Funded by the Horizon 2020 Framework Programme of the European Union

EC Framework Programme for Research and Innovation

Horizon 2020
H2020-SFS-2017-2-RIA-774548-STOP:
Science & Technology in childhood Obesity Policy

Science & Technology in childhood Obesity Policy

Start date of project: 1st June 2018 Duration: 48 months

D2.1: Data collection protocol and meeting report

Author(s): M. Ezzati (ICL), J. Breda (WHO)

Version: Draft 2

Preparation date: 23/05/19

Dissemination Level

PU	Public	☒
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

Funded by the Horizon 2020
Framework Programme
of the European Union
GA: 774548

Table of Contents

Abbreviation	Definition
WP	Work Package
BMI	Body Mass Index
yo	years old
DHS	Demographic and Health Surveys
HBSC	Health Behaviour in School-aged Children

1 NCD-RisC and COSI collaborators meeting: London, 14 March 2019

The NCD-RisC and COSI collaborators meeting occurred on the 14 March 2019 at Imperial College London. All STOP WP2 partners convened for the meeting together with NCD-RisC and COSI collaborators from various European countries, and they discussed various approaches to establishing a surveillance system on BMI among children under the age of five.

The topics covered included alternative data sources, including kindergarten- and population-based surveys, paediatrician and general practice data; their relative strengths and limitations; their availability in different countries; legal, administrative and other barriers to collating and accessing the data; and their comparability across countries. The group also talked about the requirements for developing a future surveillance system for obesity in children under age 5 in European countries.

Invited attendees were from Estonia, Netherlands, Romania, United Kingdom, Italy, Czech Republic, Finland, Portugal, Latvia, Austria, Germany, Croatia, Slovenia. The agenda of meeting is included in Annex 1, and attendees list in Annex 2.

2 Data for 5 to 19-year-old age group

Data inclusion and exclusion criteria were discussed[1]. And the value of school-based measurement and conscript data were emphasised. The inclusion and exclusion criteria for this age group are:

2.1 Data inclusion criteria

- Studies with data on height, weight, waist circumference, or hip circumference;
- Studies participants 5 years of age and older;
- Probabilistic sampling method for collecting data with a defined sampling frame;
- Population samples at the national, sub-national (i.e., covering one or more sub-national regions, more than three urban communities or more than five rural communities), or community level.

2.2 Data exclusion criteria

- Studies with self-reported weight and height;
- Studies that include or exclude people based on their health status or cardiovascular risk;
- Studies where participants are only ethnic minorities;
- Studies on specific educational, occupational, or socioeconomic subgroups;
- School-based data in countries, and in age-sex groups, with school enrolment of 70% or higher are included;
- Studies where participants are recruited through health facilities;
- Data whose sampling frame is health insurance schemes in countries where at least 80% of the population are insured, and data collected through general practice and primary care systems in high-income and central European countries with universal insurance are included;
- Women aged 15-19 years in DHS surveys which sampled only ever-married women or measured height and weight only among mothers (not applicable to STOP).

2.3 Discussion

There was extensive discussion of the trade-offs between coverage and response of a data source and its protocol, with the realisation that each type of data has its advantages and disadvantages: surveys have a standard protocol but increasingly suffer from issues around representativeness due to low response rates and typically are too small to allow some forms of subgroup analysis; routine school-based data have the advantage of covering all children and being large, but can be affected by non-standardisation. Both types of data are usable, and their differences and variations reflect the true uncertainty of our measurement.

There was a follow-up discussion on specific data sources. It was mentioned that in some countries HBSC data, which cover children aged 11-13 years in schools, are self-reported and hence excluded; in others, they are self-recorded based on measurement. There will need to be a systematic assessment of which meet these criteria.

COSI data that are in primary schools and based on measurements are already included in NCD-RisC databases.

Country specific discussions followed on general national school measurements and it is the case that in many countries these are done by local school districts and may be hard to collate. However, in specific countries, e.g., Estonia, such data may be accessible.

Also discussed was the use of data from paediatric services. It was however emphasised that unless these are collected as a part of routine monitoring that has the potential to measure every child, they would be subject to bias.

3 Data for Under 5-year-old group

There was a discussion of the age range of interest, with a general agreement that it would be ideal to cover the entire 0-5 age range to have a handle on when/what ages cross-country variations in weight gain begin.

There was extensive discussion of how a survey can recruit to be representative given variations in kindergarten enrolment and how and where routine growth monitoring data can be accessible. It was acknowledged that the two sources may cover different age ranges. A discussion followed on what countries may allow collecting data using multiple platforms for understanding how they vary.

A draft data collection protocol for children under 5 years old can be found in Annex 3.

4 References

1. NCD Risk Factor Collaboration (NCD-RisC). Worldwide trends in body-mass index, underweight, overweight, and obesity from 1975 to 2016: a pooled analysis of 2416 population-based measurement studies in 128· 9 million children, adolescents, and adults. The Lancet. 2017 Dec 16;390(10113):2627-42.

Funded by the Horizon 2020
Framework Programme
of the European Union
GA: 774548

Annex 1: Agenda

STOP WP2: NCD-RisC and COSI collaborators meeting

14 March 2019

Location: Imperial College Business School, Exhibition Road, London SW7 2AZ, Room 19A Lower Ground Floor (imperial.ac.uk/business-school/about-us/location/)

Contact: Cristina Romano, STOP project Manager (c.romano@imperial.ac.uk)

Agenda:

10:00	Welcome
10:05	Overview of the STOP project: Franco Sassi, PI
10:15	Overview of population estimation data and methods: Majid Ezzati, WP2 Leader
10:45	Discussion of data on school-age children and adolescents – Chair: Majid Ezzati
	1. Administrative data
	2. COSI data and other surveys
11:45	Availability of information on socio-economic status
12:45	Sandwich Lunch
13:30	Discussion of data on children under age 5 – Chair: Joao Breda
	1. Administrative data (e.g. from paediatrics and general practice)
	2. Survey data, including new COSI
15:30	Action plan, timescale and deliverables;
16:00	End of Meeting

Annex 2: Attendees

Country	Name	Surname	Organisation
Estonia	Anu	Aaspõllu	National Institute for Health Development
Netherlands	Jolanda	Boer	National Institute for Public Health and the Environment
Switzerland	João	Breda	World Health Organisation
Romania	Adela	Chirita Emandi	UMFTimisoara
United Kingdom	Ramyia	Elangovan	University of Surrey
United Kingdom	Majid	Ezzati	Imperial College London
Italy	Simona	Giampaoli	Istituto Superiore di Sanità, Rome, Italy
United Kingdom	Uy	Hoang	RCGP RSC, University of Surrey
Romania	Constanta	Huidumac-Petrescu	National Institute of Public Health
Czech Republic	Marie	Kunesova	Institute of Endocrinology Obesity Unit
Finland	Päivi	Mäki	THL
United Kingdom	Angela	Mensah	Royal College of Paediatrics and Child Health
Portugal	Cristina	Padez	University of Coimbra - Portugal
Latvia	Iveta	Pudule	Centre for Disease Prevention and Control
Austria	Susanne	Ring-Dimitriou	University of Salzburg, European Childhood Obesity Group
Portugal	Ana	Rito	National Institute of Health Dr Ricardo Jorge
United Kingdom	Franco	Sassi	Imperial College London
Germany	Anja	Schienkiewitz	Robert Koch-Institut
Croatia	Maroje	Soric	Faculty of Kinesiology, Zagreb, Croatia
Italy	Angela	Spinelli	Istituto Superiore di Sanità - National Institute of Health
Slovenia	Gregor	Starc	University of Ljubljana

Annex 3: Draft Data Collection Protocol for Children Under 5 Years Old

European Childhood Obesity Surveillance Initiative under 5 years old

COSI U5

PROTOCOL

Table of Contents

Introduction

Childhood obesity remains an important public health problem in the WHO European Region. It seems to have plateaued in Europe in recent years, albeit at high levels (1,2,3). Childhood obesity causes a wide range of serious health and social consequences and increases the likelihood of morbidity in adults such as dyslipidaemia, hyperinsulaemia, hypertension and early atherosclerosis, as well as mortality in adulthood (4,5). The health consequences of overweight for children during childhood are less clear, but a systematic review shows that childhood obesity is strongly associated with risk factors for cardiovascular disease and diabetes, orthopaedic problems and mental disorders (6). Obese infants and young children will likely continue to be obese during childhood, adolescence and adulthood (2).

It is recognized that prevention is the only feasible option for curbing the epidemic, since current treatment practices largely aim at bringing the problem under control rather than effecting a cure (7). In addition, making intercountry comparisons is difficult owing to a lack of standardization of obesity measurement tools at the international level or of standardized calculation and presentation of the data. At the first consultation with Member States (Copenhagen, October 2005) in the process leading to the WHO European Ministerial Conference on Counteracting Obesity (Istanbul, 15–17 November 2006), the need was recognized for standardized and European-wide harmonized surveillance systems on which policy development within the WHO European Region could be based. As a follow-up to this recommendation, the nutrition, obesity and physical activity programme of the WHO Regional Office for Europe established a European childhood obesity surveillance system in some countries in the Region.

The childhood obesity surveillance system is an ongoing, systematic process of collection, analysis, interpretation and dissemination of descriptive information for monitoring excess body weight being identified as a serious public health problem in the WHO European Region (8) allowing intercountry comparisons. This system targets primary school children aged 6.0–9.9 years at the national level. Although data can be extrapolated from research projects, it is routine surveillance data that provide the most robust information for an understanding of the problem (9). A first data collection round took place during the school year 2007/2008, a second round was carried out during the school year 2009/2010, followed by a third round

during the school year 2012/2013, which was followed by the next, fourth round in the school year 2015/2016. The fifth round is in place during the school year 2018/2019.

Childhood Obesity Surveillance Initiative System Under 5 (COSI U5)

For school-aged children, COSI created a well-established networks and logistics that could be adapted and implemented among other age groups. In fact, there is limited high quality data available on overweight and obesity in children under five years of age in Europe. This information is necessary for countries to adequately design, implement and evaluate policies and strategies related to maternal nutrition, early childhood feeding, physical activity and to monitor determinants of overweight and obesity throughout the life course.
Additionally, a number of COSI partner countries have expressed their interest in expanding COSI to include measurement of children under five years of age using the COSI approach and protocols. A comprehensive and detailed assessment of the magnitude of this public health problem is imperative to stimulate an adequate political response.
Therefore, the COSI U5 aims to collect comparable, valid and reliable data on overweight and obesity among children under 5 years of age in 6 countries in Europe.

However, as COSI collects data through the school system, a modified approach needs to be identified and pilot tested. The proposal for the implementation of this system includes approaching public and private kindergartens/preschools of the capital cities of Bulgaria, Czech Republic, Slovenia, Italy, Latvia and Portugal, by establishing a joint agreement between these cities and WHO.

Each country is responsible for its capital city national representative data collection, to be funded from local resources, and for identifying an institute to be responsible for overall national coordination. WHO is responsible for the development of the protocols, international coordination of the surveillance initiative, data analysis at European level and facilitation of investigators meetings. Each participating country signs a collaboration arrangement with WHO, declaring that a copy of the cleaned data file will be sent to the Regional Office together with a detailed report of the data cleaning procedures. Data are analysed both at country level by the national coordinating team and at European level (common cross-country analyses) by the Surveillance Initiative Investigators Team.

In this context, it is important to stress that surveillance is not equivalent to screening. Screening means applying a test to a defined group of people in order to identify an early or preliminary stage, a risk factor or a combination of risk factors of a disease. The people found are then treated. The object of a screening service is to identify a certain disease or risk factor for a disease before the affected person seeks treatment, in order to cure the disease or prevent or delay its progression or onset by early intervention (9-11).

Although each country is free to develop a system that fits its local circumstances, it is imperative that data are collected according to an agreed common protocol and that they contain the stipulated core items. The system is designed to be as simple as possible and should not demand a major investment of public resources.

For the data collection, the core objective is to measure, in a new cross-sectional sample of preschool children:

- body weight, body height, body mass index (BMI);
- prevalence of underweight, normal weight, overweight, obesity, median BMI and mean BMI.

Countries have the choice to collect details on the family environmental characteristics.

This protocol is to be used for the pilot round of COSI U5 data collection, planned for the school year 2019/2020.
The main documents consulted in the preparation of this protocol were the COSI manual regarding the data collection procedures 2018-2019 and the COSI protocol 2016 (12, 13).

Table 1 summarizes the core and optional items for each of the sections set out in this protocol. The core items are mandatory and need to be followed by the participating countries. The optional items are voluntary and additional to the core items.

Table 1. Core and optional items set out in the protocol

Section	Core (mandatory) items	Optional (voluntary) items
Study design	Semi-longitudinal design with repeated cross-sectional samples	Prospective cohort design with repeated rounds run every three years
Site and setting	Preschools Sentinel site approach, or new sample of schools at each round	 All pre-schools in the country
Study population and subjects	One or more of the following age groups: 2.0–2.9, 3.0–3.9, 4.0–4.9 or 5.0–5.9 years	Other age groups
Sampling design	Capital city National representative sample Cluster sampling of schools or classes	— —
Final effective sample size	Per age group: ≈2800 children	All children in the respective age group in a country
Data collection form	Child record form (examination) School record form (self-report)	Family record form (self-report)

Section	Core (mandatory) items	Optional (voluntary) items
Variables	Children's characteristics: child's id, date of birth or age, sex, geography of residence, date and time indication of measurement, child's consent for measurement body weight, body height, clothes worn when measured	Children's characteristics: Child's name, child's age in months, child's place of residence, child's postal code, population size, child's region/municipality, exact time of measurement, child's reasons for declined measurements, second height measure, body height average, , associated co-morbidities, dietary intake patterns, physical activity/ inactivity patterns, family's socioeconomic characteristics

	School characteristics: school's id, respondent's function at school, number and grade of classes sampled, number of registered/absent/measured children per age, refusals. School nutrition and physical activity environmental characteristics: existence of outdoor playground areas, existence of indoor gym, mandatory PE lessons, minutes of PE lessons per class, nutrition education in curriculum, initiatives/projects promoting healthy lifestyle, availability of food and beverage items at school, school canteen, school meals offer, meals planner	School characteristics: school name, school postal code, school geographical area. Detailed school nutrition and physical activity environmental characteristics: active play in extreme weather conditions, outdoor playground area use and indoor gym use outside school hours, sport or physical activities organized by school outside school hours, children attending sport activities, availability of bus transport, safety of walking, bicycling
Translation	Translation of original English data collection forms into local language and back-translated into English	—
Administration	Examiners administer the child's record form and take anthropometric measurements according to protocol	—
Measurement instruments	Same instruments across each country in accordance with the requirements	—
Calibration	Calibrated anthropometric instruments	—
Training-standardization	All examiners trained and standardized	—
Time period	Same time period across each country; data collection within 4–10 weeks	—
Data entry	Data entered by countries themselves or in the online Open Clinica database.	
Data management	Data quality procedures Data processing at national coordinating centre Data file with report on cleaning procedures sent to Regional Office (not applicable for countries who enter in the Open Clinica database)	— — —
Ethical considerations	In accordance with international ethical guidelines Informed consent for measurements and data treatment (if required)	—

Schedule

The estimated total time-frame for a data collection round during one school year targeting one age group is approximately one school year (Table 2). This is only an indication and may need to be adjusted to local circumstances, seasonal considerations and countries' ability to provide staff for the surveillance initiative.

Table 2. Schedule for a data collection round

Activity	Month					
	1	2	3	4	5	6
Establish the Country Coordination Team	X					
Select the sample frame	X					
Make agreements with the sampled schools	X	X				
Obtain ethical approval	X	X				
Print and translate form(s) and instructions for their administration	X					
Organize an information event for teachers (and parents) of the selected classes	X					
Approach the parents of the pupils in the selected classes	X	X				
Obtain informed consent from parents	X	X				
Purchase anthropometric instruments	X					
Schedule data collection in the schools	X	X				
Recruit examiners, data clerks and data managers	X					
Train examiners in administering the form, taking anthropometric measurements and calibrating instruments		X				
Train data entry clerks and data manager on data management		X				
Data collection: mandatory items			X	X		
Data collection: optional items			X	X		
Data entry, cleaning and validation			X	X	X	
Produce detailed report on data cleaning procedures					X	
If data is not entered online in the OpenClinica and/or LimeSurvey databases, send final cleaned data file along with the report on data cleaning procedures to the Regional Office					X	
Conduct national data analyses					X	X
Produce country report						X

3. Study design and sample

3.1 Study design

A semi-longitudinal design is applied, meaning that at each data collection round, which will be repeated at defined intervals, a new cross-sectional sample of children of the same age group is selected. In addition, countries may opt for a prospective cohort design, in which the initial sample of children is followed up for one round.

3.2 Site and setting

The surveillance system targets preschool-age children. Once a capital city national representative sample of public and private kindergartens/preschools is selected at the introduction of the system, the same schools may remain the nationwide sentinel sites for the system. (For Marta´s revision)

3.3 Study population and subjects

Measurements are performed in preschool children. Countries have the flexibility to collect data across age groups and thus the option of selecting one or more of the following age groups: 2.0–2.9, 3.0–3.9, 4.0–4.9 or 5.0–5.9 years. At these ages, identification of obesity is valuable for predicting the condition in adulthood (14). It is further suggested that targeting prevention efforts at children before the onset of puberty is important in reducing the incidence of obesity and promoting remission (15).

3.4 Sampling design

Given the differences among countries in school systems, age of starting school, number of children held back and levels of advancement of pupils, it is difficult to propose a uniform approach to sampling that is equally applicable. It is therefore suggested that age should be the first priority for sampling procedures (16). According to the first consultation in 2007 with the participating countries, the majority of the children of a specific age group (e.g. 6.0–6.9 years) correspond to one school grade. If all children of the specifically targeted age group are in the same grade, then the sample can be drawn within a grade level. If the specifically targeted age

group is spread across grades, however, all grades where children from this age group are present should be sampled.

Cluster sampling is employed, whereby the cluster or primary sampling unit is the primary school or the class. In the case of the first option: (a) a simple random sample of primary schools (public, private and special) is taken with probability proportional to size; and (b) in each school sampled, one class for each of the targeted age group(s) is randomly selected. If less than 1% of the target children are enrolled in private or special schools, countries have the choice of excluding these schools from the sampling frame. In the case of the second option, a simple random sample of primary school classes is taken.

Stratification may be applied if there are differences in BMI across strata.

If appropriate, sampling with replacement may be considered for reducing bias of non-response, which should be kept as low as possible.

Countries may also opt for the inclusion of all children of interest in the respective age group in a country. This may require, however, more logistical arrangements with respect to, for example, the collection of data on the school nutrition and physical activity environment.

3.5 Sample size

Rudolf et al. suggested using the standard deviation scores or Z-scores of the mean BMI to demonstrate whether a halt in the rise in obesity is achieved (17). The selected sample size of ≈2300 children per age group is based on an 80% power to detect a minimum difference of 0.10 Z-score in mean BMI per year at a two-sided 5% significance level.

A disadvantage of cluster sampling is that the overall estimate is less precise than that based on a simple random sampling of the same total size of the whole population. To achieve the same precision as a simple random sample requires a larger total sample size to take into account this design effect (18, 19). Referring to the calculation above, and taking a design effect of 1.2 based on analyses done by HBSC (16), one needs to have a final effective sample size of ≈2800 children (≈1400 boys and ≈1400 girls).
Countries should consider their expected consent rates in determining the necessary oversampling. For example, an estimated proportion of 0.9 of subjects giving consent requires

the enrolment of ≈3100 children initially to achieve the minimum target sample size of ≈2800 children; whereas an estimated response rate of 80% requires the enrolment of ≈3500 initially.

Assuming an average of ≈25 pupils per class, ≈124/140 classes would be required to achieve the final recommended sample size of ≈2800 pupils per targeted age group. Extra classes are required if there are fewer than 25 pupils or when there are lower attendance rates than expected.

4. Data collection

4.1 Data collection forms

Three data collection forms have been prepared: a mandatory child record form, a mandatory school record form and a voluntary family record form. They include mostly closed questions with pre-coded answers (if applicable) and are kept as short as possible to improve responsiveness and sample retention. Both forms are accompanied by detailed instructions and include mandatory questions, which are only numerical (e.g. (1), (2). etc.), and voluntary questions, that country can decide to use or not, which have a letter next to the questions' number, such as (1a), (2a), etc.

4.1.1 MANDATORY CHILD'S RECORD FORM

The following variables are mandatory and are collected through the child's record form: child's ID code, date of birth (or age), sex, geography of residence, date of measurement, time indication, clothes worn when measured, body weight and body height. The child's permission is obtained before the measurements are taken.

Body weight and body height are easy to measure, but the anthropometric indices derived from these measures are often considered more useful than the measures alone (20). BMI is a measure of weight for height that is a well-recognized tool in determining whether a child may be underweight, normal weight, at risk for overweight, overweight or obese. When body weight and body height are measured by a trained person, BMI is more accurate than when self-reported or reported by parents, since people tend to under-report their own body weight (especially the obese) and to over-report body height (21, 22).

Examiners are recommended not to calculate BMI at the point of measurement because it requires time and special instruments.

Country			Year		School				Gr	Cl	Child's code	

Project Logos	CHILD RECORD FORM European Childhood Obesity Surveillance Initiative under 5 COSI U5	COUNTRY NAME/LOGO

IDENTIFICATION, CHILD

(1a) **What is your name**?

First name _____ Surname _____

(2) **Child's sex**

☐ Boy
☐ Girl

(3) **Child's date of birth**

Day / Month / Year

☐☐/☐☐/☐☐☐☐ OR **Child´s age in months** ☐☐☐•☐

(4) **Categorize the child's place of residence according to the country's urbanization grade**

☐ Urban
☐ Semi-urban
☐ Rural

(4a) **Child's place of residence** _____

(4b) **Child's postal code** _____

(4c) **Population size**_____

(4d) **Child region/municipality**_____

~~(5) **Did you have breakfast this morning?**~~

~~☐ Yes~~
~~☐ Yes, but just a beverage (eg milk, tea or juice)~~
~~☐ No~~

Country			Year		School				Gr	Cl	Child's code	

Project Logos	CHILD'S RECORD FORM European Childhood Obesity Surveillance Initiative under 5 COSI U5	COUNTRY NAME/LOGO

ANTHROPOMETRIC EXAMINATION

(6) **Date of measurement** Day /Month / Year

☐☐/☐☐/☐☐☐☐

(7) **Time of measurement** (7a) **Hour / Minute**

☐ Before lunch ☐☐/☐☐

☐ After lunch

(8) **Now I would like to weigh you, measure your height and take your waist and hip circumferences. I will explain to you how I am going to do this. May I take these measurements**?

☐ Yes, child agrees to be measured (take the measurements and continue with question 9)

☐ No, child does not agree to be measured (complete question 8a, enter your (14) code and sign the form)

(8a) **Can you tell me why you don't want to be measured**?

☐ Child is not feeling well or is in pain

☐ Child is anxious/nervous

☐ Child has a physical disability

☐ Other reason (please specify) _____

(9) **Body weight** kg ☐☐☐•☐

(10) **Body height** cm ☐☐☐•☐ (10a) **Second height measure** cm ☐☐☐•☐

Country			Year		School				Gr	Cl	Child's code	

Project Logos	CHILD'S RECORD FORM European Childhood Obesity Surveillance Initiative under 5 COSI U5	COUNTRY NAME/LOGO

(13) Describe the clothes the child is wearing when measured (select one option only).

(Please remember to take off any kind of shoes, socks or stockings as well as any other ~~heavy~~ objects ~~(phone, wallet, belt, etc.)~~

- ☐ Underwear only or with dry/clean dippers
- ☐ Gym clothes (e.g. shorts and t-shirt only)
- ☐ Light clothing (e.g. t-shirt, cotton trousers or skirt)
- ☐ Heavy clothing (e.g. sweater and jeans)
- ☐ Other clothing (please specify) _____

(14) Examiner's code ☐☐☐☐

Signature.....

OBSERVATIONS BY EXAMINER

4.1.1.1 Administration of child's record form

Taking the local arrangements, circumstances and budget into account, countries choose the most appropriate persons to collect the core data from the children:

- school nurses, physicians or paediatricians linked to the school health system;
- other suitable school personnel during various school functions, such as physical education teachers during physical education lessons or health professionals as part of a comprehensive health screening routine for all schoolchildren; or
- a small number of centrally based travelling examiners.

Implementation of the surveillance initiative in the preschools takes place in close collaboration with teachers and other school personnel. The basic principles of confidentiality, privacy and objectivity must be ensured throughout the process. Measurements are carried out in a private room in the school. Children should not be routinely informed of their body weight and body height, as this would then, in effect, become a screening programme (23).

The measurements may be carried out within the context of a whole-school approach to promoting health and well-being. This should ensure that it is not received as an isolated and intrusive event but be experienced by the children as supporting their health.

It is envisaged that the administration of the child's record form and measurement of body weight and body height for a class of 10 pupils lasts for approximately 2–3 hours.

In Appendix 1 a more detailed guidance for completing the child's record form is presented.

4.1.2. MANDATORY SCHOOL RECORD FORM

The school record form is completed by the school principal (headmaster or headmistress), or the teachers of the sampled classes or by another person who can document and report the location of the school, the number of children registered and measured per sampled class, those who refused to be measured and those who were absent on the measuring day.

A few school (environmental) characteristics are included such as the frequency of physical education lessons, the availability of playgrounds, access to a number of listed food items and beverages on the school premises, current initiatives to promote a healthy lifestyle (healthy eating, physical activity) and meals offer and planners. The voluntary questions are given a number followed by a letter (e.g. 1a, 2a)

Country			Year		School code			

Project Logos	SCHOOL RECORD FORM European Childhood Obesity Surveillance Initiative under 5 COSI U5	COUNTRY LOGO/NAME

IDENTIFICATION

(1a) **School name** ....

(2a) **Postal code**...

(3a) **City/ town/ suburban area/ village**...

(4) **What is your function at the school?**

☐ Headmaster/Headmistress/Principal
☐ Teacher
☐ Other (*Please specify*)...

INFORMATION ON PARTICIPATING CLASSES

(5a) **What is the number of classes per age group/grade selected in your school to participate?**

2 years old ☐☐ 3 years old ☐☐ 4 years old ☐☐ 5 years old ☐☐

(5) **For each participating age group, please complete the columns below:** ***(Please complete this question together with the examiner)***

Class code	~~Grade/level of class~~ Age group/Grade	No. of pupils registered	No. of pupils examined	No. of pupils absent	No. of pupils who themselves declined to be examined	No. of pupils whose parents who did not give consent
☐	☐☐	☐☐ Girls ☐☐ Boys	☐☐ Girls ☐☐ Boys	☐☐ Girls ☐☐ Boys	☐☐ Girls ☐☐ Boys	☐☐ Girls ☐☐ Boys
☐	☐☐	☐☐ Girls ☐☐ Boys	☐☐ Girls ☐☐ Boys	☐☐ Girls ☐☐ Boys	☐☐ Girls ☐☐ Boys	☐☐ Girls ☐☐ Boys
☐	☐☐	☐☐ Girls ☐☐ Boys	☐☐ Girls ☐☐ Boys	☐☐ Girls ☐☐ Boys	☐☐ Girls ☐☐ Boys	☐☐ Girls ☐☐ Boys
☐	☐☐	☐☐ Girls ☐☐ Boys	☐☐ Girls ☐☐ Boys	☐☐ Girls ☐☐ Boys	☐☐ Girls ☐☐ Boys	☐☐ Girls ☐☐ Boys

Country			Year		School code			

Project Logos	**SCHOOL RECORD FORM** **European Childhood Obesity Surveillance Initiative under 5** **COSI U5**	**COUNTRY LOGO/NAME**

INFORMATION ON THE SCHOOL ENVIRONMENT

(6) **Does your school have outdoor playground area(s)?**

☐ Yes
☐ No

(7) **Does your school have an indoor gym?**

☐ Yes
☐ No

(8) **Does your school curriculum include physical education lessons?**

☐ Yes, for all age groups/grade levels
☐ Only for some age groups/grade levels or classes (*Please specify the age group/grade or classes*):
.....
☐ No (If no, please proceed to question (10a))

(9) **In this current school year, for how much time each week does your school provide physical education lessons to the pupils of each class participating in this project?** ***(Please complete this question with the examiner)***

Participating class code	
☐	☐☐☐ Min/week
☐	☐☐☐ Min/week
☐	☐☐☐ Min/week
☐	☐☐☐ Min/week

Country			Year		School code			

Project Logos	**SCHOOL RECORD FORM** **European Childhood Obesity Surveillance Initiative under 5** **COSI U5**	**COUNTRY LOGO/NAME**

INFORMATION ON THE SCHOOL ENVIRONMENT (continued)

(10a) **Are the children allowed to actively play in extreme weather conditions (rain, snow, windy, hot) in outdoor playing areas?**

☐ Yes
☐ No

(10b) **Are the children allowed to use outdoor playground areas outside school hours?**

☐ Yes
☐ No

(10c) **Are the children allowed to use the indoor gym outside school hours?**

☐ Yes
☐ No

(10d) **Does your school organize any sport/physical activities at least once a week for preschool children outside school hours?**

☐ Yes, for all age groups/grade level
☐ Only to some age groups/grade level
(*please specify ~~the grade~~*): ……
☐ No (*If you answered 'No', please proceed to question 11a*)

(10e) **Do children attend these organized sport/ physical activities:**

☐ Yes, more than half of the children
☐ Yes, half or less than half of the children
☐ No or mostly not (less than a quarter of the children)

(11a) **Is school bus transport available to or provided by your ~~school~~?**

☐ Yes, to all pupils
☐ Only to some age groups/grades (*please specify ~~grade~~ age group*):
……
☐ Only to pupils from rural areas
☐ Only to pupils living far away (*Please specify distance*): ……..
☐ No

Country			Year		School code			

Project Logos	SCHOOL RECORD FORM European Childhood Obesity Surveillance Initiative under 5 COSI U5	COUNTRY LOGO/NAME

INFORMATION ON SCHOOL ENVIRONMENT (continued)

(11b) **In your opinion, how safe are the routes to and from school for most pupils to walk ~~or ride a bicycle~~? *(Please circle the appropriate number*)**

Extremely safe – Extremely unsafe
1 2 3 4 5 6 7 8 9 10

(12) **Does your school curriculum include nutrition education, either given as a separate lesson or integrated into other lessons?**

☐ Yes
☐ No

(13) **In this current school year, have any initiatives/projects been organized (or will be) in each class participating to promote a healthy lifestyle (e.g. to promote physical activity and/or healthy eating)?** ***(Please complete this question with the examiner)***

Class Code .

☐	☐ Yes ☐ No
☐	☐ Yes ☐ No
☐	☐ Yes ☐ No
☐	☐ Yes ☐ No

Country			Year		School code			

Project Logos	SCHOOL RECORD FORM European Childhood Obesity Surveillance Initiative under 5 COSI U5	COUNTRY LOGO/NAME

INFORMATION ON SCHOOL ENVIRONMENT (continued)

(14) **Which of the following kinds of foods or beverages can pupils obtain on the school premises, excluding lunch provided by the school?** ***Please tick all items that apply.***

BEVERAGES	**Free**	**Paid**	**Not available**	**FOODS**	**Free**	**Paid**	**Not available**
Without added sugar				Fresh fruit	☐	☐	☐
Water	☐	☐	☐	Vegetables	☐	☐	☐
Tea	☐	☐	☐	Sweet snacks (e.g. chocolate, sugar confectionery, cakes, breakfast and/or cereal bars, sweet biscuits and/or pastries)	☐	☐	☐
100% fruit Juices	☐	☐	☐				
With added sugar				Ice-cream	☐	☐	☐
Fruit juices or other non-carbonated drinks	☐	☐	☐	Savoury snacks (e.g. potato crisps, salted popcorn, salted nuts, savoury biscuits and/or pretzels)	☐	☐	☐
Carbonated (soft) drinks	☐	☐	☐				
Flavoured milk	☐	☐	☐				
Hot drinks (cocoa, tea, coffee with milk)	☐	☐	☐				
Dairy							
Milk, yoghurt, ayran	☐	☐	☐				
Formula Milk	☐	☐	☐				
Alternative "milks" (soy, almond, oat, rice, etc..)	☐	☐	☐				

(15) **Does your school have a canteen?**

☐ Yes
☐ No

(15a) **Does your school have a shop or cafeteria where foods or beverages can be purchased?**

☐ Yes
☐ No

Country			Year		School code			

Project Logos	**SCHOOL RECORD FORM** **European Childhood Obesity Surveillance Initiative under 5** **COSI U5**	**COUNTRY LOGO/NAME**

(16) **Does your school offer any meal(s) during the day to the children?**

☐ Yes
☐ No

Which meal(s)?

☐ Breakfast ☐ Mid-morning snack ☐ Lunch
☐ Mid-afternoon snack ☐ Other_____

(17) **Who is the person responsible for the meal's planning?**

☐ Principal ☐ Cook ☐ Nutritionist
☐ Other_____

(18) **Are the menus available for the parents to consult?**

☐ Yes
☐ No

(19) **How often do the menus are repeated?**

_____

(20) **Does your school have vending machines where children are allowed to purchase foods or beverages (*other than water, fruits and vegetables*)?**

☐ Yes ☐ No

(21) **Is your school free from advertising and marketing (e.g. posters, billboards or banners with food company names or products featured, food company imagery or names on vending machines, and/or branded school materials such as books, sports equipment) of any energy-dense and nutrient-poor foods (e.g. cakes, pastries, sweets) and beverages that could undermine the promotion of a healthy, balanced diet?**

☐ Yes ☐ No

Signature

*Date*_____

Country			Year		School code			

Project Logos	**SCHOOL RECORD FORM** **EUROPEAN CHILDHOOD GROWTH SURVEILLANCE INITIATIVE**	**Country name/logo**

REMARKS

Write any remarks in this box:

************END OF QUESTIONNAIRE************

THANK YOU VERY MUCH FOR COMPLETING THIS QUESTIONNAIRE.

PLEASE RETURN IT TO THE PROJECT COORDINATOR.

In Appendix 2 a more detailed guidance for completing the school record form is presented.

4.1.3 VOLUNTARY FAMILY RECORD FORM

Two groups of objectives – optimizing diet and increasing physical activity – are essential for combating the epidemic. In addition to the anthropometric measures it is thus important to obtain data on simple indicators of the children's dietary intake and physical activity/inactivity patterns. However, this collection of additional information is voluntary and countries may choose all or just some of the items. These data are collected through the family record form and completed by the parents or caregivers.

Further, the family's socioeconomic characteristics and co-morbidities associated with obesity may be obtained through the family record form.

If countries decide to use the family record form, it may be attached to the letter that is given to the parents to inform them about this initiative and ask for their consent. The country may also choose to use the online program called Lime survey, set up for completing the family record form.

Country			Year		School				Gr	Cl	Child code	

Project Logos	**FAMILY RECORD FORM** **European Childhood Obesity Surveillance Initiative under 5** **COSI U5**	**COUNTRY NAME/LOGO**

THIS PART CAN BE ADAPTED BY COUNTRY DEPENDING ON COUNTRY NEEDS

Dear Parent/Guardian parent or guardian,

This questionnaire has been sent to you from the *……insert coordinating institute……* which is working with the xxxxxxx in the "*European Childhood Surveillance Initiative* for under 5 years old". This initiative aims to promote health and well-being of preschool children and is taking place in several countries in Europe.

We would like to ask you, as the child's parent, main caregiver or guardian, to complete this form. This can be completed online or on paper. The information will be used to develop better health programmes for children like yours.

If you chose to complete the online version of the questionnaire, the information you provide will automatically be saved when you have completed the survey. If you complete the paper version of the survey, you or your child can return it to his or her teacher in the enclosed envelope, which can be sealed, or you can post it directly to the coordinating institute. The information you provide is confidential and will not be disclosed to anyone at the school. It will be made anonymous and will be used only for research and monitoring.

Your participation is voluntary and you are free to refuse to answer any question that is asked in this survey. If you have any questions about the survey, you may contact *……insert coordinating institution and contact details….. or name Principal Investigator…..*

We thank you very much in advance for your kind cooperation.

GENERAL IDENTIFICATION OF THE CHILD

(1) ***What is your relationship to the child?***

☐ I am the mother

☐ I am the father

☐ Other (please specify), I am ……..

Country			Year		School				Gr	Cl	Child code	

GENERAL IDENTIFICATION OF THE CHILD (continued)

(2a) ***What is your child's name*****?**

First name …… Surname .....

(3a) ***What is your child's date of birth*****?** Day / Month / Year

☐☐/☐☐/☐☐☐☐

(4a) ***What is the sex of your child*****?**

☐ Boy ☐ Girl

(5a) ***What did your child weigh when he/she was born*****?** ☐kg ☐☐☐ g

(6a) **Was your child born late, on time or early?**

☐ Late birth (42 weeks or more)
☐ On time (37-41 weeks)
☐ Somewhat early (33-36 weeks)
☐ Very early (32 weeks or less)
☐ Don't know

(7) ***Was your child ever breastfed?***

☐ No (*if not, please proceed to question 9*)
☐ Yes, but for less than 1 month
☐ Yes, for ☐☐ months
☐ Don't know

(8a) **Was your child ever exclusively breastfed? (*Exclusive breastfeeding means that the infant receives only breast milk. No other liquids or solids are given – not even water – with the exception of oral rehydration solution, or drops/syrups of vitamins, minerals or medicines*)**

☐ No
☐ Yes, less than 1 month
☐ Yes, for ☐☐ months
☐ I don't know ☐ I don't remember

Country			Year		School				Gr	Cl	Child code	

CHILD BEHAVIOUR CHARACTERISTICS

The next questions ask about some behaviour characteristics of your child:

(9a) ***How far is your child's school from your home*?**

☐ Less than 1 km
☐ 1–2 km
☐ 3–4 km
☐ 5–6 km
☐ More than 6 km

(10) ***How does your child usually get to and from school? Please tick one option that he or she uses the most.***

To school:	From school:
☐ Walking	☐ Walking
☐ ~~Cycling, skating or non-motorized scooter~~	☐ ~~Cycling, skating or non-motorized scooter~~
☐ School bus or public transport	☐ School bus or public transport
☐ Private motorized vehicles	☐ Private motorized vehicles

~~-~~(10a) If your child doesn't walk ~~or ride a bicycle, skateboard or non-motorized scooter~~ from home to school or vice versa, please indicate the reason(s):

☐ the route is not safe
☐ the school is too far from home
☐ the child does enough physical activity during the day
☐ lack of time
☐ other (Specify:_____)

Country			Year		School				Gr	Cl	Child code	

(11a) ***In your opinion, how safe are the routes to and from school for your child to walk ~~or ride a bicycle, skateboard or non-motorized scooter~~?*** ***(Circle the number that best represents your opinion)***

1 = Extremely safe (eg walking paths and/or cycling lanes and safe neighbourhood) to

10 = Extremely unsafe (eg no walking paths and/or cycling lanes and unsafe neighbourhood)

1 2 3 4 5 6 7 8 9 10

(12) ***Is your child a member of one or more sport clubs or dancing courses (e.g. football, soccer, running, hockey, swimming, tennis, basketball, gymnastics, ballet, fitness, ballroom dancing, et cetera)?***

☐ Yes (please continue to the next question)
☐ No (please continue to question 14)

(13) ***Over a typical week (including weekends), how many hours does your child spend on sports and physical activities with these sport clubs or dancing courses?***

☐ None
☐ 1 h/week
☐ 2 h/week
☐ 3 h/week
☐ 4 h/week
☐ 5 h/week
☐ 6 h/week
☐ 7 h/week
☐ 8 h/week
☐ 9 h/week
☐ 10 h/week
☐ 11 h/week or more

(14) ***At what time does your child usually go to bed on school days (weekdays)?***

☐☐:☐☐
hours : minutes

(15) ***At what time does your child usually wake up on school days (weekdays)?***

☐☐:☐☐
hours : minutes

(16) ***During a normal week, how many hours per day is your child usually playing actively/vigorously (e.g. running, jumping outside or moving and)*****? Please tick one box for weekdays and one box for weekend.**

Weekdays

☐ Never at all
☐ Less than 1 hour per day
☐ About 1 hour per day
☐ About 2 hours per day
☐ About 3 or more hours per day

Weekend

☐ Never at all
☐ Less than 1 hour per day
☐ About 1 hour per day
☐ About 2 hours per day
☐ About 3 or more hours per day

Country			Year		School				Gr	Cl	Child code	

~~(17a) **Outside school hours, during a normal week, how many hours does your child usually spend doing homework or reading a book, either at home or somewhere else? Please tick one box for weekdays and one box for weekend.**~~

~~**Weekdays**~~

- ☐ ~~Never at all~~
- ☐ ~~Less than 1 hour per day~~
- ☐ ~~About 1 hour per day~~
- ☐ ~~About 2 hours per day~~
- ☐ ~~About 3 or more hours per day~~

~~**Weekend**~~

- ☐ ~~Never at all~~
- ☐ ~~Less than 1 hour per day~~
- ☐ ~~About 1 hour per day~~
- ☐ ~~About 2 hours per day~~
- ☐ ~~About 3 or more hours per day~~

(18) ***~~Outside school lessons,~~ how much time does your child usually spend watching TV or playing with electronic devices such as computer, tablet, smartphone or other electronic device (not including moving or fitness games), either at home or outside home ~~(e.g Internet cafes, game centres etc.)~~? Please tick one for the weekdays and one for the weekend.***

Weekdays

Not at all ☐

Number of hours and minute per day
Hours ☐☐
Minutes ☐☐

Weekend

Not at all ☐

Number of hours and minute per day
Hours ☐☐
Minutes ☐☐

(19) ***Over a typical or usual week, how often does your child have breakfast (more than just a beverage eg milk, tea or juice)*? Please tick one box.**

Never	Some days (1-3 days)	Most days (4-6 days)	Every day
☐	☐	☐	☐

(20) ***Over a typical or usual week, how often does your child eat or drink the following kinds of foods or beverages*? Please tick one box for each line**.

	Never	**Less than once a week**	**Some days** (1-3 days)	**Most days** (4-6 days)	**Every day**
Fresh fruit	☐	☐	☐	☐	☐
Vegetables (including vegetable soup, excluding potatoes)	☐	☐	☐	☐	☐
Soft drinks containing sugar	☐	☐	☐	☐	☐

Country			Year		School				Gr	Cl	Child code	

(20a) ***Over a typical or usual week, how often does your child eat or drink the following kinds of foods or beverages*? Please tick one box for each line**.

	Never	**Less than once a week**	**Some days** (1-3 days)	**Most days** (4-6 days)	**Every day**
Breakfast cereals or infant cereals Please read the nutrition label and check quantity/content of carbohydrates of which sugar ____g/100g	☐	☐	☐	☐	☐
Meat	☐	☐	☐	☐	☐
Fish	☐	☐	☐	☐	☐
Egg dishes	☐	☐	☐	☐	☐
Low fat/ semi-skimmed milk	☐	☐	☐	☐	☐
Whole-fat milk	☐	☐	☐	☐	☐
Flavoured milk	☐	☐	☐	☐	☐
Formula Milk	☐	☐	☐	☐	☐
Alternative "Milk"s (soy, almond, oat, rice...)	☐	☐	☐	☐	☐
Cheese	☐	☐	☐	☐	☐
Yoghurt, milk pudding, cream cheese/quark or other dairy products	☐	☐	☐	☐	☐
100% Fruit Juice	☐	☐	☐	☐	☐
Diet or "light" soft drinks	☐	☐	☐	☐	☐
Savoury snacks (eg potato chips, corn chips, popcorn, peanuts)	☐	☐	☐	☐	☐
Sweet snacks (eg cakes, biscuits, candy desserts	☐	☐	☐	☐	☐
Legumes (eg beans, lentils)	☐	☐	☐	☐	☐

(21) ***In your opinion, is your child:***

☐ Underweight
☐ Normal weight
☐ A little overweight
☐ Extremely overweight

Country			Year		School				Gr	Cl	Child code	

HOUSEHOLD HEALTH CHARACTERISTICS

The next questions ask about some health characteristics of yourself and your household:

(22a) ***Have you or anyone else in your household ever been diagnosed or treated for high blood pressure (hypertension) by a doctor or other health worker*****?**

☐ Yes
☐ No
☐ Don't know

(23a) ***Have you or anyone else in your household ever been diagnosed or treated for diabetes by a doctor or other health worker*****?**

☐ Yes
☐ No
☐ Don't know

(24a) ***Have you or anyone else in your household ever been diagnosed or treated for high cholesterol level by a doctor or other health worker?***

☐ Yes
☐ No
☐ Don't know

(25a) ***We would also like to ask about your or your spouse's/partner's weight, height and age:***

	You	Spouse/ partner _____
Weight (in kg)		
Height (in cm)		
Age (years)		

(26) ***For the home where your child lives all or most of the time (>50%) please indicate the number of people, in each box, who live there:***

☐ Mother
☐ Father
☐ Stepmother or girlfriend/partner)
☐ Stepfather or boyfriend/partner)
☐ Brother/stepbrother(s)
☐ Sister/stepsister(s)
☐ Grandfather(s)
☐ Grandmother(s)
☐ A foster home or children's home
☐ Someone else (please specify)_____

Country			Year		School				Gr	Cl	Child code	

GENERAL HOUSEHOLD CHARACTERISTICS

(27a) ***Was your child born in <insert country>?***

☐ Yes

☐ No, he/she was born in:_____

(28a) ***Was the child's mother born in <insert country>?***

☐ Yes

☐ No, he/she was born in:_____

(29a) ***Was the child's father born in <insert country>?***

☐ Yes

☐ No, he/she was born in:_____

(30a) ***In what language(s) do you usually/mainly speak with your child at home?***

☐ <insert national languages>

☐ Other language, please specify:_____

Country			Year		School				Gr	Cl	Child code	

GENERAL HOUSEHOLD CHARACTERISTICS (continued)

(31) ***What is the highest level of education that you or your spouse or partner has completed*? Please select only one answer for each of you.**

For this question each country will adapt the answer categories to suit the country context. They need to match the ISCED categories indicated in brackets. ISCED classifications are commonly used in international statistics regarding education. We suggest utilising experts from your national statistical office to ensure correct categorisation.

You

☐ Primary education or less (ISCED 0-1)
☐ Lower secondary education (ISCED 2)
☐ Upper secondary and post-secondary non-tertiary education (ISCED 3 and 4)
☐ Short-cycle tertiary education or Bachelor's or equivalent level (ISCED 5 and 6)
☐ Master's or Doctoral or equivalent level (ISCED 7 and 8)

Spouse/ partner

☐ Primary education or less (ISCED 0-1)
☐ Lower secondary education (ISCED 2)
☐ Upper secondary and post-secondary non-tertiary education (ISCED 3 and 4)
☐ Short-cycle tertiary education or Bachelor's or equivalent level (ISCED 5 and 6)
☐ Master's or Doctoral or equivalent level and (ISCED 7 and 8)

☐ I don't have a spouse/partner

(32a) ***Please tick the box which best represents your household situation? Please tick one box.***

☐ We easily pass the month with our earnings
☐ We pass the month without serious problems with our earnings
☐ We have trouble making ends meet in the month with our earnings
☐ We barely making ends meet in the month with our earnings

(33a) ***What is the main occupation of you and your spouse/partner over the last 6 months?*** **Please select one answer only for each of you.**

You

☐ Full-time domestic housework/homemaker
☐ Work full-time
☐ Work part-time
☐ Unemployed
☐ Full-time education
☐ Sick/disabled
☐ Something else:

Spouse or partner

☐ Full-time domestic housework/homemaker
☐ Work full-time
☐ Work part-time
☐ Unemployed
☐ Full-time education
☐ Sick/disabled
☐ Something else:
☐ I don't have a spouse/partner

Country			Year		School				Gr	Cl	Child code	

Date of completion of this form Day / Month / Year

☐☐/☐☐/☐☐☐☐

Signature

……

REMARKS

You may write down any remarks you would like to make in this box:

*************END OF QUESTIONNAIRE*************

THANK YOU VERY MUCH FOR COMPLETING THIS QUESTIONNAIRE.

The following text is country-specific and will be changed to reflect the country's choice (online, paper or both). The following sentence would not appear on the online form: PLEASE PUT IT IN THE ATTACHED ENVELOPE AND SEAL IT. YOUR CHILD CAN THEN RETURN IT TO HIS OR HER TEACHER.

4.1.3.1 Example of a parents' informed consent form (passive approach)

Important: The parents' informed consent letter should not mention the term "childhood obesity" or give any indication that the data collected reflect assessment of the prevalence of overweight and obesity in schoolchildren.

Important: The passive approach should be chosen if it would result in a higher response rate than the active approach.

Important: This example of an informed consent letter for parents can be adapted to each country's situation as necessary, applicable and appropriate. For instance, it may depend on the issues for which informed consent is sought (anthropometric measurements, data management or transfer) or on the addition of anthropometric measurements other than weight and height. The letter may mention whether the measurements are to be taken during a gym class. Moreover, if the voluntary family record form is to be attached to this letter, it should also be explained.

Subject: Childhood Growth Surveillance Initiative

Dear Madam or Sir [*or insert name(s) of parent(s)*]

The [*coordinating institute*] is collaborating with the World Health Organization Regional Office for Europe in routinely measuring the growth of pre-school children in [*name of country*], the objective being to promote health and well-being. This will require examiners visiting children aged 2–5 years in their school and measuring their body dimensions.

The measures include weight and height. All measures will be done by trained staff. They will be extremely careful to make the measurements in a sensitive way; for example, children will not be weighed or measured in front of their classmates, and boys and girls will be measured separately. The children will not have to undress, although they will be asked to wear normal, light, indoor clothing on the measurement day and to take off their shoes and socks.

The preschool that your child attends is one of the [*number*] preschools throughout the capital/country in which these measurements will be done. Further, your child's class has been selected to participate. The [*name of coordinating institute*] hopes that all the children in your child's class will be weighed and measured. We are seeking your permission to measure the

weight and height [*waist circumference and hip circumference*] of your child and to ask her or him some questions listed in the attached questionnaire.

This project is also taking place in other European countries. The [*name of coordinating institute*], jointly with the World Health Organization Regional Office for Europe, will analyse the data collected in all [*insert number*] participating pre-schools. We are seeking your permission to transfer the data on your child to the national database of [*name of coordinating institute*] and the international database of the World Health Organization for this purpose.

We assure you that any information that you and your child provide will be treated with strict confidentiality. The Principal Investigator, [*insert name*], will be available to listen to any concern you may have.

Much as we hope that you decide to participate, you are free to withdraw from the project at any time.

If your child is absent from school on the appointed day or if you return this letter to the school stating that you do not wish your child to be weighed or measured, the [*name of coordinating institute*] will not measure your child.

If you do not wish your child to participate in the project and do not wish her or his data to be used for further analysis, please indicate this on the following page and sign the form. Your child can then return it to her or his teacher.

If we have not received a signed letter from you by [*date*], we will assume that you have given consent for your child to participate in the measurements and for both the [*name of coordinating institute*] and the World Health Organization Regional Office for Europe to use the collected data for further analysis at both national and European levels.

Childhood Growth Surveillance Initiative

I, Miss/Ms/Mrs/Mr/Dr ....., having read and understood the objectives and measurement procedures, do not wish my child to participate in this project or for her or his data to be used for further analysis by the [*name of coordinating institute*] and the World Health Organization Regional Office for Europe. I do not give consent because (*please give the reason*) _____

Signature _____

Child's name _____

Child's date of birth _____

Child's class grade _____

4.1.3.2 Example of a parents' informed consent form (active approach)

Important: The parents' informed consent letter should not mention the term "childhood obesity" or give any indication that the data collected reflect assessment of the prevalence of overweight and obesity in schoolchildren.

Important: The active approach should be chosen if the country's legislation requires it.

Important: This example of an informed consent letter for parents can be adapted to each country's situation as necessary, applicable and appropriate. For instance, it may depend on the issues for which informed consent is sought (anthropometric measurements, data management or transfer) or on the addition of anthropometric measurements other than weight and height. The letter may mention whether the measurements are to be taken during a gym class. Moreover, if the voluntary family record form is to be attached to this letter, it should also be explained.

Subject: Childhood Growth Surveillance Initiative

Dear Madam or Sir [*or name(s) of parents(s)*],

The [*coordinating institute*] is collaborating with the World Health Organization Regional Office for Europe in routinely measuring the growth of primary-school children in [*name of country*], the objective being to promote health and well-being. This will require examiners visiting children aged 6–9 years in their school and measuring their body dimensions.

The measures include weight and height [*waist circumference and hip circumference*]. All measures will be done by trained staff. They will be extremely careful to make the measurements in a sensitive way; for example, children will not be weighed or measured in front of their classmates, and boys and girls will be measured separately. The children will not have to undress, although they will be asked to wear normal, light, indoor clothing on the measurement day and to take off their shoes and socks. [*For measurement of waist and hip circumference, the children will be asked to lower their trousers to the tops of their thighs.]*

The primary school that your child attends is one of the [*number*] schools throughout the country in which these measurements will be taken. Further, your child's class has been selected to participate. The [*name of coordinating institute*] hopes that all the children in your

child's class will be weighed and measured. We are seeking your permission to measure the weight and height [*waist circumference and hip circumference*] of your child and to ask her or him some questions listed in the attached questionnaire.

This project is also taking place in other European countries. The [*name of coordinating institute*], jointly with the World Health Organization Regional Office for Europe, will analyse the data collected in all [*number*] participating schools. We are seeking your permission to transfer the data on your child to the national database of [*name of coordinating institute*] and the international database of the World Health Organization for this purpose.

We assure you that any information you and your child provide will be treated with strict confidentiality. The Principal Investigator, [*name*], will be available to listen to any concern you may have.

Much as we hope that you decide to participate, you are also free to withdraw from the project at any time.

If your child is absent from school on the appointed day or if you return this letter to the school stating that you do not wish your child to be weighed or measured, the [*name of coordinating institute*] will not measure your child.

If you wish your child to participate in the project and agree to use of her or his data for further analysis, please indicate this on the following page and sign the form [*and fill in the family questionnaire*]. Your child can then return it to her or his teacher.

If we have not received a signed letter from you by [*date*], we will assume that you have not given consent for your child to participate in the measurements, and the [*name of coordinating institute*] will not measure your child.

European Childhood Growth Surveillance Initiative

I, Miss/Ms/Mrs/Mr/Dr ....., having read and understood the objectives and measurement procedures, give my consent for my child to participate in this project and for her or his data to be used for further analysis by the [*name of coordinating institute*] and the World Health Organization Regional Office for Europe.

Signature _____

Child's name _____

Child's date of birth _____

Child's class grade _____

Alternatively, parents could use the following option.

European Childhood Growth Surveillance Initiative

Please tick one of the two options, complete the details at the end of the form, sign it, and return it to the school.

☐ I, Miss/Ms/Mrs/Mr/Dr ....., having read and understood the objectives and measurement procedures, give my consent for my child to participate in this project and for her or his data to be used for further analysis by the [*name of coordinating institute*] and the World Health Organization Regional Office for Europe.

☐ I, Miss/Ms/Mrs/Mr/Dr ....., having read and understood the objectives and measurement procedures, do not wish my child to participate in this project or for her or his data to be used for further analysis by the [*name of coordinating institute*] and the World Health Organization Regional Office for Europe. I do not give consent because (*please insert the reason*) _____

_____

_____

_____

_____

_____

_____

Signature _____

Child's name _____

Child's date of birth _____

Child's class grade _____

5. Standardization of conditions

5.1 Examiners

For each data collection round, examiners are trained in taking standardized measurements as accurately and precisely as possible, according to the prescribed measurement techniques and instructions for examiners.

The training includes a review of the background and objectives of the surveillance system, standardized use of the forms, taking measurements as described in the protocol, support to children with anxieties, calibration of measurement instruments, recording measurement values immediately after reading them, and writing legibly to reduce mistakes during data transfer. Strict adherence to the measurement techniques and recording procedures is emphasized.
Attention is also paid to issues relating to confidentiality, preventing stigmatization or bullying of vulnerable children, and addressing questions from children, school staff or parents. Examiners should ensure the basic principles of confidentiality, privacy and objectivity throughout the process. Children can be very sensitive about their own size and that of the children around them. Measuring body height and weight could accentuate this sensitivity and increase the risk for stigmatization and bullying. Examiners should take measurements in such a way as to minimize any potential for harm (23). They should not mention the words "childhood obesity" or give any indication that the data are being collected for assessment of the prevalence of overweight and obesity in preschool children.
Examiners should not calculate the child's body mass index at the place of measurement.
Children have the right to know their height and weight. Although examiners should not give these data routinely, they should give them if they are requested to do so.

5.2 Children

Children should wear normal, light, indoor clothing. Before the measurements, they should be asked to take off their shoes and socks, all heavy clothing (e.g. coats, pullovers, jackets). They should also remove ~~wallets, mobile phones, key chains, belts and~~ any objects, like toys, pacifiers. ~~Further,~~ and any hair ornaments or braids should be undone.

Children should never be told the measurements of other children.

During data analyses, body weight will be adjusted for the weight of the clothes worn by the children when measured.

5.3 Instruments

Countries are required to use the same anthropometric instruments everywhere and to calibrate them, preferably early in the morning before measurements begin, on each day that measurements are taken (provided calibration features are available; some scales have been calibrated by the company and cannot be calibrated by the user). In all cases, the instruments need to be highly accurate and precise. Should countries need to purchase new equipment, however, they are recommended to choose that already being used in other countries.

5. Anthropometric techniques

Anthropometric measurements are preferably carried out in the mornings before lunchtime following standardized procedures (20, 24–27).

The order in which the measurements are presented is that in which it is suggested they be taken.

It is envisaged that one examiner will be able to measure the weights and heights of a class of 10 pupils and complete the examiner's record form in approximately 2–3 h.

5.1 Weight

To measure weight, portable electronic (digital) scales calibrated to 0.1 kg (100 g) and measuring up to 150 kg should be used. These are easy to use and transport and reduce observer measurement error, as the weight is displayed electronically. The scales may have a solar on-switch, thus requiring adequate lighting to function.

Weight should be measured in kilograms and recorded to the nearest 100 g (0.1 kg).

Procedure

1. Place the scales on a perfectly flat, hard horizontal surface in such a way that the display is clearly visible. The surface of the scales should be clean. The indoor temperature should not exceed 45 °C, and there should be enough light in the room to operate solar-powered scales. Measurements taken with the scales on thick-pile carpets or rugs are not reliable.
2. The child should wear normal, light, indoor clothing. If this is not the case, ask the child to take off his or her shoes and socks, all heavy clothing (e.g. coat, pullover, jacket), wallet, mobile phone, key chain, belt and other objects before weighing. Further, undo any hair ornaments or braids.
3. Communicate with the child in a sensitive, reassuring way.
4. Explain the weighing procedures to the child.
5. To turn on solar-powered scales, cover the solar panel for a second. When the number 0.0 appears, the scales are ready.

6. Ask the child to stand in the middle of the scales with his or her feet slightly apart and to remain still until the weight appears on the display. Ask the child to stand completely still until the weight is registered.
7. Record the child's body weight to the nearest 100 g (0.1 kg).
8. In case of doubt or uncertainty about the measurement, repeat the procedure in points 5–7. Draw a line next to the boxes giving the first body weight measurement, and record the second measurement on this line. *Do not erase the first recorded measurement*.

5.2 Height

To measure standing height, a height board mounted at a right angle between a level floor and a straight, vertical surface (if possible with a digital counter) should be used; its reliability is well established. The height board should be made of smooth, moisture-resistant (varnished or polished) wood. The horizontal and vertical pieces should be firmly joined at right angles. A moveable piece serves as the headboard.

Height should be measured in centimetres and the reading taken to the last completed millimetre (0.1 cm).

Procedure

1. Ensure that the height board is on level ground against a wall, pillar or staircase. Make sure that the board is stable.
2. Check that shoes, socks, hair ornaments and braids have been removed. The child should wear normal, light, indoor clothing.
3. Communicate with the child in a sensitive, reassuring way.
4. Explain the height-measuring procedure to the child.
5. Height is measured with the child standing upright. Help the child to stand on the baseboard with his or her feet slightly apart and against the vertical backboard. Make sure that the child's shoulders are level and his or her hands at the sides. The back of the head, shoulder blades, buttocks, calves and heels should all touch the vertical backboard. The legs should be straight and the feet flat.

6. Position the child's head so that a horizontal line from the ear canal to the lower border of the eye socket runs parallel to the baseboard. To keep the child's head in this position, hold her or his chin in the bridge between your thumb and forefinger.
7. Ask the child to look straight ahead.
8. If necessary, push gently on the child's stomach to help him or her stand to full height.
9. Keeping the head in position, pull the headboard down with your other hand so that it rests firmly on the top of the head and compresses the hair.
10. Read the measurement, and record the child's height in centimetres to the last completed millimetre (0.1 cm). This is the last line you can actually see. For example, if the height is between 145.7 and 145.8 cm, the figure 145.7 cm is recorded.
11. In case of doubt or uncertainty about the measurement, repeat the procedure in points 5–10. Draw a line next to the boxes giving the first height measurement, and record the second measurement on this line. *Do not erase the first recorded measurement*.

6. Anthropometric instruments

The comparability of data among countries will be improved if all countries use the same set of anthropometric instruments, although this is not mandatory.

If countries have to purchase new equipment, it is recommended that they choose the instruments already being used in other countries. In the past, for example, we recommended that countries use the following weighing scales: SECA 872, SECA 862, SECA Bella 840, Bellissima 841, Tanita UM–072, Beurer PS07; and the following portable height boards: SECA 214, TB I Hyssna 4205, SECA 206 and Leicester. Most of the SECA instruments have, however, been replaced by new models. Now, SECA 874 scales and SECA 217 height boards meet the requirements.

6.1 Calibration procedures

The weighing scales and height board should be checked and calibrated frequently, ideally early in the morning before measurements begin on each of the days that measurements are taken (if calibration features are available and the instruments can be calibrated by the user). All checks should be marked on a calibration form with the date. The measuring tape need not be calibrated.

6.1.1 Weighing scale

The weighing scale should be checked over the full range of standard metal (brass) weights (e.g. 5, 10 and 20 kg) or calibrated containers of water of known weight to make sure that the scales are accurate at both low and high values.

1. First, use the calibrating procedure, recommended by the manufacturer.
2. Weigh test weights of 5, 10, 20 and 35 kg successively, and mark the results on the calibration form.
3. Check whether all the recorded weights correspond to the test weights. In case of disagreement, repeat the check to determine whether it is due to a recording error. If there is still disagreement, check another set of scales. If that set functions correctly, use it on that day, and advise the Principal Investigator or supervisor of the problem.

6.1.2 Height board

The height board should be checked to ensure that the minimum value indicated corresponds exactly to the counter reading when the footboard or headboard is moved to the minimum.

The general indication of de-calibration of height equipment is a 3-mm deviation from the mark. If the counter on the height board gives a clearly inaccurate reading, unfasten the screws that hold it in position (a magnetic screwdriver works best), and slide it out of its case. Then, hold a rod of known length in an upright position and bring the headboard to rest over it. Adjust the reading on the counter manually to the length of the rod, slide the counter showing the correct reading back into its case, and screw it back firmly.

Polyvinyl chloride (PVC) or metal rods of known length (100 and 150 cm) should be used. Note that metal calibration rods may vary slightly in response to changes in ambient temperature.

1. Move the headboard of the height board to the minimum (ensure that no small objects are lying on the board).
2. Check the minimum value on the counter reading against the minimum value indicated on the board. If they agree, mark the minimum value on the calibration form. If they disagree, mark the counter reading on the calibration form, check and use another height board, and advise the Principal Investigator or supervisor of the problem.
3. Check whether the counter displays 100 cm and 150 cm when metal or PVC rods of these lengths are placed between the footboard and the headboard. Mark the counter reading on the calibration form. If there is disagreement, check and use another height board, and advise the Principal Investigator or supervisor of the problem.

6.1.3 Sample calibration form

Instrument **Date**

Weighing scale							
Zero value							
5 kg							
10 kg							
20 kg							
35 kg							
Height board							
Minimum value							
100 cm							
150 cm							

6.2 Maintenance, storage and transport

Maintenance is important for ensuring the accuracy of equipment and extending its life. Good equipment is expensive, and examiners should understand this fact. All equipment should be handled with care during storage, transport and use. It should be kept clean, and all parts should be stored and transported in their correct places. Cool, dry storage is a standard requirement for anthropometric equipment.

Different instruments and parts require different materials for cleaning and regular care. For example, a height board may be unstable because the metal guide along which the counter wheel runs is bent. Moving the headboard quickly can cause the gears to skid and give an inaccurate reading. It is important that some replacement parts for each piece of equipment are at hand, e.g. screws for the height board.

Portable height boards are robust if they are handled with care. They should always be transported with the moveable footboard and headboard well locked.

Weighing scales will not function correctly if they become too warm or if there is too little light. Thus, they should be used indoors or in the shade, while ensuring sufficient light. They should be stored at normal indoor temperature and protected against humidity and damp. If they have been transported in hot conditions, they should be put in a cool place for 15 min before use. Scales should be handled with care under all circumstances.

Tape measures are accurate in virtually all circumstances. Spare tape measures should nevertheless be available in case of damage.

5. Data management

Both the data manager and the data clerks are trained at the beginning of the data collection work on all aspects related to data management. Should the country choose to use the online data collection system, data manager and data clerks need to be familiarized with the system and pass the test in order to be allowed to use the system. The training materials and tests are available in separate manuals.

5.1 Data quality control

Data quality assurance begins with the examiner carefully filling out the forms, either on paper or online and with the supervisor checking the returned forms for completeness and correct coding, or in case of online data entering, checking only for completeness. If the country chooses to use Open Clinica data entry system, built-in range and consistency checks for validation purposes are already incorporated in the system. Additional checks for inconsistencies and incompleteness are made, as well as data cleaning, validation (e.g. checking for outliers, data entry errors and out-of-range values) and back-up by the data manager.

5.2 Data processing

After the completion of data collection in a school, the child's record forms along with the school record form is forwarded to the national coordinating centre for processing.

The data are entered to either Open Clinica system or another system of the country's choice.

The data manager is responsible for archiving the forms as well as the data cleaning, validation and back-up. If a country does not use the online system (ie, OpenClinica and/or Lime survey), the country sends a copy of the cleaned data file to the Regional Office, along with a detailed report of the data cleaning procedures.

Countries have the option of using direct electronic recording of the variables that are included on the child's and school record form instead of first filling out the paper form, in which case examiners will need access to a computer while carrying out the measurements.

5.3 Data analysis

Data are analysed both at the country level at the national coordinating centre and at the European level (common cross-country analyses of the pooled dataset) by the Surveillance Initiative Investigators Team. All analyses are carried out by a common statistical package such as Stata (StataCorp LP, Texas, USA) or SPSS (SPSS Inc., Chicago, USA).

Children are classified as being underweight, normal weight, overweight or obese by the 2007 WHO Child Growth Standards for the common cross-country analyses (28). Countries may choose to use the growth reference described by Cole et al. (29-31) or others for their own purposes and national data analyses.

Each country is asked to sign a collaboration arrangement with WHO, in which it declares that a copy of the cleaned data file will be sent to the Regional Office and that it will comply with the data copyright policies and procedures.

5.4 Data reporting

A report of the results of each data collection round will be produced, including an evaluation of the feasibility and the sustainability of the surveillance system. This will be used for correcting the design and possible extension of the network. The prevalence data will also be included in the Regional Office's database on nutrition, obesity and physical activity.

Other options for disseminating the outcomes of the surveillance system may be publications in peer-reviewed scientific journals. These will have to be agreed by the Surveillance Initiative Investigators Team.

A detailed publication and presentation policy for the dissemination of the results is included in the collaboration arrangement between WHO and the participating countries.

A flow chart of the steps in the paper form collection, processing and analysis of the data is shown in Fig. 1., and online collection and entering in the online database is shown in Fig. 2.

Fig. 1. Data flow chart using paper forms

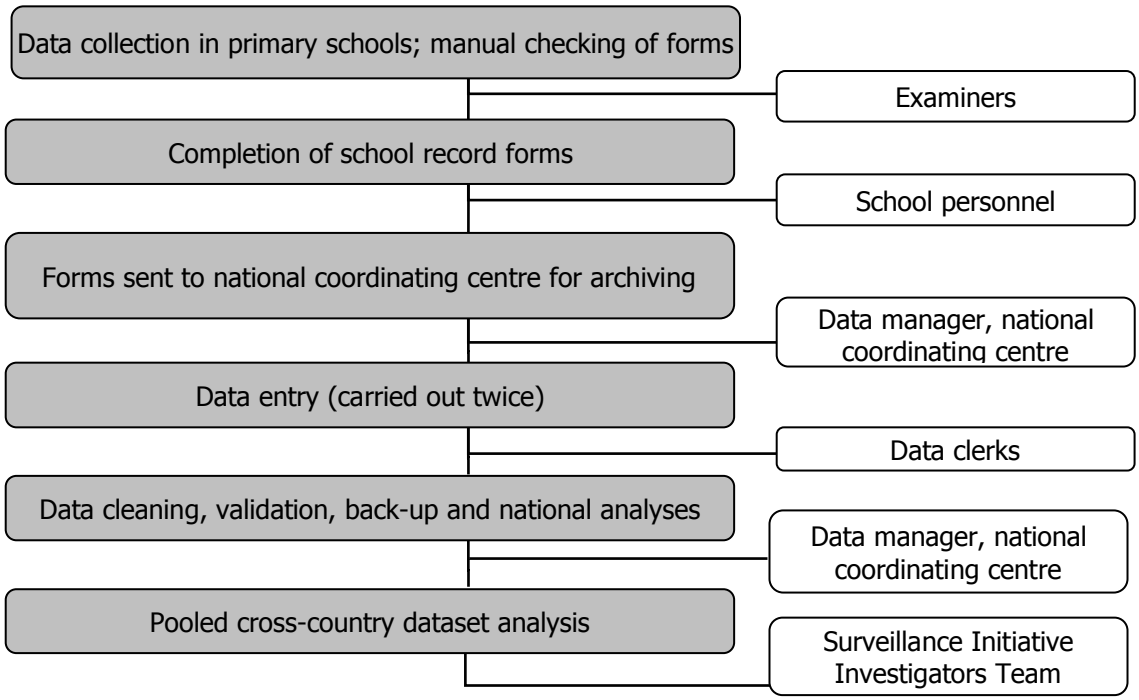
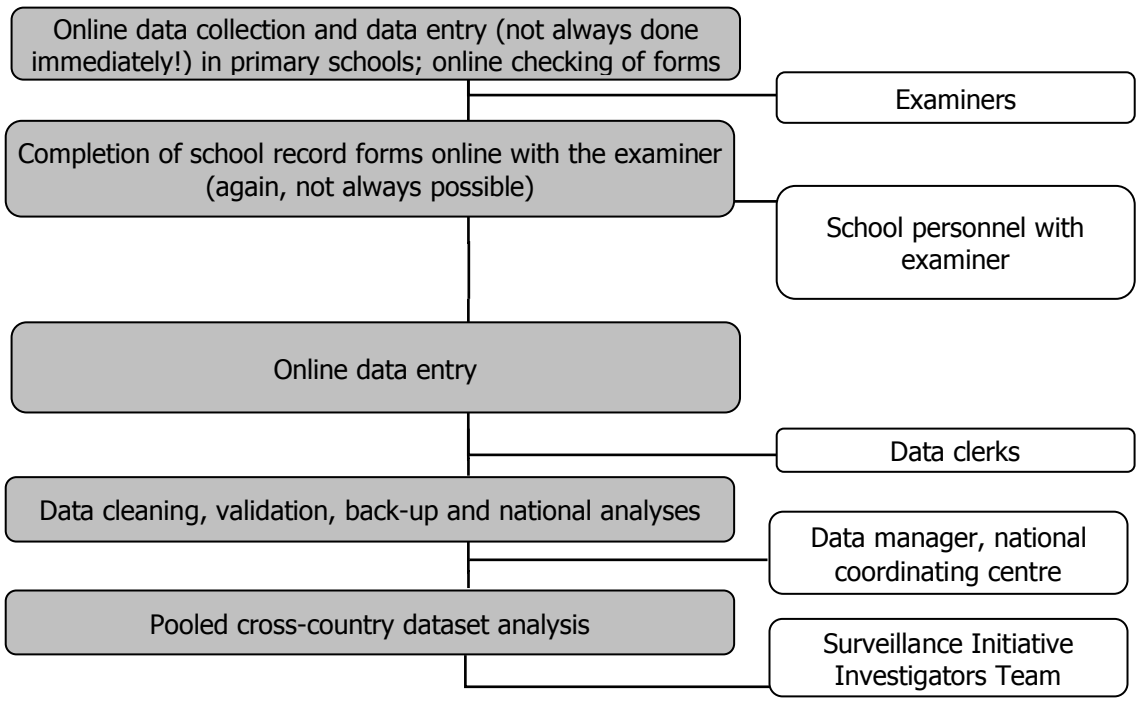


Fig. 2. Data flow chart using online forms



6. Ethical considerations

The surveillance system is implemented in accordance with the International Ethical Guidelines for Biomedical Research Involving Human Subjects (32). Depending on local circumstances, ethical permission is asked of the relevant ethical committees.

Parents are fully informed about all study procedures and their informed consent for the measurements and for data treatment (written in local language) obtained on a voluntary basis prior to the child's enrolment in the system. This is done either through a letter or through a school information meeting. The objectives of the surveillance system, anthropometric measurements and data treatment are explained. Depending on local legal circumstances, countries have the option of choosing passive or active informed consent. The approach that would provide the highest response rate is to be preferred. In exceptional circumstances, there may be no need to obtain informed consent from the parents.

Confidentiality of all collected and archived data is ensured. Identification numbers are assigned to the children and each register mentions only those numbers. Only one person in the school has a full list of identification numbers and the corresponding names and addresses of the children sampled. No information on the subjects is given to outside people. Forms are stored in safes at the national coordinating centre.

Parents have a right to know their child's body height and body weight measurements. Although these are not provided routinely, they are given on request. Children are never told the measurements of other children.

The children's names are not included in the electronic data files.

It is vital that examiners work in such a way that stigmatization and bullying are minimized and that they acknowledge the right of children and parents to withhold consent.

Examples of an informed consent letter are given in a separate manual.

School-specific results are not routinely provided to the schools.

7. Organization of the surveillance initiative

Each country is responsible for its national data collection and analysis, to be funded from local resources. Prior to the introduction of the surveillance initiative, the institute responsible for overall national coordination needs to be identified.

The Country Coordination Team in each country is composed of:

- a Principal Investigator, responsible for the overall coordination, who is a member of the Surveillance Initiative Investigators Team;
- supervisor(s) responsible for data collection in each sampled school; and
- a data manager responsible for overall data management.

The Country Coordination Team also includes:

- examiners responsible for the administration of the examiner's record form and taking the anthropometric measurements;
- data clerks responsible for entering the data into electronic data files; and
- school personnel responsible for the completion of the school record forms and other relevant tasks.

The involvement of each member of the country team depends on the local organization of the surveillance initiative and whether or not it is possible to second staff of the national coordinating centre to the project. In some cases, countries may need to recruit new staff.

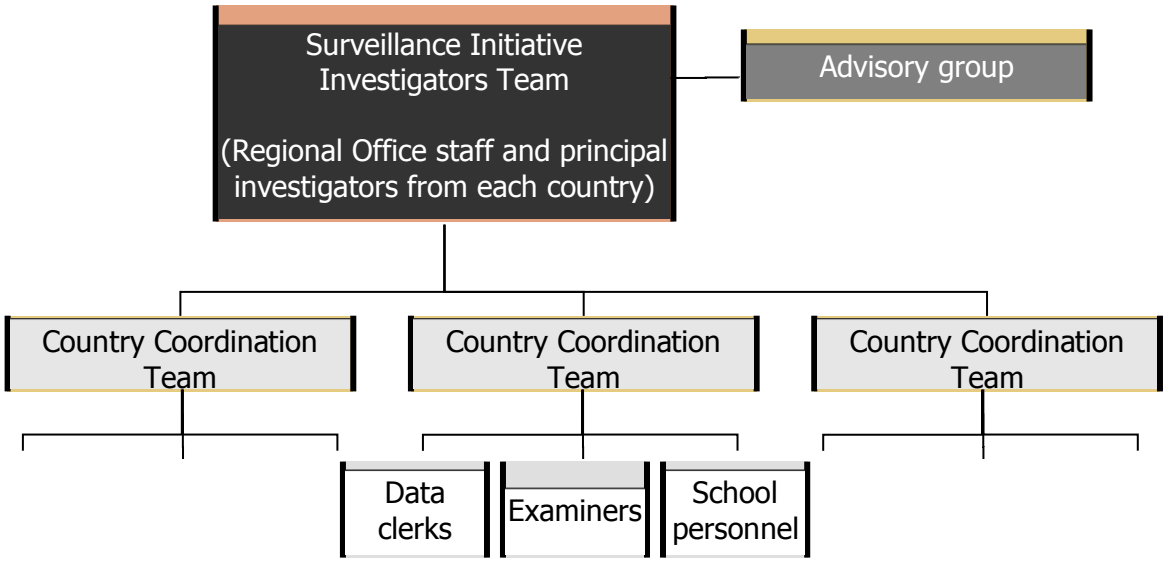
The Surveillance Initiative Investigators Team comprises staff from the nutrition, physical activity and obesity programme of the Regional Office and the Principal Investigators from each country. The Team meets regularly throughout the implementation of the surveillance initiative to review its progress, to ensure uniformity of data collection in the countries and to discuss issues that arise.

WHO is responsible for the development of the protocols, international coordination of the surveillance initiative, data analysis at the European level and facilitation of investigators' meetings.

Further, international advisory group has been formed to provide technical advice to the Surveillance Initiative Investigators Team.

Fig. 3 shows the organizational structure for implementing the surveillance initiative.

Fig. 3. Organizational structure



8. References

1. Abarca-Gómez L, Abdeen Z, Hamid Z, Abu-Rmeileh N, Acosta-Cazares B, Acuin C, et al.; NCD Risk Factor Collaboration (NCD-RisC). Worldwide trends in body-mass index, underweight,overweight, and obesity from 1975 to 2016: a pooled analysis of 2416 populationbased measurement studies in 128·9 million children, adolescents, and adults. Lancet. 2017 Dec; 390(10113): 2627–42.
2. WHO. Report of the commission on ending childhood obesity. Geneva: World Health Organization; 2016.
3. Childhood Obesity Surveillance Initiative - Factsheet. Highlights 2015-17. Copenhagen: World Health Organization Regional Office for Europe; 2018.
4. Krassas GE, Tzotzas T. Do obese children become obese adults: childhood predictors of adult disease. Pediatric Endocrinology Reviews, 2004, 1(Suppl. 3):455–459.
5. Freedman DS et al. The relation of overweight to cardiovascular risk factors among children and adolescents: the Bogalusa Heart Study. Pediatrics, 1999, 103:1175–1182.
6. Dietz WH. Health consequences of obesity in youth: childhood predictors of adult disease. Pediatrics, 1998, 101:518–525.
7. Lobstein T et al. Obesity in children and young people: a crisis in public health. Obesity Reviews, 2004, 5(Suppl. 1):4–104.
8. Branca F, Nikogosian H, Lobstein, T, eds. The challenge of obesity in the WHO European Region and the strategies for response. Copenhagen, World Health Organization Regional Office for Europe; 2007
9. Wilkinson JR, Walrond S, Ells LJ, Summerbell C. Surveillance and monitoring. Obes Rev 2007;8(Suppl. 1):23–29.
10. Recommendation No. R(94)11 of the Committee of Ministers to Member Sates on screening as a tool of preventive medicine. Brussels: Council of Europe; 1994
11. Wilson JM, Jungner YG. Principles and practices of screening for disease. Geneva: World Health Organization; 1968.
12. Childhood Obesity Surveillance Initiative (COSI) – Data collection procedures 2018/2019. World Health Organization Regional Office for Europe.
13. Childhood Obesity Surveillance Initiative (COSI) Protocol. World Health Organization Regional Office for Europe; 2016.
14. Janssen I et al. Utility of childhood BMI in the prediction of adulthood disease: comparison of national and international references. Obesity Research, 2005, 13:1106–1115.

15. Kim J et al. Incidence and remission rates of overweight among children aged 5 to 13 years in a district-wide school surveillance system. American Journal of Public Health, 2005, 95:1588–1594.
16. Currie C, Samdal O, Boyce W, Smith R, eds. Health behaviour in school-aged children: a WHO cross-national study (HBSC), research protocol for the 2001/2002 survey. Edinburgh: University of Edinburgh; 2001.
17. Rudolf MCJ et al. The TRENDS project: development of a methodology to reliably monitor the obesity epidemic in childhood. Archives of Disease in Childhood, 2006, 91:309–311.
18. Kirkwood BR. Essentials of medical statistics. Oxford, Blackwell Science, 1988.
19. Killip S, Mayfoud Z, Pearce K. What is an intracluster correlation coefficient? Crucial concepts for primary care researchers. Annals of Family Medicine, 2004, 2:204–208.
20. Physical status: the use and interpretation of anthropometry. Report of a WHO Expert Committee. Geneva, World Health Organization, 1995 (WHO Technical Report Series 854).
21. Elgar FJ et al. Validity of self-reported height and weight and predictors of bias in adolescents. Journal of Adolescent Health, 2005, 37:371–375.
22. Boutelle K et al. Mothers' perceptions of their adolescents' weight status: are they accurate? Obesity Research, 2004, 12:1754–1757.
23. Measuring childhood obesity. Guidance to primary care trusts. London, Department of Health, 2006
24. de Onis M et al. Measurement and standardization protocols for anthropometry used in the construction of a new international growth reference. Food and Nutrition Bulletin, 2004, 25:S27–S36.
25. WHO Multicentre Growth Reference Study Protocol. Appendix B. Measurement and standardization protocols. Geneva, World Health Organization, 1999.
26. WHO child growth standards. Training course on child growth assessment: B, measuring a child's growth. Geneva, World Health Organization, 2006.
27. Lohman TG, Roche AF, Martorell R, eds. Anthropometric standardization reference manual. Champaign, IL, Human Kinetics Books, 1988.
28. WHO Child Growth Standards. Length/height-for-age, weight-for-age, weight-for-length, weight-for-height and body mass index-for-age: Methods and development. Geneva, World Health Organization, 2006. (https://www.who.int/childgrowth/standards/Technical_report.pdf)

29. Cole TJ et al. Establishing a standard definition for child overweight and obesity worldwide: international survey. British Medical Journal, 2000, 320:1240–1243.
30. Cole TJ et al. Body mass index cut offs to define thinness in children and adolescents: international survey. British Medical Journal, 2007, 335:194.
31. Cole TJ et al. Extended international (IOTF) body mass index cut-offs for thinness, overweight and obesity. Pediatric Obesity, 2012, 4:284-94.
32. International ethical guidelines for biomedical research involving human subjects. Geneva, Council for International Organizations of Medical Sciences/World Health Organization, 1993.

9. Appendixes

Appendix 1 - Guidance for completing the child's record form

1.1.Identification, child

Child identification code. This is a code that univocally identifies each child involved in the surveillance and should be pre-entered before data collection. The code is composed by the following information/codes.

Country			Year		School code				Grade	Class code	Child's code	

Country code. The country code must be entered into the designated boxes on all pages of the examiner's record form. The three-letter country codes of Member States of the WHO European Region are listed in section 1.2.

Year of data collection*.* The year is designated by the last two digits.

School code*.* This is the numerical code assigned to each school included in the survey. The code is composed of four digits and must be entered into the designated boxes on all pages of the examiner's record form. For example, school code 1 is entered as "0001", school code 10 is entered as "0010", school code 100 is entered as "0100", school code number 1000 is entered as "1000", and so on.

If country's sampling design includes schools as sampling units, the Principal Investigator should prepare a list of all schools in the country from which a sample will be taken, and number them, starting with "0001". In all other situations, the Principal Investigator should number the schools included in the survey starting with "0001".

Grade. The grade should be obtained from the school register and be entered numerically.

Class code. This is a numerical code assigned to each class included in the survey. The code is composed of one digit and must be entered into the designated boxes on all pages of the examiner's record form. Classes belonging to the same school should be coded numerically with one digit starting with 1, even though, in some schools, classes are designated by letters.

If country's sampling design includes classes as sampling units, the Principal Investigator should prepare a list of all classes with children of the targeted age group(s) from which the sample will be taken, and number them school by school, starting with 1. In all other situations, the Principal Investigator should number the classes included in the survey school by school, starting with 1.

Child code. This is a two-digit code assigned to each child invited to participate in the survey, even to those children who refuse to participate in the surveillance system. The code must be assigned class by class and its format may differ by country.

(1a**)** **Child's name.** Voluntary item. Ask the child for her or his first name and surname. *This information will not be entered into the national online database system*.

(2) **Child's sex.** Tick either "Boy" or "Girl".

(3) **Child's date of birth.** This information should be obtained from the school register as day, month and year. Note: When only the month and year of birth can be provided, the dataset should include the field "**Age**", which is calculated as:

Date of measurement – Child's date of birth in months / 365.25.

Otherwise, **Child's age in months can be calculated instead.** The response should be obtained from the school register.

(4) **Urbanization grade of place of residence.** The child's place of residence should be categorized according to level of urbanization, as defined by the country. The three categories can be adjusted to the country situation. For instance "Urban" may be defined as a "Town or city with at least 10 000 inhabitants", "Semi-urban" as a "Suburb of a town or city with at least 10 000 inhabitants or a village with at least 1000 inhabitants" and "Rural" as a "Village or area with fewer than 1000 inhabitants".

(4a) **Child's place of residence.** Voluntary item. This information should be obtained from the school register.

(4b) **Child's postal code.** Voluntary item. This information should be obtained from the school register. Its format may differ by country.

(4c) **Population size of place of residence.** Voluntary item. This information should be obtained from census data.

(4d) **Region or municipality.** Voluntary item. This information should be obtained from the school register.

(5) **Breakfast.** The child is asked whether he or she had anything for breakfast. A simple beverage, such as milk, juice or tea, is not considered breakfast and should be recorded as such. In case of doubt, ask the child to describe what did he/she had for breakfast and then fill accordingly.

1.2 Anthropometric examination

Important: The supervisor should impress upon the examiners the importance of recording measurements precisely. A certain variation is to be expected and does not reflect failure.

In case of doubt or uncertainty about one or more measurements, they should be taken again. The examiner should draw a line next to the designated boxes and record the second measurement(s) on this line. *The examiner should not erase the first recorded measurement(s).*

(6) **Date of measurement.** Enter the date on which the anthropometric measurements were taken in the designated boxes (Day/Month/Year).

(7) **Rough indication of time of measurement.** Tick the box "Before lunch" or "After lunch".

(7a) **Precise time of measurement.** Voluntary item. Enter the time at which the anthropometric measurements were taken in the designated boxes (hour/minutes) using the *24-h clock*. Minutes can be entered to the nearest quarter of an hour; for example, if the measurement was taken at 09:09, enter 09:15.

(8) **Child's assent.** Tick only one answer option.

If the answer is "Yes" (child agrees to be measured), leave question (8a) blank, and continue to question (9).

If the answer is "No" (child does not agree to be measured), voluntary question (8a) can be completed and questions 9–13 left blank. **Important:** This answer should be recorded only if the child does not agree to be measured *at all*. If the child, for instance, agrees to measurement of her or his weight or height, code "Yes".

(8a) **Child's reason for refusal.** Ask the child why she or he does not agree to be measured. Let the child talk, and tick the most appropriate answer option.

Measurement items

Before weighing children, ask them to take off their shoes and socks, all heavy clothing (e.g. coat, pullover, jacket), wallets, mobile phones, key chains, belts and other objects. Also, undo any hair ornaments or braids.

Perform the anthropometric examination according to the techniques described below. The order in which the measurements are presented is that in which it is suggested they be taken.

(9) **Weight** should be measured in kilograms and recorded to the nearest 100-g (0.1-kg) unit. For instance, 22.5 kg is entered in the designated boxes as follows: .. 2 2 • 5. A display reading of 108.7 is entered as 1 0 8 • 7.

(10) **Height** should be measured in centimetres and the reading taken to the last completed 1 mm (0.1 cm). For instance, if the height is between 111.4 and 111.5, the figure 111.4 is entered in the designated boxes as 1 1 1 • 4.

(10a) **Second height measure**. Voluntary item. Height should be measured a second time in the same way as in item 10.

(11a) **Waist circumference.** Voluntary item. Waist circumference should be measured in centimetres and recorded to the last completed 1 mm (0.1 cm).

(12a) **Hip circumference.** Voluntary item. Hip circumference should be measured in centimetres and recorded to the last completed 1 mm (0.1 cm).

(13) **Clothes worn when measured.** Tick only one answer option. In case of doubt, select the option "Other", and specify the clothes the child wore when measured.

Important: The child should wear normal, light indoor clothing (preferably underwear only). If this is not the case, ask the child to take off shoes, socks, all heavy clothing (e.g.

coat, pullover, jacket), wallet, mobile phone, key chain, belt and any other objects. Also, undo any hair ornaments or braids.

(14)**Examiner's code.** This is a 4 digits code that is assigned by the Principal Investigator to each examiner who is to measure the children. Should an examiner no longer be involved in surveillance, he or she will retain his or her assigned code, which should not be assigned to another (new) examiner.

Each examiner enter his/her code in the designated boxes and then, sign the form.

Examiner's observations

This space can be used to write any remarks that the examiner considers important or relevant for the examination of a particular child, such as poor cooperation by the child. It can also be used to record observations on the anthropometric examinations, such as why some measurements were not taken or when there was uncertainty about the first measurement taken and a second measurement was done.

1.3 Country codes of Member States of the WHO European Region

Country name	Country code	Country name	Country code
Bulgaria	BUL	Portugal	POR
Czechia	CZH	Slovenia	SVN
Italy	ITA	Latvia	LVA

1.4 Weight units for clothes (mandatory)

The Principal Investigator should prepare a list of weight units for the options of clothes to be worn by the children when measured (underwear only, gym clothes, light clothing, heavy clothing), so that body weight can be adjusted accordingly during data processing.

The Principal Investigator should provide the Regional Office with a list of these weight units.

1.5 Individual sampling weights and survey design variables (mandatory)

Some countries may be able to include individual sampling weights to adjust for the sampling design. The weighting factor is set to 1.00 for countries that include the entire population of interest.

The Principal Investigator should provide the Regional Office with a description of the method used for calculating sampling weights and all the variables used. He or she should also provide information on the sampling design used, including the primary sampling unit, the secondary sampling unit (if applicable), the strata chosen (when stratification was applied) and the final sample size.

In order to make comparisons the Regional Office will calculate sampling weight according to a common procedure. Therefore, the Principal Investigator will be asked to provide the necessary information.

Appendix 2 - Guidance for completing the mandatory school record form

Important: The examiner should fill in the identification code of the school, including country and year, before giving the form to the headmaster or headmistress.

The supervisor or examiner should advise the person who will complete the school record form that she or he can ask for assistance in the case of any uncertainty, for further clarification or for other queries about completion of the form.

The school record form includes mandatory and voluntary items; voluntary items are identified with a letter next to the number (e.g. 1a, 2a).

2.1.1 Identification

(1a) **School name.** Voluntary item

(2a) **School postal address.** Voluntary item

(3a) **City, town or village.** Voluntary item

(4) **Function at school.** Tick the answer that gives the primary function of the person who fills in the form.

2.1.2 Participating classes

(5a) **Number of classes selected per age group.** Voluntary item. Enter the number of all the classes selected (sampled) to participate in the project. If only one class has been selected, enter the number 1.

(5) **Record the class code ~~and grade/level~~ of each participating age group.** The code of each class should be entered in the first box. Then the class or level of each of the participating age group should be added in the next field. The examiner should check that the codes are correctly reported and that the person who completed the form is fully aware of the code given to each participating class.

Number of pupils registered. Enter the numbers of girls and boys registered in each participating class in your school. Each row refers to one class, so if the first row refers to

the class with code No. 1 then the numbers of girls and boys registered in class No. 1 should be entered in the designated boxes on the first row and so on.

Number of pupils examined (measured). For each participating class, enter the number of girls and boys for whom anthropometric measurements such as weight and height were taken. Each row refers to one class, so if the first row refers to the class with code No. 1 then the numbers of girls and boys in class No. 1 who were examined should be entered in the designated boxes on the first row and so on.

Number of pupils absent. For each participating class, enter the numbers of girls and boys who were absent on the day of measurements. Each row refers to one class, so if the first row refers to the class with code No. 1 then the numbers of absent girls and boys in class No. 1 should be entered in the boxes on the first row, and so on. If none of the registered pupils in a class were absent and all children could be measured, enter "0" for girls and "0" for boys.

Pupils who refused. For each participating class, enter the numbers of girls and boys who refused to be examined (measured).

Parents who refused consent. For each participating class, enter the numbers of girls and boys whose parents did not give consent for them to be examined (measured).

2.1.3 Information on the school environment

(6) **Outdoor playground area(s).** Tick either "Yes" or "No".

(7) **Indoor gym.** Tick either "Yes" or "No".

(8) **Physical education lessons in the curriculum.** Tick "Yes", "Only for some grade levels" or "No". If the answer is "No", proceed to voluntary question 10a, if used by the country.

(9) **Minutes per week of physical education.** (*Please complete this question with the examiner.*) The code of each class should be entered in the first box. Then write the length of time (in minutes) that physical education is provided each week for pupils in each of the classes participating in the project. Each row refers to one class, so if the first row refers to the class with code No. 1 then number of minutes of physical education provided each week to class No. 1 should be entered in the designated box(es) on the

first row, and so on. Physical education provided during school hours include gym classes, dance lessons and swimming lessons.

Example 1: If a swimming class of 45 min and a gym class of 50 min are provided once a week to class No. 1, enter "095" in the designated boxes on the first row.

Example 2: If a gym class of 60 min and a dance class of 30 min are provided twice a week to class No. 2, enter "180" in the designated boxes on the second row.

Example 3: If no physical education is provided during school hours to class No. 3, enter "000" in the designated boxes on the third row.

(10a) **Active play in extreme conditions during school time.** Voluntary item. Tick either "Yes" or "No".

(10b) **Outdoor playground gym outside school hours.** Voluntary item. Tick either "Yes" or "No".

(10c) **Indoor gym outside school hours.** Voluntary item. Tick either "Yes" or "No".

(10d) **Sports or physical activities at least once a week outside school hours.** Voluntary item. Tick either "Yes", "Only to some grades" (if so, specify grades) or "No".

(10e) **Attendance at sports and physical activities.** Voluntary item. Tick the designated box: "Yes, more than half the children", "Yes, half or less than half the children" or "No or mostly not"

(11a) **Availability of school transport.** Voluntary item. Tick the appropriate box.

(11b) **Safety of routes for walking or riding a bicycle to and from school.** Voluntary item. Circle the appropriate number on the scale.

(12) **Nutrition education in school curriculum.** Tick either "Yes" or "No".

(13) **School projects and initiatives.** (*Please complete this question with the examiner.*) The code of each class should be entered in the first box. Then Tick either "Yes" or "No" for each participating class.

(14) **Foods and beverages available on school premises.** Tick all the foods and beverages that pupils can obtain on the school premises (for free, to purchase or not available).

Please list, on the lines provided, any foods or beverages, other than those listed, that children can obtain at school.

(15) **School canteen.** Tick either "Yes" or "No".

(15a) **Shop or cafeteria in which foods or beverages can be purchased.** Voluntary item. Tick either "Yes" or "No".

(16) **Does your school offer any meal(s) during the day to the children?** Tick either "Yes" or "No".

Which meal(s)? Tick all the meals that pupils can obtain on the school.

Please list, on the line provided, any other meal that children can obtain at school.

(17) **Who is the person responsible for the meal's planning?** Tick the appropriate box.

Please list, on the line provided, any other responsible person if that is the case.

(18) **Are the menus available for the parents to consult?** Tick either "Yes" or "No".

(19) **How often do the menus are repeated?**

Please specify, on the line provided, how often the menus are repeated.

(20) **Vending machines at schools from which children can purchase foods and beverages other than water, fruit and vegetables.** Tick either "Yes" or "No".

(21) **Advertising or marketing of energy-dense and nutrient-poor foods and beverages.** Tick either "Yes" or "No".