 years			10-13 years			14-17 years			Consumers N (%)	Recall days with consumption N (%)
	Females	Males	Total	Females	Males	Total	Females	Males	Total	Females	Males	Total		
Nuts and seeds	3 [0, 0, 0]	3 [0, 0, 1]	3 [0, 0, 1]	3 [0, 0, 0]	3 [0, 0, 2]	3 [0, 0, 1]	2 [0, 0, 0]	3 [0, 0, 2]	3 [0, 0, 1]	3 [0, 0, 0]	3 [0, 0, 0]	3 [0, 0, 0]	497 (26.8%)	605 (16.4%)
Olives and avocados unprocessed	3 [0, 0, 0]	2 [0, 0, 0]	3 [0, 0, 0]	1 [0, 0, 0]	2 [0, 0, 0]	1 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	5 [0, 0, 0]	4 [0, 0, 0]	4 [0, 0, 0]	232 (12.5%)	251 (6.8%)
Total	5 [0, 0, 4]	5 [0, 0, 4]	5 [0, 0, 4]	4 [0, 0, 2]	5 [0, 0, 4]	4 [0, 0, 3]	5 [0, 0, 4]	5 [0, 0, 4]	5 [0, 0, 4]	8 [0, 0, 7]	7 [0, 0, 2]	7 [0, 0, 5]	**622 (33.6%)**	**768 (20.8%)**

mean [P25, P50, P75]

Table 7.18 shows that total consumption of **nuts, seeds, olives, avocados** is slightly higher in the oldest age group, while no consistent difference is observed between sexes.

Oils and fats

Table 7.19 Amount consumed in food group Oils and Fats (g/day), by sex, age group and number of consumers and recall days with consumption (N, %)

Food group: **oils and fats (g/day)**	All ages			6-9 years			10-13 years			14-17 years			Consumers N (%)	Recall days with consumption N (%)
	Females	Males	Total	Females	Males	Total	Females	Males	Total	Females	Males	Total		
Butter	5 [0, 3, 8]	6 [0, 2, 8]	6 [0, 2, 8]	5 [0, 3, 8]	6 [0, 3, 9]	5 [0, 3, 8]	6 [0, 3, 9]	5 [0, 2, 8]	6 [0, 3, 9]	4 [0, 1, 7]	6 [0, 2, 8]	5 [0, 1, 7]	1148 (62.0%)	1619 (43.9%)
Cream	6 [0, 0, 6]	6 [0, 0, 3]	6 [0, 0, 5]	6 [0, 0, 7]	6 [0, 0, 5]	6 [0, 0, 6]	6 [0, 0, 7]	7 [0, 0, 3]	6 [0, 0, 5]	6 [0, 0, 5]	7 [0, 0, 0]	6 [0, 0, 3]	585 (31.6%)	659 (17.8%)
Dressing sauces	6 [0, 0, 8]	6 [0, 0, 8]	6 [0, 0, 8]	4 [0, 0, 4]	4 [0, 0, 5]	4 [0, 0, 4]	5 [0, 0, 8]	6 [0, 0, 9]	6 [0, 0, 8]	8 [0, 0, 13]	9 [0, 0, 12]	8 [0, 0, 13]	751 (40.6%)	970 (26.3%)
Margarine	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	140 (7.6%)	173 (4.7%)
Other fats and oils	1 [0, 0, 1]	1 [0, 0, 1]	1 [0, 0, 1]	1 [0, 0, 1]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 1]	1 [0, 0, 1]	1 [0, 0, 1]	2 [0, 0, 1]	2 [0, 0, 2]	2 [0, 0, 2]	602 (32.5%)	683 (18.5%)
Sauces rich in fats	13 [0, 1, 15]	16 [0, 3, 20]	15 [0, 2, 18]	7 [0, 0, 9]	12 [0, 0, 14]	10 [0, 0, 11]	13 [0, 0, 15]	14 [0, 2, 17]	14 [0, 1, 15]	20 [0, 8, 28]	24 [0, 10, 36]	22 [0, 9, 28]	953 (51.5%)	1182 (32.0%)
Substitutes for cream and cheese*	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	2 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	62 (3.3%)	67 (1.8%)
Vegetable oils	6 [1, 3, 9]	6 [1, 4, 10]	6 [1, 4, 9]	5 [1, 3, 7]	6 [1, 4, 8]	5 [1, 3, 8]	6 [1, 3, 9]	7 [1, 5, 10]	6 [1, 4, 9]	7 [0, 4, 10]	7 [1, 4, 12]	7 [1, 4, 11]	1475 (79.6%)	2160 (58.5%)
Oils and fats Total	38 [17, 30, 48]	44 [17, 34, 62]	41 [17, 32, 55]	29 [13, 26, 39]	37 [14, 28, 55]	33 [13, 26, 43]	39 [17, 30, 53]	41 [17, 33, 55]	40 [17, 32, 54]	47 [22, 38, 60]	55 [18, 47, 76]	51 [21, 42, 70]	1835 (99.1%)	3444 (93.3%)

*mean [P25, P50, P75] *all substitute products were classified separately from "conventional products" to enable accurate reporting of their consumption, but also as a result of their heterogeneity. Additionally, cheese substitutes had to be grouped with another category due to the very low consumption frequency of cheese substitutes in this survey (fewer than 10 occurrences). Within the dairy substitutes group, the category of cream substitutes was preferred over the yoghurt substitutes and the milk substitutes categories, due to the high fat content of cheese substitutes currently on the market.*

Table 7.19 shows that **total oils and fats c**onsumption increases with age, is higher in males. Overall, sauces and oils show the more these increases, whereas butter, cream, margarine/ substitutes are quite stables among groups.

Alcoholic and sweetened beverages, sweets and salty snacks (optional)

Table 7.20 Amount consumed in food group alcoholic and sweetened beverages, sweets and salty snacks (g/day), by sex, age group and number of consumers and recall days with consumption

Food group: **Alcoholic and sweetened beverages, sweets and salty snacks (g/day)**	All ages			6-9 years			10-13 years			14-17 years			Consumers N (%)	Recall days with consumption N (%)
	Females	Males	Total	Females	Males	Total	Females	Males	Total	Females	Males	Total		
Soft drinks	138 [0, 0, 200]	202 [0, 100, 250]	171 [0, 75, 250]	99 [0, 0, 140]	103 [0, 0, 150]	101 [0, 0, 150]	146 [0, 38, 225]	209 [0, 100, 300]	179 [0, 100, 250]	173 [0, 50, 250]	309 [0, 250, 500]	242 [0, 150, 365]	968 (52.3%)	1294 (35.0%)
All fruit-vegetable juice, nectar and schorle	69 [0, 0, 100]	79 [0, 1, 125]	75 [0, 0, 100]	65 [0, 0, 100]	74 [0, 0, 100]	70 [0, 0, 100]	79 [0, 0, 100]	82 [0, 34, 120]	80 [0, 2, 103]	64 [0, 0, 100]	82 [0, 0, 150]	73 [0, 0, 104]	864 (46.7%)	1178 (31.9%)
Energy drinks	5 [0, 0, 0]	5 [0, 0, 0]	5 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	4 [0, 0, 0]	2 [0, 0, 0]	3 [0, 0, 0]	13 [0, 0, 0]	15 [0, 0, 0]	14 [0, 0, 0]	140 (7.6%)	173 (4.7%)
Salty snacks	13 [0, 0, 20]	18 [0, 0, 24]	16 [0, 0, 20]	13 [0, 5, 20]	15 [0, 0, 21]	14 [0, 4, 20]	13 [0, 0, 15]	18 [0, 5, 25]	16 [0, 0, 21]	14 [0, 0, 16]	22 [0, 0, 23]	18 [0, 0, 20]	828 (44.7%)	1012 (27.4%)
Sugary Foods and Desserts	93 [45, 77, 126]	98 [47, 85, 129]	95 [46, 81, 128]	86 [46, 74, 115]	98 [48, 86, 124]	92 [47, 81, 124]	105 [49, 87, 142]	103 [57, 92, 137]	104 [51, 89, 139]	87 [37, 73, 117]	91 [33, 72, 119]	89 [36, 72, 118]	1812 (97.8%)	3414 (92.5%)
Alcoholic beverages	3 [0, 0, 0]	12 [0, 0, 0]	8 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	1 [0, 0, 0]	0 [0, 0, 0]	9 [0, 0, 0]	41 [0, 0, 0]	25 [0, 0, 0]	84 (4.5%)	89 (2.4%)

Alcoholic drink substitutes	2 [0, 0, 0]	4 [0, 0, 0]	3 [0, 0, 0]	2 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	2 [0, 0, 0]	6 [0, 0, 0]	4 [0, 0, 0]	1 [0, 0, 0]	4 [0, 0, 0]	3 [0, 0, 0]	51 (2.8%)	51 (1.4%)
added artificial sweeteners, stevia	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	10 (0.5%)	12 (0.3%)
Sweetened beverages, sweets and salty snacks (optional) Total	323 [113, 239, 452]	418 [169, 326, 574]	372 [139, 280, 525]	265 [105, 209, 338]	292 [114, 256, 384]	279 [110, 224, 372]	349 [131, 256, 490]	422 [181, 351, 578]	387 [161, 305, 543]	361 [117, 272, 517]	564 [220, 461, 803]	463 [169, 360, 646]	1836 (99.1%)	3591 (97.3%)

mean [P25, P50, P75]

Table 7.20 shows that consumption of **total sweetened beverages, and salty snacks** as well as consumption of **soft drinks** alone and **salty snacks** increases with age, is higher in males. **Energy drinks** consumption is null in the youngest age group and shows a gradual increase across the middle and oldest age group, without distinction between males and females. **Fruit juice** consumption is relatively stable with age and is slightly higher in boys. **Sugary foods and desserts** consumption is slightly higher in the middle age group. Artificial sweeteners are almost never consumed. Consumption of **alcoholic beverages** is almost null in children up to 13 years and shows a marked peak in male adolescents. **Alcoholic substitutes beverages** consumption is highest in the 10-13-year-old group and males.

Others

Table 7.21 Amount consumed in food group others (g/day) by age group and sex

Food group: **others (g/day)**	All ages			6-9 years			10-13 years			14-17 years			Consumers N (%)	Recall days with consumption N (%)
	Females	Males	Total	Females	Males	Total	Females	Males	Total	Females	Males	Total		
Soups and bouillon	27 [0, 0, 2]	27 [0, 0, 2]	27 [0, 0, 2]	28 [0, 0, 13]	27 [0, 0, 0]	27 [0, 0, 3]	30 [0, 0, 2]	29 [0, 0, 13]	30 [0, 0, 3]	23 [0, 0, 0]	25 [0, 0, 0]	24 [0, 0, 0]	484 (26.1%)	545 (14.8%)
Varia	8 [1, 3, 10]	11 [1, 5, 14]	10 [1, 4, 12]	7 [1, 3, 9]	12 [1, 4, 14]	9 [1, 3, 11]	9 [1, 5, 11]	10 [1, 5, 12]	10 [1, 5, 12]	8 [0, 3, 11]	12 [0, 5, 16]	10 [0, 4, 13]	1694 (91.5%)	2689 (72.8%)
Total	35 [1, 7, 28]	38 [1, 10, 34]	37 [1, 8, 33]	35 [1, 7, 34]	38 [1, 9, 36]	37 [1, 7, 36]	39 [1, 8, 28]	39 [2, 11, 40]	39 [2, 9, 36]	31 [0, 7, 23]	37 [1, 8, 33]	34 [1, 7, 29]	**1731 (93.5%)**	**2834 (76.8%)**

mean [P25, P50, P75]. The food group "Varia" corresponds to: Ice cubes, vinegar and other liquid condiment (e.g. Tabasco), yeast, gelatine and its vegetable substitutes, mustard, herbs, spices, added salt, sauces made essential with water and condiment (e.g. brown gravy for roast meat, wasabi paste, soya sauce, Ketchup, miso), sauces n.s., (salty) if clearly without fat, chewing gums, spiced mixed breadcrumbs, concentrated dry instant coffee not reconstituted

Table 7.21 shows that **foods in category "other"** are overall consumed in small quantities and there are no clear differences between sexes or age groups.

7.2.3 Place of consumption and time of consumption

The following tables show the mean consumption of all food groups in g/day and the place of consumption (at home or out of home) or moment of consumption in numbers and percentages. In addition to the food groups from the Swiss food pyramid[67], some "special categories" have been created grouping subgroups or specific food items to better fit Swiss recommendations or answer specific research question on hot topics. The special categories have been put at the end of the table which fitted the most. These quantities refer to the **consumers portions only** (i.e. recalls with a given food group not consumed are excluded from this line). The numbers correspond to the mean number of grams (portion size) of the food group consumed in a given place/moment of the day. The percentage is calculated by adding up the quantities of a given food group eaten in a certain place / at a certain time and dividing it by the total sum of the grams consumed in this group. Thus, it is possible to have a smaller quantity but a bigger percentage in a given moment. For example, for bread, the mean amount is lower for breakfast but consumed quite often (high %) compared to lunch, where it is less frequent but with bigger quantities. In short, for each food group, the amount in g/day reflects the average portion size among consumers at a given place or moment, while the percentages reflect the share of the total daily intake that is eaten at a given place or moment.

Beverages

Table 7.22 Mean consumed quantity for food group beverages (g/day) and distribution of intake (%), by place of consumption

Food group: **Beverages (g/day)**		Quantity consumed per recall day	Place of consumption	
		Total (Mean in g/day)	**At home (Mean in g/day and %)**	**Out of home (Mean in g/day and %)**
Beverages: water, coffee, tea, unsweetened waters	Water	1066	794 (59.7%)	536 (40.3%)
	coffee, tea, flavoured water without sugar	332	301 (47.4%)	334 (52.6%)
	Total	**1113**	**824 (60%)**	**549 (40%)**
Special category: All beverages (without soups), **(incl. sweetened)**		1490	1046 (60.8%)	674 (39.2%)

Table 7.23 Mean consumed quantity for food group beverages (g/day) and distribution of intake (%), by moment of consumption

Food group: **Beverages (g/day)**		Moment of consumption					
		Breakfast (Mean in g/day and %)	**Between meals morning (Mean in g/day and %)**	**Lunch (Mean in g/day and %)**	**Between meals afternoon (Mean in g/day and %)**	**Dinner (Mean in g/day and %)**	**Between meals other (Mean in g/day and %)**
Beverages: water, coffee, tea, unsweetened waters	Water	240 (8.1%)	289 (11.6%)	314 (19.5%)	370 (21.1%)	366 (25.8%)	315 (13.9%)
	coffee, tea, flavoured water without sugar	205 (28.4%)	222 (9%)	269 (10.8%)	289 (20.8%)	262 (18.6%)	254 (12.5%)
	Total	**240 (9.1%)**	**289 (11.4%)**	**316 (19.1%)**	**375 (21.1%)**	**366 (25.4%)**	**319 (13.8%)**
Special category: All beverages, without soups, (incl. sweetened)		265 (14.3%)	299 (9.9%)	344 (19.2%)	404 (20.9%)	382 (23.1%)	356 (12.6%)

Table 7.22 and Table 7.23 show that for **water** both the mean amount and the share of total intake are higher at home than out of home. Water intake is larger at dinner and in between meals in the afternoon, in both proportion and mean amount. In contrast, **coffee, tea, flavoured water without sugar**, are consumed slightly more out of home than at home, and in a higher proportion at breakfast, followed by in the afternoon and at dinner. However, mean consumed amounts (g/day) tend to be higher at lunch, in the afternoon and at dinner than at breakfast. **All beverages together,** including sweetened beverages, are consumed at home more than out of home, and, although consumption is relatively well spread over the day, there is a larger proportion and larger amounts during the second part of the day (lunch, afternoon, dinner).

Fruits and vegetables

Table 7.24 Mean consumed quantity for food group fruits and vegetables, (g/day) and distribution of intake (%), by place of consumption

Food group: **Fruits and vegetables,** without juices and soups **(g/day)**		Quantity consumed per recall day	Place of consumption	
		Total (Mean in g/day)	At home (Mean in g/day and %)	Out of home (Mean in g/day and %)
Fruits and vegetables, without juices and soups	Fruits	201	172 (54.1%)	146 (45.9%)
	Vegetables	147	131 (58.2%)	94 (41.8%)
	Total	**279**	**224 (59.3%)**	**154 (40.7%)**
Special category: Vegetables with vegetable soups		154	137 (58.7%)	96 (41.3%)

Table 7.25 Mean consumed quantity for food group fruits and vegetables (g/day) and distribution of intake (%), by moment of consumption

Food group: **Fruits and vegetables,** without juices and soups **(g/day)**		Moment of consumption					
		Breakfast (Mean in g/day and %)	Between meals morning (Mean in g/day and %)	Lunch (Mean in g/day and %)	Between meals afternoon (Mean in g/day %)	Dinner (Mean in g/day and %)	Between meals other (Mean in g/day and %)
Fruits and vegetables, without juices and soups	Fruits	98 (11%)	119 (17.7%)	108 (11.6%)	142 (39.2%)	116 (14.6%)	131 (6.1%)
	Vegetables	68 (1.5%)	80 (4.3%)	89 (44.8%)	94 (5.1%)	95 (43%)	74 (1.3%)
	Total	**97 (6.3%)**	**118 (11.1%)**	**106 (27.9%)**	**144 (22.4%)**	**114 (28.6%)**	**127 (3.7%)**
Special category: Vegetables with vegetable soups		68 (1.4%)	80 (4.1%)	92 (44.1%)	95 (4.9%)	100 (44.2%)	74 (1.2%)

Table 7.24 and Table 7.25 show that for **vegetables/fruits** both the mean amount and the share of total intake are higher at home than out of home. **Fruits** are largely consumed as snacks, especially in the afternoon. **Vegetables** are consumed mainly at lunch and dinner.

Cereal products and potatoes

Table 7.26 Mean quantity of food group cereal products and potatoes consumed (g/day) and distribution of intake (%), by place of consumption

Food group: **Cereal products and potatoes (g/day)**		Quantity consumed per recall day	Place of consumption	
		Total (Mean in g/day)	At home (Mean in g/day and %)	Out of home (Mean in g/day and %)
Cereal products and potatoes	Bread and bread products	120	101 (55.8%)	80 (44.2%)
	Cereal flakes and breakfast cereals	52	52 (57.5%)	39 (42.5%)
	Cereal products	185	170 (54.1%)	144 (45.9%)
	Tubers and tuber products	145	150 (55.7%)	119 (44.3%)
	Total	**309**	**239 (62.2%)**	**146 (37.8%)**

Table 7.27 Total mean quantity of food group cereal products and potatoes consumption (g/day) and distribution of intake (%), by moment of consumption

Food group: **Cereal products and potatoes (g/day)**		Moment of consumption					
		Breakfast (Mean in g/day and %)	Between meals morning (Mean in g/day and %)	Lunch (Mean in g/day and %)	Between meals afternoon (Mean in g/day and %)	Dinner (Mean in g/day and %)	Between meals other (Mean in g/day and %)
Cereal products and potatoes	Bread and bread products	71 (31.2%)	45 (10.4%)	79 (19.3%)	57 (10.5%)	81 (26.7%)	76 (1.9%)
	Cereal flakes and breakfast cereals	47 (73.3%)	35 (0.6%)	43 (2.3%)	57 (11.1%)	46 (9.6%)	47 (3.2%)
	Cereal products	85 (1.9%)	38 (0.2%)	141 (52.7%)	66 (1.7%)	139 (42.8%)	64 (0.6%)
	Tubers and tuber products	76 (0.2%)	116 (0.1%)	125 (49.1%)	99 (2.2%)	146 (47.3%)	127 (1.1%)
	Total	**67 (14.6%)**	**45 (3.5%)**	**140 (38.9%)**	**63 (5.1%)**	**134 (36.7%)**	**76 (1.2%)**

Table 7.26 and Table 7.27 show that **total cereals and potatoes consumption** are higher at home than out of home, both the mean amount and the share of total intake. **Bread** is comparatively more consumed at breakfast and dinner, followed by lunch. **Cereal flakes** consumption is clearly highest at breakfast. **Cereal products and tubers** are almost exclusively consumed at lunch and dinner, when portion sizes also tend to be larger.

Dairy products

Table 7.28 Mean consumed quantity for food group dairy products consumed (g/day) and distribution of intake (%), by place of consumption

Food group: **Dairy products, without desserts and butters (g/day)**		Quantity consumed per recall day	Place of consumption	
		Total (Mean in g/day)	At home (Mean in g/day and %)	Out of home (Mean in g/day and %)
Dairy products, without desserts and butters	Cheese	60	56 (55.3%)	45 (44.7%)
	Milk and milk products	239	229 (53.5%)	198 (46.5%)
	Yoghurt and yoghurt products	151	155 (58.6%)	109 (41.4%)
	Total	**239**	**223 (65.9%)**	**115 (34.1%)**

Table 7.29 Mean consumed quantity for food group dairy products, (g/day) and distribution of intake (%), by moment of consumption

Food group: **Dairy products, without desserts and butters (g/day)**		Moment of consumption					
		Breakfast (Mean in g/day and %)	Between meals morning (Mean in g/day and %)	Lunch (Mean in g/day and %)	Between meals afternoon (Mean in g/day and %)	Dinner (Mean in g/day and %)	Between meals other (Mean in g/day and %)
Dairy products, without desserts and butters	Cheese	54 (7.5%)	34 (3.3%)	36 (30.7%)	48 (6.5%)	49 (49.7%)	56 (2.2%)
	Milk and milk products	188 (58.4%)	208 (4.6%)	102 (5.6%)	189 (10.1%)	141 (11.5%)	203 (9.8%)
	Yoghurt and yoghurt products	137 (36.6%)	152 (3%)	98 (6.9%)	145 (17%)	134 (28.8%)	151 (7.8%)
	Total	**183 (46%)**	**125 (4.1%)**	**58 (10.2%)**	**143 (10.6%)**	**92 (21%)**	**190 (8.1%)**

Table 7.28 and Table 7.29 show that overall, for **dairy products,** the mean amount and the share of total intake are higher at home than out of home. **Cheese** consumption is higher at dinner and secondly at lunch. **Milk** consumption is highest at breakfast. **Yoghurts** are more commonly consumed at breakfast followed by dinner and during the afternoon.

Milk and yoghurt substitutes

Table 7.30 Mean consumed quantity for food group milk and yoghurt substitutes (g/day) and distribution of intake (%), by place of consumption

Food group: **Milk and yoghurt substitutes (g/day)**		Quantity consumed per recall day	Place of consumption	
		Total (Mean in g/day)	**At home (Mean in g/day and %)**	**Out of home (Mean in g/day and %)**
Milk and yoghurt substitutes	Milk substitute	190	192 (58.8%)	134 (41.2%)
	Yoghurt substitute	135	135 (50.2%)	135 (49.8%)
	Total	**188**	**188 (54.3%)**	**158 (45.7%)**

Table 7.31 Mean consumed quantity for food group milk and yoghurt substitutes (g/day) and distribution of intake (%), by moment of consumption

Food group: **Milk and yoghurt substitutes (g/day)**		Moment of consumption					
		Breakfast (Mean in g/day and %)	**Between meals morning (Mean in g/day and %)**	**Lunch (Mean in g/day and %)**	**Between meals afternoon (Mean in g/day and %)**	**Dinner (Mean in g/day and %)**	**Between meals other (Mean in g/day and %)**
Milk and yoghurt substitutes	Milk substitute	187 (74.5%)	143 (1.8%)	68 (3.3%)	111 (10.4%)	59 (3.1%)	200 (6.9%)
	Yoghurt substitute	112 (25.2%)	0 (0.0%)	90 (13.9%)	145 (24.3%)	103 (33.1%)	101 (3.4%)
	Total	**184 (70.4%)**	**143 (1.6%)**	**80 (4.2%)**	**122 (11.6%)**	**75 (5.6%)**	**192 (6.6%)**

Table 7.30 and Table 7.31 show that for **milk substitutes,** the share of total intake is higher at home than out of home and also markedly higher at breakfast, when portion sizes also tend to be larger. **Yoghurt substitutes** consumption is highest at dinner, followed by breakfast and in the afternoon (with a higher average portion size).

Pulses, eggs, meat and others

Table 7.32 Mean consumed quantity for food group pulses, eggs, meat and others consumed (g/day) and distribution of intake (%), by place of consumption

Food group: **Pulses, eggs, meat and others, Special category: Soy products and Special category: All meat and meat products**		Quantity consumed per recall day	Place of consumption	
		Total (Mean in g/day)	At home (Mean in g/day and %)	Out of home (Mean in g/day and %)
Pulses, eggs, meat and others	Eggs	52	54 (63.4%)	31 (36.6%)
	Fish and seafood	84	85 (52.5%)	77 (47.5%)
	Meat alternatives, pulses and soy	103	106 (58.1%)	76 (41.9%)
	Processed meat	74	67 (50.5%)	66 (49.5%)
	Unprocessed meat	119	114 (51.8%)	106 (48.2%)
	Dietary and Sports Supplements, high protein bars	110	79 (31.7%)	169 (68.3%)
	Total	**140**	**122 (56.2%)**	**95 (43.8%)**
Special category: All meat and meat products, without meat substitute, without soups containing meat		118	105 (53.8%)	90 (46.2%)
Special category: Soy products	**Special category:** Liquid soy products	46	54 (78.5%)	15 (21.5%)
	Special category: Solid soy products without soy oils/margarines and without mixed products	81	76 (49.5%)	78 (50.5%)
	Special category: All soy products	63	66 (62.2%)	40 (37.8%)

Table 7.33 Mean consumed quantity for food group cereal pulses, eggs, meat and others consumption (g/day) and distribution of intake (%), by moment of consumption

Food group: **Pulses, eggs, meat and others** **Special category: Soy products (g/day) and Special category: All meat and meat products**		Moment of consumption					
		Breakfast (Mean in g/day and %)	Between meals morning (Mean in g/day and %)	Lunch (Mean in g/day and %)	Between meals afternoon (Mean in g/day and %)	Dinner (Mean in g/day and %)	Between meals other (Mean in g/day and %)
Pulses, eggs, meat and others	Eggs	62 (26.1%)	30 (0.7%)	41 (29.1%)	17 (2.5%)	47 (39.6%)	39 (1.9%)
	Fish and seafood	46 (1%)	32 (0.5%)	84 (54.2%)	36 (1.3%)	79 (41.4%)	81 (1.5%)
	Meat alternatives, pulses and soy	117 (2.9%)	12 (0.1%)	92 (48.7%)	57 (2.6%)	95 (44.4%)	126 (1.3%)
	Processed meat	32 (3.7%)	28 (3.3%)	69 (43.9%)	41 (4.6%)	59 (42.6%)	52 (1.9%)
	Unprocessed meat	132 (0.9%)	56 (0.3%)	103 (51.6%)	118 (1.6%)	101 (44.1%)	146 (1.5%)
	Dietary and Sports Supplements, high protein bars	153 (21.6%)	182 (20.4%)	243 (25.8%)	51 (21.9%)	50 (5.2%)	73 (5.2%)
	Total	**64 (4.9%)**	**34 (1.5%)**	**94 (46.5%)**	**45 (2.9%)**	**86 (42.5%)**	**81 (1.7%)**
Special category: All meat and meat products, without meat substitute, without soups containing meat		40 (2.2%)	30 (1.6%)	91 (48.2%)	52 (2.9%)	82 (43.4%)	77 (1.7%)
Special category: Soy products	Liquid Soy products	215 (57.3%)	1 (0%)	14 (12.7%)	45 (9.6%)	17 (16.9%)	117 (3.5%)
	Solid soy products*	59 (5.4%)	0 (0.0%)	72 (48.5%)	94 (7.2%)	73 (38.8%)	0 (0.0%)
	All Soy products	178 (32.7%)	1 (0%)	41 (29.7%)	57 (8.5%)	36 (27.3%)	117 (1.8%)

**Without soy oils/margarines and without mixed products*

Table 7.32 and Table 7.33 show that for **meat** (total, processed and unprocessed), the share of total intake is higher at home than out of home, and consumption occurs mainly at lunch and dinner. **Fish and seafood and pulses** are more commonly consumed at home. **Fish** is consumed more at home and almost exclusively at lunch and dinner. **Meat alternatives, pulses and soy** are mainly consumed at home and for lunch and dinner. For **Eggs,** the share of total intake is higher at home and **eggs** are eaten in a larger proportion at dinner, but also at lunch and breakfast. **Dietary sports supplements** are mainly consumed out of home and from morning to afternoon, with lunch portion size being the largest. **Liquid soy products** consumption is markedly higher in both mean amount and proportion at home and at breakfast. **Solid soy products** are consumed almost evenly in and out of home, and in a larger proportion at lunch and dinner.

Nuts, seeds, olives, avocados

Table 7.34 Mean consumed quantity for food group nuts, seeds, olives, avocados (g/day) and distribution of intake (%), by place of consumption

Food group: **nuts, seeds, olives, avocados (g/day)**		Quantity consumed per recall day	Place of consumption	
		Total (Mean in g/day)	At home (Mean in g/day and %)	Out of home (Mean in g/day and %)
Nuts, seeds, olives, avocados	Nuts and seeds	19	17 (47.3%)	19 (52.7%)
	Olives and avocados unprocessed	41	44 (60.9%)	28 (39.1%)
	Total	**28**	**27 (54.2%)**	**23 (45.8%)**

Table 7.35 Total mean quantity of food group nuts, seeds, olives, avocados consumption (g/day) and distribution of intake (%), by moment of consumption

Food group: **nuts, seeds, olives, avocados (g/day)**		Moment of consumption					
		Breakfast (Mean in g/day and %)	Between meals morning (Mean in g/day and %)	Lunch (Mean in g/day and %)	Between meals afternoon (Mean in g/day and %)	Dinner (Mean in g/day and %)	Between meals other (Mean in g/day and %)
Nuts, seeds, olives, avocados	Nuts and seeds	13 (12.6%)	19 (22.9%)	11 (9.9%)	22 (32.6%)	10 (11.8%)	27 (10.2%)
	Olives and avocados unprocessed	53 (5.3%)	66 (5.6%)	30 (23.6%)	65 (14.7%)	34 (44.9%)	94 (6%)
	Total	**16 (9.2%)**	**23 (14.7%)**	**21 (16.4%)**	**28 (24.1%)**	**24 (27.5%)**	**36 (8.2%)**

Table 7.34 and Table 7.35 show that for **nuts and seeds,** the share of total intake is slightly higher out of home than at home, as opposed to **olives and unprocessed avocados,** for which it is higher at home. **Nuts and seeds** tend to be consumed as snacks (between meals), when portions also tend to be larger. Consumption of **olives and avocado** is more frequent at dinner, while portions eaten as snacks tend to be larger.

Oils and fats

Table 7.36 Mean consumed quantity for food group oils and fats consumed (g/day) and distribution of intake (%), by place of consumption

Food group: **nuts, seeds, olives, avocados (g/day)**		Quantity consumed per recall day	Place of consumption	
		Total (Mean in g/day)	At home (Mean in g/day and %)	Out of home (Mean in g/day and %)
Oils and fats	Butter	13	12 (54.4%)	10 (45.6%)
	Cream	36	36 (55.8%)	29 (44.2%)
	Margarine	13	13 (46.3%)	15 (53.7%)
	Other fats and oils	8	7 (41.9%)	9 (58.1%)
	Dressing sauces	23	23 (53.9%)	20 (46.1%)
	Sauces rich in fats	45	48 (59.9%)	32 (40.1%)
	Substitutes for cream and cheese	43	43 (49.5%)	44 (50.5%)
	Vegetable oils	11	10 (47.1%)	11 (52.9%)
	Total	**43**	**37 (57.2%)**	**28 (42.8%)**

Table 7.37 Total mean quantity of food group oils and fats consumption (g/day) and distribution of intake (%), by moment of consumption

Food group: **nuts, seeds, olives, avocados** (g/day)		Moment of consumption					
		Breakfast (Mean in g/day and %)	**Between meals morning (Mean in g/day and %)**	**Lunch (Mean in g/day and %)**	**Between meals afternoon (Mean in g/day and %)**	**Dinner (Mean in g/day and %)**	**Between meals other (Mean in g/day and %)**
Oils and fats	Butter	12 (39.3%)	9 (4.6%)	8 (21.9%)	8 (4.1%)	10 (29.1%)	11 (1.1%)
	Cream	40 (3.5%)	50 (1.6%)	32 (45%)	30 (6.8%)	30 (41%)	36 (2.1%)
	Margarine	13 (49.1%)	9 (4.8%)	9 (16.5%)	13 (7.6%)	9 (21.5%)	18 (0.5%)
	Other fats and oils	11 (3%)	3 (0.5%)	7 (54.3%)	9 (3.5%)	8 (38.3%)	6 (0.5%)
	Dressing sauces	36 (0.6%)	26 (0.1%)	19 (50.9%)	16 (0.7%)	23 (46.8%)	42 (0.9%)
	Sauces rich in fats	30 (1.6%)	11 (0.8%)	42 (54.4%)	21 (2.2%)	38 (39.9%)	53 (1.1%)
	Substitutes for cream and cheese	0 (0.0%)	0 (0.0%)	35 (40.5%)	21 (0.5%)	45 (58.3%)	28 (0.7%)
	Vegetable oils	7 (2.6%)	1 (0.1%)	9 (46.1%)	11 (3.9%)	8 (46.1%)	8 (1.2%)
	Total	**14 (7.5%)**	**11 (1.2%)**	**27 (46.3%)**	**17 (3.3%)**	**25 (40.5%)**	**24 (1.2%)**

Table 7.36 and Table 7.37 show that **overall oils and fats** are consumed more at home, although **vegetable oils** slightly more out of home. The consumption of **butter** and **margarine** are highest at breakfast, then at dinner and lunch. The consumption of **cream, dressing sauces and other fats and oils** is highest at lunch and dinner, and minimal throughout the rest of the day. Consumption of **sauces rich in fats** is highest at lunch, followed by dinner. **Substitutes for cream and cheese** consumption is highest at dinner, followed by lunch. **Vegetable oils** are consumed equally at lunch and dinner, and marginally throughout the rest of the day.

Sweetened beverages, sweets and salty snacks

Table 7.38 Mean consumed quantity for food group alcoholic and sweetened beverages, sweets and salty snacks (g/day) and distribution of intake (%), by place of consumption

Food group: **Alcoholic and sweetened beverages, sweets and salty snacks (g/day)**		**Quantity consumed per recall day**	**Place of consumption**	
		Total (Mean in g/day)	**At home (Mean in g/day and %)**	**Out of home (Mean in g/day and %)**
Sweetened beverages, sweets and salty snacks (optional)	Soft drinks	479	394 (46.3%)	456 (53.7%)
	All fruit-vegetable juice, nectar and schorle	234	221 (49%)	229 (51%)
	Energy drinks	290	260 (46.1%)	305 (53.9%)
	Salty snacks	56	64 (59.4%)	44 (40.6%)
	Sugary Foods and Desserts	105	77 (50.9%)	74 (49.1%)
	Alcoholic beverages	332	105 (17.9%)	481 (82.1%)
	Alcoholic drink substitutes	208	217 (55.5%)	174 (44.5%)
	Added artificial sweeteners, stevia	4	4 (82.1%)	1 (17.9%)
	Total	**389**	**238 (45%)**	**290 (55%)**

Table 7.39 Mean consumed quantity for food group alcoholic sweetened beverages, sweets and salty snacks consumption (g/day) and distribution of intake (%), by moment of consumption

Food group: **Alcoholic and sweetened beverages, sweets and salty snacks (g/day)**		Moment of consumption					
		Breakfast (Mean in g/day and %)	Between meals morning (Mean in g/day and %)	Lunch (Mean in g/day and %)	Between meals afternoon (Mean in g/day and %)	Dinner (Mean in g/day and %)	Between meals other (Mean in g/day and %)
Sweetened beverages, sweets and salty snacks (optional)	Soft drinks	249 (1.7%)	322 (6.4%)	341 (32.5%)	340 (29%)	323 (22.3%)	406 (8.1%)
	All fruit-vegetable juice, nectar and schorle	192 (38.6%)	210 (5.9%)	176 (17.1%)	207 (18.9%)	156 (13%)	193 (6.5%)
	Energy drinks	0 (0.0%)	319 (17.6%)	241 (23%)	288 (43.6%)	329 (3.4%)	225 (12.5%)
	Salty snacks	58 (1.2%)	28 (12.9%)	72 (17.5%)	41 (34.2%)	88 (25.8%)	50 (8.4%)
	Sugary Foods and Desserts	39 (20.4%)	39 (8.6%)	46 (13%)	62 (36.5%)	50 (13.8%)	46 (7.7%)
	Alcoholic beverages	0 (0.0%)	203 (2.9%)	73 (5.5%)	360 (13.3%)	221 (28.5%)	558 (49.7%)
	Alcoholic drink substitutes	0 (0.0%)	0 (0.0%)	197 (27.7%)	252 (19.9%)	155 (31.3%)	329 (21%)
	Added artificial sweeteners, stevia	4 (56.8%)	0 (1.1%)	1 (6.7%)	5 (24.6%)	1 (8.3%)	2 (2.5%)
	Total	**91 (13.6%)**	**90 (7.2%)**	**189 (23.2%)**	**160 (29%)**	**164 (18.4%)**	**150 (8.7%)**

Table 7.38 and Table 7.39 show that for **alcoholic beverages**, **all fruit-vegetable juice**, **energy drinks**, **soft drinks**, and **artificial sweeteners** the share of total intake is higher out of home, and this trend is particularly marked for alcoholic drinks and artificial sweeteners. In contrast **alcoholic drink substitutes**, **salty snacks** and **sugary foods and deserts** consumption is higher at home. **Alcoholic beverages** consumption is highest after dinner, followed by dinner. **Alcoholic drink substitutes** consumption is highest at dinner. **Salty snacks**, **energy drinks** and **sugary foods** tend to be mainly consumed in the afternoon. For **all fruit-vegetable juices, nectar and schorle,** the share of total intake is highest at breakfast, followed by lunch and in the afternoon. **Soft drinks** consumption is highest at lunch and between meals in the afternoon, followed by dinner.

Others

Table 7.40 Mean consumed quantity for food group others, (g/day) and distribution of intake (%), by place of consumption

Food group: **Others**		Quantity consumed per recall day	Place of consumption	
		Total (Mean in g/day)	At home (Mean in g/day and %)	Out of home (Mean in g/day and %)
Others	Soups and bouillon	198	204 (58.5%)	145 (41.5%)
	Varia	14	11 (44.3%)	14 (55.7%)
	Total	**51**	**50 (63.2%)**	**29 (36.8%)**

The food group "Varia" corresponds to: Ice cubes, vinegar and other liquid condiment (e.g. Tabasco), yeast, gelatine and its vegetable substitutes, mustard, herbs, spices, added salt, sauces made essential with water and condiment (e.g. brown gravy for roast meat, wasabi paste, soya sauce, Ketchup, miso), sauces n.s., (salty) if clearly without fat, chewing gums, spiced mixed breadcrumbs, concentrated dry instant coffee not reconstituted

Table 7.41 Mean consumed quantity for food group others (g/day) and distribution of intake (%), by moment of consumption

Food group: **Others**		Moment of consumption					
		Breakfast (Mean in g/day and %)	Between meals morning (Mean in g/day and %)	Lunch (Mean in g/day and %)	Between meals afternoon (Mean in g/day and %)	Dinner (Mean in g/day and %)	Between meals other (Mean in g/day and %)
Others	Soups and bouillon	207 (0.6%)	194 (0.4%)	152 (33.8%)	162 (2.2%)	210 (61.6%)	199 (1.3%)
	Varia	2 (1.2%)	6 (1.4%)	11 (50.2%)	7 (4.6%)	10 (40.6%)	11 (2%)
	Total	**6 (0.8%)**	**10 (0.6%)**	**31 (38%)**	**17 (2.9%)**	**46 (56.2%)**	**31 (1.5%)**

The food group "Varia" corresponds to: Ice cubes, vinegar and other liquid condiment (e.g. Tabasco), yeast, gelatine and its vegetable substitutes, mustard, herbs, spices, added salt, sauces made essential with water and condiment (e.g. brown gravy for roast meat, wasabi paste, soya sauce, Ketchup, miso), sauces n.s., (salty) if clearly without fat, chewing gums, spiced mixed breadcrumbs, concentrated dry instant coffee not reconstituted

Table 7.40 and Table 7.41 show that for **soups/bouillons** the total share of intake is higher at home than out of home and that overall consumption largely takes place at dinner followed by lunch. Foods corresponding to category **varia** are consumed slightly more out of home than at home and mostly at lunch and dinner.

8 Physical measurements and additional questions during the visit

8.1 Methods

During the visit at the study centre, various physical measurements were taken on participants. This included weight, height, waist and hip circumferences, skin colour assessment, blood pressure measurements and, when available, body composition analysis with bioimpedance.

8.1.1 Data management physical measurements

Data from the anthropometric measurements could either be directly entered into REDCap by the FW or initially recorded on a paper form and later entered into REDCap. Information on medication intake, supplements, and fish consumption was also collected and entered directly into REDCap. To reduce inconsistencies and missing values, all required fields in REDCap were marked as mandatory.

REDCap was hosted on a secure institutional server managed by Unisanté to ensure IT security. The server was equipped with a back-up system, and access was password protected. Each month, the data were reviewed for missing or implausible values, as well as important comments. Notably, less than 1% of physical measurements data were missing, except for blood pressure, where missing data for the third measurement reached up to 1.9%.

8.1.2 Weight and height measurement

Material

Body weight and height were measured on calibrated SECA scales (SECA 704) with stadiometers, provided for each study centre by the study coordination team. The scales had an accuracy of 0.1 kg for weight measurements. For quality control, a weight plate and a folding meter were available at each study centre.

Monitoring

Before transporting the material to the study centres, SECA® Switzerland carried out service and inspection of the scales. After the transport, both the scale and the stadiometer were checked at the study centres. To verify the accuracy of the scales, each study centre received a weight calibration plate (appr. 4-5 kg, with the exact weight indicated on the plate). For the height, a folding meter was used to measure 102, 142 and 182cm accuracy. Any discrepancy exceeding 0.5cm, had to be reported to the regional coordinator. FW were also instructed on how to lock the headpiece in the correct position for accurate measurement. Those verifications were done once a month, or every time the scale was moved.

Weight measurement

Weight measurement was carried out according to procedures previously described in the literature and used in the menuCH adults study[77–79]. FW were instructed on how to position the scale correctly (ensuring it did not touch the wall and stood stably on the floor. Participants were asked to stand still in the centre of the scale, without shoes and without touching any surrounding objects or surfaces. Participants were also asked to remove heavy belts and items from their pockets, as well as sweaters.

For reasons of timing and practicality, it was decided that weight would be measured with clothes on. FW were required to record the type of clothing worn by participants during the measurement and enter this information into REDCap. They could select from "light/thin clothes", "heavy/thick clothes" or "other". After selecting the clothing type, they could add a comment to provide further details about the participant's attire.

Based on the comments, data were re-coded in four new categories during data cleaning process: underwear, light/thin clothes, jeans + T-shirt (medium), heavy/thick clothes. The new category "underwear" was added, after comments revealed that a few participants had been weighted wearing only underwear, which deviated from the standard procedure.

To estimate the weight of the clothes, several types of clothes (pants, t-shirts, sweaters, shorts, skirts, leggings, joggings, dresses, underwear) were weighted for six different ages and then combined in several complete outfits to approximate the mean weight to be deducted for each clothing category within a given age group. The weight to subtract for each age and clothing category is shown in Table 8.1.

Furthermore, four children were wearing a cast, and two children were wearing medical accessories, such as a corset and a clavicle bandage. In these cases, an additional deduction of 500 g was applied for casts and 120 g for medical accessories.

Table 8.1 Estimation and deduction of clothing weight

	Weight deduction (g) 6-9 years	Weight deduction (g) 10-13 years	Weight deduction (g) 14-17 years
Underwear = code 1	80	80	80
Light clothes = code 2	300	360	410
Jeans and T-shirt = code 3	400	630	740
Heavy clothes = code 4	500	820	930

Thanks to this process, clothes' weight was estimated more accurately for each participant. It was then deducted from the participant's measured weight to obtain the participant's weight without clothes.

Height measurement

The height measurement was performed according to procedures previously described in the literature and used for the menuCH adults study, which are based on the recommendation from WHO and Cambridge university[77–80]. Height was measured using the integrated stadiometer of the SECA scales (SECA 704) with an additional ruler placed under the horizontal bar, as a measuring aid to make the bar longer. Participants needed to stand in an upright position on the scale platform, with their back turned to the measurement rod. Their heels had to be together and touching the back edge of the scale platform, with their feet positioned slightly outward at a 60-degree angle. If the participant touched the measurement rod when placed in this position, they were asked to make a small step forward. The FW stood beside the participant when reading the measurement value. FW had to ensure the participant's heads were positioned correctly, with the top of the external auditory meatus (ear canal) as aligned with the inferior margin of the bony orbit (cheekbone), in according with recommendations from Cambridge University and WHO guidelines[78,80]. If participants had hairstyles that could affect the measurement, they were asked to flatten their hair.

8.1.3 Waist- and hip circumference measurement

Material

To measure waist and hip circumferences, FW used a non-stretchable measuring tape for both measurements, plus sticky medical tape as a visual aid of the anatomical landmarks. An aluminium mirror was available in each study centre to ensure the tape was positioned correctly and horizontally during the procedure. Each study centre was also responsible for providing disinfectant for the process. A towel was available for girls who came to the visit wearing a dress so that they could cover their lower body for the waist circumference measurement.

Waist circumference

The waist circumference measurement was performed according to procedures previously described in the literature and used for the menuCH adults study[77–79]. The waist circumference was assessed using a measuring tape and with the aid of medical tape to mark the distance between the iliac crest and the lower rib margin. The measurement was taken at the midpoint between these two points. Participants were asked to roll-up their T-shirts, which were fixed with clothing pins. Participants were also asked to stand with their feet close together, distributing their weight evenly on both legs. The FW performed the measurement with disinfected hands, from the side of participants. Participants were asked to breathe normally during the measurement, which was taken with their arms lowered. This procedure was repeated three times, resulting in three measurements. After each measurements the medical tape was removed, and the iliac crest and lowest point of the last rib were marked again[77–79].

Hip circumference

The hip circumference measurement was performed according to procedures previously described in the literature and used for the menuCH adults study[77–79]. For the hip circumference measurement, participants were also asked to stand with their feet close together and distributing their weight evenly on both legs. The measurement was taken at the widest part of the buttocks using a measuring tape, with the FW positioned on the side of the participant. If the participants were wearing thick trousers, the pockets had to be turned out. This measurement was also taken three times[77–79].

8.1.4 Body composition measurement

Material

In some study centres (Bern, Vaud, Zurich and St. Gallen), a bioimpedance measurement was performed. The study centres had different devices available validated for children's analyses. The following devices were available:

- TANITA MC-780MA-N: in Bern and Vaud
- InBody 770: in Zurich and St. Gallen

Each device had its own related analysis program. These were "GMON Customer Administration" for the Tanita device and "LookinBody120" for the InBody device.

Measurement

The measurement was carried out after confirming that participants had given their consent and did not meet any of the exclusion criteria for BIA (based on the devices instructions manuals): pacemaker or implanted cardiac defibrillator, cochlear implant or other implanted medical devices, pregnancy. Any condition that could affect the measurement or the results - such as substantial metallic implants, specific medications or conditions influencing water balance - was recorded in REDCap. When possible, the measurement was performed in a fasting state. Participants were asked to remove all metal objects such as earrings, belts etc. Participants had to stand on the platform with bare feet. The platform was disinfected prior to the procedure. To perform the measurement, FW followed the official instructions of the devices and recommendations from the literature where also taken into account[81–87].

8.1.5 Skin colour assessment

Material and assessment

To support the interpretation and analysis of vitamin D levels, the skin colour of participants was assessed, as darker-skinned individuals may have an increased risk of vitamin D deficiency compared with lighter-skinned individuals[88]. The Fitzpatrick scaling system[89], initially designed to determine the “skin’s phototype”, reflecting the skin’s reaction and sensitivity to sun exposure, was used. This tool comprises a colour scale defining six skin phototypes (type I to VI), from lightest to darkest, which can be compared to one’s skin. The system also includes a short questionnaire, assessing genetic physical traits, sun exposure reaction and tanning habits, which was not included in our assessment, as our aim was only to assess skin colour and not the risk associated with sun exposure. The use of the Fitzpatrick system as a standard skin colour classification tool, beyond its initial purpose, is well established in clinical and research settings[90]. Although the tool has reported limitations[90,91], in the present study where skin colour was assessed to interpret vitamin D levels rather than to provide an exact determination of ethnicity or specific dermatologic traits, the Fitzpatrick system was identified as the most robust and practical option.

To perform the measurement, the laminated card displaying the skin phototype scale, was held against the inner side of the participant’s upper arm. The correspondent phototype was then defined and noted in REDCap. Moreover, FW were instructed to explain the purpose of performing this measurement to the participants. Of note, this assessment was added after the pilot phase of the study.

Monitoring

As the method used was not fully validated, a cross-validation of skin phototype classification was conducted in September 2023 by study nurses and dieticians. The dietician assessed the participants phototype prior to the 24HDR visit and the study nurse assessed it again for the same participant, during the anthropometric measurements.

During validation, it was noted that out of 101 participants, 94 (93%) participants were classified with same skin colour by both the dietician and the nurse. Therefore, 7% were classified with a different skin colour by the two FW. Within the latter percentage, 71% of the cases were classified either in type 1 or 2 and 29% were classified either under type 2 and 3. This showed a high agreement between dieticians and study nurses and good reproducibility.

Table 8.2 shows the distribution of skin colour assessed during the validation period by the dieticians and the study nurses. We calculated Cohen’s kappa score to assess the inter-rater agreement, using linear weighting as values are ordinal with equal intervals between adjacent categories. The weighted kappa value was 0.78, indicating a substantial level of agreement according to the commonly used interpretation scale by Landis and Koch[92] .

Table 8.2: Distribution of skin colour and inter-observer variability

		Assessment FW1					
	Skin colour	1	2	3	4	5	6
Assessment FW2	1	88	5	0	0	0	0
	2		2	2	0	0	0
	3			2	0	0	0
	4				2	0	0
	5					0	0
	6						0

8.1.6 Blood pressure measurement

Material

Omron® HBP 1320 blood pressure measuring device was used. This device is validated for professional use in children and adolescents[93] according to the American Association for the Advancement of Medical Instrumentation (AAMI), the American National Standards Institute (ANSI) and the European Society for Hypertension (ESH)[94]. Of note, the devices were financed by The Swiss Hypertension Research Foundation.

Measurement

Prior to blood pressure measurement, the device had to be charged. It was also necessary for the room to have a comfortable temperature. Ideally, participants did not smoke, drink caffeine or ate within 30 minutes prior to the measurement. They were asked to sit and relax 3-5 minutes before taking the measurements, during which a few medical questions were asked (see 8.1.8 *Assessment of diseases, supplements, medications, fish consumption and time spent outside*). Participants were also instructed not to move nor speak during the procedure. The measurement was taken on the non-dominant arm, after asking the participant for this information. If participants could not answer, the dominant arm was identified by observing which hand they used to grasp a handed over pen. To define the appropriate cuff size, the arm circumference was measured, and the ideal cuff size was chosen based on the device official reference values as seen in Table 8.3. The described procedure was performed according to Stergiou et al[95].

Table 8.3: Cuff sizes for different arm circumferences

Designation of cuff	Arm circumference (cm)
GS CUFF2 XS	12-18
GS CUFF2 S	17-22
GS CUFF2 M	22-32
GS CUFF L	32-42

XS: extra small, S: small, M: medium, L: large

Defining the correct cuff size was crucial to avoid an over- or under-estimation of blood pressure values, as there can be significant differences in arm circumference between children and adolescents. The cuffs needed to be placed 1-2 cm above the inside of the elbow joint, with the mark for the brachial artery placed in the appropriate position. Participants were instructed to sit with their back supported by the chair, keeping legs uncrossed with feet flat on the floor. Small children had a stool placed under their feet to ensure correct positioning. Participants were asked to rest their forearm on the table with the palm open and facing upward, ensuring the forearm was positioned at heart level. If this was not possible due to the height of the table, the forearm was laid on pillows placed on the participant's lap. Measurements were taken three times[96,97]. The mean of the two last readings was used for analysis and for providing feedback to participants, in line with standard scientific procedures, as the first reading is expected to be higher[98]. If only two measures were taken, the mean was used, unless the difference was bigger than 20 mmHg for systolic / 10 mmHg for diastolic, in which case only the second measure was used (as a referential, the European Society of hypertension recommend repeating measurements for Systolic blood pressure (SBP) if the difference is higher than 10mmHg, for Diastolic blood pressure (DBP) than 5mmHg, so we took a conservative approach.

The 90th percentile, as calculated by *Simonetti et al, 2010* [99] was used as the upper limit of the normal blood pressure range. Thus:

- For systolic blood pressure: 0.95*(100 + age(years)*2)
- For diastolic blood pressure:
    - Children aged 1-10 years: 0.95*(60+age*2)
    - Children aged 11-17 years: 0.95*(70+age)

Monitoring

If blood pressure values exceeded 120/80 mmHg (age 6-7) or 130/90 mmHg (age 8-17)[99], the FW notified the on-site supervising physician. The procedure to follow was described in the study Roadmap. As the blood pressure devices were new, no calibration was required.

8.1.7 Puberty stages assessment

The puberty stage of the participant was self-assessed using the illustrated 5-stage Tanner scale for breast and pubic hairs in girls, and testicle development and pubic hairs in boys, as well as an additional question about menstrual bleeding for girls and voice change for boys. The participants (with or without their parents) had to fill out the illustrated puberty sheet at home and bring it to the study centre during the visit. Alternatively, they could complete the paper form directly at the study centre.

8.1.8 Assessment of diseases, supplements, medications, fish consumption and time spent outside

During the visit, additional information was collected from participants and directly entered into REDCap by the FW.

The participant was asked if he/she was ill on the day of visit or shortly before and the recent intake of medications and supplements was assessed. For this, the participants and their families were invited to bring packages and/or photos about the products that they were taking to record as much details as possible. Moreover, the participants were asked about their fish/sea food consumption during the last seven days prior to the visit, useful for the risk assessment of some food contaminants. Participants were asked to name the type of fish type, if they could remember. Finally, the average time participants spent outdoors during the week and separately during the weekend was assessed, to allow comparison with their vitamin D status.

8.2 QC and learnings

8.2.1 Physical measurements evaluation and intercorrelation between fieldworkers

Physical measurement techniques and accuracy were tested and evaluated during some trainings.

During the second refresher training of the main phase, in April 2024, the inter-rater-agreement (with ICC) was assessed. All FW participated in a quality control for physical measurements, to assess the variability across FW. Dieticians (group A, n=9) were divided in two, and each sub-group measured two specific test subjects. It was the same for nurses (group B, n=12).

Test subjects' age was 14-26 years, as it was observed in the pilot that being calm during repeated measures with many different FW was too complicated for younger children, and it was difficult to find motivated and free children for a whole afternoon during the week. There were at least seven measurements per test-subject, and each FW assessed two test subjects.

Consistent with repeated-measures designs, ICCs were computed as two-way mixed effects models under absolute agreement assumptions with "average measure" outputs, ICC (3, K). This is formulated as $MS_R - MS_E / (MS_R + (MS_C - MS_E / n)$.

All results are summarised in Table 8.4 below. As shown in the table, ICC was excellent for test subjects of both groups. For individual measurements, all interpretable ICCs indicated excellent inter-rater reliabilities, except for Hip measurement, for which the group A exhibited uninterpretable ICCs, whereas group B exhibited excellent ICCs. Additionally, group B exhibited uninterpretable values for weight, whereas group A exhibited excellent values. The uninterpretable values are somewhat expected, given the low sample size (n=9, n=12) and number of raters under the recommended minimal (n>2). Therefore, the uninterpretable values are ignorable. All other values exhibit excellent reliabilities.

Following best-practice recommendation standards[100], ICCs should be interpreted as follows:

ICC < .5 = poor

ICC .5 - .75 = moderate

ICC .75 - .90 = good

ICC > .90 = excellent

Table 8.4: Intra-Class-Correlation (ICCs) by groups and measurements

Groups	ICC_{Weight}	ICC_{Height}	ICC_{Waist1}	ICC_{Waist2}	ICC_{Hip1}	ICC_{Hip2}	$ICC_{Overall}$
Group A	1.00	1.00	.97	.99	-	-	1.00
Group B	-	.99	.98	.98	.98	.98	1.00

Group A = group of 5 dieticians measuring volunteers 1 and 3 + group of 4 dieticians measuring volunteers 2 and 4; Group B = group of 6 nurses measuring volunteers 1 and 3 + group of 6 nurses measuring volunteers 2 and 4.

8.3 Results of physical measurements and additional questions

The following sub-chapter presents descriptive results of the physical measurements and additional questions assessed during the visits. For each measure, a first part describes the raw data, and then weighted means represent variable in the Swiss target population (weighting procedure is detailed in chapter 5.2 *Weighting strategy*).

All analyses were performed using a 95% confidence interval; p-values < 0.05 were considered statistically significant in selected group comparisons. Results are presented as mean ± (Standard Deviation = SD) or median [Interquartile range = IQR], as appropriate.

8.3.1 Body weight

Weight was measured on a calibrated SECA® scale. For practicality, intimacy and timing questions, participants were weighted with their clothes on, so the weight of the clothes needed to be estimated and deducted from the weight that was measured. Additional details on this measurement procedure are presented in chapter 8.1.2 *Weight and height measurement.*

Body weight: Description of collected data (unweighted data)

A total of 1 852 measurements were recorded, with no missing values. The mean participant body weight is 40.90 kg (SD 15.97), the median participant body weight is 37.88 kg (IQR 25.33), minimum participant body weight is 16.10 kg, and maximum participant body weight is 127.39 kg.

Figure 8.1 Distribution of body weight with clothes, unweighted

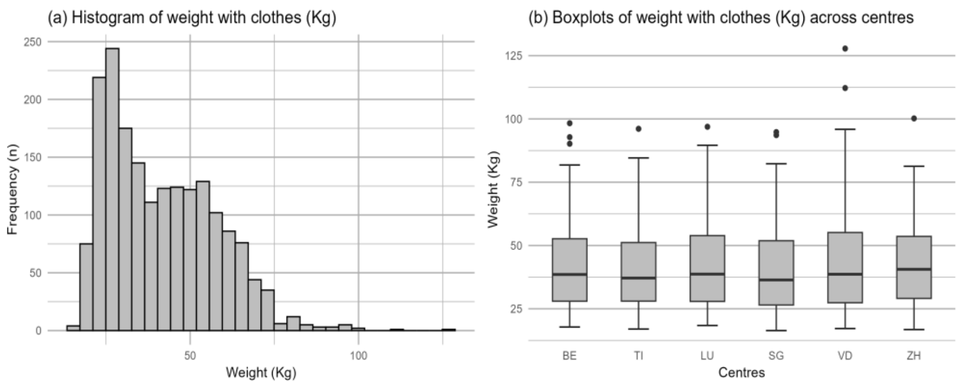


Figure 8.2 Weight distribution after clothing weight removal, overall and stratified by study centre, sex and age group, unweighted

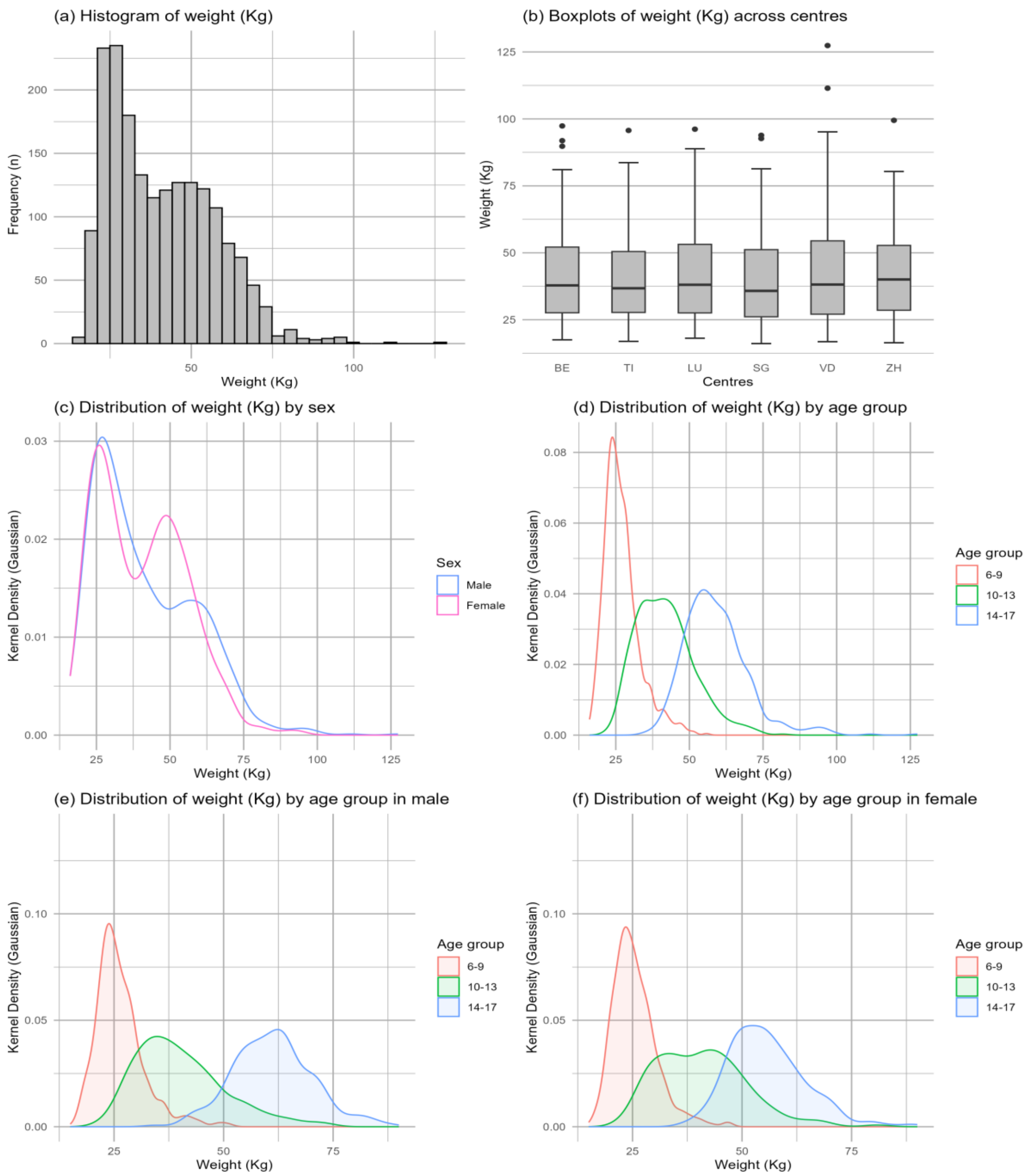


Figure 8.2 a) shows the distribution of body weight among participants. There is no statistically significant difference in weight distribution detected across study centres or between sexes. Different peaks of weight are observed between males and females (Figure 8.2 c)), and may be explained by the different growth spurts: according to the literature, there is a transient growth spurt between the ages of 6 and 8, and then another growth spurt occurs around age 12 for girls and 14 for boys[101,102] reflects the higher proportion of younger children in the total study sample. As expected, the average weight was significantly different between age groups (Kruskal-Wallis non-parametric test, p<0.001)), with a progressive increase across age groups (Figure 8.2 d), e), f)).

Body weight: Results (weighted data)

As shown in Table 8.5, the mean body weight, after weighting to match the population margins, is 42.62 kg. The mean value is 27.45 kg for 6-9-year-olds, 42.62 kg for 10-13-year-olds and 60.24 kg for 14-17-year-olds. In adolescents, there is a clear difference depending on sex, with 56.68 kg for female and 63.74 kg for male adolescents.

Table 8.5 Weighted results weight measurement, overall and stratified by age group, sex and linguistic region

Measure -ment	Total Mean (SD)	6-9 years			10-13 years			14-17 years			Sex		Region		
		Females Mean (SD)	Males Mean (SD)	Total Mean (SD)	Females Mean (SD)	Males Mean (SD)	Total Mean (SD)	Females Mean (SD)	Males Mean (SD)	Total Mean (SD)	Females Mean (SD)	Males Mean (SD)	DE Mean (SD)	FR Mean (SD)	IT Mean (SD)
Weight (kg)	**42.62 (16.44)**	27.19 (6.31)	27.73 (7.49)	**27.47 (6.79)**	43.40 (10.78)	41.92 (10.31)	**42.62 (10.31)**	56.68 (10.18)	63.74 (12.91)	**60.24 (11.99)**	41.75 (15.31)	43.44 (17.93)	42.42 (16.23)	43.57 (18.17)	42.64 (16.51)

8.3.2 Body Height

The height was measured with the SECA stadiometer present on the scale, without shoes but in socks. Additional details on this measurement procedure are presented in chapter 8.1.2 *Weight and height measurement.*

Body height: Description of collected data (unweighted data)

A total of 1 852 measurements were recorded, with no missing values. The mean participant height is 148.47 cm (SD 18.71), the median participant height is 149.15 cm (IQR 32.20), minimum participant height is 107.20 cm, and maximum participant height is 197.00 cm.

Figure 8.3 Height distribution: overall and stratified by study centre, sex and age groups, unweighted

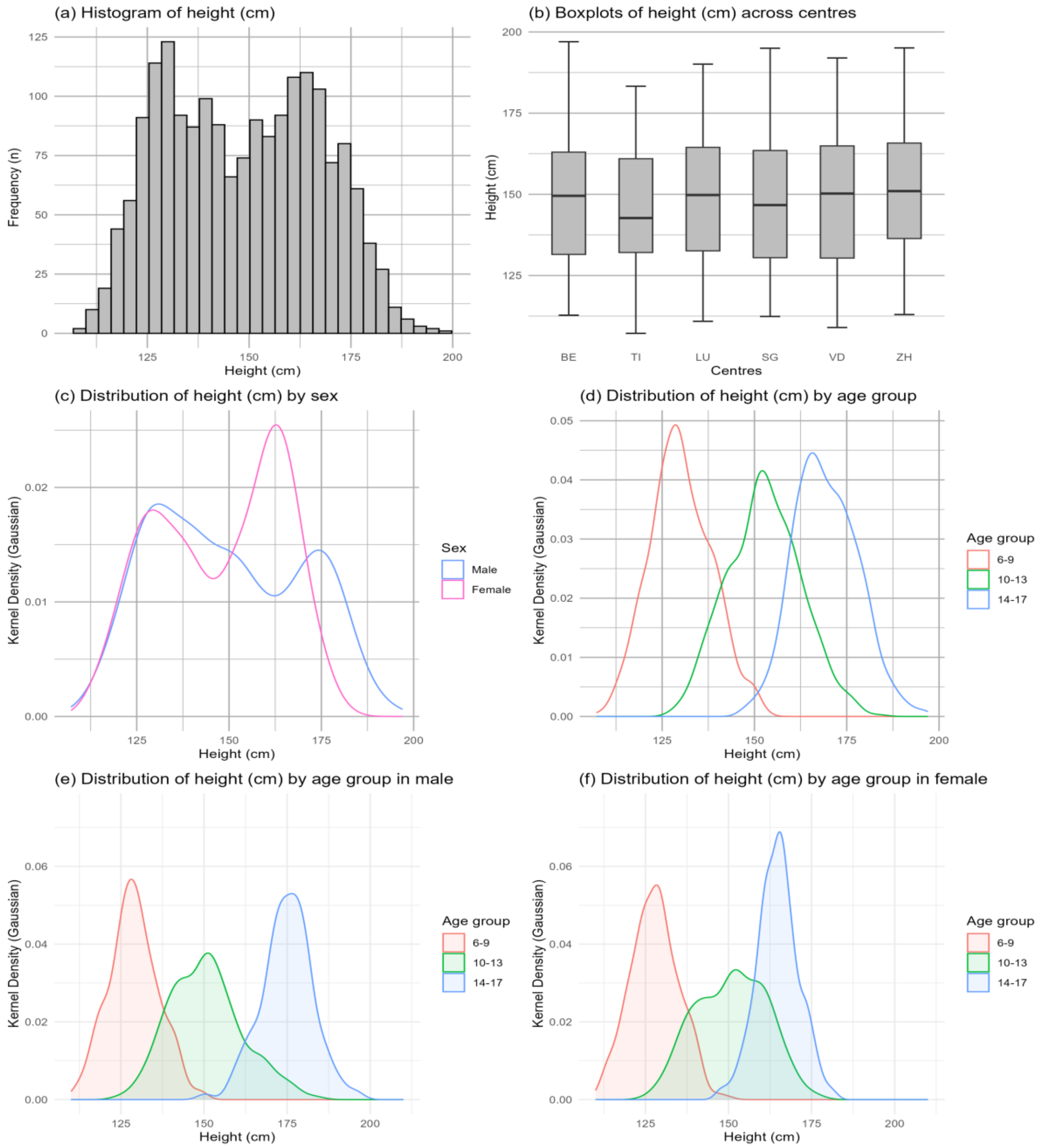


Figure 8.3 a) shows the height distribution among participants. There was no statistically significant height difference detected across study centres, although the median height in the Ticino centre is slightly lower than in the other cantons (Figure 8.3 b). No significant difference was observed between sexes. Figure 8.3 c) shows a bimodal distribution of height for girls, which is consistent with the fact that two growth spurts are usually observed, around age 6-8 and around age 12 (14 for boys)[101]. The bimodal distribution is also present in boys, but growth is overall more constant. Girls tend to reach their adult height about two years earlier than boys[102]. As expected, the average height was significantly different between age groups (Kruskal-Wallis non-parametric test, $p<0.001$)), with a progressive increase across age groups (Figure 8.3 d), e), f)).

Body height: Results (weighted data)

As shown in Table 8.6, the mean height, after weighting to match the population margins, is 150.81 cm. The mean value is 131.00 cm for 6-9-year-olds, 153.79 cm for 10-13-year-olds and 170.42 cm for 14-17-year-olds. In adolescents, there is a clear difference depending on sex, with 165.09 cm for females and 175.09 cm for male adolescents.

Table 8.6 Weighted results height measurement, overall and stratified by age group, sex and linguistic region

Measur-ement	Total Mean (SD)	6-9 years			10-13 years			14-17 years			Sex		Region		
		Females Mean (SD)	Males Mean (SD)	Total Mean (SD)	Females Mean (SD)	Males Mean (SD)	Total Mean (SD)	Females Mean (SD)	Males Mean (SD)	Total Mean (SD)	Females Mean (SD)	Males Mean (SD)	DE Mean (SD)	FR Mean (SD)	IT Mean (SD)
Height (cm)	**150.81 (18.67)**	130.53 (9.21)	131.46 (9.79)	**131.00 (9.26)**	154.30 (9.91)	153.33 (10.81)	**153.79 (10.13)**	165.09 (6.65)	175.09 (8.34)	**170.42 (9.23)**	149.22 (17.17)	152.32 (20.52)	150.96 (18.75)	150.62 (19.30)	149.14 (17.78)

8.3.3 Body Mass Index

Body mass index (BMI) is calculated by dividing a person's weight in kilograms by their height in meters squared. Figure 8.4 a) shows the distribution of the BMI of our participants.
For children and adolescents, BMI is age- and sex-specific as weight and height constantly change during children's growth and development. Consequently, to be able to compare BMI values among different age- and sex- groups, the BMI of each participant is expressed as a percentile based on the BMI distribution in a defined population[103]. We used the percentiles of the 2007 World Health Organisation (WHO)[78]. It is considered that a normal BMI lies between percentile 10 (P10) and percentile 90 (P90). Below P10, children are considered underweight/thin, and below P3 as severely underweight/thin. Above P90, children are considered overweight, and obese above P97[78].

BMI: Description of collected data (unweighted data)

The distribution (number and %) of participants in the three categories (underweight, normal weight, overweight), by gender, age groups and study centres can be seen in Annex 14.1 *Unweighted distribution of BMI percentiles by sex, age group and study centre.*
Figure 8.4 b) – g) represent the percentiles distribution in different subgroups.

Figure 8.4 BMI distribution: overall and stratified by study centre, sex, and age group, unweighted

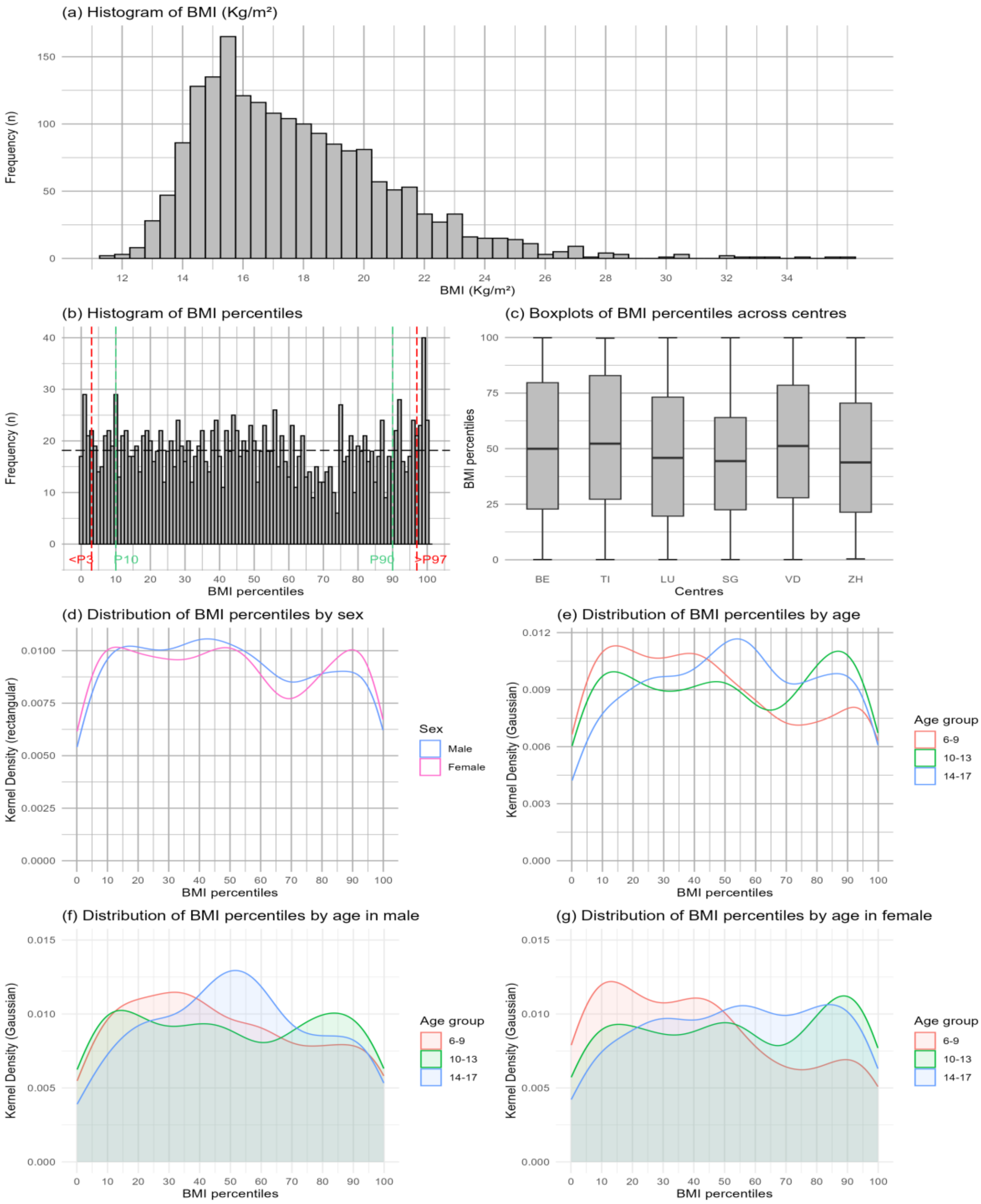


Figure 8.4 a) shows the BMI distribution among participants. Figure 8.4 b) shows that most individuals in our sample fall within the normal BMI range. The proportion of participants presenting underweight (P<10, 11.4%) or overweight (P>90, 12.9%) is low. Statistically significant differences were observed across study centres (Kruskal-Wallis non-parametric test, p=0.015), with higher BMI values in the Ticino and Vaud centre, (Figure 8.4 c)). No statistically significant differences in BMI were detected between sexes, but statistically significant differences were observed with age (Kruskal-Wallis non-parametric test, p=0.003), with younger children having lower BMI percentiles values (Figure 8.4 e)). The higher proportion of high BMI percentiles observed

in the 10-13 age group is likely due to the physiological changes specific to puberty, which often starts around this age. Studies show that, with pubertal development, levels of the anabolic hormone leptin gradually increase in girls, promoting the accumulation of body fat[104]. In boys, androgen hormones stimulate the growth of muscle mass, also contributing to an increase in BMI. These physiological changes lead to a temporary rise in BMI during puberty[104].

BMI: Results (weighted data)

After weighting to match the population margins, around 10.7% of children are underweight (below P10), while around 12.9% are overweight (above P90), among which 5.8% are obese (above P97). Linguistic region differences can still be observed (more overweight and obesity in the Ticino and Vaud centres), but in the weighted data, sex differences are also visible (more overweight females). Older adolescents are less underweight, whereas overweight and obesity levels are similar across age categories, though overweight is increasing and obesity decreasing, as shown in Table 8.7.

Table 8.7 Weighted distribution of BMI (percentiles)

Estimated Total in the population	<P3 (severe underweight)	>P3 <P10 (underweight)	Total Underweight (<P10)	Normal range ([P10-P90])	Total overweight (>P90)	>P90 <P97 (overweight)	>P97 (obese)
	N = 23 107	N = 36 055	N=591 622	N = 424 665	N = 39 682	N = 39 682	N = 32 210
Gender							
Males	4.4%	5.9%	**10.3%**	**78.0%**	**11.4%**	5.3%	6.1%
Females	3.9%	7.1%	**11.0%**	**74.0%**	**14.5%**	9.0%	5.5%
Age Group							
6-9 years	5.5%	8.0%	**13.5%**	**74.0%**	**12.1%**	5.4%	6.7%
10-13 years	4.5%	7.0%	**11.5%**	**75.0%**	**13.4%**	7.1%	6.3%
14-17 years	2.2%	4.1%	**6.3%**	**80.0%**	**13.3%**	9.2%	4.1%
Study centre							
BE	4.7%	8.0%	**12.7%**	**72.0%**	**15.0%**	9.4%	5.6%
TI	6.5%	4.9%	**11.4%**	**70.0%**	**18.1%**	10.0%	8.1%
LU	3.6%	7.6%	**11.2%**	**75.0%**	**14.2%**	5.9%	8.3%
SG	3.5%	8.1%	**11.6%**	**79.0%**	**9.7%**	5.4%	4.3%
VD	4.0%	5.3%	**9.3%**	**73.0%**	**17.8%**	9.4%	8.4%
ZH	4.1%	5.5%	**9.6%**	**81.0%**	**9.4%**	5.5%	3.9%
Total	4.2%	6.5%	**10.7%**	**76.0%**	**12.9%**	7.1%	5.8%

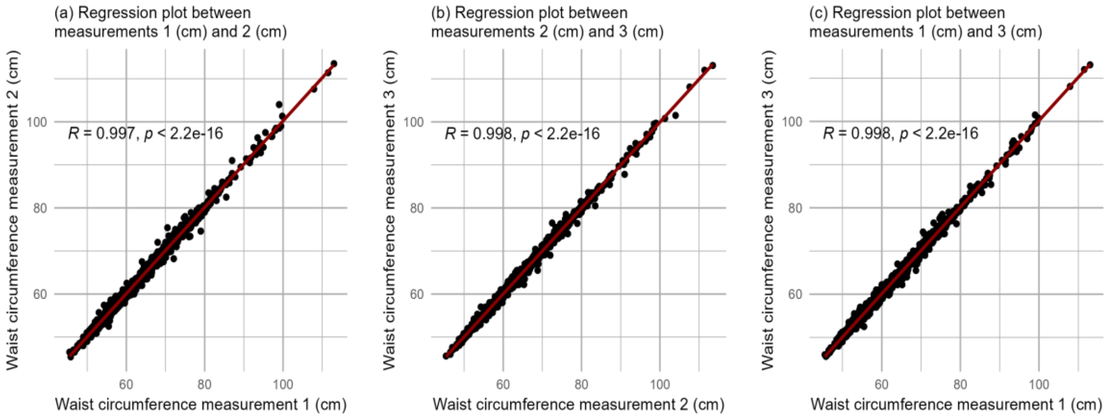
8.3.4 Waist circumference

Waist circumference measurement was repeated three times (on bare skin) to ensure reliability. The FW removed the marking tapes between each of the three measurements.
The main outcome of these measurements is presented below. Additional details on this measurement procedure are presented in Chapter 8.1.3 *Waist- and hip circumference measurement.*

Waist circumference: Description of collected data (unweighted data)

For the first measurement, a total of 1 846 measurements was recorded, for the second we have 1 845 measurements, and for the third 1 844 measurements. Over all three measurements, minimum waist circumference is 45.40 cm and maximum waist circumference is 113.50 cm. Detailed description of the unweighted data is presented in 14.2 *Unweighted results of waist circumference* .

Figure 8.5 Correlation among repeated waist circumference measurements



As shown in Figure 8.5 the Pearson's correlation among repeated waist measurements is close to 1 (R > 0.99), showing very high correlation and reliability of the measurements. It was important to have three measures, as it allowed to correct for typing errors during data cleaning (e.g. 74.1, **47**.2, 74.0).

An average value of the three measurements has been calculated and used for the following plots, to display the distribution of average waist circumference overall, as well as by study centre, sex, and age groups.

Figure 8.6 Waist circumference distribution: overall and stratified by study centre, sex, and age group

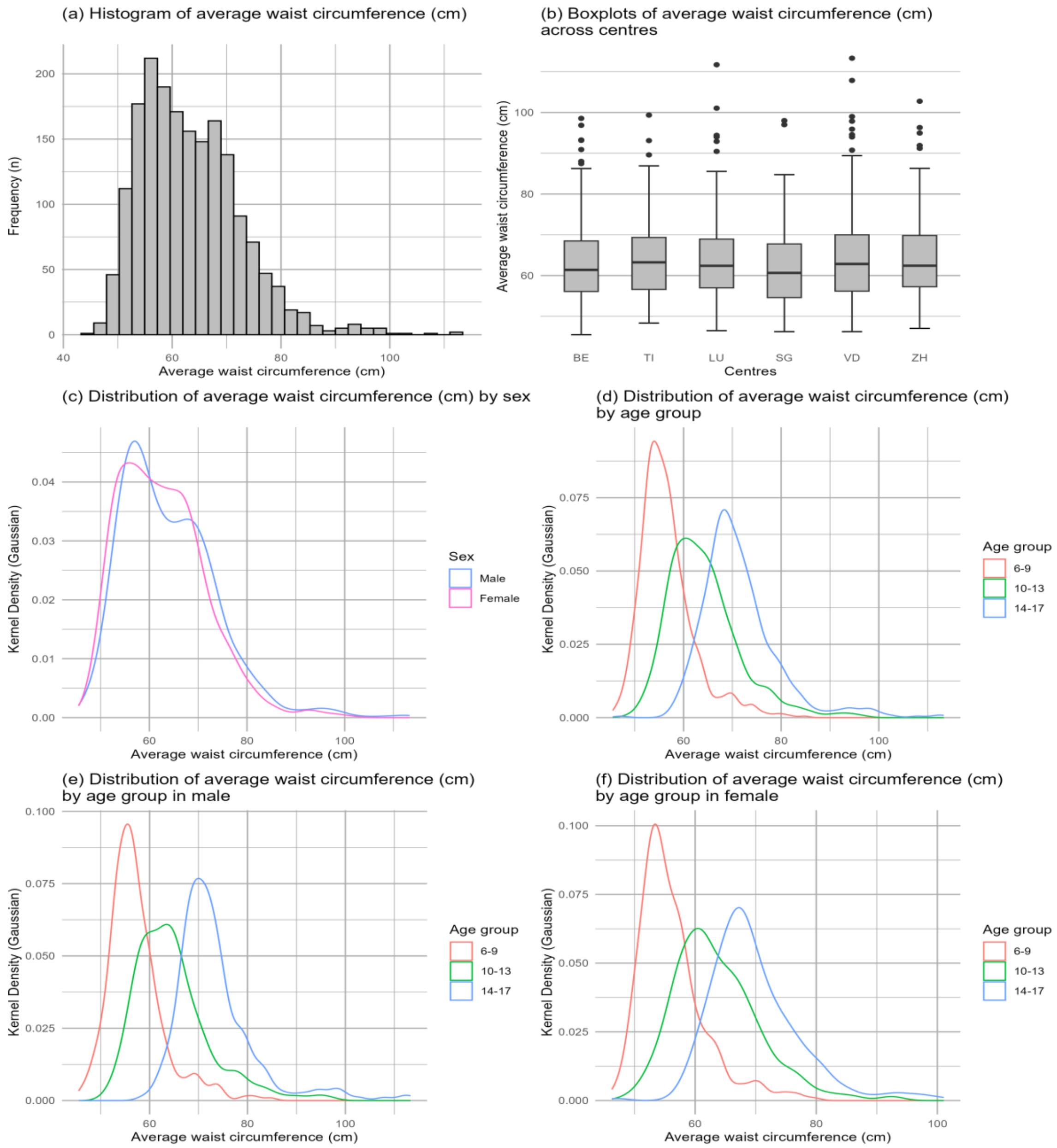


Figure 8.6 a) shows the distribution of waist circumference among participants. Statistically significant differences were observed across study centres (Kruskal-Wallis non-parametric test, p=0.027), with the Ticino and Vaud centres showing higher values and the St. Gallen centre the lowest (Figure 8.6 b)), suggesting regional differences consistent with BMI observations. Statistically significant differences between sexes were also observed (Kruskal-Wallis non-parametric test, p=0.004), with boys presenting slightly larger waist circumference than girls (Figure 8.6 c)). As expected, the average waist circumference was significantly different between age groups (Kruskal-Wallis non-parametric test, p<0.001), with lower values in the 6-9 age group than in the older age groups (Figure 8.6 d), e), f)).

Waist circumference: Results (weighted data)

As shown in Table 8.8, the mean waist circumference, after weighting to match the population margins, is 64.24 cm with a mean value of 56.92 cm for 6-9-year-olds, 64.64 cm for 10-13-year-olds and 72.30 cm for 14-17-year-olds. In adolescents, there is a clearer difference depending on sex, with 70.51 cm for females and 74.05 cm for male adolescents.

Table 8.8 Weighted results waist circumference measurement, overall and stratified by age group, sex and linguistic region

Measur-ement	Total	6-9 years			10-13 years			14-17 years			Sex		Region		
	Mean (SD)	Females Mean (SD)	Males Mean (SD)	Total Mean (SD)	Females Mean (SD)	Males Mean (SD)	Total Mean (SD)	Females Mean (SD)	Males Mean (SD)	Total Mean (SD)	Females Mean (SD)	Males Mean (SD)	DE Mean (SD)	FR Mean (SD)	IT Mean (SD)
Waist (cm)	**62.24 (9.77)**	56.49 (5.83)	57.33 (6.84)	**56.92 (6.52)**	64.30 (7.73)	64.95 (8.42)	**64.64 (7.92)**	70.51 (8.24)	74.05 (9.15)	**72.30 (8.73)**	63.45 (9.23)	64.99 (10.47)	64.03 (9.63)	64.96 (10.78)	65.28 (10.31)

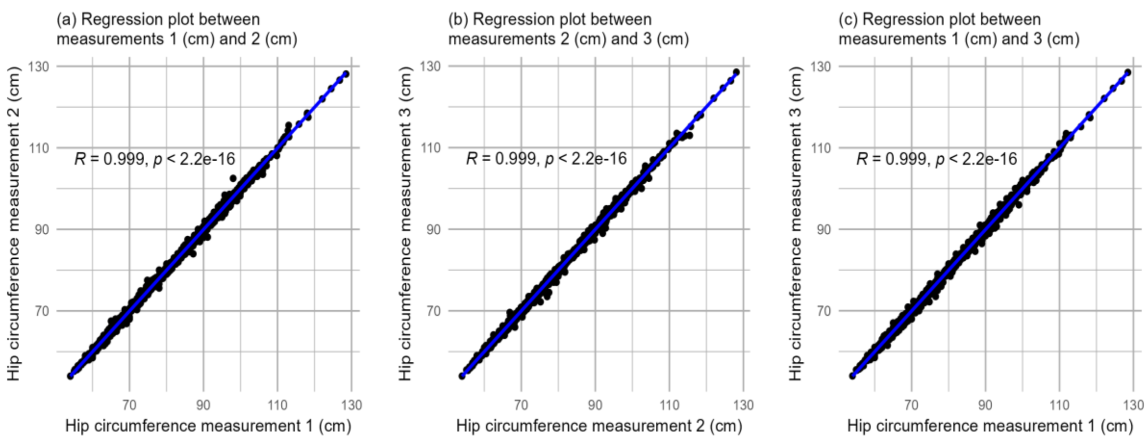
8.3.5 Hip circumference

Hip circumference measurement was repeated three times (over clothing), to ensure reliability. The main outcomes of these measurements are presented below. Additional details on this measurement procedure are presented in Chapter 8.1.3 *Waist- and hip circumference measurement.*

Hip circumference: Description of collected data (unweighted data)

For the first measurement a total of 1 846 measurements was recorded, for the second and third measurement a total of 1 845 measurements were recorded. Over all three measurements, minimum hip circumference is 54.00 cm and maximum hip circumference is 128.50 cm. Detailed description of the unweighted data is presented *in 14.3 Unweighted results of hip circumference* .

Figure 8.7 Correlation among repeated hip circumference measurements



As shown in Figure 8.7, the Pearson's correlation among repeated waist measurements is close to 1 (R > 0.99), showing a very high correlation and reliability of the measurements. It was important to have three measures, as it allowed to correct for typing errors during data cleaning (e.g. 98.2, 98.5, 91.8).

An average value has been calculated and used for the following plots, to display the distribution of average hip circumference overall, as well as by study centre, sex, and age groups.

Figure 8.8 Hip circumference distribution: overall and stratified by study centre, sex, and age group

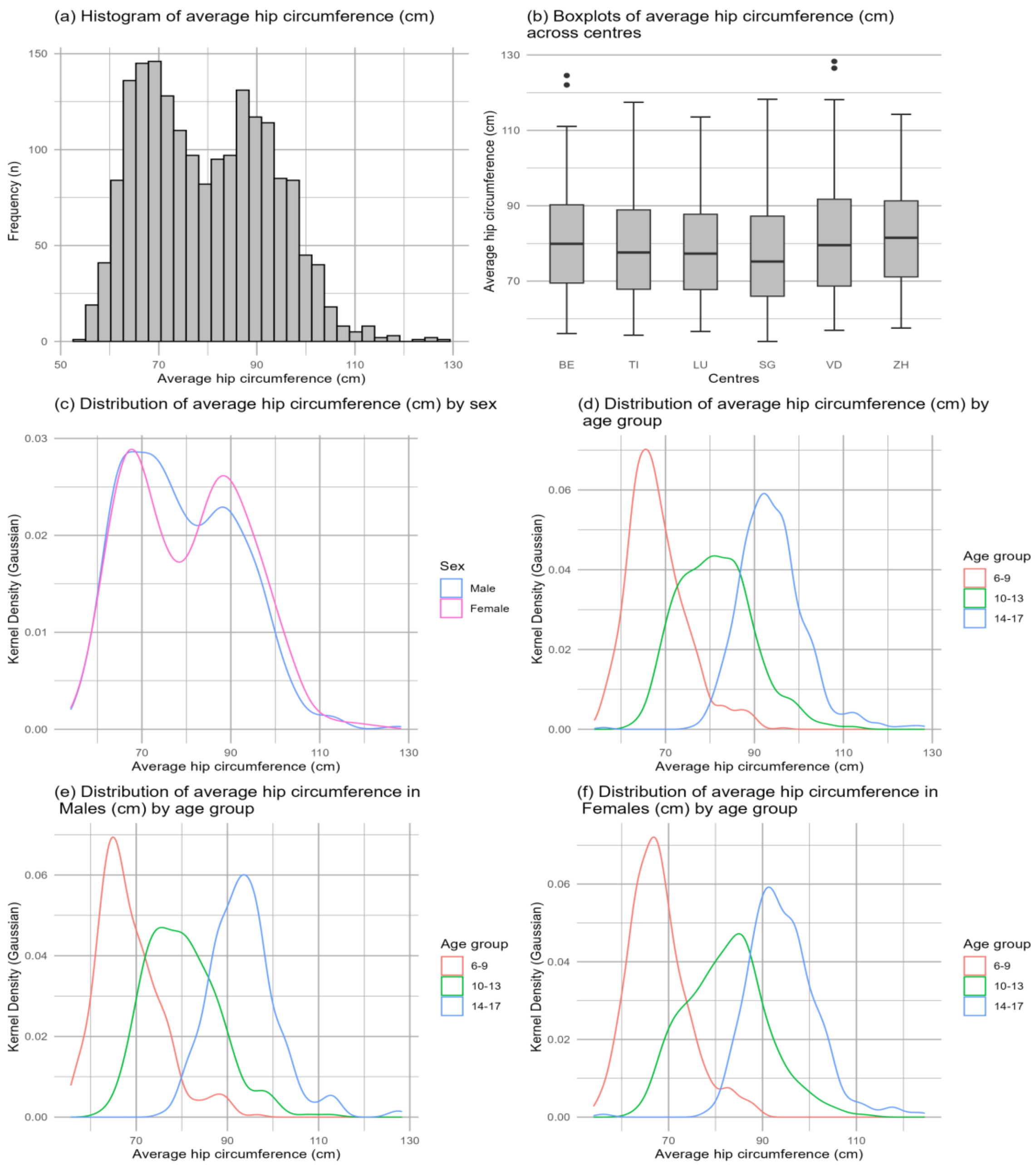


Figure 8.8 a) shows the distribution of hip circumference among participants. Statistically significant differences were observed between study centres (Kruskal-Wallis non-parametric test, p<0.001),

with the Zurich centre presenting the highest values and the St. Gallen centre the lowest (Figure 8.8 b)). Statistically significant differences were observed between sexes, with girls having higher hip circumference values (Kruskal-Wallis non-parametric test, p=0.034). As expected, the average hip circumference was significantly different between age groups (Kruskal-Wallis non-parametric test, p<0.001), with progressive increase across age groups (Figure 8.8 d), e), f)). Figure 8.8 c) shows a bimodal distribution in both males and females, which may reflect previously mentioned growth spurts.[101,102] Figure 8.8 d) e) f) show a larger range of hip circumference values in the 10-13 age group, likely reflecting variability in the timing of puberty onset.[102]

Hip circumference: Results (weighted data)

As shown in Table 8.9, the mean hip circumference, after weighting to match the population margins, is 81.20 cm, with a mean value of 68.85 cm for 6-9-year-olds, 82.07 cm for 10-13-year-olds and 94.57 cm for 14-17-year-olds.

Table 8.9 Weighted results hip circumference measurement, overall and stratified by age group, sex and linguistic region

Measur-ement	Total Mean (SD)	6-9 years			10-13 years			14-17 years			Sex		Region		
		Females Mean (SD)	Males Mean (SD)	Total Mean (SD)	Females Mean (SD)	Males Mean (SD)	Total Mean (SD)	Females Mean (SD)	Males Mean (SD)	Total Mean (SD)	Females Mean (SD)	Males Mean (SD)	DE Mean (SD)	FR Mean (SD)	IT Mean (SD)
Hip (cm)	**81.20 (13.04)**	68.77 (6.88)	68.93 (8.21)	**68.85 (7.42)**	83.39 (9.33)	80.86 (8.21)	**82.07 (8.66)**	92.85 (7.70)	94.30 (7.79)	**94.57 (7.60)**	81.75 (13.46)	80.68 (13.07)	81.00 (12.91)	82.04 (14.10)	81.65 (13.63)

8.3.6 Measurement of blood pressure

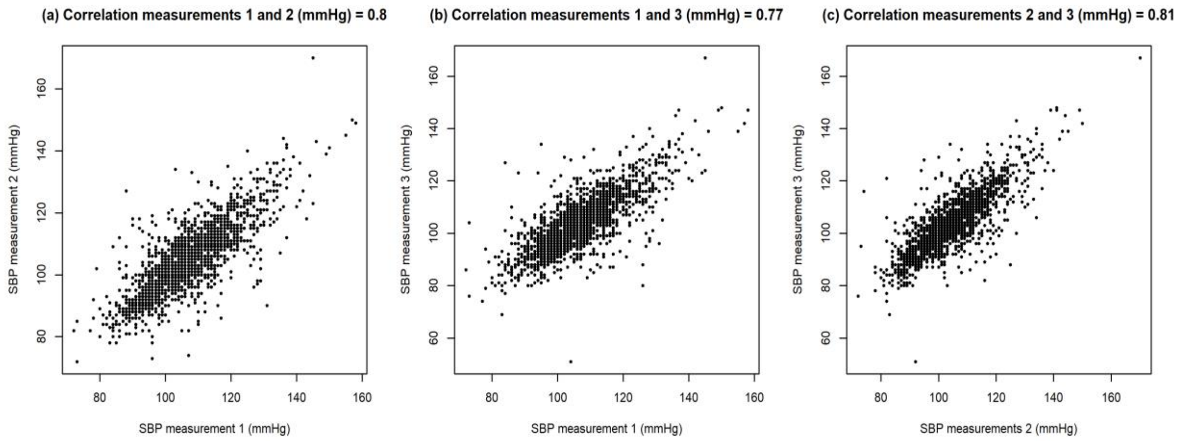
Blood pressure measurement was repeated three times, using Omron HBM 1320 device validated on children. The child was in a sitting position, and a cuff size adapted to the child's arm circumference was used. Additional details on this measurement procedure are presented in chapter 8.1.6 *Blood pressure measurement.*

Systolic blood pressure

Description of collected data (unweighted data)

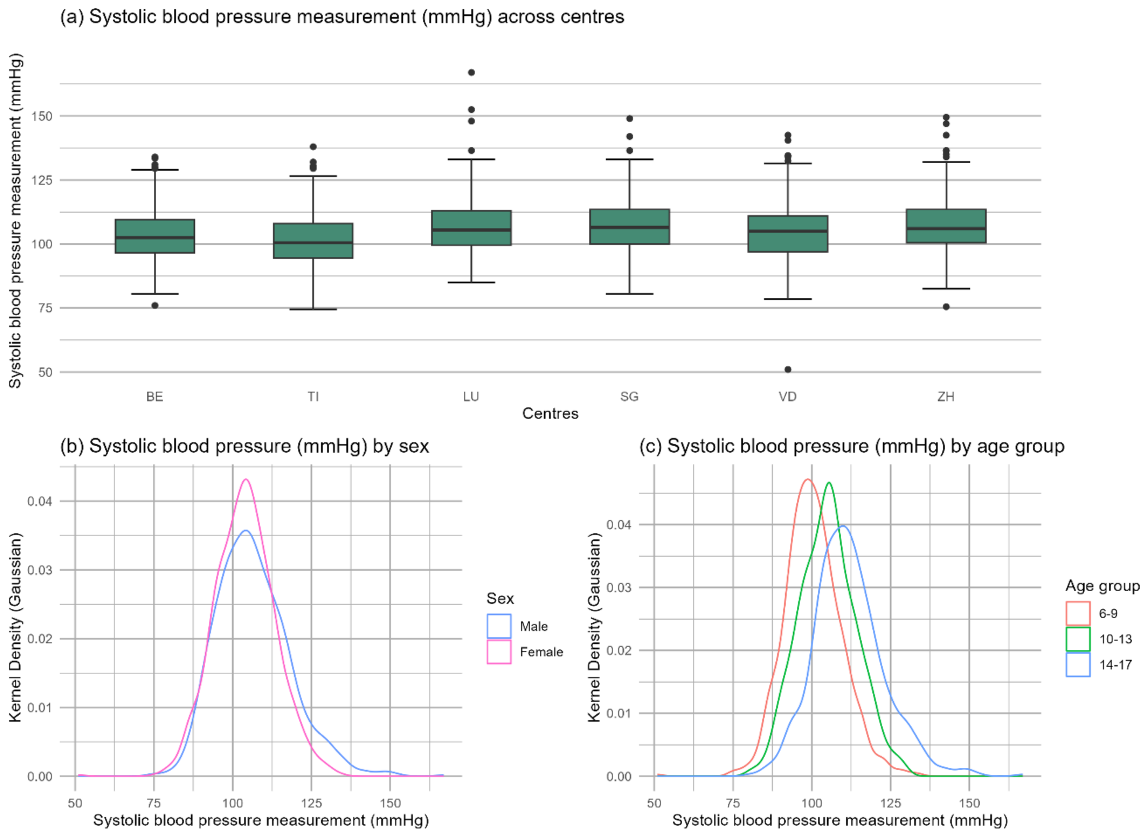
For the first measurement, a total of 1 831 measurements was recorded, for the second 1 820 and for the third 1 818 measurements. Over all three measurements, minimum systolic blood pressure is 51.00 mmHg and maximum systolic blood pressure is 170.00 mmHg. Detailed description of the unweighted data is presented in 14.4 *Unweighted results of blood pressure*.

Figure 8.9 Correlation among repeated SBP measurements



Repeated measurements showed a strong Pearson's correlation (R > 0.7), indicating reliability, although values decreased across measurements, as expected and shown in Figure 8.9.

Figure 8.10 SBP distribution: overall and stratified by study centre, sex, and age group



Statistically significant differences were observed between study centres (one-way ANOVA test, $p<0.001$), with Ticino showing lower values (Figure 8.10 a)). Statistically significant differences in SBP values were also observed between sexes, higher in males (one-way ANOVA test, $p<0.001$) (Figure 8.10b). The average SBP was significantly different between age groups, (one-way ANOVA test, p<0.001), with a progressive increase in SBP with age, as illustrated in Figure 8.10 c). This is expected as an elevation of blood pressure values occurs during growth[99,105].

Note: When communicating the results to participants, normal range thresholds were calculated according to the recommendations of Simonetti et al, 2010[99], using the 90th percentile as the upper limit of the normal range 8.1.6 Blood pressure measurement.

Systolic blood pressure: Results (weighted data)

As shown in Table 8.10, the mean SPB, after weighting to match the population margins, is 106.31 mmHg. There is a slight increase with age, with a mean value of 101.59 mmHg for 6-9-year-olds, 105.75 mmHg for 10-13-year-olds and 112.4 mmHg for 14-17-year-olds. There is a clear sex difference among adolescents, with a 107.73 mmHg for females and 117.09 for males. Around 14.65% of the population have elevated blood pressure (systolic pressure above the 90th percentile).

Table 8.10 Weighted results systolic blood pressure measurement, overall and stratified by age group, sex and linguistic region

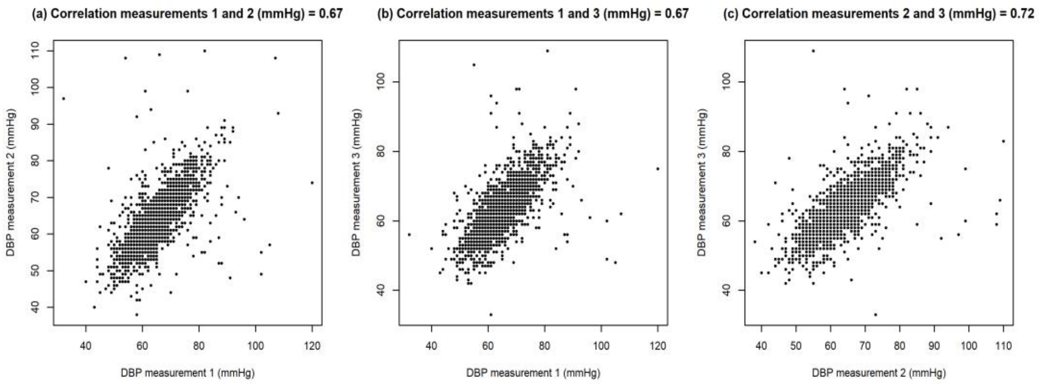
Measure-ment	Total Mean (SD)	6-9 years			10-13 years			14-17 years			Sex		Region		
		Females Mean (SD)	Males Mean (SD)	Total Mean (SD)	Females Mean (SD)	Males Mean (SD)	Total Mean (SD)	Females Mean (SD)	Males Mean (SD)	Total Mean (SD)	Females Mean (SD)	Males Mean (SD)	DE Mean (SD)	FR Mean (SD)	IT Mean (SD)
Systolic blood pressure (mmHg)	**106.31 (11.43)**	100.56 (10.34)	102.58 (10.45)	**101.59 (10.23)**	105.58 (9.31)	105.91 (10.43)	**105.75 (9.71)**	107.73 (9.01)	117.09 (13.73)	**112.46 (12.41)**	104.47 (9.84)	108.06 (12.76)	106.72 (11.42)	105.46 (11.90)	102.59 (11.90)

Diastolic blood pressure

Description of collected data (unweighted data)

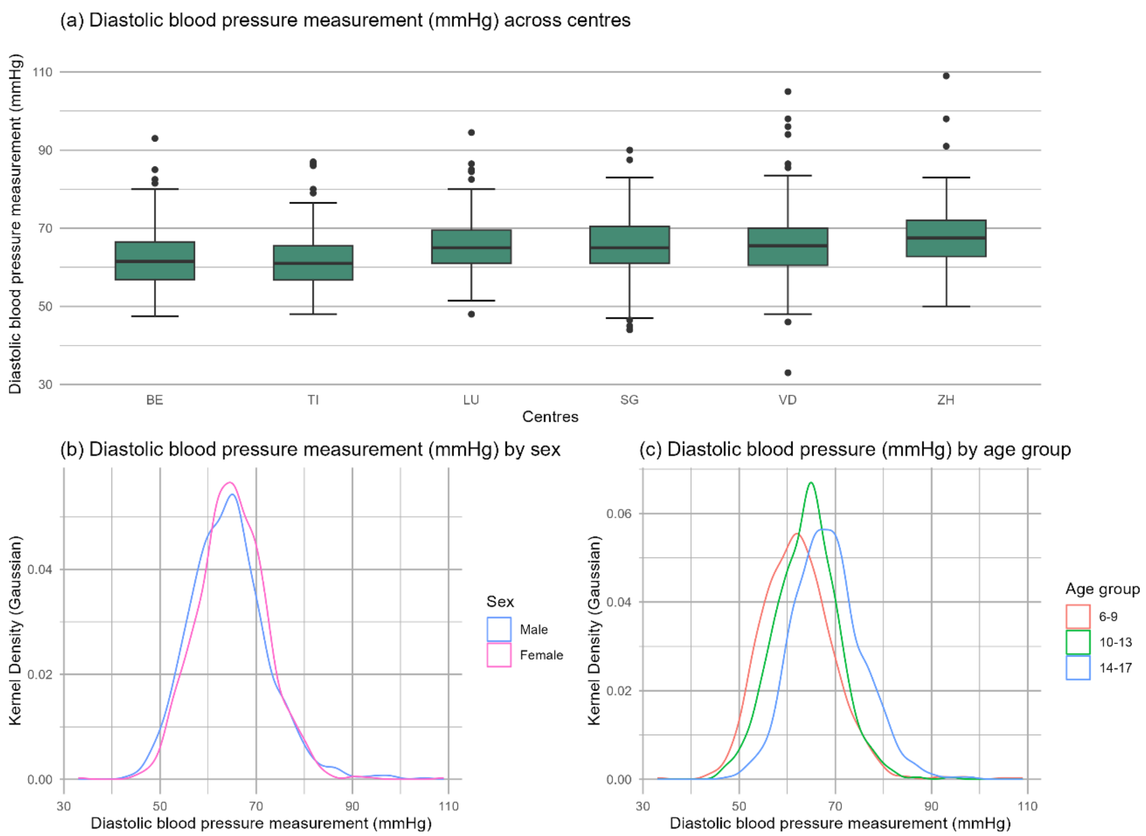
For the first measurement, a total of 1 831 measurements was recorded, for the second 1 820 and for the third measurement 1 818. Over all three measurements, minimum diastolic blood pressure is 32.00 mmHg and maximum diastolic blood pressure is 120.00 mmHg. Detailed description of the unweighted data is presented in 14.4 *Unweighted results of blood pressure*.

Figure 8.11 Correlation among DBP measurements



As shown in Figure 8.11, a strong Pearson's correlation was observed between measurements 2 and 3 (R > 0.7). Correlations between the other measurements were weaker, though still showing a rather strong correlation. As previously described for the systolic blood pressure measurement, it should also be noted that values are expected to decrease over the three measurements[98].

Figure 8.12 DBP distribution: overall and stratified by study centre, sex and age group



As for SBP values, statistically significant differences in DPB values were observed between study centres (one-way ANOVA test, p<0.001), with the Zurich centre showing the highest DBP values and the Ticino centre the lowest (Figure 8.12 a)). DBP values were consistent between sexes, as illustrated in Figure 8.12 b), although a statistically significant difference was detected for the second measurement, with female participants showing slightly higher DBP values (one-way ANOVA test, p=0.031) than male participants. The average DBP was significantly different between age groups (one-way ANOVA test, p<0.001), with a progressive increase in DBP with age[106], as illustrated in Figure 8.12 c).

Diastolic blood pressure: Results (weighted data)

As shown in Table 8.11, the mean DBP, after weighting to match the population margins, is 65.69 mmHg. There is a slight increase with age, with a mean value of 63.57 mmHg for 6-9-year-olds, 64.86 mmHg for 10-13-year-olds and 69.10 mmHg for 14-17-year-olds. Around 4.88% of the population have a diastolic blood pressure above the 90th percentile. Of note, normal range for feedback to participants was based on the systolic blood pressure only.

Table 8.11 Weighted results diastolic blood pressure measurement, overall and stratified by age group, sex and linguistic region

Measure-ment	Total Mean (SD)	6-9 years			10-13 years			14-17 years			Sex		Region		
		Females Mean (SD)	Males Mean (SD)	Total Mean (SD)	Females Mean (SD)	Males Mean (SD)	Total Mean (SD)	Females Mean (SD)	Males Mean (SD)	Total Mean (SD)	Females Mean (SD)	Males Mean (SD)	DE Mean (SD)	FR Mean (SD)	IT Mean (SD)
Diastolic blood pressure (mmHg)	**65.69 (8.06)**	63.97 (9.88)	63.19 (8.34)	**63.57 (8.93)**	65.50 (6.37)	64.28 (7.35)	**64.86 (6.79)**	68.31 (6.92)	69.88 (8.66)	**69.10 (7.72)**	65.82 (7.91)	65.56 (8.39)	65.83 (8.08)	66.05 (8.27)	62.15 (8.02)

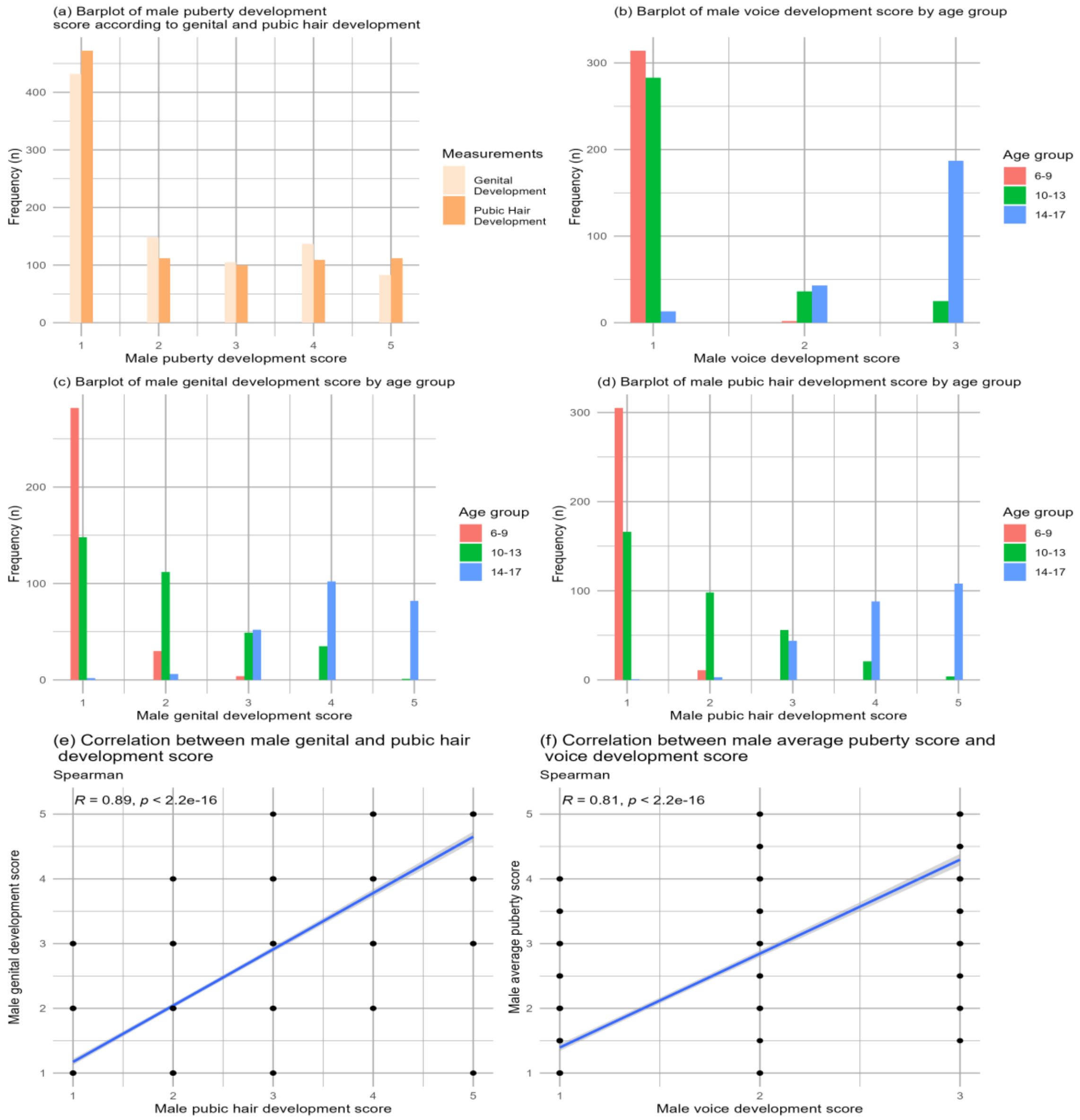
8.3.7 Puberty

Puberty was assessed using a paper-based questionnaire presenting images of the different Tanner stages of pubertal development[107]. Participants were asked to complete it at home. With the help of the images, males scored their genital development and their pubic hair development (1 to 5 developmental stages each) and assessed their voice change (1 to 3). Females scored their breast development and their pubic hair development (1 to 5 developmental stages each) and entered the month and year of their first menstruation. Based on this information, the number of months since their menstruations was calculated. Further information on the procedure of this assessment can be found in chapter 8.1.7 *Puberty stages assessment.*

Of note, true puberty is based on hypopituitary-gonadal related sex hormone production of testosterone in boys and oestrogen in females and is represented by breast and genital development. Pubic hair development is related to the awakening of adrenal steroid production, which might start before puberty, and thus might not be considered, depending on the research question[108].

Male puberty stage: Description of collected data (unweighted data)

Figure 8.13 Development score distribution in males: overall and by age group, with inter-score correlation

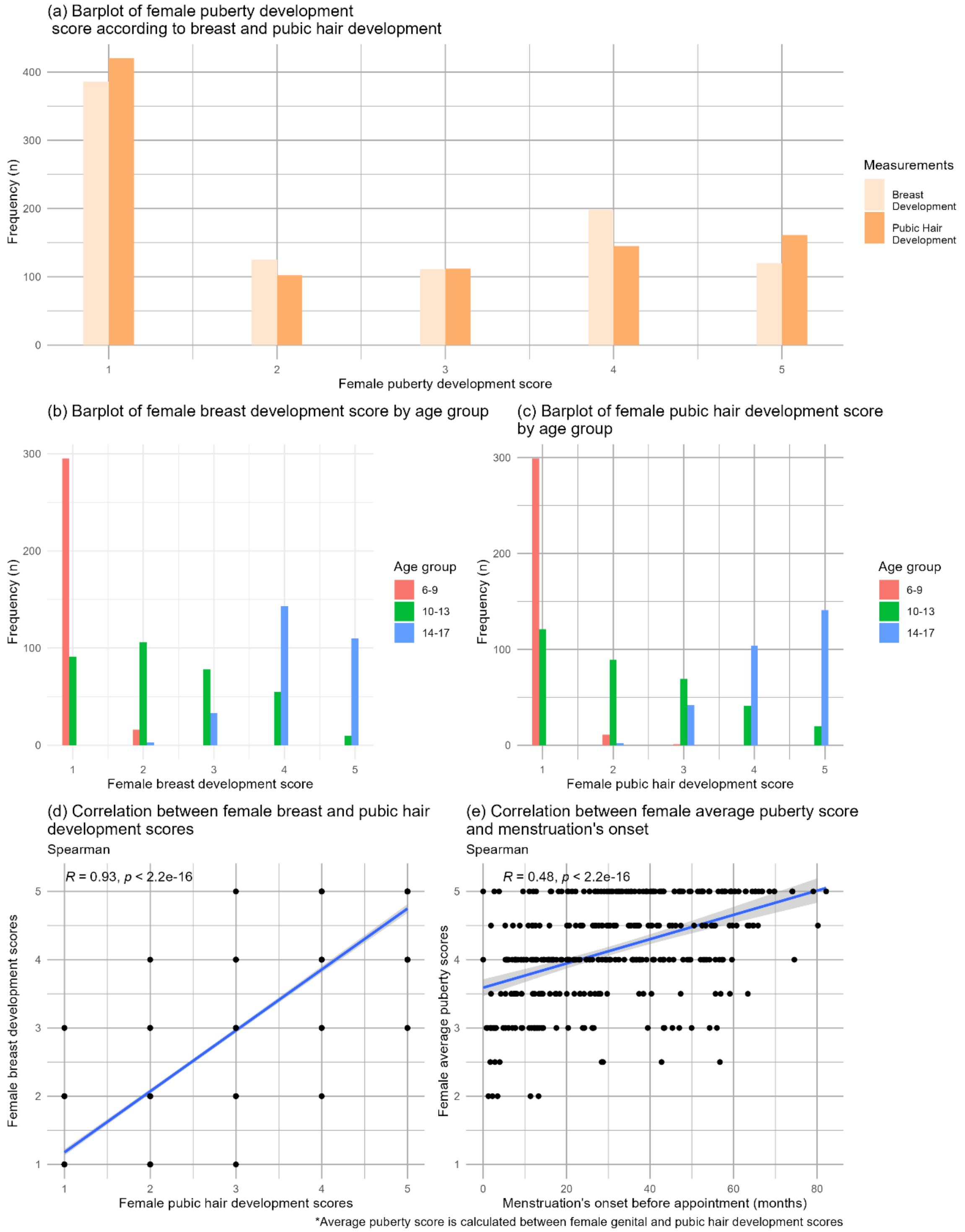


As expected[109], statistically significant differences in male development scores between age groups were observed (Fisher's exact test, p<0.001), with a progressive score increase with age. Figure 8.13 b), c), d) show how in males, genital, pubic hair and voice development scores were associated with the age group.

In addition, as male genital and pubic hair development scores were highly correlated (R=0.89, Spearman rank correlation), a combined puberty score was calculated as the mean of the two scores. This combined score was positively correlated to male voice development score (R=0.81, Spearman rank correlation). This shows a good reliability of the measurement. Figure 8.13 e), f), illustrate these correlations.

Female puberty stage: Description of collected data (unweighted data)

Figure 8.14 Development score distribution in females: overall and by age group, with inter-score correlation



As expected[109], statistically significant differences in female development scores between age groups were observed (Fisher's exact test, p<0.001), with a progressive score increase with age.

Figures 8. b) and c), show how in females, breast and pubic development scores were associated with the age group.

In addition, as female breast and pubic hair development scores were well correlated (R=0.93, Spearman rank correlation), a mean puberty score was calculated as the mean of the two scores. This combined score showed a moderate positive correlation with the time since menarche (R=0.44, Spearman rank correlation). Figure 8.14 d), e), illustrate these correlations.

Of note, the onset of menstruation varies considerably among girls (from 10 to 16 years, with a mean around 12 years), and a physiological delay is often observed between the onset of breast development and the onset of menarche[102].

8.3.8 BIA Parameters

Bioimpedance was measured in four centres, having child-validated devices already available. Vaud and Bern had the Tanita MC-780MA-N and Zurich and St Gallen had the InBody 770. However, it was later seen that even with both devices being validated, the data collected from the two devices, could not easily be compared.

Phase angle is one of the fundamental parameters measured by bioimpedance devices. It is calculated based on resistance (related to the water and electrolytes composition) and reactance (related to electrical energy storage and cell membrane integrity). A clear shift was observed between the two device types, but not between both devices of the same type (Figure 8.15 a). Unsurprisingly, body fat percentage, automatically calculated by each device, partly based on phase angle, also reflects this shift between device types (Figure 8.16 b). This difference appears to be influenced by potentially distinct and proprietary algorithms. While age, sex, BMI and hydration can influence phase angle and body fat composition, no clear difference between centres were identified that could explain the observed shifts (see 5.1.1 *Characteristics*). Other parameters, such as total body water or bone mass, are also derived from similar inputs, and therefore show comparable discrepancies (Figure 8.17 c and Figure 8.18 d).

Figure 8.15 (a) Phase angle: Stratified by device and study centre

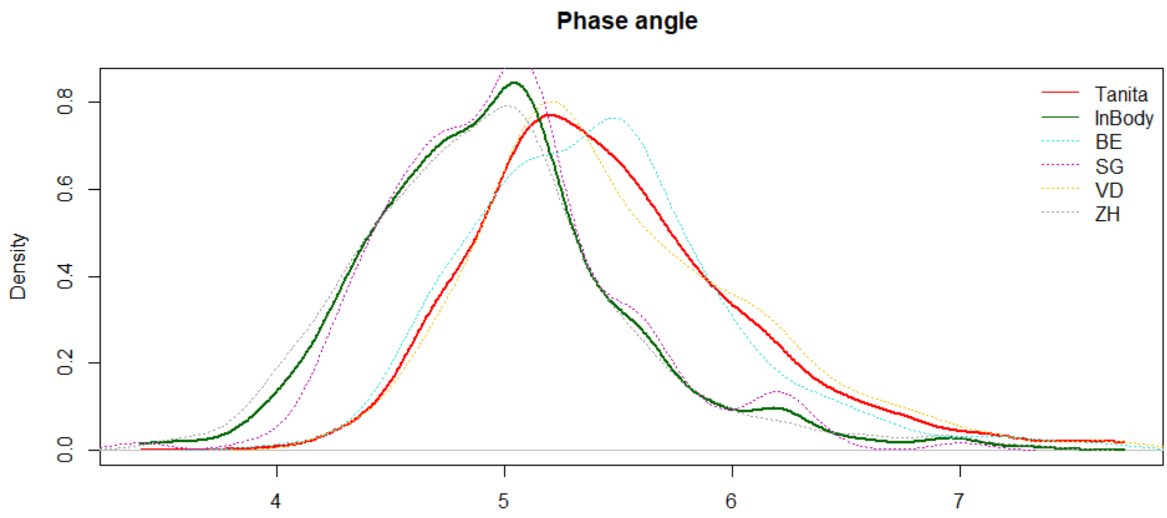


Figure 8.16 (b) Bodyfat percentage stratified by device and study centre

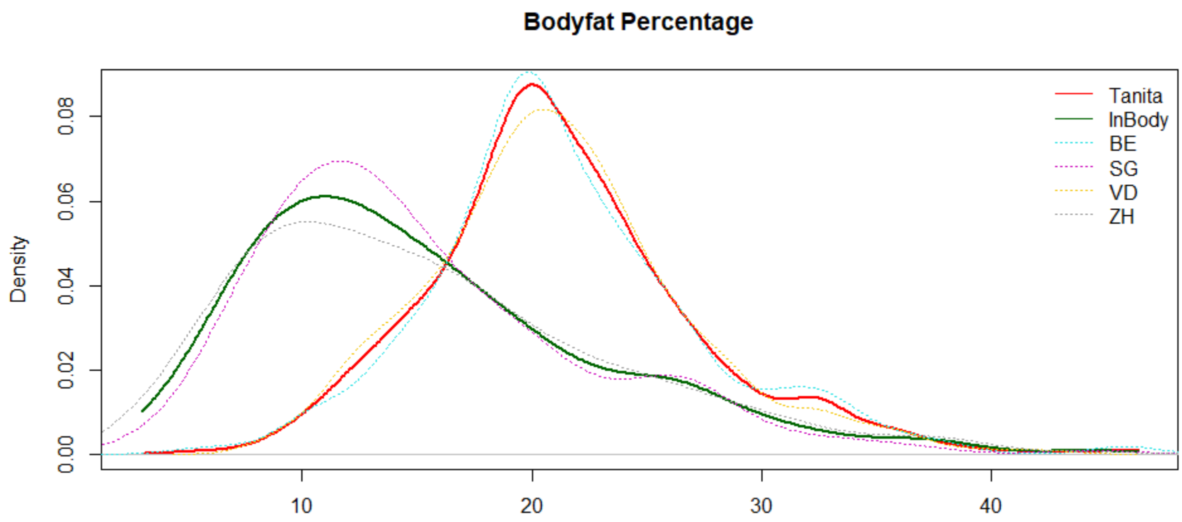


Figure 8.17 (c) Total hydric mass stratified by device and study centre

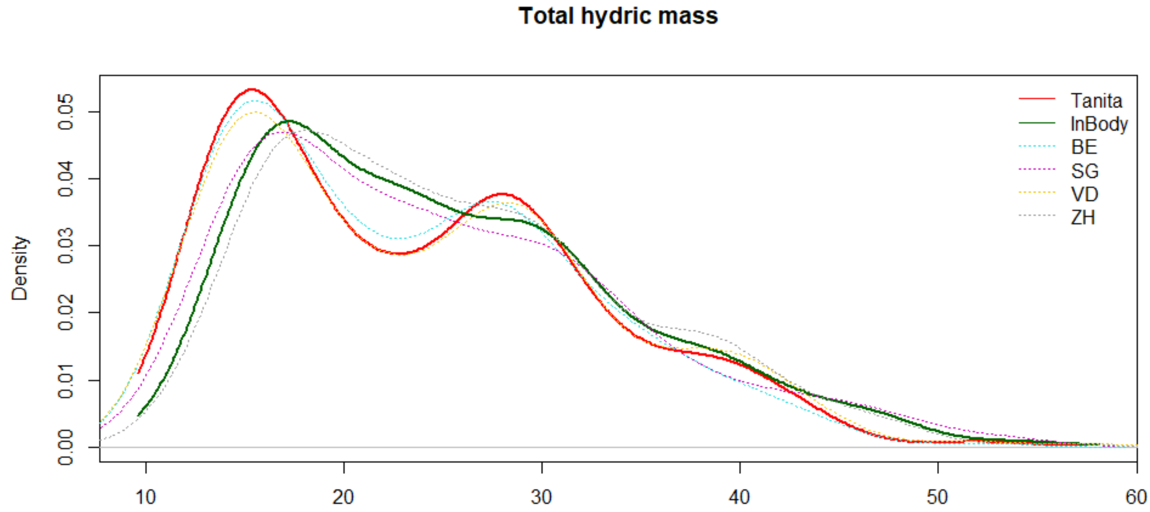
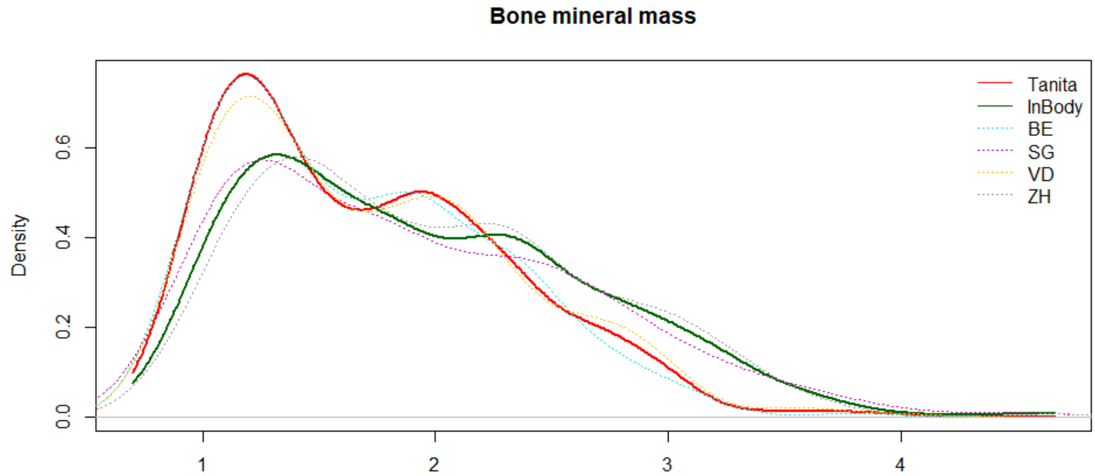


Figure 8.18 (d) Bone mineral mass stratified by device and study centre



Interestingly, although the phase angle shift doesn't change much with age, the shift between the two devices gets thinner with increasing age (Figure 8.19 a and Figure 8.20 b). This might suggest that measured differences might be compensated by each algorithm for older participants / adults, but that the devices do not work well on children, even though they are supposed to be validated.

Figure 8.19 (a) Phase angle stratified by device, study centre and age group

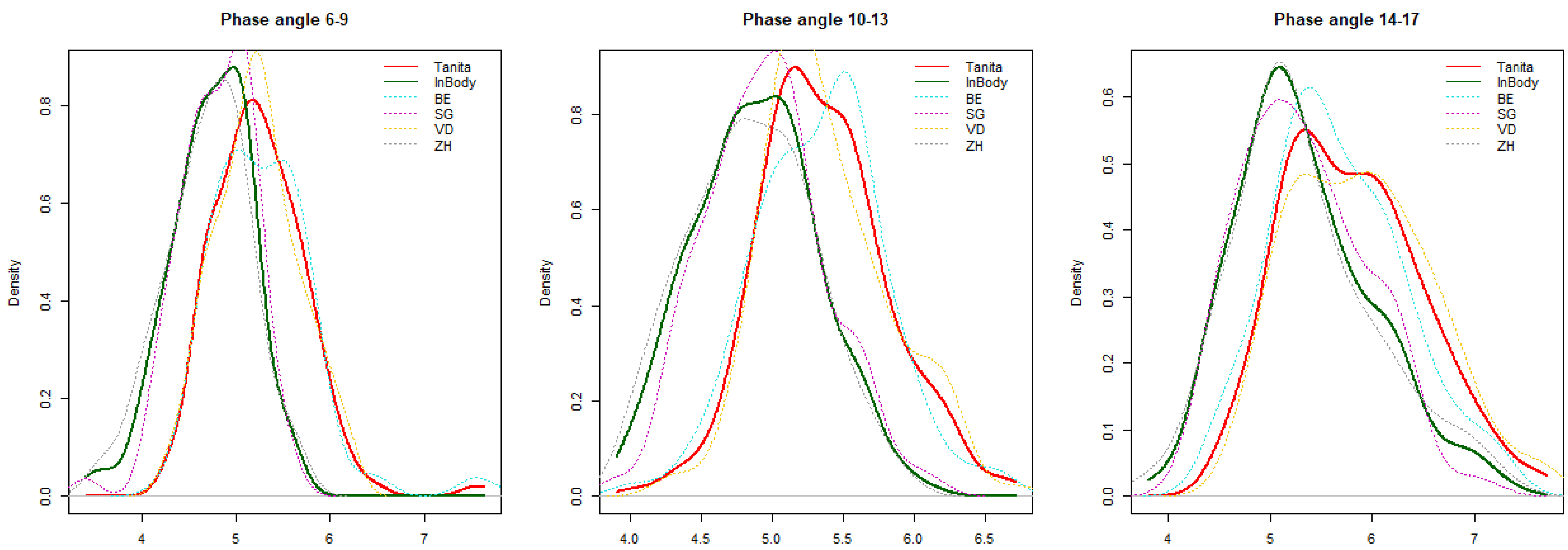
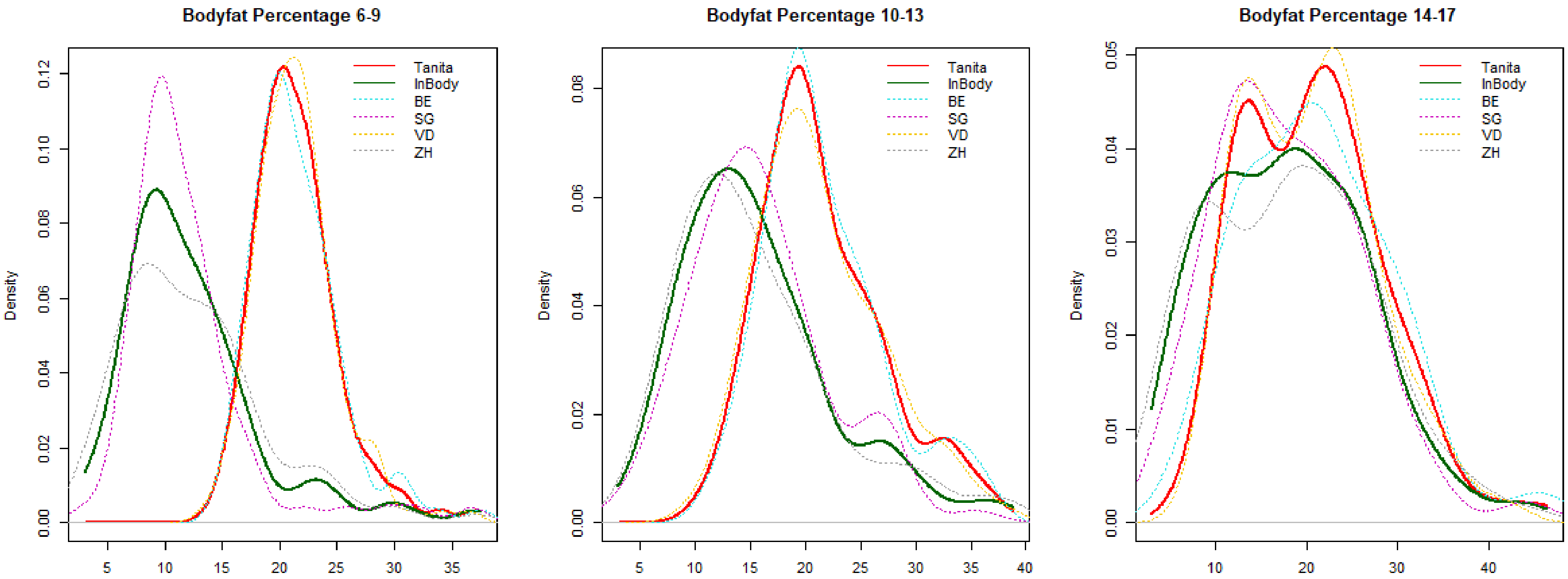


Figure 8.20 (b) Bodyfat percentage stratified by device, study centre and age group



A dedicated study comparing the two BIA devices, measuring the same people (from 6 to 65 years) consecutively on each device, is ongoing and results will be published separately.

8.3.9 Additional questions

Diseases, medication and Supplements: Descriptive data (unweighted)

On the day of the visit, participants were asked about any existing medical conditions as well as their use of medications and dietary supplements. (For detailed information see 8.1.8 *Assessment of diseases, supplements, medications, fish consumption and time spent outside*).

Among all participants, 625 (34%) reported having a specific type of disease. The most frequently mentioned conditions were allergies, in particular to pollen, but also to certain foods, as well as asthma. Other reported conditions including congenital heart defects, mild autism and musculoskeletal impairments. It should also be noted that a few participants were included despite having conditions that did not meet the inclusion criteria, such as celiac disease, polycystic kidney disease or haemolytic uraemic syndrome. These individuals may be excluded from certain analyses at a later stage.

Some participants reported taking medications (n=605, 32.66%), with antihistaminic medications and anti-inflammatory / painkiller medications being frequently mentioned. The latter were often reported as being taken for only one or a few days. Some participants also reported taking dietary supplements (n=613, 33.09%). Commonly mentioned supplements included vitamin D, multivitamins, which sometimes included minerals, magnesium, omega-3 fatty acids and Echinacea. Three participants had missing data for these questions.

Fish consumption: Descriptive data (unweighted)

Fish consumption during the week preceding the visit was recorded to assess whether a correlation could subsequently be established with certain biomarkers, particularly contaminants. It should be noted that participants may have consumed more than one type of fish or fish product.

“Salmon-type fish” was reported as having been consumed by 422 participants (22.8). Within this category, salmon and trout were the most mentioned species. “Other types of fish” or “unknown type of fish” were reported by 543 participants (29.3%). Fish sticks and tuna were often mentioned within this category. If tuna consumption was reported, FW were instructed to classify it as “other type of fish”, and to specify its consumption in a comment. Seafood consumption was reported by 191 participants (10.3%), with shrimps and octopus commonly mentioned within this category. Finally, 936 participants (50.5%) either did not consume any kind of fish or did not remember.

Time spent outside: Descriptive data (unweighted)

Participants were asked about the time they spent outside on average on weekdays and separately on weekends. This information was considered valuable, for further analysis of Vit D levels, as increased time spent outdoors has been shown to be related with higher vit D levels in children by previous authors[110] .

Results of the two questions have been combined ((mean time in the week * 5 + mean time in the weekend *2)/7) for each participant and the time spend outside per day is presented in Figure 8.21 a)-f).

Figure 8.21: Time spent outside during the week: overall and stratified by study centre, sex, and age group

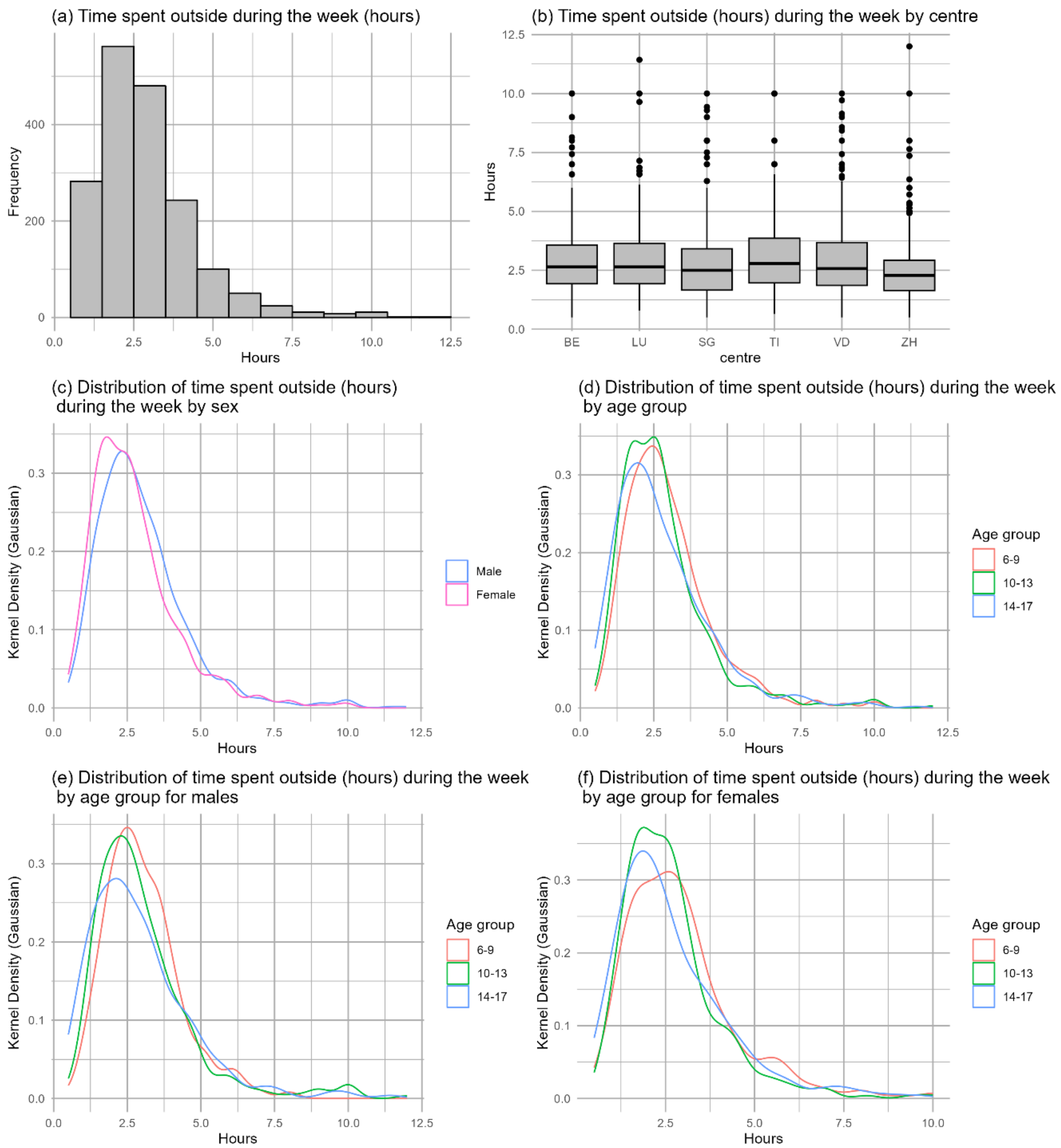


Figure 8.21 a) shows the distribution of the time spent outside by the participants during the whole week (on weekdays and weekends combined). A statistically significant difference was observed across study centres (one-way ANOVA test, $p<0.001$). The greatest time spent outside during the week was observed in the Ticino centre, while the lowest time spent outside during the week was observed in the Zurich centre (Figure 8.21 b)). Statistically significant differences were also observed between sexes (one-way ANOVA test, $p=0.001$), with male participants spending more time outside compared to female participants (Figure 8.21 c)). Lastly, statistically significant

differences were also observed between age groups (one-way ANOVA test, p=0.046), with a decreasing time spent outside with increasing age. This can be seen in the distribution curves of Figure 8.21 d), e), f).

The same patterns, with greater differences, are observed during the weekend compared to the weekdays. The graphical representation of these data can be found in Figure 14.1 and Figure 14.2 in chapter 14.5 *Time spent outside on weekdays and during the weekend*.

Skin colour: Description of collected data (unweighted data)

To support the interpretation and analysis of vitamin D levels, the skin colour of participants was assessed, as darker-skinned individuals may have an increased risk of vitamin D deficiency compared with lighter-skinned individuals[88]. The Fitzpatrick scale[89] was used to assess skin colour (for details on this procedure see 8.1.5 *Skin colour assessment).*

Figure 8.22 Histogram skin colour

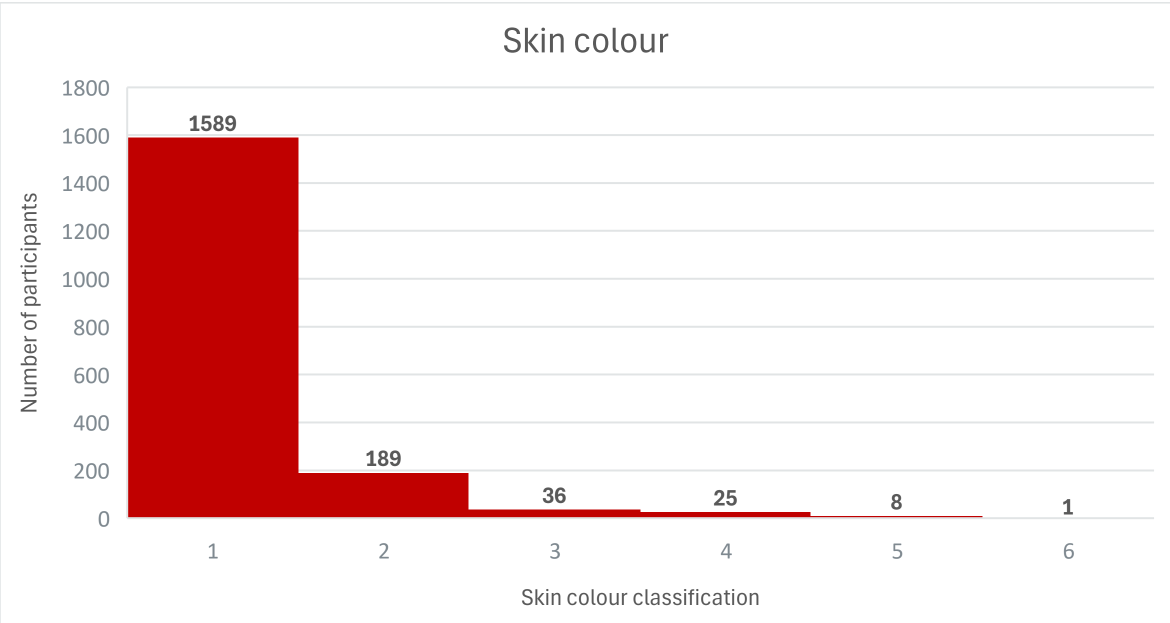


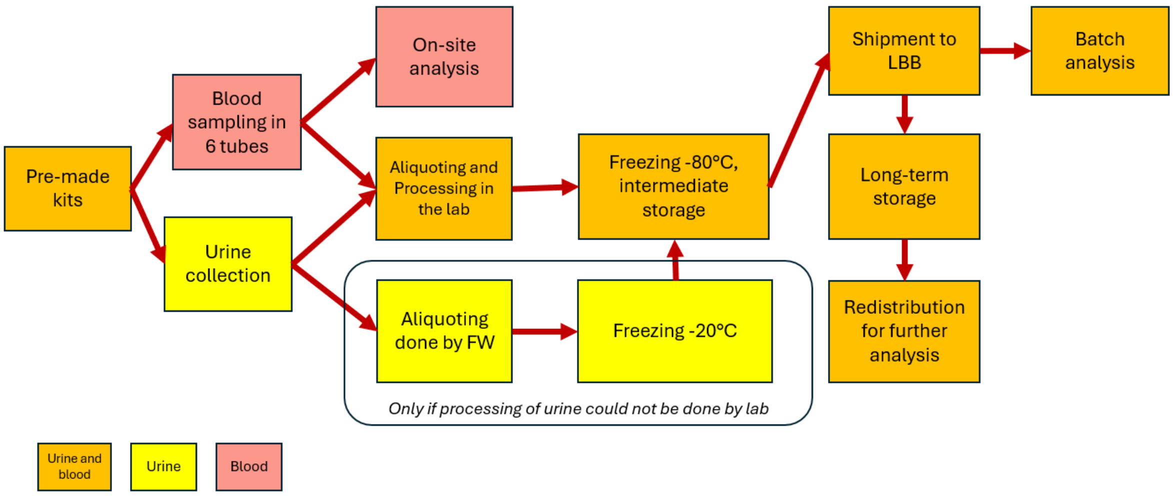
Figure 8.22 shows that the majority of participants (n=1 589, 85.8%) were classified as skin colour category 1.

9 Biosamples

9.1 Methods: biosamples collection procedures

Blood and urine samples were collected and processed under standardized conditions. Blood samples were partly analysed directly on-site, partly stored at -80°C and either analysed later in batches at a central laboratory or stored in a biobank for future analyses and research. Urine samples were aliquoted upon reception, stored at -80°C, and part of the aliquots were analysed in batches, while the remaining aliquots were stored in a biobank for future use. Figure 9.1 provides an overview of the workflow of the biosamples.

Figure 9.1 Biosamples workflow



The biobank collection of biosamples for the menuCH-Kids survey received the Swiss Biobanking Platform Vita label. This label ensures that the biobank complies with legal and ethical standards applied in Switzerland. It is obtained by answering an online questionnaire and undergoing a remote evaluation covering the aspects of governance and regulation over biosamples use.

9.1.1 Urine collection procedure and processing

All participants were asked to collect their first morning urine sample at home on the day of their visit to the study centre. They received a urine cup prior to the visit, together with an instruction sheet. As video was also accessible on the study website describing the collection procedure, cup handling, minimum volume required, how to avoid contamination, and ideal storage in the refrigerator before bringing the sample to the study centre. If it was not possible to collect a urine sample at home, or if forgotten, participants were asked to provide a sample directly at the study centre during the visit. Every deviation from the protocol was documented.

For processing, a pre-made urine kit (prepared by the LBB) was provided to the study centres, and its barcode was scanned into REDCap, linking the collected urine sample and the kit to the participants' ID. Quality information about urine collection was registered by the FW (e.g., urinary night void, abnormalities, insufficient volume). Urine processing was carried out either by the lab technicians or the FW, depending on the organisation and schedule of the study centre. The urine was pipetted from the cup into the nine cryotubes provided in the kit. To avoid contamination with plastic, the pipette was rinsed three times with urine, which was discarded, prior to pipetting the liquid into the cryotubes. If necessary (for example on Saturdays in some centres), the cryotubes were frozen at -20°C until they could be transported to the laboratory for freezing at -80°C. Urine processing was tracked using a urine processing datasheet.

First morning urine

During data cleaning, some adjustments were made to the classification criteria for "first morning urine sample", after identification of inconsistencies in the definition. These inconsistencies, as recorded by the FW in REDCap, mainly concerned cases involving nocturnal voids or samples collected later in the morning. In such cases, it was unclear whether the sample could still be classified as a first morning urine and whether a specific time interval should separate the nocturnal void from the first morning collection. Accordingly, a revised classification was established:

Samples were classified as "first morning urine" under the following conditions:

- First morning urine collected promptly after waking, as indicated.
- Morning urine collected promptly after waking, following a single nocturnal void, provided that the void occurred before a cut-off time of 5 a.m. <u>and</u> there was a minimum interval of two hours between the void and the sample collection.
- Urine collected later in the morning, not necessarily immediately after waking, (with a potential risk that the participant may have eaten or drunk before urine collection, possibly affecting some analyses), but with the REDCap entry indicating collection before 12p.m. and a clear comment that it was the first morning urine.

Samples were classified as "non-first morning urine" in the following situations:

- Urine sample collected during the day, with clear mention that the child urinated before.
- Uncertainty whether the sample was truly first morning urine (based on comments), the occurrence of night voids, or late collection of the sample (after 12p.m.)

Detailed information, for each sample, is documented in the corresponding comments section of the raw dataset.

9.1.2 Blood sampling procedure and processing

Blood samples were collected on a voluntary basis, at the study centre by a paediatric study nurse specifically trained to perform the procedure. Participants who consented to blood sampling and had an early morning appointment were asked to come in a fasting state. To ensure that blood collection was as comfortable as possible, a local anaesthetic cream (Emla® cream 5%) was applied to the elbow crease during the welcome phase of the visit at the study centre (about an hour and a half prior to blood sampling). To minimise vasoconstriction, the cream was removed about 20 minutes before the blood draw.

A pre-made blood kit was provided to the study centres, containing primary blood tubes and cryotubes, and its barcode was scanned into REDCap to link the kit to the participants' ID. The blood kits also contained a blood processing datasheet used to transfer information, ensure traceability and quality control.

Blood was collected by venipuncture with the participants in a lying position. A total of six tubes were collected in the preferred following order: **1)** 6 ml Vacutainer serum; **2)** 6 ml Vacutainer serum; **3)** 6 ml Vacutainer EDTA; **4)** 4.9 ml Sarstedt Li-Hep; **5+6)** EDTA tubes (volume between 1.2 and 1.6ml depending on each centre's specificity). The two last EDTA tubes were used for direct analysis (HbA1c and hemogram). The two different types of collection tubes (Vacutainer and Sarstedt Monovette) had to be used since metal-free blood collection primary tubes were needed for some analyses. Only Vacutainer could provide such tubes. However, Sarstedt tubes were used in routine in each centre and are usually preferred to Vacutainer for young children.

After blood collection, the tubes were placed upright with a lid, in a closed cooler bag containing cold packs and transported by a FW to the laboratory. The laboratory was informed in advance of planned blood collection processing (date and hour) and was notified by the FW in case the blood sampling was not performed as planned. Once the cooler bag was delivered, the lab staff was expected to start the procedure directly: tubes 5 and 6 were sent for direct analysis and the rest were processed. The procedure involved the following steps: verification of the required blood volume in each tube, verification of the kit ID on each blood tube, sampling of two whole blood aliquots, centrifugation, and aliquoting of plasma, serum, and buffy coat. As the blood samples needed to be protected from light, the tubes were kept in the dark until they were handled for aliquoting. Each cryotube was filled with the appropriate volume and featured a colour-coded cap corresponding to the aliquot type. A total of 26 different cryotubes were to be aliquoted, provided that the total blood volume was sufficient. The cryotubes were placed on a rack with a dark cover, and frozen at -80°C, within one hour after blood collection.

The process of blood sampling and preparation for direct analyses and biobanking was designed to account for the most delicate and sensitive biomarkers in the panel of interest. This care at ensuring the best possible conditions for quality preservation of biomarkers is a standard in best practices of biobanking: Blood tubes were put in the dark, at 4°C immediately after sampling (except for blood aimed at preparing serum, that needs room temperature to allow for coagulation), and should ideally be centrifugated (at 4°C) in 30 minutes after blood draw.

For monitoring purposes, the biobank specialist served as the primary contact for any queries from FW or lab staff. She performed on-site visits to set up the procedures in the study centres and to ensure adherence. Data verification and cleaning of variables related to biosamples collection and processing were carried out for each batch, following the entry of blood processing datasheet information into REDCap. The main review focused on key quality indicators for blood sample quality: the time intervals between blood collection, centrifugation and cryotube freezing. The dataset was regularly checked for missing tubes, prolonged delays before freezing and unexplained laboratory results (often linked to measurement issues). Study centres were notified of any issues requiring attention.

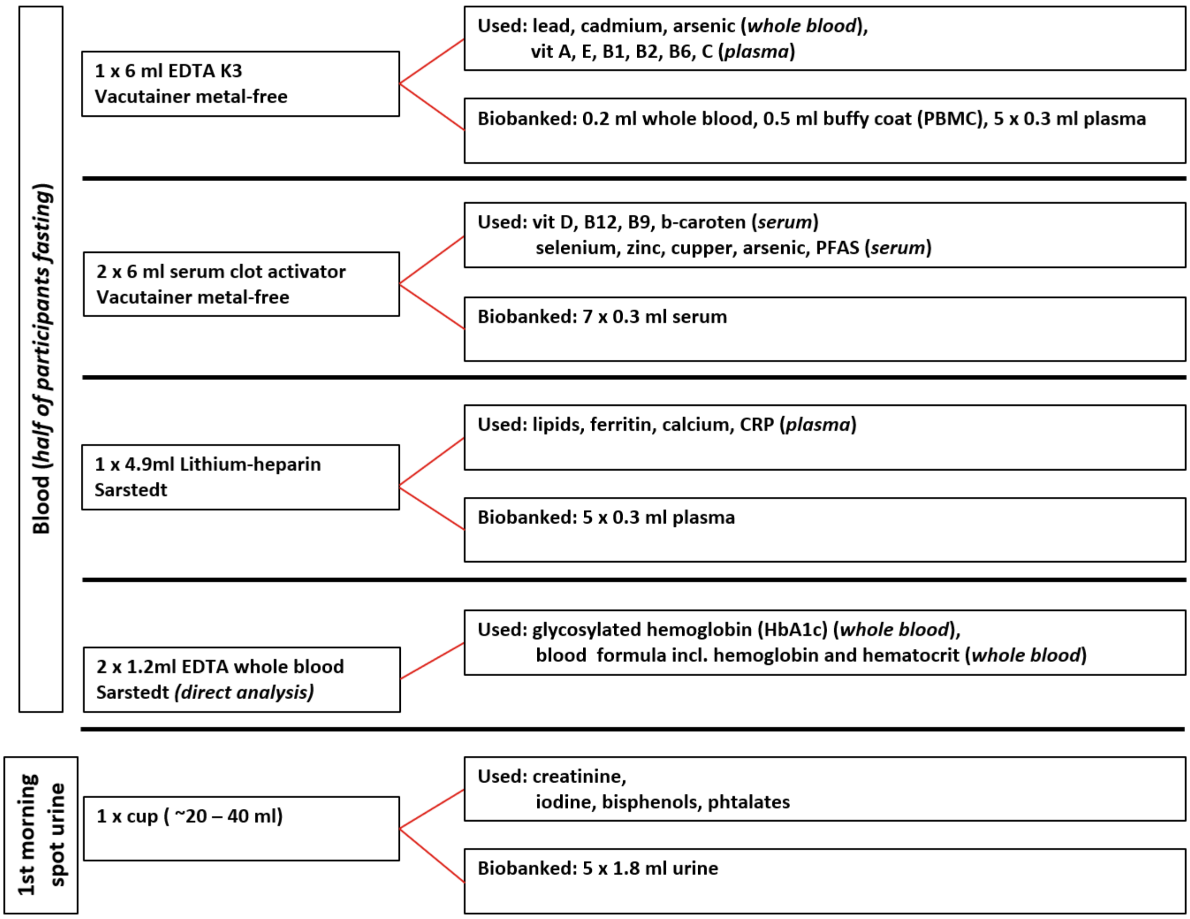
9.1.3 Intermediate storage, shipment, long-term storage

The processed frozen samples were temporarily stored at the study centres in a dedicated space to prevent loss of aliquots. A record of the temporarily stored samples was maintained by the laboratory staff. Once after the pilot and five times during the main study phase, the samples were transferred to the LBB facility. The LBB, a certified organisation, was selected as the storage facility for the biosamples. All frozen cryotubes were stored at the facility and recorded in the LBB database, which tracks sample availability within the biobank and documents retrieval dates for analysis. Once registered in the LBB, some samples were withdrawn shortly for batch-analysis (medium-term storage), and others were placed in long-term storage to establish a biobank for future use.

9.1.4 Laboratory analyses

Figure 9.2 provides an overview of the collected blood tubes indicating the analyses they were used for, the matrix on which they were taken, and what remains available in the biobank for future use.

Figure 9.2 Overview of used and biobanked blood samples for long-term storage



On-site analyses

Blood analyses which needed to be carried out immediately on fresh blood samples (HbA1c, hemogram), were conducted at each study centre, see Table 9.1 and Table 9.2. The results of these analyses were retrieved by the FW via each hospital's standard patient result retrieval system. This was done twice a week, and any concerning result was forwarded to the medical supervisor at the study centre, who then contacted the parents of the participant. For Hb and HbA1c, a prompt medical visit would have been recommended in case of abnormal values (specifically, abnormal glycated haemoglobin (HbA1c) levels suggestive of diabetes (> 6.5%)[111], and low haemoglobin levels suggesting anaemia (<70 g/l[112])). However, such cases never occurred during the study.

At each planned batch deadline, study centres sent the laboratory blood results to the coordination centre at Unisanté; the coded results being retrieved via global extraction in .csv format and uploaded into REDCap. A script was executed by the data manager to display the distribution of values and to identify outliers, helping to ensure that no abnormalities were overlooked.

Table 9.1 Fresh blood biomarkers (measured in each centre)

Value	Unit	Blood matrix
Haemoglobin	Grams per Liter (g/L)	EDTA
Haematocrit	Percentage (%)	EDTA
HbA1c (Calibration NGSP-DCCT)	Percentage (%)	EDTA
HbA1c (Calibration IFCC)*	Nanomole per mol (nmol/mol)	EDTA

**Not provided by ZH and SG*

Table 9.2 Additional blood count biomarkers (measured in each centre, when available)

Value	Unit	Blood matrix
Mean corpuscular haemoglobin (MCH)	Picograms (pg)	EDTA
Mean corpuscular haemoglobin concentration (MCHC)	Grams per Liter (g/L)	EDTA
Mean corpuscular volume (MCV)	Femtoliters (fl)	EDTA
Erythroblasts	/100 leucocytes	EDTA
Thrombocytes / blood platelets	10^6/liter (G/L)	EDTA
Red cell distribution width (RDW)*	Percentage (%)	EDTA
Erythrocytes	10^9 per Liter (T/L)	EDTA
Leucocytes	10^6 per Liter (G/L)	EDTA
Platelet distribution width (PDW)*	Femtoliters (fl)	EDTA
Mean platelet volume (MPV)*	Femtoliters (fl)	EDTA

**Not always provided*

Batch analyses

Batch analyses (on frozen samples) were carried out at CHUV and the SNHf, five times during the main study. The CHUV's central laboratory analysed lipids, total calcium, vitamin D, and urine creatinine. The SNHf measured vitamins B12, B9 and β-carotene. A script was executed by the data manager to display the distribution of values and to identify outliers, helping to ensure that no abnormalities were overlooked. Every laboratory is certified by the International Organization for Standardization (ISO) and has its internal quality process to retrieve results according to best practice procedures, as well as data security and traceability. Data safety and backup procedures were specific to each laboratory and allowed to store results safely.

The results of batch analyses carried out at CHUV were retrieved directly from the CHUV's laboratory data warehouse by the Unisanté IT specialist and then uploaded to REDCap after data cleaning. Results of measurement done by the SNHf were transferred in .csv format and integrated into REDCap.

The contaminants analyses in urine and blood were run by METAS and are not part of this report. Results will be published at a later stage. Table 9.3 displays an overview of the analysed values.

Table 9.3 Nutritional biomarkers (measured in batch at CHUV and the SNHf)

Value	Unit	Matrix	Method	Laboratory
Cholesterol Total	Millimole per Liter (mmol/L)	Blood (plasma), Lithium-Heparin	CHOD-PAP	CHUV
High-density Lipoprotein (HDL) Cholesterol	Millimole per Liter (mmol/L)	Blood (plasma), Lithium-Heparin	CHOD-PAP	CHUV
Low-density Lipoprotein (LDL) Cholesterol	Millimole per Liter (mmol/L)	Blood (plasma), Lithium-Heparin	Calculation	CHUV
Triglyceride	Millimole per Liter (mmol/L)	Blood (plasma), Lithium-Heparin	GPO-PAP	CHUV
C-reactive Protein (CRP)	Milligram per Liter (mg/L)	Blood (plasma), Lithium-Heparin	Immunoturbidimetry	CHUV
Ferritin	Micrograms per Liter (µg/L)	Blood (plasma), Lithium-Heparin	Immunoturbidimetry	CHUV
Total calcium*	Millimole per Liter (mmol/L)	Blood (plasma), Lithium-Heparin	NM-BAPTA	CHUV
25(OH) vitamin D	Nanomole per Liter (nmol/L)	Blood (Serum)	LC-MS/MS	CHUV
Vitamin B9	Nanomole per Liter (nmol/L)	Blood (Serum)	Microbiological method	SNHf
Vitamin B12	Picomoles per Liter (pmol/L)	Blood (Serum)	Microbiological method	SNHf
β-carotene	Nanomole per Liter (nmol/L)	Blood (Serum)	UV-spectrophotometry	SNHf
Urine creatinine	Micromoles per Liter µmol/L)	Spot urine	Jaffé	CHUV

CHOD-PAP: Cholesterol Oxidase-Phenol + Aminophenazone, GPO-PAP: Glycerolphosphateoxidase- Phenol + Aminophenazone, NM-BAPTA: Chromophore5-nitro-5'-methyl-(1,2-bis(o-aminophenoxy) ethan-N, N, N', N'-tetraacetic acid, LC-MS/MS: Liquid-Chromatography Mass spectrometry/Mass spectrometry

**Measurement of total calcium was added only for the main phase, as analysing this biomarker at the same time than the other biomarkers saved one aliquot and decreased costs.*

The coefficients of variation of the laboratory methods are detailed in 15.3 *Overview laboratory measurements and coefficients of variation*.

Results for participants

The measured levels of haemoglobin, HbA1c, ferritin, total cholesterol, High-density Lipoprotein (HDL) cholesterol, Low-density Lipoprotein (LDL) cholesterol, triglycerides, vitamin D, vitamin B12, and β-carotene were communicated to participants via a result letter using a colour-coded format. All values were reviewed by the medical supervisor of the centre before sending the letter. Instead of receiving the exact numerical values, participants were informed whether their results fell within the "green" zone (i.e. in range) or the "orange" zone (i.e. out of range). For values in "orange" zone, participants were advised to consult their paediatrician, as previously outlined. The colour-coding system and corresponding reference ranges are detailed in 15.1 *Colour coding results*.

As batch analysis results may become available several months after the visit, no immediate follow-up was initially planned. Nevertheless, in 15 instances, the medical supervisor chose to contact parents upon sending the results letter, due to findings or combinations of findings that were considered potentially concerning and encourage them to seek medical evaluation.

We decided not to provide detailed results for the following biomarkers: C-reactive protein (CRP), urine creatinine, vitamin B9, haematocrit, and total calcium. CRP and urine creatinine results were not provided, because they lack diagnostic specificity and are mainly useful to interpret other laboratory findings. Given the high number of out-of-range values for vitamin B9 (see chapter 9.4.11 *Vitamin B9*), we questioned the applicability of those reference values in a primarily healthy population, so these results were not provided, to avoid raising unnecessary concerns among participants and their parents. Additionally, as haematocrit values were considered difficult to understand and interpret, they were also not provided but still reviewed by the medical supervisor of the centre. In the same way, as calcium levels can be difficult to interpret on their own and were not measured in pilot for validation of the normal ranges for children, it was decided not to give the results to participants.

If the participants or their parents wished to receive the exact biomarker values, this information was made available upon request. FW or YouGov forwarded such requests to the coordinating team, which occurred on 33 occasions.

9.2 Overview of collected biosamples

Table 9.4 summarises the total number of urine and blood samples collected. It should be noted that sample collection does not necessarily imply that all aliquots were successfully filled.

Table 9.4 Number of visits, blood draws and urine collection by study centre

	BE	TI	LU	SG	VD	ZH	Total
Visit completed	**394**	**214**	**242**	**277**	**408**	**317**	**1 852**
Complete participation	**391**	**213**	**240**	**275**	**400**	**312**	**1 831**
Blood draw	**186**	**98**	**111**	**125**	**186**	**142**	**848**
Urine collection	391	213	242	274	408	317	1 845

9.2.1 Urine samples

Among the 1 852 participants who completed their visit, four did not provide a urine sample (three refused or were unable to provide a sample during the visit, one sample was forgotten by FW at room temperature and had to be discarded). In addition, three collections were lost between the centre and the LBB.

Among the 1 845 urine samples, 26 were incomplete:

- 17 samples had insufficient volume to fill the planned 8 cryotubes, as the minimum required volume of 20 mL was not reached.
- 1 sample kit was missing the urine creatinine cryotube (0.4 mL).
- 8 kits had fewer cryotubes frozen at the LBB than announced.

Additionally, 6 samples were not processed according to protocol:

- 4 samples were left in the refrigerator over the weekend and brought to the lab for processing after a two-day delay at 4°C.
- 2 samples were processed and frozen the day after their collection, following overnight storage in the refrigerator.

Of the 1 845 participants for whom a urine sample was available, 1685 (91.3%) provided a first morning urine samples, 160 (8.7%) did not. In three cases, the timing of the sample was not specified.

9.2.2 Blood draw completion

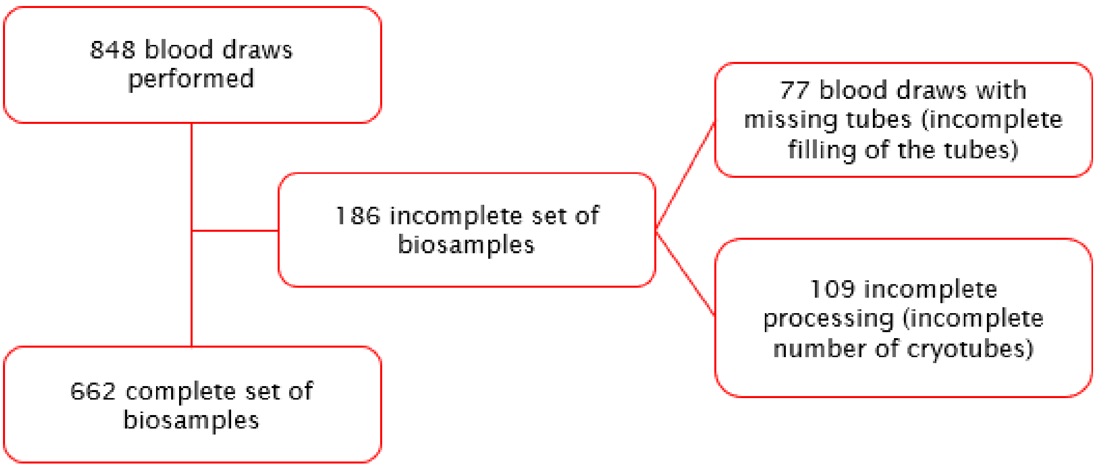
Blood samples were collected from 848 participants. It was not always possible to obtain a complete biobank set, defined as 26 cryotubes of various types. Overall, 186 blood samples resulted in an incomplete biobank set. The procedure was designed to obtain the maximum number of cryotubes of different types, provided that the 6 intended blood tubes were successfully filled during the draw.

Incomplete blood draws occurred for various reasons, including incomplete filling of tubes due to vein collapse from vacuum pressure, slow or halted blood flow, and physiological factors such as dehydration or vasoconstriction caused by Emla® cream. Technical issues, such as malfunctioning vacuum systems or air leaks also posed challenges that required skilled handling. Additionally, participant-related factors like malaise, fear, crying or agitation sometimes necessitated early termination of the procedure. In case of unsuccessful blood collection, the protocol allowed for a second attempt, provided the child gave consent. In 77 cases, not all tubes could be filled (9.1%), see Figure 9.3.

Despite successful blood draws, full sample processing was not always possible. In some cases, coagulation or suboptimal blood volume (leakage or excessive viscosity related to vacuum pressure), resulted in incomplete collection (109 participants, 12.8%), see Figure 9.3. This implies that when using those aliquots for the batch analysis (see 9.1.4), some were missing, or not full enough to do all analyses. Also, in a few cases, some of the analyses didn't work. Overall, all measurements have less than 5% missing values (~3.3% for Lithium-heparin tubes analysis like cholesterol or ferritin, ~1.6% for serum tubes with vitamins analyses).

The two blood tubes intended for the on-site analyses (blood count and HbA1c) were collected last (after the blood tubes for the biobank). As a result, in case where blood flow stopped prematurely or the participant's condition changed, these tubes were often not collected. However, in some instances of vacutainer malfunction, they could still be obtained. Overall, 47 HbA1c results (5.5%), and 49 blood counts (5.8%) are missing.

Figure 9.3 Summary of blood draws and completeness of biobank samples



9.2.3 Fasting status for blood collection

Literature on observational population-based studies shows varying approaches to fasting during blood collection. Some countries, such as Germany[113], Sweden[114] and the USA[115] collected both fasting and non-fasting blood samples. Other countries like France[116], Turkey[117], the UK[118] and China[119] reported only collecting fasting blood samples. However, implementing a strictly fasting protocol poses several challenges. FW experience has shown that it can be difficult for children to arrive fasting and remain so throughout the visit. Additionally, scheduling constraints – such as afternoon appointments at study centres – further complicate the adherence to fasting requirements. Therefore, we adopted a mixed approach, collecting both fasting and non-fasting samples, in line with practices in in Germany[113] and the USA[115].

Proportions of fasting and non-fasting participants among those who underwent blood collection, are described in Table 9.5.

Table 9.5 Proportions of fasting and non-fasting participants at time of blood draw

Study centre	% non-fasting	% fasting
BE	39.2	60.8
TI	63.9	36.1
LU	57.7	42.3
SG	56.0	44.0
VD	44.1	55.9
ZH	59.3	40.7

These proportions primarily reflect the scheduling and organisation of participants visits. In the Ticino centre, appointments were mostly planned after lunch or in the afternoon, whereas in the Bern centre, visits could be organised in the early morning. For the Vaud centre, visits were split between morning and afternoon sessions.

Overall, 48.5% of participants (n=411) who completed the blood draw were fasting, while 51.2% of them (n=434) were not. For three participants, this information is missing.

9.2.4 Quality control of sample processing

The key indicators for biosample quality were the time intervals between each step of the processing workflow. According to protocol, blood tubes were to be centrifuged within 30 minutes of collection and freezing was to be completed within 60 minutes. These strict conditions were established to ensure high-quality stored aliquots, including for potential future analyses involving sensitive biomarkers. Delays in centrifugation and freezing can compromise sample integrity and the quality of selected biomarkers. To support future research, information on processing times is included in the dataset, allowing researchers to identify biosamples that do not meet the required standards for specific biomarkers.

Figure 9.4 and Figure 9.5 show the distribution of blood samples by time-to-centrifugation and time-to-freezing (time in minutes from blood draw completion to centrifugation and to freezing, respectively), with 66.2% and 73.7% of samples meeting the stringent processing times. The average time between collection and centrifugation was 32.8 minutes (± 41.7), and the average interval between collection and freezing was 57.6 minutes (± 46.8). In 17 cases, (2%), time to freezing lasted longer than three hours, which might have reduced the quality of very sensitive biomarkers[40], even though storage on ice and in the dark before processing might have helped protecting the average quality of the samples.

Figure 9.4 Time intervals between blood collection and centrifugation (in minutes)

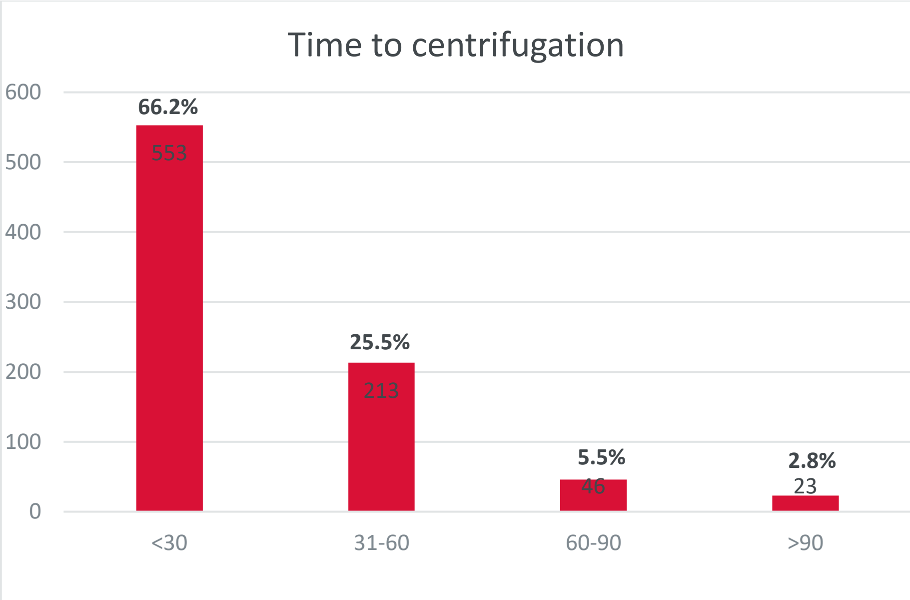


Figure 9.5 Time intervals between blood collection and freezing (in minutes)

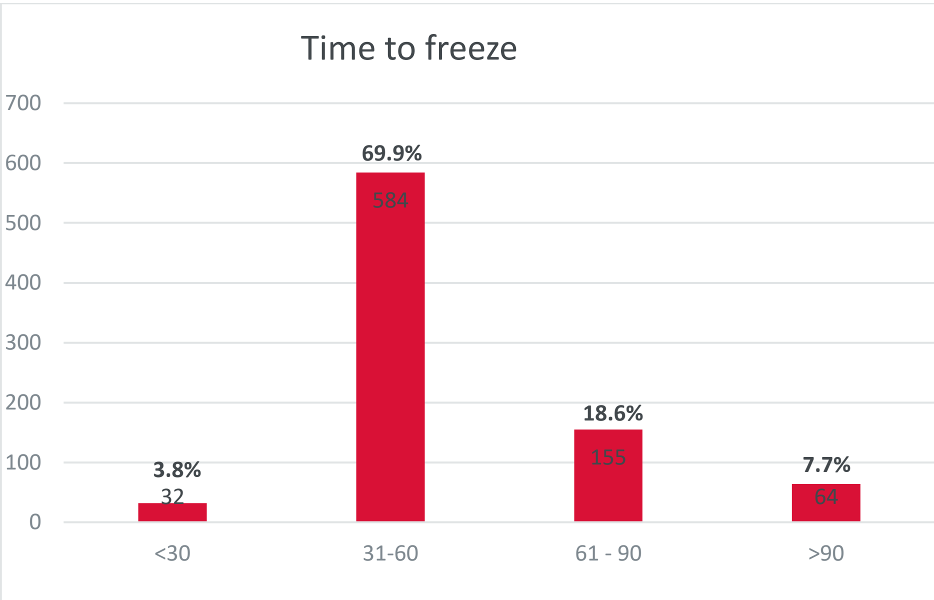


Table 9.6 and Table 9.7show the distribution of blood samples by time intervals and study centre, from collection to centrifugation and from collection to freezing, respectively.

Table 9.6 Distribution of time-to-centrifugation intervals by study centre (in minutes)

Time to centrifugation (minutes)	BE (N, %)	LU (N, %)	SG (N, %)	TI (N, %)	VD (N, %)	ZH (N, %)	Total (N, %)
< 30	26 (14.0)	92 (83.6)	121 (97.5)	51 (52.0)	153 (82.7)	110 (77.5)	553 (65.4)
31 – 60	114 (61.3)	13 (11.8)	2 (1.6)	28 (28.6)	28 (15.1)	28 (19.7)	213 (25.5)
61 – 90	30 (16.1)	4 (3.6)	1 (0.8)	6 (6.1)	2 (1.1)	3 (2.1)	46 (5.4)
> 90	8 (4.3)	1 (0.9)	0	12 (12.2)	1 (0.5)	1 (0.7)	23 (2.7)
Missing information	8 (4.3)	0	0	1 (1.0)	1 (0.5)	0	10 (1.2)
Sum	**186**	**110**	**124**	**98**	**185**	**142**	**845**

Table 9.7 Distribution of time-to-freezing intervals by study centre (in minutes)

Time to freezing (minutes)	BE (N, %)	LU (N, %)	SG (N, %)	TI (N, %)	VD (N, %)	ZH (N, %)	Total (N, %)
< 30	1 (0.5)	0 (0.0)	0 (0.0)	1 (1.0)	21 (11.4)	9 (6.3)	32 (3.8)
31 – 60	64 (34.4)	92 (83.6)	118 (95.2)	42 (42.9)	153 (82.7)	115 (81.0)	584 (69.1)
61 – 90	89 (47.8)	12 (10.9)	5 (4.0)	27 (27.5)	8 (4.3)	14 (9.9)	155 (18.3)
> 90	24 (12.9)	6 (5.5)	1 (0.8)	27 (27.5)	2 (1.1)	4 (2.8)	64 (7.6)
Missing information	8 (4.3)	0 (0.0)	0 (0.0)	1 (1.0)	1 (0.5)	0 (0.0)	10 (1.2)
Sum	**186**	**110**	**124**	**98**	**185**	**142**	**845**

The laboratories at BE and TI study centres faced challenges in processing blood tubes within the timeframes specified by the protocol. Staff were not consistently available to handle samples immediately upon arrival, as they were occupied with routine tasks that could not be interrupted. Despite multiple discussions with the laboratory teams, no viable solution was identified to improve the workflow.

9.3 Urine sampling results

The primary biomarker assessed in urine during the study was creatinine. Creatinine concentration was determined using the Jaffé method**.** Single (spot) urine creatinine levels are primarily used to evaluate urine dilution and to adjust the concentrations of other analytes accordingly[120].

Monitoring results on urine (e.g. selected contaminants and chemicals) conducted by the FSVO will be made available at a later stage).

9.4 Blood analyses

The methods for the performed measurements and coefficients of variation are described in 15.3 *Overview laboratory measurements and coefficients of variation*.

For the analyses of HbA1c, haematocrit and Hb measured directly on fresh blood in each centre, different methods were used across the study centres (as shown in 9.1.4 *Laboratory analyses and* 15.3 *Overview laboratory measurements and coefficients of variation*). These methodological differences may partially explain the variations observed in the values between centres. Laboratory variability was not assessed due to organisational constraints. For all other biomarkers, samples from all centres were processed in batches using frozen specimens at a single laboratory (CHUV or SNHf, see Table 9.3).

Of note, as some participants reported underlying diseases and/or the intake of medications or supplements, their samples may need to be excluded from analysis due to potential interactions or confounding effects on the blood sample data. For details, see 8.3.9 *Additional questions*.

For each measure, a first part describes the raw data, and then weighted means represent variable in the Swiss target population (weighting procedure is detailed in chapter 5.2 *Weighting strategy*).

Appropriate statistical tests were used based on the distribution and nature of the data. For normally distributed data, the one-way ANOVA test was performed, while the Kruskal-Wallis non-parametric test was performed otherwise. The specific test is named only for statistically significant results. Non-significant findings are reported without test details for clarity. All analyses were performed using a 95% confidence interval with p-values below 0.05 considered statistically significant.

9.4.1 HbA1c

HbA1c is widely used to assess diabetes risk as it reflects average blood levels over approximately 8-12 weeks[121]. Its measurement was performed on whole blood in the lab of each study centre, shortly after sample collection, applying their standard clinical test. The normal range was defined according to CDC (Centre for Disease Control and Prevention), as < 5.7 % (calibration NGSP-DCCT), with levels above this value classified as “out-of-range”[122]. If the values were > 6.5 %, participants were to be contacted by a paediatrician and advised to do a medical check-up (but no such cases were observed). Of note, HbA1c can also be measured in nmol/mol (calibration IFCC), but not all centres provide this value in addition to the percentage, so only they were not reported below.

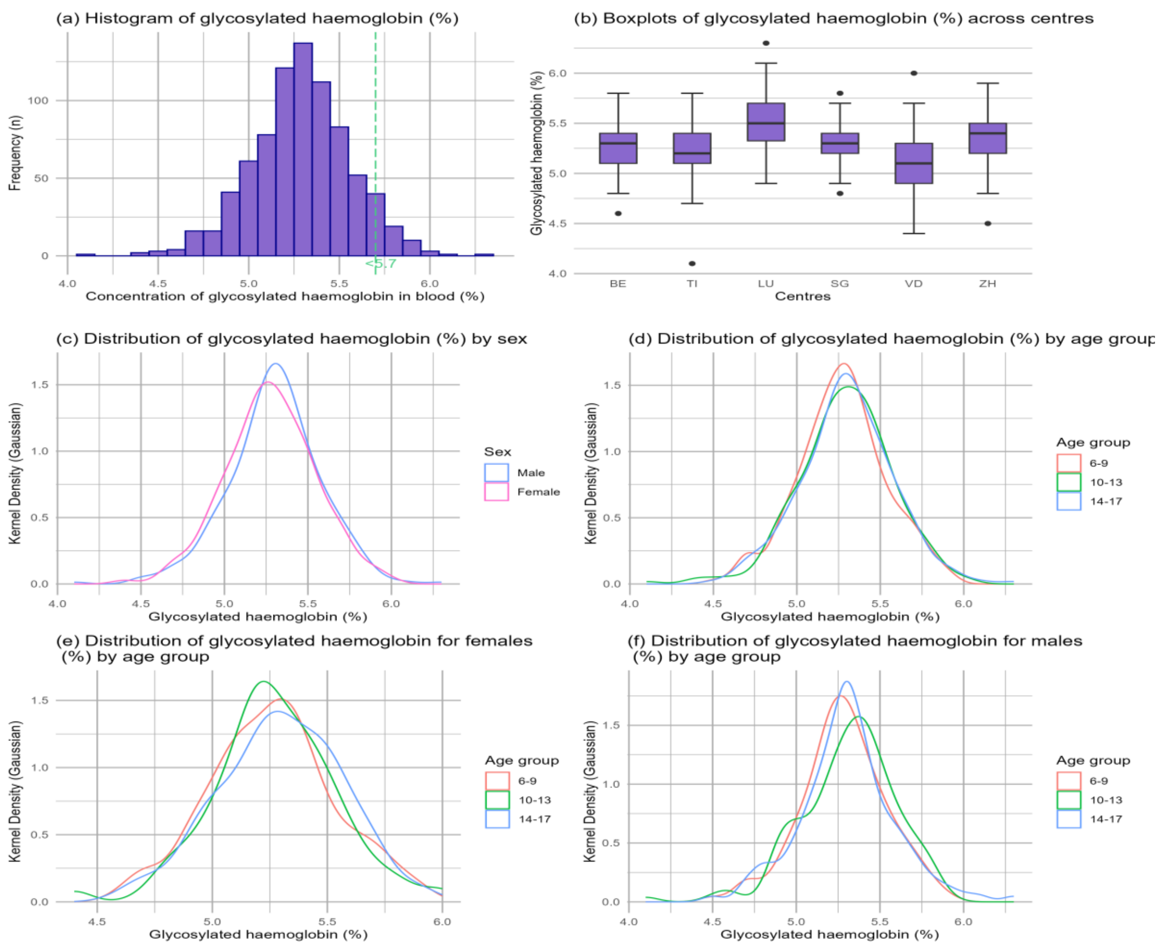
Key results for Hb1ac are presented in Table 9.8 and Figure 9.6.

Table 9.8: Summary statistics for HbA1c

	Mean	SD	Median	IQR	Min	Max	N	Missing	Out of range (> 5.7%)	HbA1c > 6.5%
HbA1c (%)	5.29	0.27	5.30	0.40	4.10	6.30	801	47	74	0

SD: standard deviation, IQR: interquartile range (P75-P25), Min: minimum value, Max: maximum value, Missing: number of missing values, Out of range: number of samples out of the normal range.

Figure 9.6 Distribution of HbA1c: overall and stratified by centre, sex and age group



Normal range: below 5.7 %.

Figure 9.6a) shows the overall distribution of HbA1c among participants. Statistically significant differences were detected across study centres (Kruskal-Wallis non-parametric test, p<0.001), with the Lucerne centre showing higher values and the Vaud centre and the Ticino centre the lowest (Figure 9.6b)). These variations may be due to the different laboratory methods and testing equipment used across study centres. No statistically significant differences were detected between sexes or age groups. This is reflected by the largely overlapping distribution curves in Figure 9.6c), d), e), f).

Weighted mean HbA1c

The mean HbA1c value, after weighting to match the population margins, is 5.32% (SD 0.28). HbA1c values below 5.7% are considered normal.[122] For detailed weighted mean HbA1c values by category, see 15.2 *Weighted results of biosamples*. About 10.4% of children have out-of-range values.

9.4.2 Haematocrit

Haematocrit analysis indicates the proportion of blood volume represented by red blood cells and is used with haemoglobin in the assessment of anaemia[123]. Its measurement was performed on whole blood in the lab of each study centre, shortly after sample collection, applying their standard clinical test. The normal range was defined according to Powers et al.[124]: 0.35-0.44 L/L (litre of cells /litre of blood) for 5-12-year-olds; 0.36-0.46 L/L for 12-18-year-old females and 0.40-0.51 L/L for 12-18 year-old males.

Key results for haematocrit are presented in Table 9.9, Table 9.10 and Figure 9.7.

Table 9.9: Summary statistics for haematocrit

	Mean	SD	Median	IQR	Min	Max	N	Missing
Haematocrit (L/L)	0.40	0.04	0.40	0.05	0.31	0.54	799	49

SD: standard deviation, IQR: interquartile range (P75-P25), Min: minimum value, Max: maximum value, Missing: number of missing values, L/L: litre of cells / litre of blood.

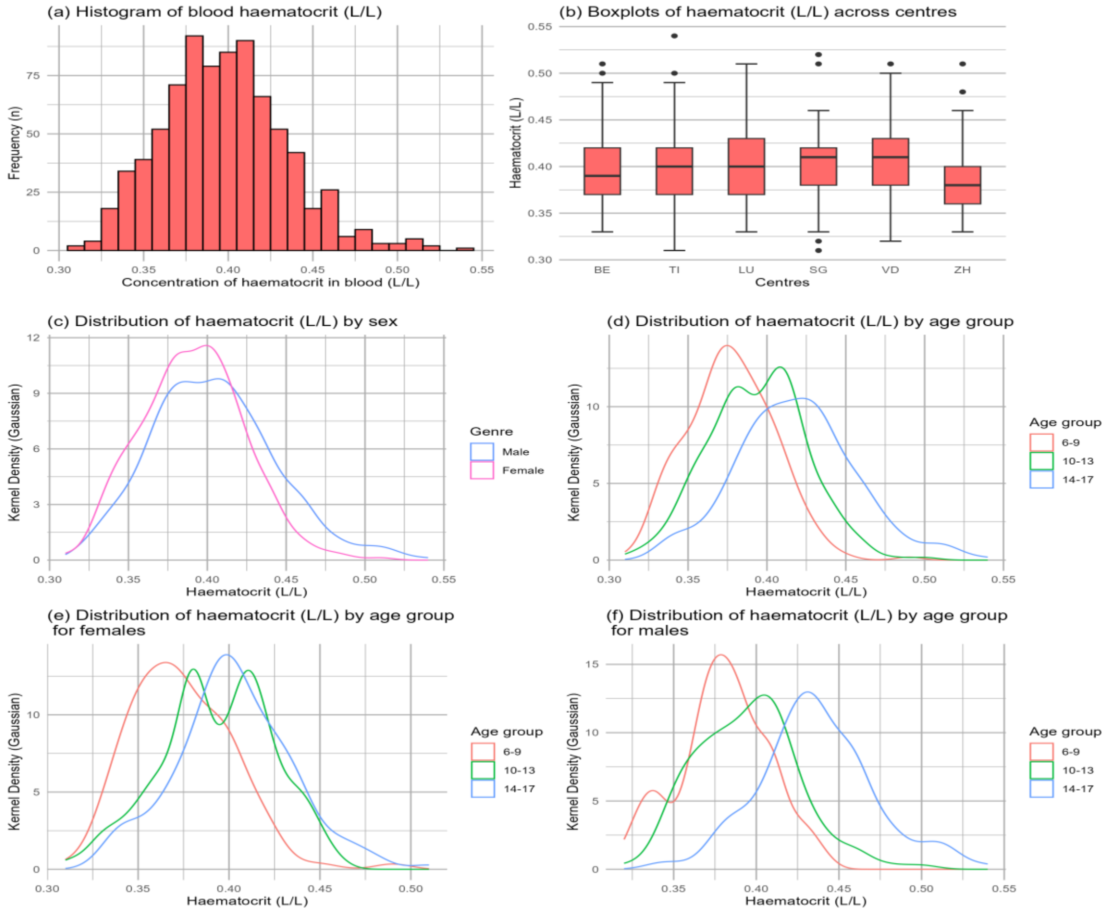
Table 9.10: Out of range cases for haematocrit

Category (age, age-sex)	N out of range	Below threshold	Above threshold
5-12 years	51	45	6
12-18 years (F)	23	18	5
12-18 years (M)	41	38	3

F: female, M: male, N out of range: number of samples out of the normal range (by age and sex categories)

Seeing the high number of out-of-range values, the appropriateness of these norms can be questioned for healthy Swiss children and adolescents and might need to be reviewed based on new data. Nevertheless, although some values fall outside the reference limits, the extent of deviation from the thresholds values remains modest and not clinically worrying (as illustrated by the minimum and maximum values in Table 9.9).

Figure 9.7 Haematocrit distribution: overall and stratified by centre, sex and age group



Normal range: 5-12y: 0.35-0.44 L/L, 12-18y (F): 0.36-0.46 L/L, 12-18y (M): 0.40-0.51 L/L.

Table 9.9 and Figure 9.7a) show the overall distribution of haematocrit among participants. Statistically significant differences were observed between study centres (Kruskal-Wallis non-parametric test, p<0.001). The highest values for haematocrit are observed in the Vaud centre and in the St. Gallen centre and the lowest values in the Zurich centre (Figure 9.7b)). This may be due to the different laboratory methods and testing equipment used across study centres[125]. Statistically significant differences are also observed between sexes (Kruskal-Wallis non-parametric test, p<0.001), with male presenting higher values compared to female participants (Figure 9.7c)). Lastly, statistically significant differences are observed between age groups[126] (Kruskal-Wallis non-parametric test, p<0.001), with older participants showing higher values than younger participants. This can be seen in the distribution curves of Figure 9.7d), e), f). A bimodal distribution can be seen in Figure 9.7 e) for girls aged 10-13, which is not visible in boys (Figure 9.7 f)).

Weighted mean haematocrit

The mean haematocrit value, after weighting to match the population margins, is 0.39 L/L (SD 0.04). The normal range is between 0.35-0.51 L/L depending on age and sex[124]. For detailed weighted mean haematocrit values by category, see 15.2 *Weighted results of biosamples*. About 17.9% of children have out-of-range values, with 16.4% below the range (8.6% of the 5-12-year-olds, 2.1% of female 12-18-year-olds and 5.7% of male 12-18-year-olds) and 1.5% above the range (0.7% of the 5-12-year-olds, 0.6% of female 12-18-year-olds and 0.2% of male 12-18-year-olds).

9.4.3 Haemoglobin

Haemoglobin is an iron-containing protein responsible for oxygen transport[127] and serves as the primary biomarker to detect anaemia[128] and, less commonly, polycythaemia[129]. Its measurement was performed on whole blood matrix in the labs of each study centre, shortly after sample collection, applying their usual clinical test. Normal range was defined according to Mattiello et al., 2020[112]: 115-150 g/L for 6-16-year-olds; 120-160 g/L for 16-18-year-old females and 130-170 g/L for 16-18-year-old males. In case of values <70 g/L[112], participants were to be contacted by a paediatrician and advised to do a medical check-up (but no such cases were observed).

Key results for haemoglobin are presented in Table 9.11 and Table 9.12 and Figure 9.8.

Table 9.11: Summary statistics for haemoglobin

	Mean	SD	Median	IQR	Min	Max	N	Missing
Haemoglobin (g/L)	135.47	12.53	135.00	15.00	90.00	179.00	799	49

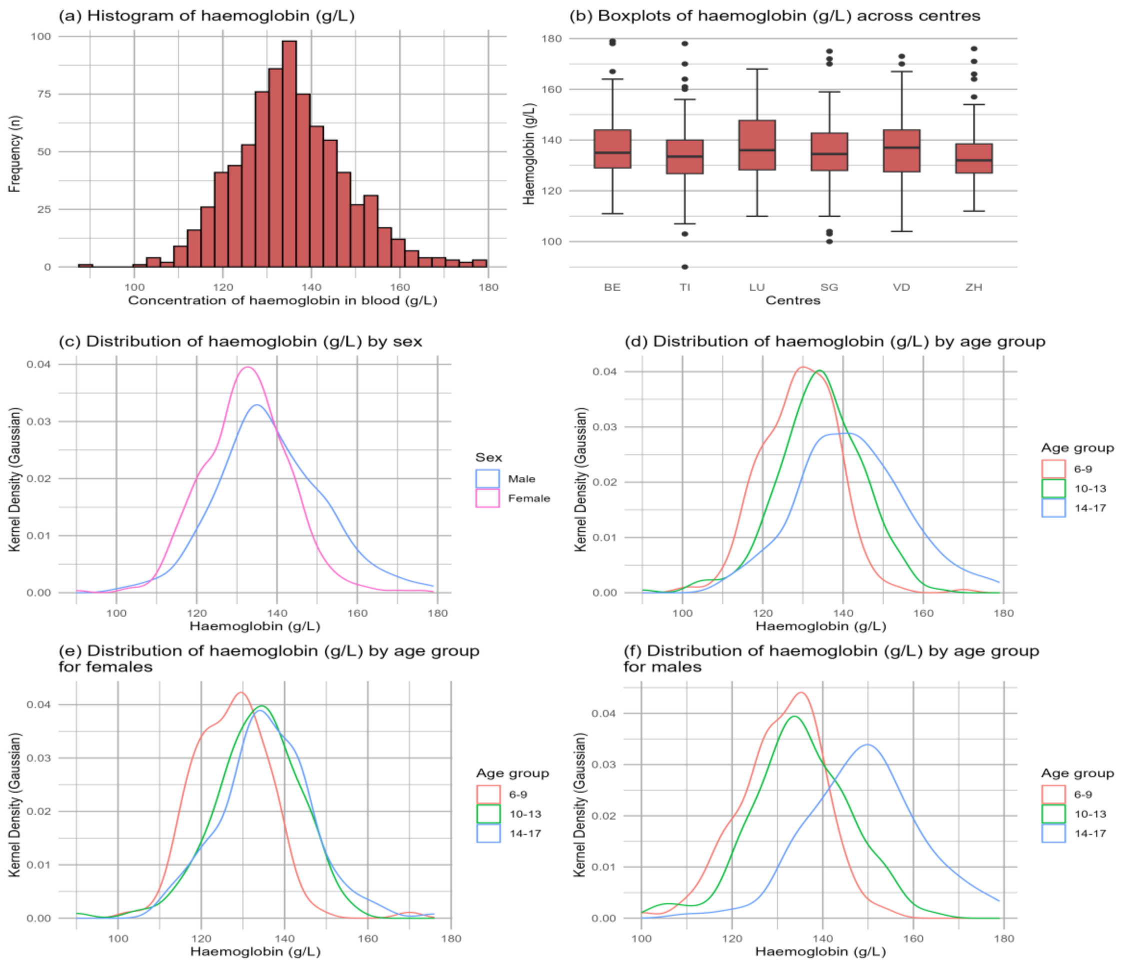
SD: standard deviation, IQR: interquartile range (P75-P25), Min: minimum value, Max: maximum value, Missing: number of missing values.

Table 9.12: Out of range cases for haemoglobin

Category (age, age-sex)	N out of range	Below threshold	Above threshold
6-16 years	79	27	52
16-18 years (F)	5	5	0
16-18 years (M)	4	0	4

F: female, M: male, N out of range: number of samples out of the normal range (by age and sex categories)

Figure 9.8 Haemoglobin distribution: overall and stratified by centre, sex and age group



Normal range: 6-16y: 115-150 g/L, 16-18y (F):120-160 g/L, 16-18y (M):130-170 g/L.

Figure 9.8a) shows the overall distribution of haemoglobin among participants. A statistically significant difference is observed across study centres (One-way ANOVA test, p=0.023), with the highest values in Lucerne and the lowest in Zurich (Figure 9.8b)). This difference might be (partially) caused by the different laboratory methods used in the different centres. A statistically significant difference is also observed between sexes (Student's t test, p<0.001)), with male presenting higher values than female (Figure 9.8c)). Lastly, a statistically significant difference is also observed between age groups (One-way ANOVA test, p<0.001), with older participants presenting higher values compared to younger participants (Figure 9.8d)). For female participants the difference is more distinct in the younger participants (Figure 9.8e)), while for male participants it is more distinct in the older participants (Figure 9.8f)).

Weighted mean haemoglobin

The mean Hb value, after weighting to match the population margins, is 134.75 g/L (SD 12.80). Normal ranges are: 115-150 g/L for 6-16-year-olds; 120-160 g/L for 16-18-year-old females and 130-170 g/L for 16-18-year-old males.[112] For detailed weighted mean haemoglobin values by category, see 15.2 *Weighted results of biosamples*. About 11.6% of children have out-of-range values, with

4.4% below the range (3.8% of the 6-16-year-olds, 0.5% of the female 16-18-year-olds and 0% of male 12-18-year-olds) and 7.2% above the range (06.6% of the 6-16-year-olds, 0% of female 12-18-year-olds and 0.6% of the male 16-18-year-olds).

9.4.4 Total cholesterol

Total cholesterol reflects overall lipid levels. Total cholesterol is a commonly used biomarker for assessing blood lipid status and evaluating cardiovascular risk[130,131]. The analysis was performed in five batches during the main phase, at the CHUV's central laboratory, using CHOD – PAP enzymatic method, on plasma-lithium-heparin matrix. The normal range was defined according to Grundy et al, 2019[130], as <5.1 mmol/L (170-199 mg/dl) or below.

Key total cholesterol results are presented in Table 9.13, Table 9.14 and Figure 9.9.

Table 9.13: Summary statistics for total cholesterol

	Mean	SD	Median	IQR	Min	Max	N	Missing
Cholesterol (mmol/L)	4.07	0.72	4.00	0.90	2.20	7.30	820	28

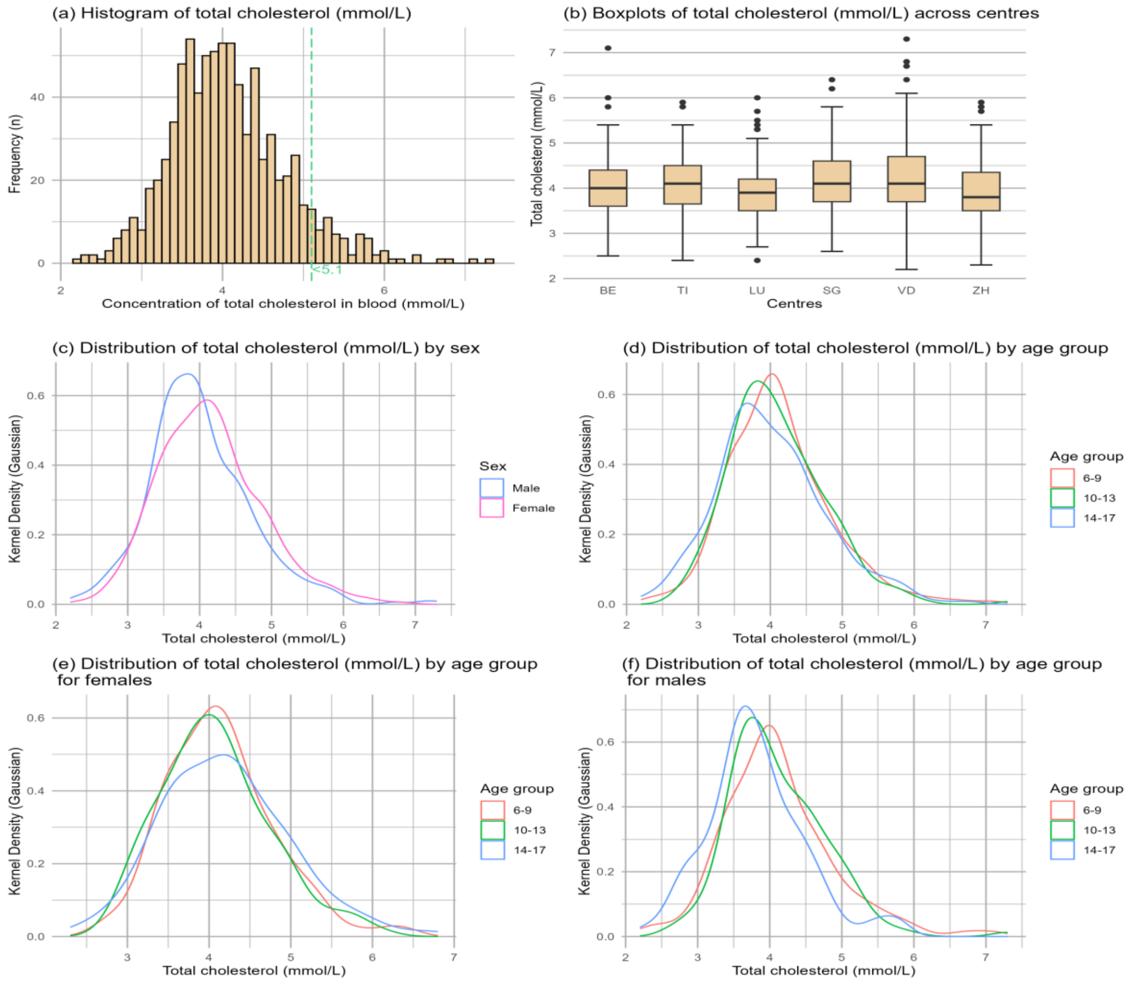
SD: standard deviation, IQR: interquartile range (P75-P25), Min: minimum value, Max: maximum value, Missing: number of missing values.

Table 9.14: Out of range cases for total cholesterol

N out of range	Below threshold	Above threshold
73	-	73

N out of range: number of samples out of the normal range

Figure 9.9 Total cholesterol distribution: overall and stratified by centre, sex and age group



Normal range: below 5.1 mmol/L.

Figure 9.9a) shows the distribution of total cholesterol among participants. Statistically significant differences are observed across study centres (One-way ANOVA test, p=0.001) even though they were all measured in batches at one location, with the highest values detected in the Vaud centre, and the lowest in the Zurich centre (Figure 9.9b)). Statistically significant differences are also observed between sexes (Student's t test, p=0.008), with female presenting higher values than male participants (Figure 9.9c). This finding is consistent with observations from previous population-based studies in children and adolescent in various settings globally[132–135]. However, no statistically significant difference is observed between age groups, with distribution curves largely overlapping, as illustrated in Figure 9.9d), e), f).

Weighted mean total cholesterol

The mean total cholesterol value, after weighting to match the population margins, is 4.03 mmol/L (SD 0.76). Total cholesterol values below 5.1mmol/L are considered normal[130]. For detailed weighted mean total cholesterol values by category, see 15.2 *Weighted results of biosamples*. About 8.7% of children are above the normal range.

9.4.5 HDL cholesterol

Cholesterol is transported to the liver by HDL particles for elimination. HDL cholesterol is commonly used biomarker to assess blood lipid status and cardiovascular risk[130,131]. The analysis was performed in five batches during the main phase, at the CHUV central laboratory, using CHOD – PAP enzymatic method, on plasma-lithium-heparin matrix. A normal value was defined as > 1 mmol/L (> 40 mg/dl), according to Grundy et al, 2019[130]. Key HDL cholesterol results are presented in Table 9.15, Table 9.16 and Figure 9.10.

Table 9.15: Summary statistics for HDL cholesterol

	Mean	SD	Median	IQR	Min	Max	N	Missing
HDL cholesterol (mmol/L)	1.49	0.31	1.50	0.40	0.70	2.90	820	28

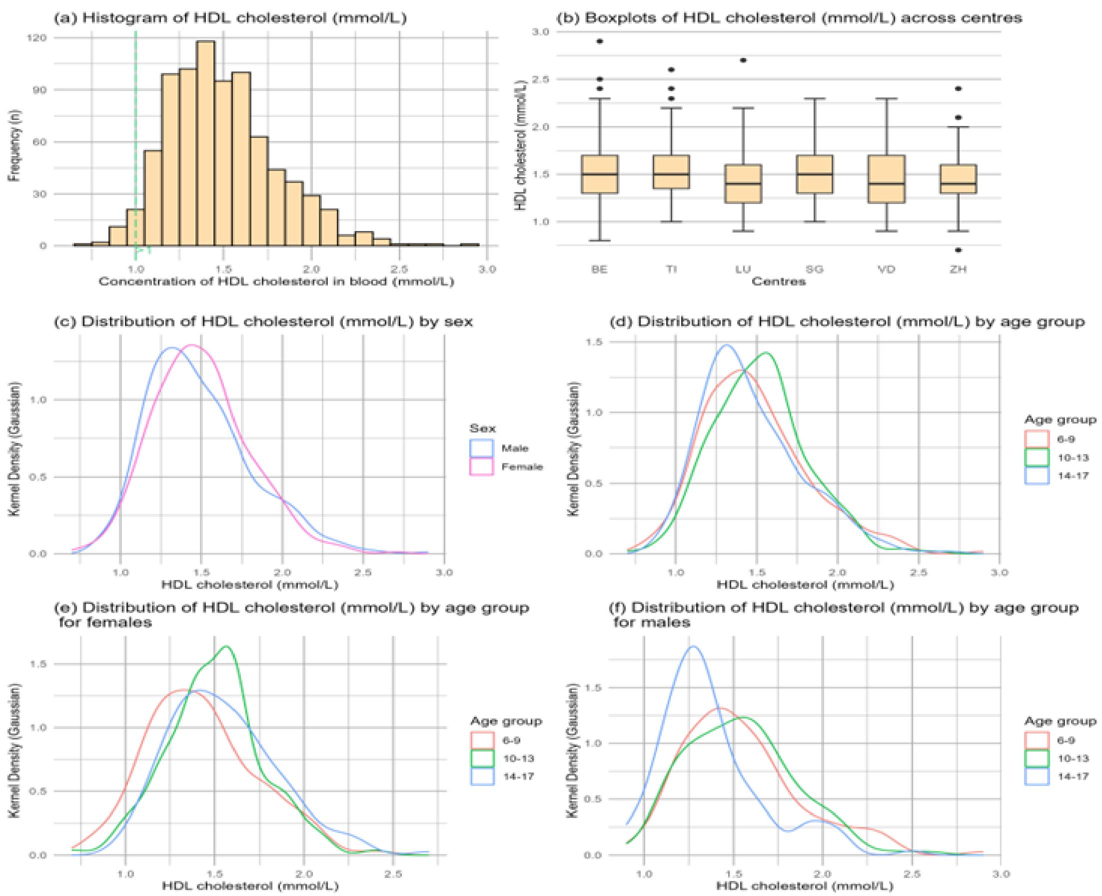
SD: standard deviation, IQR: interquartile range (P75-P25), Min: minimum value, Max: maximum value, Missing: number of missing values.

Table 9.16: Out of range cases for HDL cholesterol

N out of range	Below threshold	Above threshold
35	35	-

N out of range: number of samples out of the normal range

Figure 9.10 Distribution of HDL cholesterol: overall and stratified by centre, sex and age group



Normal range: above 1 mmol/L.

Figure 9.10a) shows the distribution of HDL cholesterol among participants. No statistically significant difference is observed across study centres (Figure 9.10b)) or between sexes (Figure 9.10 c)). However, a statistically significant difference is observed between age groups (Kruskal-Wallis non-parametric test, p=0.016), with higher values in the 10-13-year-old age group compared to the other age groups (Figure 9.10d)). This finding is consistent with observations from previous population-based studies in children and adolescents, showing a progressive rise of HDL-levels during childhood, highest values in early adolescence, followed by a decrease[133,134,136]. For females the lowest values are observed in the younger age group (Figure 9.10e)), while for males the lowest values were observed in the older age group (Figure 9.10f)).

Weighted mean HDL cholesterol

The mean HDL cholesterol value, after weighting to match the population margins, is 1.47 mmol/L (SD 0.32). HDL cholesterol values above 1 mmol/L are considered normal[130]. For detailed weighted mean HDL cholesterol values by category, see 15.2 *Weighted results of biosamples*. About 4.7% of children are below the normal range.

9.4.6 LDL cholesterol

LDL particles transport cholesterol from the liver to peripheral tissues. LDL cholesterol is a commonly used biomarker to assess blood lipid status and cardiovascular risk[130,131]. A normal value was defined as < 3.4 mmol/L (< 130 mg/dL), according to Grundy et al, 2019[130].

LDL cholesterol was calculated in the laboratory, using the following equation[137], according to routine clinical laboratory procedures.
LDL cholesterol = (Total cholesterol (mmol/L)-HDL cholesterol(mmol/L)-Triglycerides(mmol/L))/ 2.2

Key LDL cholesterol results are presented in Table 9.17, Table 9.18 and Figure 9.11.

Table 9.17: Summary statistics for LDL cholesterol

	Mean	SD	Median	IQR	Min	Max	N	Missing
LDL cholesterol (mmol/L)	2.16	0.64	2.10	0.70	0.20	4.80	820	28

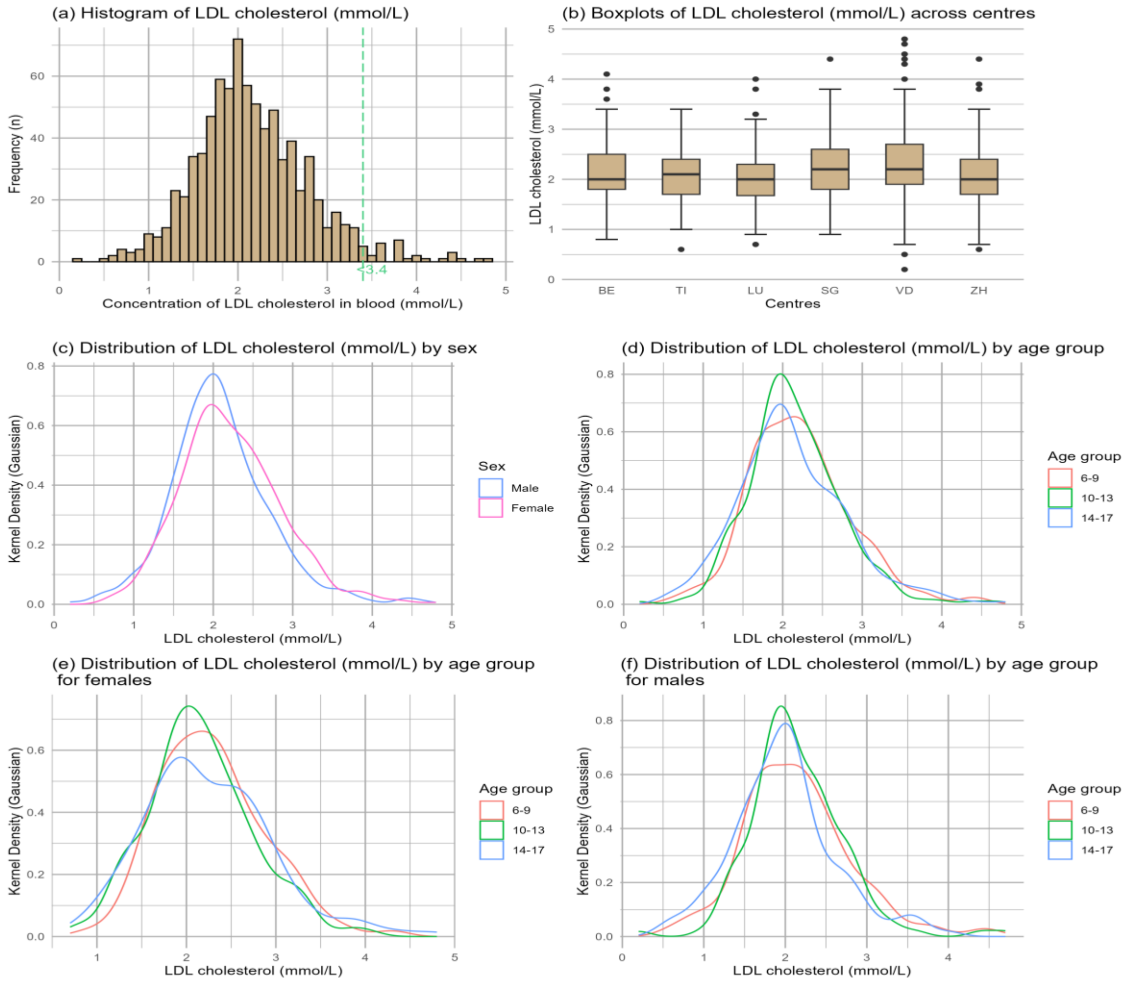
SD*: standard deviation, IQR: interquartile range (P75-P25), Min: minimum value, Max: maximum value, Missing: number of missing values.*

Table 9.18: Out of range cases for LDL cholesterol

N out of range	Below threshold	Above threshold
31	-	31

N out of range: number of samples out of the normal range.

Figure 9.11 Distribution of LDL cholesterol: stratified by centre, sex and age group



Normal range: below 3.4 mmol/L.

Figure 9.11a) shows the distribution of LDL among participants. As LDL is a calculated value, subtracted from total cholesterol, the same trends are observed for both biomarkers. Statistically significant differences are observed across study centres (One-way ANOVA test, $p<0.001$), with the highest values observed in the Vaud centre and the lowest values observed in the Lucerne centre Figure 9.11b). Statistically significant differences are also observed between sexes (Student's t test, $p=0.003$), with female presenting higher values than male participants (Figure 9.11c)). As for total-cholesterol, levels of LDL are known to be higher in females than in males from infancy to early adulthood, although the mechanisms underlying these differences remain partially unexplained[135]. There is no statistically significant difference between age groups (Figure 9.11d), e), f)).

Weighted mean LDL cholesterol

The mean LDL cholesterol, after weighting to match the population margins, is 2.13 mmol/L (SD 0.68). LDL cholesterol values below 3.4 mmol/L are considered normal[130]. For detailed weighted mean LDL cholesterol values by category, see 15.2 *Weighted results of biosamples*. About 4.1% of children are above the normal range.

9.4.7 Triglycerides

Through triglycerides analysis, lipid metabolism can be evaluated. The level of triglycerides is commonly used as a biomarker to assess blood lipid status and cardiovascular risk [130,131]. The analysis was performed in five batches during the main phase, at the CHUV's central laboratory, using the GPO-PAP enzymatic colorimetric method, on plasma-lithium-heparin matrix. A normal value was defined as < 1.7 mmol/L (for mixed fasting and non-fasting measures), according to Elkins et al, 2019[138].

Key triglycerides results are presented in Table 9.19, Table 9.20 and Figure 9.12.

Table 9.19: Summary statistics for triglycerides

	Mean	SD	Median	IQR	Min	Max	N	Missing
Triglycerides (mmol/L)	0.93	0.46	0.80	0.50	0.30	3.90	820	28

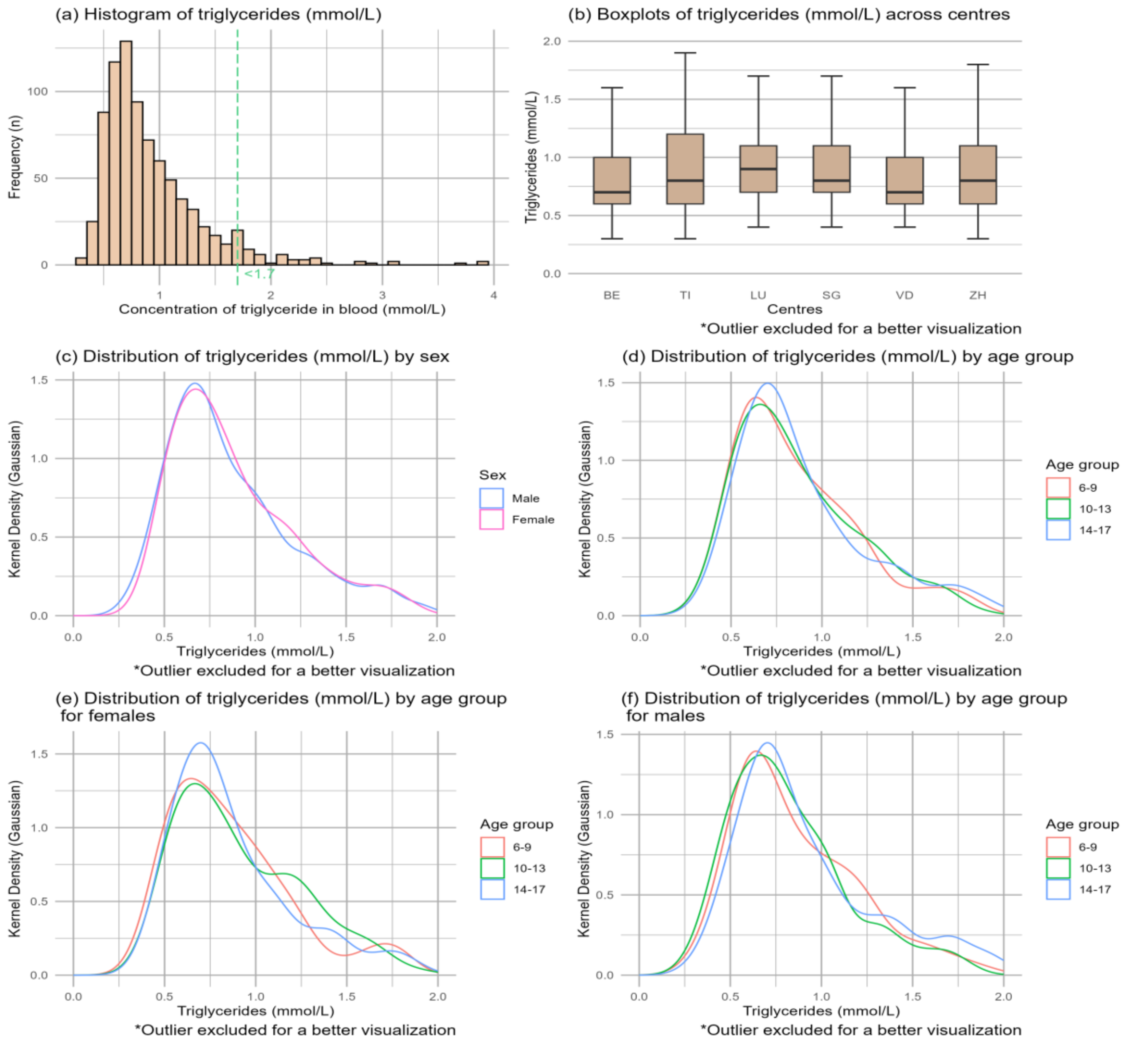
SD: standard deviation, IQR: interquartile range (P75-P25), Min: minimum value, Max: maximum value, Missing: number of missing values.

Table 9.20: Out of range cases for triglycerides

N out of range	Below threshold	Above threshold
61	-	61

N out of range: number of samples out of the normal range

Figure 9.12 Distribution of triglycerides: stratified by centre, sex and age group



Normal range: below 1.7 mmol/L.

Figure 9.12a) shows the distribution of triglycerides among participants. Statistically significant differences are observed across study centres (Kruskal-Wallis non-parametric test, p=0.004), with the highest values detected in the Lucerne centre and the lowest values observed in the Bern and Vaud centres (Figure 9.12b)). No statistically significant difference is observed between sexes (Figure 9.12c)) or between age groups (Figure 9.12d), e), f)).

Weighted mean triglycerides

The mean triglyceride value, after weighting to match the population margins, is 0.93 mmol/L (SD 0.50). Triglycerides values below 1.7 mmol/L are considered normal[138]. For detailed weighted mean triglyceride values by category, see 15.2 *Weighted results of biosamples*. About 7.7% of children are above the normal range.

9.4.8 Ferritin

Ferritin is a protein that stores iron. It serves as a biomarker of iron deficiency, as well as an indirect measure of iron reserves[139]. The analysis was performed in five batches during the main phase, at the CHUV's central laboratory, using immunoturbidimetry on plasma-lithium-heparin matrix. The normal ranges were defined according to Mattiello et al. 2020[112], as 10-99µg/L for 6-16-year-old children; 18-103µg/L for 16-18-year-old females and 16-213µg/L for 16-18-year-old males.

Key ferritin results are presented in Table 9.21, Table 9.22 and Figure 9.13.

Table 9.21: Summary statistics for ferritin

	Mean	SD	Median	IQR	Min	Max	N	Missing
Ferritin (µg/L)	47.47	28.73	42.00	32.00	6.00	198.00	817	31

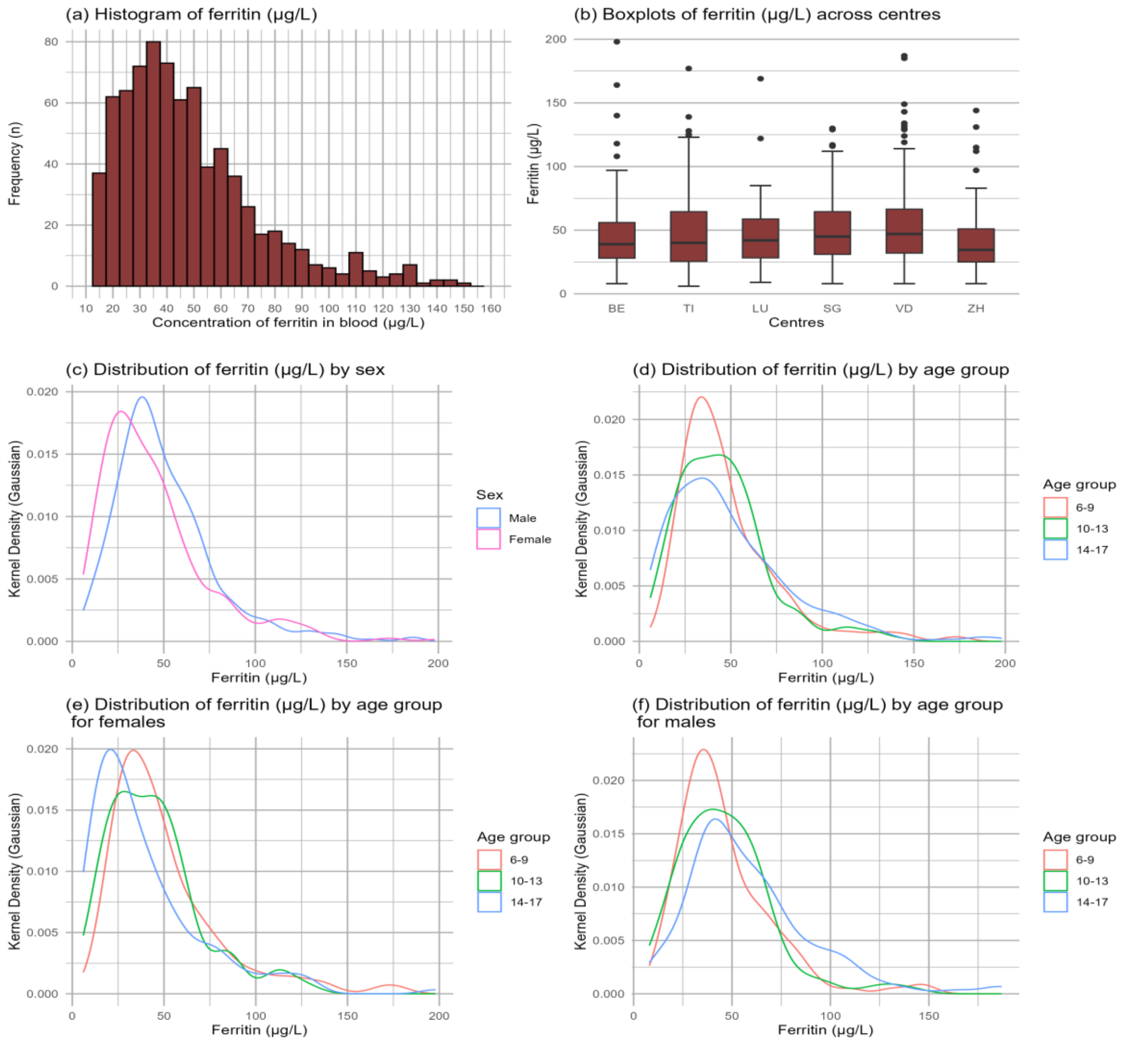
SD: standard deviation, IQR: interquartile range (P75-P25), Min: minimum value, Max: maximum value, Missing: number of missing values.

Table 9.22: Out of range values for ferritin

Category (age, age-sex)	N Out of range	Below threshold	Above threshold
6-16 years	47	12	35
16-18 years (F)	13	10	3
16-18 years (M)	0	0	0

F: female, M: male, N out of range: number of samples out of the normal range (by age and sex categories).

Figure 9.13 Distribution of ferritin: stratified by centre, sex and age group



Normal range 6-16y: 10-99 µg/L, 16-18y (F): 18-103 µg/L, 16-18y (M): 16-213 µg/L.

Figure 9.13a) shows the distribution of ferritin among participants. A statistically significant difference is observed across study centres (Kruskal-Wallis non-parametric test, p=0.001). The highest values are observed in the Vaud centre, while the lowest were detected in the Zurich centre (Figure 9.13b)). A statistically significant difference between sexes is also observed (Kruskal-Wallis non-parametric test, p<0.001), with male presenting higher values than female participants (Figure 9.13c)). No statistically significant difference is observed between age groups. This is illustrated by overlapping distribution curves in (Figure 9.13d)). Still female participants of the oldest age group presents the lowest values (Figure 9.12 e)), which may be related to menstrual blood loss[140] and further matches the differences observed between sexes, as this difference is not visible in males (Figure 9.13f)).

Weighted mean ferritin

The mean ferritin value, after weighting to match the population margins, is 45.42 µg/L (SD 27.89). Differences are seen with age and sex with a net decrease for female adolescents (36.99 µg/L) (For detailed weighted mean ferritin values by category, see 15.2 *Weighted results of biosamples*). The normal ranges are: 10-99 µg/L for 6-16-year-old children; 18-103 µg/L for 16-18-year-old females and 16-213 µg/L for 16-18-year-old males.[112] About 7.1% of children have out-of-range values, with 3.5%% below the range (2.4% of the 6-16-year-olds, 1.1% of the 16-18-year-olds females and 0% of male 16-18-year-olds) and 3.6% above the range (3.4% of the 6-16-year-olds, 0.2% of the 16-18-year-old females and 0% of 16-18-year-old males).

9.4.9 Total calcium

Calcium is a mineral involved in bone metabolism as well as in other body functions, such as muscle contraction and various enzymatic activity[141,142]. It was measured only during the main phase of the study, in five batches at the CHUV's central laboratory, using NM-BAPTA method on plasma-lithium-heparin matrix.

Total plasma calcium was measured, and its normal range was defined as 2.15-2.55 mmol/L according to the CHUV's reference intervals[143]. Total calcium values >3.5mmol/L results are classified as severe hypercalcemia[144].

Key total calcium results are presented in Table 9.23 and Figure 9.14.

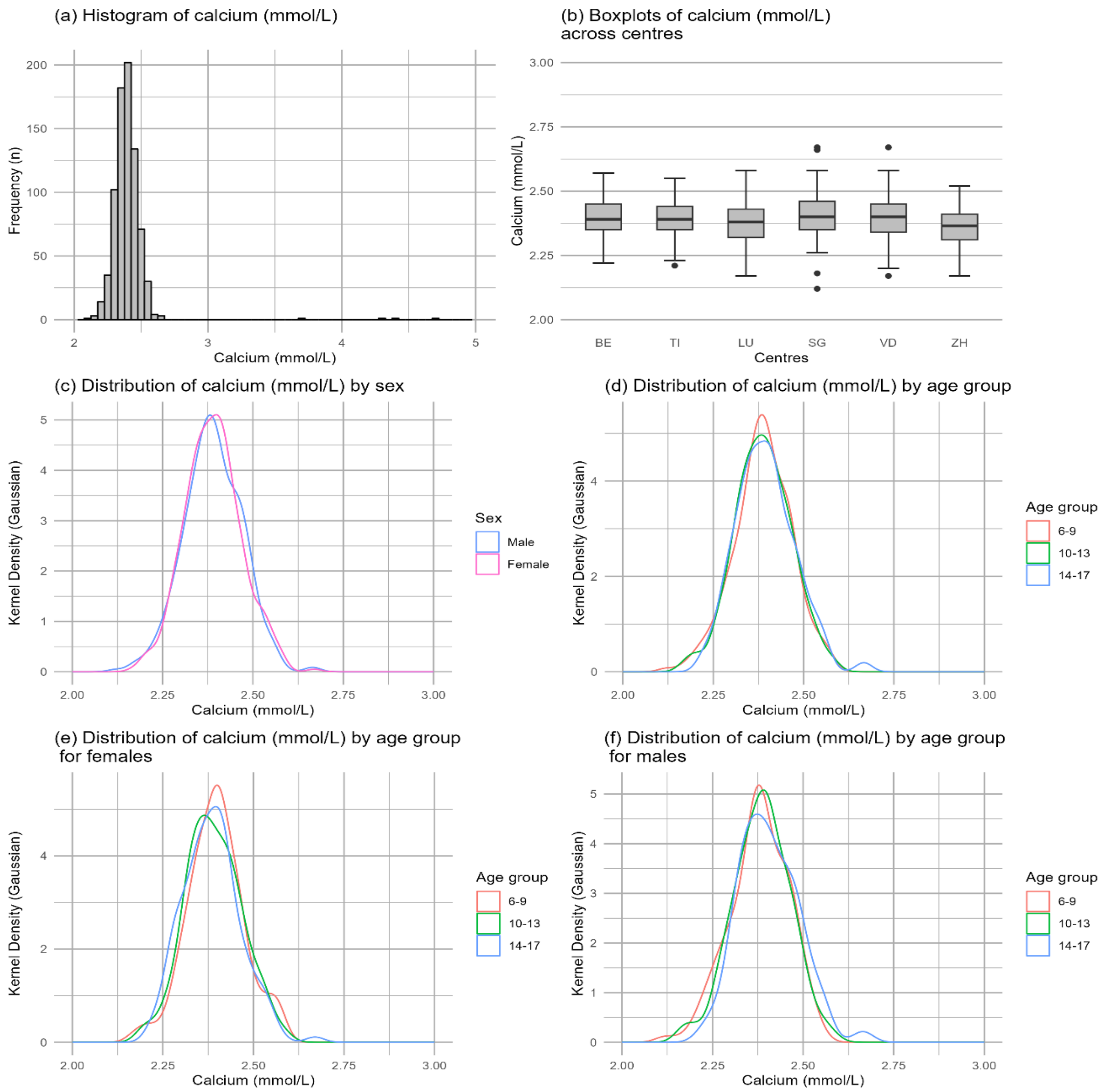
Table 9.23 Summary statistics for total calcium

	Mean	SD	Median	IQR	Min	Max	N	Missing	Out of range
Total plasma calcium (mmol/L)	2.40	0.16	2.39	0.10	2.12	4.72	785	63	4

SD: standard deviation, IQR: interquartile range (P75-P25), Min: minimum value, Max: maximum value, Missing: number of missing values, Out of range: number of samples out of the normal range >3.5 mmol/L.

Of note, the four participants with high out-of-range values have been contacted and re-tested by their paediatricians, obtaining normal values, so there might have been an analytical problem (all were from batch 3 but not from the same centre nor analysed on the same day).

Figure 9.14 Distribution of total calcium: stratified by centre, sex and age group



Normal range: 2.15-2.55 mmol/L. The four outliers were excluded from figures b) to f) for readability

Figure 9.14a) shows the distribution of total calcium among participants. Statistically significant differences are observed across study centres (Kruskal-Wallis non-parametric test, p<0.001), with higher values observed in St. Gallen, Ticino centre and Vaud centres, while the lowest values were detected in the Zurich centre (Figure 9.14b)). There is no statistically significant difference between sexes or between age groups, as illustrated by the overlapping curves in Figure 9.14c), d), e) and f).

Weighted mean total calcium

The mean total calcium value, after weighting to match the population margins, is 2.39 mmol/L (SD 0.16). The normal range is 2.15-2.55 mmol/L.[143] For detailed weighted mean total calcium values by category, see 15.2 *Weighted results of biosamples*. About 0.8% of children are above normal range.

9.4.10 Vitamin D

Vitamin D is a fat-soluble steroid-derived molecule, which is primarily synthesized in the skin through sunlight exposure (UV). To become biologically active, it needs a transformation which takes place in the kidney. Vitamin D is involved in many biological pathways and especially plays a central role in phospho-calcic homeostasis and metabolism, as well as in bone health[145–147]. The analysis was performed in five batches during the main phase, at the CHUV's central laboratory, using the LC-MS/MS method on serum matrix. There was some uncertainty about which normal range to choose, as values under 50 nmol/l are already considered insufficient for good health, but a high percentage of the population might be in this case (up to 30-50%, depending on the studies[148,149]). Therefore, to avoid raising unnecessary concern among families, the lower threshold was set at 25 nmol/L, as recommended by Braegger *et al.*[150], as it marks the onset of deficiency, with potential adverse effect on bone and general health. At the upper end, values above 250nmol/L can be considered excessive[151], and values exceeding 375 nmol/L are above the toxicity threshold[152].

Key vitamin D results are presented in Table 9.24, Table 9.25 and Figure 9.15.

Table 9.24: Summary statistics for vitamin D

	Mean	SD	Median	IQR	Min	Max	N	Missing
Vitamin D (nmol/L)	64.16	26.33	61.20	27.20	11.60	375.00	834	14

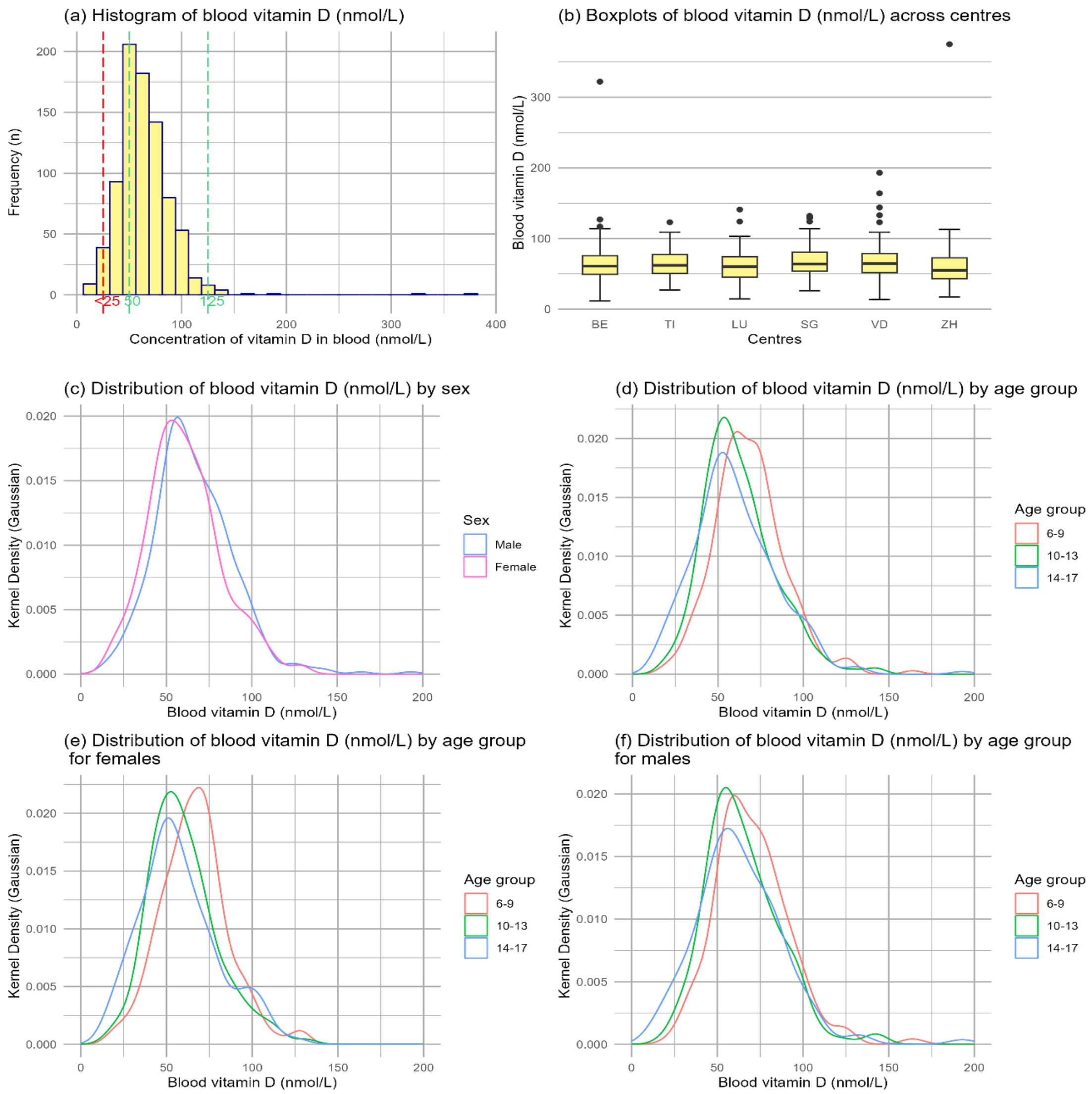
SD: standard deviation, IQR: interquartile range (P75-P25), Min: minimum value, Max: maximum value, Missing: number of missing values.

Table 9.25: Values of vitamin D grouped by range

Values by range
N <25nmol/L: 25
N in [25-50[nmol/L: 204
N in range [50-125] nmol/L: 593
N]125-250] nmol/L: 10
N >250nmol/L: 2

Values by range: number of cases in each range, including out of range cases (values < 25 nmol/L and > 250nmol/L). Of note, the two participants with very high values were called and advised to stop supplementation.

Figure 9.15 Distribution of vitamin D: stratified by centre, sex and age group



Normal range: between 50 and 125 nmol/L; Deficit: below 25 nmol/L. Two outliers have been excluded from c) to f) for readability

Figure 9.15a) shows the distribution of blood vitamin D among participants. A statistically significant difference is observed across study centres (Kruskal-Wallis non-parametric test, p=0.008). The highest values are observed in the Vaud centre and the lowest values in the Zurich centre (Figure 9.15b)). A statistically significant difference is also observed between sexes (Kruskal-Wallis non-parametric test, p<0.001), with male presenting higher values than female participants (Figure 9.15c)). Lastly, a statistically significant difference is observed across age groups (Kruskal-Wallis non-parametric test, p<0.001), with younger participants presenting the highest values (Figure 9.15d), e), f)).

Weighted mean vitamin D

The mean vitamin D value, after weighting to match the population margins, is 62.09 mmol/L (SD 28.88). The normal range is 25-250nmol/L[152,153]. For detailed weighted mean vitamin D values by category, see 15.2 *Weighted results of biosamples*. About 4.6% of children are below 25nmol/L (deficiency), 27.5% in range of 25-50 nmol/L (insufficiency), and 0.3% above 250 nmol/L (excess).

9.4.11 Vitamin B9

Vitamin B9 or folate, is a water-soluble vitamin involved in amino-acid metabolism and cell division. Green leaves vegetables, lentils, and whole grain are its main food sources[154,155].
The SNHf measured vitamin B9 using a microbiologic method (ISO validated): the growth of *Lactobacillus Casei* (ATCC7469), as reporter of vitamin B9 concentration in biological fluid. The analysis was performed on serum matrix at the SNHf laboratory in five batches during the main phase. Finding an appropriate norm for this measurement was challenging, as there is no consensus in the literature. Moreover, results can vary significantly depending on the method used. Ultimately, the reference values from the Centre for Diseases Control [156]were used, as the method most closely matched that employed by the SNHf and is indicated for all ages. For their use, a conversion factor of 2.265[157] was applied to their reference values to convert them from ng/mL to nmol/L. The reference values were defined as 5.89 - 27.63 nmol/L.

Key plasma vitamin B9 results are presented in Table 9.26, Table 9.27 and Figure 9.16.

Table 9.26: Summary statistics for vitamin B9

	Mean	SD	Median	IQR	Min	Max	N	Missing
Plasma vitamin B9 (nmol/L)	21.44	13.35	18.00	12.58	5.00	125.00	834	14

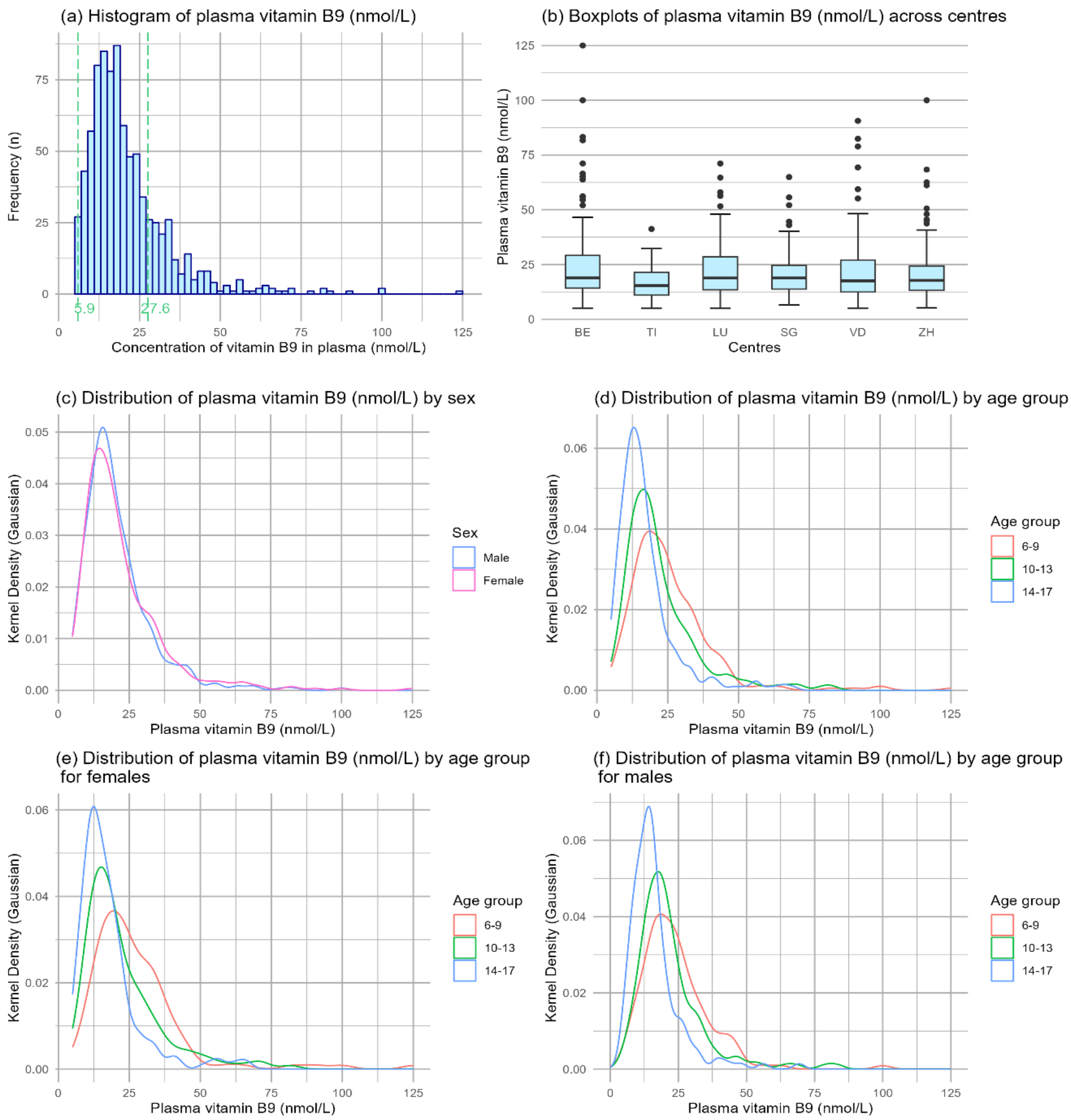
SD: standard deviation, IQR: interquartile range (P75-P25), Min: minimum value, Max: maximum value, Missing: number of missing values.

Table 9.27: Out of range values for vitamin B9

N out of range	Below threshold	Above threshold
195	15	180

N out of range: number of samples of the normal range

Figure 9.16 Distribution of plasma vitamin B9: stratified by centre, sex and age group



Normal range: between 5.9 and 27.6 nmol/L.

Figure 9.16a) shows the distribution of plasma vitamin B9 among participants. Statistically significant differences are observed across study centres (Kruskal-Wallis non-parametric test, p=0.004). The highest values were detected in the Bern centre and the lowest in the Ticino centre (Figure 9.16b)). There is no statistically significant difference between sexes (Figure 9.16c)). Statistically significant differences are observed between age groups (Kruskal-Wallis non-parametric test, p<0.001), with lower values observed in the oldest age group, followed by a progressive increase with decreasing age (Figure 9.16d), e), f)).

Weighted mean vitamin B9

The mean vitamin B9 value, after weighting to match the population margins, is 21.81 nmol/L (SD 14.01). The chosen normal range is 5.89 - 27.63 nmol/L. For detailed weighted mean vitamin B9 values by category, see 15.2 *Weighted results of biosamples*. About 1.7% of children are below and 22.4% above this normal range.

9.4.12 Vitamin B12

Vitamin B12 belongs to the water-soluble vitamins. It is involved in DNA synthesis, and fatty acid as well as amino acid metabolism. Animal-based food, such as meat, fish, eggs and dairy products are the food sources of this vitamin[154,158]. Vitamin B12 serum concentrations were assessed. The analysis was performed in five batches during the main phase, at the SNHf laboratory on serum matrix, using a microbiologic method commonly use in routine analysis. The normal range was defined as 150-790pmol/L, according to Schüpbach et al, 2017[159].

Key vitamin B12 results are presented in Table 9.28, Table 9.29 and Figure 9.17.

Table 9.28: Summary statistics for vitamin B12

	Mean	SD	Median	IQR	Min	Max	N	Missing
Vitamin B12 (pmol/L)	337.82	168.62	297.05	194.25	91.30	1 732.00	834	14

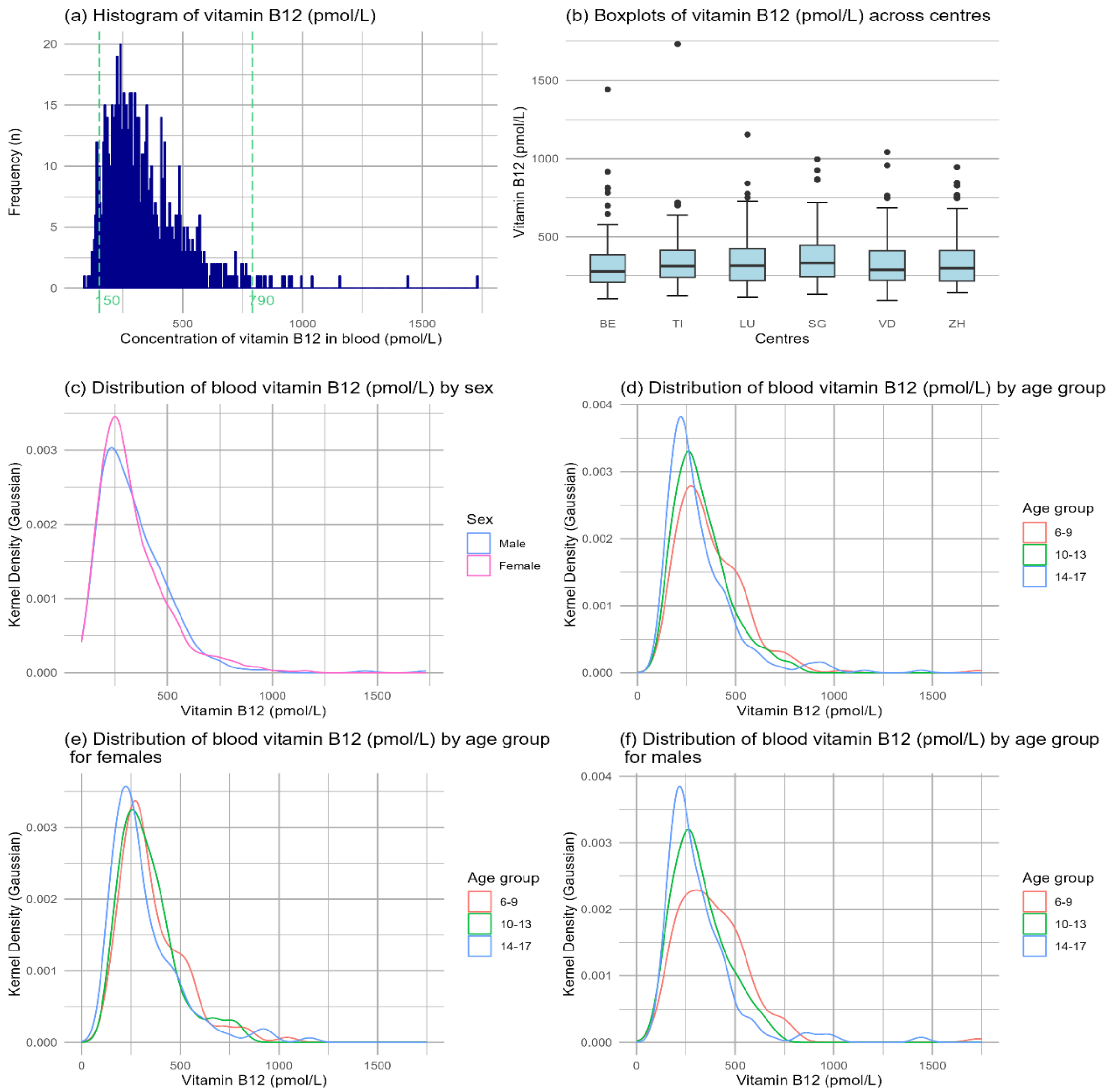
SD: standard deviation, IQR: interquartile range (P75-P25), Min: minimum value, Max: maximum value, Missing: number of missing values.

Table 9.29: Out of range cases for vitamin B12

N out of range	Below threshold	Above threshold
60	44	16

N out of range: number of samples out of the normal range

Figure 9.17 Distribution of vitamin B12: stratified by centre, sex and age group



Normal range: between 150 and 790 pmol/L.

Figure 9.17a) shows the distribution of vitamin B12 among participants. No statistically significant difference is observed across study centres (Figure 9.17b)), or between sexes (Figure 9.17c)). A statistically significant difference is observed between age groups (Kruskal-Wallis non-parametric test, p<0.001), with lower values observed in the oldest age group (Figure 9.17d), e) and f)). Similar findings were observed in other settings among children, with lower levels of vit B12 reported in adolescents versus younger children[160].

Weighted mean vitamin B12

The mean vitamin B12 values, after weighting to match the population margins, is 341.35 pmol/L (SD 171.13). The normal range is 150-790 pmol/L[159]. For detailed weighted mean vitamin B12 values by category, see 15.2 *Weighted results of biosamples.* About 5.3% of children are below and 2.1% above normal range.

9.4.13 C-reactive protein

CRP is a biomarker of systemic inflammation, relevant for the evaluation of other nutritional biomarkers[161]. Blood CRP measurement was performed in five batches during the main phase of the study by the CHUV's central laboratory, using immunoturbidimetry on plasma-lithium-heparin matrix. Normal values were defined according to Singh B. et al.[162] as <3mg/L. Values between 3mg/L and 10mg/L, are considered minor elevation, which may be related to chronic conditions such as obesity, sedentary lifestyle, diabetes or cigarette smoking, as well as to minor infections (e.g. common cold) or certain genetic factors. Values between 10 and 100 mg/L are considered moderate elevation and tend to reflect systemic inflammation linked to conditions such as autoimmune diseases, malignancies, infections, or myocardial infarction. Values above 100mg/L, are considered marked elevation and are more common in severe acute viral or bacterial infections, or major trauma[162]. Of note, all observations under the detection limit (0.6mg/L), were replaced by this value.

Key CRP results are presented in Table 9.30, Table 9.31 and Figure 9.18.

Table 9.30: Distribution of CRP values

	Min	Max	N	Missing
CRP (mg/L)	0.60	49.00	820	28

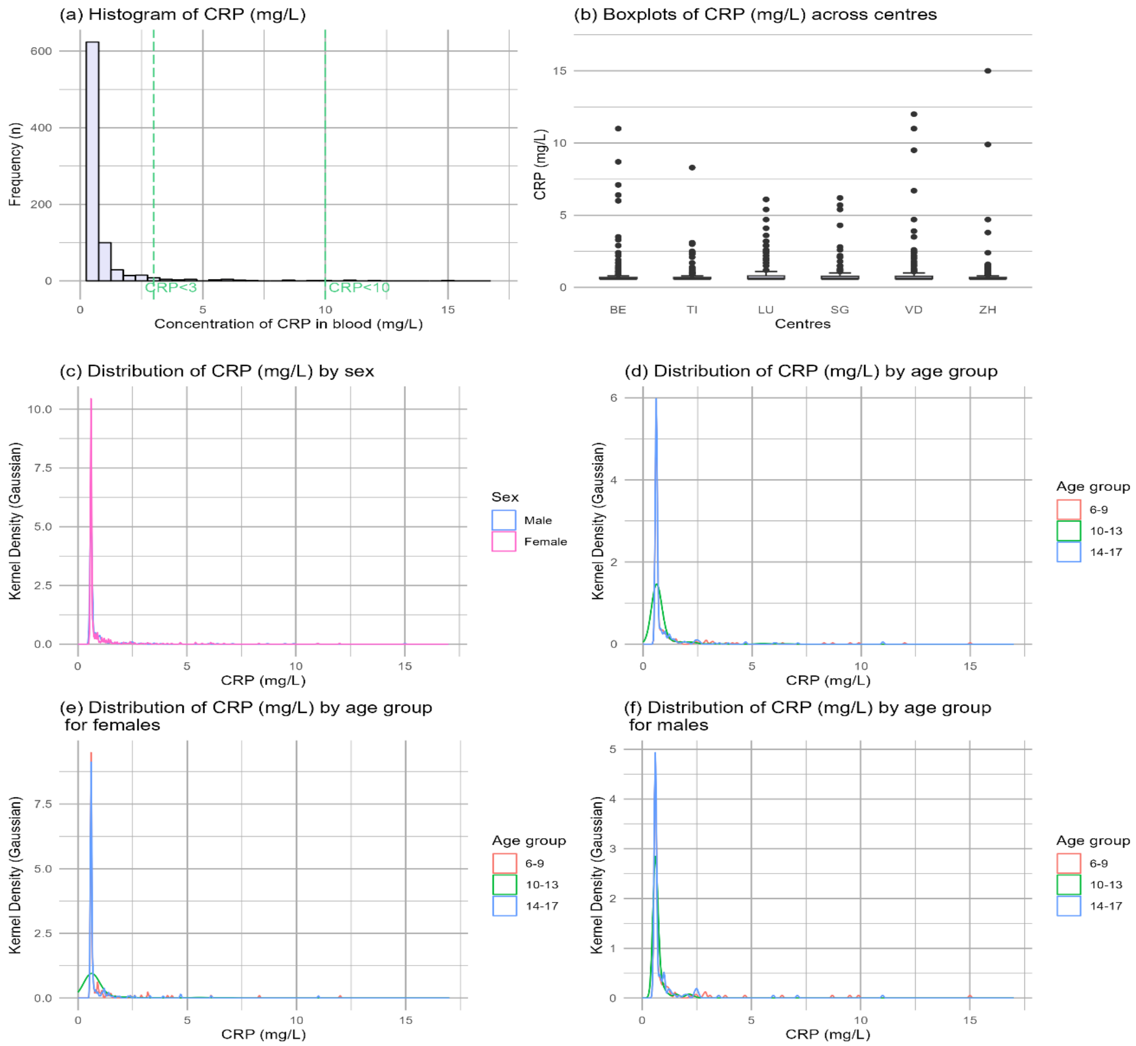
Min: minimum value, Max: maximum value, Missing: number of missing values.

Table 9.31: Out of range values for CRP

N out of range
CRP]3;10[mg/L: 28
CRP ≥ 10 mg/L: 5

N out of range: number of samples out of the normal range.

Figure 9.18 Distribution of CRP: stratified by centre, sex and age group



Normal range: CRP below 10 mg/L.

Figure 9.18a) shows the distribution of CRP among participants. No statistically significant difference is observed across study centres (Figure 9.18b)), between sexes (Figure 9.18c)), or age groups (Figure 9.18d), e), f)). Most participant had no inflammation, although a few presented a minor or moderate inflammation (value above 3mg/L or 10mg/L[162]). Of note, there was one value at 49mg/L, a participant who felt sick (headache, vomiting) the day before the interview, which was excluded from the graphs above.

Weighted mean CRP

The mean CRP value, after weighting to match the population margins, is 1.01 mg/L (SD 1.67). Normal values are defined as < 3mg/L. Of note, as a high proportion of the values are under the detection limit (0.6 mg/L) and replaced by it, while on the other hand impacted by very high values, the mean value might not be exact. For detailed weighted mean CRP values by category, see 15.2 *Weighted results of biosamples*. After weighting to match the population margins, 0.9% are above 10 mg/L (moderate inflammation).

9.4.14 Blood β-carotene

Green and orange vegetables are the main food sources of β-carotene[163]. Serum concentrations were assessed. The analysis was performed in five batches during the main phase, at the SNHf laboratory on serum matrix (UV-spectrophotometry). The normal range used was defined according to Schüpbach et al, 2017[159] and was 600-4700 nmol/L.

Key β-carotene results are presented in Table 9.32, Table 9.33 and Figure 9.19.

Table 9.32: Summary statistics for β-carotene

	Mean	SD	Median	IQR	Min	Max	N	Missing
Serum β-carotene (nmol/L)	2 685.78	938.07	2 543.40	1 089.85	300.00	7 446.00	811	37

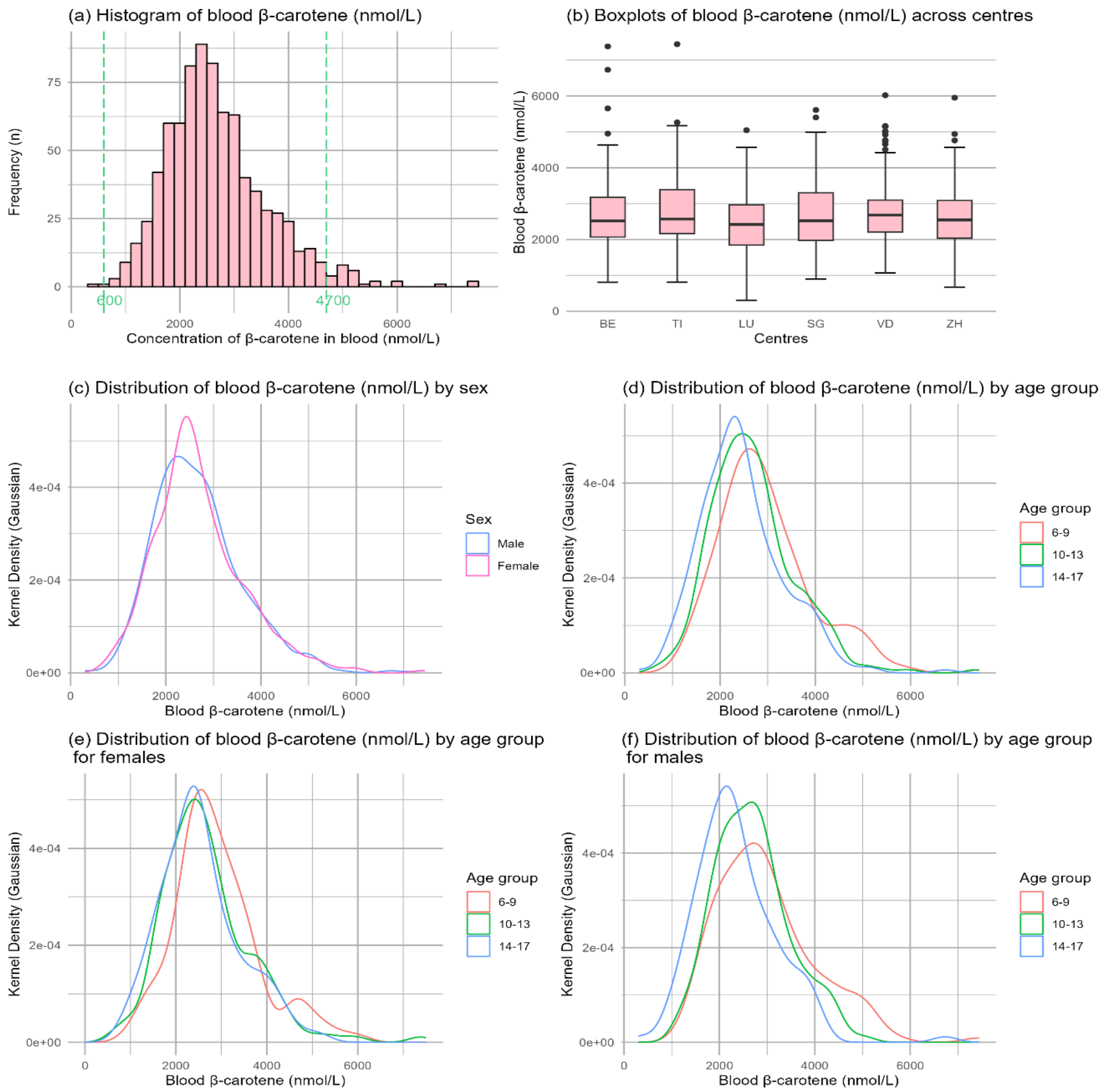
SD: standard deviation, IQR: interquartile range (P75-P25), Min: minimum value, Max: maximum value, Missing: number of missing values, Out of range: number out of the normal range.

Table 9.33 Out of range values for β-carotene

N out of range	Below threshold	Above threshold
27	1	26

N out of range: number of samples out of the normal range

Figure 9.19 Distribution of blood β-carotene: stratified by centre, sex and age group



Normal range: between 600 and 4700 nmol/L.

Figure 9.19a) shows the distribution of β-carotene among participants. No statistically significant difference is observed across study centres (Figure 9.19b)) or between sexes (Figure 9.19c)). There is a statistically significant difference between age groups (Kruskal-Wallis non-parametric test, $p<0.001$), with participants in the youngest age group presenting the highest values, followed by a decrease with increasing age (Figure 9.19d), e), f)).

Weighted mean β-carotene

The mean β-carotene value, after weighting to match the population margins, is 2 658.86 nmol/L (SD 963.72). The normal range is 600-4700 nmol/L.[159] For detailed weighted mean β-carotene values by category, see 15.2 *Weighted results of biosamples*. About 0.1% of children are below and 3.4% above normal range.

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11 Annexes Chapters 1-5

11.1 Weighting strategy details

Three sets of weights were developed to make the participant sample comparable to the Swiss population. The first set was calculated for participants who attended the on-site visit (N = 1 852 participants), the second set was for those who consented to blood sample collection (N = 848 participants) and the third for all participants with a questionnaire, including those without an on-site visit (N = 1 935). The weight calculation process was similar for all sets of weights and can be summarised in four steps.

In the first step, sampling weights were calculated to reflect the sampling methodology. The sampling was conducted in four waves across 18 strata (six centres by three age groups), with population totals available for each stratum at each wave. To simplify the weight calculation, data from the four waves were pooled and an average sampling frame was calculated by averaging the population totals over the four waves. The sampling weights were defined as the inverse of the inclusion probabilities, which were assumed equal for all individuals within the same stratum. The inclusion probabilities were defined as the ratio of the total number of individuals invited to participate in a given stratum to the size of the average sampling frame for that stratum.

The second step involved correcting the sampling weights obtained at step one for non-response. This adjustment was achieved by modelling the response probability based on variables that were used to define the strata (i.e. age group and study centre) as well as sex, nationality, household size, and Swiss-SEP quintiles[48] using a logistic regression model. Initially, all predictors and their pairwise interactions were included in the model. A backwards elimination process based on the Bayesian Information Criterion (BIC)[164] was then applied to refine the model, retaining only those predictors and interactions whose removal would result in a higher BIC (indicating a poorer fit). The predicted response probabilities from the final model were then analysed using a hierarchical clustering algorithm (k-means) to build up to five homogeneous response groups. The common response probability in each group was calculated as the weighted average of the participation indicator (1 for participants, 0 for non-participants) for all individuals in the group, using the sampling weights obtained at the first step. The weights corrected for non-response were then computed as the ratio of the sampling weights obtained in step one to the common response probability for each individual's group (defined by k-means).

In the third step, the weights obtained after non-response correction were used to calibrate the sample to align with population totals for design and auxiliary variables through a raking procedure executed in two phases[165]. First, a preliminary calibration was performed to align the sample with population totals for the 7 major regions of Switzerland. The resulting weights were then adjusted for the remaining variables: sampling strata (18 categories which combine age groups and study centres), age (separate years), sex, nationality, household size, Swiss SEP quintiles, and season. The process was then repeated until convergence. This sequential calibration approach was adopted because the raking algorithm often had difficulty converging when both the 18 strata and the 7 major regions of Switzerland were included simultaneously, as the strata information (which includes the area around the study centre) is largely colinear with the regional information. This method ensured that the strata margins were matched while still achieving adequate calibration for the regions. Note that the four seasons were defined based on the month of the visit with winter covering the months December to February. The margins for each season were calculated by dividing the size of the average sampling frame by four. To account for difference in dietary intake during the week, the day of the week was used as an additional auxiliary variable in the calibration process for the first set of weights only (participants who attended the on-site visit and had 2x24HDR). The day of the week was categorized into three groups (week=Monday to Thursday, weekend=Friday to Sunday, mix of both) based on the days of the first and second 24HDRs. Participants with a single 24HDR were allocated to the "week" or "weekend" categories based on the day of their unique 24HDR. The margins for the day of the week were obtained by multiplying the size of the average sampling frame by 16/49 (week), 9/49 (weekend) or 24/49 (mix), corresponding to the combinations of ordered pairs of days of the two weeks falling into each category.

Finally, the last step involved trimming excessively large weights that could adversely affect the variance of the weighted estimator. A trimming limit was set at the median plus five times the interquartile range of the weights. Any weight exceeding this limit was capped at the limit, and the remaining weights were adjusted proportionally to ensure the sum of the weights still equals the size of the sampling frame. When weight trimming was necessary, the calibration process (step three) was repeated on the trimmed weights to ensure proper calibration. This process of weight trimming and calibration was carried out sequentially until no weight exceeded the trimming limit.

A rescaling bootstrap procedure based on the approach proposed by Rao and Wu (1988) was used to build 1000 replicates for each set of weights[166]. These replicates were used to calculate the variance of the weighted estimators while accounting for the sampling design.

11.2 Variables used for imputation

Table 11.1 Overview of variables used for imputation

Variable	Variable description
fso_yearofbirth	Participant's year of birth retrieved from the FSO
age_pkg	Participant's age at the day the invitation letter was sent to her/him
fso_householdsizesrph	Number of people living in the participant's household
fso_sex	Participant's sex retrieved from the FSO
fso_maritalstatus	Participant's marital status
fso_nationalitystate	Participant's nationality code
fso_residenceswisszipcode	Participant's Swiss ZIP code of residence retrieved by the FSO
fso_communicationlanguage	Participant's spoken language retrieved by the FSO
fso_communelanguage	Official language of the commune of the participant's commune of living
fso_strate	Participant's age and centre group she / he belonged to
fso_package_no	Package number in which the participant was collocated for participation
fso_typo	Participant's residential area classification by the FSO (urban/peri-urban/rural)
fso_sep_q	SEP quintile of the participant
mk_f2f_weight_final	Participant's weight after the subtraction of the weight of the clothes worn during the measurement
mk_f2f_height	Participant's measured height
mean mk_f2f_abdominal_circ_1 / 2 /3	Participant's mean abdominal circumference from the three measured values
mean mk_f2f_hip_circ_1 1/2/3	Participant's mean hip circumference from the three measured values
mk_f2f_skin_scan_skintyp	Participant's evaluated skin type
mk_f2f_puberty_boy_gd ***or*** **mk_f2f_girl_puberty_bd**	Participant's genital development stage (for boys); Participant's breast development stage (for girls)
mk_f2f_fish_7d___1	Participant's consumption of type salmon fish (salmon, herring, mackerel)
mk_f2f_fish_7d___2	Participant's consumption of other type of fish / white fish (fish sticks, tuna, white fish, unknown)
mk_f2f_fish_7d___3	Participant's consumption of sea food (shellfish, shrimps, …)
mk_f2f_fish_7d___4	Participant does not remember fish consumption or did not consume fish
mck_f2f_outside_week	Participant's average time spent outside per day during the week in hours

mck_f2f_outside_weekend	Participant's average time spent outside per day during the weekend in hours
mean mk_f2f_sbp_1 /2 /3*	Participant's mean measured systolic blood pressure from the last two measured values
mean mk_f2f_dbp_1 /2/3*	Participant's mean measured diastolic blood pressure from the last two measured values
mean mk_f2f_heart_rate_1 / 2 / 3	Participant's mean measures heart rate
mk_f2f_fasting	Participant's fasting status
hba1cs	Participant's HbA1c value (calibration NGSP-DCCT) in %
hba1ci	Participant's HbA1c value (calibration IFCC) in nmol / mol
hb	Participant's haemoglobin value in g / L
ht	Participant's haematocrit value in %
mch	Participant's average corpuscular content in haematocrit in pg
mchc	Participant's average corpuscular concentration in haematocrit in g / L
mcv	Participant's average globular volume in fl
plaq	Participant's blood platelets G / L
rdw	Participant's red cell distribution width in %
ery	Participant's erythrocytes in T / L
leuc	Participant's leucocytes in G / L
pdw	Participant's index of platelets distribution in fl
mpv	Participant's average platelets volume in fl
nrbc	Participant's erythroblasts / 100 leucocytes
chol	Participant's total cholesterol value in mmol / L
chdl	Participant's HDL cholesterol value in mmol / L
ldl	Participant's LDL cholesterol value in mmol / L
tg	Participant's triglycerides value in mmol / L
crp	Participant's CRP value in mg / L
frt	Participant's ferritin value in ug / L
ca	Participant's calcium value in mmol / L
vitd	Participant's vitamin D value in nmol / L
vitb9	Participant's plasma vitamin B9 value in nmol / L
vitb12	Participant's vitamin B12 value in pmol / L
bcar	Participant's β-carotene value in nmol / L
urct	Participant's urine creatinine value in µmol/l
gd_day_int1	Day on which the first GD interview took place

* The mean of the two last measures was used (if only two measures were taken, the mean was used, unless the difference was bigger than 20 mmHg for systolic / 10mmHg for diastolic, in which case only the second measure was taken).

12 Annexes Chapter 6

12.1 Descriptive sociodemographic results (unweighted)

The following results are descriptive results and are not weighted to match the population margins.

12.1.1 Children: Siblings and other children living with target child

Table 12.1 Mean number of siblings per age group

Age group	Mean number of siblings
6-9 years	1.3
10-13 years	1.3
14-17 years	1.4
Overall	**1.3**

Question: How many other children (e.g. brother/sister, half-brother/half-sister, cousin, etc.) live with [FIRST NAME CHILD] most of the time? Question was exclusively answered by parents.

Table 12.1 shows the mean number of siblings living with the target child, broken down by age group of the target child. When including the target child, the mean number of children living in the household is 2.3.

Table 12.2 Number and percentage distribution of other children living with target child

Number of children living with target child	N (%)
0	193 (10.5%)
1	1 011 (54.9%)
2	495 (26.9%)
3	121 (6.6%)
4	13 (0.7%)
5	5 (0.3%)
6	1 (0.1%)
10	2 (0.1%)
Total	1 841 (100%)

Question: How many other children (e.g. brother/sister, half-brother/half-sister, cousin, etc.) live with [FIRST NAME CHILD] most of the time? Question was exclusively answered by parents.

Table 12.2 shows the number of children living in the same household as the target child. Most families include one additional child besides the target child (54.9%), followed by those with two additional children (26.9%). In 10.5% of cases, the target child is the only child in the household.

Figure 12.1 Number of children living in the household stratified by age group

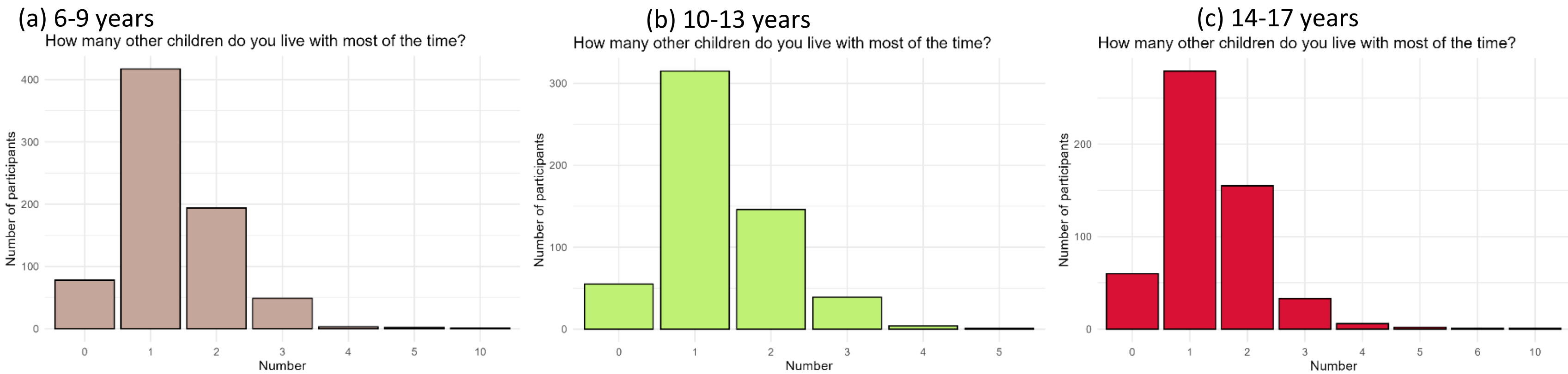
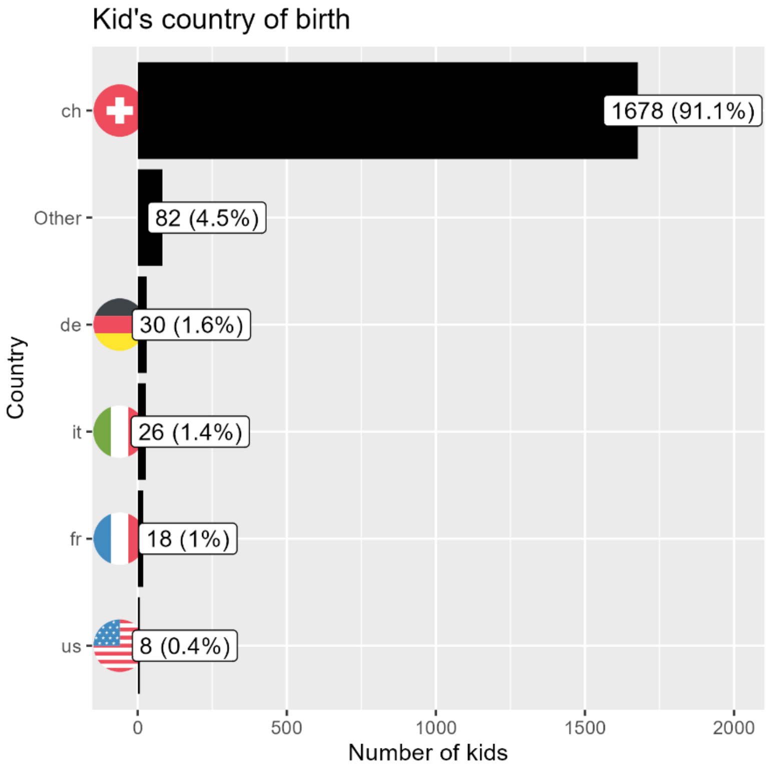


Figure 12.1 shows the number of other children living in the household alongside the target child by age group of the target child. The graphs show that the majority of participants live with one other child.

12.1.2 Children: Country of birth

Figure 12.2 Percentage distribution of participant's country of birth



Question: In which country was [FIRST NAME CHILD] born? Question was exclusively answered by parents. N= 1 842. Missing answers: 18.

Figure 12.2 shows the participating child's country of birth. The figure shows that the majority of participants is born in Switzerland (91.1%).

12.1.3 Sex/Gender of participants

Table 12.3 Number and percentage distribution of sex and identified gender of participants, stratified by sex and age group

	What sex was assigned to you when you were born?				Do you identify as ...				
	Males	Females	Other	No Answer	A boy/ young man	A girl/ young woman	Non-binary	Other	No Answer
Females	**0**	**938 (100%)**	**0**	**0**	**1 (0.1%)**	**931 (99.3%)**	**1 (0.1%)**	**5 (0.5%)**	**0**
6-9 years	0	372 (100%)	0	0	0	370 (99.5%)	1 (0.3%)	1 (0.3%)	0
10-13 years	0	273 (100%)	0	0	1 (0.4%)	272 (99.6%)	0	0	0
14-17 years	0	293 (100%)	0	0	0	289 (98.6%)	0	4 (1.4%)	0
Males	**906 (100%)**	**0**	**0**	**0**	**902 (99.6%)**	**1 (0.1%)**	**0**	**3 (0.3%)**	**0**
6-9 years	372 (100%)	0	0	0	371 (99.7%)	0	0	1 (0.3%)	0
10-13 years	287 (100%)	0	0	0	286 (99.7%)	0	0	1 (0.3%)	0
14-17 years	247 (100%)	0	0	0	245 (99.2%)	1 (0.4%)	0	1 (0.4%)	0

Question: What sex was assigned to [FIRST NAME CHILD]/you when he/she/you was/were born? Does [FIRST NAME CHILD]/do you identify as …Question was answered by parents for children aged 6-13 years. Question was answered by adolescent for children aged 14-17 years. Content of cells: N (%).

Table 12.3 indicates that the majority of participants identify with the sex assigned to them at birth. A small proportion identify as a different gender, including non-binary or other identities.

12.1.4 Household's parental status

Table 12.4 Percentage distribution of child's living situation

Child's living situation	N (%)
Living with both parents	1 616 (87.8%)
Other	224 (12.2%)
Total	1 840 (100%)

Question: What is [FIRST NAME CHILD]'s situation in respect of your household? Does [FIRST NAME CHILD] live with … Question was exclusively answered by parents.

Table 12.4 shows the child's situation in respect of the household. The results show that the majority of participants live with both parents (87.8%).

Table 12.5 Percentage distribution of relationship of adult answering (part of) the questionnaire with the participating child

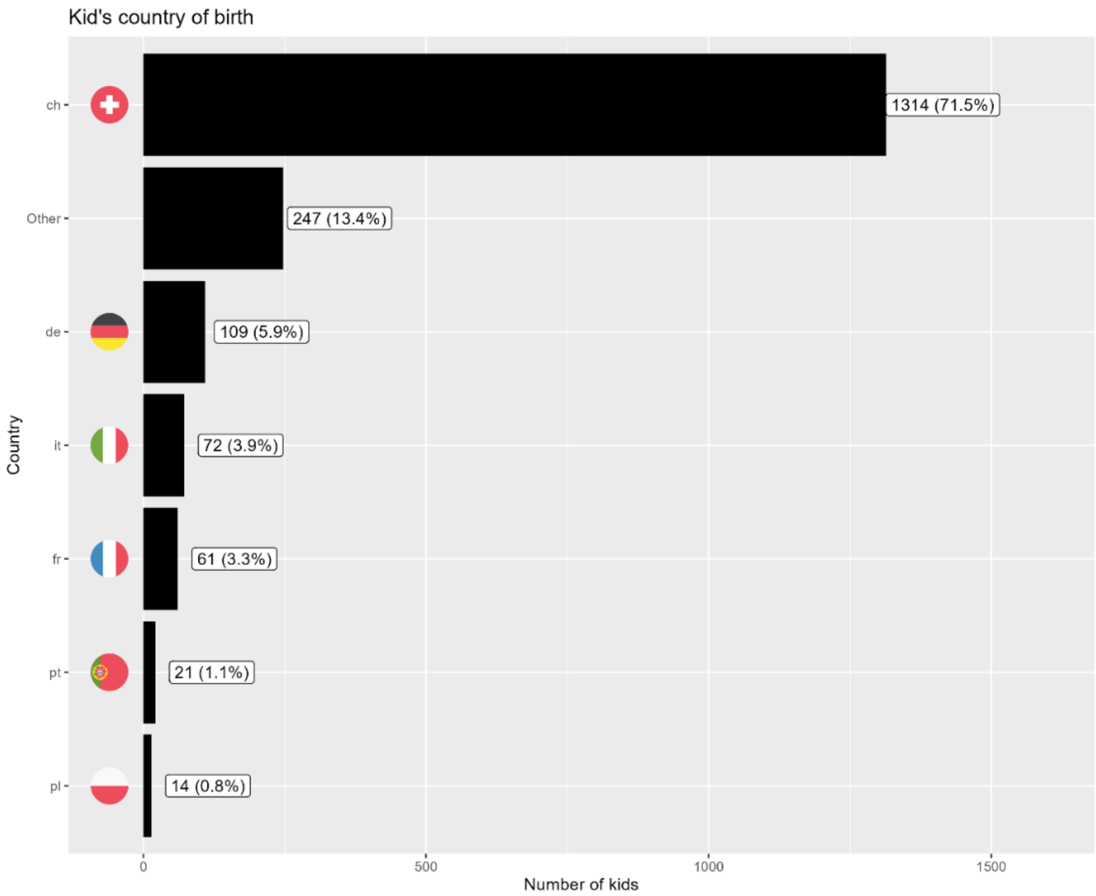
Relationship with target child	N (%)
of respondents are biological mothers.	1 477 (80.3%)
of respondents are biological fathers.	342 (18.6%)
of respondents are adoptive mothers.	7 (0.4%)
of respondents are adoptive fathers.	3 (0.2%)
of respondents are stepmothers.	0 (0%)
of respondents are stepfathers.	2 (0.1%)
of respondents are foster mothers	2 (0.1%)
of respondents are foster fathers	1 (0.1%)
of respondents are grandparents	0 (0%)
Other	5 (0.3%)
Total	1 839 (100%)

Question: Please indicate your relationship with [FIRST NAME CHILD] (select as appropriate). Question was exclusively answered by parents.

Table 12.5 shows the relationship between the adult answering (part of) the online questionnaire with the participating child. The majority of responding adults are biological mothers (80.3%), followed by biological fathers (18.6%).

12.1.5 Parents: Place of birth

Figure 12.3 Percentage distribution of parent's place of birth



Question: In which country were you born? In which country was your spouse/partner born? Question was exclusively answered by parents. N= 1 838. Missing answers: 18

Figure 12.3 shows parents' place of birth, in absolute and relative numbers. Overall, 71.5% of parents are born in Switzerland, and 28.4% are born abroad.

12.1.6 Parents: Education

Table 12.6 shows the score of education according to the FSO classification.

Table 12.6 Score of education (FSO classification)

Score	Description
1	I did not go to school or complete compulsory schooling
1	I completed compulsory schooling, 10th school year, pre-apprenticeship or internship
2	Apprenticeship / Federal Diploma of Vocational Education and Training or vocational school (no Federal Vocational Baccalaureate)
2	Baccalaureate, Federal Vocational Baccalaureate after a Federal Diploma of Vocational Education and Training, upper-secondary level commercial school or upper-secondary specialised school
3	Professional education with Advanced Federal Diploma of Higher Education or Federal Diploma of Higher Education
3	University of teacher education or university of applied sciences
3	University or institute of technology: Bachelor's, Master's, Doctorate

Table 12.7 shows the mean score of parental education based on the classification above, which is calculated for both parents. For 55.6% of parents and their partners, the mean score of education is 3, for 22.6% it's 2.5 and for 17.1% it's 2.

Table 12.7 Mean score of parental education

FSO score	N (%)
1	43 (2.3%)
1.5	44 (2.4%)
2	315 (17.1%)
2.5	415 (22.6%)
3	1 022 (55.6%)
Total	1 839 (100%)

Question: What is the highest level of education/training you have achieved? What is the highest level of education/training achieved by your spouse/partner? Question was exclusively answered by parents. Score is based on the FSO classification.

12.1.7 Parents: Paid profession, professional status and situation

Table 12.8 Number and percentage distribution of parents reporting paid work

Paid work	N (%)
No	313 (9%)
Yes	3 172 (91%)
Total	3 485 (100%)

Question: Do you have one or more regular professional activities for which you are paid? Does your spouse/partner have one or more regular professional activities for which they are paid? Question was exclusively answered by parents.

Table 12.9 Number and percentage distribution of households paid working situation

Working situation	N (%)
Two working	1 373 (74.6%)
One working, one not working	249 (13.5%)
One working + no response	177 (9.6%)
One not working + No response	18 (1%)
Two not working	23 (1.2%)

Table 12.8 and Table 12.9 show the number of parents and their partner/spouse having one or more regular professional activities for which they are paid. Most parents and their partners report having paid work (91%), with 74.6% being both doing paid work.

Table 12.10 Number and percentage distribution of parent and partner/spouse's professional status

Professional status	N (%)
Apprentice	5 (0.2%)
Unskilled worker, labourer with no training	131 (4.1%)
Self-employed with small business, craftsman, farmer, garage owner	166 (5.2%)
Skilled worker with qualification (Federal Diploma of Vocational Education and Training) or qualified employee (e.g.: electrician, commercial employee, hairdresser)	728 (22.9%)
Self-employed liberal professional (e.g.: doctor, lawyer, architect)	193 (6.1%)
Employee with higher-level qualification/university qualification (e.g.: teacher, journalist, nurse, engineer)	1 070 (33.7%)
Mid-level/higher-level management (e.g.: office manager or group head)	709 (22.3%)
Managing director, senior manager, senior public official	172 (5.4%)
Total	3 174 (100%)

Question: What is your current professional situation? Question was exclusively answered by parents.

Table 12.10 shows the parent and partner/spouse's professional status in both absolute and relative numbers. The results are merged for both parents (i.e. the responding parent and the partner, if any), which means there are more answers than participating children (almost twice as much). The majority of parents are employees with higher-level qualification (33.7%), followed by skilled workers with qualification (22.9%) and mid-level/higher-level management personnel (22.3%).

Table 12.11 Number and percentage distribution of non-professional situation parent and partner/spouse

Non-professional situation	Yes, n (%)	No, n (%)	Total n (%)
Student/Doctorate student	42 (1.2%)	3 448 (98.8%)	3490 (100%)
In continuing training/education	193 (5.5%)	3 297 (94.5%)	3490 (100%)
Stay-at-home parent	1 122 (32.1%)	2 368 (67.9%)	3490 (100%)
In military/civilian service	5 (0.1%)	3 485 (99.9%)	3490 (100%)
Retired (OASI)	20 (0.6%)	3 470 (99.4%)	3490 (100%)
Disability pension recipient (IV or SUVA)	22 (0.6%)	3 468 (99.4%)	3490 (100%)
Unemployed/jobseeker	67 (1.9%)	3 423 (98.1%)	3490 (100%)
Volunteer or unpaid worker in family business	302 (8.7%)	3 188 (91.3%)	3490 (100%)
None	2 047 (58.7%)	1 443 (41.3%)	3490 (100%)

Question: Do any of the following situations apply to you? Question was exclusively answered by parents. Giving several answer options was possible and was asked additionally to the question about professional status (e.g., employee + student).

Table 12.11 shows the number of mentions of non-professional situations of both parent and partner/spouse merged. This question was asked independently of the working or professional situation. The table shows that the majority of parents and their partners selected the item “none of the situations apply” (58.7%), followed by “stay-at-home parent (32.1%)” and “volunteer or unpaid worker in family business” (8.7%). Several answers were possible.

Table 12.12 Number and percentage distribution of workload percentage of paid work of parents and partner/spouse

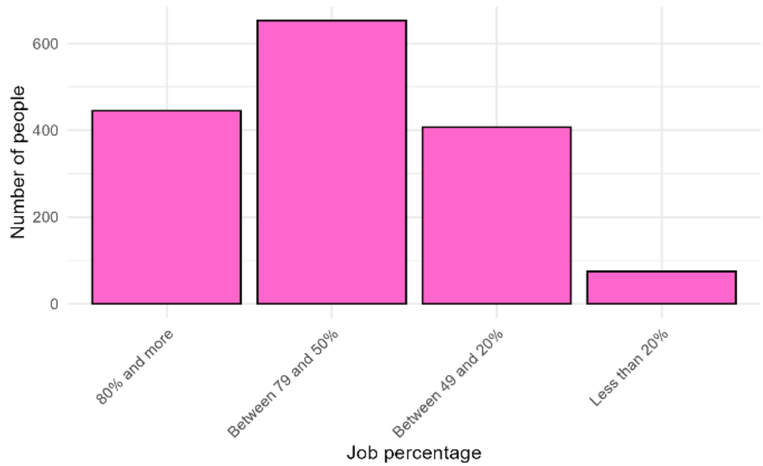
% Paid work	Women	Men	Overall
80% and more	445 (28.2%)	1 463 (91.8%)	**1 908 (60.1%)**
Between 79 and 50%	653 (41.3%)	102 (6.4%)	**755 (23.8%)**
Between 49 and 20%	407 (25.8%)	18 (1.1%)	**425 (13.4%)**
Less than 20%	75 (4.7%)	11 (0.7%)	**86 (2.7%)**
Total	**1 580 (100%)**	**1 594 (100%)**	**3 174 (100%)**

Question: What percentage of a normal working week do you work? What percentage of a normal working week does your spouse/partner work? Question was exclusively answered by parents.

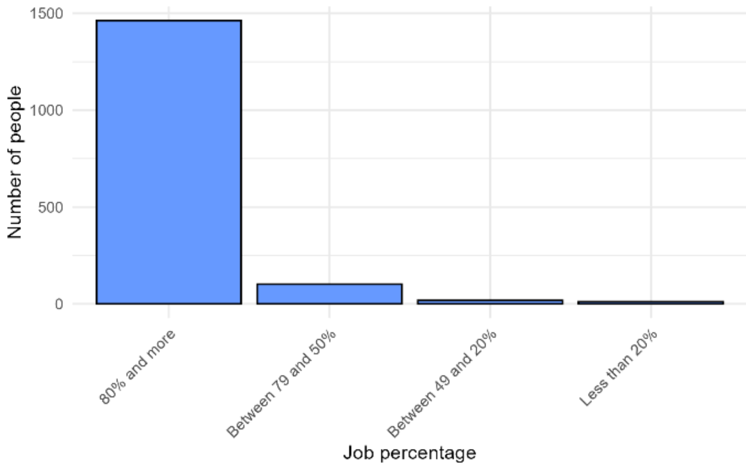
Table 12.12 and Figure 12.4 show the workload percentages of paid work of both parents and partner/spouse. It can be observed that altogether the majority of parents work 80% and more (60.1%). The majority of men work 80% and more (91.8%), whereas the majority of women work between 50% and 79 % (41.3%).

Figure 12.4 Number of paid working percentages of parents and partner/spouse, stratified by sex

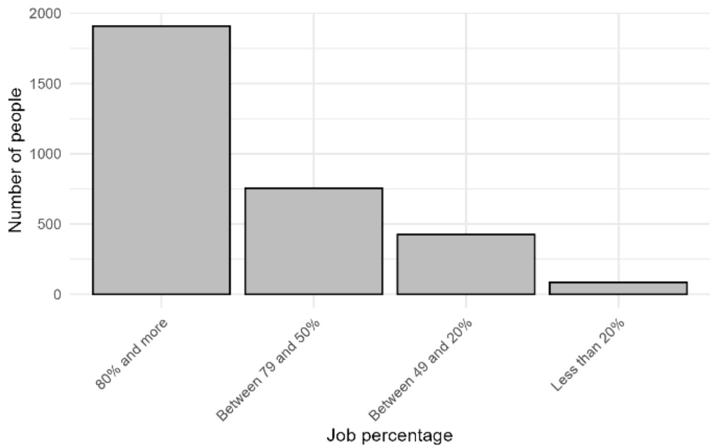
(a) Paid working percentage of women



(b) Paid working percentage of men



(c) Paid working percentage of women and men



12.1.8 Parents: BMI

Table 12.13 Number and percentage distribution of BMI of parents, stratified by sex

	Mean BMI (kg/m^2)	Underweight n (%)	Normal n (%)	Overweight n (%)	Obese n (%)	Total n (%)
Woman – Age range (31-56)	23.69	75 (4.2%)	1 195 (66.1%)	393 (21.7%)	144 (8%)	1 807 (100%)
Man – Age range (37-64)	25.68	7 (0.4%)	789 (47.4%)	682 (40.9%)	188 (11.3%)	1 666 (100%)
Overall – Age range (31-64)	**24.65**	**82 (2.4%)**	**1 984 (57.1%)**	**1 075 (31%)**	**332 (9.6%)**	**3 473 (100%)**

Question: How much do you weigh? How tall are you? How much does your partner/spouse weigh? How tall is your partner/spouse? Question was exclusively answered by parents.

Table 12.13 shows the mean BMI of the adult answering (part of) the questionnaire and of their partner/spouse's. The Mean BMI is 24.65, most parents have a normal body weight (57.1%), followed by parents being overweight (31%) and obese parents (9.6%).

12.2 Weighted results of the online questionnaire

The following results were weighted to match the population margins.

12.2.1 Early life: Weight and height at birth

Table 12.14 Mean and median weight and height at birth

	Weight at birth (g)	Size at birth (cm)
Mean (standard deviation)	3308 (604)	49.6 (3.8)
median [interquartile range]	3315 [3315, 3650]	50 [48, 51]

Question: How much did [FIRST NAME CHILD] weigh at birth? What size was [FIRST NAME CHILD] at birth (i.e. length)? Question was exclusively answered by parents.

Table 12.14 shows the mean and median birth weight and length. Mean birth weight and length were 3 308 g and 49.6 cm, respectively.

12.2.2 Food insecurity and healthy eating

Diet quality

Table 12.15 Distribution of perception of diet (%), overall and stratified by parents' and adolescents' opinions, sex, age group and linguistic region

	Balanced	Fairly balanced	Fairly unbalanced	Unbalanced
Parents' opinion				
6-9 years				
Females	30.7%	56.9%	12.4%	0%
Males	31.8%	56.7%	10.1%	1.3%
10-13 years				
Females	30.9%	53.9%	13.8%	1.3%
Males	28.9%	53.9%	16.3%	0.9%
14-17 years				
Females	25%	57.9%	13%	4.1%
Males	18.7%	60.7%	17.4%	3.2%
Regions				
DE	28.6%	54.8%	15%	1.5%
FR	28.5%	59.9%	9.1%	2.5%
IT	15.7%	70.5%	11.7%	2.1%
Overall	**28%**	**56.5%**	**13.8%**	**1.7%**
Adolescent's opinion				
14-17 years				
Females	23.9%	53.1%	17.9%	5.1%
14-17 years				
Males	21.7%	52.2%	23.9%	2.3%
Regions				
DE	25%	50%	21%	4%
FR	16%	58.5%	22.5%	3.1%
IT	16.8%	66.3%	15.7%	1.2%
Overall	**22.7%**	**52.6%**	**21%**	**3.7%**

Question: In general, do you think [FIRST NAME CHILD]'s diet is…. /your diet is … Question was answered by parent for children aged 6-13 years. Question was answered by both parent and adolescent for children aged 14-17 years.

Table 12.15 describes the perception of the child's diet, as reported by parents for younger children, and by both parents and adolescents for those aged 14 and above. The distribution of responses is consistent across age groups, but varies by sex, with females reporting a more positive perception of their diet compared to males. A comparison across linguistic regions reveals that people from the German-speaking region are more likely to perceive their diet as "balanced" than those from the French and Italian-speaking regions.

12.2.3 Dietary habits

Place of consumption for lunch

Table 12.16 Distribution of lunch setting on weekdays (%), overall and stratified by age group

	Never	1 day a week	2 days a week	3 days a week	4 days a week	5 days a week	Proportion of lunches eaten in a given place
At home (your house or that of a close relative)							
6-9 years	5.3%	7.4%	13.6%	17.4%	14.1%	42.1%	64.8%
10-13 years	3.7%	13.4%	8.9%	13.8%	16.8%	43.3%	64.8%
14-17 years	27.1%	12.7%	16.9%	7%	13%	23.3%	37.2%
Overall	**11.3%**	**11.1%**	**12.9%**	**13%**	**14.7%**	**36.9%**	**55.6%**
at someone else's house							
6-9 years	84.8%	10.7%	2.7%	1%	0.4%	0.3%	4.0%
10-13 years	82.8%	13.2%	2.4%	0.4%	1.1%	0.2%	4.4%
14-17 years	88.3%	8.6%	1.4%	0.2%	0.6%	1%	3.0%
Overall	**85.2%**	**10.9%**	**2.2%**	**0.6%**	**0.7%**	**0.5%**	**3.8%**
at the school canteen (e.g.: school meals)							
6-9 years	46%	13%	15.6%	12.9%	6.4%	6%	25.3%
10-13 years	58.6%	13%	11.6%	7.9%	5.7%	3.2%	17.9%
14-17 years	54.5%	11.2%	9.8%	7.5%	6.3%	10.8%	20.8%
Overall	**53%**	**12.4%**	**12.4%**	**9.5%**	**6.1%**	**6.5%**	**21.3%**
during cookery lessons at school							
6-9 years	99.9%	0%	0%	0%	0%	0.1%	0.0%
10-13 years	90.1%	9.8%	0%	0%	0%	0.1%	1.8%
14-17 years	83.7%	16.1%	0%	0%	0%	0.2%	2.6%
Overall	**91.6%**	**8.3%**	**0%**	**0%**	**0%**	**0.1%**	**1.5%**
by eating out*							
6-9 years	92.5%	6.8%	0.8%	0%	0%	0%	1.5%
10-13 years	85.4%	12.3%	1.8%	0.4%	0%	0.1%	3.2%
14-17 years	44.6%	29.8%	12.3%	6.6%	3.7%	3%	16.3%
Overall	**75.6%**	**15.6%**	**4.6%**	**2.1%**	**1.1%**	**0.9%**	**7%**
by eating a packed lunch brought from home							
6-9 years	92.2%	2.9%	2.2%	0.1%	0.4%	2.2%	3.7%
10-13 years	82.4%	9.4%	2.1%	2.9%	2.1%	1.2%	6.6%
14-17 years	54.5%	16.7%	6.8%	7.4%	8.7%	5.8%	18.4%
Overall	**77.4%**	**9.3%**	**3.6%**	**3.3%**	**3.5%**	**2.9%**	**9.5%**
Other, please specify:							
6-9 years	97.8%	1.9%	0.1%	0.1%	0%	0.1%	0.5%
10-13 years	97.7%	0.7%	0%	0.9%	0%	0.7%	1.3%
14-17 years	94.5%	3.6%	0.5%	0.4%	0.4%	0.5%	1.6%
Overall	**96.8%**	**2%**	**0.2%**	**0.5%**	**0.1%**	**0.5%**	**1.1%**

*Question: On weekdays, how often does [FIRST NAME CHILD]/do you have lunch… *something purchased from a take-away, a restaurant, supermarket, baker's, fast food outlet or food truck. Question was answered by parents for children aged 6-13 years. Question was answered by adolescent for children aged 14-17 years. The proportion of lunches eaten in a given place corresponds to the number of lunches over 5 weekdays eaten in a particular setting divided by the total amount of lunches, weighted.*

Table 12.16 shows that the majority of young people eat lunch at home during weekdays (36.9% five days a week), followed by those who eat at the school canteen (5.7% five days a week) and those who bring lunch from home (6.5% five days a week). Younger children eat at home more regularly than adolescents, who tend to bring food from home, eat at the school canteen or eat out more often.

Meal preparation

Table 12.17 Distribution of children's involvement in meal preparation (%), overall and stratified by age group

	Every day	Several times a week	Several times a month	Rarely
6-9 years	0.4%	12.9%	41.5%	45.2%
10-13 years	1.4%	17.4%	38.6%	42.7%
14-17 years	4.5%	38.3%	31.6%	25.6%
Overall	**2%**	**22.1%**	**37.5%**	**38.4%**

Question: How frequently does [FIRST NAME CHILD]/do you prepare or help prepare meals? Question was answered by parents for children aged 6-13 years. Question was answered by adolescent for children aged 14-17 years.

Table 12.17 shows that the majority of young people rarely prepare or assist in preparing meals (38.4%), followed by those who report helping several times a month (37.5%), several times a week (22.1%) and a small proportion who do so daily (2%). A comparison across age groups shows that older children tend to be more involved in meal preparation.

12.2.4 Food allergies and special dietary regimens

Food allergies and intolerances

Table 12.18 Food allergies and intolerances (%), distribution by allergy type, overall and stratified by age group

	No, no known allergies or intolerances	Yes	Milk and dairy products	Eggs	Certain fruits and/or vegetables (not celery)	Celery	Cereals containing gluten (e.g.: wheat, spelt, barley)	Nuts (e.g.: walnuts, hazelnuts)	Peanuts	Fish and/or seafood	Soya
6-9 years	91.2%	8.8%	27.6%	0%	5.1%	0%	1.5%	23.6%	7.4%	14%	0%
10-13 years	85.3%	14.7%	45.6%	6.5%	16.8%	4%	10.6%	17.3%	6.1%	2.8%	1.7%
14-17 years	88.8%	11.2%	30.5%	0.7%	22.6%	0.6%	4.2%	10.7%	7.8%	10.8%	6.5%
Overall	**88.4%**	**11.6%**	**36.4%**	**3.1%**	**15.4%**	**1.9%**	**6.3%**	**17%**	**6.9%**	**8.1%**	**2.6%**

Question: Does [FIRST NAME CHILD]/do you avoid certain foods because of allergies and/or intolerances? Question was answered by parents for children aged 6-13 years. Question was answered by adolescent for children aged 14-17 years.

A first question was asked on whether they had an allergy or not (two first columns). If they answered yes, the different types of allergies were shown and they could answer yes or no for each one, the percentages thus correspond to the proportion of yes for each allergy and can't be added. A total of 8.16% have another type of allergy, most commonly lactose intolerance, kiwi allergy and pineapple allergy. Table 12.18 shows that the most frequently reported allergy was to milk and dairy products (36.4%), followed by allergies to nuts (17%) and to certain fruits and/or vegetables (except celery) (15.4%). No clear pattern emerges when comparing the age groups.

Table 12.19 Medically diagnosed food allergies and intolerances, overall and stratified by age group

	6-9 years	10-13 years	14-17 years	Overall
No	49.1%	54.1%	73.8%	**58.5%**
Yes	50.9%	45.9%	26.2%	**41.5%**
Lactose intolerance	44.1%	46.2%	10.7%	39%
Coeliac disease	0%	3.1%	9.4%	3.2%
Other	70.2%	53.3%	82.6%	64.1%

Question: Has this allergy and/or intolerance, or have these allergies and/or intolerances been diagnosed by a doctor (e.g.: allergy specialist, gastroenterologist, paediatrician, GP - general practitioner)? What food allergies and/or intolerance/intolerances have been diagnosed by a doctor? Question was answered by parents for children aged 6-13 years. Question was answered by adolescent for children aged 14-17 years.

Table 12.19 shows that the majority of cases were not diagnosed by a medical professional (58.5%). Among all cases diagnosed by a doctor, the majority were other allergies (64.1%), followed by lactose intolerance (39%) and coeliac disease (3.2%). For other allergies, the most frequently mentioned were allergy to nuts and cross-sensitivities to certain fruits such as apples, kiwi, peach or stone fruits.

Vegetarian/vegan diet

Table 12.20 Vegetarian and vegan diet (%), overall and stratified by sex and age group

	Yes, (%)
Vegetarian	
6-9 years	**4.1%**
Females	4.6%
Males	3.6%
10-13 years	**3%**
Females	4.5%
Males	1.6%
14-17 years	**6.5%**
Females	10.8%
Males	2.4%
Overall F	**6.4%**
Overall M	**2.6%**
Overall	**4.4%**
Vegan	
6-9 years	**0.4%**
Females	0.7%
Males	0.1%
10-13 years	**0.8%**
Females	0.9%
Males	0.7%
14-17 years	**2%**
Females	2.3%
Males	1.7%
Overall F	**1.3%**
Overall M	**0.8%**
Overall	**1%**

Question: Is [FIRST NAME CHILD]/are you vegan (diet that does not contain any products of animal origin such as eggs, meat, fish, dairy products, honey)? Is [FIRST NAME CHILD]/are you vegetarian (meaning the diet does not include any meat, poultry or fish but contains dairy products and/or eggs)? Question was answered by parents for children aged 6-13 years. Question was answered by adolescent for children aged 14-17 years.

Table 12.20 shows that more adolescents have a vegetarian/vegan diet, compared to younger children. Across all age groups, females are more likely to report a vegetarian or vegan diet than males.

Weight loss diet

Table 12.21 Specific diet to lose weight in the past 12 months (%), overall and stratified by sex, age group (years) and linguistic region

	No, n (%)	Yes, n (%)
Females		
14-17 years	92.3%	7.7%
Males		
14-17 years	90.2%	9.8%
Regions		
DE	91.1%	8.9%
FR	92.4%	7.6%
IT	88.1%	11.9%
Overall	**91.2%**	**8.8%**

Question: Have you followed a specific diet to lose weight over the past 12 months? Question was answered by adolescent for children aged 14-17 years and exclusively asked to this age group.

Table 12.21 shows that the majority of adolescents do not report following a weight-loss diet in the past 12 months (91.2%). Overall, more people from the Italian part reported following a weight-loss diet.

Additionally 6.1% take medication regularly (e.g. Ritalin, cortisone) that could affect the appetite and/or the body weight. The most frequently mentioned products were: Medikinet®, Ritalin®, Concerta®, Elvanse®, Axotide®, Antibabypille (birth control pill).

12.2.5 Dietary supplements

Table 12.22 Dietary supplements use in the last month (%) and distribution of supplement types (among users), overall and stratified by sex and age group

	Over the past month have you taken any dietary supplements?		Types of dietary supplements (%, among users)							
	No (%)	Yes (%)	Vitamins	Minerals	Preparations combining vitamins and minerals	Omega-3 fatty acids	Plant-based products	Probiotics	Supplements to increase muscle mass and strength	Other
Females										
6-9 years	79%	21%	53.2%	16.5%	26.8%	14.8%	0.6%	4.1%	3.5%	4.8%
10-13 years	80.4%	19.6%	62.9%	47.7%	26.1%	12.9%	2%	8.6%	3.3%	8.3%
14-17 years	67.4%	32.6%	66.1%	64.4%	15.5%	20.8%	11.8%	2.6%	8.3%	8.7%
Males										
6-9 years	75.2%	24.8%	60.9%	33.8%	33.7%	34.6%	7.1%	8.1%	0%	9.3%
10-13 years	81.8%	18.2%	58.4%	36.2%	28.2%	26.9%	5.9%	10.2%	0%	9.8%
14-17 years	67.3%	32.7%	58%	62%	21.6%	20.3%	8.6%	10.8%	53.9%	12.3%
Overall	**75.6%**	**24.4%**	**60.1%**	**45.2%**	**24.8%**	**22.1%**	**6.5%**	**7.3%**	**13.5%**	**9%**

Question: Over the past month has [FIRST NAME CHILD]/have you taken any dietary supplements? What different types of dietary supplements has [FIRST NAME CHILD]/have you taken over the past month? Question was answered by parents for children aged 6-13 years. Question was answered by adolescent for children aged 14-17 years. Note: Several answers possible, thus the number of "yes" is not equal to the sum of supplement types. The % corresponds to yes/no for a certain type of supplement.

Table 12.22 shows that that most young people did not take dietary supplements over the past month (75.6%). The most used were vitamins, minerals or both (60.1%, 45.2% and 24.8%, respectively). No clear patterns emerge when comparing the age and sex groups. The most often mentioned products in category "other" are Echinacea/Echinaforce, Biotin and creatine powder.

Table 12.23 Percentage distribution of dietary supplements taken over the previous winter, overall and stratified by sex and age group

	Over the past winter did you take any dietary supplements?		Types of dietary supplements							
	No	Yes	Vitamins	Minerals	Preparations combining vitamins and minerals	Omega-3 fatty acids	Plant-based products	Probiotics	Supplements to increase muscle mass and strength	Other
Female										
6-9 years	77.2%	22.8%	67.1%	10.9%	27.8%	9.5%	1.2%	6.4%	0%	8.5%
10-13 years	77.7%	22.3%	60.4%	26.2%	31.1%	8.2%	2.8%	7.2%	0%	11.3%
14-17 years	69.9%	30.1%	61.4%	58.7%	18.4%	22.3%	5.6%	2.1%	6.4%	3.1%
Male										
6-9 years	66.9%	33.1%	60.8%	20.3%	37.9%	16.9%	5.4%	5.1%	0%	5.9%
10-13 years	75.4%	24.6%	62.9%	27.6%	30.9%	20.7%	4.5%	7.4%	0%	7.1%
14-17 years	67%	33%	60.9%	51%	12.9%	15.7%	11.7%	5.3%	37%	5.9%
Overall	**72.5%**	**27.5%**	**62.1%**	**32.8%**	**26.7%**	**16%**	**5.5%**	**5.5%**	**7.8%**	**6.8%**

Question: Over the past winter did [FIRST NAME CHILD]/did you take any dietary supplements? What different types of dietary supplements has [FIRST NAME CHILD]/have you taken over the past winter? Question was answered by parents for children aged 6-13 years. Question was answered by adolescent for children aged 14-17 years. Note: Several answers possible, thus the number of "yes" is not equal to the sum of supplement types. The % corresponds to yes/no for a certain type of supplement. Past winter corresponds to winter 2024.

Table 12.23 shows that most young people did not take dietary supplements over the past winter (72.5%). The most used were vitamins, minerals or both (62.1%, 32.8% and 26.7%, respectively). No clear patterns emerge when comparing the age and sex groups. The most often mentioned products in category "other" are Echinacea/Echinaforce, Omega 3 fatty acids, Vitamin D and protein or powder.

12.2.6 Physical activity

Table 12.24 Distribution of physical activity duration (%), stratified by sex, age group and linguistic region

	0 minutes	1 to 15 minutes	16 to 30 minutes	31 to 60 minutes	61 to 120 minutes (1 to 2 hours)	121 to 180 minutes (2 to 3 hours)	More than 180 minutes (more than 3 hours)
Females							
6-9 years							
going to/from school/your apprenticeship (e.g.: walking, by skateboard or by scooter)?	3.8%	47.3%	29.4%	16.5%	2.8%	0.2%	0%
during compulsory physical education classes or optional school sports?	18.4%	0.7%	2.9%	48.8%	23.9%	4.4%	0.9%
during lessons (e.g.: movement in class not including physical education lessons)?	21.1%	45.8%	21.4%	8.7%	2%	0.7%	0.3%
during breaks?	2.1%	37.2%	47.8%	12.2%	0.7%	0%	0%
doing sport outside of school or your apprenticeship (e.g.: in a club or playing with friends)	20.3%	5%	6.6%	25.9%	26.8%	9.8%	5.5%
during other activities (e.g.: housekeeping, gardening)?	24.1%	34.4%	25.6%	10.1%	4.6%	0.9%	0.2%
10-13 years							
going to/from school/your apprenticeship (e.g.: walking, by skateboard or by scooter)?	3.5%	53%	25.3%	13.6%	2.7%	1.8%	0.2%
during compulsory physical education classes or optional school sports?	17.8%	0.7%	1.8%	36.6%	31.8%	9.6%	1.7%
during lessons (e.g.: movement in class not including physical education lessons)?	27.5%	53%	14.5%	3.8%	0.5%	0.2%	0.5%
during breaks?	6.6%	51.9%	32.6%	8.3%	0.4%	0.3%	0%
doing sport outside of school or your apprenticeship (e.g.: in a club or playing with friends)	21.7%	9.9%	7.8%	14.4%	32.3%	7.8%	6.2%
during other activities (e.g.: housekeeping, gardening)?	30.1%	37.5%	21.1%	8.8%	2.1%	0.5%	0%
14-17 years							
going to/from school/your apprenticeship (e.g.: walking, by skateboard or by scooter)?	5.1%	46%	30.1%	14.1%	2.5%	1.1%	1.2%
during compulsory physical education classes or optional school sports?	14.4%	0.2%	4.3%	23.6%	50%	7.3%	0.2%
during lessons (e.g.: movement in class not including physical education lessons)?	40.8%	39.5%	13.6%	4.5%	0.9%	0.2%	0.4%
during breaks?	13.1%	60.5%	20.1%	6%	0.3%	0%	0%
doing sport outside of school or your apprenticeship (e.g.: in a club or playing with friends)	18.6%	7.8%	3.5%	17.6%	34.3%	12.8%	5.3%
during other activities (e.g.: housekeeping, gardening)?	21.4%	31.6%	21.1%	16.8%	5.6%	2.2%	1.2%
Males							
6-9 years							
going to/from school/your apprenticeship (e.g.: walking, by skateboard or by scooter)?	4.2%	47.2%	30.7%	14.5%	3%	0.4%	0%
during compulsory physical education classes or optional school sports?	22.6%	1.9%	5.2%	44.4%	21.8%	2.5%	1.5%
during lessons (e.g.: movement in class not including physical education lessons)?	23.7%	43.5%	19.4%	11.2%	2.1%	0.2%	0%
during breaks?	1.2%	28.3%	60%	9.5%	0.9%	0.1%	0%
doing sport outside of school or your apprenticeship (e.g.: in a club or playing with friends)	16.9%	2.2%	6.2%	22.7%	38.5%	9.2%	4.3%
during other activities (e.g.: housekeeping, gardening)?	26.7%	26.2%	21.8%	17.5%	3.9%	2.2%	1.7%

10-13 years							
going to/from school/your apprenticeship (e.g.: walking, by skateboard or by scooter)?	2%	48.1%	26.5%	20.6%	2.4%	0%	0.4%
during compulsory physical education classes or optional school sports?	17.7%	0.6%	3%	41.2%	28.1%	8.2%	1.2%
during lessons (e.g.: movement in class not including physical education lessons)?	31.1%	48.4%	12.4%	5.7%	1.3%	0.6%	0.5%
during breaks?	3.1%	35.1%	45.2%	11.8%	3.8%	0.9%	0%
doing sport outside of school or your apprenticeship (e.g.: in a club or playing with friends)	19.4%	4.6%	6.2%	19%	37.6%	7.2%	6%
during other activities (e.g.: housekeeping, gardening)?	35.2%	39.4%	11.6%	9.9%	2.3%	0.9%	0.7%
14-17 years							
going to/from school/your apprenticeship (e.g.: walking, by skateboard or by scooter)?	6.2%	36.7%	34.7%	12.5%	5.7%	4.1%	0.3%
during compulsory physical education classes or optional school sports?	16.9%	1.6%	4.7%	26.6%	35.9%	12.7%	1.6%
during lessons (e.g.: movement in class not including physical education lessons)?	45.5%	33.1%	13.8%	5%	1.9%	0%	0.6%
during breaks?	19.7%	45.4%	27.5%	3.9%	2.9%	0.5%	0.2%
doing sport outside of school or your apprenticeship (e.g.: in a club or playing with friends)	18.3%	7.1%	4%	9.7%	39%	12.1%	9.8%
during other activities (e.g.: housekeeping, gardening)?	22.5%	37.8%	22.6%	10.2%	4.5%	1.2%	1.2%
Regions							
DE							
going to/from school/your apprenticeship (e.g.: walking, by skateboard or by scooter)?	2.8%	44.1%	31.9%	16.9%	2.5%	1.5%	0.3%
during compulsory physical education classes or optional school sports?	18.3%	1%	3.1%	38.2%	30.4%	7.6%	1.4%
during lessons (e.g.: movement in class not including physical education lessons)?	28.6%	47%	16.7%	6%	1.3%	0.2%	0.2%
during breaks?	4.3%	41.8%	42.9%	8.8%	1.7%	0.4%	0%
doing sport outside of school or your apprenticeship (e.g.: in a club or playing with friends)	18.2%	6.2%	6.1%	18.5%	35.3%	9.8%	5.9%
during other activities (e.g.: housekeeping, gardening)?	23.2%	35.4%	22.3%	12.7%	3.9%	1.5%	1%
FR							
going to/from school/your apprenticeship (e.g.: walking, by skateboard or by scooter)?	7.6%	57%	17.7%	11.3%	6%	0.1%	0.2%
during compulsory physical education classes or optional school sports?	18.3%	0.7%	5.4%	36.8%	32.2%	6%	0.7%
during lessons (e.g.: movement in class not including physical education lessons)?	40.9%	34.8%	12.5%	8.5%	2.2%	0.6%	0.5%
during breaks?	17.9%	42.8%	29.5%	8.4%	1.1%	0%	0.2%
doing sport outside of school or your apprenticeship (e.g.: in a club or playing with friends)	22.8%	5.7%	5.2%	18.3%	32.9%	8.2%	7%
during other activities (e.g.: housekeeping, gardening)?	41.3%	30.3%	13.9%	10.2%	3.3%	0.9%	0.2%
IT							
going to/from school/your apprenticeship (e.g.: walking, by skateboard or by scooter)?	10.3%	46.4%	32.9%	8.1%	1.8%	0%	0.6%
during compulsory physical education classes or optional school sports?	13.8%	1.1%	5%	28.5%	42.9%	8.1%	0.6%
during lessons (e.g.: movement in class not including physical education lessons)?	34.3%	35.3%	15.6%	9.7%	1.6%	1.2%	2.3%
during breaks?	11.4%	49.5%	28.2%	10.3%	0.6%	0%	0%
doing sport outside of school or your apprenticeship (e.g.: in a club or playing with friends)	21.3%	4.1%	3%	18.6%	33.1%	13.9%	6%
during other activities (e.g.: housekeeping, gardening)?	32.6%	35.8%	16.3%	11.2%	3.2%	0%	0.9%

Question: Over the last normal day when [FIRST NAME CHILD]/you had school/apprenticeship, for how long he/she/you practised a physical activity: … Question was answered by parents for children aged 6-13 years. Question was answered by adolescent for children aged 14-17 years.

Table 12.24 shows that “sport outside of school or apprenticeship” accounts for the largest proportion of physical activity time. Physical activity on the way to/from school usually contributes for about 1 to 30 minutes, and the same applies to physical activity during breaks. Compulsory physical education classes or optional school sports most often account for a physical activity time of 30 to 120 minutes.

12.2.7 Screen time

Table 12.25 Distribution of screen time on weekdays (%), overall and stratified by sex, age group and linguistic region

	None	About half an hour per day	About 1 hour per day	About 2 hours per day	About 3 hours per day	About 4 hours per day	About 5 hours per day	About 6 hours per day	About 7 hours or more per day	Less than 1hour per day	1-2 hour per day	More than 3 hour per day	Mean time (h)	Median time (h)
Females														
6-9 years	7.5%	45.2%	32.4%	10.2%	2.5%	0.6%	1.1%	0.5%	0.1%	52.6%	42.6%	4.7%	1.69	1
10-13 years	2%	10.6%	27%	28.6%	13.8%	9.5%	3.2%	3.2%	2.1%	12.6%	55.6%	31.8%	2.58	2.5
14-17 years	0.6%	0.5%	4.7%	15.7%	17.8%	19.4%	12.1%	10.5%	18.8%	1.1%	20.4%	78.5%	4.81	5
Males														
6-9 years	13.6%	34.7%	30.8%	15.2%	1.5%	1.8%	0.6%	1.6%	0.2%	48.3%	45.9%	5.7%	1.69	2
10-13 years	0.9%	13.3%	21.8%	32.7%	16.2%	8.6%	3.4%	1.3%	1.8%	14.2%	54.5%	31.3%	2.42	2
14-17 years	0%	0.3%	2.7%	8.6%	26.9%	16.6%	14.4%	7.7%	22.8%	0.3%	11.3%	88.4%	4.41	4
Regions														
DE	3.4%	19.2%	19.9%	18.1%	11.7%	9.3%	6%	4.1%	8.2%	22.6%	38%	39.4%	3.05	2.5
FR	8.2%	16.1%	21.3%	19.6%	15.5%	8.5%	4.1%	3.6%	3.2%	24.3%	40.9%	34.8%	3.25	3
IT	3.7%	10.7%	30%	27.2%	17.5%	5.2%	2.3%	1%	2.3%	14.4%	57.2%	28.4%	2.91	3
Overall weekdays	**4.3%**	**18.2%**	**20.6%**	**18.8%**	**12.7%**	**9%**	**5.4%**	**3.9%**	**7%**	**22.5%**	**39.5%**	**38%**	**3.06**	**3**

Question: On weekdays, how many hours per day does [FIRST NAME CHILD]/do you generally spend in front of a screen (meaning smartphone, television, computer, tablet, games console) during his/her/your free time, at school/apprenticeship and doing the homework? Question was answered by parents for children aged 6-13 years. Question was answered by adolescent for children aged 14-17 years.

Table 12.25 shows that most young people spend 1-2 hours per day (39.5%) or more than 3 hours per day (38%) in front of a screen during weekdays. Younger children spend less time in front of a screen compared to older adolescents. There are no clear differences between females and males. For the linguistic regions, people from the Italian part spend less time in front of a screen on weekdays compared to other regions (mean value of 2.91 h, vs 3.05 h and 3.25 h).

Table 12.26 Distribution of screen time on weekends (%), overall and stratified by sex, age group and linguistic region

	None	About half an hour per day	About 1 hour per day	About 2 hours per day	About 3 hours per day	About 4 hours per day	About 5 hours per day	About 6 hours per day	About 7 hours or more per day	Less than 1hour per day	1-2 hour per day	More than 3 hour per day	Mean time (h)	Median time (h)
Females														
6-9 years	2.9%	22.4%	33.3%	26.1%	10.3%	2.7%	1.7%	0.4%	0.3%	25.3%	59.4%	15.3%	1.84	2
10-13 years	0.3%	6.1%	16.3%	28.2%	18.9%	12.3%	10.5%	3.7%	3.7%	6.4%	44.5%	49.1%	3.04	3
14-17 years	1.3%	1.9%	4%	10%	19.4%	21.2%	20.3%	13.1%	8.7%	3.2%	14%	82.8%	4.56	5
Males														
6-9 years	3%	20.8%	27.9%	27%	14.9%	3.1%	2%	1%	0.3%	23.8%	54.9%	21.3%	2.13	2
10-13 years	1.2%	3.9%	14.7%	28.7%	25.5%	11.9%	6.4%	5.2%	2.6%	5%	43.5%	51.5%	2.97	3
14-17 years	2.3%	1.2%	1.9%	8.9%	16.2%	21.5%	23.3%	10.6%	14.1%	3.5%	10.8%	85.7%	4.25	4
Regions														
DE	2.1%	11%	17.1%	22.1%	16.3%	11.1%	10.8%	5%	4.5%	13.1%	39.2%	47.7%	2.95	3
FR	0.9%	5.6%	17%	21%	22%	12.7%	8.6%	6.3%	5.9%	6.5%	38%	55.5%	3.85	4
IT	0.8%	5.4%	15%	25.6%	21.3%	17.4%	5.1%	7.5%	1.9%	6.2%	40.6%	53.2%	3.03	3
Overall weekends	**1.8%**	**9.7%**	**16.9%**	**22.1%**	**17.6%**	**11.7%**	**10.1%**	**5.4%**	**4.6%**	**11.6%**	**39%**	**49.4%**	**3.13**	**3**

Question: On weekends, how many hours per day does [FIRST NAME CHILD]/do you generally spend in front of a screen (meaning smartphone, television, computer, tablet, games console) during his/her/your free time, at school/apprenticeship and to do the homework? Question was answered by parents for children aged 6-13 years. Question was answered by adolescent for children aged 14-17 years.

Table 12.26 shows that a higher percentage of young people spend 1-2 hours per day (39%) and more than 3 hours per day (49.4%) in front of a screen during weekend days, compared to weekdays. Younger children spend less time in front of a screen compared to older adolescents. There are no clear differences between males and females.

Meals in front of a screen

Table 12.27 Percentage distribution of meals in front of a screen, overall and stratified by sex and age group

	Rarely or never (less than 1 meal out of 7)	Sometimes (1 to 3 meals out of 7)	Frequently (4 to 6 meals out of 7)	Always (7 meals out of 7)
Breakfast				
6-9 years				
Males	92.5%	3.6%	1.9%	1.9%
Females	95.4%	3.5%	1%	0.1%
10-13 years				
Males	88.9%	4.8%	4.1%	2.2%
Females	87.7%	10.1%	1.2%	1%
14-17 years				
Males	69%	13.9%	13.3%	3.9%
Females	72.3%	15.6%	9.3%	2.8%
Overall	**85%**	**8.2%**	**4.9%**	**1.9%**
Lunch				
6-9 years				
Males	91.5%	4.2%	3.3%	1%
Females	90.8%	8.2%	0.9%	0.1%
10-13 years				
Males	87.3%	9%	2.2%	1.5%
Females	86.5%	7.3%	5.4%	0.8%
14-17 years				
Males	60.4%	24.6%	11.2%	3.8%
Females	62.1%	27.4%	9.1%	1.3%
Overall	**80.7%**	**12.8%**	**5.1%**	**1.4%**
Dinner				
6-9 years				
Males	85.9%	7.9%	3.9%	2.4%
Females	81.3%	12.7%	4.4%	1.5%
10-13 years				
Males	79.5%	12.6%	6.2%	1.7%
Females	82.1%	9.7%	6.6%	1.6%
14-17 years				
Males	65.4%	22%	8.4%	4.2%
Females	71.3%	15.8%	8.2%	4.7%
Overall	**78%**	**13.2%**	**6.2%**	**2.6%**

Question: How often does [FIRST NAME CHILD]/do you watch a screen while he/she/you eat (e.g.: smartphone, tablet, television, computer, games console)? Question was answered by parents for children aged 6-13 years. Question was answered by adolescent for children aged 14-17 years.

Table 12.27 shows that the majority of young people never or rarely use a screen during meals. More than 78% of young people do not eat in front of a screen, regardless of the meal. Dinner is the most likely meal to be spent in front of a screen, followed by breakfast, and lunch. Adolescents tend to eat more often in front of a screen than younger children. Sex does not seem to influence the result.

12.2.8 Sleep

Table 12.28 Mean sleep duration during weekdays and weekend days, overall and stratified by sex and age group

	Mean time (h) weekdays	Mean time (h) weekend days
6-9 years	10.3	10.7
Males	10.4	10.6
Females	10.3	10.8
10-13 years	9.4	10.3
Males	9.5	10.2
Females	9.3	10.4
14-17 years	7.9	9.7
Males	8.0	9.6
Females	7.9	9.8
Overall males	**9.4**	**10.2**
Overall females	**9.3**	**10.4**

Question: Typically, at what time does [FIRST NAME CHILD]/do you fall asleep when he/she/you have school or your apprenticeship the next day? Typically, at what time does [FIRST NAME CHILD]/do you wake up when you have school or your apprenticeship? Typically, on weekends, at what time does [FIRST NAME CHILD]/do you fall asleep when he/she/you do/do not have school or your apprenticeship the next day? Typically, on weekends, at what time does [FIRST NAME CHILD]/do you wake up when you do not have school or your apprenticeship? Question was answered by parents for children aged 6-13 years. Question was answered by adolescent for children aged 14-17 years.

Figure 12.5 to Figure 12.8 and Table 12.28 show that the overall mean sleep duration is lower for weekdays compared to weekend days. It can be observed that the mean sleep duration slightly varies between weekdays and weekend days for the youngest age group but varies more among adolescents. In general, mean sleep duration is shorter for adolescents than for younger children. No clear influence of the sex can be observed.

Figure 12.5 Distribution of sleep duration for females on weekdays, stratified by age group

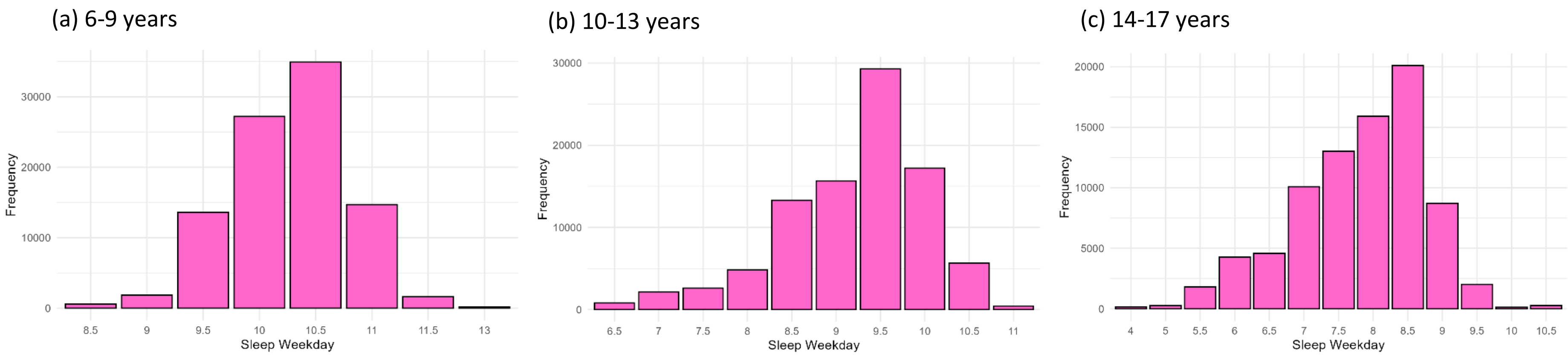


Figure 12.6 Distribution of sleep duration for males on weekdays, stratified by age group

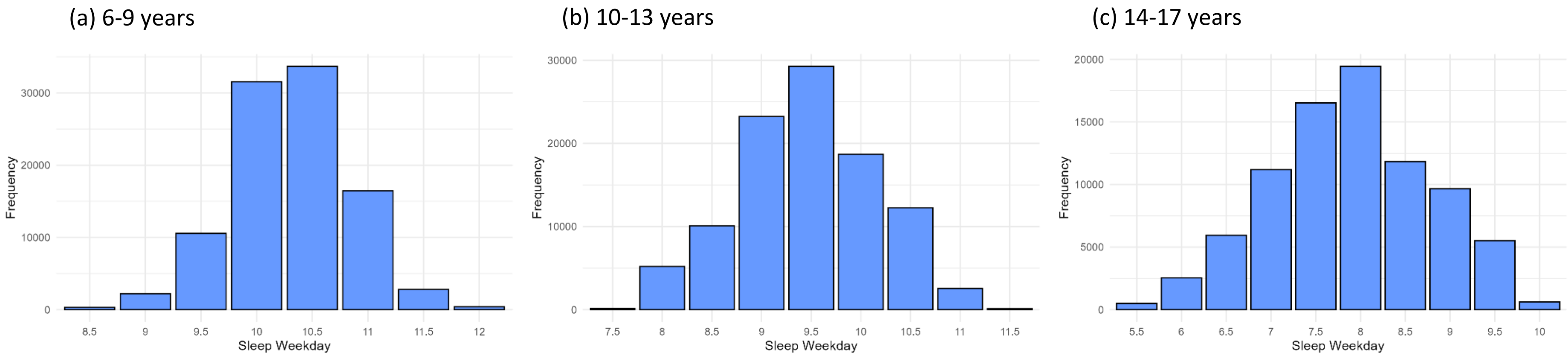


Figure 12.7 Distribution of sleep duration for females on weekend days, stratified by age group

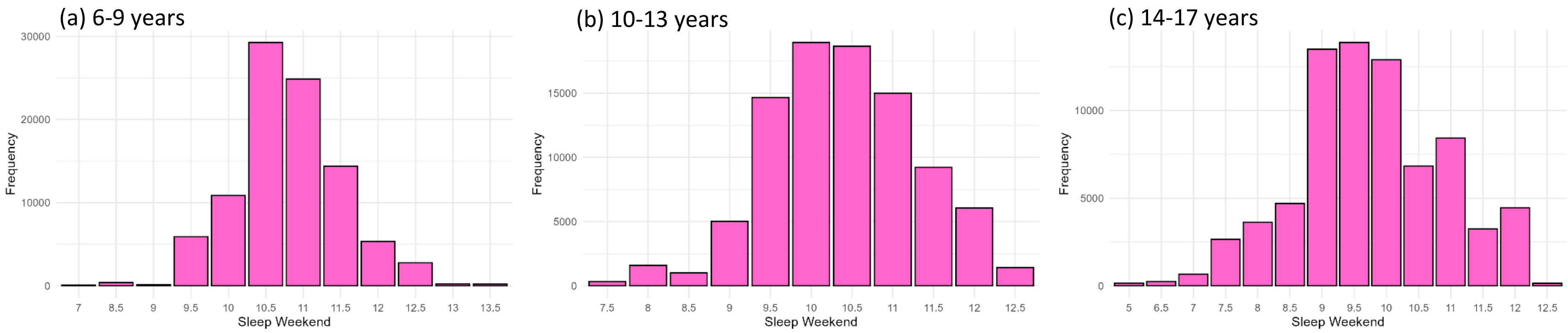
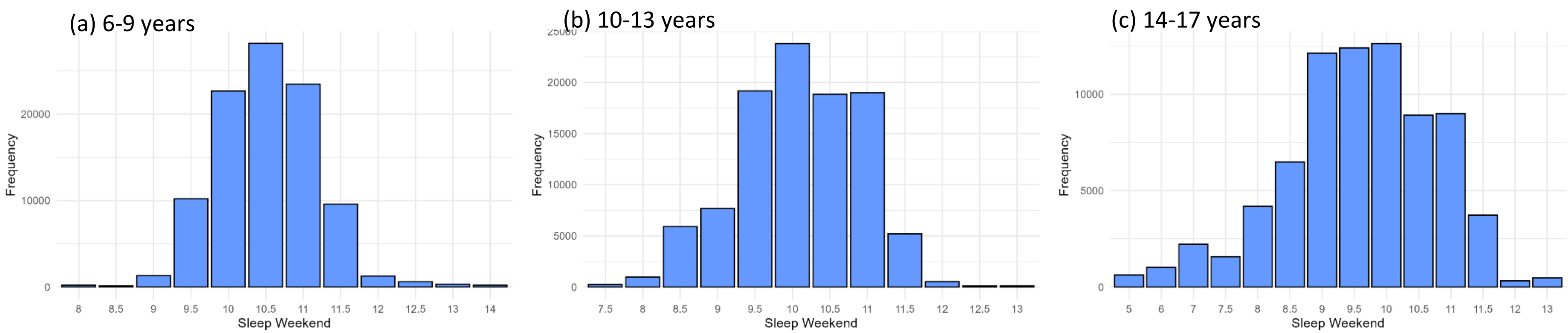


Figure 12.8 Distribution of sleep duration for males on weekend days, stratified by age group



12.2.9 General health

Pains/issues over past six months

Table 12.29 Percentage distribution of experienced pains or issues over the past six months, overall and stratified by sex and age group

	Frequently (between once a day and several times a week)	Fairly often (several times a month)	Relatively seldom	Never
Females				
6-9 years				
Stomach ache	4%	12.2%	56.3%	27.5%
Headache	0.6%	7.3%	51.4%	40.6%
Back pain	0%	1.9%	13%	85.1%
Stress	1.7%	18.6%	37%	42.7%
Difficulty falling asleep	6.4%	23%	39%	31.6%
Being tired without any known cause	1.1%	7%	32%	59.8%
Loss of appetite for no reason	0.2%	2.6%	21.4%	75.8%
Hunger pangs (cravings)	4.1%	10.9%	29.4%	55.7%
10-13 years				
Stomach ache	4.8%	14.7%	53.7%	26.8%
Headache	1.5%	13.7%	51.4%	33.4%
Back pain	2.5%	8%	34.2%	55.2%
Stress	9.2%	27.1%	43%	20.7%
Difficulty falling asleep	10.1%	17.4%	40.2%	32.3%
Being tired without any known cause	3.6%	14.5%	33.6%	48.2%
Loss of appetite for no reason	1.1%	4.1%	24.2%	70.6%
Hunger pangs (cravings)	3%	14.4%	31.7%	50.9%
14-17 years				
Stomach ache	3.6%	24.7%	62.9%	8.8%
Headache	6.4%	28.3%	50.7%	14.5%
Back pain	9.3%	23%	39.3%	28.3%
Stress	33.1%	33.7%	28.1%	5.1%
Difficulty falling asleep	11.6%	21.9%	44.2%	22.3%
Being tired without any known cause	20.9%	25.3%	30.9%	22.8%
Loss of appetite for no reason	6%	11.3%	33.2%	49.5%
Hunger pangs (cravings)	7.8%	18.6%	38.8%	34.8%
Males				
6-9 years				
Stomach ache	3.3%	7.8%	54.6%	34.3%
Headache	0.9%	6%	50.1%	43.1%
Back pain	0%	0.8%	16%	83.2%
Stress	2.4%	13.9%	46.7%	37%

Difficulty falling asleep	7%	21.7%	42.1%	29.2%
Being tired without any known cause	1.5%	6.4%	31.8%	60.3%
Loss of appetite for no reason	0.3%	2.9%	20.5%	76.4%
Hunger pangs (cravings)	3.7%	13.5%	32.4%	50.4%
10-13 years				
Stomach ache	3.5%	11.8%	54.7%	29.9%
Headache	3.2%	18%	52.5%	26.3%
Back pain	2.2%	8.6%	27.6%	61.5%
Stress	8.3%	23.1%	42.7%	26%
Difficulty falling asleep	8.6%	18.3%	35.6%	37.5%
Being tired without any known cause	1.4%	10.1%	28.8%	59.6%
Loss of appetite for no reason	0.9%	4.2%	14.9%	80%
Hunger pangs (cravings)	3.8%	14.1%	37%	45.1%
14-17 years				
Stomach ache	2.1%	9.5%	64.8%	23.7%
Headache	1.8%	19.8%	56.1%	22.3%
Back pain	4.8%	21.7%	36.2%	37.3%
Stress	7.3%	38.4%	42.5%	11.8%
Difficulty falling asleep	5.2%	20%	34.6%	40.2%
Being tired without any known cause	6.7%	16.3%	33.3%	43.7%
Loss of appetite for no reason	2.2%	6.3%	21.4%	70.1%
Hunger pangs (cravings)	10.5%	13.3%	34.9%	41.3%
Overall				
Stomach ache	3.6%	13.2%	57.5%	25.7%
Headache	2.3%	15.1%	52%	30.6%
Back pain	3%	10.1%	27.2%	59.7%
Stress	9.8%	25.3%	40.3%	24.7%
Difficulty falling asleep	8.1%	20.4%	39.2%	32.3%
Being tired without any known cause	5.5%	12.9%	31.7%	50%
Loss of appetite for no reason	1.7%	5.1%	22.2%	71%
Hunger pangs (cravings)	5.3%	14%	33.9%	46.7%

Question: Over the past 6 months, how often has [FIRST NAME CHILD] had/did you have any of the following pains or issues? Question was answered by parents for children aged 6-13 years. Question was answered by adolescent for children aged 14-17 years.

Table 12.29 shows that pain or issues are more often reported by adolescents than younger children. It seems that females tend to report more pains/issues than males.

12.2.10 Cigarettes and pocket money

Table 12.30 Percentage distribution of adolescents' smoking habits, overall and stratified by sex and linguistic region

	Every day	Several times a week, but not every day	Less than once a week	I don't smoke
Females 14-17 years	2.8%	2.8%	7%	87.4%
Males 14-17 years	2.4%	1.8%	6.7%	89.1%
DE	2.5%	2%	8%	87.5%
FR	2.4%	3.3%	4.8%	89.5%
IT	4%	2.2%	0%	93.8%
Overall	**2.6%**	**2.3%**	**6.9%**	**88.2%**

Question: Currently, how often do you smoke cigarettes (including e-cigarettes)? Question was answered by adolescent aged 14-17 years and exclusively asked to this age group.

Table 12.30 shows that, with regards to smoking habits, there is no marked difference between male and females. However, slight variations are observed across linguistic regions.

12.2.11 Results FPQ

Water, coffee, tea, matcha, mate

Table 12.31 FPQ: Percentage distribution of consumption of water, coffee, tea, matcha, mate, overall and stratified by sex, age group and linguistic region

	Never	Less than once a month	Around 1 to 3 times a month	1 to 3 times a week	4 to 6 times a week	1 to 2 times a day	More than 3 times a day	Weekly consumption	Daily consumption
Water (e.g.: tap water, sparkling water)									
6-9 years	**0%**	**0%**	**0%**	**0.7%**	**1.9%**	**7.4%**	**90%**	**100%**	**97.4%**
Females	0%	0%	0%	0.6%	2%	9.2%	88.1%	100%	97.3%
Males	0%	0%	0%	0.7%	1.9%	5.7%	91.7%	100%	97.4%
10-13 years	**0%**	**0%**	**0.1%**	**0.9%**	**2.8%**	**11%**	**85.2%**	**99.9%**	**96.2%**
Females	0%	0%	0.2%	1.1%	4.2%	13.3%	81.2%	99.8%	94.5%
Males	0.1%	0%	0%	0.7%	1.5%	8.9%	88.8%	99.9%	97.7%
14-17 years	**0%**	**0.4%**	**0.3%**	**2%**	**2.8%**	**13.1%**	**81.3%**	**99.3%**	**94.4%**
Females	0%	0%	0%	2%	1.7%	16.7%	79.6%	100%	96.3%
Males	0%	0.9%	0.6%	2.1%	3.9%	9.6%	83%	98.6%	92.6%
Regions									
DE	0%	0.2%	0.1%	1.4%	2.7%	11%	84.7%	99.8%	95.7%
FR	0%	0%	0.5%	0.4%	2.2%	8.7%	88.2%	99.5%	96.9%
IT	0.2%	0%	0%	0%	0.5%	7.8%	91.5%	99.8%	99.3%
Overall	**0%**	**0.1%**	**0.1%**	**1.2%**	**2.5%**	**10.4%**	**85.7%**	**99.7%**	**96.1%**
Tea, coffee, matcha, mate									
6-9 years	**48.7%**	**14.5%**	**13.2%**	**14%**	**5%**	**4.1%**	**0.4%**	**23.6%**	**4.5%**
Females	47.8%	15.8%	12.2%	14.4%	6.3%	3.4%	0.1%	24.3%	3.5%
Males	49.7%	13.3%	14.1%	13.7%	3.7%	4.8%	0.7%	22.9%	5.5%
10-13 years	**28.2%**	**20.4%**	**22.4%**	**15.3%**	**8.4%**	**4.3%**	**0.8%**	**28.9%**	**5.1%**
Females	29%	15.9%	22.6%	18%	7.5%	6.1%	1.1%	32.6%	7.2%
Males	27.6%	24.6%	22.3%	13%	9.3%	2.8%	0.5%	25.5%	3.3%
14-17 years	**16.3%**	**16.1%**	**21.9%**	**18.5%**	**13.1%**	**12.7%**	**1.4%**	**45.7%**	**14.1%**
Females	14%	13.4%	19.5%	23%	13.9%	14.8%	1.5%	53.1%	16.3%
Males	18.5%	18.7%	24.3%	14.2%	12.3%	10.7%	1.3%	38.5%	12.0%
Regions									
DE	28.3%	18%	19.4%	16.8%	9.1%	7.5%	0.9%	34.3%	8.4%
FR	41.7%	14.1%	18.4%	13.2%	7.6%	4.6%	0.4%	25.8%	5.0%
IT	50.3%	12.5%	15.9%	10.3%	5%	4.1%	1.9%	21.3%	6.0%
Overall	**31.8%**	**17.1%**	**19%**	**15.8%**	**6.8%**	**8.6%**	**6.8%**	**32.1%**	**15.4%**

FPQ: In general, how often does [FIRST NAME CHILD]/do you eat the following foods? Question was answered by parents for children aged 6-13 years. Question was answered by adolescent for children aged 14-17 years.

Table 12.31 shows that the majority of young people report drinking water more than three times a day, with similar patterns observed across age groups and linguistic regions. In contrast, the consumption of tea, coffee, matcha and mate varies notably across age groups, being more frequent among adolescents than younger children.

Vegetables, fruits, vegetable and fruit juice (100% pure)

Table 12.32 FPQ: Percentage of vegetables, fruits, vegetable and fruit juice (100% pure) consumption, overall and stratified by sex, age group and linguistic region

	Never	Less than once a month	Around 1 to 3 times a month	1 to 3 times a week	4 to 6 times a week	1 to 2 times a day	More than 3 times a day	Weekly consumption	Daily consumption
Vegetables (potatoes do not count as vegetables; not including vegetable juice)									
6-9 years	**0.5%**	**0.2%**	**2.0%**	**12.7%**	**24.6%**	**56.1%**	**4.0%**	**97.3%**	**60.1%**
Females	0.8%	0.0%	2.1%	13.5%	21.6%	56.0%	6.0%	97.1%	62.0%
Males	0.2%	0.4%	1.9%	11.9%	27.6%	56.1%	2.0%	97.6%	58.1%
10-13 years	**0.7%**	**0.4%**	**3.1%**	**14.3%**	**28.8%**	**48.2%**	**4.5%**	**95.7%**	**52.7%**
Females	1.5%	0.2%	1.6%	12.7%	28.6%	50.6%	4.8%	96.7%	55.4%
Males	0.0%	0.7%	4.5%	15.7%	29.0%	46.0%	4.2%	94.9%	50.2%
14-17 years	**0.7%**	**0.3%**	**5.3%**	**13.8%**	**32.3%**	**44.2%**	**3.5%**	**93.8%**	**47.7%**
Females	0.5%	0.0%	4.1%	13.8%	30.9%	46.9%	3.7%	95.4%	50.6%
Males	0.9%	0.5%	6.4%	13.8%	33.6%	41.6%	3.2%	92.2%	44.8%
Regions									
DE	0.4%	0.3%	3.4%	14.6%	29.1%	48.6%	3.6%	95.9%	52.2%
FR	1.0%	0.3%	3.4%	8.9%	24.9%	55.4%	5.9%	95.2%	61.3%
IT	2.9%	0.5%	2.5%	15.6%	29.5%	46.3%	2.7%	94.2%	49.0%
Overall	**0.6%**	**0.3%**	**3.4%**	**13.6%**	**28.4%**	**49.7%**	**4.0%**	**95.7%**	**53.7%**
Fruit (**not including** juice)									
6-9 years	**0.8%**	**0.0%**	**1.0%**	**7.8%**	**29.0%**	**58.3%**	**3.1%**	**98.2%**	**61.4%**
Females	1.2%	0.0%	1.5%	6.8%	29.5%	59.0%	2.0%	97.3%	61.0%
Males	0.4%	0.0%	0.5%	8.8%	28.6%	57.6%	4.1%	99.1%	61.7%
10-13 years	**1.1%**	**0.6%**	**5.5%**	**17.0%**	**31.2%**	**41.9%**	**2.6%**	**92.8%**	**44.5%**
Females	1.3%	1.1%	3.2%	14.9%	26.6%	50.0%	2.9%	94.5%	52.9%
Males	1.0%	0.2%	7.5%	18.9%	35.3%	34.6%	2.4%	91.2%	37.0%
14-17 years	**0.7%**	**1.7%**	**9.6%**	**30.4%**	**28.0%**	**27.2%**	**2.5%**	**88.1%**	**29.7%**
Females	0.7%	1.1%	7.3%	32.1%	23.2%	34.2%	1.3%	90.9%	35.5%
Males	0.6%	2.2%	11.8%	28.7%	32.6%	20.3%	3.7%	85.3%	24.0%
Regions									
DE	0.5%	0.6%	5.0%	17.9%	30.0%	43.7%	2.2%	93.8%	45.9%
FR	1.8%	1.0%	5.6%	16.7%	27.2%	42.6%	5.0%	91.5%	47.6%
IT	2.8%	0.9%	5.2%	19.9%	30.3%	37.5%	3.5%	91.1%	41.0%
Overall	**0.9%**	**0.7%**	**5.1%**	**17.8%**	**29.5%**	**43.2%**	**2.8%**	**93.3%**	**46.0%**

Fruit and vegetable juice (100% pure)									
6-9 years	**11.2%**	**24.6%**	**29.4%**	**20.2%**	**8.3%**	**5.7%**	**0.6%**	**34.7%**	**6.3%**
Females	11.4%	25.3%	30.3%	22.0%	8.9%	2.0%	0.0%	32.9%	2.0%
Males	11.1%	23.9%	28.5%	18.5%	7.7%	9.2%	1.1%	36.5%	10.3%
10-13 years	**9.4%**	**22.3%**	**28.7%**	**23.1%**	**8.5%**	**7.7%**	**0.4%**	**39.6%**	**8.1%**
Females	11.6%	24.1%	29.2%	20.7%	5.0%	9.5%	0.0%	35.1%	9.5%
Males	7.3%	20.7%	28.2%	25.3%	11.7%	6.0%	0.8%	43.7%	6.8%
14-17 years	**15.5%**	**20.0%**	**29.7%**	**16.8%**	**11.4%**	**6.3%**	**0.3%**	**34.8%**	**6.6%**
Females	18.1%	22.0%	29.9%	10.9%	12.4%	6.2%	0.6%	30.1%	6.8%
Males	13.0%	18.2%	29.5%	22.5%	10.5%	6.4%	0.0%	39.4%	6.4%
Regions									
DE	11.2%	22.9%	30.9%	19.9%	9.0%	5.5%	0.6%	35.0%	6.1%
FR	12.1%	22.1%	22.8%	21.5%	10.8%	10.6%	0.0%	42.9%	10.6%
IT	20.9%	17.1%	26.7%	19.4%	7.8%	8.1%	0.0%	35.3%	8.1%
Overall	**11.9%**	**22.4%**	**29.2%**	**20.2%**	**9.3%**	**6.5%**	**0.4%**	**36.5%**	**6.9%**

FPQ: In general, how often does [FIRST NAME CHILD]/do you eat the following foods? Question was answered by parents for children aged 6-13 years. Question was answered by adolescent for children aged 14-17 years.

Table 12.32 shows that 95.7% consume vegetables more than once a week, with half of young people doing so daily. Regarding fruit consumption, 93.3% of young people eat fruit more than once a week, and 43.2% once or twice daily. Only 36.5% of them consume vegetable or fruit juice more than once a week. There are no major differences across age groups, linguistic regions or between sex.

Wholegrain and sweetened cereals

Table 12.33 FPQ: Percentage of wholegrain and sweetened cereals consumption, overall and stratified by sex, age group and linguistic region

	Never	Less than once a month	Around 1 to 3 times a month	1 to 3 times a week	4 to 6 times a week	1 to 2 times a day	More than 3 times a day	Weekly consumption	Daily consumption
Wholegrain cereals (e.g.: wholegrain rice, wholegrain pasta, wholegrain bread)									
6-9 years	**10.4%**	**15.7%**	**20.8%**	**25.1%**	**21.2%**	**6.7%**	**0.2%**	**53.1%**	**6.9%**
Females	11.3%	17.5%	21.2%	24.1%	19.1%	6.5%	0.2%	49.9%	6.7%
Males	9.5%	14.0%	20.3%	25.9%	23.1%	7.0%	0.1%	56.2%	7.1%
10-13 years	**12.1%**	**18.3%**	**19.6%**	**28.5%**	**14.7%**	**6.4%**	**0.4%**	**50.0%**	**6.8%**
Females	11.4%	21.5%	21.6%	25.0%	14.4%	6.0%	0.0%	45.5%	6.0%
Males	12.7%	15.4%	17.8%	31.6%	15.0%	6.7%	0.8%	54.1%	7.5%
14-17 years	**10.2%**	**12.6%**	**20.8%**	**29.6%**	**17.5%**	**8.2%**	**1.1%**	**56.4%**	**9.3%**
Females	7.4%	13.8%	23.2%	26.8%	18.1%	9.3%	1.5%	55.7%	10.8%
Males	13.0%	11.4%	18.5%	32.2%	17.0%	7.2%	0.6%	57.1%	7.8%
Regions									
DE	9.7%	16.0%	21.2%	28.0%	17.8%	7.0%	0.3%	53.0%	7.3%
FR	12.3%	13.8%	17.0%	27.9%	19.4%	8.0%	1.6%	56.9%	9.6%
IT	24.5%	17.3%	19.7%	20.6%	12.8%	4.8%	0.2%	38.4%	5.0%
Overall	**10.9%**	**15.7%**	**20.4%**	**27.6%**	**17.8%**	**7.1%**	**0.5%**	**53.0%**	**7.6%**
Sweetened breakfast cereals (e.g.: cornflakes, crunchy muesli, cereals with chocolate)									
6-9 years	**13.3%**	**13.0%**	**19.7%**	**30.9%**	**16.3%**	**6.4%**	**0.4%**	**53.9%**	**6.8%**
Females	13.0%	11.7%	19.6%	31.1%	18.2%	6.0%	0.4%	55.6%	6.4%
Males	13.5%	14.3%	19.9%	30.7%	14.5%	6.9%	0.3%	52.3%	7.2%
10-13 years	**13.3%**	**17.1%**	**19.9%**	**25.2%**	**15.7%**	**7.9%**	**0.9%**	**49.7%**	**8.8%**
Females	15.7%	21.1%	20.7%	24.0%	11.9%	6.4%	0.2%	42.5%	6.6%
Males	11.1%	13.4%	19.1%	26.3%	19.2%	9.2%	1.6%	56.3%	10.8%
14-17 years	**23.2%**	**17.1%**	**19.5%**	**21.0%**	**14.2%**	**5.0%**	**0.0%**	**40.2%**	**5.0%**
Females	24.0%	21.7%	19.1%	24.1%	7.8%	3.3%	0.0%	35.2%	3.3%
Males	22.5%	12.6%	19.9%	17.9%	20.4%	6.7%	0.0%	45.0%	6.7%
Regions									
DE	14.5%	15.4%	19.9%	26.6%	16.2%	7.0%	0.4%	50.2%	7.4%
FR	20.4%	16.8%	19.9%	24.5%	13.2%	4.6%	0.6%	42.9%	5.2%
IT	29.0%	16.1%	15.5%	20.4%	12.1%	5.6%	1.4%	39.5%	7.0%
Overall	**16.3%**	**15.7%**	**19.7%**	**25.9%**	**15.5%**	**6.5%**	**0.5%**	**48.3%**	**7.0%**

FPQ: In general, how often does [FIRST NAME CHILD]/do you eat the following foods? Question was answered by parents for children aged 6-13 years. Question was answered by adolescent for children aged 14-17 years.

Table 12.33 shows that overall, wholegrain products are slightly more consumed then sweetened cereals. Older adolescents consume wholegrain products more often than younger children. People from the German-speaking and French-speaking regions of Switzerland show a slightly higher intake of wholegrain products compared to those from the Italian-speaking region.

Meat, fish, seafood, pulses, plant-based substitutes

Table 12.34 FPQ: Percentage distribution of meat, fish, seafood, pulses, plant-based substitutes consumption, overall and stratified by sex, age group and linguistic region

	Never	Less than once a month	Around 1 to 3 times a month	1 to 3 times a week	4 to 6 times a week	1 to 2 times a day	More than 3 times a day	Weekly consumption	Daily consumption
Meat (e.g.: chicken, rib steak)									
6-9 years	**4.2%**	**2.2%**	**11.4%**	**46.5%**	**28.9%**	**6.8%**	**0.0%**	**82.2%**	**6.8%**
Females	5.2%	2.3%	9.4%	46.1%	28.4%	8.5%	0.0%	83.1%	8.5%
Males	3.4%	2.1%	13.2%	46.8%	29.3%	5.2%	0.0%	81.3%	5.2%
10-13 years	**4.5%**	**0.8%**	**5.8%**	**51.6%**	**31.0%**	**6.0%**	**0.3%**	**88.9%**	**6.3%**
Females	7.0%	1.0%	4.4%	53.8%	28.9%	4.3%	0.6%	87.6%	4.9%
Males	2.3%	0.6%	7.0%	49.6%	33.0%	7.5%	0.0%	90.1%	7.5%
14-17 years	**8.5%**	**1.8%**	**6.4%**	**38.9%**	**29.3%**	**14.1%**	**1.1%**	**83.3%**	**15.2%**
Females	11.9%	2.0%	8.8%	44.7%	24.9%	6.9%	0.9%	77.4%	7.8%
Males	5.3%	1.6%	4.0%	33.2%	33.6%	21.0%	1.3%	90.1%	22.3%
Regions									
DE	6.5%	1.9%	9.3%	45.8%	28.5%	7.6%	0.3%	82.3%	7.9%
FR	2.5%	0.3%	3.1%	43.5%	35.3%	14.4%	0.9%	94.1%	15.3%
IT	4.1%	1.1%	4.1%	57.7%	28.1%	5.0%	0.0%	90.8%	5.0%
Overall	**5.6%**	**1.6%**	**7.9%**	**46.0%**	**29.8%**	**8.7%**	**0.4%**	**84.9%**	**9.1%**
Processed meat, cold meats (e.g.: sausage, ham)									
6-9 years	**5.1%**	**5.1%**	**20.0%**	**46.6%**	**18.3%**	**4.8%**	**0.0%**	**69.8%**	**4.8%**
Females	5.0%	7.4%	19.5%	46.1%	19.4%	2.6%	0.0%	68.1%	2.6%
Males	5.3%	2.8%	20.6%	47.2%	17.3%	7.0%	0.0%	71.4%	7.0%
10-13 years	**6.4%**	**4.2%**	**19.4%**	**45.7%**	**20.1%**	**4.2%**	**0.0%**	**70.0%**	**4.2%**
Females)	8.4%	4.1%	19.1%	45.9%	18.5%	3.9%	0.0%	68.3%	3.9%
Males	4.6%	4.2%	19.7%	45.5%	21.6%	4.4%	0.0%	71.5%	4.4%
14-17 years	**12.7%**	**7.2%**	**20.9%**	**42.4%**	**12.6%**	**4.2%**	**0.0%**	**59.2%**	**4.2%**
Females	17.0%	9.2%	21.6%	43.1%	7.8%	1.3%	0.0%	52.2%	1.3%
Males	8.6%	5.2%	20.1%	41.7%	17.3%	7.0%	0.0%	66.1%	7.0%
Regions									
DE	8.2%	5.2%	18.8%	43.8%	19.3%	4.7%	0.0%	67.9%	4.7%
FR	7.0%	6.6%	24.3%	48.7%	9.7%	3.7%	0.0%	62.0%	3.7%
IT	6.3%	4.1%	24.1%	50.8%	12.4%	2.4%	0.0%	65.5%	2.4%
Overall	**7.9%**	**5.4%**	**20.1%**	**45.0%**	**17.2%**	**4.4%**	**0.0%**	**66.7%**	**4.4%**

Fish (e.g.: salmon, breaded fish)									
6-9 years	**14.1%**	**15.9%**	**43.0%**	**25.9%**	**1.0%**	**0.0%**	**0.0%**	**26.9%**	**0.0%**
Females	15.9%	17.8%	36.5%	28.4%	1.4%	0.0%	0.0%	29.8%	0.0%
Males	12.4%	14.0%	49.3%	23.5%	0.6%	0.1%	0.0%	24.2%	0.1%
10-13 years	**15.8%**	**20.8%**	**40.6%**	**21.6%**	**1.1%**	**0.0%**	**0.0%**	**22.7%**	**0.0%**
Females	20.2%	19.8%	37.2%	21.8%	0.9%	0.0%	0.0%	22.7%	0.0%
Males	11.7%	21.8%	43.8%	21.4%	1.3%	0.0%	0.0%	22.8%	0.0%
14-17 years	**18.8%**	**22.4%**	**40.2%**	**17.1%**	**1.5%**	**0.0%**	**0.1%**	**18.6%**	**0.1%**
Females	23.4%	22.3%	38.1%	15.2%	0.7%	0.0%	0.2%	16.2%	0.2%
Males	14.2%	22.5%	42.2%	18.9%	2.2%	0.0%	0.0%	21.1%	0.0%
Regions									
DE	18.6%	22.0%	42.3%	16.5%	0.6%	0.0%	0.0%	17.2%	0.0%
FR	7.4%	11.9%	38.4%	39.4%	2.6%	0.1%	0.2%	42.3%	0.3%
IT	10.0%	10.3%	38.1%	37.7%	3.8%	0.0%	0.0%	41.6%	0.0%
Overall	**16.1%**	**19.6%**	**41.3%**	**21.8%**	**1.2%**	**0.0%**	**0.0%**	**23.0%**	**0.0%**
Seafood (e.g.: prawns, fried squid rings)									
6-9 years	**56.7%**	**22.3%**	**17.2%**	**3.3%**	**0.2%**	**0.2%**	**0.0%**	**3.7%**	**0.2%**
Females	58.2%	24.0%	14.6%	2.4%	0.4%	0.4%	0.0%	3.2%	0.4%
Males	55.3%	20.6%	19.8%	4.2%	0.0%	0.0%	0.0%	4.2%	0.0%
10-13 years	**51.8%**	**30.2%**	**16.1%**	**1.9%**	**0.0%**	**0.0%**	**0.0%**	**1.9%**	**0.0%**
Females	51.3%	30.5%	15.5%	2.7%	0.0%	0.0%	0.0%	2.7%	0.0%
Males	52.2%	30.0%	16.7%	1.2%	0.0%	0.0%	0.0%	1.2%	0.0%
14-17 years	**47.5%**	**34.0%**	**16.3%**	**1.2%**	**0.6%**	**0.4%**	**0.0%**	**2.2%**	**0.4%**
Females	53.9%	31.9%	13.6%	0.4%	0.2%	0.0%	0.0%	0.6%	0.0%
Males	41.3%	36.0%	19.0%	1.9%	1.0%	0.9%	0.0%	3.7%	0.9%
Regions									
DE	57.9%	26.5%	13.0%	2.0%	0.3%	0.3%	0.0%	2.6%	0.3%
FR	32.4%	36.7%	28.9%	1.8%	0.2%	0.0%	0.0%	2.0%	0.0%
IT	37.3%	30.2%	27.0%	5.6%	0.0%	0.0%	0.0%	5.6%	0.0%
Overall	**52.2%**	**28.6%**	**16.6%**	**2.2%**	**0.3%**	**0.2%**	**0.0%**	**2.6%**	**0.2%**
Pulses (e.g.: hummus, lentils, kidney beans)									
6-9 years	**28.8%**	**25.9%**	**26.9%**	**14.4%**	**3.7%**	**0.3%**	**0.0%**	**18.4%**	**0.3%**
Females	28.0%	23.5%	28.4%	16.2%	3.4%	0.4%	0.1%	20.1%	0.5%
Males	29.5%	28.3%	25.4%	12.7%	4.0%	0.1%	0.0%	16.8%	0.1%
10-13 years	**26.3%**	**25.1%**	**30.7%**	**15.3%**	**2.6%**	**0.1%**	**0.0%**	**18.0%**	**0.1%**
Females	30.0%	24.4%	25.3%	17.1%	3.0%	0.2%	0.0%	20.3%	0.2%
Males	22.9%	25.7%	35.5%	13.7%	2.1%	0.1%	0.0%	15.9%	0.1%
14-17 years	**20.2%**	**20.3%**	**36.3%**	**19.0%**	**3.3%**	**1.0%**	**0.0%**	**23.3%**	**1.0%**
Females	16.1%	21.0%	35.4%	22.6%	4.0%	0.9%	0.0%	27.5%	0.9%
Males	24.1%	19.6%	37.1%	15.5%	2.6%	1.0%	0.0%	19.2%	1.0%
Regions									
DE	28.5%	25.2%	28.4%	14.6%	3.0%	0.3%	0.0%	17.9%	0.3%
FR	13.9%	21.2%	42.1%	18.0%	4.0%	0.9%	0.0%	22.9%	0.9%
IT	18.8%	15.0%	30.6%	31.8%	3.3%	0.3%	0.2%	35.6%	0.5%
Overall	**25.3%**	**23.9%**	**31.0%**	**16.1%**	**3.2%**	**0.4%**	**0.0%**	**19.7%**	**0.4%**

Plant-based meat substitutes (e.g.: beyond® burger, Planted-chicken®, tofu)									
6-9 years	**56.6%**	**20.2%**	**14.5%**	**7.9%**	**0.9%**	**0.0%**	**0.0%**	**8.8%**	**0.0%**
Females	62.6%	21.7%	9.9%	5.2%	0.6%	0.0%	0.0%	5.8%	0.0%
Males	50.7%	18.7%	18.9%	10.4%	1.3%	0.0%	0.0%	11.7%	0.0%
10-13 years	**58.4%**	**17.4%**	**16.0%**	**7.4%**	**0.7%**	**0.0%**	**0.0%**	**8.2%**	**0.0%**
Females	58.9%	18.7%	14.6%	7.0%	0.8%	0.0%	0.0%	7.8%	0.0%
Males	58.0%	16.3%	17.2%	7.8%	0.7%	0.0%	0.0%	8.6%	0.0%
14-17 years	**53.4%**	**19.4%**	**14.0%**	**9.6%**	**2.8%**	**0.9%**	**0.0%**	**13.3%**	**0.9%**
Females	44.9%	18.2%	19.9%	14.4%	2.3%	0.3%	0.0%	17.0%	0.3%
Males	61.7%	20.5%	8.3%	4.9%	3.2%	1.6%	0.0%	9.6%	1.6%
Regions									
DE	54.0%	19.9%	15.2%	9.2%	1.3%	0.3%	0.0%	10.8%	0.3%
FR	62.8%	16.8%	13.7%	5.1%	1.3%	0.2%	0.0%	6.6%	0.2%
IT	66.5%	11.6%	13.8%	5.1%	3.0%	0.0%	0.0%	8.1%	0.0%
Overall	**56.3%**	**19.0%**	**14.9%**	**8.2%**	**1.4%**	**0.3%**	**0.0%**	**9.9%**	**0.3%**

FPQ: In general, how often does [FIRST NAME CHILD]/do you eat the following foods? Question was answered by parents for children aged 6-13 years. Question was answered by adolescent for children aged 14-17 years.

Table 12.34 shows that among the listed protein sources, meat is the most consumed: 84.9% of young people eat it weekly (with 29.8% almost every day and 9.1% daily). Processed meat, fish and pulses are less frequently consumed, with 66.7%, 23% and 19.7% of people, respectively, reporting weekly intake. While results between boys and girls are quite similar during childhood, male adolescents have a marked higher consumption of meat (22.3% consumed it daily). On the opposite, female adolescents consume more pulses and plant-based meat substitutes, and less processed meat. Regional differences are also evident: people from the German-speaking region tend to eat less fish, while those from the Italian-speaking region consume more seafood and pulses.

Dairy products

Table 12.35 FPQ: Percentage distribution of dairy products consumption, overall and stratified by sex, age group and linguistic region

	Never	Less than once a month	Around 1 to 3 times a month	1 to 3 times a week	4 to 6 times a week	1 to 2 times a day	More than 3 times a day	Weekly consumption	Daily consumption
Milk									
6-9 years	**9.3%**	**6.7%**	**9.6%**	**23.3%**	**16.2%**	**34.0%**	**0.9%**	**74.4%**	**34.9%**
Females	11.5%	5.7%	9.9%	24.1%	17.3%	30.8%	0.7%	72.9%	31.5%
Males	7.3%	7.6%	9.3%	22.6%	15.1%	37.1%	1.0%	75.8%	38.1%
10-13 years	**9.8%**	**5.3%**	**9.9%**	**25.1%**	**16.1%**	**32.6%**	**1.1%**	**74.9%**	**33.7%**
Females	12.1%	6.8%	10.4%	29.7%	10.9%	30.1%	0.0%	70.7%	30.1%
Males	7.8%	4.0%	9.5%	20.9%	20.8%	34.8%	2.2%	78.7%	37.0%
14-17 years	**13.1%**	**7.5%**	**13.4%**	**23.1%**	**17.9%**	**24.2%**	**0.8%**	**66.0%**	**25.0%**
Females	19.8%	12.2%	16.0%	24.1%	12.0%	15.5%	0.4%	52.0%	15.9%
Males	6.6%	2.9%	10.9%	22.1%	23.7%	32.6%	1.2%	79.6%	33.8%
Regions									
DE	9.4%	6.7%	10.9%	25.1%	17.0%	30.1%	0.8%	73.0%	30.9%
FR	14.9%	6.4%	10.9%	19.8%	16.5%	30.4%	1.2%	67.8%	31.6%
IT	14.9%	2.4%	10.0%	19.4%	13.3%	38.6%	1.5%	72.8%	40.1%
Overall	**10.7%**	**6.4%**	**10.9%**	**23.9%**	**16.7%**	**30.6%**	**0.9%**	**72.0%**	**31.5%**
Cheese (e.g.: Gruyère, mozzarella, feta)									
6-9 years	**6.1%**	**5.3%**	**11.4%**	**41.2%**	**27.5%**	**8.4%**	**0.1%**	**77.1%**	**8.5%**
Females	7.7%	6.4%	8.7%	41.6%	28.0%	7.4%	0.1%	77.2%	7.5%
Males	4.7%	4.3%	14.0%	40.8%	27.0%	9.3%	0.0%	77.0%	9.3%
10-13 years	**5.9%**	**6.3%**	**13.2%**	**39.9%**	**26.1%**	**7.9%**	**0.7%**	**74.6%**	**8.6%**
Females	7.2%	7.4%	12.7%	39.8%	24.4%	7.5%	1.0%	72.7%	8.5%
Males	4.6%	5.4%	13.8%	40.0%	27.6%	8.3%	0.3%	76.2%	8.6%
14-17 years	**5.8%**	**3.1%**	**16.8%**	**41.6%**	**23.8%**	**8.2%**	**0.8%**	**74.3%**	**9.0%**
Females	5.6%	4.4%	13.6%	47.5%	19.6%	8.5%	0.9%	76.4%	9.4%
Males	6.0%	1.8%	19.9%	35.8%	27.8%	8.0%	0.7%	72.3%	8.7%
Regions									
DE	6.2%	5.1%	13.6%	41.6%	25.0%	8.2%	0.3%	75.1%	8.5%
FR	4.9%	4.7%	14.8%	38.2%	27.8%	8.2%	1.4%	75.6%	9.6%
IT	5.2%	4.1%	11.1%	40.0%	32.4%	6.7%	0.4%	79.6%	7.1%
Overall	**5.9%**	**5.0%**	**13.7%**	**40.9%**	**25.9%**	**8.2%**	**0.5%**	**75.4%**	**8.7%**

Sweetened dairy products (e.g.: yoghurts, chocolate drinks)									
6-9 years	**8.1%**	**9.7%**	**19.9%**	**34.7%**	**18.7%**	**8.2%**	**0.7%**	**62.4%**	**8.9%**
Females	10.0%	11.2%	19.9%	35.0%	16.9%	6.5%	0.3%	58.8%	6.8%
Males	6.2%	8.2%	19.8%	34.3%	20.5%	9.8%	1.2%	65.8%	11.0%
10-13 years	**11.3%**	**13.1%**	**17.9%**	**30.0%**	**16.8%**	**10.7%**	**0.2%**	**57.6%**	**10.9%**
Females	10.7%	16.1%	20.7%	31.0%	12.3%	9.2%	0.0%	52.5%	9.2%
Males	11.9%	10.3%	15.5%	29.1%	20.9%	12.0%	0.3%	62.3%	12.3%
14-17 years	**10.5%**	**10.9%**	**23.4%**	**29.5%**	**15.0%**	**10.2%**	**0.5%**	**55.2%**	**10.7%**
Females	9.6%	12.9%	25.9%	31.2%	10.9%	9.2%	0.2%	51.6%	9.4%
Males	11.3%	8.9%	21.0%	27.9%	19.0%	11.0%	0.8%	58.8%	11.8%
Regions									
DE	9.3%	10.1%	21.3%	32.1%	16.8%	9.8%	0.5%	59.3%	10.3%
FR	11.6%	14.6%	16.5%	29.0%	17.8%	10.2%	0.3%	57.3%	10.5%
IT	13.7%	16.0%	18.4%	30.6%	15.6%	4.7%	0.9%	51.9%	5.6%
Overall	**9.9%**	**11.2%**	**20.3%**	**31.5%**	**17.0%**	**9.6%**	**0.5%**	**58.6%**	**10.1%**
Plant-based drinks or plant-based milk substitutes (e.g.: drinks based on soya, oats, almonds)									
6-9 years	**83.5%**	**6.5%**	**4.4%**	**1.6%**	**2.3%**	**1.8%**	**0.0%**	**5.7%**	**1.8%**
Females	85.9%	5.8%	5.5%	1.2%	0.8%	0.8%	0.0%	2.8%	0.8%
Males	81.1%	7.2%	3.2%	2.1%	3.7%	2.7%	0.0%	8.5%	2.7%
10-13 years	**81.9%**	**8.8%**	**2.5%**	**3.9%**	**1.8%**	**1.2%**	**0.0%**	**6.8%**	**1.2%**
Females	81.2%	8.7%	2.8%	4.9%	0.6%	1.8%	0.0%	7.3%	1.8%
Male	82.6%	8.9%	2.1%	2.9%	2.8%	0.6%	0.0%	6.4%	0.6%
14-17 years	**72.0%**	**11.5%**	**8.3%**	**3.2%**	**3.2%**	**1.8%**	**0.0%**	**8.2%**	**1.8%**
Females	66.0%	12.4%	10.5%	4.7%	3.7%	2.7%	0.0%	11.1%	2.7%
Males	77.9%	10.6%	6.1%	1.8%	2.6%	0.9%	0.0%	5.3%	0.9%
Regions									
DE	78.5%	9.0%	5.5%	2.9%	2.4%	1.7%	0.0%	7.0%	1.7%
FR	81.5%	9.4%	3.0%	3.1%	2.1%	1.0%	0.0%	6.1%	1.0%
IT	86.8%	4.6%	2.3%	2.3%	2.7%	1.3%	0.0%	6.4%	1.3%
Overall	**79.5%**	**8.8%**	**4.9%**	**2.9%**	**2.4%**	**1.6%**	**0.0%**	**6.8%**	**1.6%**

FPQ: In general, how often does [FIRST NAME CHILD]/do you eat the following foods? Question was answered by parents for children aged 6-13 years. Question was answered by adolescent for children aged 14-17 years.

Table 12.35 shows that milk and cheese are the most commonly consumed dairy products, with 72% of young people drinking milk and 75.4% eating cheese at least once a week. Sweetened dairy products are less popular, and plant-based milk substitutes are regularly consumed only by a minority. A comparison across age groups shows that younger children drink milk more frequently.

Seeds or nuts

Table 12.36 FPQ: Percentage distribution of seeds or nuts consumption, overall and stratified by sex, age group and linguistic region

	Never	Less than once a month	Around 1 to 3 times a month	1 to 3 times a week	4 to 6 times a week	1 to 2 times a day	More than 3 times a day	Weekly consumption	Daily consumption
Non-salted/**non**-sweetened seeds or nuts (e.g.: hazelnuts, almonds)									
6-9 years	**14.3%**	**26.8%**	**23.2%**	**22.5%**	**10.8%**	**2.3%**	**0.1%**	**35.7%**	**2.4%**
Females	14.1%	29.0%	22.6%	19.4%	12.8%	2.0%	0.1%	34.3%	2.1%
Males	14.5%	24.7%	23.8%	25.4%	8.8%	2.7%	0.2%	37.0%	2.9%
10-13 years	**18.1%**	**24.1%**	**32.3%**	**19.3%**	**4.0%**	**2.2%**	**0.0%**	**25.4%**	**2.2%**
Females	16.7%	23.5%	33.8%	20.0%	5.0%	1.0%	0.0%	26.1%	1.0%
Males	19.4%	24.7%	31.0%	18.6%	3.0%	3.3%	0.0%	24.8%	3.3%
14-17 years	**17.4%**	**25.3%**	**31.7%**	**15.8%**	**8.3%**	**1.2%**	**0.1%**	**25.5%**	**1.3%**
Females	20.4%	27.2%	29.2%	13.3%	9.0%	0.7%	0.2%	23.3%	0.9%
Males	14.5%	23.5%	34.3%	18.3%	7.6%	1.8%	0.0%	27.7%	1.8%
Regions									
DE	16.6%	26.1%	28.6%	18.6%	8.1%	2.0%	0.0%	28.7%	2.0%
FR	15.2%	23.6%	29.8%	23.0%	6.4%	1.8%	0.2%	31.4%	2.0%
IT	20.9%	22.1%	32.1%	17.4%	5.1%	2.1%	0.2%	24.9%	2.3%
Overall	**16.6%**	**25.4%**	**29.0%**	**19.4%**	**7.6%**	**2.0%**	**0.1%**	**29.0%**	**2.1%**

FPQ: Question for parent: In general, how often does [FIRST NAME CHILD] eat the following foods? Question for adolescent: In general, how often do you eat the following foods? Question was answered by parent for children aged 6-13 years. Question was answered by adolescent for children aged 14-17 years.

Table 12.36 shows that 29% of all young people consume non-salted/non-sweetened nuts and seeds at least once a week. Younger children tend to consume them more frequently than adolescents.

Chocolate, candy, pastries, savoury snacks and fast food

Table 12.37 FPQ: Percentage of chocolate, candy, pastries, savoury snacks and fast-food consumption, overall and stratified by sex, age group and linguistic region

	Never	Less than once a month	Around 1 to 3 times a month	1 to 3 times a week	4 to 6 times a week	1 to 2 times a day	More than 3 times a day	Weekly consumption	Daily consumption
Chocolate, chocolate bars (e.g.: Snickers®, Kinder®, Toblerone®)									
6-9 years	**2.8%**	**2.8%**	**14.1%**	**42.7%**	**25.0%**	**12.3%**	**0.3%**	**80.3%**	**12.6%**
Females	1.6%	3.4%	12.1%	41.4%	31.0%	10.1%	0.5%	83.0%	10.6%
Males	3.9%	2.3%	16.0%	44.1%	19.1%	14.4%	0.2%	77.8%	14.6%
10-13 years	**3.1%**	**6.9%**	**15.2%**	**37.9%**	**22.2%**	**14.7%**	**0.0%**	**74.8%**	**14.7%**
Females	3.3%	7.0%	14.3%	40.5%	19.2%	15.7%	0.0%	75.4%	15.7%
Males	3.0%	6.7%	16.0%	35.5%	25.0%	13.8%	0.0%	74.2%	13.8%
14-17 years	**2.0%**	**5.1%**	**22.4%**	**40.0%**	**21.7%**	**7.5%**	**1.2%**	**70.4%**	**8.7%**
Females	1.9%	2.9%	21.6%	42.4%	20.0%	9.5%	1.7%	73.6%	11.2%
Males	2.2%	7.3%	23.2%	37.5%	23.5%	5.6%	0.8%	67.3%	6.4%
Regions									
DE	1.9%	4.0%	15.3%	41.0%	25.4%	12.1%	0.3%	78.8%	12.4%
FR	5.8%	9.3%	23.6%	35.3%	15.0%	9.8%	1.1%	61.3%	10.9%
IT	3.3%	3.7%	18.5%	46.1%	15.7%	12.0%	0.7%	74.5%	12.7%
Overall	**2.7%**	**4.9%**	**17.0%**	**40.2%**	**23.0%**	**11.7%**	**0.5%**	**75.4%**	**12.2%**
Candy/sweets (e.g.: Haribo®, lollipops, Trolli®)									
6-9 years	**1.6%**	**8.0%**	**21.3%**	**38.5%**	**21.6%**	**8.5%**	**0.4%**	**69.0%**	**8.9%**
Females	0.5%	6.4%	22.3%	37.8%	25.0%	7.6%	0.3%	70.8%	7.9%
Males	2.7%	9.5%	20.4%	39.3%	18.2%	9.3%	0.6%	67.4%	9.9%
10-13 years	**4.9%**	**10.0%**	**21.7%**	**38.8%**	**17.8%**	**6.8%**	**0.1%**	**63.4%**	**6.9%**
Females	4.8%	11.6%	21.6%	39.9%	12.9%	9.2%	0.0%	62.0%	9.2%
Males	4.9%	8.6%	21.8%	37.7%	22.1%	4.6%	0.1%	64.6%	4.7%
14-17 years	**9.4%**	**15.5%**	**31.7%**	**30.9%**	**10.3%**	**2.3%**	**0.0%**	**43.5%**	**2.3%**
Females	9.5%	16.9%	35.6%	29.1%	6.2%	2.7%	0.0%	38.0%	2.7%
Males	9.2%	14.1%	27.9%	32.6%	14.3%	1.9%	0.0%	48.8%	1.9%
Regions									
DE	3.7%	9.4%	22.0%	37.3%	20.2%	7.3%	0.1%	64.9%	7.4%
FR	8.6%	15.8%	32.8%	34.9%	6.5%	0.9%	0.6%	42.8%	1.5%
IT	13.1%	17.5%	33.4%	27.2%	3.0%	5.4%	0.4%	36.0%	5.8%
Overall	**5.1%**	**11.0%**	**24.6%**	**36.3%**	**16.8%**	**6.1%**	**0.2%**	**59.4%**	**6.3%**

Baked goods and pastries (e.g.: croissants, doughnuts, cakes)									
6-9 years	**0.8%**	**11.7%**	**45.4%**	**35.7%**	**5.2%**	**1.1%**	**0.0%**	**42.0%**	**1.1%**
Females	1.2%	10.3%	46.6%	34.9%	6.6%	0.3%	0.0%	41.9%	0.3%
Males	0.5%	13.1%	44.3%	36.4%	3.8%	1.9%	0.0%	42.2%	1.9%
10-13 years	**1.4%**	**14.8%**	**36.7%**	**40.7%**	**5.3%**	**0.9%**	**0.2%**	**47.1%**	**1.1%**
Females	1.4%	16.1%	37.8%	41.6%	1.7%	0.9%	0.4%	44.7%	1.3%
Males	1.3%	13.7%	35.8%	39.9%	8.5%	0.9%	0.0%	49.3%	0.9%
14-17 years	**1.9%**	**8.8%**	**34.7%**	**39.2%**	**13.4%**	**1.6%**	**0.4%**	**54.6%**	**2.0%**
Females	2.7%	9.1%	37.8%	37.1%	13.2%	0.1%	0.0%	50.4%	0.1%
Males	1.1%	8.4%	31.8%	41.3%	13.5%	3.0%	0.9%	58.7%	3.9%
Regions									
DE	0.9%	10.7%	38.2%	40.1%	8.6%	1.2%	0.3%	50.2%	1.5%
FR	2.3%	15.8%	44.4%	32.5%	4.1%	0.9%	0.0%	37.4%	0.9%
IT	4.3%	16.6%	35.1%	35.5%	7.1%	1.5%	0.0%	44.0%	1.5%
Overall	**1.3%**	**11.9%**	**39.2%**	**38.5%**	**7.7%**	**1.2%**	**0.2%**	**47.6%**	**1.4%**
Savoury snacks (e.g.: crisps, pretzel sticks, salted bread sticks)									
6-9 years	**0.5%**	**6.9%**	**34.8%**	**43.9%**	**11.2%**	**2.2%**	**0.5%**	**57.8%**	**2.7%**
Females	0.3%	6.3%	34.7%	45.2%	12.3%	1.0%	0.2%	58.7%	1.2%
Male	0.7%	7.5%	34.9%	42.7%	10.2%	3.3%	0.9%	57.0%	4.2%
10-13 years	**0.1%**	**7.5%**	**29.0%**	**46.5%**	**14.4%**	**2.5%**	**0.0%**	**63.4%**	**2.5%**
Females	0.3%	8.4%	31.5%	40.2%	16.7%	2.9%	0.0%	59.8%	2.9%
Males	0.0%	6.6%	26.7%	52.2%	12.4%	2.1%	0.0%	66.6%	2.1%
14-17 years	**1.0%**	**7.2%**	**27.7%**	**52.6%**	**9.0%**	**2.4%**	**0.2%**	**64.1%**	**2.6%**
Females	1.0%	7.4%	29.6%	52.2%	7.9%	1.7%	0.3%	62.1%	2.0%
Males	1.1%	7.0%	25.9%	53.0%	10.0%	3.1%	0.0%	66.1%	3.1%
Regions									
DE	0.2%	5.1%	29.0%	49.5%	13.2%	2.8%	0.3%	65.8%	3.1%
FR	1.8%	15.8%	37.7%	39.2%	4.6%	0.9%	0.0%	44.7%	0.9%
IT	1.4%	8.4%	29.5%	45.1%	14.4%	1.2%	0.0%	60.7%	1.2%
Overall	**0.5%**	**7.2%**	**30.6%**	**47.4%**	**11.7%**	**2.4%**	**0.2%**	**61.7%**	**2.6%**
Fast foods (e.g.: hamburgers, hot dogs, chips, kebabs, pizza, chicken nuggets)									
6-9 years	**2.2%**	**23.8%**	**53.4%**	**19.9%**	**0.6%**	**0.0%**	**0.0%**	**20.5%**	**0.0%**
Females	2.2%	24.9%	53.6%	18.2%	1.1%	0.0%	0.0%	19.3%	0.0%
Males	2.3%	22.8%	53.3%	21.5%	0.1%	0.0%	0.0%	21.6%	0.0%
10-13 years	**1.5%**	**24.3%**	**58.4%**	**14.9%**	**0.7%**	**0.1%**	**0.2%**	**15.9%**	**0.3%**
Females	2.8%	27.3%	53.6%	15.8%	0.0%	0.2%	0.3%	16.3%	0.5%
Males	0.4%	21.5%	62.7%	14.2%	1.3%	0.0%	0.0%	15.4%	0.0%
14-17 years	**2.6%**	**16.1%**	**52.8%**	**26.2%**	**2.4%**	**0.0%**	**0.0%**	**28.6%**	**0.0%**
Females	3.6%	19.4%	59.0%	17.1%	0.9%	0.0%	0.0%	18.0%	0.0%
Males	1.6%	12.8%	46.8%	35.1%	3.8%	0.0%	0.0%	38.8%	0.0%
Regions									
DE	1.7%	18.4%	57.5%	21.0%	1.4%	0.0%	0.0%	22.5%	0.0%
FR	3.8%	33.1%	46.6%	15.8%	0.4%	0.0%	0.3%	16.5%	0.3%
IT	2.6%	29.6%	47.1%	20.3%	0.4%	0.0%	0.0%	20.7%	0.0%
Overall	**2.1%**	**21.7%**	**55.0%**	**20.0%**	**1.2%**	**0.0%**	**0.1%**	**21.3%**	**0.1%**

FPQ: In general, how often does [FIRST NAME CHILD]/do you eat the following foods? Question was answered by parents for children aged 6-13 years. Question was answered by adolescent for children aged 14-17 years.

Table 12.37 shows that among snacks, chocolate is the most frequently consumed, followed by salty snacks and candy. Overall, 75.4% of young people consume chocolate at least once a week, and 12% daily, and more than half consume candy and salty snacks at least once a week, followed closely by pastries. A comparison across age groups shows that adolescents consume less chocolate and candy, but more baked goods/pastries and fast-food items than younger children. People from the German-speaking region consume more chocolate, candy, pastries and savoury snacks than those from the French-speaking and Italian-speaking regions. Fench-speaking region consumes less of all those categories, except for cady for which Italian-speaking region is lower.

Soda, alcoholic beverages

Table 12.38 FPQ: Percentage distribution of soda, alcoholic beverages consumption, overall and stratified by sex, age group and linguistic region

	Never	Less than once a month	Around 1 to 3 times a month	1 to 3 times a week	4 to 6 times a week	1 to 2 times a day	More than 3 times a day	Weekly consumption	Daily consumption
Sweetened drinks (e.g.: Coca-Cola®, Capri Sun®, Fanta®, Iced Tea)									
6-9 years	**11.6%**	**23.8%**	**39.6%**	**19.0%**	**2.6%**	**2.6%**	**0.8%**	**25.0%**	**3.4%**
Females	14.1%	26.2%	35.4%	17.5%	3.7%	2.5%	0.6%	24.3%	3.1%
Males	9.1%	21.5%	43.7%	20.5%	1.5%	2.6%	1.1%	25.7%	3.7%
10-13 years	**4.3%**	**19.1%**	**32.7%**	**35.5%**	**5.1%**	**2.8%**	**0.4%**	**43.9%**	**3.2%**
Females	5.0%	20.8%	36.6%	29.2%	5.9%	1.8%	0.8%	37.7%	2.6%
Males	3.7%	17.6%	29.2%	41.3%	4.4%	3.8%	0.0%	49.5%	3.8%
14-17 years	**6.6%**	**12.1%**	**27.1%**	**36.8%**	**13.8%**	**3.1%**	**0.5%**	**54.2%**	**3.6%**
Females	6.0%	20.6%	36.4%	22.9%	10.0%	3.5%	0.7%	37.0%	4.2%
Males	7.3%	3.8%	18.0%	50.3%	17.5%	2.8%	0.3%	70.9%	3.1%
Regions									
DE	6.6%	18.2%	33.2%	31.2%	7.1%	3.0%	0.7%	42.0%	3.7%
FR	9.9%	20.2%	35.0%	26.3%	6.6%	1.9%	0.1%	34.9%	2.0%
IT	14.2%	19.8%	31.2%	27.1%	4.1%	2.6%	1.1%	34.8%	3.7%
Overall	**7.6%**	**18.6%**	**33.4%**	**30.1%**	**6.8%**	**2.8%**	**0.6%**	**40.4%**	**3.4%**
Artificially sweetened drinks (e.g.: Coca-Cola zero® or light®, Rivella bleu®)									
6-9 years	**57.2%**	**17.4%**	**18.5%**	**3.5%**	**2.5%**	**0.8%**	**0.0%**	**6.9%**	**0.8%**
Females	62.0%	14.9%	16.9%	3.5%	2.2%	0.5%	0.0%	6.2%	0.5%
Males	52.6%	19.7%	20.1%	3.5%	2.9%	1.2%	0.0%	7.5%	1.2%
10-13 years	**46.6%**	**20.1%**	**16.8%**	**14.1%**	**1.9%**	**0.4%**	**0.1%**	**16.5%**	**0.5%**
Females	46.4%	22.5%	14.1%	14.1%	2.1%	0.5%	0.3%	17.0%	0.8%

Males	46.7%	18.0%	19.2%	14.1%	1.8%	0.2%	0.0%	16.1%	0.2%
14-17 years	**35.1%**	**18.8%**	**22.0%**	**15.8%**	**7.4%**	**0.7%**	**0.3%**	**24.1%**	**1.0%**
Females	34.3%	24.3%	25.1%	9.8%	5.4%	0.9%	0.2%	16.4%	1.1%
Males	35.9%	13.4%	19.0%	21.6%	9.3%	0.4%	0.3%	31.6%	0.7%
Regions									
DE	43.6%	19.7%	20.1%	11.4%	4.2%	0.8%	0.2%	16.5%	1.0%
FR	58.8%	14.3%	14.5%	9.9%	2.4%	0.1%	0.0%	12.4%	0.1%
IT	52.5%	20.2%	17.6%	7.0%	2.7%	0.0%	0.0%	9.6%	0.0%
Overall	**46.8%**	**18.8%**	**19.0%**	**10.9%**	**3.8%**	**0.6%**	**0.1%**	**15.4%**	**0.7%**
Energy drinks (e.g.: Red Bull®, Monster®)									
6-9 years	**99.3%**	**0.6%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**
Females	99.5%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Males	99.2%	0.7%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
10-13 years	**86.6%**	**8.3%**	**2.3%**	**2.1%**	**0.7%**	**0.0%**	**0.0%**	**2.8%**	**0.0%**
Females	86.3%	6.1%	2.1%	4.1%	1.4%	0.0%	0.0%	5.5%	0.0%
Males	86.8%	10.4%	2.5%	0.3%	0.0%	0.0%	0.0%	0.3%	0.0%
14-17 years	**50.8%**	**14.9%**	**13.7%**	**14.8%**	**4.6%**	**1.3%**	**0.0%**	**20.6%**	**1.3%**
Females	58.6%	13.8%	11.2%	10.1%	3.9%	2.4%	0.0%	16.4%	2.4%
Males	43.1%	16.0%	16.3%	19.3%	5.2%	0.1%	0.0%	24.7%	0.1%
Regions									
DE	78.5%	7.8%	5.5%	5.9%	1.8%	0.4%	0.0%	8.2%	0.4%
FR	86.3%	6.8%	3.0%	2.5%	1.2%	0.2%	0.0%	3.4%	0.2%
IT	86.0%	7.7%	2.9%	3.4%	0.0%	0.0%	0.0%	3.9%	0.0%
Overall	**83.0%**	**6.2%**	**5.7%**	**1.5%**	**2.1%**	**1.5%**	**0.0%**	**7.2%**	**1.5%**
Liquid or powdered sports drinks (e.g.: Isostar®, Sponser®)									
6-9 years	**93.4%**	**4.0%**	**2.2%**	**0.4%**	**0.0%**	**0.0%**	**0.0%**	**0.4%**	**0.0%**
Females	96.7%	2.2%	1.0%	0.2%	0.0%	0.0%	0.0%	0.2%	0.0%
Males	90.2%	5.7%	3.4%	0.7%	0.0%	0.0%	0.0%	0.7%	0.0%
10-13 years	**80.7%**	**8.9%**	**8.5%**	**1.3%**	**0.6%**	**0.0%**	**0.0%**	**1.9%**	**0.0%**
Females	88.6%	5.0%	4.5%	1.3%	0.6%	0.0%	0.0%	2.0%	0.0%
Males	73.5%	12.6%	12.0%	1.3%	0.6%	0.0%	0.0%	1.9%	0.0%
14-17 years	**68.5%**	**13.5%**	**7.8%**	**5.5%**	**3.1%**	**1.6%**	**0.0%**	**10.3%**	**1.6%**
Females	80.4%	9.3%	4.3%	4.1%	0.4%	1.5%	0.0%	6.0%	1.5%
Males	56.8%	17.7%	11.1%	6.8%	5.8%	1.8%	0.0%	14.4%	1.8%
Regions									
DE	77.8%	10.0%	7.5%	2.7%	1.4%	0.6%	0.0%	4.7%	0.6%
FR	94.3%	3.5%	1.2%	0.6%	0.5%	0.0%	0.0%	2.4%	0.0%
IT	89.8%	5.5%	2.3%	1.9%	0.5%	0.0%	0.0%	1.1%	0.0%
Overall	**81.4%**	**8.6%**	**6.1%**	**2.3%**	**1.2%**	**0.5%**	**0.0%**	**3.9%**	**0.5%**
Beer (with alcohol)*									
14-17 years	**69.8%**	**10.6%**	**15.7%**	**3.8%**	**0.1%**	**0.0%**	**0.0%**	**3.9%**	**0.0%**
Females	72.8%	12.9%	12.9%	1.3%	0.0%	0.0%	0.0%	1.3%	0.0%
Males	66.9%	8.4%	18.3%	6.2%	0.3%	0.0%	0.0%	6.4%	0.0%
Regions									
DE	69.2%	11.6%	15.9%	3.3%	0.0%	0.0%	0.0%	3.3%	0.0%
FR	69.2%	8.1%	16.2%	5.9%	0.6%	0.0%	0.0%	6.5%	0.0%

IT	79.7%	6.0%	10.8%	3.6%	0.0%	0.0%	0.0%	3.6%	0.0%
Overall	**69.8%**	**10.6%**	**15.7%**	**3.8%**	**0.1%**	**0.0%**	**0.0%**	**3.9%**	**0.0%**
Wine (red, white, rosé, prosecco, Champagne)*									
14-17 years	**79.9%**	**11.5%**	**6.7%**	**1.7%**	**0.1%**	**0.0%**	**0.0%**	**1.9%**	**0.0%**
Females	79.1%	12.9%	6.8%	1.2%	0.0%	0.0%	0.0%	1.2%	0.0%
Males	80.6%	10.2%	6.6%	2.2%	0.3%	0.0%	0.0%	2.5%	0.0%
Regions									
DE	80.0%	11.1%	7.7%	1.1%	0.0%	0.0%	0.0%	1.1%	0.0%
FR	77.1%	14.2%	3.9%	4.1%	0.6%	0.0%	0.0%	4.8%	0.0%
IT	87.7%	6.8%	4.0%	1.4%	0.0%	0.0%	0.0%	1.4%	0.0%
Overall	**79.9%**	**11.5%**	**6.7%**	**1.7%**	**0.1%**	**0.0%**	**0.0%**	**1.9%**	**0.0%**
Spirits, cocktails (e.g.: whiskey and cola, vodka and orange, Aperol® spritz, mojito), alcopops (= mix of a soft drink and alcohol, e.g.: Smirnoff Ice®, Eve®)*									
14-17 years	**74.3%**	**13.3%**	**9.7%**	**2.4%**	**0.1%**	**0.0%**	**0.1%**	**2.7%**	**0.1%**
Females	66.6%	18.0%	13.5%	1.9%	0.0%	0.0%	0.0%	1.9%	0.0%
Males	81.6%	8.8%	6.1%	3.0%	0.3%	0.0%	0.2%	3.4%	0.2%
Regions									
DE	73.0%	14.0%	10.8%	2.3%	0.0%	0.0%	0.0%	2.3%	0.0%
FR	78.2%	11.8%	6.5%	2.3%	0.6%	0.0%	0.5%	3.5%	0.5%
IT	78.6%	9.2%	6.8%	5.5%	0.0%	0.0%	0.0%	5.5%	0.0%
Overall	**74.3%**	**13.3%**	**9.7%**	**2.4%**	**0.1%**	**0.0%**	**0.1%**	**2.7%**	**0.1%**

*FPQ: In general, how often does [FIRST NAME CHILD]/do you eat the following foods? Question was answered by parents for children aged 6-13 years. Question was answered by adolescent for children aged 14-17 years. *Questions for alcoholic beverages was asked to age group 14-17 exclusively.*

Table 12.38 shows that sweetened drinks are more commonly consumed than artificially sweetened beverages, with 40.4% of young people drinking them at least once a week. Energy drinks consumption varies across age groups, with adolescents mainly being the primary consumers. A similar pattern is observed for sports drinks, which are also mainly consumed by adolescents. Regarding alcoholic beverages, male adolescents tend to consume them more frequently than Females adolescents. A comparison across linguistic regions reveals that people from the German-speaking part consume more artificially sweetened drinks, energy drinks and sports drinks, while those from the French-speaking part consume more alcoholic beverages.

Portion of fruits/vegetables per day

Table 12.39 Percentage distribution of consumed portions of fruit/vegetables per day, overall and stratified by sex, age group and linguistic region

	Portions of fruits/day							Portions of vegetables/day						
	He/She never eats fruit	Less than one portion	1 portion	2 portions	3 portions	4 portions	5 portions or more	He/She never eats vegetables	Less than one portion	1 portion	2 portions	3 portions	4 portions	5 portions or more
Females														
6-9 years	0.7%	8.4%	37.5%	38.4%	14%	0.9%	0.1%	0.3%	16.5%	28%	37.4%	15.4%	1.6%	0.7%
10-13 years	0.8%	17.8%	32.7%	37.8%	8.8%	1.6%	0.5%	1.9%	8.1%	32.3%	39.8%	13.1%	3.6%	1.3%
14-17 years	2.5%	21%	36.2%	31.6%	7.2%	1.3%	0.1%	0.8%	11%	25%	38.2%	17.4%	6.1%	1.6%
Males														
6-9 years	0.3%	7.7%	37.5%	38.8%	14.5%	1.1%	0.2%	0.9%	12.7%	32.2%	42.4%	9.2%	1.9%	0.7%
10-13 years	2.5%	23.8%	37.8%	26.9%	7.6%	0.8%	0.5%	0%	21.7%	29.6%	33.9%	11.8%	2.7%	0.3%
14-17 years	3.2%	31.4%	32.6%	23.4%	6.4%	2.6%	0.4%	1.8%	14.9%	23.2%	38.3%	18.8%	0.9%	2.1%
Regions														
DE	1.3%	18%	36.1%	33.4%	9.9%	1.1%	0.1%	0.6%	15.1%	31.3%	36.5%	13.4%	2.4%	0.7%
FR	2.3%	17.5%	35.2%	31.3%	10.6%	2.1%	0.9%	1.5%	11%	16.7%	46.2%	18%	3.8%	2.8%
IT	3.7%	20.8%	33.7%	31.5%	7.6%	2.1%	0.6%	3.5%	13.6%	29.7%	37.8%	10%	4.4%	0.9%
Overall	**1.6%**	**18%**	**35.8%**	**33%**	**9.9%**	**1.4%**	**0.3%**	**0.9%**	**14.3%**	**28.6%**	**38.3%**	**14.1%**	**2.8%**	**1.1%**

Question: How many fruit/vegetables does [FIRST NAME CHILD]/do you eat per day? One portion corresponds to one handful of fruits/vegetables. Please note: Fruit/vegetable juice does not count! Question was answered by parent for children aged 6-13 years. Question was answered by adolescent for children aged 14-17 years.

Table 12.39 shows that the majority of young people consume one or two portions of fruits and of vegetables per day. Overall, young people tend to consume more vegetables than fruits. Females consume slightly more vegetables and fruits than males.

13 Annexes Chapter 7

13.1 Results dietary assessment

13.1.1 Daily energy intake (kcal/day) and macronutrients contribution (kcal/day)

Table 13.1 Daily energy intake (kcal/day) and macronutrients contribution (kcal/day), across selected strata

Daily Energy Intake		Total (kcal/day)				Macronutrients contribution																			
						Proteins (kcal/day)				Carbohydrates (kcal/day)				Fibres (kcal/day)				Fats (kcal/day)				Alcohol (kcal/day)			
Age	Sex	Mean	P25	Median	P75	Mean	P25	Median	P75	Mean	P25	Median	P75	Mean	P25	Median	P75	Mean	P25	Median	P75	Mean	P25	Median	P75
6-9 years	F	1652	1416	1643	1827	231	178	219	265	802	680	792	898	34	27	32	39	581	462	566	673	0.6	0	0	0
6-9 years	M	1938	1600	1858	2153	268	208	254	320	951	781	912	1064	39	29	37	45	674	536	647	764	0.7	0	0	0
10-13 years	F	1889	1568	1840	2149	263	212	258	300	900	712	884	1069	36	27	35	44	676	536	658	792	0.5	0	0	0
10-13 years	M	2108	1759	2047	2314	295	236	281	340	1025	852	979	1160	39	30	38	45	741	590	718	850	1.3	0	0	0
14-17 years	F	1821	1485	1791	2157	257	201	247	297	862	663	858	1007	36	27	34	43	657	498	611	786	4.4	0	0	0
14-17 years	M	2422	1945	2282	2866	385	294	359	468	1111	848	1071	1275	43	30	40	52	864	643	819	1045	13	0	0	0
All Females		1782	1488	1750	2060	250	195	240	291	854	694	832	992	35	27	34	42	637	494	610	757	1.7	0	0	0
All Males		2141	1734	2046	2391	312	233	293	364	1025	810	972	1164	40	30	38	47	754	573	712	877	4.5	0	0	0
Total		1967	**1589**	**1889**	**2245**	**282**	**213**	**262**	**331**	**942**	**740**	**904**	**1090**	**38**	**28**	**36**	**45**	**697**	**531**	**663**	**810**	**3.2**	**0**	**0**	**0**

Table 13.1 shows the daily energy intake in kcal/day and the macronutrients contribution in kcal/day for each age group, stratified by sex and SEP. A clear trend emerges showing that energy intake increases with age, except for female adolescents aged 14-17 who have a lower energy intake than female aged 10-13 years. Overall, males have a higher energy intake than females. Similarly, the intake of all macronutrients – proteins, carbohydrates, fibres, and fats –

also rises with age except for older female adolescents whose intake is slightly lower than that of females aged 10-13 years. Males consistently consume more energy than their female counterparts.

13.1.2 Daily energy intake (kcal/day) and macronutrients contribution (g/day) in 24HDR visit

Table 13.2 Daily energy intake (kcal/day) and macronutrients contribution (g/day) across selected strata in 24HDR visit

Daily Energy Intake		Total (kcal/day)				Macronutrients contribution (g/day)																			
						Proteins (g/day)				Carbohydrates (g/day)				Fibres (g/day)				Fats (g/day)				Alcohol (g/day)			
Age	Sex	Mean	P25	Median	P75	Mean	P25	Median	P75	Mean	P25	Median	P75	Mean	P25	Median	P75	Mean	P25	Median	P75	Mean	P25	Median	P75
6-9 years	F	1670	1321	1641	1914	58	43	53	68	205	157	202	240	17	12	17	21	65	48	61	78	0.1	0	0	0
6-9 years	M	1972	1559	1897	2218	68	50	65	76	242	189	237	279	20	15	19	24	76	56	72	91	0.1	0	0	0
10-13 years	F	1932	1557	1845	2255	66	51	63	81	236	180	219	291	19	13	18	23	75	56	70	89	0.1	0	0	0
10-13 years	M	2174	1726	2099	2569	76	58	70	89	264	194	253	321	20	14	19	24	85	62	84	100	0.1	0	0	0
14-17 years	F	1881	1463	1811	2240	65	46	62	80	221	161	211	276	18	13	17	22	77	53	73	99	0.9	0	0	0
14-17 years	M	2512	1919	2360	3028	99	68	91	124	287	204	265	339	21	14	21	26	100	69	94	118	2.6	0	0	0
All Females		1824	1441	1755	2140	63	47	60	77	221	164	211	265	18	13	17	22	72	51	67	88	0.3	0	0	0
All Males		2204	1702	2081	2571	80	57	71	94	263	194	249	317	20	14	19	25	87	61	80	104	0.8	0	0	0
Total		2019	1561	1907	2374	72	50	66	85	242	179	230	290	19	13	18	23	79	56	74	97	0.6	0	0	0

Table 13.2 shows the daily energy intake in kcal/day and the macronutrients consumption in g/day collected during **24HDR visit**, by age group and sex.

13.1.3 Daily energy intake (kcal/day) and macronutrients contribution (g/day) in phone 24HDR

Table 13.3 Daily energy intake (kcal/day) and macronutrients contribution (g/day) across selected strata in phone 24HDR

Daily Energy Intake		Total (kcal/day)				Macronutrients contribution (g/day)																			
						Proteins (g/day)				Carbohydrates (g/day)				Fibres (g/day)				Fats (g/day)				Alcohol (g/day)			
Age	Sex	Mean	P25	Median	P75	Mean	P25	Median	P75	Mean	P25	Median	P75	Mean	P25	Median	P75	Mean	P25	Median	P75	Mean	P25	Median	P75
6-9 years	F	1637	1352	1631	1867	58	42	54	67	197	157	188	233	16	13	15	19	65	49	64	76	0.1	0	0	0
6-9 years	M	1902	1588	1820	2175	66	52	61	80	234	182	224	269	19	14	18	24	73	54	69	88	0.1	0	0	0
10-13 years	F	1832	1424	1776	2120	65	51	62	76	214	161	203	266	17	12	17	21	75	54	72	92	0.1	0	0	0
10-13 years	M	2041	1614	1938	2284	72	52	69	85	249	192	231	284	19	14	18	23	79	60	76	92	0.2	0	0	0
14-17 years	F	1760	1336	1725	2131	63	42	60	75	210	154	207	259	18	12	17	23	69	46	67	85	0.4	0	0	0
14-17 years	M	2330	1750	2234	2779	93	65	85	122	269	187	243	339	21	14	20	27	92	59	83	116	1.1	0	0	0
All Females		1741	1369	1697	2040	62	45	58	74	207	158	198	250	17	12	16	21	70	50	67	85	0.2	0	0	0
All Males		2077	1614	1941	2407	76	54	69	90	249	187	231	292	20	14	18	24	81	57	75	95	0.5	0	0	0
Total		1914	1497	1812	2232	69	50	63	82	229	171	217	271	18	13	17	22	75	54	71	90	0.3	0	0	0

Table 13.3 shows the daily energy intake in kcal/day and the macronutrients consumption in g/day collected during **phone 24HDR**, by age group and sex. Values are slightly lower than for the visit.

13.1.4 Relative Contribution of Macronutrients to Daily Energy Intake vs. Recommendations

Table 13.4 Relative Contribution of Macronutrients to Daily Energy Intake and comparison with recommendations, by age group and sex

Macronutrients	Recommended and Actual intake	6-9 years		10-13 years		14-17 years	
		Males	Females	Males	Females	Males	Females
Carbohydrates	*Recommended intake (% of total daily intake)*	*45%-65%*	*45%-65%*	*45%-65%*	*45%-65%*	*45%-65%*	*45%-65%*
	Actual intake (% of total daily intake)	49.1%	48.5%	48.6%	47.8%	45.9%	47.3%
Fats	*Recommended intake (% of total daily intake)*	*20% to 35%*	*20% to 35%*	*20% to 35%*	*20% to 35%*	*20% to 35%*	*20% to 35%*
	Actual intake (% of total daily intake)	34.8%	35.2%	35.2%	35.9%	35.7%	36.0%
Proteins	*French recommended intake (% of total daily intake)*	*7 to 17%*	*7 to 17%*	*9 to 19%*	*9 to 19%*	*10 to 20%*	*10 to 20%*
	Actual intake (% of total daily intake)	13.8%	14.0%	14.0%	14.0%	15.9%	14.1%
	Swiss Recommended Intake (g/kg of body weight/day)	*0.91-0.92 g / kg body weight*	*0.91-0.92 g / kg body weight*	*0.89-0.91 g / kg body weight*	*0.87-0.90 g / kg body weight*	*0.86-0.88 g / kg body weight*	*0.83-0.85 g / kg body weight*
	Weighted mean body weight (kg)	27.73	27.19	41.92	43.4	63.73	56.68
	Calculated recommendations according to mean body weight (g/day)	*25.5*	*25.01*	*38.1*	*39.1*	*56.1*	*48.2*
	Actual intake (g/day)	67	58	74	66	96	64

Table 13.4 shows the relative contribution of macronutrients to total daily energy intake by age group and sex, as well as the recommended intake.

13.1.5 Daily amount of consumed food for each food sub-subgroup by sex and age groups

Amount consumed

Table 13.5 shows the **food sub-subgroup consumption** (g/day)**,** stratified by sex and age group. In addition to the food groups from the Swiss food pyramid[67], some “special categories” have been created grouping subgroups or specific food items to better fit dietary recommendations[75,76] or answer specific research question on hot topics. The special categories have been put at the end of the table which fitted the most. These amounts include non-consumers, defined as participants having a mean intake of 0g/day in a given category for one or both recorded days. As such, these values represent the mean consumption for the entire population, including non-consumers, and do not reflect the portion size of a consumed product. Table 13.5 also shows the number and proportion of consumers for each food group and the number and proportion of recalls days on which the food group was consumed.

Table 13.5 Amount consumed (g/day), for each sub-subgroup, by sex, age group and number of consumers and recall days with consumption (N, %)

Food group: mean [P25, P50, P75] (g/day)			6-9 years			10-13 years			14-17 years			All ages		Total	Consumers N (%)	Recall days with consumption N (%)
Main category	Sub-categories		Females	Males	Total	Females	Males	Total	Females	Males	Total	Females	Males			
Beverages: water, coffee, tea, unsweetened waters	Water		765 [503,737, 969]	890 [600, 844, 1100]	829 [532, 800, 1019]	1054 [675, 975, 1405]	1006 [650, 930, 1300]	1029 [662, 950, 1325]	1188 [725, 1150, 1575]	1455 [885, 1345, 1878]	1323 [800, 1235, 1675]	993 [625, 900, 1285]	1098 [675, 988, 1400]	**1047 [650, 950, 1350]**	1844 (99.6%)	3609 (97.8%)
	coffee, tea, flavoured water without sugar	Coffee, tea with undefined added sugars (small quantities), without milk	6 [0, 0, 0]	10 [0, 0, 0]	8 [0, 0, 0]	8 [0, 0, 0]	6 [0, 0, 0]	7 [0, 0, 0]	18 [0, 0, 0]	8 [0, 0, 0]	13 [0, 0, 0]	10 [0, 0, 0]	8 [0, 0, 0]	**9 [0, 0, 0]**	107 (5.8%)	117 (3.2%)

		Coffee, tea, flavoured waters without added sugars, without milk	28 [0, 0, 0]	30 [0, 0, 0]	29 [0, 0, 0]	59 [0, 0, 60]	58 [0, 0, 0]	58 [0, 0, 0]	92 [0, 0, 125]	40 [0, 0, 0]	66 [0, 0, 75]	58 [0, 0, 50]	43 [0, 0, 0]	**50 [0, 0, 0]**	403 (21.8%)	520 (14.1%)
		coffee, tea, flavoured water without sugar **Total**	34 [0, 0, 0]	40 [0, 0, 0]	37 [0, 0, 0]	67 [0, 0, 75]	64 [0, 0, 0]	65 [0, 0, 35]	110 [0, 0, 125]	48 [0, 0, 0]	79 [0, 0, 125]	68 [0, 0, 75]	51 [0, 0, 0]	**59 [0, 0, 50]**	460 (24.8%)	610 (16.5%)
	Beverages: water, coffee, tea, unsweetened waters **Total**		**799 [532, 775, 1000]**	**929 [671, 900, 1157]**	**865 [581, 825, 1070]**	**1121 [780, 1088, 1430]**	**1070 [706, 980, 1350]**	**1094 [725, 1015, 1400]**	**1299 [842, 1235, 1613]**	**1503 [911, 1400, 1928]**	**1402 [885, 1320, 1765]**	**1062 [668, 975, 1360]**	**1149 [725, 1005, 1450]**	**1107 [700, 1000, 1403]**	**1848 (99.8%)**	**3633 (98.4%)**
Special category: All beverages, without soups (incl. sweetened)			**1080 [831, 1035, 1255]**	**1261 [978, 1198, 1528]**	**1172 [885, 1124, 1375]**	**1468 [1150, 1415, 1727]**	**1529 [1133, 1425, 1875]**	**1500 [1133, 1416, 1800]**	**1664 [1213, 1575, 2000]**	**2155 [1608, 2050, 2514]**	**1912 [1401, 1770, 2289]**	**1391 [1000, 1305, 1694]**	**1621 [1119, 1475, 1975]**	**1509 [1058, 1385, 1820]**	**1852 (100.0%)**	**3691 (100.0%)**
Fruits and vegetables, without juices and soups	Fruits	Dried fruits	3 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	1 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	**2 [0, 0, 0]**	211 (11.4%)	243 (6.6%)
		Raw fruits	155 [78, 134, 224]	167 [79, 149, 228]	161 [79, 145, 225]	122 [25, 102, 188]	113 [9, 101, 170]	117 [14, 101, 173]	112 [0, 94, 165]	97 [0, 50, 150]	104 [0, 74, 157]	131 [43, 113, 193]	127 [11, 104, 191]	**129 [26, 108, 192]**	1514 (81.7%)	2483 (67.3%)
		Transformed fruits	12 [0, 0, 0]	15 [0, 0, 9]	14 [0, 0, 4]	10 [0, 0, 0]	11 [0, 0, 0]	11 [0, 0, 0]	11 [0, 0, 0]	8 [0, 0, 0]	9 [0, 0, 0]	11 [0, 0, 0]	11 [0, 0, 0]	**11 [0, 0, 0]**	413 (22.3%)	472 (12.8%)
		Fruits **Total**	170 [87, 154, 234]	184 [97, 169, 248]	177 [90, 160, 244]	134 [44, 118, 207]	125 [13, 104, 190]	129 [25, 112, 197]	124 [25, 104, 181]	106 [0, 69, 154]	115 [0, 93, 173]	144 [53, 129, 207]	140 [26, 116, 209]	**142 [45, 123, 207]**	1588 (85.7%)	2663 (72.1%)
	Vegetables	Dried vegetables	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	0 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	**1 [0, 0, 0]**	117 (6.3%)	118 (3.2%)

		Raw vegetables	82 [20, 58, 112]	72 [14, 51, 104]	76 [18, 54, 110]	66 [19, 48, 102]	70 [9, 50, 95]	68 [14, 49, 100]	61 [9, 43, 88]	65 [0, 33, 92]	63 [5, 40, 90]	70 [17, 48, 104]	69 [9, 48, 96]	**70 [12, 48, 99]**	1549 (83.6%)	2429 (65.8%)
		Transformed vegetables	50 [10, 38, 76]	58 [11, 41, 87]	54 [10, 40, 82]	54 [8, 37, 80]	55 [11, 44, 77]	55 [9, 40, 78]	70 [16, 47, 99]	62 [8, 49, 86]	66 [12, 47, 93]	58 [10, 40, 85]	58 [10, 44, 86]	**58 [10, 41, 86]**	1602 (86.5%)	2495 (67.6%)
		Vegetable sauces	8 [0, 0, 0]	6 [0, 0, 0]	7 [0, 0, 0]	11 [0, 0, 0]	8 [0, 0, 0]	9 [0, 0, 0]	10 [0, 0, 0]	14 [0, 0, 0]	12 [0, 0, 0]	10 [0, 0, 0]	9 [0, 0, 0]	**9 [0, 0, 0]**	377 (20.4%)	411 (11.1%)
		Vegetables **Total**	140 [66, 121, 190]	136 [69, 121, 185]	138 [67, 121, 188]	131 [69, 120, 179]	134 [56, 112, 191]	133 [65, 115, 182]	142 [66, 125, 196]	142 [62, 107, 191]	142 [63, 116, 196]	138 [68, 121, 188]	137 [63, 115, 189]	**137 [66, 117, 189]**	1818 (98.2%)	3366 (91.2%)
	Fruits and vegetables, without juices and soups **Total**		**311 [201, 288, 397]**	**320 [183, 311, 414]**	**315 [194, 291, 408]**	**266 [147, 245, 355]**	**259 [119, 243, 357]**	**262 [141, 243, 357]**	**266 [141, 249, 343]**	**247 [104, 201, 344]**	**257 [121, 223, 344]**	**282 [170, 263, 370]**	**277 [136, 248, 382]**	**279 [151, 254, 375]**	**1840 (99.4%)**	**3537 (95.8%)**
Special category: Vegetables with vegetable soups			146 [69, 124, 199]	142 [72, 126, 203]	144 [70, 126, 203]	140 [74, 122, 191]	138 [57, 114, 201]	139 [66, 117, 193]	149 [70, 126, 206]	148 [67, 116, 206]	149 [68, 121, 206]	145 [70, 124, 197]	143 [65, 118, 203]	**144 [68, 121, 198]**	1818 (98.2%)	3376 (91.4%)
Cereal products and potatoes	Bread and bread products	Bread	75 [38, 65, 98]	90 [43, 76, 118]	83 [40, 68, 110]	86 [39, 76, 122]	105 [51, 92, 140]	96 [44, 86, 130]	86 [32, 70, 128]	119 [45, 94, 161]	102 [37, 84, 135]	82 [37, 70, 116]	104 [46, 87, 136]	**93 [41, 79, 126]**	1721 (92.9%)	2891 (78.3%)
		Crisp bread	8 [0, 0, 14]	9 [0, 3, 15]	9 [0, 2, 14]	8 [0, 0, 14]	7 [0, 0, 8]	8 [0, 0, 13]	4 [0, 0, 3]	4 [0, 0, 0]	4 [0, 0, 0]	7 [0, 0, 12]	7 [0, 0, 8]	**7 [0, 0, 10]**	734 (39.6%)	919 (24.9%)
		Bread and bread products **Total**	83 [46, 75, 109]	99 [53, 84, 130]	91 [49, 79, 120]	94 [43, 87, 132]	112 [62, 104, 147]	104 [53, 93, 140]	90 [37, 77, 130]	123 [53, 95, 164]	106 [42, 88, 143]	89 [43, 77, 123]	111 [55, 93, 147]	**100 [48, 86, 133]**	1770 (95.6%)	3103 (84.0%)
	Cereal flakes and breakfast cereals	Breakfast cereals	10 [0, 0, 20]	14 [0, 0, 20]	12 [0, 0, 20]	10 [0, 0, 12]	16 [0, 0, 25]	13 [0, 0, 20]	6 [0, 0, 0]	16 [0, 0, 30]	11 [0, 0, 20]	9 [0, 0, 12]	15 [0, 0, 25]	**12 [0, 0, 20]**	686 (37.0%)	892 (24.2%)
		Cereal flakes	3 [0, 0, 0]	5 [0, 0, 0]	4 [0, 0, 0]	4 [0, 0, 0]	3 [0, 0, 0]	3 [0, 0, 0]	3 [0, 0, 0]	4 [0, 0, 0]	4 [0, 0, 0]	3 [0, 0, 0]	4 [0, 0, 0]	**4 [0, 0, 0]**	294 (15.9%)	369 (10.0%)
		Cereal flakes and breakfast cereals **Total**	13 [0, 4, 20]	19 [0, 8, 30]	16 [0, 6, 25]	13 [0, 0, 20]	19 [0, 0, 38]	16 [0, 0, 27]	9 [0, 0, 14]	20 [0, 1, 30]	15 [0, 0, 25]	12 [0, 0, 20]	20 [0, 0, 30]	**16 [0, 0, 25]**	880 (47.5%)	1186 (32.1%)

	Cereal products	Dough	8 [0, 0, 0]	9 [0, 0, 8]	8 [0, 0, 6]	10 [0, 0, 14]	13 [0, 0, 15]	12 [0, 0, 15]	11 [0, 0, 10]	19 [0, 0, 35]	15 [0, 0, 20]	9 [0, 0, 10]	13 [0, 0, 16]	**11 [0, 0, 13]**	558 (30.1%)	625 (16.9%)
		Flours and starches	2 [0, 0, 1]	3 [0, 0, 1]	3 [0, 0, 1]	3 [0, 0, 0]	3 [0, 0, 0]	3 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	**2 [0, 0, 0]**	496 (26.8%)	548 (14.8%)
		Pasta and stuffed pasta	68 [0, 54, 114]	88 [23, 77, 135]	78 [14, 60, 120]	79 [0, 58, 121]	89 [0, 75, 140]	84 [0, 63, 133]	92 [0, 84, 134]	104 [0, 75, 170]	98 [0, 84, 160]	79 [0, 60, 121]	93 [0, 75, 148]	**86 [0, 65, 133]**	1341 (72.4%)	1783 (48.3%)
		Rice	21 [0, 0, 30]	29 [0, 0, 48]	25 [0, 0, 32]	24 [0, 0, 42]	32 [0, 0, 56]	28 [0, 0, 50]	33 [0, 0, 56]	38 [0, 0, 56]	35 [0, 0, 56]	26 [0, 0, 33]	33 [0, 0, 56]	**29 [0, 0, 45]**	709 (38.3%)	821 (22.2%)
		other cereals, pseudo cereals and other starchy food	15 [0, 0, 4]	16 [0, 0, 0]	15 [0, 0, 0]	16 [0, 0, 0]	14 [0, 0, 0]	15 [0, 0, 0]	16 [0, 0, 0]	14 [0, 0, 0]	15 [0, 0, 0]	15 [0, 0, 0]	15 [0, 0, 0]	**15 [0, 0, 0]**	413 (22.3%)	449 (12.2%)
		Cereal products **Total**	114 [54, 104, 163]	145 [63, 135, 199]	130 [60, 119, 181]	131 [60, 120, 179]	151 [80, 132, 213]	141 [63, 121, 194]	152 [84, 127, 208]	175 [73, 159, 245]	164 [79, 142, 223]	131 [60, 119, 177]	156 [70, 140, 214]	**144 [64, 125, 200]**	1768 (95.5%)	2980 (80.7%)
	Tubers and tuber products	Tuber products	17 [0, 0, 30]	23 [0, 0, 35]	20 [0, 0, 31]	23 [0, 0, 32]	34 [0, 0, 60]	28 [0, 0, 49]	24 [0, 0, 31]	34 [0, 0, 54]	29 [0, 0, 49]	21 [0, 0, 31]	30 [0, 0, 49]	**26 [0, 0, 40]**	630 (34.0%)	707 (19.1%)
		Tubers	20 [0, 0, 30]	19 [0, 0, 21]	19 [0, 0, 26]	24 [0, 0, 32]	25 [0, 0, 0]	24 [0, 0, 25]	24 [0, 0, 29]	37 [0, 0, 26]	31 [0, 0, 29]	22 [0, 0, 30]	27 [0, 0, 15]	**25 [0, 0, 26]**	531 (28.7%)	599 (16.2%)
		Tubers and tuber products **Total**	37 [0, 16, 59]	42 [0, 25, 62]	40 [0, 22, 60]	46 [0, 27, 80]	59 [0, 31, 90]	53 [0, 31, 86]	48 [0, 12, 86]	71 [0, 31, 110]	60 [0, 26, 95]	44 [0, 20, 71]	57 [0, 31, 86]	**50 [0, 29, 80]**	1014 (54.8%)	1258 (34.1%)
	Cereal products and potatoes Total		**246 [188, 243, 298]**	**305 [226, 292, 367]**	**276 [204, 263, 332]**	**285 [201, 274, 353]**	**341 [255, 323, 397]**	**314 [228, 296, 372]**	**299 [208, 301, 374]**	**388 [253, 362, 500]**	**344 [230, 331, 419]**	**276 [200, 265, 343]**	**343 [243, 322, 409]**	**310 [221, 292, 372]**	**1850 (99.9%)**	**3674 (99.5%)**
Dairy products, without desserts and butters	Cheese	Fresh cheese with added sugar	4 [0, 0, 0]	3 [0, 0, 0]	3 [0, 0, 0]	4 [0, 0, 0]	3 [0, 0, 0]	4 [0, 0, 0]	3 [0, 0, 0]	0 [0, 0, 0]	2 [0, 0, 0]	4 [0, 0, 0]	2 [0, 0, 0]	**3 [0, 0, 0]**	80 (4.3%)	86 (2.3%)
		Fresh cheese without added sugar	3 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	1 [0, 0, 0]	2 [0, 0, 0]	3 [0, 0, 0]	6 [0, 0, 0]	4 [0, 0, 0]	3 [0, 0, 0]	3 [0, 0, 0]	**3 [0, 0, 0]**	132 (7.1%)	139 (3.8%)

		Hard and semi-hard cheese	14 [0, 7, 25]	16 [0, 8, 25]	15 [0, 8, 25]	14 [0, 3, 21]	15 [0, 5, 19]	15 [0, 4, 20]	15 [0, 3, 18]	23 [0, 7, 32]	19 [0, 5, 21]	14 [0, 5, 22]	18 [0, 7, 23]	**16 [0, 5, 22]**	1176 (63.5%)	1599 (43.3%)
		Soft cheese	10 [0, 0, 13]	8 [0, 0, 12]	9 [0, 0, 13]	11 [0, 0, 19]	11 [0, 0, 14]	11 [0, 0, 16]	14 [0, 0, 19]	17 [0, 0, 33]	15 [0, 0, 24]	12 [0, 0, 17]	12 [0, 0, 16]	**12 [0, 0, 16]**	704 (38.0%)	821 (22.2%)
		Spread cheese	2 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	3 [0, 0, 0]	3 [0, 0, 0]	3 [0, 0, 0]	4 [0, 0, 0]	3 [0, 0, 0]	4 [0, 0, 0]	3 [0, 0, 0]	3 [0, 0, 0]	**3 [0, 0, 0]**	365 (19.7%)	411 (11.1%)
		Cheese **Total**	32 [5, 25, 48]	30 [7, 23, 44]	31 [5, 25, 45]	34 [8, 25, 50]	35 [10, 21, 51]	34 [9, 23, 50]	39 [5, 22, 50]	49 [7, 33, 75]	44 [5, 25, 61]	35 [5, 24, 49]	37 [8, 24, 52]	**36 [6, 24, 50]**	1563 (84.4%)	2354 (63.8%)
	Milk and milk products	Milk and milk products with added sugars	16 [0, 0, 0]	15 [0, 0, 0]	16 [0, 0, 0]	19 [0, 0, 0]	23 [0, 0, 0]	21 [0, 0, 0]	20 [0, 0, 0]	36 [0, 0, 0]	28 [0, 0, 0]	18 [0, 0, 0]	24 [0, 0, 0]	**21 [0, 0, 0]**	245 (13.2%)	283 (7.7%)
		Milk and milk products without added sugars	94 [0, 65, 138]	134 [21, 100, 206]	114 [8, 77, 175]	95 [0, 50, 147]	131 [0, 100, 200]	114 [0, 68, 187]	79 [0, 15, 125]	155 [0, 103, 232]	117 [0, 65, 200]	90 [0, 50, 131]	139 [0, 100, 206]	**115 [0, 75, 185]**	1332 (71.9%)	2050 (55.5%)
		Milk and milk products **Total**	110 [12, 75, 160]	149 [35, 114, 224]	130 [17, 100, 193]	114 [0, 68, 180]	154 [9, 116, 227]	135 [0, 100, 215]	98 [0, 50, 163]	190 [22, 133, 322]	145 [0, 100, 224]	108 [0, 67, 175]	163 [19, 125, 232]	**136 [2, 100, 206]**	1399 (75.5%)	2205 (59.7%)
	Yoghurt and Yoghurt products	Yoghurt and Yoghurt products with added sugars	24 [0, 0, 23]	33 [0, 0, 63]	29 [0, 0, 50]	14 [0, 0, 0]	24 [0, 0, 0]	20 [0, 0, 0]	18 [0, 0, 0]	28 [0, 0, 0]	23 [0, 0, 0]	19 [0, 0, 0]	29 [0, 0, 31]	**24 [0, 0, 0]**	490 (26.5%)	590 (16.0%)
		Yoghurt and Yoghurt products without added sugars	10 [0, 0, 0]	10 [0, 0, 0]	10 [0, 0, 0]	9 [0, 0, 0]	8 [0, 0, 0]	8 [0, 0, 0]	10 [0, 0, 0]	9 [0, 0, 0]	9 [0, 0, 0]	10 [0, 0, 0]	9 [0, 0, 0]	**9 [0, 0, 0]**	310 (16.7%)	360 (9.8%)

		Yoghurt and Yoghurt products **Total**	34 [0, 0, 63]	43 [0, 0, 76]	39 [0, 0, 70]	23 [0, 0, 20]	33 [0, 0, 63]	28 [0, 0, 41]	27 [0, 0, 51]	38 [0, 0, 31]	33 [0, 0, 47]	28 [0, 0, 46]	38 [0, 0, 63]	**33** **[0, 0, 62]**	718 (38.8%)	898 (24.3%)
	Dairy products, without desserts and butters **Total**		**176** **[67, 143, 268]**	**222** **[110, 198, 315]**	**200** **[98, 176, 293]**	**170** **[64, 145, 258]**	**221** **[86, 189, 316]**	**197** **[69, 169, 285]**	**164** **[50, 128, 235]**	**277** **[88, 236, 417]**	**221** **[69, 179, 325]**	**171** **[62, 141, 248]**	**238** **[103, 202, 329]**	**205** **[79, 175, 298]**	**1797** **(97.0%)**	**3259** **(88.3%)**
Milk and Yoghurt substitutes	Milk substitute		6 [0, 0, 0]	4 [0, 0, 0]	5 [0, 0, 0]	3 [0, 0, 0]	5 [0, 0, 0]	4 [0, 0, 0]	7 [0, 0, 0]	11 [0, 0, 0]	9 [0, 0, 0]	5 [0, 0, 0]	6 [0, 0, 0]	**6** **[0, 0, 0]**	100 (5.4%)	129 (3.5%)
	Yoghurt substitute		0 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	0 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	0 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	**1** **[0, 0, 0]**	16 (0.9%)	18 (0.5%)
	Milk and Yoghurt substitutes Total		**6** **[0, 0, 0]**	**5** **[0, 0, 0]**	**5** **[0, 0, 0]**	**3** **[0, 0, 0]**	**6** **[0, 0, 0]**	**5** **[0, 0, 0]**	**8** **[0, 0, 0]**	**11** **[0, 0, 0]**	**10** **[0, 0, 0]**	**6** **[0, 0, 0]**	**7** **[0, 0, 0]**	**6** **[0, 0, 0]**	**112** **(6.0%)**	**143** **(3.9%)**
Pulses, eggs, meat and others	Dietary and Sports Supplements, high protein bars		0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	2 [0, 0, 0]	8 [0, 0, 0]	5 [0, 0, 0]	1 [0, 0, 0]	3 [0, 0, 0]	**2** **[0, 0, 0]**	39 (2.1%)	45 (1.2%)
	Eggs		11 [0, 0, 22]	14 [0, 0, 23]	13 [0, 0, 23]	13 [0, 0, 18]	15 [0, 0, 24]	14 [0, 0, 23]	8 [0, 0, 11]	19 [0, 0, 24]	14 [0, 0, 20]	11 [0, 0, 16]	16 [0, 0, 24]	**13** **[0, 0, 23]**	830 (44.8%)	982 (26.6%)
	Fish and seafood	Unprocessed fish and seafood	8 [0, 0, 0]	9 [0, 0, 0]	8 [0, 0, 0]	7 [0, 0, 0]	10 [0, 0, 0]	9 [0, 0, 0]	8 [0, 0, 0]	9 [0, 0, 0]	8 [0, 0, 0]	8 [0, 0, 0]	9 [0, 0, 0]	**8** **[0, 0, 0]**	397 (21.4%)	439 (11.9%)
		fish products	2 [0, 0, 0]	4 [0, 0, 0]	3 [0, 0, 0]	2 [0, 0, 0]	3 [0, 0, 0]	3 [0, 0, 0]	1 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	3 [0, 0, 0]	**3** **[0, 0, 0]**	136 (7.3%)	139 (3.8%)
		Fish and seafood **Total**	10 [0, 0, 11]	13 [0, 0, 0]	11 [0, 0, 8]	9 [0, 0, 0]	13 [0, 0, 7]	11 [0, 0, 0]	10 [0, 0, 0]	11 [0, 0, 0]	10 [0, 0, 0]	9 [0, 0, 0]	12 [0, 0, 0]	**11** **[0, 0, 0]**	475 (25.6%)	536 (14.5%)
	Meat alternatives, pulses and soy	Cooked pulses and soy, unprocessed	2 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	10 [0, 0, 0]	3 [0, 0, 0]	6 [0, 0, 0]	3 [0, 0, 0]	6 [0, 0, 0]	4 [0, 0, 0]	5 [0, 0, 0]	3 [0, 0, 0]	**4** **[0, 0, 0]**	152 (8.2%)	163 (4.4%)
		Typical pulses and soy products	2 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	3 [0, 0, 0]	3 [0, 0, 0]	3 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	**2** **[0, 0, 0]**	66 (3.6%)	72 (2.0%)

		other processed meat substitute	4 [0, 0, 0]	3 [0, 0, 0]	3 [0, 0, 0]	3 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	4 [0, 0, 0]	4 [0, 0, 0]	4 [0, 0, 0]	3 [0, 0, 0]	3 [0, 0, 0]	**3 [0, 0, 0]**	105 (5.7%)	119 (3.2%)
		Meat alternatives, pulses and soy **Total**	7 [0, 0, 0]	6 [0, 0, 0]	7 [0, 0, 0]	15 [0, 0, 0]	6 [0, 0, 0]	11 [0, 0, 0]	9 [0, 0, 0]	13 [0, 0, 0]	11 [0, 0, 0]	10 [0, 0, 0]	8 [0, 0, 0]	**9 [0, 0, 0]**	288 (15.6%)	333 (9.0%)
	Processed meat	Meat sauces and hamburger meat	3 [0, 0, 0]	8 [0, 0, 0]	6 [0, 0, 0]	5 [0, 0, 0]	11 [0, 0, 0]	8 [0, 0, 0]	7 [0, 0, 0]	11 [0, 0, 0]	9 [0, 0, 0]	5 [0, 0, 0]	10 [0, 0, 0]	**7 [0, 0, 0]**	259 (14.0%)	270 (7.3%)
		Typical processed meat	26 [0, 15, 44]	29 [0, 19, 45]	28 [0, 18, 45]	30 [0, 19, 50]	35 [4, 19, 52]	33 [0, 19, 50]	20 [0, 10, 30]	40 [0, 25, 50]	30 [0, 16, 45]	26 [0, 15, 43]	34 [0, 20, 49]	**30 [0, 18, 46]**	1295 (69.9%)	1774 (48.0%)
		Processed meat **Total**	29 [2, 20, 47]	37 [5, 25, 55]	33 [3, 23, 48]	35 [0, 24, 54]	46 [8, 30, 70]	41 [4, 25, 62]	27 [0, 15, 44]	50 [0, 32, 75]	39 [0, 23, 52]	30 [0, 20, 47]	44 [4, 30, 65]	**37 [0, 24, 54]**	1372 (74.1%)	1933 (52.4%)
	Unprocessed meat	Other unprocessed meat	2 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	3 [0, 0, 0]	4 [0, 0, 0]	4 [0, 0, 0]	2 [0, 0, 0]	3 [0, 0, 0]	**2 [0, 0, 0]**	81 (4.4%)	83 (2.2%)
		Poultry	18 [0, 0, 28]	18 [0, 0, 25]	18 [0, 0, 27]	17 [0, 0, 22]	24 [0, 0, 31]	21 [0, 0, 29]	21 [0, 0, 25]	42 [0, 0, 85]	32 [0, 0, 50]	19 [0, 0, 26]	27 [0, 0, 38]	**23 [0, 0, 31]**	669 (36.1%)	799 (21.6%)
		Red meat	19 [0, 0, 28]	20 [0, 0, 27]	19 [0, 0, 28]	27 [0, 0, 45]	23 [0, 0, 35]	25 [0, 0, 42]	23 [0, 0, 36]	38 [0, 5, 62]	31 [0, 0, 52]	23 [0, 0, 38]	26 [0, 0, 40]	**25 [0, 0, 39]**	751 (40.6%)	886 (24.0%)
		Unprocessed meat **Total**	38 [0, 20, 60]	40 [0, 25, 60]	39 [0, 24, 60]	47 [0, 26, 81]	48 [0, 34, 77]	48 [0, 30, 79]	47 [0, 19, 75]	84 [0, 71, 137]	66 [0, 43, 109]	44 [0, 22, 71]	56 [0, 37, 87]	**50 [0, 29, 79]**	1173 (63.3%)	1592 (43.1%)
	Pulses, eggs, meat and others Total		**95 [52, 88, 127]**	**110 [58, 95, 147]**	**103 [54, 92, 141]**	**119 [65, 106, 153]**	**129 [74, 117, 169]**	**124 [68, 109, 162]**	**103 [47, 90, 142]**	**185 [103, 170, 246]**	**144 [71, 119, 197]**	**106 [54, 96, 143]**	**139 [75, 120, 183]**	**123 [64, 106, 164]**	**1814 (97.9%)**	**3292 (89.2%)**
Special category: All meat and meat products (without meat substitute, without soups containing meat)			67 [21, 58, 97]	77 [30, 68, 113]	72 [26, 62, 105]	82 [37, 78, 123]	94 [42, 77, 131]	88 [38, 78, 125]	74 [18, 59, 116]	135 [64, 118, 183]	105 [36, 88, 153]	74 [25, 64, 111]	100 [39, 84, 145]	**88 [32, 75, 126]**	1649 (89.0%)	2780 (75.3%)
	Special category: Liquid soy products		2 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	2 [0, 0, 0]	5 [0, 0, 0]	4 [0, 0, 0]	1 [0, 0, 0]	2 [0, 0, 0]	**2 [0, 0, 0]**	152 (8.2%)	160 (4.3%)

Special category: Soy products	**Special category:** Solid soy products without soy oils/margarines and without mixed products		2 [0, 0, 0]	1 [0, 0, 0]	2 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	3 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	**2 [0, 0, 0]**	77 (4.2%)	84 (2.3%)
	Special category: Soy products Total		**4 [0, 0, 0]**	**2 [0, 0, 0]**	**3 [0, 0, 0]**	**1 [0, 0, 0]**	**2 [0, 0, 0]**	**1 [0, 0, 0]**	**5 [0, 0, 0]**	**7 [0, 0, 0]**	**6 [0, 0, 0]**	**3 [0, 0, 0]**	**4 [0, 0, 0]**	**3 [0, 0, 0]**	**206 (11.1%)**	**224 (6.1%)**
Nuts and seeds	Nuts and seeds		3 [0, 0, 0]	3 [0, 0, 2]	3 [0, 0, 1]	2 [0, 0, 0]	3 [0, 0, 2]	3 [0, 0, 1]	3 [0, 0, 0]	3 [0, 0, 0]	3 [0, 0, 0]	3 [0, 0, 0]	3 [0, 0, 1]	**3 [0, 0, 1]**	497 (26.8%)	605 (16.4%)
	Olives and avocados unprocessed	Olives unprocessed	0 [0, 0, 0]	1 [0, 0, 0]	0 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	0 [0, 0, 0]	1 [0, 0, 0]	0 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	**1 [0, 0, 0]**	110 (5.9%)	116 (3.1%)
		avocado unprocessed	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	2 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	5 [0, 0, 0]	3 [0, 0, 0]	4 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	**2 [0, 0, 0]**	135 (7.3%)	141 (3.8%)
		Olives and avocados unprocessed **Total**	1 [0, 0, 0]	2 [0, 0, 0]	1 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	5 [0, 0, 0]	4 [0, 0, 0]	4 [0, 0, 0]	3 [0, 0, 0]	2 [0, 0, 0]	**3 [0, 0, 0]**	232 (12.5%)	251 (6.8%)
	Nuts and seeds Total		**4 [0, 0, 2]**	**5 [0, 0, 4]**	**4 [0, 0, 3]**	**5 [0, 0, 4]**	**5 [0, 0, 4]**	**5 [0, 0, 4]**	**8 [0, 0, 7]**	**7 [0, 0, 2]**	**7 [0, 0, 5]**	**5 [0, 0, 4]**	**5 [0, 0, 4]**	**5 [0, 0, 4]**	**622 (33.6%)**	**768 (20.8%)**
Oils and fats	Butter		5 [0, 3, 8]	6 [0, 3, 9]	5 [0, 3, 8]	6 [0, 3, 9]	5 [0, 2, 8]	6 [0, 3, 9]	4 [0, 1, 7]	6 [0, 2, 8]	5 [0, 1, 7]	5 [0, 3, 8]	6 [0, 2, 8]	**6 [0, 2, 8]**	1148 (62.0%)	1619 (43.9%)
	Cream		6 [0, 0, 7]	6 [0, 0, 5]	6 [0, 0, 6]	6 [0, 0, 7]	7 [0, 0, 3]	6 [0, 0, 5]	6 [0, 0, 5]	7 [0, 0, 0]	6 [0, 0, 3]	6 [0, 0, 6]	6 [0, 0, 3]	**6 [0, 0, 5]**	585 (31.6%)	659 (17.8%)
	Dressing sauces		4 [0, 0, 4]	4 [0, 0, 5]	4 [0, 0, 4]	5 [0, 0, 8]	6 [0, 0, 9]	6 [0, 0, 8]	8 [0, 0, 13]	9 [0, 0, 12]	8 [0, 0, 13]	6 [0, 0, 8]	6 [0, 0, 8]	**6 [0, 0, 8]**	751 (40.6%)	970 (26.3%)
	Margarine		1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	**1 [0, 0, 0]**	140 (7.6%)	173 (4.7%)
	Other fats and oils		1 [0, 0, 1]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 1]	1 [0, 0, 1]	1 [0, 0, 1]	2 [0, 0, 1]	2 [0, 0, 2]	2 [0, 0, 2]	1 [0, 0, 1]	1 [0, 0, 1]	**1 [0, 0, 1]**	602 (32.5%)	683 (18.5%)
	Sauces rich in fats		7 [0, 0, 9]	12 [0, 0, 14]	10 [0, 0, 11]	13 [0, 0, 15]	14 [0, 2, 17]	14 [0, 1, 15]	20 [0, 8, 28]	24 [0, 10, 36]	22 [0, 9, 28]	13 [0, 1, 15]	16 [0, 3, 20]	**15 [0, 2, 18]**	953 (51.5%)	1182 (32.0%)
	Substitutes for cream and cheese		1 [0, 0, 0]	2 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	**1 [0, 0, 0]**	62 (3.3%)	67 (1.8%)
	Vegetable oils		5 [1, 3, 7]	6 [1, 4, 8]	5 [1, 3, 8]	6 [1, 3, 9]	7 [1, 5, 10]	6 [1, 4, 9]	7 [0, 4, 10]	7 [1, 4, 12]	7 [1, 4, 11]	6 [1, 3, 9]	6 [1, 4, 10]	**6 [1, 4, 9]**	1475 (79.6%)	2160 (58.5%)

	Oils and fats Total		**29 [13, 26, 39]**	**37 [14, 28, 55]**	**33 [13, 26, 43]**	**39 [17, 30, 53]**	**41 [17, 33, 55]**	**40 [17, 32, 54]**	**47 [22, 38, 60]**	**55 [18, 47, 76]**	**51 [21, 42, 70]**	**38 [17, 30, 48]**	**44 [17, 34, 62]**	**41 [17, 32, 55]**	**1835 (99.1%)**	**3444 (93.3%)**
Sweetened beverages, sweets and salty snacks (optional)	Alcoholic beverages	Beer	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	6 [0, 0, 0]	36 [0, 0, 0]	21 [0, 0, 0]	2 [0, 0, 0]	11 [0, 0, 0]	**7 [0, 0, 0]**	25 (1.3%)	27 (0.7%)
		Other alcoholic beverages	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	**0 [0, 0, 0]**	13 (0.7%)	13 (0.4%)
		Wine	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	2 [0, 0, 0]	3 [0, 0, 0]	3 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	**1 [0, 0, 0]**	55 (3.0%)	57 (1.5%)
		Alcoholic beverages **Total**	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	1 [0, 0, 0]	0 [0, 0, 0]	9 [0, 0, 0]	41 [0, 0, 0]	25 [0, 0, 0]	3 [0, 0, 0]	12 [0, 0, 0]	**8 [0, 0, 0]**	84 (4.5%)	89 (2.4%)
	Alcoholic drink substitutes		2 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	2 [0, 0, 0]	6 [0, 0, 0]	4 [0, 0, 0]	1 [0, 0, 0]	4 [0, 0, 0]	3 [0, 0, 0]	2 [0, 0, 0]	4 [0, 0, 0]	**3 [0, 0, 0]**	51 (2.8%)	51 (1.4%)
	All fruit-vegetable juice, nectar and schorle		65 [0, 0, 100]	74 [0, 0, 100]	70 [0, 0, 100]	79 [0, 0, 100]	82 [0, 34, 120]	80 [0, 2, 103]	64 [0, 0, 100]	82 [0, 0, 150]	73 [0, 0, 104]	69 [0, 0, 100]	79 [0, 1, 125]	**75 [0, 0, 100]**	864 (46.7%)	1178 (31.9%)
	Energy drinks		0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	4 [0, 0, 0]	2 [0, 0, 0]	3 [0, 0, 0]	13 [0, 0, 0]	15 [0, 0, 0]	14 [0, 0, 0]	5 [0, 0, 0]	5 [0, 0, 0]	**5 [0, 0, 0]**	58 (3.1%)	60 (1.6%)
	Salty snacks	Dry salty snacks	11 [0, 4, 17]	11 [0, 0, 15]	11 [0, 1, 17]	9 [0, 0, 13]	11 [0, 0, 18]	10 [0, 0, 14]	8 [0, 0, 10]	10 [0, 0, 10]	9 [0, 0, 10]	10 [0, 0, 15]	11 [0, 0, 15]	**10 [0, 0, 15]**	733 (39.6%)	884 (23.9%)
		Ready-to-eat salty snacks	2 [0, 0, 0]	4 [0, 0, 0]	3 [0, 0, 0]	4 [0, 0, 0]	7 [0, 0, 0]	6 [0, 0, 0]	5 [0, 0, 0]	12 [0, 0, 0]	9 [0, 0, 0]	4 [0, 0, 0]	8 [0, 0, 0]	**6 [0, 0, 0]**	167 (9.0%)	176 (4.8%)
		Salty snacks **Total**	13 [0, 5, 20]	15 [0, 0, 21]	14 [0, 4, 20]	13 [0, 0, 15]	18 [0, 5, 25]	16 [0, 0, 21]	14 [0, 0, 16]	22 [0, 0, 23]	18 [0, 0, 20]	13 [0, 0, 20]	18 [0, 0, 24]	**16 [0, 0, 20]**	828 (44.7%)	1012 (27.4%)
	Softdrinks	Soft drinks with artificial sweeteners	7 [0, 0, 0]	10 [0, 0, 0]	8 [0, 0, 0]	13 [0, 0, 0]	15 [0, 0, 0]	14 [0, 0, 0]	20 [0, 0, 0]	43 [0, 0, 0]	31 [0, 0, 0]	13 [0, 0, 0]	21 [0, 0, 0]	**17 [0, 0, 0]**	146 (7.9%)	164 (4.4%)
		Sugary soft drinks	92 [0, 0, 125]	94 [0, 0, 150]	93 [0, 0, 150]	133 [0, 0, 215]	194 [0, 100, 250]	165 [0, 75, 250]	153 [0, 0, 240]	266 [0, 200, 415]	210 [0, 113, 300]	125 [0, 0, 200]	181 [0, 75, 250]	**153 [0, 0, 250]**	890 (48.1%)	1175 (31.8%)
		Softdrinks **Total**	99 [0, 0, 140]	103 [0, 0, 150]	101 [0, 0, 150]	146 [0, 38, 225]	209 [0, 100, 300]	179 [0, 100, 250]	173 [0, 50, 250]	309 [0, 250, 500]	242 [0, 150, 365]	138 [0, 0, 200]	202 [0, 100, 250]	**171 [0, 75, 250]**	968 (52.3%)	1294 (35.0%)
		Biscuit	9 [0, 0, 15]	11 [0, 0, 13]	10 [0, 0, 14]	9 [0, 0, 12]	11 [0, 0, 17]	10 [0, 0, 14]	9 [0, 0, 14]	10 [0, 0, 3]	9 [0, 0, 12]	9 [0, 0, 14]	11 [0, 0, 14]	**10 [0, 0, 14]**	824 (44.5%)	992 (26.9%)

	Sugary Foods and Desserts	Cake	23 [0, 0, 38]	26 [0, 0, 38]	24 [0, 0, 38]	41 [0, 23, 53]	29 [0, 12, 43]	35 [0, 18, 48]	31 [0, 8, 40]	27 [0, 0, 38]	29 [0, 0, 40]	32 [0, 11, 43]	27 [0, 0, 40]	**29 [0, 0, 43]**	928 (50.1%)	1129 (30.6%)
		Desserts	7 [0, 0, 0]	8 [0, 0, 0]	8 [0, 0, 0]	5 [0, 0, 0]	10 [0, 0, 0]	8 [0, 0, 0]	6 [0, 0, 0]	4 [0, 0, 0]	5 [0, 0, 0]	6 [0, 0, 0]	8 [0, 0, 0]	**7 [0, 0, 0]**	226 (12.2%)	239 (6.5%)
		Ice-cream	15 [0, 0, 30]	14 [0, 0, 20]	14 [0, 0, 25]	14 [0, 0, 24]	10 [0, 0, 8]	12 [0, 0, 18]	11 [0, 0, 0]	11 [0, 0, 0]	11 [0, 0, 0]	13 [0, 0, 21]	12 [0, 0, 16]	**12 [0, 0, 20]**	555 (30.0%)	658 (17.8%)
		Pure Chocolate and chocolate products	8 [0, 4, 13]	8 [0, 0, 13]	8 [0, 3, 13]	9 [0, 3, 13]	12 [0, 3, 17]	10 [0, 3, 15]	9 [0, 0, 14]	10 [0, 0, 14]	9 [0, 0, 14]	9 [0, 3, 13]	10 [0, 0, 15]	**9 [0, 0, 14]**	949 (51.2%)	1208 (32.7%)
		Sugar	15 [2, 10, 22]	21 [4, 16, 33]	18 [2, 12, 28]	17 [2, 10, 28]	24 [2, 14, 30]	21 [2, 12, 29]	17 [0, 10, 29]	23 [0, 8, 31]	20 [0, 10, 30]	17 [1, 10, 26]	23 [0, 14, 31]	**20 [1, 11, 29]**	1424 (76.9%)	2189 (59.3%)
		Sweets	8 [0, 2, 12]	11 [0, 2, 13]	9 [0, 2, 13]	11 [0, 0, 16]	8 [0, 0, 10]	9 [0, 0, 11]	6 [0, 0, 5]	5 [0, 0, 0]	5 [0, 0, 0]	8 [0, 0, 10]	8 [0, 0, 10]	**8 [0, 0, 10]**	785 (42.4%)	983 (26.6%)
		Sugary Foods and Desserts **Total**	86 [46, 74, 115]	98 [48, 86, 124]	92 [47, 81, 124]	105 [49, 87, 142]	103 [57, 92, 137]	104 [51, 89, 139]	87 [37, 73, 117]	91 [33, 72, 119]	89 [36, 72, 118]	93 [45, 77, 126]	98 [47, 85, 129]	**95 [46, 81, 128]**	1812 (97.8%)	3414 (92.5%)
	added artificial sweeteners, stevia		0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	**0 [0, 0, 0]**	10 (0.5%)	12 (0.3%)
	Sweetened beverages, sweets and salty snacks (optional) Total		**265 [105, 209, 338]**	**292 [114, 256, 384]**	**279 [110, 224, 372]**	**349 [131, 256, 490]**	**422 [181, 351, 578]**	**387 [161, 305, 543]**	**361 [117, 272, 517]**	**564 [220, 461, 803]**	**463 [169, 360, 646]**	**323 [113, 239, 452]**	**418 [169, 326, 574]**	**372 [139, 280, 525]**	**1836 (99.1%)**	**3591 (97.3%)**
Others	Soups and bouillon	Bouillon	10 [0, 0, 0]	6 [0, 0, 0]	8 [0, 0, 0]	6 [0, 0, 0]	12 [0, 0, 0]	9 [0, 0, 0]	4 [0, 0, 0]	6 [0, 0, 0]	5 [0, 0, 0]	7 [0, 0, 0]	8 [0, 0, 0]	**7 [0, 0, 0]**	254 (13.7%)	265 (7.2%)
		Meat or fish soup, fresh made	0 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	5 [0, 0, 0]	2 [0, 0, 0]	3 [0, 0, 0]	1 [0, 0, 0]	0 [0, 0, 0]	1 [0, 0, 0]	2 [0, 0, 0]	1 [0, 0, 0]	**2 [0, 0, 0]**	14 (0.8%)	14 (0.4%)
		other type of soups	13 [0, 0, 0]	13 [0, 0, 0]	13 [0, 0, 0]	11 [0, 0, 0]	11 [0, 0, 0]	11 [0, 0, 0]	11 [0, 0, 0]	13 [0, 0, 0]	12 [0, 0, 0]	12 [0, 0, 0]	12 [0, 0, 0]	**12 [0, 0, 0]**	169 (9.1%)	178 (4.8%)
		vegetable soups, fresh made	6 [0, 0, 0]	6 [0, 0, 0]	6 [0, 0, 0]	9 [0, 0, 0]	4 [0, 0, 0]	6 [0, 0, 0]	7 [0, 0, 0]	7 [0, 0, 0]	7 [0, 0, 0]	7 [0, 0, 0]	6 [0, 0, 0]	**6 [0, 0, 0]**	101 (5.5%)	104 (2.8%)

	Soups and bouillon **Total**	28 [0, 0, 13]	27 [0, 0, 0]	27 [0, 0, 3]	30 [0, 0, 2]	29 [0, 0, 13]	30 [0, 0, 3]	23 [0, 0, 0]	25 [0, 0, 0]	24 [0, 0, 0]	27 [0, 0, 2]	27 [0, 0, 2]	**27 [0, 0, 2]**	484 (26.1%)	545 (14.8%)
Varia		7 [1, 3, 9]	12 [1, 4, 14]	9 [1, 3, 11]	9 [1, 5, 11]	10 [1, 5, 12]	10 [1, 5, 12]	8 [0, 3, 11]	12 [0, 5, 16]	10 [0, 4, 13]	8 [1, 3, 10]	11 [1, 5, 14]	**10 [1, 4, 12]**	1694 (91.5%)	2689 (72.8%)
Others Total		**35 [1, 7, 34]**	**38 [1, 9, 36]**	**37 [1, 7, 36]**	**39 [1, 8, 28]**	**39 [2, 11, 40]**	**39 [2, 9, 36]**	**31 [0, 7, 23]**	**37 [1, 8, 33]**	**34 [1, 7, 29]**	**35 [1, 7, 28]**	**38 [1, 10, 34]**	**37 [1, 8, 33]**	**1731 (93.5%)**	**2834 (76.8%)**

mean [P25, P50, P75]. The food group "Varia" corresponds to: Ice cubes, vinegar and other liquid condiment (e.g. Tabasco), yeast, gelatine and its vegetable substitutes, mustard, herbs, spices, added salt, sauces made essential with water and condiment (e.g. brown gravy for roast meat, wasabi paste, soya sauce, Ketchup, miso), sauces n.s., (salty) if clearly without fat, chewing gums, spiced mixed breadcrumbs, concentrated dry instant coffee not reconstituted

Energy intake

Table 13.6 Mean daily energy intake (kcal/day), by detailed food group, sex, age group and number of consumers and recall days with consumption (N, %)

Table 13.6 shows the **food sub-subgroup energy intake** (kcal/day)**,** stratified by sex and age group. In addition to the food groups from the Swiss food pyramid [67], some "special categories" have been created grouping subgroups or specific food items to better fit dietary recommendations[75,76] or answer specific research question on hot topics. These amounts include non-consumers, defined as participants having a mean intake of 0kcal/day in a given category for one or both recorded days. As such, these values represent the mean consumption for the entire population, including non-consumers, and do not reflect the energy portion size of a consumed product. Table 13.6 also shows the number and proportion of consumers for each food sub-subgroup and the number and proportion of recalls days on which the food group was consumed.

Food group: mean [P25, P50, P75] (kcal/day) - Detailed			6-9 years			10-13 years			14-17 years			All ages		Total	Consumers N (%)	Recall days with consumption N (%)
Main category	Sub-categories		Females	Males	Total	Females	Males	Total	Females	Males	Total	Females	Males			
Beverages: water, coffee, tea, unsweetened waters	Water		0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	**0 [0, 0, 0]**	1844 (99.6%)	3609 (97.8%)
	coffee, tee, flavoured water without sugar	Coffee, tea with undefined added sugars (small quantities), without milk	0 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	3 [0, 0, 0]	1 [0, 0, 0]	2 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	**1 [0, 0, 0]**	107 (5.8%)	117 (3.2%)
		Coffee, tea, flavoured waters without added sugars, without milk	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	1 [0, 0, 0]	0 [0, 0, 0]	1 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	**0 [0, 0, 0]**	403 (21.8%)	520 (14.1%)
		coffee, tea, flavoured water without sugar **Total**	1 [0, 0, 0]	2 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	3 [0, 0, 0]	1 [0, 0, 0]	2 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	**1 [0, 0, 0]**	460 (24.8%)	610 (16.5%)
	Beverages: water, coffee, tea, unsweetened waters Total		1 [0, 0, 0]	2 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	3 [0, 0, 0]	1 [0, 0, 0]	2 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	**1 [0, 0, 0]**	1848 (99.8%)	3633 (98.4%)

Special category: All beverages, without soups			136 [51, 105, 181]	164 [77, 147, 231]	150 [63, 123, 211]	159 [54, 137, 223]	208 [101, 181, 265]	185 [68, 162, 247]	166 [60, 146, 244]	277 [154, 246, 365]	222 [91, 192, 308]	153 [54, 124, 214]	213 [99, 183, 282]	**184 [71, 157, 256]**	1852 (100.0%)	3691 (100.0%)
Fruits and vegetables, without juices and soups	Fruits	Dried fruits	7 [0, 0, 0]	6 [0, 0, 0]	7 [0, 0, 0]	6 [0, 0, 0]	3 [0, 0, 0]	4 [0, 0, 0]	4 [0, 0, 0]	4 [0, 0, 0]	4 [0, 0, 0]	6 [0, 0, 0]	4 [0, 0, 0]	**5 [0, 0, 0]**	211 (11.4%)	243 (6.6%)
		Raw fruits	86 [45, 80, 121]	93 [45, 84, 122]	90 [45, 82, 122]	68 [12, 59, 102]	63 [4, 54, 99]	65 [8, 56, 100]	66 [0, 54, 94]	57 [0, 37, 88]	61 [0, 45, 91]	74 [25, 64, 108]	72 [6, 59, 109]	**73 [14, 61, 108]**	1514 (81.7%)	2483 (67.3%)
		Transformed fruits	8 [0, 0, 0]	9 [0, 0, 6]	9 [0, 0, 2]	6 [0, 0, 0]	7 [0, 0, 0]	7 [0, 0, 0]	7 [0, 0, 0]	5 [0, 0, 0]	6 [0, 0, 0]	7 [0, 0, 0]	7 [0, 0, 0]	**7 [0, 0, 0]**	413 (22.3%)	472 (12.8%)
		Fruits **Total**	101 [52, 96, 145]	108 [54, 100, 148]	105 [54, 97, 148]	80 [26, 72, 117]	73 [12, 60, 110]	77 [14, 67, 112]	77 [16, 60, 105]	66 [0, 45, 101]	72 [0, 54, 105]	86 [33, 76, 124]	83 [16, 72, 123]	**85 [26, 73, 124]**	1588 (85.7%)	2663 (72.1%)
	Vegetables	Dried vegetables	1 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	1 [0, 0, 0]	2 [0, 0, 0]	1 [0, 0, 0]	2 [0, 0, 0]	1 [0, 0, 0]	2 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	**1 [0, 0, 0]**	117 (6.3%)	118 (3.2%)
		Raw vegetables	18 [4, 12, 26]	17 [4, 11, 24]	18 [4, 12, 25]	15 [3, 11, 21]	16 [2, 9, 23]	16 [3, 10, 22]	13 [2, 8, 18]	15 [0, 6, 20]	14 [1, 8, 19]	16 [3, 11, 21]	16 [2, 9, 22]	**16 [2, 10, 22]**	1549 (83.6%)	2429 (65.8%)
		Transformed vegetables	21 [4, 15, 31]	24 [3, 17, 35]	23 [4, 16, 33]	21 [2, 13, 32]	21 [4, 16, 30]	21 [3, 14, 31]	28 [5, 21, 40]	24 [3, 14, 38]	26 [4, 17, 38]	23 [3, 15, 34]	23 [3, 16, 32]	**23 [3, 16, 33]**	1602 (86.5%)	2495 (67.6%)
		Vegetable sauces	6 [0, 0, 0]	4 [0, 0, 0]	5 [0, 0, 0]	8 [0, 0, 0]	5 [0, 0, 0]	7 [0, 0, 0]	7 [0, 0, 0]	10 [0, 0, 0]	8 [0, 0, 0]	7 [0, 0, 0]	6 [0, 0, 0]	**7 [0, 0, 0]**	377 (20.4%)	411 (11.1%)
		Vegetables **Total**	46 [19, 37, 65]	46 [21, 40, 64]	46 [20, 38, 64]	44 [21, 36, 60]	45 [19, 36, 62]	45 [21, 36, 60]	51 [22, 40, 73]	48 [17, 38, 71]	50 [20, 39, 71]	47 [21, 38, 66]	46 [19, 37, 64]	**47 [20, 38, 65]**	1818 (98.2%)	3366 (91.2%)
	Fruits and vegetables, without juices and soups Total		146 [100, 136, 191]	154 [87, 147, 206]	150 [95, 141, 197]	125 [61, 116, 170]	118 [50, 110, 170]	121 [60, 113, 170]	128 [60, 111, 176]	115 [40, 84, 164]	121 [53, 102, 171]	133 [72, 121, 179]	130 [58, 116, 182]	**131 [65, 119, 181]**	1840 (99.4%)	3537 (95.8%)
Special category: Vegetables with vegetable soups			48 [19, 39, 69]	48 [22, 41, 67]	48 [21, 40, 67]	48 [21, 40, 65]	46 [19, 36, 63]	47 [21, 37, 64]	54 [23, 44, 75]	51 [20, 41, 71]	52 [22, 42, 72]	49 [21, 40, 69]	48 [21, 39, 67]	**49 [21, 39, 68]**	1818 (98.2%)	3376 (91.4%)
Cereal products and potatoes	Bread and bread products	Bread	205 [101, 178, 274]	250 [121, 203, 343]	228 [109, 190, 303]	232 [104, 204, 330]	279 [135, 249, 364]	257 [120, 233, 356]	232 [84, 186, 343]	321 [135, 249, 420]	277 [106, 222, 388]	223 [98, 187, 317]	281 [126, 234, 369]	**253 [112, 212, 344]**	1721 (92.9%)	2891 (78.3%)

		Crisp bread	34 [0, 0, 55]	38 [0, 13, 64]	36 [0, 8, 61]	36 [0, 0, 59]	31 [0, 0, 33]	33 [0, 0, 51]	18 [0, 0, 12]	16 [0, 0, 0]	17 [0, 0, 0]	30 [0, 0, 49]	29 [0, 0, 33]	**29 [0, 0, 42]**	734 (39.6%)	919 (24.9%)
		Bread and bread products **Total**	239 [133, 214, 306]	287 [150, 237, 381]	263 [140, 228, 345]	268 [128, 253, 388]	311 [174, 278, 422]	290 [141, 258, 414]	250 [101, 226, 354]	336 [136, 255, 438]	294 [121, 243, 398]	252 [123, 230, 355]	310 [152, 256, 419]	**282 [135, 246, 388]**	1770 (95.6%)	3103 (84.0%)
	Cereal flakes and breakfast cereals	Breakfast cereals	42 [0, 0, 76]	59 [0, 0, 89]	50 [0, 0, 76]	39 [0, 0, 47]	65 [0, 0, 104]	53 [0, 0, 76]	24 [0, 0, 0]	65 [0, 0, 114]	45 [0, 0, 75]	35 [0, 0, 48]	63 [0, 0, 103]	**49 [0, 0, 76]**	686 (37.0%)	892 (24.2%)
		Cereal flakes	9 [0, 0, 0]	19 [0, 0, 0]	14 [0, 0, 0]	13 [0, 0, 0]	12 [0, 0, 0]	12 [0, 0, 0]	13 [0, 0, 0]	15 [0, 0, 0]	14 [0, 0, 0]	12 [0, 0, 0]	15 [0, 0, 0]	**14 [0, 0, 0]**	294 (15.9%)	369 (10.0%)
		Cereal flakes and breakfast cereals **Total**	51 [0, 12, 84]	77 [0, 30, 111]	65 [0, 22, 96]	52 [0, 0, 77]	76 [0, 0, 146]	65 [0, 0, 111]	37 [0, 0, 52]	80 [0, 1, 124]	59 [0, 0, 98]	47 [0, 0, 76]	78 [0, 0, 115]	**63 [0, 0, 99]**	880 (47.5%)	1186 (32.1%)
	Cereal products	Dough	26 [0, 0, 0]	30 [0, 0, 29]	28 [0, 0, 21]	32 [0, 0, 38]	40 [0, 0, 55]	36 [0, 0, 45]	34 [0, 0, 37]	57 [0, 0, 109]	45 [0, 0, 73]	30 [0, 0, 33]	41 [0, 0, 54]	**36 [0, 0, 43]**	558 (30.1%)	625 (16.9%)
		Flours and starches	8 [0, 0, 4]	10 [0, 0, 2]	9 [0, 0, 4]	9 [0, 0, 0]	9 [0, 0, 1]	9 [0, 0, 0]	5 [0, 0, 0]	4 [0, 0, 0]	4 [0, 0, 0]	7 [0, 0, 0]	8 [0, 0, 0]	**8 [0, 0, 0]**	496 (26.8%)	548 (14.8%)
		Pasta and stuffed pasta	103 [0, 77, 162]	134 [33, 111, 198]	119 [22, 90, 182]	119 [0, 87, 190]	136 [0, 105, 207]	128 [0, 99, 198]	138 [0, 113, 207]	156 [0, 109, 261]	147 [0, 111, 227]	119 [0, 87, 190]	141 [0, 107, 224]	**130 [0, 99, 198]**	1341 (72.4%)	1783 (48.3%)
		Rice	25 [0, 0, 36]	35 [0, 0, 56]	30 [0, 0, 38]	29 [0, 0, 50]	38 [0, 0, 67]	34 [0, 0, 58]	39 [0, 0, 65]	44 [0, 0, 67]	42 [0, 0, 65]	31 [0, 0, 39]	39 [0, 0, 65]	**35 [0, 0, 53]**	709 (38.3%)	821 (22.2%)
		other cereals, pseudo cereals and other starchy food	22 [0, 0, 4]	22 [0, 0, 0]	22 [0, 0, 0]	25 [0, 0, 0]	21 [0, 0, 0]	23 [0, 0, 0]	23 [0, 0, 0]	22 [0, 0, 0]	23 [0, 0, 0]	24 [0, 0, 0]	22 [0, 0, 0]	**23 [0, 0, 0]**	413 (22.3%)	449 (12.2%)
		Cereal products **Total**	184 [81, 166, 268]	231 [111, 208, 318]	208 [90, 190, 281]	215 [98, 195, 299]	243 [120, 211, 346]	229 [106, 207, 315]	239 [136, 202, 332]	283 [133, 259, 387]	261 [136, 215, 356]	211 [95, 190, 290]	251 [118, 213, 352]	**231 [107, 203, 322]**	1768 (95.5%)	2980 (80.7%)

		Tuber products	26 [0, 0, 42]	35 [0, 0, 59]	31 [0, 0, 43]	35 [0, 0, 63]	51 [0, 0, 97]	43 [0, 0, 75]	36 [0, 0, 64]	52 [0, 0, 84]	44 [0, 0, 68]	32 [0, 0, 45]	46 [0, 0, 73]	**39 [0, 0, 64]**	630 (34.0%)	707 (19.1%)
	Tubers and tuber products	Tubers	17 [0, 0, 26]	16 [0, 0, 15]	16 [0, 0, 22]	21 [0, 0, 28]	22 [0, 0, 0]	21 [0, 0, 19]	20 [0, 0, 24]	31 [0, 0, 20]	26 [0, 0, 24]	19 [0, 0, 26]	22 [0, 0, 15]	**21 [0, 0, 22]**	531 (28.7%)	599 (16.2%)
		Tubers and tuber products **Total**	42 [0, 22, 71]	51 [0, 23, 77]	47 [0, 22, 75]	55 [0, 29, 95]	73 [0, 44, 115]	65 [0, 43, 107]	56 [0, 18, 95]	82 [0, 43, 136]	69 [0, 30, 114]	51 [0, 24, 89]	68 [0, 42, 106]	**60 [0, 29, 99]**	1014 (54.8%)	1258 (34.1%)
	Cereal products and potatoes Total		515 [395, 499, 618]	647 [484, 626, 773]	583 [427, 565, 703]	590 [438, 576, 715]	702 [510, 688, 828]	649 [473, 631, 772]	582 [429, 580, 729]	782 [561, 716, 957]	683 [453, 650, 846]	561 [413, 544, 675]	707 [510, 680, 850]	**636 [451, 610, 767]**	1850 (99.9%)	3674 (99.5%)
Dairy products, without desserts and butters	Cheese	Fresh cheese with added sugar	4 [0, 0, 0]	3 [0, 0, 0]	3 [0, 0, 0]	4 [0, 0, 0]	4 [0, 0, 0]	4 [0, 0, 0]	3 [0, 0, 0]	0 [0, 0, 0]	2 [0, 0, 0]	4 [0, 0, 0]	2 [0, 0, 0]	**3 [0, 0, 0]**	80 (4.3%)	86 (2.3%)
		Fresh cheese without added sugar	3 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	3 [0, 0, 0]	1 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	4 [0, 0, 0]	3 [0, 0, 0]	3 [0, 0, 0]	2 [0, 0, 0]	**2 [0, 0, 0]**	132 (7.1%)	139 (3.8%)
		Hard and semi-hard cheese	54 [0, 28, 100]	59 [0, 32, 94]	57 [0, 31, 99]	53 [0, 12, 84]	58 [0, 20, 75]	56 [0, 16, 78]	55 [0, 10, 71]	87 [0, 28, 122]	71 [0, 20, 84]	54 [0, 18, 86]	67 [0, 29, 87]	**61 [0, 21, 86]**	1176 (63.5%)	1599 (43.3%)
		Soft cheese	25 [0, 0, 32]	22 [0, 0, 30]	24 [0, 0, 32]	30 [0, 0, 48]	30 [0, 0, 37]	30 [0, 0, 41]	36 [0, 0, 57]	45 [0, 0, 83]	41 [0, 0, 64]	30 [0, 0, 44]	32 [0, 0, 41]	**31 [0, 0, 42]**	704 (38.0%)	821 (22.2%)
		Spread cheese	6 [0, 0, 0]	5 [0, 0, 0]	6 [0, 0, 0]	7 [0, 0, 0]	9 [0, 0, 0]	8 [0, 0, 0]	11 [0, 0, 0]	8 [0, 0, 0]	10 [0, 0, 0]	8 [0, 0, 0]	7 [0, 0, 0]	**8 [0, 0, 0]**	365 (19.7%)	411 (11.1%)
		Cheese **Total**	92 [19, 73, 151]	91 [20, 67, 130]	92 [20, 70, 141]	96 [20, 70, 134]	101 [26, 70, 136]	99 [25, 70, 134]	108 [16, 68, 152]	145 [25, 100, 198]	126 [21, 79, 178]	98 [19, 70, 147]	110 [25, 74, 156]	**105 [20, 72, 153]**	1563 (84.4%)	2354 (63.8%)
	Milk and milk products	Milk and milk products with added sugars	11 [0, 0, 0]	10 [0, 0, 0]	11 [0, 0, 0]	13 [0, 0, 0]	16 [0, 0, 0]	15 [0, 0, 0]	14 [0, 0, 0]	25 [0, 0, 0]	20 [0, 0, 0]	13 [0, 0, 0]	17 [0, 0, 0]	**15 [0, 0, 0]**	245 (13.2%)	283 (7.7%)

		Milk and milk products without added sugars	54 [0, 34, 79]	79 [11, 55, 117]	67 [4, 47, 101]	57 [0, 29, 89]	77 [0, 59, 126]	67 [0, 41, 112]	46 [0, 9, 73]	90 [0, 59, 130]	68 [0, 39, 110]	53 [0, 29, 79]	81 [0, 58, 130]	**67 [0, 43, 107]**	1332 (71.9%)	2050 (55.5%)
		Milk and milk products **Total**	66 [5, 46, 101]	89 [19, 69, 134]	78 [11, 58, 114]	70 [0, 39, 117]	92 [6, 68, 141]	82 [0, 60, 132]	60 [0, 32, 91]	115 [14, 84, 173]	87 [0, 59, 130]	65 [0, 39, 106]	98 [12, 77, 147]	**82 [1, 58, 127]**	1399 (75.5%)	2205 (59.7%)
	Yoghurt and Yoghurt products	Yoghurt and Yoghurt products with added sugars	25 [0, 0, 23]	35 [0, 0, 63]	30 [0, 0, 45]	16 [0, 0, 0]	26 [0, 0, 0]	21 [0, 0, 0]	19 [0, 0, 0]	28 [0, 0, 0]	23 [0, 0, 0]	20 [0, 0, 0]	29 [0, 0, 32]	**25 [0, 0, 0]**	490 (26.5%)	590 (16.0%)
		Yoghurt and Yoghurt products without added sugars	8 [0, 0, 0]	7 [0, 0, 0]	7 [0, 0, 0]	6 [0, 0, 0]	6 [0, 0, 0]	6 [0, 0, 0]	8 [0, 0, 0]	6 [0, 0, 0]	7 [0, 0, 0]	7 [0, 0, 0]	6 [0, 0, 0]	**7 [0, 0, 0]**	310 (16.7%)	360 (9.8%)
		Yoghurt and Yoghurt products **Total**	33 [0, 0, 55]	41 [0, 0, 75]	37 [0, 0, 63]	22 [0, 0, 13]	31 [0, 0, 47]	27 [0, 0, 33]	27 [0, 0, 43]	34 [0, 0, 31]	30 [0, 0, 39]	27 [0, 0, 39]	36 [0, 0, 57]	**32 [0, 0, 48]**	718 (38.8%)	898 (24.3%)
	Dairy products, without desserts and butters Total		191 [96, 178, 262]	221 [133, 208, 275]	206 [114, 197, 266]	188 [98, 175, 253]	225 [106, 199, 315]	207 [104, 186, 278]	194 [80, 161, 261]	293 [113, 258, 438]	244 [98, 209, 336]	191 [92, 173, 259]	244 [121, 214, 324]	**218 [106, 193, 292]**	1797 (97.0%)	3259 (88.3%)
Milk and Yoghurt substitutes	Milk substitute		3 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	3 [0, 0, 0]	2 [0, 0, 0]	4 [0, 0, 0]	6 [0, 0, 0]	5 [0, 0, 0]	3 [0, 0, 0]	3 [0, 0, 0]	**3 [0, 0, 0]**	100 (5.4%)	129 (3.5%)
	Yoghurt substitute		0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	1 [0, 0, 0]	**0 [0, 0, 0]**	16 (0.9%)	18 (0.5%)
	Milk and Yoghurt substitutes **Total**		3 [0, 0, 0]	2 [0, 0, 0]	3 [0, 0, 0]	2 [0, 0, 0]	4 [0, 0, 0]	3 [0, 0, 0]	5 [0, 0, 0]	6 [0, 0, 0]	5 [0, 0, 0]	3 [0, 0, 0]	4 [0, 0, 0]	**3 [0, 0, 0]**	112 (6.0%)	143 (3.9%)
Pulses, eggs, meat and others	Dietary and Sports Supplements, high protein bars		0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	5 [0, 0, 0]	10 [0, 0, 0]	8 [0, 0, 0]	2 [0, 0, 0]	3 [0, 0, 0]	**3 [0, 0, 0]**	39 (2.1%)	45 (1.2%)

	Eggs		17 [0, 0, 28]	22 [0, 0, 36]	19 [0, 0, 36]	20 [0, 0, 27]	23 [0, 0, 37]	22 [0, 0, 36]	13 [0, 0, 17]	29 [0, 0, 37]	21 [0, 0, 31]	17 [0, 0, 24]	25 [0, 0, 37]	**21 [0, 0, 36]**	830 (44.8%)	982 (26.6%)
	Fish and seafood	Unprocessed fish and seafood	10 [0, 0, 0]	14 [0, 0, 0]	12 [0, 0, 0]	11 [0, 0, 0]	15 [0, 0, 0]	13 [0, 0, 0]	14 [0, 0, 0]	13 [0, 0, 0]	13 [0, 0, 0]	11 [0, 0, 0]	14 [0, 0, 0]	**13 [0, 0, 0]**	397 (21.4%)	439 (11.9%)
		fish products	5 [0, 0, 0]	10 [0, 0, 0]	8 [0, 0, 0]	5 [0, 0, 0]	7 [0, 0, 0]	6 [0, 0, 0]	3 [0, 0, 0]	5 [0, 0, 0]	4 [0, 0, 0]	4 [0, 0, 0]	8 [0, 0, 0]	**6 [0, 0, 0]**	136 (7.3%)	139 (3.8%)
		Fish and seafood **Total**	14 [0, 0, 11]	24 [0, 0, 0]	19 [0, 0, 9]	16 [0, 0, 0]	22 [0, 0, 8]	20 [0, 0, 0]	16 [0, 0, 0]	18 [0, 0, 0]	17 [0, 0, 0]	16 [0, 0, 0]	22 [0, 0, 0]	**19 [0, 0, 0]**	475 (25.6%)	536 (14.5%)
	Meat alternatives, pulses and soy	Cooked pulses and soy, unprocessed	2 [0, 0, 0]	3 [0, 0, 0]	3 [0, 0, 0]	12 [0, 0, 0]	3 [0, 0, 0]	7 [0, 0, 0]	3 [0, 0, 0]	7 [0, 0, 0]	5 [0, 0, 0]	6 [0, 0, 0]	4 [0, 0, 0]	**5 [0, 0, 0]**	152 (8.2%)	163 (4.4%)
		Typical pulses and soy products	3 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	5 [0, 0, 0]	4 [0, 0, 0]	4 [0, 0, 0]	4 [0, 0, 0]	4 [0, 0, 0]	4 [0, 0, 0]	4 [0, 0, 0]	3 [0, 0, 0]	**4 [0, 0, 0]**	66 (3.6%)	72 (2.0%)
		other processed meat substitute	7 [0, 0, 0]	6 [0, 0, 0]	6 [0, 0, 0]	5 [0, 0, 0]	5 [0, 0, 0]	5 [0, 0, 0]	7 [0, 0, 0]	9 [0, 0, 0]	8 [0, 0, 0]	6 [0, 0, 0]	6 [0, 0, 0]	**6 [0, 0, 0]**	105 (5.7%)	119 (3.2%)
		Meat alternatives, pulses and soy **Total**	12 [0, 0, 0]	10 [0, 0, 0]	11 [0, 0, 0]	22 [0, 0, 0]	11 [0, 0, 0]	16 [0, 0, 0]	14 [0, 0, 0]	20 [0, 0, 0]	17 [0, 0, 0]	16 [0, 0, 0]	13 [0, 0, 0]	**15 [0, 0, 0]**	288 (15.6%)	333 (9.0%)
	Processed meat	Meat sauces and hamburger meat	5 [0, 0, 0]	12 [0, 0, 0]	8 [0, 0, 0]	6 [0, 0, 0]	16 [0, 0, 0]	12 [0, 0, 0]	9 [0, 0, 0]	18 [0, 0, 0]	13 [0, 0, 0]	7 [0, 0, 0]	15 [0, 0, 0]	**11 [0, 0, 0]**	259 (14.0%)	270 (7.3%)
		Typical processed meat	63 [0, 44, 97]	74 [0, 47, 110]	69 [0, 46, 104]	69 [0, 42, 112]	90 [8, 50, 136]	80 [0, 47, 127]	45 [0, 16, 62]	92 [0, 42, 125]	69 [0, 31, 95]	60 [0, 31, 93]	85 [0, 47, 125]	**73 [0, 41, 106]**	1295 (69.9%)	1774 (48.0%)
		Processed meat **Total**	68 [3, 52, 100]	86 [9, 63, 125]	77 [5, 56, 113]	76 [0, 53, 122]	106 [10, 64, 149]	92 [10, 59, 135]	53 [0, 29, 75]	110 [0, 62, 137]	82 [0, 43, 115]	66 [0, 44, 103]	100 [8, 63, 140]	**84 [0, 52, 124]**	1372 (74.1%)	1933 (52.4%)
	Unprocessed meat	Other unprocessed meat	4 [0, 0, 0]	3 [0, 0, 0]	4 [0, 0, 0]	4 [0, 0, 0]	3 [0, 0, 0]	4 [0, 0, 0]	5 [0, 0, 0]	8 [0, 0, 0]	6 [0, 0, 0]	4 [0, 0, 0]	5 [0, 0, 0]	**4 [0, 0, 0]**	81 (4.4%)	83 (2.2%)

		Poultry	26 [0, 0, 38]	26 [0, 0, 33]	26 [0, 0, 36]	25 [0, 0, 28]	35 [0, 0, 43]	30 [0, 0, 37]	31 [0, 0, 32]	62 [0, 0, 126]	46 [0, 0, 64]	27 [0, 0, 32]	40 [0, 0, 51]	**34 [0, 0, 43]**	669 (36.1%)	799 (21.6%)
		Red meat	34 [0, 0, 49]	38 [0, 0, 53]	36 [0, 0, 50]	51 [0, 0, 81]	43 [0, 0, 67]	47 [0, 0, 77]	43 [0, 0, 63]	69 [0, 9, 123]	56 [0, 0, 97]	42 [0, 0, 64]	49 [0, 0, 77]	**46 [0, 0, 69]**	751 (40.6%)	886 (24.0%)
		Unprocessed meat **Total**	63 [0, 32, 99]	67 [0, 41, 100]	65 [0, 37, 99]	80 [0, 47, 131]	81 [0, 54, 118]	80 [0, 53, 127]	79 [0, 30, 118]	138 [0, 114, 206]	109 [0, 71, 167]	74 [0, 34, 119]	93 [0, 56, 146]	**84 [0, 48, 130]**	1173 (63.3%)	1592 (43.1%)
	Pulses, eggs, meat and others Total		175 [96, 162, 234]	209 [104, 185, 288]	192 [100, 173, 264]	214 [113, 198, 284]	244 [131, 212, 317]	230 [119, 203, 294]	180 [84, 150, 249]	325 [182, 296, 437]	253 [125, 216, 342]	190 [94, 170, 259]	256 [139, 224, 336]	**224 [114, 194, 294]**	1814 (97.9%)	3292 (89.2%)
Special category: All meat and meat products (without meat substitute, without soups containing meat)			131 [46, 114, 183]	153 [63, 133, 221]	142 [54, 121, 207]	156 [67, 141, 241]	187 [78, 143, 261]	172 [73, 143, 250]	132 [25, 109, 192]	248 [125, 212, 328]	190 [62, 158, 264]	140 [48, 121, 207]	193 [76, 160, 271]	**167 [62, 140, 239]**	1649 (89.0%)	2780 (75.3%)
Special category: Soy products	**Special category:** Liquid soy products		1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	1 [0, 0, 0]	3 [0, 0, 0]	2 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	**1 [0, 0, 0]**	152 (8.2%)	160 (4.3%)
	Special category: Solid soy products without soy oils/margarines and without mixed products		3 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	1 [0, 0, 0]	2 [0, 0, 0]	1 [0, 0, 0]	5 [0, 0, 0]	3 [0, 0, 0]	4 [0, 0, 0]	3 [0, 0, 0]	2 [0, 0, 0]	**2 [0, 0, 0]**	77 (4.2%)	84 (2.3%)
	Special category: Soy products Total		4 [0, 0, 0]	3 [0, 0, 0]	3 [0, 0, 0]	1 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	6 [0, 0, 0]	6 [0, 0, 0]	6 [0, 0, 0]	3 [0, 0, 0]	3 [0, 0, 0]	**3 [0, 0, 0]**	206 (11.1%)	224 (6.1%)
Nuts and seeds	Nuts and seeds		17 [0, 0, 0]	19 [0, 0, 12]	18 [0, 0, 7]	13 [0, 0, 0]	19 [0, 0, 13]	16 [0, 0, 5]	17 [0, 0, 0]	20 [0, 0, 0]	19 [0, 0, 0]	16 [0, 0, 0]	20 [0, 0, 9]	**18 [0, 0, 3]**	497 (26.8%)	605 (16.4%)
	Olives and avocados unprocessed	Olives unprocessed	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	**1 [0, 0, 0]**	110 (5.9%)	116 (3.1%)
		avocado unprocessed	1 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	3 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	7 [0, 0, 0]	5 [0, 0, 0]	6 [0, 0, 0]	4 [0, 0, 0]	3 [0, 0, 0]	**3 [0, 0, 0]**	135 (7.3%)	141 (3.8%)
		Olives and avocados unprocessed **Total**	2 [0, 0, 0]	3 [0, 0, 0]	2 [0, 0, 0]	4 [0, 0, 0]	2 [0, 0, 0]	3 [0, 0, 0]	8 [0, 0, 0]	6 [0, 0, 0]	7 [0, 0, 0]	5 [0, 0, 0]	4 [0, 0, 0]	**4 [0, 0, 0]**	232 (12.5%)	251 (6.8%)
	Nuts and seeds Total		19 [0, 0, 9]	22 [0, 0, 16]	20 [0, 0, 13]	17 [0, 0, 13]	22 [0, 0, 22]	19 [0, 0, 18]	25 [0, 0, 25]	26 [0, 0, 8]	26 [0, 0, 16]	20 [0, 0, 13]	23 [0, 0, 16]	**22 [0, 0, 15]**	622 (33.6%)	768 (20.8%)

Oils and fats	Butter		40 [0, 23, 60]	41 [0, 20, 66]	41 [0, 23, 62]	45 [0, 22, 68]	39 [0, 16, 56]	42 [0, 19, 66]	33 [0, 5, 50]	46 [0, 14, 60]	40 [0, 9, 54]	40 [0, 19, 60]	42 [0, 17, 60]	**41 [0, 18, 60]**	1148 (62.0%)	1619 (43.9%)
	Cream		18 [0, 0, 21]	18 [0, 0, 17]	18 [0, 0, 19]	19 [0, 0, 21]	20 [0, 0, 10]	19 [0, 0, 13]	17 [0, 0, 14]	19 [0, 0, 0]	18 [0, 0, 8]	18 [0, 0, 20]	19 [0, 0, 9]	**19 [0, 0, 14]**	585 (31.6%)	659 (17.8%)
	Dressing sauces		14 [0, 0, 14]	14 [0, 0, 15]	14 [0, 0, 14]	18 [0, 0, 26]	21 [0, 0, 32]	19 [0, 0, 28]	27 [0, 0, 44]	32 [0, 0, 44]	30 [0, 0, 44]	19 [0, 0, 26]	22 [0, 0, 27]	**20 [0, 0, 26]**	751 (40.6%)	970 (26.3%)
	Margarine		4 [0, 0, 0]	6 [0, 0, 0]	5 [0, 0, 0]	3 [0, 0, 0]	5 [0, 0, 0]	4 [0, 0, 0]	3 [0, 0, 0]	1 [0, 0, 0]	2 [0, 0, 0]	3 [0, 0, 0]	4 [0, 0, 0]	**4 [0, 0, 0]**	140 (7.6%)	173 (4.7%)
	Other fats and oils		9 [0, 0, 5]	10 [0, 0, 1]	9 [0, 0, 4]	13 [0, 0, 7]	10 [0, 0, 10]	12 [0, 0, 10]	16 [0, 0, 10]	20 [0, 0, 22]	18 [0, 0, 14]	12 [0, 0, 7]	13 [0, 0, 10]	**13 [0, 0, 8]**	602 (32.5%)	683 (18.5%)
	Sauces rich in fats		23 [0, 0, 32]	33 [0, 0, 46]	28 [0, 0, 38]	42 [0, 0, 64]	40 [0, 9, 59]	41 [0, 2, 60]	55 [0, 32, 76]	76 [0, 43, 105]	66 [0, 35, 95]	39 [0, 3, 58]	48 [0, 13, 67]	**44 [0, 9, 62]**	953 (51.5%)	1182 (32.0%)
	Substitutes for cream and cheese		1 [0, 0, 0]	3 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	2 [0, 0, 0]	**2 [0, 0, 0]**	62 (3.3%)	67 (1.8%)
	Vegetable oils		43 [5, 25, 66]	53 [7, 33, 75]	48 [7, 29, 72]	54 [8, 27, 83]	59 [5, 42, 86]	56 [6, 34, 85]	61 [0, 34, 93]	63 [9, 37, 107]	62 [5, 34, 97]	52 [4, 28, 78]	58 [7, 37, 88]	**55 [6, 32, 83]**	1475 (79.6%)	2160 (58.5%)
	Oils and fats Total		151 [79, 142, 206]	178 [79, 154, 234]	165 [79, 146, 219]	195 [111, 166, 252]	195 [100, 172, 268]	195 [104, 169, 261]	213 [124, 194, 283]	258 [123, 226, 328]	236 [123, 205, 310]	185 [105, 164, 237]	208 [98, 177, 285]	**197 [101, 169, 265]**	1835 (99.1%)	3444 (93.3%)
Sweetened beverages, sweets and salty snacks (optional)	Alcoholic beverages	Beer	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	2.2 [0, 0, 0]	15 [0, 0, 0]	9 [0, 0, 0]	1 [0, 0, 0]	4 [0, 0, 0]	**3 [0, 0, 0]**	25 (1.3%)	27 (0.7%)
		Other alcoholic beverages	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	**0 [0, 0, 0]**	13 (0.7%)	13 (0.4%)
		Wine	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	**1 [0, 0, 0]**	55 (3.0%)	57 (1.5%)
		Alcoholic beverages **Total**	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	9 [0, 0, 0]	18 [0, 0, 0]	14 [0, 0, 0]	3 [0, 0, 0]	6 [0, 0, 0]	**4 [0, 0, 0]**	84 (4.5%)	89 (2.4%)
	Alcoholic drink substitutes		0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	0 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	0 [0, 0, 0]	1 [0, 0, 0]	**1 [0, 0, 0]**	51 (2.8%)	51 (1.4%)
	All fruit-vegetable juice, nectar and schorle		26 [0, 0, 44]	32 [0, 0, 47]	29 [0, 0, 45]	34 [0, 0, 44]	35 [0, 18, 53]	34 [0, 1, 47]	29 [0, 0, 44]	35 [0, 0, 55]	32 [0, 0, 47]	30 [0, 0, 44]	34 [0, 0, 51]	**32 [0, 0, 47]**	864 (46.7%)	1178 (31.9%)

Energy drinks		0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	5 [0, 0, 0]	5 [0, 0, 0]	5 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	**2 [0, 0, 0]**	58 (3.1%)	60 (1.6%)
Salty snacks	Dry salty snacks	49 [0, 18, 81]	50 [0, 0, 67]	49 [0, 2, 73]	43 [0, 0, 54]	52 [0, 0, 88]	48 [0, 0, 65]	39 [0, 0, 54]	51 [0, 0, 51]	45 [0, 0, 54]	44 [0, 0, 61]	51 [0, 0, 64]	**48 [0, 0, 61]**	733 (39.6%)	884 (23.9%)
	Ready-to-eat salty snacks	7 [0, 0, 0]	12 [0, 0, 0]	9 [0, 0, 0]	10 [0, 0, 0]	22 [0, 0, 0]	16 [0, 0, 0]	15 [0, 0, 0]	29 [0, 0, 0]	22 [0, 0, 0]	10 [0, 0, 0]	20 [0, 0, 0]	**15 [0, 0, 0]**	167 (9.0%)	176 (4.8%)
	Salty snacks **Total**	56 [0, 27, 90]	61 [0, 0, 94]	59 [0, 17, 91]	53 [0, 0, 67]	74 [0, 24, 112]	64 [0, 0, 96]	54 [0, 0, 70]	79 [0, 0, 100]	67 [0, 0, 83]	54 [0, 0, 80]	71 [0, 0, 108]	**63 [0, 0, 91]**	828 (44.7%)	1012 (27.4%)
Softdrinks	Soft drinks with artificial sweeteners	0 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	4 [0, 0, 0]	2 [0, 0, 0]	3 [0, 0, 0]	2 [0, 0, 0]	1 [0, 0, 0]	**1 [0, 0, 0]**	146 (7.9%)	164 (4.4%)
	Sugary soft drinks	40 [0, 0, 55]	38 [0, 0, 60]	39 [0, 0, 55]	51 [0, 0, 68]	74 [0, 38, 97]	63 [0, 19, 83]	57 [0, 0, 76]	95 [0, 60, 138]	76 [0, 38, 120]	49 [0, 0, 67]	67 [0, 29, 95]	**58 [0, 0, 79]**	890 (48.1%)	1175 (31.8%)
	Softdrinks **Total**	40 [0, 0, 55]	39 [0, 0, 60]	39 [0, 0, 57]	51 [0, 0, 68]	75 [0, 40, 100]	64 [0, 29, 88]	60 [0, 6, 80]	96 [0, 75, 139]	79 [0, 40, 123]	50 [0, 0, 68]	69 [0, 30, 95]	**60 [0, 10, 83]**	968 (52.3%)	1294 (35.0%)
Sugary Foods and Desserts	Biscuit	41 [0, 0, 68]	52 [0, 0, 65]	47 [0, 0, 65]	40 [0, 0, 58]	51 [0, 0, 71]	46 [0, 0, 70]	41 [0, 0, 62]	48 [0, 0, 12]	44 [0, 0, 56]	41 [0, 0, 62]	50 [0, 0, 67]	**46 [0, 0, 65]**	824 (44.5%)	992 (26.9%)
	Cake	89 [0, 0, 141]	93 [0, 0, 136]	91 [0, 0, 141]	147 [0, 82, 212]	106 [0, 44, 160]	125 [0, 64, 181]	108 [0, 42, 152]	96 [0, 0, 121]	102 [0, 0, 150]	114 [0, 43, 174]	98 [0, 0, 148]	**106 [0, 0, 164]**	928 (50.1%)	1129 (30.6%)
	Desserts	11 [0, 0, 0]	12 [0, 0, 0]	12 [0, 0, 0]	9 [0, 0, 0]	17 [0, 0, 0]	13 [0, 0, 0]	10 [0, 0, 0]	6 [0, 0, 0]	8 [0, 0, 0]	10 [0, 0, 0]	12 [0, 0, 0]	**11 [0, 0, 0]**	226 (12.2%)	239 (6.5%)
	Ice-cream	37 [0, 0, 57]	29 [0, 0, 45]	33 [0, 0, 48]	34 [0, 0, 55]	26 [0, 0, 17]	30 [0, 0, 29]	25 [0, 0, 0]	29 [0, 0, 0]	27 [0, 0, 0]	32 [0, 0, 48]	28 [0, 0, 26]	**30 [0, 0, 33]**	555 (30.0%)	658 (17.8%)
	Pure Chocolate and chocolate products	43 [0, 17, 69]	43 [0, 0, 65]	43 [0, 16, 67]	46 [0, 13, 64]	61 [0, 13, 89]	54 [0, 13, 81]	45 [0, 0, 69]	52 [0, 0, 75]	48 [0, 0, 70]	45 [0, 16, 69]	52 [0, 0, 75]	**48 [0, 0, 72]**	949 (51.2%)	1208 (32.7%)
	Sugar	56 [7, 37, 83]	81 [14, 49, 116]	69 [8, 41, 98]	70 [8, 34, 103]	99 [7, 49, 113]	85 [7, 42, 110]	63 [0, 30, 95]	88 [0, 28, 110]	76 [0, 29, 100]	63 [4, 35, 94]	90 [2, 43, 114]	**77 [3, 40, 104]**	1424 (76.9%)	2189 (59.3%)
	Sweets	31 [0, 7, 43]	39 [0, 5, 54]	35 [0, 7, 48]	39 [0, 0, 60]	30 [0, 0, 34]	34 [0, 0, 44]	21 [0, 0, 17]	18 [0, 0, 0]	20 [0, 0, 0]	31 [0, 0, 42]	30 [0, 0, 34]	**30 [0, 0, 41]**	785 (42.4%)	983 (26.6%)

		Sugary Foods and Desserts **Total**	308 [170, 266, 414]	348 [173, 331, 486]	328 [172, 294, 451]	384 [188, 332, 514]	389 [212, 326, 510]	387 [200, 329, 510]	313 [142, 288, 431]	337 [138, 243, 438]	325 [138, 265, 434]	335 [169, 294, 450]	359 [176, 304, 477]	**348 [174, 299, 466]**	1812 (97.8%)	3414 (92.5%)
	added artificial sweeteners, stevia		0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	**0 [0, 0, 0]**	10 (0.5%)	12 (0.3%)
	Sweetened beverages, sweets and salty snacks (optional) Total		431 [260, 370, 590]	480 [265, 443, 645]	456 [262, 402, 626]	525 [266, 438, 701]	575 [356, 499, 725]	551 [313, 479, 701]	466 [260, 428, 654]	572 [298, 474, 785]	520 [279, 450, 679]	474 [261, 413, 644]	541 [308, 471, 701]	**508 [286, 440, 669]**	1836 (99.1%)	3591 (97.3%)
Others	Soups and bouillon	Bouillon	2 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	1 [0, 0, 0]	3 [0, 0, 0]	2 [0, 0, 0]	1 [0, 0, 0]	2 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	2 [0, 0, 0]	**2 [0, 0, 0]**	254 (13.7%)	265 (7.2%)
		Meat or fish soup, fresh made	0 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	3 [0, 0, 0]	1 [0, 0, 0]	2 [0, 0, 0]	1 [0, 0, 0]	0 [0, 0, 0]	0 [0, 0, 0]	1 [0, 0, 0]	1 [0, 0, 0]	**1 [0, 0, 0]**	14 (0.8%)	14 (0.4%)
		other type of soups	5 [0, 0, 0]	5 [0, 0, 0]	5 [0, 0, 0]	6 [0, 0, 0]	5 [0, 0, 0]	5 [0, 0, 0]	5 [0, 0, 0]	9 [0, 0, 0]	7 [0, 0, 0]	5 [0, 0, 0]	6 [0, 0, 0]	**6 [0, 0, 0]**	169 (9.1%)	178 (4.8%)
		vegetable soups, fresh made	2 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	3 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	3 [0, 0, 0]	2 [0, 0, 0]	2 [0, 0, 0]	3 [0, 0, 0]	2 [0, 0, 0]	**2 [0, 0, 0]**	101 (5.5%)	104 (2.8%)
		Soups and bouillon **Total**	9 [0, 0, 1]	10 [0, 0, 0]	9 [0, 0, 0]	13 [0, 0, 0]	11 [0, 0, 1]	12 [0, 0, 0]	9 [0, 0, 0]	13 [0, 0, 0]	11 [0, 0, 0]	11 [0, 0, 0]	11 [0, 0, 0]	**11 [0, 0, 0]**	484 (26.1%)	545 (14.8%)
	Varia		7 [0, 3, 10]	12 [1, 4, 16]	10 [0, 3, 12]	9 [0, 4, 10]	11 [1, 6, 14]	10 [1, 5, 13]	8 [0, 3, 12]	12 [0, 4, 16]	10 [0, 3, 13]	8 [0, 3, 10]	12 [0, 5, 15]	**10 [0, 4, 13]**	1694 (91.5%)	2689 (72.8%)
	Others Total		16 [1, 6, 21]	21 [1, 8, 30]	19 [1, 7, 25]	22 [1, 7, 24]	22 [2, 10, 25]	22 [1, 8, 24]	18 [0, 5, 19]	24 [1, 7, 27]	21 [0, 5, 22]	19 [1, 6, 21]	22 [1, 9, 27]	**21 [1, 7, 24]**	1731 (93.5%)	2834 (76.8%)

mean [P25, P50, P75]. The food group "Varia" corresponds to: Ice cubes, vinegar and other liquid condiment (e.g. Tabasco), yeast, gelatine and its vegetable substitutes, mustard, herbs, spices, added salt, sauces made essential with water and condiment (e.g. brown gravy for roast meat, wasabi paste, soya sauce, Ketchup, miso), sauces n.s., (salty) if clearly without fat, chewing gums, spiced mixed breadcrumbs, concentrated dry instant coffee not reconstituted

13.1.6 Place of consumption and time of consumption of food sub-subgroups in kcal/day

Place of consumption

Table 13.7 shows the mean daily intake for each detailed (in kcal/day), along with the distribution of consumption locations – at home versus out-of-home – expressed in both absolute numbers (n) and percentages. In addition to the food groups from the Swiss food pyramid[67] some "special categories" have been created grouping subgroups or specific food items to better fit dietary recommendations[75,76] or answer specific research question on hot topics. The special categories have been put at the end of the table which fitted the most. These values reflect only the portions consumed by participants who reported intake of the respective food group (i.e. recalls without consumption of a given group are excluded in this line). The "n" reflects the average portion size (in kcal) consumed at each location. Percentages are calculated by summing the energy intake (kcal) consumed at home (or out-of-home) for each food group and dividing by the total energy intake (kcal) consumed for that group.

Table 13.7 Mean energy intake (kcal/day), for each food group and distribution of intake (%), by place of consumption

Mean energy intake (kcal/day) and distribution across place of consumption (%)		Place of consumption		
Food group		Total (Mean in kcal/day)	At home (Mean in kcal/day and %)	Out of home (Mean in kcal/day and %)
Beverages: water, coffee, tea, unsweetened waters	Water	0.0	0.0 (0%)	0.0 (0%)
	coffee, tee, flavoured water without sugar	7	5 (25.5%)	14 (74.5%)
	Total	**1**	**0.7 (41.2%)**	**1 (58.8%)**
Special category: All beverage, without soups **(incl. sweetened)**		**183**	**129 (61%)**	**82 (38.8%)**
Fruits and vegetables, without juices and soups	Fruits	120	102 (53.4%)	89 (46.6%)
	Vegetables	50	46 (59.7%)	31 (40.3%)
	Total	132	104 (58%)	76 (42%)
Special category: Vegetables with vegetable soups		53	48 (60.2%)	32 (39.8%)
Cereal products and potatoes	Bread and bread products	338	279 (54.5%)	233 (45.5%)

	Cereal flakes and breakfast cereals	207	209 (57.4%)	155 (42.6%)
	Cereal products	296	272 (54%)	232 (46%)
	Tubers and tuber products	174	172 (52%)	159 (48%)
	Total	**631**	**483 (61.2%)**	**306 (38.8%)**
Dairy products, without desserts and butters	Cheese	173	159 (53.5%)	138 (46.5%)
	Milk and milk products	144	136 (50.8%)	132 (49.2%)
	yoghurt and yoghurt products	144	149 (59.9%)	100 (40.1%)
	Total	253	224 (58.2%)	161 (41.8%)
Milk and yoghurt substitutes	Milk substitute	96	96 (57%)	72 (43%)
	Yoghurt substitute	103	105 (53.7%)	91 (46.3%)
	Total	99	98 (52.3%)	90 (47.7%)
Pulses, eggs, meat and others	Dietary and Sports Supplements, high protein bars	182	153 (39.4%)	235 (60.6%)
	Eggs	81	84 (63.4%)	49 (36.6%)
	Fish and seafood	144	146 (52.7%)	131 (47.3%)
	Meat alternatives, pulses and soy	160	164 (57.4%)	122 (42.6%)
	Processed meat	165	152 (51.5%)	143 (48.5%)
	Unprocessed meat	198	190 (52.1%)	175 (47.9%)
	Total	**255**	**222 (55.7%)**	**177 (44.3%)**
Special category: All meat and meat products, without meat substitute, without soups containing meat		226	201 (53.8%)	173 (46.2%)
Special category: Soy products	**Special category**: Liquid soy products	28	32 (78.2%)	9 (21.8%)
	Special category: Solid soy products without soy oils/margarines and without mixed products	121	114 (49.9%)	114 (50.1%)
	Special category: All soy products	**64**	**66 (57%)**	**50 (43%)**
Nuts and seeds	Nuts and seeds	116	106 (47.8%)	116 (52.2%)

	Olives and avocados unprocessed	66	70 (60.9%)	45 (39.1%)
	Total	113	102 (48%)	110 (52%)
Oils and fats	Butter	94	92 (54.3%)	77 (45.7%)
	Cream	108	110 (55.7%)	87 (44.3%)
	Dressing sauces	80	80 (54.4%)	67 (45.6%)
	Margarine	83	77 (44.8%)	95 (55.2%)
	Other fats and oils	72	59 (41.9%)	82 (58.1%)
	Sauces rich in fats	133	131 (53.8%)	113 (46.2%)
	Substitutes for cream and cheese	89	88 (48.3%)	94 (51.7%)
	Vegetable oils	97	88 (47.1%)	99 (52.9%)
	Total	**205**	**174 (54.8%)**	**143 (45.2%)**
Sweetened beverages, sweets and salty snacks (optional)	Alcoholic beverages	160	46 (16.5%)	234 (83.5%)
	Alcoholic drink substitutes	51	54 (57%)	41 (43%)
	All fruit-vegetable juice, nectar and schorle	100	95 (49.9%)	95 (50.1%)
	Energy drinks	99	100 (50.6%)	98 (49.4%)
	Salty snacks	222	249 (58.2%)	178 (41.8%)
	Softdrinks	168	149 (49.9%)	150 (50.1%)
	Sugary Foods and Desserts	386	281 (50.6%)	274 (49.4%)
	added artificial sweeteners, stevia	7	7 (100%)	0.0 (0%)
	Total	**529**	**358 (51%)**	**344 (49%)**
Others	Soups and bouillon	78	81 (60.5%)	53 (39.5%)
	Varia	14	12 (44.1%)	15 (55.9%)
	Others Total	**28**	**27 (57.2%)**	**20 (42.8%)**

mean [P25, P50, P75]. The food group “Varia” corresponds to: Ice cubes, vinegar and other liquid condiment (e.g. Tabasco), yeast, gelatine and its vegetable substitutes, mustard, herbs, spices, added salt, sauces made essential with water and condiment (e.g. brown gravy for roast meat, wasabi paste, soya sauce, Ketchup, miso), sauces n.s., (salty) if clearly without fat, chewing gums, spiced mixed breadcrumbs, concentrated dry instant coffee not reconstituted.

Time of consumption

Table 13.8 shows the mean daily for each food group (in kcal/day), categorised by eating occasion (e.g., breakfast, lunch, dinner, snacks), and expressed in both absolute values (n) and percentages. These figures refer exclusively to consumer portions—participants who did not consume a given food group are excluded. For example, a participant who consumed 100kcal in one recall and 0kcal in another would have a mean intake of 100kcal. The "n" represents the average portion size (in kcal) of each food group consumed during a specific eating occasion. Percentages are calculated by summing the energy intake (kcal) consumed during each occasion for a given food group and dividing by the total energy intake (kcal) consumed for that group across all occasions. As a result, it is possible for an eating occasion to have a smaller average quantity (portion size) but a higher percentage of consumption, reflecting a larger contribution to the total energy intake.

Table 13.8 Mean energy intake (kcal/day), for each food group and distribution of intake (%), by moment of consumption

Mean energy intake (kcal/day) and distribution across the day (%)		Moment of consumption					
Food group		Breakfast (Mean in kcal/day and %)	Between meals morning (Mean in kcal/day and %)	Lunch (Mean in kcal/day and %)	Between meals afternoon (Mean in kcal/day and %)	Dinner (Mean in kcal/day and %)	Between meals other (Mean in kcal/day and %)
Beverages: water, coffee, tea, unsweetened waters	Water	0.0 (0%)	0.0 (0%)	0.0 (0%)	0.0 (0%)	0.0 (0%)	0.0 (0%)
	coffee, tee, flavoured water without sugar	5 (30.4%)	11 (19.7%)	7 (11.8%)	6 (18.3%)	3 (10%)	5 (9.9%)
	Total	**0.9 (30.4%)**	**0.6 (19.7%)**	**0.2 (11.8%)**	**0.4 (18.3%)**	**0.3 (10%)**	**0.3 (9.9%)**
Special category: All beverage, without soups **(incl. sweetened)**		**78 (34.2%)**	**20 (5.4%)**	**37 (16.7%)**	**43 (18.3%)**	**32 (15.8%)**	**34 (9.6%)**
Fruits and vegetables, without juices and soups	Fruits	58 (10.9%)	72 (17.8%)	67 (12%)	85 (39.1%)	67 (14.1%)	80 (6.1%)
	Vegetables	14 (0.9%)	21 (3.3%)	32 (46.9%)	30 (4.6%)	32 (42.8%)	28 (1.4%)
	Total	54 (7.4%)	64 (12.7%)	44 (24.4%)	81 (26.8%)	46 (24.3%)	72 (4.5%)
Special category: Vegetables with vegetable soups		14 (0.9%)	21 (3.2%)	33 (46.1%)	30 (4.5%)	34 (44%)	28 (1.4%)
Cereal products and potatoes	Bread and bread products	206 (32.1%)	149 (12.3%)	207 (17.9%)	172 (11.2%)	210 (24.6%)	210 (1.9%)
	Cereal flakes and breakfast cereals	190 (73.6%)	135 (0.5%)	162 (2.2%)	224 (10.9%)	188 (9.7%)	184 (3.1%)

	Cereal products	165 (2.4%)	97 (0.4%)	216 (50.6%)	152 (2.5%)	225 (43.3%)	156 (0.8%)
	Tubers and tuber products	82 (0.2%)	107 (0.1%)	159 (52%)	152 (2.8%)	163 (44%)	128 (0.9%)
	Total	**208 (22.3%)**	**148 (5.6%)**	**232 (31.5%)**	**182 (7.2%)**	**237 (31.8%)**	**195 (1.5%)**
Dairy products, without desserts and butters	Cheese	106 (5%)	106 (3.6%)	110 (32.5%)	128 (6%)	146 (51%)	140 (1.9%)
	Milk and milk products	112 (57.7%)	132 (4.9%)	68 (6.2%)	113 (10%)	85 (11.6%)	122 (9.7%)
	yoghurt and yoghurt products	130 (36.2%)	145 (2.9%)	84 (6.2%)	141 (17.2%)	132 (29.6%)	147 (7.9%)
	Dairy products, without desserts and butters Total	124 (29.5%)	127 (4%)	112 (18.7%)	130 (9.1%)	153 (33%)	142 (5.7%)
Milk and yoghurt substitutes	Milk substitute	93 (73.5%)	68 (1.7%)	39 (3.8%)	61 (11.5%)	35 (3.7%)	85 (5.8%)
	Yoghurt substitute	74 (21.7%)	0.0 (0.0%)	71 (14.4%)	109 (23.8%)	85 (35.8%)	95 (4.2%)
	Total	92 (67.2%)	68 (1.5%)	51 (5.1%)	72 (13%)	53 (7.6%)	86 (5.6%)
Pulses, eggs, meat and others	Dietary and Sports Supplements, high protein bars	164 (13.9%)	232 (15.7%)	217 (14%)	141 (36.4%)	196 (12.5%)	177 (7.6%)
	Eggs	97 (26.2%)	46 (0.7%)	63 (29%)	26 (2.5%)	73 (39.7%)	61 (1.9%)
	Fish and seafood	81 (1.1%)	53 (0.5%)	148 (55.9%)	66 (1.4%)	131 (39.9%)	113 (1.2%)
	Meat alternatives, pulses and soy	153 (2.4%)	14 (0.1%)	142 (48.4%)	103 (3%)	150 (45.2%)	147 (0.9%)
	Processed meat	74 (3.9%)	72 (3.9%)	146 (41.8%)	108 (5.4%)	133 (43%)	125 (2%)
	Unprocessed meat	239 (1%)	79 (0.3%)	172 (51.5%)	238 (1.9%)	167 (43.6%)	272 (1.6%)
	Total	**110 (4.6%)**	**75 (1.9%)**	**168 (45.6%)**	**105 (3.7%)**	**157 (42.5%)**	**159 (1.8%)**
Special category: All meat and meat products, without meat substitute, without soups containing meat		88 (2.5%)	73 (2.1%)	167 (46.6%)	126 (3.7%)	156 (43.3%)	164 (1.8%)
Special category: Soy products	**Special category:** Liquid soy products	107 (47.2%)	0.5 (0%)	9 (14%)	31 (11%)	15 (25.5%)	47 (2.4%)
	Special category: Solid soy products without soy oils/margarines and without mixed products	73 (4.5%)	0.0 (0.0%)	112 (51.3%)	98 (5.1%)	109 (39.1%)	0.0 (0.0%)
	Special category: All soy products	**99 (17.8%)**	**0.5 (0%)**	**55 (39.8%)**	**48 (6.9%)**	**47 (34.8%)**	**47 (0.7%)**
Nuts and seeds	Nuts and seeds	76 (12.2%)	120 (23.1%)	67 (9.8%)	136 (32.9%)	60 (11.8%)	169 (10.2%)
	Olives and avocados unprocessed	88 (5.5%)	104 (5.5%)	49 (23.7%)	103 (14.5%)	55 (44.9%)	148 (5.9%)

	Total	78 (10.9%)	121 (19.7%)	64 (12.4%)	137 (29.4%)	63 (18.1%)	166 (9.4%)
Oils and fats	Butter	89 (39%)	69 (4.6%)	58 (22.1%)	63 (4.1%)	75 (29.1%)	84 (1.1%)
	Cream	114 (3.3%)	164 (1.7%)	97 (45.2%)	92 (6.8%)	92 (40.8%)	111 (2.1%)
	Dressing sauces	122 (0.6%)	95 (0.1%)	66 (51.1%)	56 (0.7%)	79 (46.7%)	142 (0.9%)
	Margarine	82 (51.3%)	55 (4.7%)	57 (16.8%)	63 (5.7%)	57 (20.8%)	128 (0.6%)
	Other fats and oils	102 (3%)	27 (0.5%)	62 (54.3%)	81 (3.5%)	71 (38.3%)	51 (0.5%)
	Sauces rich in fats	75 (1.3%)	63 (1.5%)	122 (52.7%)	77 (2.7%)	116 (40.9%)	126 (0.9%)
	Substitutes for cream and cheese	0.0 (0.0%)	0.0 (0.0%)	74 (41.6%)	34 (0.4%)	90 (57.5%)	45 (0.5%)
	Vegetable oils	64 (2.6%)	11 (0.1%)	80 (46.1%)	96 (3.9%)	75 (46.1%)	70 (1.2%)
	Total	**90 (10.5%)**	**67 (1.6%)**	**121 (43.1%)**	**91 (3.6%)**	**117 (40.1%)**	**106 (1.1%)**
Sweetened beverages, sweets and salty snacks (optional)	Alcohol beverages	0.0 (0.0%)	106 (3.2%)	32 (5%)	149 (11.4%)	119 (31.9%)	261 (48.5%)
	Alcoholic drink substitutes	0.0 (0.0%)	0.0 (0.0%)	46 (26.4%)	59 (19.1%)	38 (31.3%)	88 (23.2%)
	All fruit-vegetable juice, nectar and schorle	85 (39.8%)	87 (5.8%)	72 (16.3%)	87 (18.8%)	65 (12.6%)	86 (6.7%)
	Energy drinks	0.0 (0.0%)	93 (14.9%)	70 (19.7%)	109 (48.1%)	83 (2.5%)	91 (14.8%)
	Salty snacks	190 (1%)	121 (14%)	220 (13.6%)	186 (39.6%)	292 (21.6%)	240 (10.2%)
	Softdrinks	98 (2%)	101 (5.7%)	118 (32.2%)	118 (28.8%)	116 (22.8%)	149 (8.5%)
	Sugary Foods and Desserts	151 (21.4%)	164 (9.9%)	163 (12.6%)	230 (36.7%)	155 (11.6%)	167 (7.7%)
	added artificial sweeteners, stevia	10 (75%)	0.0 (0%)	0.7 (2.3%)	2 (6.4%)	5 (16.2%)	0.0 (0%)
	Total	159 (17.5%)	164 (9.6%)	170 (15.3%)	261 (34.9%)	174 (14.4%)	196 (8.4%)
Others	Soups and bouillon	90 (0.7%)	98 (0.5%)	57 (32.2%)	81 (2.8%)	84 (62.4%)	81 (1.4%)
	Varia	3 (1.5%)	11 (2.4%)	11 (46.3%)	11 (6.6%)	10 (40.1%)	17 (2.9%)
	Others Total	**5 (1.1%)**	**13 (1.4%)**	**18 (38.9%)**	**15 (4.7%)**	**24 (51.8%)**	**24 (2.1%)**

mean [P25, P50, P75]. The food group "Varia" corresponds to: Ice cubes, vinegar and other liquid condiment (e.g. Tabasco), yeast, gelatine and its vegetable substitutes, mustard, herbs, spices, added salt, sauces made essential with water and condiment (e.g. brown gravy for roast meat, wasabi paste, soya sauce, Ketchup, miso), sauces n.s., (salty) if clearly without fat, chewing gums, spiced mixed breadcrumbs, concentrated dry instant coffee not reconstituted.

13.2 Categorisation of food items based on the Food Pyramid 2024

Table 13.9 details the type of foods which have been included in each of the sub- or sub-sub- categories of the food pyramid.

Table 13.9 Detailed categorisation of food items based on the Food Pyramid 2024

Food Pyramid category code	**Categories - Food pyramid 2024**	Food Pyramid sub-category code	**Sub-categories - Food Pyramid 2024**	Food Pyramid sub-subcategory code	**Sub-sub-categories - Food Pyramid 2024**	**Food Pyramid code 2024 (full code incl. Sub-subcategory)**	**Description categories "food pyramid code 2024" Foods from GloboDiet tool classified in the sub-sub-categories**
A	**Beverages**	1	Water	1	No Sub-subcategory	**A0101**	Water (spring, tap, mineral water). **Except:** ice cubes.
A	**Beverages**	2	Coffee, tee, flavoured water	1	Coffee, tea, flavoured waters all without added sugars/artificial sweeteners	**A0201**	Tea, coffee, coffee substitutes (e.g. chicory), herbal and fruit tea, with undefined added sugars/artificial sweeteners (e.g. coffee from vending machine), all without added milk/milk alternatives/cream or small amounts. **Except:** ice cubes and sweetened iced tea.
A	**Beverages**	2	Coffee, tee, flavoured water	2	Coffee, tea with undefined added sugars/artificial sweeteners (small quantities)	**A0202**	Tea, coffee, coffee substitutes (e.g. chicory), herbal and fruit tea, with undefined added sugars/artificial sweeteners (e.g. coffee from vending machine), all without added milk/milk alternatives or cream **Except:** ice cubes and sweetened iced tea.

B	**Fruits and vegetables (without juices and soups)**	1	Vegetables	1	Raw vegetables	**B0101**	All types of **raw* vegetables** incl. green salads/leaves, sprouts, mushrooms and seaweeds, pumpkin, onions, radish. **fresh and eaten raw (unprocessed) also in sandwich or in puree (if raw and fresh or raw and unprocessed).* **<u>Except:</u>** avocadoes, olives, herbs, fruit-vegetable juices, or vegetables present in small amounts in salty snacks (e.g. petits fours, samosa), bread (bread with dried tomatoes), or sauces (e.g. Ketchup, pesto sauce).
B	**Fruits and vegetables (without juices and soups)**	1	Vegetables	2	Dried vegetables	**B0102**	All types of **dried vegetables** (e.g. dried mushrooms, tomatoes and seaweeds, green beans etc.), incl. in sachet or vacuumed. **<u>Except:</u>** herbs, if contained in small amounts in salty snacks (e.g. petits fours, samosa), bread (bread with dried tomatoes).
B	**Fruits and vegetables (without juices and soups)**	1	Vegetables	3	Transformed vegetables	**B0103**	All types of **transformed vegetables**, frozen (if typically blanched before freezing), canned, pickled (incl. capers), cooked, past/concentrate (tomato paste), in puree (if not explicitly eaten raw and fresh, incl. peeled tomatoes in tin can), on pizza/quiches and in sandwiches (if with nutrient doses), incl. unknown cooking method or unknown conservation method. Eggplant , green beans, peas, asparagus and sweet corn which are toxic when eaten raw, were considered transformed unless described as dried. Silverskin onions are per definition considered as pickled. **<u>Except:</u>** unknown cooking method for salad, rucola and radish because there are most commonly eaten raw; avocadoes and olives (spread), fruit-vegetable juices or sauces (e.g. Ketchup, pesto sauce) or vegetables present in small amounts in salty snacks (e.g. petits fours, samosa).
B	**Fruits and vegetables (without juices and soups)**	1	Vegetables	4	Vegetable sauces	**B0104**	All types of **vegetables sauces** made essentially with vegetables and without large amount of fat (e.g. tomato sauce, all'arrabbiata sauce). **<u>Except:</u>** tomato concentrate (e.g. tomato paste)

B	**Fruits and vegetables (without juices and soups)**	2	Fruits	1	Dried fruits	**B0201**	All types of **dried fruits** (e.g. raisins/sultanas, dried apricots and figs). **<u>Except</u>**: fruit juices, fruit jams, candied fruits or if contained in small amounts in yoghurts, cakes (e.g. blueberry muffin), ice-creams and other sweets, dry fruit in nut mix.
B	**Fruits and vegetables (without juices and soups)**	2	Fruits	2	Raw fruits	**B0202**	All types of **raw* fruits** (included fruits described as raw but with unknown conservation method) **eaten raw and fresh (unprocessed) or eaten raw after freezing (e.g. frozen berries) or raw and in puree if homemade/restaurant-catering and described* fruits described as raw with unknown cooking method (not compote or explicitly cooked or transformed) or fruits described as raw but with unknown conservation methods (not compote or explicitly cooked or transformed) or cooking method not applicable and fresh (not in compote) were classified as raw. **<u>Except:</u>** fruit juices, if contained in small amounts in yoghurts, cakes (e.g. blueberry muffin), ice-creams and other sweets.
B	**Fruits and vegetables (without juices and soups)**	2	Fruits	3	Transformed fruits	**B0203**	All types of **transformed fruits**, frozen if not eaten raw, compote, in puree, canned (without the conservation juice), **<u>Except:</u>** fruit puree described: i) as raw and fresh or ii) as fresh and no cooking methods apply and homemade/catering-restaurant; fruit juices, fruit jams, candied fruits or if contained in small amounts in yoghurts, cakes (e.g. blueberry muffin), ice-creams and other sweets.
C	Cereal products and potatoes	1	Tubers and tuber products	1	Tubers	**C0101**	All types of minimal cooked **tubers** (e.g. potatoes, sweet potatoes).
C	Cereal products and potatoes	1	Tubers and tuber products	2	Tuber products	**C0102**	**Potato products** (e.g. rösti, gnocchi, French fries, reconstituted mashed potatoes), any fried tuber, any mashed tuber or reconstituted from dry form

C	Cereal products and potatoes	2	Bread and bread products	1	Bread	**C0201**	All types of **bread** (e.g. baguette, bread rolls, milk bread), flat bread, croissants, bread/pastry with caraway. **Except:** stuffed croissants (e.g. hazelnut croissants), sweet pastries (e.g. chocolate croissants) and any bread with chocolate.
C	Cereal products and potatoes	2	Bread and bread products	2	Crisp bread	**C0202**	All types of **crisp bread** (e.g. zwieback, rice crackers, Swedish rolls) and breadcrumbs.
C	Cereal products and potatoes	3	Cereal products	1	Rice	**C0301**	All type of **rice** (e.g. rice for risotto, wholegrain rice), vine leaf filled with rice.
C	Cereal products and potatoes	3	Cereal products	2	Pasta and stuffed pasta	**C0302**	All type of **pasta** (e.g. penne, spaghetti, pasta for lasagne) and **stuffed pasta** (e.g. ravioli, tortellini), schupfnudeln, spätzli, rice noodles and salty knödel (e.g. Serviettenknödel), pasta made with pulses.
C	Cereal products and potatoes	3	Cereal products	3	Flours and starches	**C0303**	All types of **flours and starches** incl. corn flour (maïzena).
C	Cereal products and potatoes	3	Cereal products	4	Dough	**C0304**	All types of **dough** (e.g. puff dough/pastry dough, dough for pizza).
C	Cereal products and potatoes	3	Cereal products	5	Other cereals, pseudo cereals and other starchy food	**C0305**	All other **cereals, pseudo cereals and starchy food**, bulgur, wheat or other cereal grains (e.g. couscous, barley, quinoa), chestnuts, cereal semolina, ready-to-eat crepe without filling and unprocessed corn for popcorn.
C	Cereal products and potatoes	4	Cereal flakes and breakfast cereals	1	Cereal flakes	**C0401**	All natural **cereal flakes**, oatmeal, flakes from birchermuesli and porridge, dried wheat germs, natural cereal bran, all with or without dried fruits and/or nuts, all without added sugars/artificial sweeteners and without major food processing.
C	Cereal products and potatoes	4	Cereal flakes and breakfast cereals	2	Breakfast cereals	**C0402**	All processed and branded **breakfast cereals** (e.g. cornflakes) with or without sugars and processed; ready-to-eat birchermuesli mixes with added sugars/artificial sweeteners/unknown sweeteners.

D	Dairy products, without desserts and butters	1	Milk and milk products	1	Milk and milk products without added sugars	**D0101**	All types of mammals' **milk**, branded fermented milk drinks (e.g. Bifidus, kefir drink, ayran), yoghurt drink and buttermilk, all in liquid form, all without added sugars/artificial sweeteners (e.g. natural milk, nature whey). All types of coffee with more milk than coffee e.g. cappuccino, wiener coffee, milk coffee with unspecified quantity of milk or cream, branded warm or cold coffee mixes with milk or cream, all without added sugars.
D	Dairy products, without desserts and butters	1	Milk and milk products	2	Milk and milk products with added sugars	**D0102**	All type of mammals' **milk**, branded fermented milk drinks (e.g. Bifidus, kefir drink, ayran), yoghurt drink and buttermilk, all in liquid form, with added sugars/artificial sweeteners/unknown sugars (e.g. milk drinks with sugar and/or fruits). All types of coffee with more milk than coffee e.g. cappuccino, wiener coffee, milk coffee with unspecified quantity of milk or cream, branded warm or cold coffee mixes with milk or cream, all with added sugars/sweeteners or unknown added sugar.
D	Dairy products, without desserts and butters	2	Yoghurt and yoghurt products	1	Yoghurt and yoghurt products without added sugars	**D0201**	All types of mammals' **yoghurt**, branded fermented milk and kefir, all in semi-solid form and without added sugars/artificial sweeteners (e.g. natural yoghurt).
D	Dairy products, without desserts and butters	2	Yoghurt and yoghurt products	2	Yoghurt and yoghurt products with added sugars	**D0202**	All types of mammals' **yoghurt**, branded fermented milk and kefir, all in semi-solid form and with added sugars/artificial sweeteners or unknown added sugar (e.g. branded yoghurt with sugar and/or fruits).
D	Dairy products, without desserts and butters	3	Cheese	1	Fresh cheese without added sugar	**D0301**	All types of mammals' **soft white cheese without** added sugar (e.g. cottage cheese, Petit suisse, quark, skyr, ricotta, fresh whey cheese ("Ziger"/"sérac"/"zigra") and tzatziki sauce).
D	Dairy products, without desserts and butters	3	Cheese	2	Spread cheese	**D0302**	All type of mammals' **spread cheese** and processed/melted cheese, often branded and portioned, included fresh cream cheese.
D	Dairy products, without desserts and butters	3	Cheese	3	Soft cheese	**D0303**	All type of mammals' **soft and semi-soft cheese** (e.g. brie, gorgonzola, mozzarella), included Halloumi, paneer and grilled cheeses.

D	Dairy products, without desserts and butters	3	Cheese	4	Hard and semi-hard cheese	**D0304**	All types of mammals' **hard and semi-hard cheese** (e.g. Gruyere, Emmental, Tilsit, Lucerner cream cheese, parmesan).
D	Dairy products, without desserts and butters	3	Cheese	5	Fresh cheese with added sugar	**D0305**	All types of mammals' **soft white cheese with** added sugar/sweeteners/fruits or unknown added sugar (e.g. Petit suisse, quark, skyr).
E	Milk and yoghurt substitutes	1	Milk substitute	0	No Sub-subcategory	**E0100**	All types of **milk substitutes** (e.g. soy drink, almond drink).
E	Milk and yoghurt substitutes	2	Yoghurt substitute	0	No Sub-subcategory	**E0200**	All types of yoghurt **substitutes**, skyr-vegan.
F	Pulses, eggs, meat and others	1	Unprocessed meat	1	Red meat	**F0101**	All types of **unprocessed meat and offal** from beef, veal, pork, lamb, mutton, horse, goat, rabbit, wild red meat (e.g. venison/deer), incl. beef tartar.
F	Pulses, eggs, meat and others	1	Unprocessed meat	2	Poultry	**F0102**	All types of **unprocessed meat and offal** from chicken, turkey, duck, goose, ostrich.
F	Pulses, eggs, meat and others	1	Unprocessed meat	3	Other unprocessed meat	**F0103**	All types of **unprocessed meat and offal** from any unspecified animals; frog and crocodile.
F	Pulses, eggs, meat and others	2	Processed meat	1	Typical processed meat	**F0201**	All types of **typically processed meat**, sausages, cold cuts, smoked or cured meat (e.g. ham, smoked bacon, salami corned beef, beef jerky, hot dog sausages, meat terrine).

F	Pulses, eggs, meat and others	2	Processed meat	2	Meat sauces and hamburger meat	**F0202**	All types of **meat sauces and hamburger meat**, meat-based sauces (e.g. Bolognese sauce), meat-based spread (e.g. liver spread), minced meat with added ingredients (e.g. meat for burgers). **Except:** beef tartar.
F	Pulses, eggs, meat and others	3	Fish and seafood	1	Unprocessed fish and seafood	**F0301**	All types of **unprocessed fish**, seafood and snails, even if canned, salmon tartar, filet battered.
F	Pulses, eggs, meat and others	3	Fish and seafood	2	Processed fish products	**F0302**	All types of **processed fish**, processed fish in crumbs and seafood (fish mousse, surimi, and caviar).
F	Pulses, eggs, meat and others	4	Eggs	0	No Sub-subcategory	**F0400**	All types of **eggs**, white egg and egg yolk, eggs used in omelets, scrambled eggs and omelet strips (flädli, "célestine/Celestina all'uovo"). **Except:** if contained in small amounts in cakes, salty snacks or sauces.
F	Pulses, eggs, meat and others	5	Meat alternatives	1	Cooked pulses and soy, unprocessed	**F0501**	All types of **pulses and soy** (e.g. lentils, dry beans).
F	Pulses, eggs, meat and others	5	Meat alternatives	2	Typical pulses and soy products	**F0502**	All type of typical **processed* pulses and soy products** (e.g. falafel, tofu, tempeh, lentil dal, etc.). **processed means more than just cooked*
F	Pulses, eggs, meat and others	5	Meat alternatives	3	Other processed meat substitute	**F0503**	All **other processed meat substitute**: seitan, quorn, yasoya, and other vegetarian products (e.g. vegetarian sausages, vegetarian meat substitute for burgers).

F	Pulses, eggs, meat and others	6	Dietary and sports supplements, high protein bars	0	No Sub-subcategory	**F0600**	All types of **dietetic products** rich in proteins (e.g. meal replacements, protein shakes, incl. protein bar).
G	Oils and fats	1	Vegetable oils	0	No Sub-subcategory	**G0100**	All types of added **vegetable oils** (e.g. rapeseed oils, olive oil, sunflower oil, and any unspecified vegetable oils).
G	Oils and fats	2	Butter	0	No Sub-subcategory	**G0200**	All types of added **butter*** to cook and spread on bread. **Butter mixed with other ingredients is considered butter if 50% of fat is butter.*
G	Oils and fats	3	Margarine	0	No Sub-subcategory	**G0300**	All types of added **margarine*** to cook and spread on bread, vegan butter substitutes. **mixed with less than 50% butter.*
G	Oils and fats	4	Other fats and oils	0	No Sub-subcategory	**G0400**	All types of **other fats and oils**, coco fat used to cook, undefined fats used to cook, added animal fats (e.g. pig fat, fish oil) and any unspecified fats.
G	Oils and fats	5	Cream	0	No Sub-subcategory	**G0500**	All types of added mammals' **creams** and mascarpone.
G	Oils and fats	6	Substitutes for cream and cheese	0	No Sub-subcategory	**G0600**	All types of vegetarian **cream substitutes** and all types of vegetarian **cheese substitutes*** ** All substitute products were classified separately from "conventional products" to enable accurate reporting of their consumption, but also as a result of their heterogeneity. Additionally, the cheese substitute consumption was so small in the study that no separate category could be created. Within the dairy substitutes group, the category of cream substitutes was preferred over the yoghurt substitutes and the milk substitutes categories, due to the high fat content of cheese substitutes currently on the market.*
G	Oils and fats	7	Sauces rich in fats	0	No Sub-subcategory	**G0700**	All types of **sauces rich in fats**, mayonnaise, veganaise, guacamole, tapenade, sesame-paste, sauces rich in oils (e.g. pesto), sauces rich in butter (e.g. sauce Hollandaise, café de Paris), other sauces rich in cream or other fats (e.g. carbonara, cocktail sauce, hummus, satay and curry sauce), coco milk and unknown salty sauces if with fat or unknown fat.
G	Oils and fats	8	Dressing sauces	0	No Sub-subcategory	**G0800**	All types of **dressing sauces** (e.g. French dressing, Italian dressing).
H	Nuts and seeds (incl. unprocessed olives and avocados)	1	Olives and avocados unprocessed	1	Olives unprocessed	**H0101**	All types of **unprocessed olives**.

H	Nuts and seeds (incl. unprocessed olives and avocados)	1	Olives and avocados unprocessed	2	Avocado unprocessed	**H0102**	**Unprocessed avocado**.
H	Nuts and seeds (incl. unprocessed olives and avocados)	2	Nuts and seeds	0	No Sub-subcategory	**H0200**	All types of **dried nuts and seeds** (e.g. almonds, hazelnuts, coconut, pumpkin seeds), all with or without salt.
I	Sweetened beverages, sweets and salty snacks (optional)	1	Sugary Foods and Desserts	1	Ice-cream	**I0101**	All types of **ice-cream** (e.g. ice-cream made with cream, sorbet and branded water ice-creams) and iced cakes.
I	Sweetened beverages, sweets and salty snacks (optional)	1	Sugary Foods and Desserts	2	Desserts	**I0102**	All types of **desserts** made with dairy products (e.g. panna cotta, pudding, chocolate mousse, caramel cream, tiramisu).
I	Sweetened beverages, sweets and salty snacks (optional)	1	Sugary Foods and Desserts	3	Sugar	**I0103**	All types of beet or cane **sugars**, jams, jelly, honey, syrup, sweet sauces (e.g. caramel or chocolate sauce, maple syrup, chutney), sweet spreads made with chocolate, nuts or other sweet spread (e.g. chocolate spread, peanut butter, lemon curd) , sweet topping (e.g. sugar or chocolate icing), and chocolate powder. **Except:** stevia and artificial sweeteners (dedicated category).
I	Sweetened beverages, sweets and salty snacks (optional)	1	Sugary Foods and Desserts	4	Cake	**I0104**	All types of sweet **cakes** pies and tarts (e.g. brownies, lemon cakes, muffins, panettone, Linz tart, lemon pie), sweet pastries (e.g. hazelnut and chocolate and filled croissants, Berliner doughnuts, churros, waffles) and pre-backed commercial pie base for small pastries.
I	Sweetened beverages, sweets and salty snacks (optional)	1	Sugary Foods and Desserts	5	Biscuit	**I0105**	All types of sweet and dried **biscuits** (e.g. shortbread, amaretto, Christmas biscuits, chocolate chip cookies, leckerli, meringue), sweet crackers (e.g. with chocolate, honey).
I	Sweetened beverages, sweets and salty snacks (optional)	1	Sugary Foods and Desserts	6	Pure Chocolate and chocolate products	**I0106**	All types of **pure chocolate** (e.g. white, milk, dark chocolate) and **chocolate products,** confectionary made with chocolate (e.g. chocolate filled with: alcohol, fruit, nuts and/or cream) pralines, branded chocolate bars, popcorn with chocolate and Easter rabbits.
I	Sweetened beverages, sweets and salty snacks (optional)	1	Sugary Foods and Desserts	7	Sweets	**I0107**	All types of **sweets** and confectionery (e.g. marzipan, candied fruits, lollipop, marshmallows, nougat, gummy bears), sweet and sports cereal bars (e.g. energy bars), sweet popcorn without chocolate and chestnut vermicelli.

I	Sweetened beverages, sweets and salty snacks (optional)	2	Salty snacks	1	Dry salty snacks	**I0201**	All types **dry salty snacks**, crisps and flips, salty crackers (e.g. golden fish biscuits, sticks sprinkled with salt and/or seeds, salty popcorn).
I	Sweetened beverages, sweets and salty snacks (optional)	2	Salty snacks	2	Ready-to-eat salty snacks	**I0202**	All types of r**eady-to-eat salty snacks** as cocktail canapés, crostini/bruschetta, spring rolls, ham croissants, samosa and sausage rolls.
I	Sweetened beverages, sweets and salty snacks (optional)	3	Softdrinks	1	Sugary soft drinks	**I0301**	All types of **sugary soft drinks**, sports drinks~~,~~ fizzy drinks, iced tea, diluted syrup, coconut water, drinks made with fruit juices (e.g lemonades), all with added sugars, flavoured water with sugars, all soft drinks with combined sugar and artificial sweeteners or undefined sugar content. **Except**: nectar, 100% fruit or vegetable juice
I	Sweetened beverages, sweets and salty snacks (optional)	3	Softdrinks	2	Soft drinks with artificial sweeteners	**I0302**	All type of **soft drinks with artificial sweeteners:** sugar-free soft drinks, sports drinks, fizzy drinks, iced tea, diluted syrup.
I	Sweetened beverages, sweets and salty snacks (optional)	4	Energy drinks	0	No Sub-subcategory	**I0400**	All types of **energy drinks** with and without sugar/artificial sweeteners.
I	Sweetened beverages, sweets and salty snacks (optional)	5	Alcoholic drink substitutes	0	No Sub-subcategory	**I0500**	All type of **alcoholic drink substitutes**, alcohol-free beers, punch and cider, all without alcohol.
I	Sweetened beverages, sweets and salty snacks (optional)	6	Alcohol beverages	1	Beer	**I0601**	All types of **beers** (with alcohol), apple or pear ciders, shandy (e.g. beer with lemonade or grenadine syrup).
I	Sweetened beverages, sweets and salty snacks (optional)	6	Alcohol beverages	2	Wine	**I0602**	All types of white and red **wine**, champagne, prosecco, wine products (e.g. sangria, mulled wine (glühwein), punch with alcohol, wine with syrup), port, sherry and vermouths.
I	Sweetened beverages, sweets and salty snacks (optional)	6	Alcohol beverages	3	Other alcoholic beverages	**I0603**	All types of **other alcoholic beverages**, spirits, cocktails and long drinks with alcohol, "alcopops", liquors and any other alcoholic drinks (e.g. coffee with spirit).
I	Sweetened beverages, sweets and salty snacks (optional)	7	added artificial sweeteners, stevia	0	No Sub-subcategory	**I0700**	All types of **added artificial sweeteners** (e.g. xylite, aspartame) and stevia.

I	Sweetened beverages, sweets and salty snacks (optional)	8	All fruit-vegetable juice, nectar and schorle	0	No Sub-subcategory	**I0800**	All types of **fruit and vegetable juices**, including 100% juice, smoothie, nectar, all with and without added sugar and made out of concentrate or fresh fruits and/or vegetables, and schorle, sparkling grape juice. **Except:** coconut water.
Z	Others	1	Soups and bouillon	1	Bouillon	**Z0101**	All types of **bouillons**, vegetable-based bouillons, meat-based bouillons or fish-based bouillons, bouillon-based soups and clear soups with small amount of meat, pasta, vegetable or egg products, miso.
Z	Others	1	Soups and bouillon	2	Vegetable soups, fresh made	**Z0102**	All types of homemade or restaurant made **vegetable soups**, without any known starchy food or meat, all with or without cream. **Except:** branded instant-vegetable soups.
Z	Others	1	Soups and bouillon	3	Meat or fish soup, fresh made	**Z0103**	All types of **meat or fish-based soups** homemade or restaurant made.
Z	Others	1	Soups and bouillon	4	Other types of soups	**Z0104**	All **other types of soups** with starchy foods, branded instant-vegetable soups, soups essentially made with cream and any unspecified soups; vegetable and meat/fish soups with unknown preparation/cooking methods.
Z	Others	2	Varia	0	No Sub-subcategory	**Z0200**	Ice cubes, vinegar and other liquid condiment (e.g. Tabasco), yeast, gelatine and its vegetable substitutes, mustard, herbs, spices, added salt, sauces made essential with water and condiment (e.g. brown gravy for roast meat, wasabi paste, soya sauce, Ketchup, sweet chili sauce), undefined sauces when not containing fat or unknown fat, chewing gums, spiced mixed breadcrumbs, concentrated dry instant coffee not reconstituted, sirup (in its concentrated form) sweetened only with artificial sweeteners.

In addition to the food groups from the Swiss food pyramid, Table 13.10 shows how some “special categories” have been created grouping subgroups or specific food items to better fit the Swiss food pyramid recommendations or answer specific research questions on hot topics.

Table 13.10 Additional groups specifically created for calculations

Grouping by combining sub-sub- categories	(variable: Food_pyramid_code_2024)
All beverages, without soups:	A0101, A0201, A0202, D0101, D0102, E0100, I0301, I0302, I0400, I0500, I0601, I0602, I0603, I0800
Vegetables with vegetable soups:	B0101, B0102, B0103, B0104, Z0102
All meat and meat products, without meat substitute:	F0101, F0102, F0103, F0201, F0202

Grouping by combining specific foods	(variable: FOOD_NUM)
Solid soy products without soy sprout, soy oils/margarines and without mixed products	00111, 00126, 00233, 00382, 00859, 00861, 01875, 01890, 01964, 02055, 02087
Liquid soy products	00232, 01567, 01575, 01839, 01888

14 Annexes Chapter 8

14.1 Unweighted distribution of BMI percentiles by sex, age group and study centre

Table 14.1 shows the unweighted distribution of the BMI percentiles according to the WHO guidelines[78] by gender, age group and study centre.

Table 14.1 Unweighted distribution of BMI percentiles

	<P3 N = 81[1]	**>P3<P10** N = 131[1]	**Normal range** N = 1,401[1]	**>P90<P97** N = 139[1]	**>P97** N = 100[1]
Sex					
Males	36 (4.0%)	58 (6.4%)	707 (78%)	58 (6.4%)	51 (5.6%)
Females	45 (4.8%)	73 (7.7%)	694 (74%)	81 (8.6%)	49 (5.2%)
Age group					
6-9 years	40 (5.3%)	58 (7.8%)	558 (75%)	44 (5.9%)	48 (6.4%)
10-13 years	27 (4.8%)	42 (7.5%)	415 (74%)	46 (8.2%)	30 (5.4%)
14-17 years	14 (2.6%)	31 (5.7%)	428 (79%)	49 (9.0%)	22 (4.0%)
Study centre					
BE	23 (5.8%)	33 (8.4%)	283 (72%)	34 (8.6%)	21 (5.3%)
TI	13 (6.1%)	9 (4.2%)	155 (72%)	20 (9.3%)	17 (7.9%)
LU	11 (4.5%)	19 (7.9%)	180 (74%)	17 (7.0%)	15 (6.2%)
SG	12 (4.3%)	23 (8.3%)	218 (79%)	14 (5.1%)	10 (3.6%)
VD	10 (2.5%)	27 (6.6%)	311 (76%)	34 (8.3%)	26 (6.4%)
ZH	12 (3.8%)	20 (6.3%)	254 (80%)	20 (6.3%)	11 (3.5%)
Total	**81 (4.4%)**	**131 (7.1%)**	**1 401 (76%)**	**139 (7.5%)**	**100 (5.4%)**

[1]n (%), <P10: underweight, >P90: overweight

14.2 Unweighted results of waist circumference

Table 14.2 Summary statistics for waist circumference measurement, unweighted

	Waist measurement 1 (cm)	Waist measurement 2 (cm)	Waist measurement 3 (cm)
Mean	63.21	63.30	63.31
SD	9.24	9.29	9.28
Median	62.00	62.00	62.00
IQR	12.80	12.90	12.90
Min	45.50	45.40	45.60
Max	113.00	113.50	113.10
N	1 846	1 845	1 844
Missing	6	7	8

SD: standard deviation, IQR: interquartile range (P75-P25), Min: minimum value, Max: maximum value, Missing: number of missing values.

Table 14.2 shows the distribution of the waist circumference measurements.

14.3 Unweighted results of hip circumference

Table 14.3: Summary statistics for hip circumference measurement, unweighted

	Hip measurement 1 (cm)	Hip measurement 2 (cm)	Hip measurement 3 (cm)
Mean	79.74	79.71	79.69
SD	13.02	13.03	13.04
Median	78.80	78.80	78.80
IQR	21.50	21.50	21.50
Min	54.00	54.00	54.00
Max	128.50	128.10	128.50
N	1 846	1 845	1 845
Missing	6	7	7

SD: standard deviation, IQR: interquartile range (P75-P25), Min: minimum value, Max: maximum value, Missing: number of missing values.

Table 14.3 shows the distribution of the hip circumference measurements.

14.4 Unweighted results of blood pressure

Systolic blood pressure

Table 14.4: Summary statistics for systolic blood pressure measurements, unweighted

	SBP measurement 1 (mmHg)	SBP measurement 2 (mmHg)	SBP measurement 3 (mmHg)
Mean	106.64	104.68	104.00
SD	11.47	10.98	10.95
Median	106.00	104.00	103.00
IQR	15.00	14.00	14.00
Min	72.00	72.00	51.00
Max	158.00	170.00	167.00
N	1 831	1 820	1 818
Missing	21	32	34

SBP: systolic blood pressure, SD: standard deviation, IQR: interquartile range (P75-P25), Min: minimum value, Max: maximum value, Missing: number of missing values.

Table 14.4 shows that, as expected, values decreased with repeated measurements over time[98] . This may be explained by reduced stress levels and greater relaxation throughout the procedure, especially as children realized that the measurement is not painful.

Diastolic blood pressure

Table 14.5: Summary statistics for diastolic blood pressure measurements, unweighted

	DBP measurement 1 (mmHg)	DBP measurement 2 (mmHg)	DBP measurement 3 (mmHg)
Mean	65.59	64.49	63.88
SD	8.31	8.29	7.99
Median	65.00	64.00	64.00
IQR	10.00	10.00	10.00
Min	32.00	38.00	33.00
Max	120.00	110.00	109.00
N	1 831	1 820	1 818
Missing	21	32	34

DBP: diastolic blood pressure, SD: standard deviation, IQR: interquartile range (P75-P25), Min: minimum value, Max: maximum value, Missing: number of missing values.

As shown in Table 14.5, also the diastolic values slightly decreased with repeated measurement over time, which was expected[98].

14.5 Time spent outside on weekdays and during the weekend

The time spent outside by participant on weekdays and on weekends are presented in Figure 14.1 a)-f) and Figure 14.2a)-f).

Figure 14.1: Time spent outside on weekdays: overall and stratified by study centre, sex, and age group

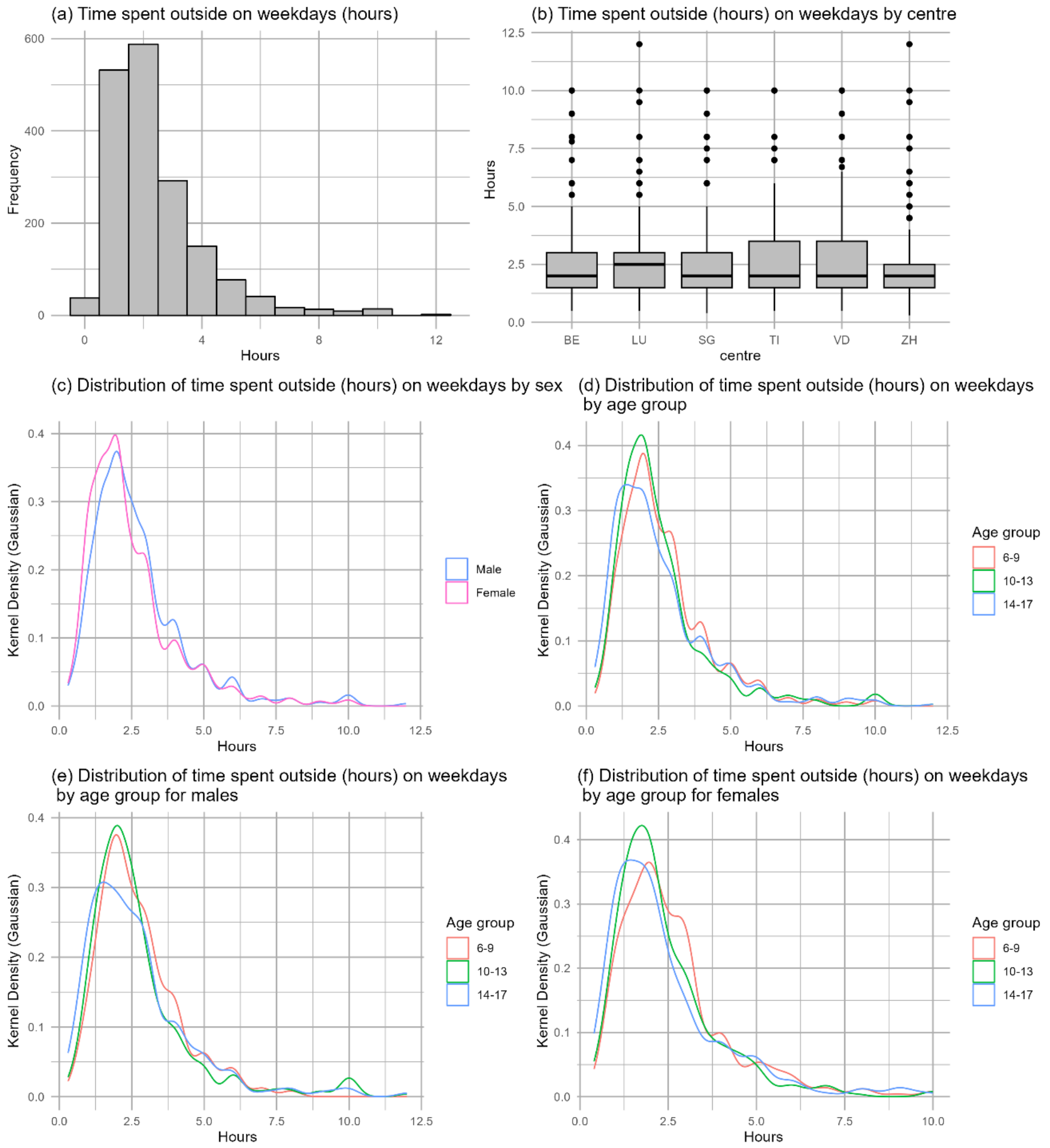


Figure 14.1a) shows the distribution of the time spent outside by the participants on weekdays. A statistically significant difference was observed across study centres (one-way ANOVA test, p=0.005). The greatest time spent outside on weekdays was observed in the Lucerne centre (Figure 14.1b)). Statistically significant differences were also observed between sexes (one-way ANOVA test, p=0.003), with male participants spending more time outside on weekdays compared to females (Figure 14.1c)). No statistically significant differences were observed between age groups (curves of Figure 14.1d), e), f), greatly overlapping).

Figure 14.2: Time spent outside on weekends: overall and stratified by study centre, sex, and age group

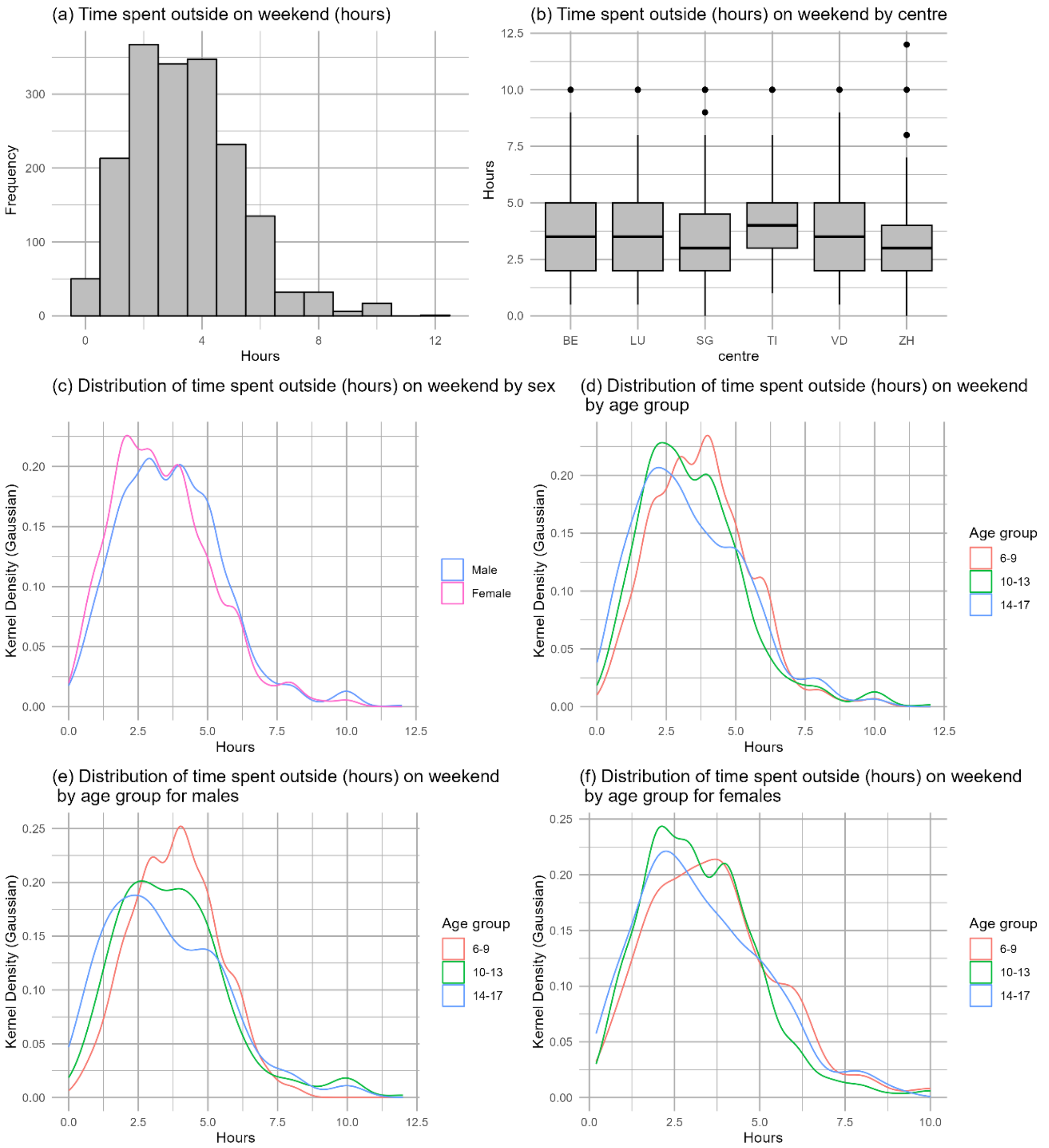


Figure 14.2a) shows the distribution of the time spent outside by the participants on weekends. A statistically significant difference was observed across study centres (one-way ANOVA test, p<0.001). The greatest time spent outside on weekends was observed in the Ticino centre (Figure 14.2b)). Statistically significant differences were also observed between sexes (one-way ANOVA test, p<0.001), with male participants spending more time outside on weekends compared to females (Figure 14.2c)). Statistically significant differences were also observed between age groups (name test, p=0.001), with a decreasing time spent outside during weekends with increasing age (Figure 14.2 d), e), f)).

15 Annexes Chapter 9

15.1 Colour coding results

Table 15.1 displays an overview of the analysed biomarkers, including their normal ranges, indicators for follow-up, and instances where referral to a paediatrician was recommended.

Table 15.1 Overview analysed blood biomarkers, their interpretation and reference values

Biomarker	Matrix	Green = normal range	Orange = advise them in the letter to do a check-up	Red = Medical Doctor calls the participants directly	Reference	Analysed by
Glycosylated haemoglobin	Whole blood	< 5.7%	5.7-6.4%	> 6.5% (pre-diabetes)	CDC: https://www.cdc.gov/diabetes/diabetes-testing/prediabetes-a1c-test.html	Each centre
Haematocrit	Whole blood	5-12y: 35-44% 12-18y (F): 36-46% 12-18y (M): 40-51%	outside those ranges	-	Powers, UpToDate (Table 1) https://www.uptodate.com/contents/approach-to-the-child-with-anemia#:~:text=Hematocrit%20(HCT)%20%E2%80%93%20The%20fractional,and%20sex%20(table%201)	Each centre
Haemoglobin	Whole blood	6-16y: 115-150 g/l 16-18y (F): 120-160 g/l 16-18y (M): 130-170 g/l	outside those ranges	<70 g/l (anaemia)	Mattiello, et al. Eur J Ped 2020 (Table 3): https://link.springer.com/article/10.1007/s00431-020-03597-5/tables/4	Each centre
Cholesterol (total)	Plasma	<5.1 mmol/l (170-199 mg/dl) or below	>= 5.1 mmol/l (>=200 mg/dl)	-	Grundy, et al. Circulation 2019 (Table 9): https://www.ahajournals.org/doi/epub/10.1161/CIR.0000000000000625	CHUV
HDL-Cholesterol	Plasma	> 1 mmol/l (> 40 mg/dl)	<=1.0 mmol/l	-	Grundy, et al. Circulation 2019 (Table 9): https://www.ahajournals.org/doi/epub/10.1161/CIR.0000000000000625	CHUV
LDL-Cholesterol	calculation	< 3.4 mmol/l (< 130 mg/dl)	>= 3.4 mmol/l (< 130 mg/dl)	-	Grundy, et al. Circulation 2019 (Table 9): https://www.ahajournals.org/doi/epub/10.1161/CIR.0000000000000625	CHUV
Triglycerides	Plasma	< 1.7 mmol/l (for mixed fasting and non-fasting measures)	>= 1.7mmol/l	-	Elkins Dyslipidemia J Pediatr Health Care 2019 https://www.sciencedirect.com/science/article/pii/S0891524518304085?via%3Dihub *	CHUV

Ferritin	Plasma	6-16y : 10-99 µg/l 16-18y (F) : 18-103 µg/l 16-18y (M) : 16-213 µg/l	outside those ranges	-	Mattiello, et al. Eur J Ped 2020 (Table 3): https://link.springer.com/article/10.1007/s00431-020-03597-5/tables/4	CHUV
25 (OH) Vitamin D	Serum	25- 125 nmol/l	< 25 nmol/l : deficit > 250 nmol/l : excess	-	L'Allemand, et al. Paediatrica 2012 : https://www.paediatrieschweiz.ch/empfehlungen-des-bundesamtes-fur-gesundheit-zur-vitamin-d-versorgung-in-der-schweiz-was-bedeuten-sie-fur-den-padiater/	CHUV
Total calcium	Plasma	2.15 – 2.55 mmol/l	Outside this range	-	CHUV reference intervals for clinical chemistry analysis (LCC RE 33 025 - v2022)	CHUV
Folic acid (vitamin B9)	Serum	5.89 - 27.63 nmol/l	outside this range	-	CDC Folate/Vitamin B12 in Serum and Whole Blood – NHANES 2001-2002 (point 12) (conversion factor to nmol/L: *2.265) https://www.cdc.gov/nchs/data/nhanes/nhanes_01_02/l06_b_met_folate_b12.pdf	SNHf
Vitamin B12	Serum	150-790 pmol/l	outside this range	-	Schüpbach, et al. Eur J Nutr 2017 (Table 2 and 3): https://link.springer.com/article/10.1007/s00394-015-1079-7	SNHf
β-Carotene	Serum	600-4700 nmol/l	outside this range	-	Schüpbach, et al. Eur J Nutr 2017 (Table 2 and 3): https://link.springer.com/article/10.1007/s00394-015-1079-7	SNHf

* Triglycerides above 1.1. mmol/l (fasting) can be considered as elevated, although there is no consensus, and no recommendation for population-wide screening. To avoid unnecessary concern for parents, we used a threshold of 1.7 mmol/l. Of note, genetic dyslipidaemia is typically indicated by levels exceeding 5 mmol/l.

15.2 Weighted results of biosamples

Table 15.2 shows the weighted mean and standard deviation for blood biomarkers, overall, stratified by age group, sex and linguistic regions.

Table 15.2 Weighted mean and standard deviation for blood biomarkers, overall, by age group, sex and linguistic region

Measurement	Total Mean (SD)	6-9 years			10-13 years			14-17 years			Females	Males	DE	FR	IT
		Females	Males	Total	Females	Males	Total	Females	Males	Total					
HbA1c (%)	5.32 (0.28)	5.31 (0.30)	5.31 (0.28)	**5.31 (0.28)**	5.29 (0.30)	5.33 (0.31)	**5.31 (0.30)**	5.34 (0.29)	5.32 (0.30)	**5.33 (0.29)**	5.31 (0.28)	5.32 (0.28)	5.36 (0.26)	5.13 (0.30)	5.20 (0.34)
Haematocrit (L/L)	0.39 (0.04)	0.37 (0.03)	0.38 (0.03)	**0.37 (0.03)**	0.39 (0.03)	0.39 (0.03)	**0.39 (0.03)**	0.40 (0.03)	0.43 (0.04)	**0.42 (0.04)**	0.39 (0.03)	0.40 (0.04)	0.39 (0.04)	0.40 (0.4)	0.40 (0.05)
Haemoglobin (g/L)	134 (12.80)	127 (8.99)	131 (11.17)	**129 (10.15)**	133 (11.24)	134 (11.28)	**133 (11.02)**	133 (11.78)	148 (15.38)	**141 (14.96)**	132 (12.80)	137 (14.18)	134 (12.56)	136 (13.91)	133 (16.75)
Total Cholesterol (mmol/L)	4.03 (0.76)	4.14 (0.77)	4.03 (0.84)	**4.08 (0.79)**	3.98 (0.79)	4.04 (0.76)	**4.01 (0.75)**	4.24 (0.83)	3.73 (0.75)	**3.99 (0.82)**	4.12 (0.77)	3.95 (0.77)	3.99 (0.73)	4.24 (0.75)	4.06 (0.75)
HDL Cholesterol (mmol/L)	1.47 (0.32)	1.43 (0.34)	1.51 (0.38)	**1.47 (0.36)**	1.47 (0.30)	1.51 (0.34)	**1.49 (0.31)**	1.52 (0.30)	1.38 (0.30)	**1.45 (0.30)**	1.47 (0.30)	1.47 (0.34)	1.47 (0.32)	1.49 (0.31)	1.51 (0.32)
LDL Cholesterol (mmol/L)	2.13 (0.68)	2.30 (0.67)	2.10 (0.72)	**2.19 (0.69)**	2.06 (0.69)	2.13 (0.67)	**2.09 (0.66)**	2.30 (0.77)	1.91 (0.72)	**2.11 (0.76)**	2.22 (0.69)	2.05 (0.68)	2.09 (0.66)	2.35 (0.84)	2.06 (0.64)
Triglycerides (mmol/L)	0.93 (0.50)	0.91 (0.45)	0.92 (0.49)	**0.91 (0.46)**	0.99 (0.60)	0.89 (0.61)	**0.94 (0.59)**	0.94 (0.47)	0.95 (0.56)	**0.94 (0.50)**	0.95 (0.49)	0.92 (0.53)	0.94 (0.52)	0.86 (0.64)	1.07 (0.64)
Ferritin (µg/L)	45.42 (27.89)	47.40 (29.56)	45.17 (26.76)	46.20 (27.35)	43.00 (27.03)	45.67 (25.87)	44.36 (25.78)	36.99 (29.65)	54.87 (34.94)	45.73 (32.86)	42.54 (28.04)	48.14 (28.31)	43.78 (25.95)	51.90 (34.74)	50.48 (39.31)

Total calcium (mmol/L)	**2.39 (0.16)**	2.40 (0.12)	2.41 (0.27)	**2.40 (0.21)**	2.37 (0.09)	2.38 (0.18)	**2.38 (0.14)**	2.39 (0.15)	2.41 (0.09)	**2.40 (0.12)**	2.39 (0.12)	2.40 (0.19)	2.39 (0.16)	2.40 (0.13)	2.41 (0.17)
Vitamin D (mmol/L)	**62.09 (28.88)**	63.39 (22.07)	71.82 (45.43)	**67.93 (35.79)**	55.78 (22.78)	65.43 (27.33)	**60.71 (25.00)**	53.50 (24.76)	60.61 (27.43)	**56.98 (25.69)**	57.57 (22.68)	66.36 (34.01)	60.99 (29.86)	66.94 (27.55)	63.83 (23.01)
Vitamin B9 (nmol/L)	**21.81 (14.01)**	27.78 (18.56)	24.04 (12.98)	**25.77 (15.49)**	22.76 (14.83)	22.75 (14.86)	**22.76 (14.43)**	17.18 (11.53)	15.13 (10.12)	**16.18 (10.66)**	22.64 (15.36)	21.03 (13.08)	22.22 (14.29)	21.55 (14.69)	16.09 (8.49)
Vitamin B12 (pmol/L)	**341.35 (171.13)**	369.50 (191.70)	392.75 (186.76)	**382.02 (183.83)**	335.67 (167.19)	314.36 (134.64)	**324.78 (147.84)**	308.54 (172.51)	319.36 (211.19)	**313.83 (187.57)**	338.20 (171.90)	344.33 (175.89)	343.94 (172.39)	330.21 (169.48)	336.00 (207.13)
CRP (mg/L)	**1.01 (1.67)**	0.97 (1.25)	1.48 (3.26)	**1.25 (2.50)**	0.89 (1.10)	0.75 (0.43)	**0.82 (0.81)**	0.90 (1.13)	1.01 (1.58)	**0.96 (1.33)**	0.92 (1.13)	1.09 (2.10)	0.99 (1.51)	1.14 (2.59)	0.88 (0.85)
β -carotene (nmol/L)	**2 658.86 (963.72)**	2 842.80 (898.89)	2 950.85 (1 148.48)	**2 900.95 (1 016.34)**	2 655.25 (1 111.75)	2 651.46 (869.01)	**2 653.31 (964.23)**	2 492.25 (930.10)	2 278.24 (922.35)	**2 387.60 (909.62)**	2 665.24 (962.96)	2 652.83 (996.78)	2 629.51 (971.44)	2 810.19 (930.03)	2 636.82 (1 193.50)

The following matrices were used for the analysis: Whole blood for HbA1c, haematocrit, haemoglobin, plasma for total cholesterol, HDL-cholesterol, triglycerides, total calcium and ferritin, serum for vitamin D, vitamin B9, vitamin B12 and β-carotene.

15.3 Overview laboratory measurements and coefficients of variation

Table 15.3 and Table 15.4 show the laboratory measures that were conducted in each study centre and corresponding coefficients of variation.

Table 15.3 Laboratory measurements and coefficients of variation (CV) for the study centres VD, ZH, LU

Biomarker	VD			ZH			LU		
	Method	Control level	Inter-assay analytical CV	Method	Control level	Inter-assay analytical CV	Method	Control level	Inter-assay analytical CV
HbA1c	HPLC on cation exchange. (CV for 5.15% - 10.20% range)	n.c	1.38 - 2.0	Immunoturbidimetry (Cobas C503)	n.c	1-1.5	Immunoturbidimetry (Cobas C503)	0.5-0.6	1.1-2.2
Haemoglobin	n.c	n.c	n.c	n.c	not measured in routine	1-1.5	Photometric (SLS-haemoglobin-method)	not measured in routine	n.c
Haematocrit	n.c	n.c	n.c	n.c	not measured in routine	1-2	Impedance (sheath current DC detection method)	not measured in routine	0.9-1.5
Total plasma calcium	NM-BAPTA colorimetric method	1.47 mmol/L	1.43						
		3.36 mmol/L	1.39						
Cholesterol (total)	Enzyme colorimetric method	2.73 mmol/L	1.8						
		6.8 mmol/L	1						
HDL-Cholesterol	Enzyme colorimetric test in homogeneous phase	0.6 mmol/L	6						
		1.45 mmol/L	3.9						
(LDL-Cholesterol calculated)									
Triglycerides	Enzyme colorimetric test	1.02 mmol/L	2.27						

C-reactive Protein	Immunoturbidimetric test on latex particles	2.2 mmol/L	1.62				
		1.05 mg/L	9.18				
		4.69 mmol/L	3				
		162.9 mg/L	5.74				
Ferritin	Immunoturbidimetric test on latex particles	61.3 µg/L	3.2				
		554.5 µg/L	2.82				
Urinary creatinine	Jaffé	6672 umol/L	1.99				
		12154 umol/L	2.05				
Vitamin B9	Microbiology; AOAC 2004.05; J. of AOAC Int., Vol 88, N°1,2005 (trienzyme)	4.68%	5.79				
	Microbiology; AOAC 952.20; SBF 1549.1	5.38%	8				
B-carotene	UV-spectrophotometry	2.13%	2.45				
Leucocytes	n.c	n.c	n.c	n.c	2-3	LC + NRBC: flow cytometry	3.3-7.7
Erythrocytes	n.c	n.c	n.c	n.c	1-1.5	EC + TC + HCT + MPV + RDW: Impedance	0.6-09
MCV	n.c	n.c	n.c	n.c	1	EC + TC + HCT + MPV + RDW: Impedance	n.c
Thrombocytes	n.c	n.c	n.c	n.c	2-5	EC + TC + HCT + MPV + RDW: Impedance	1.5-3.2
CBC*	Semiconductor laser flow cytometry	n.c	n.c	Fluorescence flow cytometry (Sysmex XN 1000)	n.c	EC + TC + HCT + MPV + RDW: Impedance - Sysmex XN-4	n.c

** The number of parameters measured in the blood formula varied between centres; only haemoglobin and haematocrit were measured everywhere. n.c: not communicated, HPLC: High-Performance Liquid Chromatography, NM-BAPTA: Chromophore5-nitro-5'-methyl-(1,2-bis(o-aminophenoxy) ethan-N, N, N', N'-tetraacetic acid, AOAC: Association of Official Analytical Chemists, EC: Erythrocytes Concentrates, TC: Total Count, HCT: Haematocrit, SLS: Sodium Lauryl Sulfate*

Table 15.4 Laboratory measurements and coefficients of variation (CV) for the study centres BE, TI, SG

Biomarker	BE			TI			SG		
	Method	Control level	Inter-assay analytical CV	Method	Control level	Inter-assay analytical CV	Method	Control level	Inter-assay analytical CV
HbA1c	Immunoturbidimetry (Cobas C502) Hemolysate	1.0-1.4	1.6-2.3	Immunoturbidimetry (Cobas C503) hemolysate	0.8-1.5	1.32 - 2.05	Cobas C	not measured in routine	0.9 – 1.7
Haemoglobin	hydrodynamic focusing impedance	not measured in routine	1-1.5	laser diffraction (ADVIA 2120i SIEMENS)	not measured in routine	n.c	Sysmed XN 1000	not measured in routine	0.4 – 1.1
Haematocrit	Cumulative pulse height measurement	not measured in routine	1-2	Calculated upon measurement of MCV by laser diffraction	not measured in routine	n.c	Sysmed XN 1000	not measured in routine	0.7 – 1.3
Total plasma calcium									
Cholesterol (total)									
HDL-Cholesterol									
(LDL-Cholesterol calculated)									
Triglycerides									
C-reactive Protein (CRP)									
Ferritin									
Urinary creatinine									
Vitamin B9									
β -carotene									

Leucocytes	flow fluorocytometry (WBC and NRBC)	n.c	n.c	n.c	n.c	n.c	Sysmed XN 1000	not measured in routine	0.9 – 2.5
Erythrocytes	hydrodynamic focusing impedancemetry (RBC and PLT), cyanide-free SLS haemoglobin measurement	n.c	n.c	n.c	n.c	n.c	Sysmed XN 1000	not measured in routine	0.5 – 0.9
MCV	n.c	n.c	n.c	n.c	n.c	n.c	Sysmed XN 1000	not measured in routine	0.4 – 0.9
Thrombocytes	n.c	n.c	n.c	n.c	n.c	n.c	Sysmed XN 1000	not measured in routine	2.1 – 5.8
CBC*	Complete blood count (CBC) analysis on Sysmex XR-Series and XN-Series haematology analysers consists of cytochemical reaction of cells with specific proprietary reagents, followed by analysis by flow fluorocytometry (WBC and NRBC), hydrodynamic focusing impedancemetry (RBC and PLT), cumulative pulse height measurement of haematocrit and cyanide-free SLS haemoglobin measurement.	n.c	n.c	n.c	n.c	<1	n.c	n.c	n.c
BE CBC*	Complete blood count (CBC) analysis on Sysmex XR-Series and XN-Series haematology analysers consists of cytochemical reaction of cells with specific proprietary reagents, followed by analysis by flow fluorocytometry (WBC and NRBC), hydrodynamic focusing impedancemetry (RBC and PLT), cumulative pulse height measurement of haematocrit and cyanide-free SLS haemoglobin measurement.								

** The number of parameters measured in the blood formula varied between centres; only haemoglobin and haematocrit were measured everywhere. n.c = not communicated*