



**World Health  
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REGIONAL OFFICE FOR **Europe**

**COSI**

9<sup>th</sup> Meeting of the WHO  
European Childhood Obesity  
Surveillance Initiative (COSI)  
Meeting Report

**St Petersburg, Russian Federation  
13-14 June 2016**

## **ABSTRACT**

The 9<sup>th</sup> meeting of the standardized childhood obesity surveillance initiative (COSI) took place in St Petersburg in June 2016. The initiative involves routine measurement of height and weight among primary school children aged 6–9 years, and was established by the WHO Regional Office for Europe in order to generate data on prevalence and trends in overweight and obesity to enhance understanding of childhood obesity trends and to permit inter-country comparisons within the European Region.

A first data collection took place during the school year 2007/2008, the second round during the school year 2009/2010, the third round during the school year 2012/2013 and the fourth round will be completed by the end of 2016. Thirty-two Member States took part in the 9<sup>th</sup> COSI meeting, convened in St Petersburg between 13 and 14 June 2016, to share preliminary findings and lessons from the fourth round of data collection and, more generally, discuss how to improve the organization and manage the growth, possible expansion of the scope and the sustainability of the Initiative.

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## Welcome note and opening speeches

Dr Valentina Peterkova, Institute of Pediatric Endocrinology, Moscow, Russian Federation welcomed participants to St Petersburg and set the scene for the meeting.

Diet-related noncommunicable diseases (NCDs) are among the biggest public health challenges of the 21<sup>st</sup> Century and all countries are affected, notably in low socio-economic groups and in children. Among the WHO regions, the European region is the most severely affected by NCDs. It is estimated that in 46 of 53 countries in the region more than 50% of women and men are overweight or obese. Childhood obesity already affects more than one in four school-aged children in the vast number of countries and prevalence is increasing in many countries. In the European region, people are increasingly eating highly processed foods and less healthy options, and there has been a very rapid loss of the traditional and healthy Mediterranean diet.

In parallel with obesity, other factors such as *trans* fats and high salt intakes add more risk to the equation. In Europe salt consumption is very high and no country complies with the WHO guidelines for intakes of no more than 5 g per day. At the same time physical inactivity is a leading risk factor for overweight, obesity and chronic conditions including diabetes, hypertension and cardiovascular diseases, various forms of cancer, stress, depression and anxiety. More than 80% of young people do not achieve the minimal daily levels of physical activity recommended by WHO.

The Russian Federation is one of the biggest countries in the European Region and, due to scale of population, often presents the biggest challenge than in some other places. One study on risk factors in some regions of the Russian Federation found that approximately one third of participants were obese and two-thirds were classified as overweight and BMI increases with age in both sexes. Overweight and obesity levels decreased with high education and prosperity levels in both men and women. At the same time, the prevalence of overweight and obesity in the Russian Federation is not equally distributed geographically, with some regions much worse affected than others.

NCDs is one of the biggest priorities for the current collaboration between the Russian Federation and WHO. The Russian Federation is very happy to be joining COSI this year and is looking forward to learning from other members' experiences and hopes to be able to share its own experience at the next meeting.

Dr Jill Farrington, WHO NCD Project Office in Moscow, added her welcome to Russia on behalf of WHO Regional Office for Europe NCD project. This project, which is funded by the Russian Ministry of Health and started in 2014, aims to support the prevention and control of NCDs. The coordinating office is based in Moscow and covers all of Europe, working both across countries and within countries. The main areas of work include helping countries to implement the global and European NCD and risk factor-specific action plans and to make progress towards the global targets. Particular areas of work are around NCD strategies and action plans (e.g., supporting development and evaluation of actions plans in more than 10 countries), intersectoral work on tobacco, alcohol, nutrition, physical activity (e.g., training and capacity building on NCDs and the law), surveillance (e.g., NCD risk factor surveys, COSI etc.), disease registries and also around essential interventions for NCDs in health systems (e.g., cardio-metabolic risk assessment, PEN protocols).

COSI will be particularly helpful to better the nature of the obesity problem, to evaluate interventions that can be put in place and inform the development of policies. Other, interconnected, areas of work include food and environment surveys, salt surveys and STEPS surveys. Together these initiatives can build a comprehensive picture of food, physical activity and obesity in a country.

COSI is also important because it is illustrating two of the guiding principles for WHO's work: life-course approach and equity. This will enable the continuum between infant feeding, childhood nutrition and adult nutrition to be monitored. A 9-year-old who was measured in a 2007/8 COSI survey is also now old enough to be joining a STEPS survey and could be followed through that child into adult surveillance. In terms of equity, it is important to disaggregate data, to be able to see the differences between gender, socio-economic differences and perhaps, if samples are large enough, the differences within and between countries. As part of the NCD project, there is great support for integrated country action, meaning that COSI surveys should ideally connect with other surveys, the action plans and future in-country planning. Another important factor is that COSI is truly European, the NCD project focuses a lot on Eastern Europe and Central Asia, which has the highest burden, but it is important to have projects that cover the whole of Europe. These provide an opportunity for exchange of best practice, training and capacity building and collection of comparable data across Europe, while making a contribution from the European region to global surveillance data. It is very important that COSI data be widely disseminated, in order for it to actually make a difference within countries.

João Breda, WHO Regional Office for Europe, closed the introductory session by conveying thanks to the Russian Federation's Ministry of Health for all its support to the area of nutrition and physical activity in Europe. Their support is very important for COSI.

COSI is now reaching an age where it is now almost adolescent (nearly 10 years old). The participation of 32 countries in the meeting shows that more and more countries are becoming involved. Only those working in the field understand the challenges in setting up such a project and to keep it going for a decade. The best example and inspiration for those who are starting now is to look at the countries that have been involved from the outset. Those countries involved since the beginning are well aware of the difficulties and how tough it is to keep the project going in terms of funding and support, in the face of changing politics and policy priorities. COSI members have to be commended for keeping the issue very high on the agenda – this is one of the Initiative's major successes.

COSI is also leading the way in global terms. It is a very good initiative and it serves as a potential example for other parts of the world. COSI members, new and old, can be proud of their involvement in something unique and groundbreaking.

It is important to recognise that growth comes with pain, and it is not that easy. Expansion will make the project more difficult to manage and some strategic thinking is required. It is time to discuss good management practices and to explore the best creative solutions to manage the expanded COSI, given that membership is approaching two-thirds of the countries in the Region.

The current boost in COSI is very much due to the support of the Russian Federation. COSI welcomes the Russian Federation and is happy to provide any support needed. Thanks are due to all who have contributed to this successful initiative.

The introductory session concluded with a round of participant introductions.

## Challenges and opportunities towards ending childhood obesity in Europe

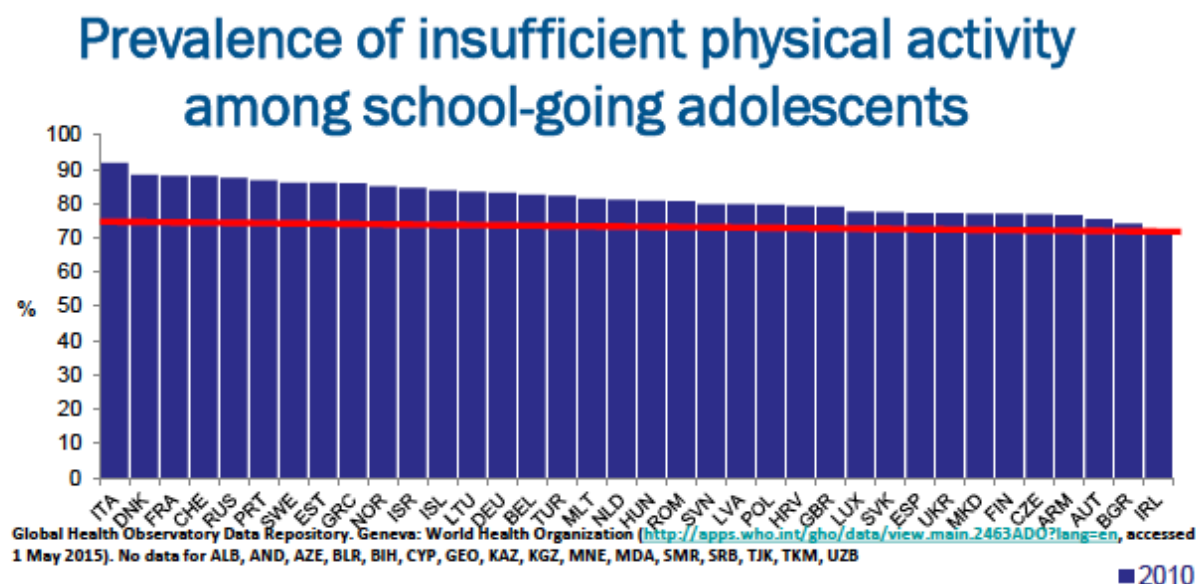
João Breda presented an overview and the challenges and opportunities related to ending childhood obesity in the WHO European Region. The situation in the European region can be linked with global developments, such as the Commission on Ending Childhood Obesity (ECHO). This Commission came up with six main areas of recommendations and these can be linked to the current situation and challenges in the Region.

### Challenges

Childhood obesity is clearly a very real problem and there are many challenges. There are few, if any, other serious health problems from which more than 20% of children suffer (except, perhaps, sporadic respiratory infections). Even where prevalence is around 20% overweight, this is still a very problematic situation with serious long-term consequences.

It is important to acknowledge problems with diet-related behaviours and the epidemic of inactivity in Europe. In adolescents, more than 70% in all countries do not achieve the WHO recommendations for physical activity.

Figure 1 Prevalence of insufficient physical activity among school-going adolescents

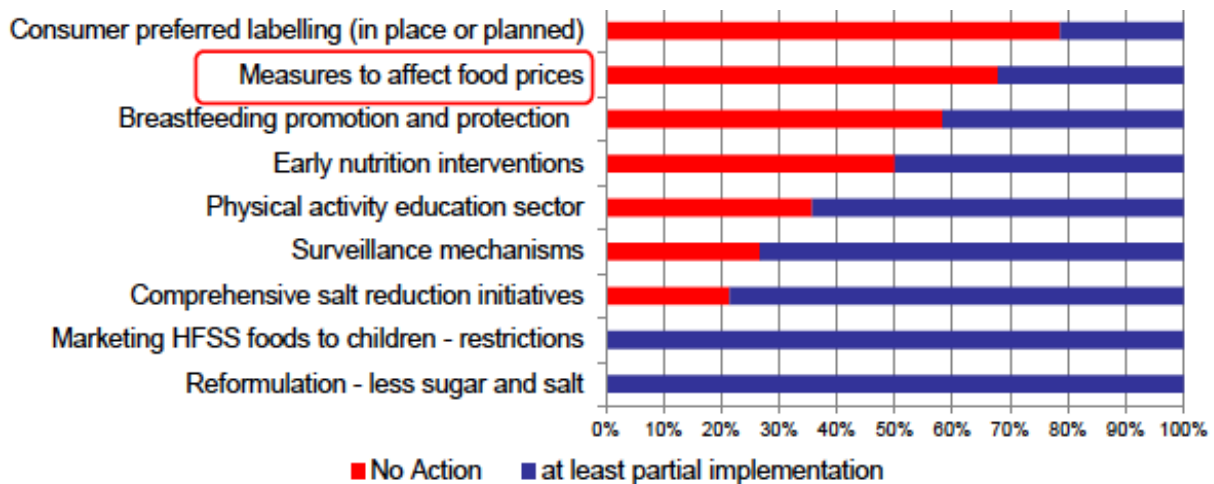


In addition, there is often a socioeconomic gradient to obesity, even if it varies between countries. Overweight and obesity affect different socioeconomic groups differently, and the equity dimension is really serious and complex. There have been some attempts to use COSI data to explore these issues, but further work is needed on the issue of equity and tackling inequalities, a main pillar of Health2020.

Another challenge is that the mix of policies that countries have implemented is far from perfect. valuable labelling initiatives have not even been partially implemented in the majority of countries.

Figure 2 shows that there are many gaps in policy implementation – for example, measures that affect prices (e.g., taxes and subsidies) and valuable labelling initiatives have not even been partially implemented in the majority of countries.

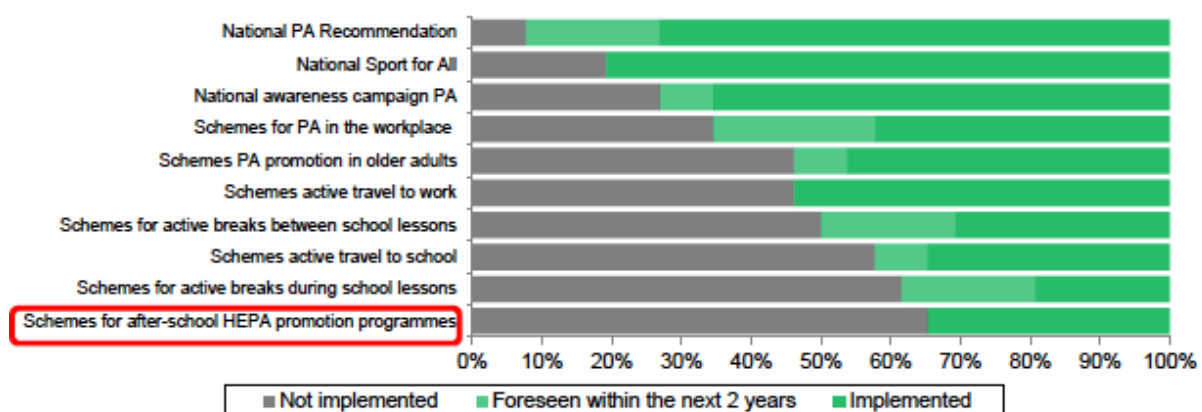
**Figure 2 Policy implementation in the European Region**



The same problem exists with physical activity – while most countries have some kind of physical activity recommendations, for example, very few have schemes for children to get engaged in physical activity outside the school context.

**Figure 3 Physical activity policy implementation**

### Overview of policy actions to promote HEPA in the EU



\*No data for Bulgaria and Greece

Overweight and obesity are now linked into global processes such as the Sustainable Development Goals, the Rome Declaration on Nutrition and the UN Decade of Action on

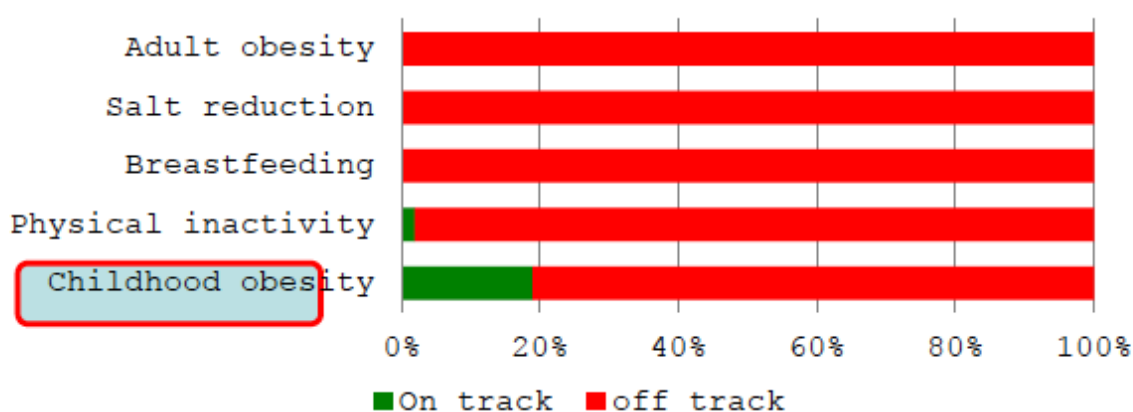


Nutrition. There are also challenging targets around adult and adolescent obesity as part of the global NCD targets, along with a global World Health Assembly target for childhood obesity.

On the basis of current trends, no countries in the Region are on track to meet the targets for adult obesity, salt reduction and breastfeeding, while a very small number are on track to meet the targets for physical inactivity and childhood obesity by 2025 (Figure 4). Achievement of the targets to which everyone has signed up remains a tremendous challenge.

**Figure 4 Progress towards global nutrition and obesity targets**

## WHO European Region MS achieving global targets around nutrition & physical inactivity by 2025 - updated



### *Opportunities*

There are also, however, great opportunities in the European Region. The Regional Office has a very strong mandate, meaning that WHO is taking action that Member States requested. Since the 2007 Ministerial Conference on obesity in Istanbul, the Regional Office and the Member States have produced a number of relevant policies and documents that have reinforced the importance of tackling diet, physical inactivity and obesity.

The Food and Nutrition Action Plan was adopted and has been in place since 2015. In addition, a regional strategy on physical activity – very specifically requested by Member States and unique among the WHO regions – has been in place since 2016. These documents give a strong policy framework and mandate.

The endorsement by the WHA of the ECHO report is really relevant for COSI, confirming that many of the actions being taken in Europe are the right way forward.



The first area highlighted was ‘promote intake of healthy foods’, although it can be seen from that chapter of the report that there is also a strong emphasis on limiting unhealthy food. This area links very nicely with priority 1 of the European FNAP on creating healthy food and drink environments. European countries have been working quite intensively in this area – notably on reducing some of the harmful elements of the diet if consumed in excess (fat, sugar and salt). In the Commission’s report topics such as taxation are highlighted, and some of the European countries are testing fiscal instruments, particularly on sugar-sweetened beverages.

The document highlights some priority actions:

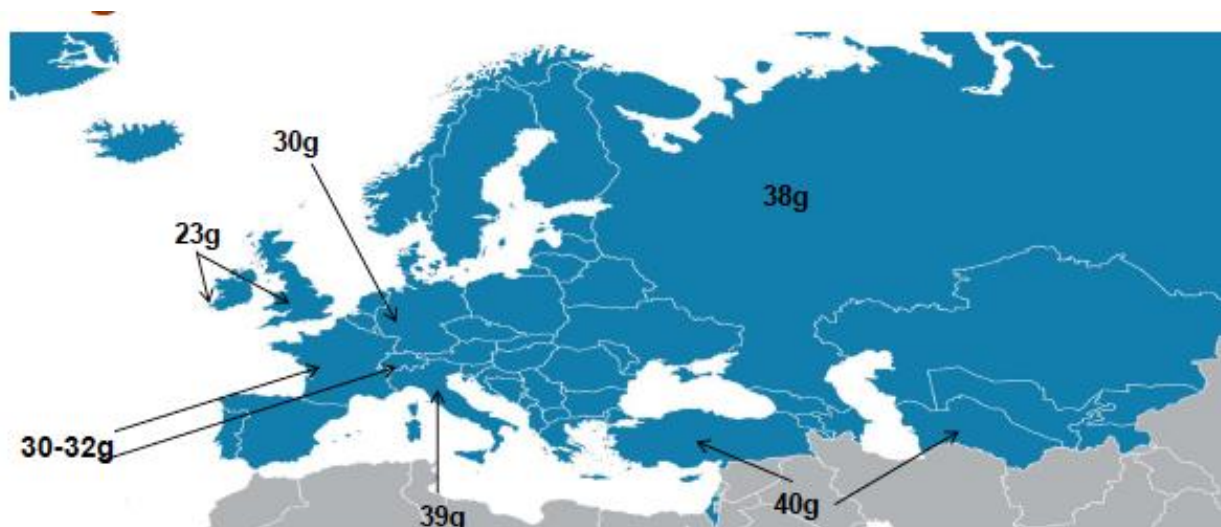
- Reduce children’s exposure to food marketing
- Fiscal measures and price policies
- Consumer-friendly front-of-pack labelling
- Food product reformulation; calorie reduction, serving sizes
- Healthier food environments in schools, etc.

WHO has been working intensively on improving the quality of diet in Europe on issues such as nutrient profiling, using price policies to promote healthier diets and eliminating *trans* fats. Evaluation of initiatives implemented is underway, and some, such as the health product tax in Hungary, are showing promising results.

This is all to underline that this first area of action in the Commission’s report covers this wide range of policies. There are a handful countries in Europe that are testing fiscal initiatives and doing very well. Similarly, there are many countries in Europe where action is being taken to control food marketing to children. Evidence has been collected and the last systematic review in

January this year consolidated all the evidence we have. So, we now have strong ammunition in terms of tackling this issue in the region. The Regional Office developed the nutrient profile model for the purpose of controlling marketing of HFSS foods to children and many countries were involved in the development and testing. This has been an important step. We have a wide region with very real differences – in obesity prevalence and in the nutrition composition of typical foods. Figure 5 shows the differences in sugar content of one a very famous soft drink across European countries, which contains just over 20 g in the UK compared with 40 g in Turkey, Turkmenistan and Russia. This is one of the advantages of countries working together, because collaboration can identify and tackle such problems. Reformulation is another key issue, also mentioned in ECHO report.

**Figure 5 Sugar contents of a popular brand of soft drink in various European countries**



Labelling is another area of unfinished business. It is proving to be difficult to move forward in implementing different systems that are better for consumers.

The second ECHO area is promotion of physical activity. As mentioned previously, the Region has a Physical Activity Strategy. The many areas of the PAS 2016-2025 are important for the issues of childhood obesity being discussed today. Sedentary behaviour might also be a specific entity that needs to be specifically addressed, as Finland and Portugal are already starting to do.

The third area of the ECHO report is the issue of preconception and pregnancy care, which corresponds to the second area of the FNAP (promote the gains of a healthy diet throughout life, especially for the most vulnerable groups). One of the Regional Office's most recent initiatives was a review of important elements of maternal nutrition throughout the region, and a report will be launched in Latvia in late June. Work on this issue has highlighted that countries would like more support from WHO in this area in order to develop guidance on diet and physical activity during pregnancy. Currently, there is enormous heterogeneity in guidelines. This also links to breastfeeding and complementary feeding. WHO is conducting a project looking at foods and baby foods in some countries and has identified some products for infants and young children that are of real concern (e.g., with more than 30 g of sugar). This has important implications for establishing later tastes and preferences.

ECHO also highlighted schools as another area for action, and this is very welcome.

The final area, of weight management, is also very important, given the very alarming prediction that *severe* obesity will increase to affect close to 10% of women globally. Some COSI members have identified prevalence levels of around 3-5% for severe obesity in children. It is very important and welcome, therefore, that the Commission has addressed this. It will be important, and challenging, to ensure that health professionals are trained and equipped with the skills to manage this area.

## **NCD surveillance initiatives in the WHO European Region**

Enrique Loyola, NCD Project, WHO Regional Office for Europe, presented an overview of NCD surveillance initiatives in the region.

Since the early 2000s, or even before, the situation in the Region NCDs have been the main cause of death in the European region and, if anything, it has been increasing in last 12-15 years.

Regional trends in overall premature NCD mortality show a decreasing trend in NCDs, but a number of countries have a high avoidable burden and large gender gap. The Eastern European countries have a risk that is three times higher than the risk of NCD mortality in EU Member States. If 2010 trends (baseline for the global NCD targets) were to remain until 2025, most of the countries in the Region would reach their target of a 25% reduction in NCD overall mortality. However, there is a very dramatic gradient from east to west in terms of probability of dying – a 30 year old in certain parts of the Region has a 30% chance of dying before the age of 70 because of NCDs. There are also important differences in gender – levels of mortality in men are at least three times higher than those for women. Importantly, irrespective of where countries are ranked, those with the highest prevalence are growing much faster than any other countries in the Region and will converge with their peers a lot faster.

As mentioned previously, there are nine global targets in relation to NCDs. There are different types of target – those targeting premature mortality (under 70), those related to risk factors and those relating to health services. A set of 25 indicators has been developed to assess and monitor progress. Initial reflections on data sources for the targets have taken place. The most common ones are related to mortality and morbidity, from the basic vital statistics systems and the cancer registries. Some of the other information can be collected from existing instruments, such as the integrated, multi-risk factor surveys known as STEPS. These surveys include alcohol, tobacco, diet physical activity and are a very efficient way of collecting information. There are some indicator areas not covered by STEPS (e.g., physical activity in adolescents, tobacco use in adolescents) because it only includes adults (18+). There is a need, therefore, to think beyond these instruments and explore where data can be found on adolescents (physical inactivity, tobacco, obesity and overweight).

Other methods for collecting information on NCDs that may be required include surveys, innovative and technological approaches (including big data, electronic health records, GIS) and statistical modelling.

Population-based surveys are essential for surveillance needs. These may be disease- or risk factor-specific surveys (e.g., Global Adult Tobacco Surveys (GATS), Global Youth Tobacco Survey (GYTS), COSI). Currently many European surveys are very specific, and there is an opportunity to bring together information about risk factors (e.g., STEPS, EHIS). Other surveys are enhanced in terms of scope and risk factors – objective measurements relating to risk factors

(e.g., measuring children, adults blood sugar, obesity and CVD risk factors). The majority of surveys concern either children, adolescents or adults, and it may be time to consider integrating the different age groups. COSI is a good example where it would be valuable to link the situation in children with the status in adolescents and adults.

One of the most important surveys providing information about children and adolescents is the Health Behaviour of School-aged Children Survey (HBSC). Very helpful, detailed information is provided through the HBSC. Throughout the region, for example, around 20% of children consume soft drinks at least once a day – but there are major differences between the highest and lowest countries (e.g., 1-2% in Finland which has a tax that affects soft drinks compared to other countries with around 40%). Data on moderate physical activity also show major differences between countries and that girls show much lower levels of moderate physical activity than boys. The levels of children with BMI > 25 (overweight and obese children) are very high, particularly among boys – with levels of 38% in boys and 22% of boys and girls combined being obese or overweight. This is a major challenge of huge concern. The survey shows that relatively low proportions of children (<15%) are engaged in weight reduction behaviour.

Two other big areas that WHO is starting to explore include:

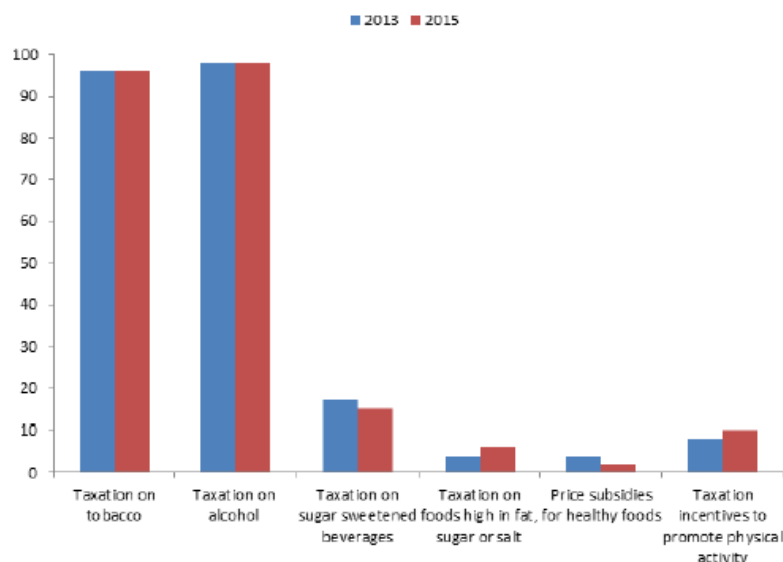
- The use of ‘big data’ (that is, data collected on a mass scale in our lives) allows collection of information that is not normally available.
- Electronic health records (EHR) – Although such systems are in the very early stages in most of the countries in the region, with some exceptions (e.g., Denmark, Estonia, UK), they will provide information about risk factors and the effectiveness of interventions, as well as enabling monitoring of inequalities.
- Statistical modelling – creating estimates and predictions for future disease progression.

Surveillance also needs to monitor countries’ progress in implementing commitments on introducing multisectoral policies to tackle NCDs. To date, progress on nutrition, obesity and physical activity is very disappointing in some areas. In the CIS countries, information from country capacity and response surveys show a disappointing lack of progress on areas such as taxation and food marketing. There has, however, been some good progress in terms of policy development in NCDs across the region, although there are still some gaps between developing policies and implementation.

Figure 6 shows that policies are implemented relatively well on tobacco and alcohol, but there is much poorer implementation of taxation on SSBs, HFSS foods and that price subsidies on healthy foods are even lower. Incentives for physical activity are still in the very early stages.

**Figure 6 Implementation of taxation policies**

**Countries having implemented the following fiscal interventions, 2013 and 2015**



In conclusion, some progress has been achieved, but all these different data sources need to be implemented in the countries and the information generated used to build a comprehensive assessment of the NCD situation in terms of impact, risk factors and health system responses.

### *Discussion*

There was discussion of whether the huge difference in imposition of taxes on tobacco and alcohol compared to on HFSS foods is only because this is an area where action was taken much earlier or whether there other lessons to learn. While it is certainly true that there is a long history of taxing tobacco and alcohol taxation products, it is also important to recognise the differences. It is much harder to negotiate the introduction of this type of policies in relation to foods. Common counter-arguments include the fact that, unlike alcohol and tobacco, food is necessary for survival and that such taxes are regressive and therefore will impact on the poor. In addition, many stakeholders challenge the classification of foods as healthy or unhealthy. As this policy area develops there is progress, for example, in better targeting of foods. Although diet-related fiscal policies present challenges they are a powerful tool available to governments.

## **Global NCD surveillance and population-based prevention – can we scale-up COSI to a global dimension?**

Leanne Riley, WHO headquarters, gave an overview of global NCD surveillance and population-based prevention and explored the idea of whether COSI can be scaled up globally.

The inclusion on NCDs in the Sustainable Development Goals adopted in September 2015 is tremendously important. SDG 3 promotes good health and well-being, and for the first time ever a target on NCDs has been included. The NCD target of 25% reduction in mortality in 2025 has been rendered more ambitious – a one-third reduction by 2030. Although Europe may be on

track to meet this target, most of the world is not. There are also many sub-targets related to NCDs, their risk factors and the health system response.

As outlined previously, there are also global targets and indicators on obesity:

- Halt the rise in obesity by 2025
  - Prevalence of overweight and obesity in adolescents
  - Prevalence of overweight and obesity in persons aged 18+ years
- No increase in child (under age 5 years) overweight by 2025
  - Prevalence of overweight in children under 5 years

While these targets may not initially sound very ambitious, they are actually among the most ambitious of all, given the currently increasing trends. In relation to adult obesity, current prevalence is 13% (10.8% in men, 14.9% in women), equivalent to 266 million obese men and 375 million women in 2014. Prevalence has been increasing over the past four decades, from a global prevalence of 3.2% in men and 6.4% in women in 1975. If the trends witnessed since 2000, there is almost zero chance of meeting the global target of halting the rise. If current trends continue, by 2025, obesity prevalence in men will be 17% and women up to 21%. We are very far from being on track for these obesity targets, particularly in adults.

In relation to childhood obesity, the picture is less clear. WHO has carried out some important work on tracking obesity in under-5s – currently at 6.7% and on the increase. This is no longer just a problem for high-income countries – in terms of absolute numbers there are now more overweight and obese children in LMICs than HICs. As countries undergo the socio-economic transition they often face a double burden of undernutrition and overweight/obesity. It is also known that undernutrition in early life puts children at much higher risk of developing obesity later in life, especially when their diet and physical activity patterns change.

To help address this, the WHO Director General announced the establishment of a high-level commission on ending childhood obesity at the World Health Assembly in 2014. Specifically in relation to surveillance, the ECHO report – which was adopted by the WHA in May 2016 – recommended that:

- Member States ensure data collection and set national targets;
- WHO Secretariat reports on progress;
- NGOs contribute to the development and implementation of monitoring and accountability mechanisms.

Globally, WHO has been monitoring adolescent BMI since 2003 through the Global School Based Student Health Survey (GSHS) that measures height and weight in school-going adolescents aged 13-17 year olds in over 80 countries. WHO has been producing global, regional and country comparable estimates of adult overweight and obesity, since 2004, now in collaboration with NCD RisC. An initiative is now underway to produce country comparable estimates of child and adolescent (5-19 year olds) overweight and obesity. A country consultation in late 2015 is now being updated, and data are scheduled for release later in 2016. Similarly, data are available on children under five. At the global level, therefore, there is a major gap in data for 5 to 10-year-olds, and that makes estimation a challenge for this group.



WHO headquarters has been looking at COSI's activities and considering the potential for scaling up of COSI or a similar initiative. Many countries have some sort of screening programme at school entry age, demonstrating the extent of interest in measuring that age group. Other than COSI, however, there are no standardised systems in place for routine measurement. There has been discussion about how any initiatives related to childhood obesity surveillance could be integrated into, and harmonised with, existing surveillance systems. There is some reluctance to develop single-issue surveillance systems in many countries. It is worth considering the other issues captured through opportunistic screening in schools (e.g., oral health, sight, hearing, immunisation status, physical inactivity patterns, etc.) and the discussions on possibly expanding the scope of COSI are pertinent.

At the global level, therefore, WHO is very keen to hear about challenges, opportunities and key lessons from COSI. It is hoped there will be an opportunity to scale up this sort of work and expand it to other regions, and other regions would certainly be interested to hear about the work of this strong, focused network. In the future, therefore, it may be possible to establish something with a global focus and the European region is clearly leading the way.

## **Expanding information on diet in the context of COSI**

Nadia Slimani, International Agency for Research on Cancer (IARC, WHO), France, gave an overview of the GloboDiet initiative to help countries with dietary monitoring.

Given that the global NCD burden is largely diet-driven, there is a clear need for a standardized methodology and research infrastructure to support action on diet. IARC-WHO established the GloboDiet initiative to provide an international framework to help countries with dietary monitoring, with a strong science-based and partly-standardised approach, to provide comparable and detailed food consumption data for multiple purposes, including nutrition surveillance, research, prevention and policymaking.

The GloboDiet Europe branch is the most advanced with seven European countries using it in their national surveillance systems and one further country currently developing it. The background to the initiative was the development, in 1995, of a highly standardised 24-hour recall method across EU countries, which was then validated for face-to-face and telephone interview alternatives and adapted into a version for children. This has been tested in different epidemiological and surveillance settings and populations before being considered for extension beyond Europe, with pilots in Latin America and Asia.

To summarise the different methods:

- 24-hour recall interview-based method is used for adolescents, adults and elderly;
- A method has been adapted more specifically with children, to be used in combination with food records.

As well as being individually highly-standardised methodologies, they are also compatible. This is very advantageous to enable comparisons across countries, continents and population groups. This international tool has been validated in depth, particularly in the context of surveillance, using biomarkers, checked with ecological correlation, country correlation and population distribution curves. This is very valuable to counter the arguments of those critics who are sceptical about information about diet.

Specifically in relation to children, the standardised methodology has been adapted for children. EFSA commissioned the Pilot Study for the Assessment of Nutrient intake and food Consumption Among Kids in Europe (PANCAKE) in 2009 to develop, test and implement a data entry system derived from, or compatible with, GloboDiet to complement food records in children. This has been tested in two pilot studies in Belgium and the Czech Republic in a total of 376 children aged from three months to 10 years using two different methods (one consecutive three-day food diary with data entry afterwards; two non-consecutive one-day food diaries with data entry during a completion interview). The main conclusions were that the GloboDiet DataEntry application was positively evaluated, and that two non-consecutive one-day food diaries with data entry during a completion interview provide a more detailed description of consumed foods than a three-day diary.

Currently, the food records are available on paper but in the future these may become electronic and combined with a data entry system. These different tools can be adapted to different age groups.

To give an example of implementation, the Netherlands used GloboDiet in surveillance. They followed the recommendations of the PANCAKE project by having two non-consecutive food diaries. In the Netherlands this method has provided results relevant to WHO dietary indicators:

- Percentages of different age/gender groups meeting the fruit and vegetable recommendation;
- Percentages of different age/gender groups meeting the saturated fat recommendations.

Such information is clearly very useful for policy-makers, to ensure that action plans are appropriately targeted, and can easily be expanded to other indicators.

Another example, is Malta's experience trying to integrate GloboDiet children in order to optimise Malta's surveillance by integrating food and health surveillance. The two non-consecutive 24-hr food diaries and the GloboDiet data entry completion were used in Malta. However, as they had also started to complete two 24-hr recall studies this will enable comparison. The experience in Malta should provide valuable lessons for integrating food and health and for exploring how GloboDiet could be integrated into COSI.

In the COSI framework there are some dietary questions, as well as anthropometric and other measures and targeted questions. For the time being the information on diet concerns a few, selected food items and dietary indicators. It would be possible, at least on a sub-sample or on a voluntary basis, to integrate the GloboDiet open-ended food records and data entry. This, in addition to the nutrient databases, could lead to very comprehensive estimates of dietary information. Ideally, this could be complemented with biological factors and biomarkers.

Research infrastructure is another important element – there is a tendency to focus on the dietary tool, but the infrastructure is equally vital. This includes issues like data cataloguing and documentation, data handling, capitalization, access and sharing. This will be an important area for further research and for any international initiatives.

Another way to optimise cost-effectiveness of activities would be to develop, under a broad framework like WHO Europe or COSI, a system whereby the same standardised and detailed data for different projects and multiple uses at the national, regional and international levels.

In conclusion, it should indeed be possible to expand a dietary component to COSI and to integrate food and health surveillance systems in relation to nutrients. There needs to be greater awareness that dealing with nutrition is neither simple or cheap, and that investment with resources is necessary. In order to optimise the cost-effectiveness of these investments, it is important to join forces and ensure that collected data serve multiple purposes and that are highly reliable. This needs to be backed up with research infrastructure and the development of a strong, sustainable and extendable international framework to support Member States. It is also important to reduce fragmentation and duplication of work and to integrate food and health surveillance systems, possibly by piloting the use of GloboDiet methodology in surveillance in COSI countries, enabling development of a roadmap for extension to other countries and development of appropriate sustainable and affordable models.

### *Discussion*

While there was widespread recognition of the importance of high quality dietary information, there was considerable discussion of the potential difficulties with collection of dietary information as part of COSI. Some countries consider that this would complicate COSI's work too much and that it would duplicate the work of existing institutes that collect data on diet.

There were also concerns about possible difficulties in obtaining permission to carry out any work involving biosamples in children. Dr Slimani clarified that inclusion of biomarkers is not necessarily a mandatory component of the surveillance – it does not have to be included nor does it have to be conducted on the whole sample.

A related area of difficulty is data protection – it was suggested that it would be very helpful if WHO would write to governments to ease the protection of personal data for health studies. Currently, navigating the data protection laws involves costly collaboration with lawyers and the issue warrants discussion at a very high level.

Others were of the view that this type of data collection should form part of the medium- to long-term vision for COSI. Dr Slimani acknowledged Member States concerns about feasibility, this is undeniably a complicated area of surveillance and this is why it is often neglected.

The experience of those countries that have tried this methodology should provide some valuable lessons. Malta decided to try GloboDiet in order to have good food consumption data to design interventions to tackle childhood obesity. The trial with the validated tool, done in conjunction with IARC, was done with parents in their own homes. Parents welcomed the interventions by trained interviewers, giving them the opportunity to get some advice in the home. Each country will need to find the best way to implement this in their own context.

Austria also had experience of working with IARC on food consumption, and had found the experience challenging but feasible and very valuable. It is important to explore methods (some kind of online platform) for “selling” the research to encourage participation and, potentially, unlock the much-needed funding.

There was discussion of the prospect of real harmonization of food composition tables in Europe. This remains a difficult issue, but it should be possible to resolve it in due course. GloboDiet collects the data, as detailed as possible, independently of nutrient databases, which means that the collected data will always be standardised across countries. If there were a strong movement for a major European project, then the EUROFIR would have to cover this part with the Member

States and food database compilers. There is potential for smart applications to ease data collection.

It is worth noting that one of the strengths of COSI is the possibility to add additional elements, on a voluntary basis, to the very simple set of core elements. The inclusion of this issue on the agenda is in no way an attempt to push Member States to incorporate this element. Rather, it is intended to facilitate sharing of recent developments and other possibilities, and to trigger discussion on this important issue.

## **Progress update in the context of the Food and Nutrition Action Plan and the Regional Physical Activity Strategy – the salt (ESAN) and reducing marketing pressure on children action networks and physical activity**

João Breda gave an update on other activities in the WHO Region on issues related to childhood obesity.

In relation to physical activity, WHO produced a set of 28 country profiles – as part of a collaboration with the European Union – on health-enhancing physical activity. These gave an overview of the epidemiological situation and policy developments, as well as identifying success stories. WHO is now in the process of doing this for the non-EU countries in the Region. These country profiles are available to download and will be available in the portal and via the smartphone app. They are the result of extensive discussions on surveillance of physical activity data. WHO has also helped countries to develop physical activity guidelines and to develop tools, such as the second HEPA Policy Analysis Tool (HEPA PAT 2), which is now available for countries to use.

In relation to food marketing to children, Portugal recently hosted the Marketing Network meeting (back to back with the salt network). The issue of digital marketing was very much on the agenda. The extent of marketing of foods to children through digital platforms is now very extensive and it is very challenging to monitor and tackle this. Methodology for monitoring marketing to children is one of the key areas for exchange through the marketing network – Norwegian colleagues and other Nordic countries are developing a process which can hopefully be adapted for other countries, and this will include these new platforms. While industry often claims that the EU Pledge is working and that falling marketing budgets point to the problem being solved, but this is really not the case – young children continue to be exposed to extensive marketing through these new channels. Portugal now leads this network of 28 countries (having taken over from Norwegians last year). It is encouraging to hear that countries are taking action – Portugal, for example, is introducing new legislation on marketing to children. EU countries increasingly recognise that the EU Pledge is rather weak and insufficient and further studies are being planned. The meeting also considered the issue of inappropriate marketing of foods for infants and young children, another important issue in relation to childhood obesity.

The European salt action network (ESAN) meeting was held back-to-back with the marketing network meeting in Lisbon. Colleagues in the Netherlands have modelled the prevalence gains for stroke and ischaemic heart disease associated with salt reductions. This is an interesting area for ongoing work. Analysis of the salt content of foods reveal huge differences in sodium content of products within product categories, highlighting how much progress could still be made. Research from WHO's Collaborating Centre in Australia presented a systematic review on

consumer acceptability of salt reduction – demonstrating that very sizeable reductions in salt contents are possible before consumers even notice any difference.

## **COSI success stories**

### **Portugal**

Ana Rito gave an overview of COSI experience in Portugal, a country that has participated in the initiative since the beginning.

In 2005, WHO reported that only 13 (25%) countries in the Region had nationally representative and validated data on obesity. Furthermore, methodological differences meant that there were several limitations to any meaningful comparisons of national data and made it very difficult to discern trends. The 2006 Ministerial Conference on counteracting obesity called for a surveillance mechanism to be established and COSI was established in response.

For Portugal, this was highly important. The then Minister of Health was very keen to raise obesity on the political agenda. The first step was establishment of a Platform Against Obesity between 2007 and 2009. This Platform was then broadened into the National Program for Healthy Food Promotion and COSI was integrated first into the platform and then into the national programme.

For Portugal, COSI has been a wonderful and a very enriching experience. The first COSI meeting took place in Portugal with the first 13 participating countries.

The COSI aims and objectives are:

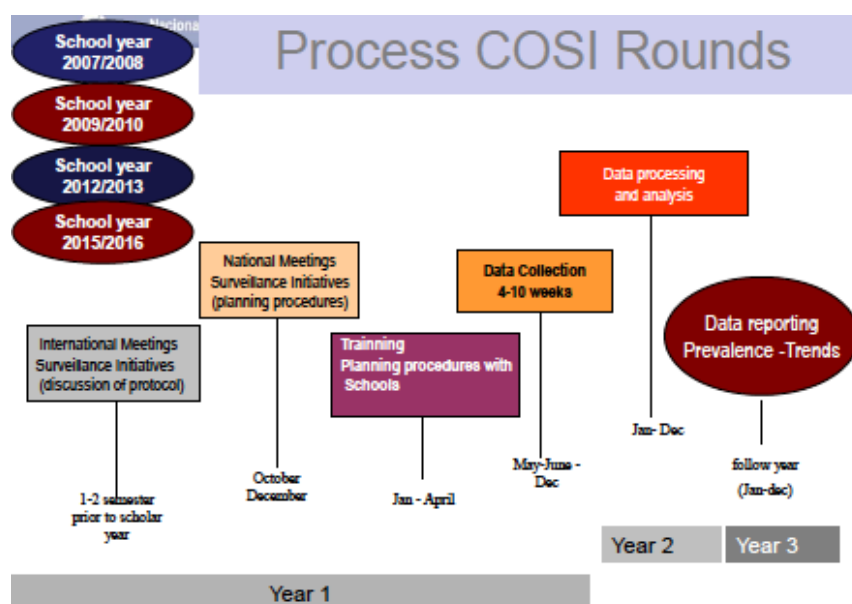
- To implement a harmonized nutritional surveillance system across the WHO European Region - collection, analysis, interpretation and dissemination of descriptive information for monitoring excess body weight;
- To measure trends in overweight and obesity in primary school children - to fill the current gap in available cross national comparable data on primary-school children aged 6-9 year-olds and to have a correct understanding of the progress of the epidemic;
- To stimulate and monitor the policy response to the emerging obesity epidemic.

The number of participating countries has continued to grow, from 13 countries in the first round of data collection to 35 countries now participating in the fourth round of data collection.

In terms of organising the data collection, activities are organised in Portugal as shown in

Figure 7.

Figure 7 COSI data collection in Portugal



The first year in the data collection round is when the preparation and collection takes place, followed by two years of data processing, analysis and reporting. Although this specifically refers to Portugal it is typical of how data collection is organised in other COSI countries.

The organisational structure follows the COSI protocol, with the involvement of national institutes and regional coordination teams. This is done in Portugal without any additional funding—it is all supported by the participating institutions using their own resources. Each round involved around 400 COSI personnel.

Each country can choose the age class to measure. Portugal decided to work with 7-year olds, meaning that children from first and second grades have to be included. 189 schools participated in the first round. Portugal has opted for a sentinel approach – in other words the same schools were kept through the first three rounds of data collection, the fourth round uses a new sample. Around 400 classes were involved, with participation of around 6,000 children and a participation rate of around 80%.

The 2013 data showed that Portugal remains in the top six countries, in terms of prevalence of childhood obesity and overweight, but the trend is showing a slight decrease (also seen in some other Mediterranean countries). This trend data is really very important for Portugal in order to set policy.

The COSI data shows regional variations within Portugal – in general, the more rural regions in the interior of Portugal have higher prevalence. The Azores has actually been the region with the highest prevalence, since the first round. There has been a great deal of work with the islands to identify the etiology of this high prevalence, and this has become a Portuguese success story. The regional health director implemented a new health plan, with a specific childhood obesity centre in each health unit involving trained nutritionists. After eight years the prevalence of obesity and overweight decreased from 22.7% in 2008 to 10.8% in 2013. This was an excellent example of policymakers reading their data and then deciding to take action.

Other elements of COSI's success include many publications of COSI data, further exploration of associated factors (e.g., positive association between low maternal education and childhood overweight and identifying that 80% of children eat a ready-to-eat cereal at breakfast, most of which do not meet the WHO regional nutrient profile model).

In relation to marketing, COSI participants are invited to participate in a European comparative study of the content and marketing techniques of food brand websites across the WHO COSI countries. The study, to be conducted in partnership with Dr Emma Boyland at the University of Liverpool, aims to:

- Evaluate compliance with the EU Pledge by studying the websites of signatory companies (including those for their product brands).
- Evaluate the extent to which this self-regulatory approach meets the requirements of the WHO recommendations on marketing to children.

Participating researchers will receive a detailed protocol (step-by-step guide) and training via Skype. Any countries interested in participating are invited to talk to Ana for further information.

## Italy

In Italy COSI is known as *OKkio all SALUTE* (watch your health) using a play on words (incorporating OK into Ochio) to appeal to children. COSI started in Italy after the 2006 Ministerial conference and other key developments in Europe. In 2007, the Italian programme *Guadagnare salute* (Gaining Health) decided to promote creation of Italian COSI. There was vigorous advocacy and networking, which was very valuable to be able to achieve what has been done so far. The work then started with the preparation of protocol, questionnaires and manuals followed by a pilot study to test everything. Then, in 2008, prior to the first round of COSI there was major training and distribution of measurement instruments. There was a big budget from the Ministry of Health which allowed purchase of 450 kits of scales, stadiometers for distribution around the country so that all regions can use the same instruments. This was a big investment at the beginning, but it is very, very useful to enable collection of highly comparable measurements. In 2010, 2012 and 2014 data was collected and the 2016 data collection round is ongoing.

The network of *OKkio alla SALUTE* is very important, involving the Ministries of Health and Education, 21 regional coordinators, 150 local coordinators for local health units, 1000 examiners and school staff. The National Institute of Health and a scientific and technical committee are also involved. A large number of examiners are involved because the study has such as big sample (c45,000 children, 45,000 parents). None of these examiners are paid, rather the work is conducted as part of their work duties.

Every time data is collected, the national coordination team (7 people) train the regional coordinators who then train the local health unit staff who, in turn, train the examiners. The examiners contact the schools and train the teachers. In total about 1200 health professionals and 2500 teachers, who are very important because of their important role in disseminating information to children and families.

A new sample of around 45,000 is constructed for every data collection round. The very big sample size, bigger than required for national data, is used to be able to have representative data



for each of the 21 regions, thus enabling regional comparisons. The response rate is very good – 98% of schools and 97% of children and parents agreed to participate.

Data from 2008 to 2014, using both IOTF and WHO cut-offs, show a decreasing trend for both overweight and obesity. Levels in the south, where socioeconomic status is generally lower than in the north, are still very high.

Additional data were collected on other indicators including, for example, eating habits. These are important data for policymakers. The existence of around 10% of children who do not eat breakfast, a very high level of excessive mid-morning snacks, very low consumption of fruit and vegetables and daily consumption of sugar-sweetened carbonated beverages have been identified as elements of the problem.

The situation for physical activity and sedentary behaviour is also improving, but there are still worrying levels of children who did not do any physical activity the day before the survey (16%), who do not do any sport (18%), have a TV in the bedroom (42%) or spend more than two hours per day on TV or games (35%).

The project has worked intensively on communication of the results, as the first step in promoting awareness and empowerment. After each round, reports are produced for health workers, teachers, parents, schools and family paediatricians. Most importantly, each child receives their own leaflet with results and some advice. A national conference is organised after each data collection round and the website is continuously updated (<http://www.epicentro.iss.it/okkioallasalute/>).

Another important of the Italian COSI system is the inclusion of data collection on other issues, such as oral health and hygiene.

In, conclusion, over the last nine years the Italian COSI has been able to:

- estimate the prevalence of childhood overweight and obesity among Italian children and to study the main risk behaviours (nutrition, physical activity, sedentary pastimes) in order to promote healthy lifestyle;
- create a network of professional workers in all Italian regions;
- train an increasing number of professional workers and teachers;
- improve the communication of results to the different stakeholders;
- increase the awareness of the problem of childhood obesity and promote regional projects.

All of this has required a lot of preparation and work, but it is certainly worth doing and is contributing to the improvement of the health of Italian children and the general population.

### *Discussion*

There was some discussion of the possible reasons for the halt in the increase in obesity and overweight in children in Portugal and in Italy. What can be discerned from the data about the reasons behind this change?

It is important to always bear in mind that when we observe, we intervene. So, within families being studied and the participating schools there may be raised awareness which leads to

changes. This is part of the answer. The other part is that education plays a crucial role – improving education in turn improves understanding and changes behaviour. Keeping childhood obesity on the political agenda at the national and regional levels – particularly in Mediterranean countries where initial data on the current extent of the problem were very shocking – is important for achieving improvements. National and regional plans have been introduced to take action and address the issue.

It is very useful to hear about these success stories in developing and implementing the processes. It is hoped that COSI has contributed to the action plans in Italy and Portugal which have been very comprehensive, tackling a very wide range of issues.

## **Progress report on 4<sup>th</sup> COSI data collection, WHO support, challenges and successes**

Jelena Jakovljevic presented a progress report on the fourth round of data collection for COSI.

Between the third and fourth rounds of data collection, there have been a number of changes following requests made at the Dubrovnik meeting and further discussions among the Advisory group.<sup>1</sup> The agreed changes were to reduce the number of forms to three: Child, School and Family (optional). In the Child and School forms there are now some mandatory and some optional questions. It was important to bear in mind the need to achieve balance and compromise, so that it remained possible and feasible within schools, while adding additional voluntary questions to produce optimal data collection depending on the country context.

Another advance was the implementation of the new database management system – OpenClinica. The system is now up and running.

The number of children measured has continued to increase. In Round 3 nearly 260,000 children were measured and the numbers will grow considerably in the coming round of data collection. The number of participating countries is also still on the rise – as many as 37 might participate in the fourth round.

Several countries have received support through implementation workshops and trainings. Since September 2015, Russian Federation, Croatia, Estonia, Kazakhstan, Montenegro, Poland and Turkmenistan have been visited. Thanks are due to the longstanding members of COSI that have participated in this capacity building and visited these new countries. Support has also been provided to countries on sampling, equipment and translations for countries in need. WHO remains ready to discuss with any countries that need support.

Eight countries had completed the fourth round data collection by June 2016 (Croatia, Ireland, Italy, Latvia, Kazakhstan, San Marino, Serbia and Slovakia). This is not the complete list of countries participating in the fourth round.

WHO also supports the publication group, a special sub-group of COSI experts involved in coordinating and working on publications. The group is not exclusive, everyone is welcome to participate.

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<sup>1</sup> Marta Buoncristiano, Dr Vesselka Duleva, Dr Sibel Gogen, Dr Mirjam Heinen, Dr Paola Nardone, Dr Iveta Pudule, Dr Ana Rito, Dr Gregor Starc, Dr Angela Spinelli, Dr Nazan Yardim.

### *Electronic data recording*

In previous rounds there was no common system for data recording, and each country was asked to send a copy of the data file to the WHO Regional Office which was responsible for combining all the files. This was not a problem when there were 13 countries, but is much more challenging when 36 countries are collecting data. The high level of heterogeneity in the data contributes to limiting the comparability of data among countries and makes the data processing phase at European level very long and complicated.

For the 2015/16 data collection a system was introduced that allows for either direct digitalization (through tablets, phones etc.) and an online system *or* paper registration first combined with an online system. The pros for an online system include that data is stored in one single place and it can be entered wherever and whenever, and that there are more options available for data management. The one disadvantage is that a good internet connection is needed.

Direct digitalisation versus paper recording first saves time, has less risk of errors and data becomes available immediately. On the other hand, internet connections and electronic devices are required, along with confidence in use of these devices. This very much depends on the country context and approach.

The system proposed by WHO for COSI is based on the use of two open source tools:

- OpenClinica – a web-based application to store data originally designed for clinical trials
- Lime Survey – a server-based application to develop and publish an online survey (for the Family form only).

The system has been developed by Trial Data Solutions. The combination of two applications is used because OpenClinica allows creation of a dedicated system for entering and storing data, but it does not allow management of the collection of information about families through a web survey, so this can be done using Lime Survey. Data collected through LimeSurvey can easily be transported to OpenClinica and stored there.

Gerben Vissen Rienk, Trial Data Solution, gave a brief overview of how the code book for COSI data on schools and children was transformed into OpenClinica and how, for some countries questionnaires were created in Lime Survey to enable families to enter data at home.

Currently, four countries (Croatia, Ireland, Kazakhstan and Slovakia) have completed data entry in OpenClinica and three further countries are in the process of data collection and entering in OpenClinica (Bulgaria, Portugal, Romania). In addition, several countries plan to use OpenClinica either for online data collection or data entry from paper forms (FYR Macedonia, Montenegro, Poland and Hungary and more). Portugal is the first country to use Lime Survey. This appears to be a relatively successful implementation of this valuable tool and any other participants wishing to use the system are encouraged to contact WHO, it is still not too late.

WHO support at the European level includes monitoring the data entry in OpenClinica and Lime Survey, data cleaning procedures, harmonization of estimates and combining all national data files. The COSI pooled data file will be validated.

Marta Buoncristiano gave a brief presentation about WHO support on study design, particularly in relation to sampling design and estimation phase.

In relation to how children are selected, four countries measure all children in the respective age group (Belgium, Malta, Estonia and San Marino), while all others include just a sample of children in the study. Most countries, therefore, start from the population and select a sub-group to be included in the study. This selection is a random selection. COSI uses a probability sampling approach, the best way to use knowledge about the population based on data collected on a sub-set of the population. The COSI Protocol identifies common rules for selection of children who will represent the whole population, and WHO supports countries in defining the sampling design and in drawing the sample. Countries are encouraged to contact WHO if they require any support.

Once data have been gathered, what do we know about the population? The estimation phase enables properties to be inferred about the population from the sample. The COSI protocol does not identify common rules to carry out this estimation phase. In previous rounds it was not possible to carry out this estimation phase for many countries. So, for this ongoing round, WHO is keen to promote the estimation phase in all countries and is ready to provide support to countries in this work. The reason that this is so important is because when the characteristics of a population are estimated from a subset of that population an error can occur. There are two types of error:

- Sampling error – caused by observing a sample instead of the whole population, and it is linked to sampling design and affects the reliability of estimates.
- Non-sampling error – this arises from factors other than taking a sample, e.g., coverage errors, response errors where there is a high level of non-response, mistakes in data recording, etc.

The estimation phase is one way to deal with both types of error and aims to produce unbiased estimates through sampling weights and calculation of the reliability of the estimates (e.g., standard errors, coefficients of variation and confidence intervals).

The methodological goal for the 2015-16 round of data collection is to promote the implementation of the estimation phase in all countries and to harmonise country-specific procedures as much as possible, in order to improve the comparability of data.

The following steps are being taken towards this goal:

- Collecting data on sampling design of each country through a specific form (study design and sampling strategy form) and assessing the level of heterogeneity among countries;
- Supporting countries in defining and carrying out the estimation procedures;
- Producing estimates (calculating and applying sampling weights) and also assessing differences among countries in terms of the level of reliability of estimates.

The proposed study design and sampling strategy form covers five sections:

- Targeted population and setting of environment;

- Study design: survey based on probability sample or census, sentinel approach or new sample at each round;
- Sample size: planned effective sample size, oversampling and children stratification;
- Sampling design: sampling units, stratification and probability of inclusion for each stage;
- Estimation phase: procedures to calculate sampling weights and reliability of the estimates.

Some countries have also started this process (Kazakhstan, Croatia, Slovakia, Romania, Portugal and Montenegro). If this form is agreed by COSI participants following this discussion, all other countries will be asked to start the process by filling the form.

### *Discussion*

With respect to sampling, schools may refuse to participate and the question was raised about what happens in such a situation if the schools are randomized. The rate of refusal can be taken into consideration in design and oversampling of schools can take place in order to have the right number of schools involved at the final count. An alternative is to identify some substitute schools to be included if schools refuse. The important point is that this substitution has to be planned when the sampling design is defined. The challenge is for new countries to know what kind of refusal rate there will be. In such cases, some oversampling should take place and also inclusion of some potential reserve schools.

There is a need to translate the family questionnaire into German. Lime Survey can work in any language. Participants are encouraged to provide details of the correct translation so that this can be verified. In countries where more than one language is spoken, there will be a drop down menu of languages so that countries can choose language from a selection. OpenClinica is set up in English and Russian, it is possible to have it, for example, German but that would be an additional task that would need to be discussed. Turkey would be happy to translate the Lime Survey into Turkish for other countries that want the survey in Turkish for migrant populations.

A question was raised about information dissemination within COSI, since not everyone had heard of the latest developments (e.g., OpenClinica, the three forms). In fact, all countries *should* have received the revised protocol and manual with the new forms. All new countries are only given the new protocol and manual.

The question was raised about what can be done with the family form where Lime Survey cannot be used. Data about the family (from the family form) can be entered in OpenClinica as well as children, if Lime Survey is not being used. This does not present a problem.

Portugal has been using OpenClinica and Lime Survey and has not had a problem. For the questionnaires, in order to facilitate the process both the Portuguese and the English questions were included in the paper format. In this way the examiner will enter the data in English, but can see the exact same question in Portuguese and English.

## **Country presentations on data collection and the results of the 4th COSI data collection round**

### **Russian Federation**

Dr Elena Bogova gave an update on COSI in Russia. The Ministry of Health of Russian Federation has taken part in COSI since 2015 and Professor Valentina Peterkova, Director of the Institute of Paediatric Endocrinology, is the Principal Investigator.

A first training course on COSI implementation was held in Moscow in March 2016. A national team of COSI experts has been constituted (60 paediatric endocrinologists, paediatricians and nutritionists) and training was provided by WHO representatives and other COSI participants.

Around 150 schools in Moscow and 3,000 7-year-olds are expected to participate in the study and data collection is scheduled for September-October 2016.

Future plans include educational programmes for children and teachers, training lessons for teachers and visual aids, to be created with help from WHO.

### **Albania**

Gene Burazeri described the second round of data collection for COSI in Albania, on behalf of Jolanda Hyska.

In preparation for the data collection, a meeting of the national team reviewed the study manual and protocol developed by WHO and decided to do data collection using the paper version, to collect data on all three forms (including, for the first time, the family form), and to target 8-9 year old children, as had been done in the first round. With support from WHO on sampling, 125 classes were included in the final sample.

The trainers familiarized themselves with the material, prepared the field worker training, selected a total of 12 examiners and provided four-day training for field workers along with a two-day training for the operators and data administrator. Permits were then obtained from the Ministry of Education and Science and a validation exercise, applying the fieldwork procedures, was carried out in two schools in Tirana in March 2016.

Five groups of examiners were involved in the data collection process between 15 March and 12 May 2016 in 125 schools selected from eight districts (Tirana, Fier, Diber, Elbasan, Shkodra, Durres, Korca and Vlora). By the end of fieldwork, 7,105 children had been measured and 2,344 questionnaires collected from schools.

The third phase, concerning data management and reporting, is still in progress. Many thanks are due to the WHO Regional Office and country office and the support team for all their assistance.

## **Austria**

Karin Schindler presented an update from Austria. As a new member of COSI, which only received the final go-ahead a few days ago, the first preparations are underway. Help from students from the Institute for Nutrition Science in Innsbruck has been enlisted.

Currently, advice is sought from long-standing COSI members on how to fast-track the process and to ensure that all the essential steps are included. It will be challenging to achieve this by September/October and may be difficult to do the whole preparation phase as it would normally be done because of the shortage of time.

## **Bulgaria**

Vesselka Duleva presented an update on the implementation of COSI in Bulgaria, which has recently finished its third round of data collection, using a sentinel approach.

For the 2016 round of data collection, a total of 199 schools and 203 classes were included in the final sample. Of these, 144 schools were urban and 55 were rural. A total of 3,759 children, aged 7 years, were registered and – after absences and refusals – the final sample included 3,423 children (response rate of 96.5%).

Three levels of permission had to be obtained prior to the study (medical ethics committee, Ministry of Education and school administrations) and Bulgaria applied the passive informed consent approach. Prior to the start of COSI, a special information event was organised for the schools and the parents.

A system of regionally-based examiners was used, in each of the 28 administrative regions. Thirty-four fieldwork teams, involving 67 members from regional health inspectorates, were involved after a one-day training course in which every examiner had to participate.

Data collection took place, using the paper format, between 15 March and 17 May 2016. All three forms – child, school and family – were included and all items on each form completed. The same equipment was used in this round as had been used in the previous two rounds.

Data entry into online OpenClinica is now underway, and should be finished by end of September.

## **Croatia**

Sanja Music Milanovic presented an update on Croatia's first experience with COSI data collection in 2015/16. Croatia joined COSI in July 2014 and kicked off its participation by hosting the 8<sup>th</sup> COSI meeting in Dubrovnik in 2015.

For the 2015-16 data collection, a total number of 164 main elementary schools all over Croatia and 364 classes (182 second and 182 third grade) were selected. An initial meeting was held in September 2015, and head teachers of the schools were invited to the Ministry of Education and were provided with information about international and national COSI activities. The school form was completed at that point, at the Ministry of Education, and this proved to be very convenient. No school refused to participate in the COSI project.

The next step was the initial training of field workers, organised by the Croatian Public Health Institute and WHO and conducted by Igor Spiroski, the COSI principal investigator for FYR Macedonia. Epidemiology residents (19) were involved as COSI examiners along with other colleagues.

The family form was voluntary, but 82% of parents agreed to complete it. An information meeting with parents was organised a month in advance, and active informed consent for the measurements was sought from parents. Children also had an option to refuse to participate – although less than 1% children did so.

There were some problems with use of OpenClinica. Sometimes, for example, examiners forgot to charge devices. A paper sheet was developed, therefore, as a backup for use when OpenClinica did not work.

Data collection took place between 26 October and 18 December 2015 and data entry finished in February 2016. The national report should be available in Autumn 2016. The initial sample size was 7,150 children, of whom 5,662 were measured. This represents a response rate of 79.2% -- 20.8% of approached children did not participate in the survey due to various reasons (illness, no parental consent, absent, etc.). Data cleaning is still underway.

Pre-preliminary results show that 36.1% of boys and 28.2% of girls are overweight or obese (with WHO cut-offs). The results are surprising because previous data suggested a prevalence of 20% overweight or obese in children of this age. There is very low rate of children playing outside and around 15% of children consume soft drinks every day.

Many thanks to WHO for all the help in this challenging process.

## **Cyprus**

Eliza Markidou Ioannidou reported on progress in Cyprus, which is on the point of organizing the fourth round of data collection. It was decided to use graduate students to help with data collection, but it has been a lengthy process to get the Ministry of Health approval for this. The Ministry of Health has now given approval for Limassol College to carry on the programme. The Ministry of Education has now given approval to conduct the project in schools. Everything is in place, therefore, for the data collection to go ahead and hopefully results will be presented to the next COSI meeting.

## **Czech Republic**

Marie Kunešová reported on the fourth round of data collection in the Czech Republic. The fourth round was started a little bit later, and the results are not yet ready for reporting.

There was double translation of modified questionnaires. Primary care paediatricians (122), according to the region and size of residential location, were selected to conduct the study. Children are examined during the obligatory 7-year-old preventive check-up by their paediatricians. All three questionnaires – child, school and family – were completed.



From the previous data collection rounds, it appears that overweight in girls has decreased but obesity has increased, while in boys there is no real change. Plotting the trend since 1951 suggests that the highest prevalence (according to WHO cut-offs) was in 2001.

## **Denmark**

Tatjana Hejgaard reported on the implementation of COSI in Denmark. Thanks are due to WHO for encouraging Denmark to join COSI. There was some resistance to joining COSI because a national register of children's health has already existed in Denmark since April 2009 and reporting on children's height and body weight when they enter school, in mid-school years and when they leave school, as well as full breastfeeding and new-born's exposure to tobacco smoking, is mandatory. Finally there was agreement to go ahead, as part of a coordinated effort in Europe.

Measuring of children in an official setting in Denmark had to be done with health professionals, so it was important to find the right implementing partner. The collaboration will now involve the Danish Health Authority and the National Institute of Public Health at the University of Southern Denmark.

Schools were sampled across the five regions and it was a pleasant surprise that all schools invited agreed to participate. In total, 3,500 children in grade 1 were included before active consent. Data collection will take place, using health nurses in schools, between mid-August and mid-September 2016, and the data will be delivered to WHO by mid-November 2016.

## **Estonia**

Eha Nurk reported on Estonia's participation in COSI.

The field work has just been completed, although the data are not yet ready to submit.

The first meeting took place in September 2015, Ministry of Social Affairs approval was received a month later and then the collaboration agreement with WHO was reached in December. Training was held in March 2016, with additional repeat training on data handling in April 2016. Fieldwork took place between 1 April and 2 June 2016 and the deadline for data submission was 15 June.

The target population was all first grade children in primary schools, aged 7 – 8 years. In total, 497 schools are involved with a total of 15,457 children.

Data was collected using the children's form and the school form. The family record form was not used, but the questions on regular physical activity and transport to and from school were included in the children's form.

To date, data from 254 schools on 10,541 children has been collected and checked. Parents of 369 children refused to participate, 458 children were not at school on the day of measurements and 17 children refused to participate. Data are therefore available for 9,671 children.

Some of the problems encountered include the fact that the end of school year is a very busy time, with several other studies in progress at schools and lots of activities taking place outside

schools. It was hard to persuade schools to participate and some schools had to perform measurements twice, because measurement of children in first grade was already mandatory and had already conducted these mandatory measurements before they received the instructions for the COSI study. Another problem was that data entry was difficult for older nurses and there were some logistical challenges associated with sharing a limited number of scales.

## **Greece**

Greece has been waiting for permission from the Ministry of Education before starting the fourth round data collection.

In Greece COSI has been funded by the Hellenic Society for the Study of Obesity, under the auspices of the Greek Ministry of Health. In 2014, a memorandum of cooperation was signed between the Ministry of Health and the Ministry of Education for some programmes of national importance, including COSI.

In the first two rounds, cluster sampling was applied (with the primary school as the cluster). For 2010, 150 schools were selected and for the 2013 round, 186 schools participated. In 2013 all the coordination and the training took place in ATEI Thessaloniki. In 2016, the training will be in Thessaloniki and Athens in September.

Greece has already developed its own online electronic platform for data entry.

The study uses dietitians as examiners. In the 2010 round, 150 dietitians were selected and finally 87 participated in the data collection. In 2013, 65 dietitians were involved in the data collection. A similar number will be required for 2016.

In the 2010 and 2013 rounds, 5,701 and 9,471 children respectively were measured from children aged 7-8 and 9-10 years old. The prevalence of overweight and obesity was 38.1% in boys and 39.9% in girls and prevalence of obesity alone was 13.6% and 14.3% respectively (based on IOTF cut-offs). Greece unfortunately has the highest prevalence of obesity and overweight of all countries. The existence of this data was extremely important for advocacy towards Ministry of Health.

Comparison of the 2009-2010 and 2012-13 data suggests that prevalence of overweight including obesity has fallen in both 7-year-old boys (33.5%) and girls (35.8%). Among 9-year-olds, prevalence had also fallen, from 45.1% to 37.9% in boys and from 42.3% to 38.7% in girls. The results of the next round are awaited with impatience!

## **Hungary**

Viktória Anna Kovác presented an overview of progress in Hungary.

Hungary has a longstanding system of mandatory health check-ups for primary school children. Nonetheless, it was decided to join the second round of COSI data collection. Hungary joined the second round of COSI data collection in 2010, collecting data in 1,269 seven year olds. Of these, 16.8% of girls and 12.1% of boys were overweight, and 7.9% of girls and 7.8% of boys were obese.

This process was very problematic because school nurses and decision-makers had difficulty in accepting that children should be measured twice. It would be helpful to have further discussion on how countries with existing child measurement programmes can integrate COSI.

For the fourth round, Hungary will collect data in October 2016 in a new representative sample of 2,800 children in the same age group (7.0-7.99 years). Data collection will be conducted with the help of school nurses using the same type of equipment all over the country.

## **Ireland**

Mirjam Heinen presented preliminary results from the fourth round of COSI data collection in Ireland.

Fieldwork took place between November 2015 and February 2016 and was carried out by trained nutritionists. Ireland uses a sentinel approach. In total, 4,907 children from first, fourth and sixth class from 153 schools (of 196 schools contacted) participated. In addition, 880 family surveys of first class children have been returned to date.

Very preliminary results suggest a participation rate of 57%, and this is relatively low and declining over time – for the next round it is under consideration whether a completely new sample should be used. Preliminary results in 7-year-olds, not adjusted for sampling design, had prevalence of overweight including obesity of 16% and of obesity of 4% (using IOTF). On abdominal obesity, using British data on waist circumference, had prevalence of 26% for overweight including obesity and 11% obesity. When this is compared with data from previous rounds, it appears that prevalence has stabilised over the years.

Data was collected on paper then entered using the OpenClinica online database. This was found to minimise inputting errors, to allow tracking of inputting and create downloadable data. In addition, there was high quality support provided. The online system, however, is not always user friendly and can be time consuming at times. Overall, it has been a very positive experience.

The next steps are to clean the data (in progress) and chase up outstanding family questionnaires and enter the data, before writing the national report, and related papers, from summer 2016 onwards.

## **Italy**

Angela Spinelli reported on Italy's latest COSI data collection.

The data collection for the fourth COSI round (Italy's fifth data collection round) started in January 2016, and involves all 21 Italian regions. In total, 2,421 schools participated, with 53,466 children aged 8-9 years old.

The data collection instruments were updated in October-November 2015, training took place in December 2015-February 2016, and data collection has taken place between April and June 2016. Data entry will finish by the end of June. The data will be cleaned and analysed in coming months, with communication of the results scheduled for December 2016.

Italy gives certificates to schools, children and examiners. We consider this is a way to strengthen the network and the children greatly appreciate it.

## **Kazakhstan**

Shynar Abdrakhmanova gave an overview of data collection in Kazakhstan and presented some preliminary results.

The study is being conducted among 9-year-old children in third and fourth grade. 140 schools, across seven regions, were sampled and in total 5,589 children were measured. Of these, 2,903 were 9 years old (1481 boys and 1422 girls). A passive informed consent approach was used and the response rate was 92.8%.

Initial training was provided by WHO and Iveta Pudule. Children were measured between October and December 2015 and all three forms were administered and filled using paper. The examiners were from regional healthy lifestyle centres and they received training in September 2015. OpenClinica was used for data entry and data management.

In terms of the school environment, preliminary results show good access to drinking water (pupils have access in 98.6% of schools), but also high presence of soft drinks (43.8%) and sweet snacks (63.5%). Preliminary results are also available from the family form.

Preliminary results suggest that prevalence of overweight (including obesity) is 17.3% in boys and 19.4% in girls aged 9 years. Prevalence of obesity is 5.2% and 5.8% in boys and girls respectively.

## **Latvia**

Iveta Pudule presented an overview of fourth round data collection and preliminary results from Latvia.

Latvia has participated in all four round of COSI data collection. In the previous three rounds data were collected on 8 year olds, but in 2015/16 data were collected on both 7 year olds and 9 year olds. The family questionnaire was also completed for the first time.

A passive parental informed consent approach was adopted. A one-stage cluster random sampling design was applied. In total, 96 schools were sampled and 3,308 first graders (of which 2,733 were 7 years old) and 3,249 third graders (of which 2,613 were 9 years old) were measured. In addition, 2,906 parents of first graders and 2,922 parents of third graders completed questionnaires.

The fieldwork was done between October and December 2015 by 52 trained interviewers from a fieldwork company. They did not use OpenClinica or Lime Survey, because they said it was slower than their own system. In future, a code book is required for those not using OpenClinica. The data entry, cleaning and checking was done in spring 2016.

## **Lithuania**

Ausra Petrauskienė presented an overview of COSI data collection in Lithuania.

Lithuania participated already in the fourth round of COSI data collection. The target group was the first formers. As mainly 7 and 8 year old children study in the first form, the study planned to invite 5800 children to participate in the COSI project. The sample was calculated with probability proportional to the 7 year old children in each county. Height and weight of first formers was measured using the Secca equipment in all schools. Child, Family and School forms were filled in paper format. Some extra variables were added for family communication, eating and physical activity habits. The survey was completed in June 2016.

The fieldwork was carried out in all 10 counties as in previous rounds. In all counties but Vilnius the target population is declining. There were some difficulties in performing the survey. When receiving parental consent, ethical process required signature of both parents – making this highly complicated at times.

In university towns parents are tired of participating in various surveys and of filling in questionnaires, because of requirement for bachelor and master students to do some research for their final thesis. For this reason some schools refused to participate in the survey. There was also a clash with another national study among children which was carried out by the Institute of Hygiene.

The fieldwork team consisted of two paediatricians, two PhD students, three masters and eight bachelor of public health students. All field workers went through the training course according to the COSI survey protocol.

The next steps will include data entry, data cleaning procedures, analysis of the data and dissemination of the results, preparation of scientific papers, presenting the results in conferences, public health bureau and others.

## **Malta**

Victoria Farrugia Sant'Angelo presented an overview of the fourth round data collection in Malta, which took place in April 2016.

The study population is 4,088 7-8 year-olds born in 2008, attending the third year of compulsory schooling. From a total of 98 schools in Malta (state, church and fee-paying independent), two of the independent schools refused to participate – the first time that any school refused to participate. There was a clash with another survey conducted earlier in the year, and these schools refused to have their children measured again.

The child, school and family forms were all completed, in paper format. The response rate for the family form was very, very good. Oral health assessments (for 417 children) and a food consumption survey (for 100 children) have been included in addition to the anthropometric measurements.

The oral health survey included a clinical examination (dental caries, erosion, plaque and trauma) and a questionnaire on dental habits, quality of life and consumption of sugary food and drinks.

The food consumption survey among 100 children from the same cohort involved food diaries linked with the GloboDiet tool (two non-consecutive one day food diaries with daily completion interviews, under supervision, and a food frequency questionnaire) and the GPAQ physical activity questionnaire.

Data processing is ongoing and analysis of the data is due to be completed by the end of 2016. This is being done using the Excel spreadsheet method, because an attempt to use OpenClinica was not successful due to some staff resistance. The child codes will be paired with the oral health examinations and the food consumption survey.

## **Montenegro**

Enisa Kujudzic presented Montenegro's experience with its first round of COSI data collection.

Montenegro has a very small total population and the population of school-aged children is 28,670. Montenegro joined COSI in April 2016 and a national coordination team as now been established, involving the Institute of Public Health and the Faculty of Sport and Physical Education. The sample frame was designed in April and agreements have been reached with the sample schools. In addition, the examiners were trained in April, with support from WHO.

Of the 410 public primary schools, 100 schools were selected. The target age group is 7.0-7.9 year-old children attending first and second grade. The effective sample size has been decreased to take into account the size of the population (1,900 children compared to 2,800 according to the COSI protocol).

Data were collected by 24 trained examiners using standardised Seca scales and meters. The Institute of Public Health provided three cars for the examiners to be able to reach the schools in rural areas. All three forms were completed, including the family form, which represents an opportunity to find out about some of the family dietary habits.

Preliminary results from the fieldwork, which had ended a few days previously, show that 3,581 children were examined and the sample size of children aged from 7.0 to 7.9 years is 1,790.

The team's impressions of the field work, were that it was a lot of work in a very short time because school activities in May are very intensive and it was necessary to adjust the fieldwork while it was in process. It might have been better to do the survey in the autumn, but nonetheless the team is satisfied with what has been achieved. There was a shortfall in the expected parental consent to have their children measured, this is probably due to the information provided for the informed consent being too long. It will be shortened for the next round.

Media information was disseminated during the fieldwork, but this should probably have been done earlier to raise awareness about the project, especially given a general scepticism about new initiatives.

In addition, the official number of expected children in schools was not quite accurate because the electronic data system is the early phase, so there were problems with a mismatch between the expected and actual numbers of children. In future, work with the Ministry of Education should help to clarify this issue.

Data entry is forthcoming, and will be done using OpenClinica.

There was discussion about the desirability of doing the research in the autumn.

## **Norway**

Anna Biehl presented the experience of the Norwegian child growth study.

Norway has participated in all four rounds of data collection, involving around 3,500 eight-year-olds (third graders) in each round. There is a high participation rate (89-90%) and this may be due to the fact that this is a school health project, involving school nurses. Fourth round data collection took place in 2015.

The trend data give the impression that prevalence of overweight (including obesity) has decreased, but this is mostly because of an unexplained peak in 2010. Waist circumference was also measured in the whole population, and abdominal obesity appears to have decreased in boys. Analysis will be conducted on socioeconomic sub-groups.

Longitudinal data have been collected from birth to eight years for children born in 2002, and there are plans to collect the data for those born in 2004 and also to collect data from the same children when they are 13 years old. There are, therefore, two longitudinal cohorts and a third may be possible. Each child in Norway has a personal identification number and it is possible to link this data with the height, weight and waist circumference and the medical birth register – information is therefore available on birth weight, parental socioeconomic background, etc.

## **Poland**

Magdalena Stalmach gave an overview of Poland's preparation for its first round of data collection for COSI.

Ten (of 16) provinces were randomly selected by size and economic status and administrative districts with probability proportional to the number of residents were selected. Regional coordinators took contact with the 113 sampled schools in 2015, and additional schools were sampled from 37 counties in 2016 in order to reach the required number of children. There was random selection of two classes in each school (second and third grade). The research document was prepared and translated. Training was organised for the provincial coordinators and school nurses.

In February, a pilot study in two primary schools was organised. Consent was sought from head teachers, parents and children. Almost 100 children were measured in this pilot study and 82 family forms were received from parents.

The main study will be conducted in autumn 2016. The preparatory phase has seen good cooperation with local coordinators, had positive experience with using OpenClinica and has the advantage of using school nurses as the examiners. A high degree of director involvement and the high level of parental consent was also positive. Some of the challenges include the need to involve two grades in order to select children of the right age, the need for proper selection of children in the target age group and potential logistical problems with sharing a limited number of measurement sets.

## **Portugal**

Ana Rito presented an overview of Portugal's experience with fourth COSI data collection.

For the fourth round, there was a new sample, which will have almost the same distribution as in previous rounds throughout the seven regions. Participation of 8,544 children from 234 schools is expected.

2015 was Year 1 of the COSI data collection round and a new protocol was prepared and distributed to examiners. The 199 examiners also participated in training programmes in the north, Lisbon and the Algarve.

A booklet with the COSI methodological protocol was produced for the second round. The idea behind this is to ensure that all other researchers in Portugal use the same method. Portugal has kept the paper format for the three questionnaires. Inclusion of all the questions in Portuguese and English is helpful for transfer to the OpenClinica platform. Portugal recruited 191 people to enter the data into OpenClinica, and the team prepared a OpenClinica video in Portuguese to show how to go through the platform and how to use it. This has been very helpful, in addition to the training, to help people understand what to do. Three members of the team provide support and answers to questions. A guide has also been produced to explain the steps involved in OpenClinica and the team provides round-the-clock support to fieldworkers.

## **Republic of Moldova**

Galina Obreja described the preparation for the COSI fourth round data collection in the Republic of Moldova.

The same group (7 year olds) was targeted as in the third round. A random sample of 203 primary schools was selected. The child and school questionnaires will definitely be used, but the family questionnaire may yet be added. The examiners will be public health specialists from district level Centers for Public Health. The same scales and stadiometers used in the third round will be used.

To date, the updated questionnaires have been translated, the anthropometric instruments have been checked and/or purchased and the research protocol has been developed. Ethical approval will be sought in August from the Ministry of Education and the Ethics Committee. In the same month, the examiners will be recruited and trained.

Between September and October, information will be provided to the school administration, teachers and parents of selected classes and active informed consent will be sought from parents. This will be followed by the field data collection in late September and during October.

## **Romania**

Constanta Huidumac Petrescu gave an overview of Romania's data collection for COSI, supported by the Romanian Ministry of Health.

The study used a representative sample of school children aged 8–9 years who attended the first and second grades in primary schools. The basis for sampling was all elementary schools in the



country that have a number of enrolled children for at least 40 students/school. Five schools were selected from each of the 41 counties (two in urban area and three in rural areas). Two schools were also selected from Bucharest. Urban rural stratified random sampling resulted in 207 public elementary schools, (84 urban, 123 rural).

In the first round (2013) the final sample was 4,348 children (response rate 90.35%). In 2016, 9,273 children were targeted, well balanced between urban and rural and first and second grade classes.

A system of regionally-based examiners was used, with 84 examiners taking measurements and doing the first data entry. Training was delivered in April 2015 and examiners received an electronic and printed manual and protocol for training, and also the forms and the equipment. Further training was then held with smaller groups. Children were measured by examiners working in pairs during May and June 2016.

For the first time, data was entered into OpenClinica using a specific team, currently in the process of preparing them. Even though it is more work, the experience will hopefully translate into results that will reflect more accurately the situation on children's development.

## **Serbia**

Darinka Korovljev presented an overview of Serbia's experience in collecting data for COSI.

The study assessed first and second grade children (aged 6.00 – 8.99 years) from the various national school districts. Passive consent was obtained from parents. Data were collected by 27 field examiners, who were regionally-based physical education teachers.

During the data collection phase, 5,102 children evaluated from the 42 different public elementary schools in 14 (out of 25, excluding Kosovo) school districts. After an initial evaluation, some children were excluded because of age or missing data. The final sample consists of 4,861 children. Prevalence of overweight in boys is 24.6, 21.8 and 22.8% at six, seven and eight years old. Corresponding obesity rates are 9.4%, 6.1% and 7.2%. For girls, the prevalence of overweight is 22.4%, 23.4% and 20.9% in six, seven and eight year olds respectively. In six and seven year old girls 7.0% are obese, as are 5.0% of eight year olds.

The strengths of this research included the strong collaboration with the PE teachers, data collection in school settings which optimized assessment time, the use of passive parental consent form which increased response rate, excellent collaboration with school administrators to improve study fluency, use of time-efficient, well-versed and professional field examiners, the strong commitment shown by study investigators and minimal cost of data collection. Some weaknesses of the study included inadequate support of national stakeholders in the field of health and education, logistical difficulties in sharing limited number of testing kits (stadiometers / scales), difficulties in the use of identical anthropometric equipment, relatively low recruitment rates in urban settings and the fact that no children were recruited from 11 school districts.

In the future, there are opportunities to implement COSI as part of a regular school physical education programme, to include advanced assessment variables in the future, to establish a stable collaboration with academia, to be able to monitor and compare obesity trends for national

and international data, to use the study data to inform health professionals and public and to develop new policies for obesity prevention in children.

Serbia successfully accomplished COSI data collection in 2015-16, with high recruitment rates, time-efficient data processing and other research activities completed as planned, with support from WHO and the WHO country office. Continuation of COSI activities in Serbia is strongly recommended.

## **Slovakia**

Lubica Ticha presented the results of experience with COSI data collection in the Slovak Republic. COSI was included in the National Action Plan for the Prevention of Overweight and Obesity. On the authority of the Ministry of Health, the Principal Investigator was Children Hospital of Comenius University in Bratislava. Project COSI was approved by the ethical committee and was implemented by the Public Health Authorities.

Schools were selected from within the public health authority area, creating an initial sample of 93 schools. Active parental consent, however, decreased participation rates by about 30%, so 43 new schools had to be added, giving a final total of 123 schools. In the end, 2,805 children aged between 7 and 7.99 years of age were studied.

The school form was completed by either the head teacher, the teachers involved with the sampled classes or by examiners. Thanks are due to Gerben Rienk, who transferred the data to OpenClinica, and Marta Buoncristiano, who conducted statistical analyses.

Preliminary data suggest that 30.3% of boys and 24.2% of girls are overweight and that 13.8% of boys and 10.7% of girls are obese.

## **Slovenia**

Gregor Starc gave an update from Slovenia.

All Slovenian children are measured every April, as part of the SloFit programme. COSI is integrated as a small part of this. SloFit measurements include anthropometry, skin folds and motor tests. Following completion of the SloFit measurements, around 100 schools are selected and the data are sent to COSI for up to three classes for each of the first three grades in the school (ie. 6 to 9 year olds). Measurements are taken by PE teachers in this system, which was set up in the 1980s. Because COSI is integrated into SloFit, the COSI study is very inexpensive. The family form is not included in the study.

For this current round the measurements were taken in April, so schools are now sending in their data. The data will be gathered then analysed using SPSS spreadsheets. Slovenia has its own, advanced software with control settings.

## **Spain**

Napoleon Perez-Farinos presented Spain's experience with the fourth round COSI data collection.

COSI is branded as Aladino in Spain, based on the Aladdin children's tale and an acronym. Aladino 2015 was carried out among six to nine year olds, obtaining a representative sample at the national level, stratified by autonomous region and by population municipalities followed by a random selection of villages. Some of the regions wanted to have regional estimates, but this was not possible because the sample is only representative at the national level. In the end, a weighting was applied, taking into account the total population of the regions.

The final sample was just under 11,000 children. The questionnaire was translated into the four official languages of Spain. The response rate was 75.8%. The results are not yet published.

## **Tajikistan**

Khayrov Khotambeg described the action taken in Tajikistan on COSI data collection.

Planned inclusion of Tajikistan into COSI was mentioned in Tajikistan's strategy on nutrition and physical activity. In 2015, thanks to the support of WHO, there was a visit to the Kazakh healthy lifestyle centre in Kazakhstan. Tajikistan then organized a committee to supervise this survey and translated the protocol and questionnaires into the national language.

The Ministry of Education provided data on the number of schools and the numbers of children. The next steps include addressing the questions of sampling (of schools and of children), buying measurement devices and training the examiners. Kazakhstan is very happy to join COSI and thanks WHO for its support.

## **FYR Macedonia**

Igor Spiroski gave an update on COSI implementation in FYR Macedonia.

Macedonia is in the process of its third round of data collection for COSI. This round took place between May and June 2016. Data was gathered in 10 regions of the country and collected by staff of the Centres of Public Health (16 teams of one medical doctor and one nurse or technician). A sentinel approach was adopted, with 111 schools selected and 3,103 second grade children (7-8 years) were targeted. Only the school and child questionnaires are being completed.

COSI is recognized as an important policy tool now in Macedonia. The Ministry of Health recognized the importance of COSI results and are being taken into account in the NCD action plan and the food and nutrition action plan.

In the coming months, the data will be entered into OpenClinica. Preliminary results will be available by the end of July. Some changes are under consideration for the next round, including some re-sampling and also a possible change to the data collection period to the end, rather than middle, of the year.

## **Turkey**

Sibel Gogen described how previous COSI data had been used to inform policymaking in Turkey.

Turkey joined COSI in 2013 and data were collected in 216 schools among 5,600 children aged between 7 and 8 years old. Results were disseminated through a press release and communication with stakeholders. Comparable data from another survey (TOCBI) suggest that overweight and obesity increased from 20.8% to 22.5% between 2009 and 2013. The data from the COSI third round was used to improve health policies and COSI is now included in the Healthy Nutrition and Physical Activity Programme of Turkey as surveillance and monitoring.

COSI has been used in a number of initiatives, such as the development of physical activity guidelines for Turkey and for school children, a physical activity score card, a nutrition friendly schools programme, a school milk programme, school canteen regulations and food and beverage standards in schools. Turkey has also developed a nutrient profile model and guidelines for the Radio Television Supreme Council to help reduce marketing pressure on children. Forthcoming policies on the agenda include price and tax policies to promote healthier diets and a free schools meal project. A million bikes have been distributed freely to all school children, and a survey is underway to see whether children are actually using these bikes!

The Ministry of Health has set a budget for the COSI fourth round data collection. The staff is comprised of Ministry of Health staff, already working for the government, and all the equipment is already available. It is proposed that the data collection will be conducted, under the coordination of Ministry of Health and Ministry of Education together, in September or possibly spring 2017.

WHO conducted an assessment of Turkey's nutrition and physical activity in April 2016. The report will be available soon and will feed into Turkey's new action plan.

## **Turkmenistan**

Maya Tanrygulyyeva presented Turkmenistan's experience with COSI.

Thanks are due to WHO for their visit to Turkmenistan and conducting an initial training in late May. Neither parents nor children were concerned with problems of overweight because they were more preoccupied with exams and finishing schools. Training is planned for September and October, and preparation will be better for the next round.

## **Uzbekistan**

Akhmedova Dilorom gave an overview of the situation in Uzbekistan.

Uzbekistan has not yet joined the COSI family, but obesity is clearly a problem that exists in the Republic, as fast food and sugary drinks have become increasingly popular with children. Since 2003, Uzbekistan has been trying to increase the participation of school children in sports. For the last five years the Ministry of Education has been carrying out a lot of local activities, including examination of children participating in sports. There is a need to standardise the methodologies and these data.

For a number of years the government has been developing a national programme for NCD prevention, including the prevention of obesity. Of the country's 31 million population, five million are school-aged children and improving their health is an important priority. Discussions

with the Deputy Minister of Health to explore the idea of joining COSI in a more productive way are planned.

### ***Discussion***

Following the country presentations, there was a discussion session to explore some of the questions that emerged.

There was discussion about cross-matching data from different registers as is being done in Norway. This would appear to be difficult in an EU country because of ethical approval, etc. Norway managed to get the informed consent from the parents and this is normal for a cohort study if everything is explained well. It is important to clarify that the researchers do not have the key to be able to identify the children.

Another area of discussion was the existence in many countries in the Eastern part of the European Region of a system of school medicine practice. Measurement of third grade children is mandatory, and schools/school nurses rarely want to share the data yet they refuse to measure for COSI because it is already being done. There is no central input of the data. For this reason, it has not been possible to get the school teams to do the measurements in, for example, Croatia. There was discussion of how to integrate COSI into the mandatory systems that exist in many countries. Integration is very important, so where countries already have some kind of system it is really important to work with Ministries, etc. to try and integrate rather than duplicate. WHO is willing and ready to help with any such discussions. This may require some active advocacy, particularly from WHO, and demonstration that the project is worth to be included. The SDGs, NCD and child obesity targets have all been approved by governments, so it could be useful to remind them that they have given themselves the mandate.

In terms of who the best people are to do the measurements (school nurses, external examiners etc.) there is no option but to address this issue on a country-by-country basis since the situation is so very different.

One element of that is the introduction of OpenClinica. There were some concerns that this is such a time-consuming process. A key element of the problem is that when teachers are a bit nervous or reticent it is so important to finish the process in very good time. This is why Croatia developed the 'backup' sheets, so that it can be completed on paper if it goes wrong with OpenClinica. Another problem, which might be solved by technical support, is the cleaning of data – it cannot be cleaned in advance. From WHO's perspective, the OpenClinica system is really a step forward compared to the previous system, and this is important for the sustainability of the initiative given the increasing numbers involved.

The question was raised about whether anything can be done to take into account the differences in response rates due to active or passive content. In fact, this has to be done on a country-by-country basis. Often presented to parents as research, it should actually be presented in a shorter form (while still complying the ethical requirements) and against a WHO mandate rather than research. It may be helpful to seek help from policy and communications staff, rather than researchers alone.

It was suggested that a question on migration (background, parental origin) could be a useful addition.

Another suggestion was that publication of a paper describing all the different ways that COSI can be done (e.g., in BMC Public Health) would be useful for the international expansion. WHO proposes to publish the protocol/methodology as a WHO document, but it could also be interesting to publish a scientific paper. In fact, much of the information is already published in the reports of the first and second rounds of data collection.

There was some discussion of how to cope with so many country presentations during the future COSI meetings. Clearly it is useful to hear about countries' experiences with data collection, and the results, and this is particularly valuable for incoming countries. On the other hand, as the number of participating countries increases, it is becoming more challenging to incorporate individual presentations by all participating countries on the agenda. It was suggested that a selection of countries could be invited to present, or that countries might be invited to do posters on their national data.

## **Update on inter-country trends report from 3<sup>rd</sup> round COSI data**

Marta Buoncristiano, ISS Italy and consultant for WHO Regional Office for Europe, gave an update on the third round data, including the challenges and finalization of processing and cleaning of the data sets and preparation of the trend report.

### *Data processing and cleaning of the 2012-13 data*

Nine countries provided data for the third round on children, schools and families (Bulgaria, Czech Republic, Italy, Lithuania, Malta, Moldova, Portugal, San Marino and Turkey). Another eight countries provided data on children and schools (Albania, Greece, Ireland, Latvia, Macedonia, Norway, Romania and Slovenia). A further country (Spain) provided data on children and families and one country (Belgium) on children alone. Altogether, therefore, 46 data sets had been provided to WHO by March 2016. Only six countries sent the 'individual sampling weights and survey design variables dataset', the information needed to carry out the estimation phase.

Data processing and cleaning was carried out to validate countries' data sets and make them comparable, in order to produce high quality and reliable data analyses. Following the series of steps involved in data processing and cleaning, a COSI pooled dataset is available for analysis.

It is necessary to harmonise datasets for a number of reasons:

- There was no common system to digitalize data, and each country used its own approach.
- Despite the availability of common templates and codebooks to adopt for preparing datasets to be sent to WHO, seven countries did not use these: 18 datasets out of 46, therefore, did not follow the common templates.
- In addition, for those datasets that had followed the common templates, there were some variables coded or formatted differently.

The data processing phase at the European level, therefore, was very long and complicated. This is why use of OpenClinica is really to be encouraged. Where use of OpenClinica is not possible, it is really important to follow the common templates and codebooks and provide notes to explain any variation from the templates.

The checking of the children dataset for inconsistencies and completeness found that there was not a problem with missing data. There were very few implausible values for date of birth and date of measurement. In addition, there were few children excluded from the analysis because of extreme values of body weight or height. However, the percentage of weight or height values rounded to .0 or .5 is higher than expected in seven countries – suggesting that there were some examiners that did not record the measurements as accurately as the equipment allows.

For the school datasets, there was also very little missing data in general, but there was some data missing on the availability of specific food items and beverages in schools and the presence of nutrition guidelines in three countries. The main problem with these datasets stemmed from the information on participating classes (number of pupils registered, examined, absent and who declined to be measured or for whom parents did not give consent). These data are important to check the quality (participation rate, response rate, etc.).

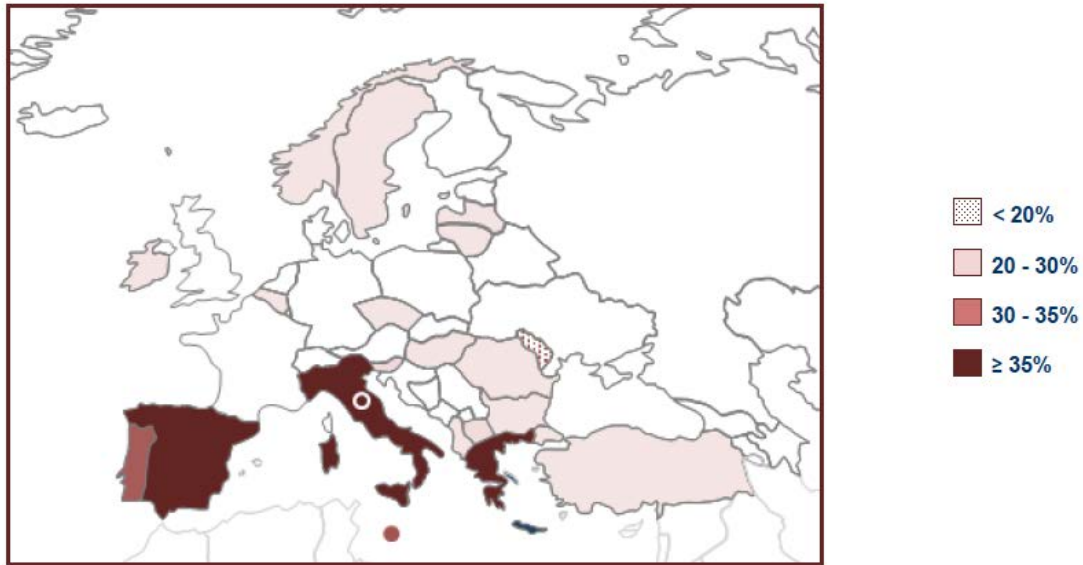
For the family datasets there was a higher degree of heterogeneity among countries in terms of data collected (the questionnaire is voluntary and each country decides which items, if any, to include). In general, there was not a problem with missing data, except for data on breastfeeding duration in four countries and parents' socio-demographic characteristics in many countries (especially income, but also employment status and educational level). There were also some inconsistencies between the family and children datasets with regard to child's gender and date of birth.

Starting with the child's data, the data was linked to the family and school data using the identification codes. This linkage allows the study of associations between children's nutritional status and the school environment and family characteristics. The school and child identification codes are really very important. The linkage between child's data and school data was very good, while the link between children and family data is not as good.

#### *Preliminary results on children's nutritional status*

There were 19 participating countries in the third round and more than 250,000 children were measured. Data were collected most frequently on 7-year-olds (13 countries) followed by 8-year-olds (nine countries), 9-year-olds (six countries) and 6-year-olds (three countries). Some countries collected data on more than one age group. There were considerable differences in the sample size per age/gender group (from 500 up to 14,500). Some countries are below the level of the sample size recommended by the protocol. There are relevant differences among countries in terms of sample design, effective sample size and, thus, different levels of reliability. A lack of information on survey design variables means that it is not possible to exactly calculate the level of reliability of each country's data. An estimate can be made by observed variability, sample size, and assumption of a 1.2 design effect. The sample size is important because it will affect the width of the confidence interval on the prevalence results and will determine the ability to detect differences between countries and trends over time.

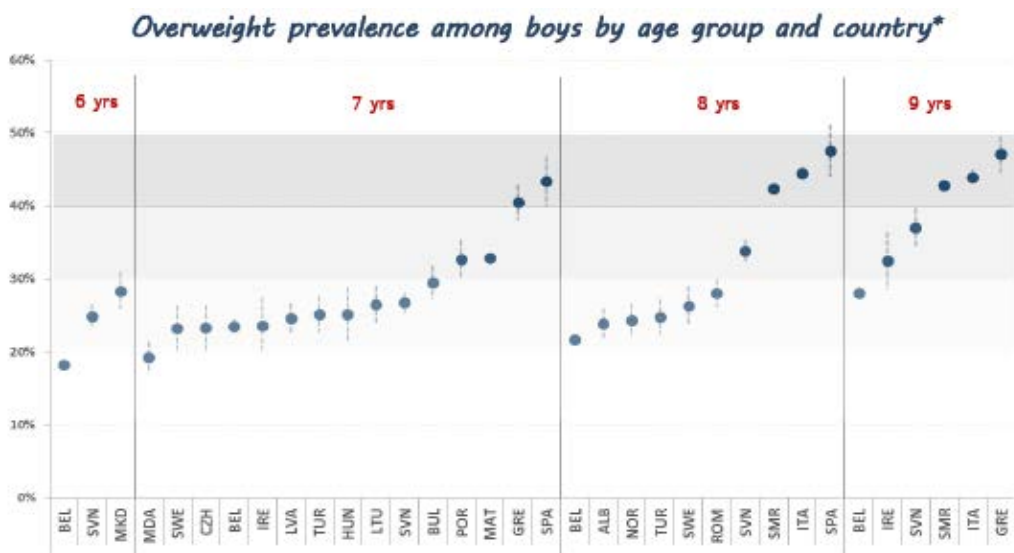
**Figure 8 Overweight prevalence among children**



\* All data from 2012-13 round but those of Sweden (2007-8) and Hungary (2010-2011)  
6 years old children: MDK - 7 years old children: BUL; CZH; GRE; HUN; IRE; LTU; LVT; MAT; MDA; POR; SPA; SVN; SWE; TUR -  
8 years old children: ALB; BEL; ITA; NOR; ROM; SMR. Data from Greece and Lithuania are preliminary

Only one country, Moldova, has a prevalence of lower than 20%. Spain, Italy, San Marino and Greece have the highest prevalence with levels over 35%.

**Figure 9 Prevalence of overweight in boys**

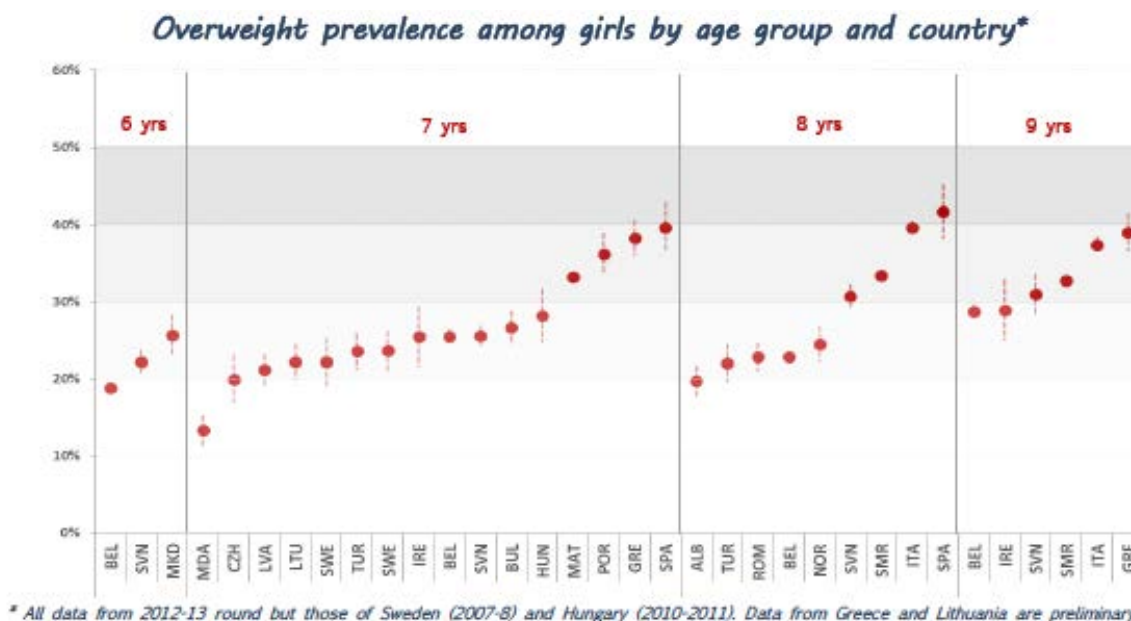


\* All data from 2012-13 round but those of Sweden (2007-8) and Hungary (2010-2011). Data from Greece and Lithuania are preliminary

Prevalence ranges from 19% in 6-year-old boys in Belgium and 7-year-old boys in Moldova, to 48% in Spanish 8-year-old boys and Greek 9-year-olds. Many countries are between 20% and 30%, and these countries are at more or less the same levels (after taking the confidence intervals into account).

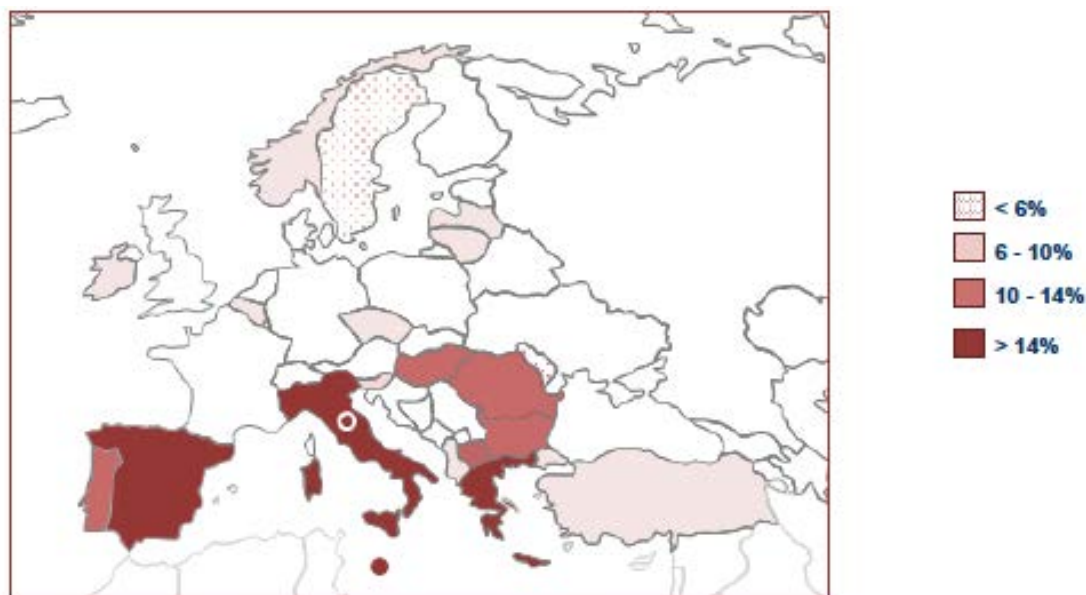


Figure 10 Prevalence of overweight in girls



The lowest prevalence is 13% among 7-year-old girls in Moldova, while it is around 40% for Spain, Greece and Italy.

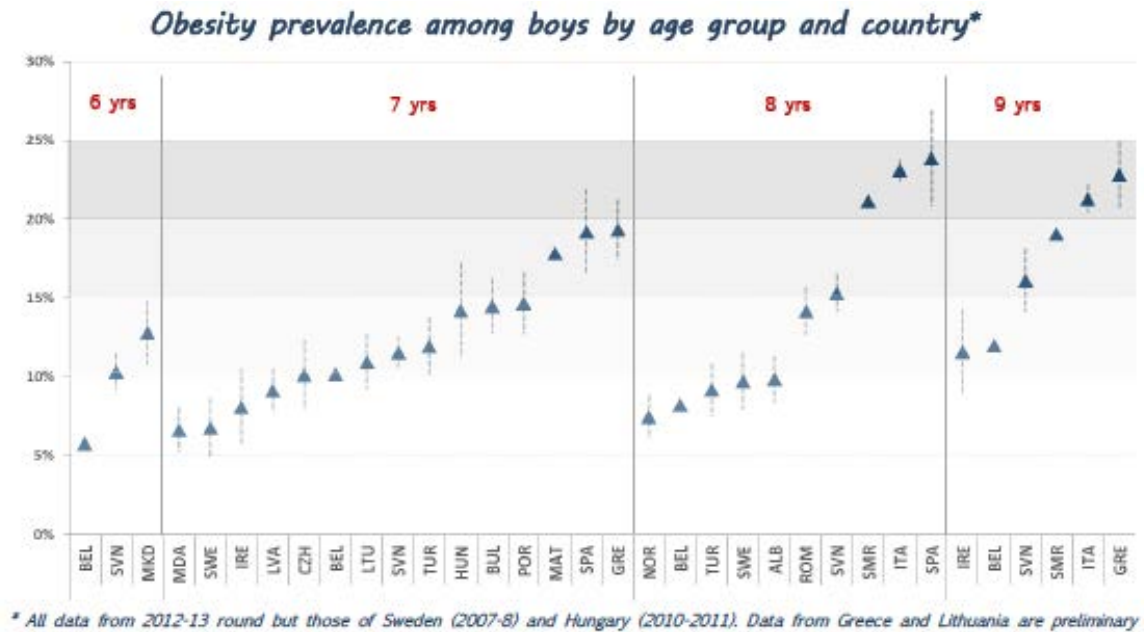
Figure 11 Prevalence of obesity



\* All data from 2012-13 round but those of Sweden (2007-8) and Hungary (2010-2011)  
 6 years old children: MDK - 7 years old children: BUL; CZH; GRE; HUN; IRE; LTU; LVT; MAT; MDA; POR; SPA; SVN; SWE; TUR -  
 8 years old children: ALB; BEL; ITA; NOR; ROM; SMR. Data from Greece and Lithuania are preliminary.

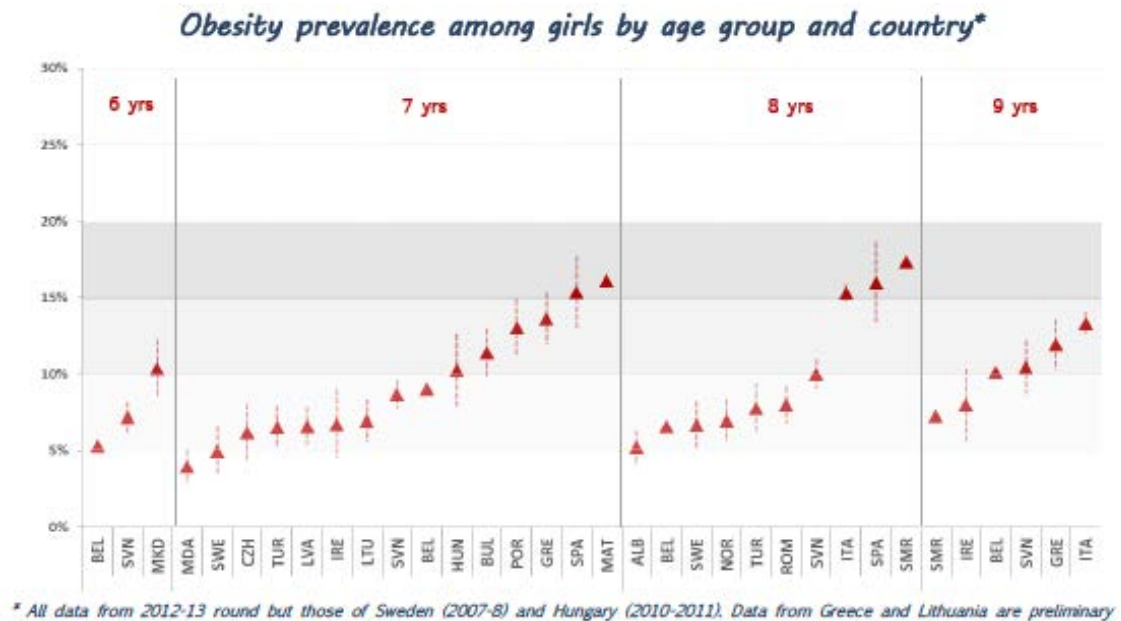
Moldova and Sweden have the lowest values at lower than 6%, while the Mediterranean countries of Spain, Italy and Greece have highest prevalence over 14%.

Figure 12 Prevalence of obesity in boys



Obesity in boys ranges from around 6% in 6-year-olds in Belgium and 7-year olds in Moldova and Sweden, to 22-23% in slightly older boys in Italy, Spain and Greece.

Figure 13 Prevalence of obesity in girls



In girls, prevalence ranges from 4% in Moldova to 17-19% in San Marino and Spain.

Comparisons between boys and girls revealed many countries with statistically significant differences. If the IOTF cut-offs were applied, the results would be quite different in terms of gender comparisons. These results are preliminary analyses and further analyses will be done with the IOTF cut-offs.

In terms of trends over time, nine countries that had participated in all rounds were included in the analyses (Belgium, Slovenia, Czech Republic, Ireland, Lithuania, Latvia, Portugal, Italy and Norway). Overweight in boys has shown a statistically significant decrease in Portugal (7 year olds), Slovenia (7 year olds), Italy (8 year olds) and Belgium (two of three age groups measured) between the 2007-8 and 2012-13 data collection rounds. Obesity prevalence decreased (statistically significantly) in Italy (8 and 9 year olds), Slovenia (7 year olds) and one Belgian age group (6 year olds). In girls, a statistically significant decrease in overweight was observed in 8 year olds in Italy and slight increases among 7-year-old and 9-year-old girls in Belgium. Obesity in girls decreased among the 8 year olds in Italy and again a slight increase was seen in 7 year olds and 9 year olds in Belgium. Although the scale of the decrease is not very large in Italy, it is possible to detect it because of the very large sample size.

The trends discerned from these preliminary analyses can be summarised thus:

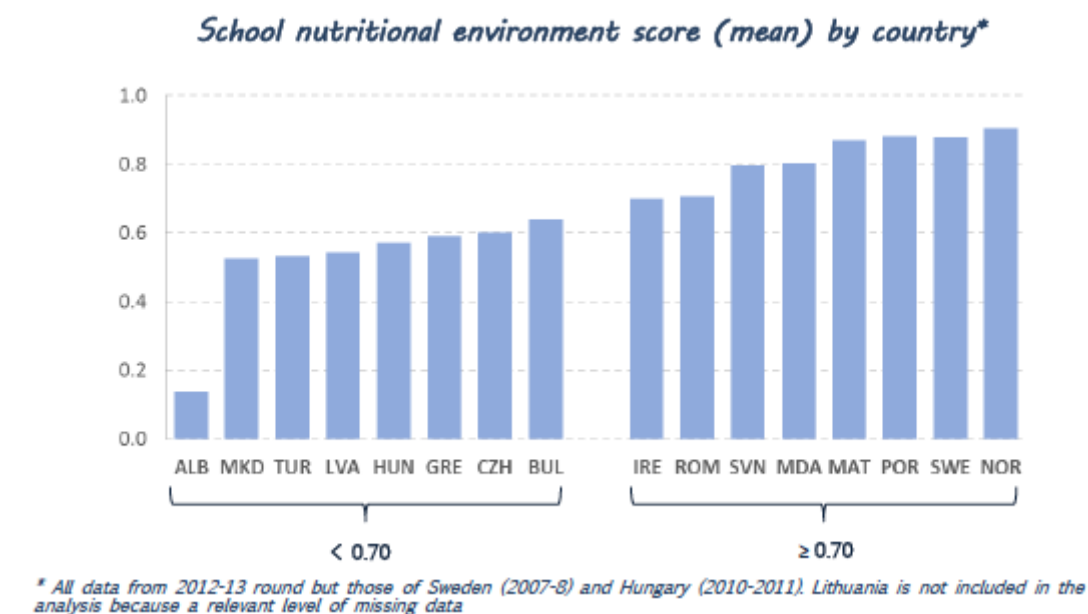
- A decrease in some age/gender groups in three countries (Italy, Slovenia and Portugal)
- A moderate increase in some age/gender groups in one country (Belgium)
- No statistically significant changes in the other five countries, even though the data from Latvia could suggest an increase (to be confirmed by future rounds).

Analyses of the countries that participated in two rounds only revealed non-statistically significant changes in Bulgaria and Spain and a decrease in Greece (but the data from 2012-13 round are still preliminary).

#### *School environment according to the 2012-13 round data and changes compared to the previous rounds*

A school nutritional environment score was calculated based on the possibility of obtaining five food items and beverages at school (graded as supportive or unsupportive depending on whether healthy or unhealthy items). On a scale of 0 to 1, a higher score corresponds to a more supportive school environment for healthy behaviour.

**Figure 14 School nutritional environment score**



In the previous round, 0.7 was used as the cut-off, with those below that having fewer than 3.5 items available. Analyses of the distribution of schools in categories based on the number of characteristics graded as supportive, by country, revealed a high degree of variability within countries, particularly in countries with a lower mean score (less supportive).

Analysis of schools that provided, each week, at least 60 minutes of physical education to pupils from participating classes by country revealed a very low level of variability and most of the countries had 100%. It might be useful to consider asking about more time in physical education.

There was also a very high variability between countries in terms of percentage of schools that organised initiatives/projects to promote a healthy lifestyle among pupils from participating classes by country. Values ranged from just below 60% in Norway to 100% or close to it in Malta and Italy.

There were no statistically significant differences over time in the school nutritional environment score or the provision of physical education for at least one hour per week. Increases in frequency of initiatives to promote healthy lifestyles were observed in Lithuania, Portugal, Slovenia and a decrease in Latvia.

This summarises the preliminary analyses so far and further analysis of the data will be necessary to obtain a clearer and more detailed picture.

### *Discussion*

The analyses were warmly welcomed as being tremendously valuable, and it is extremely rewarding for all involved to see how large the pooled dataset is and trend data emerging.

There was considerable discussion about the issue of response rates. The low response rates in some countries (particularly on the family questionnaire) gives cause for concern, because the results can be affected by a selection bias. Data collection in England (not as part of COSI) found that this can be a serious issue – heavier children opt out of the measurements resulting in

under-reporting of overweight/obesity. It was suggested that, in addition to statistical confidence intervals, there is a need to be cautious in interpretation and to include a consideration of response rate (a sample size confidence interval).

There are several issues to consider –while low response rates can cause bias, small sample sizes affect reliability. There is a clear need to work on improving several aspects of the quality of data – the sample size, sample design and response rate. Furthermore, it is important to try to understand the sources of bias, whether these change over time and why there are differences between countries.

A number of suggestions were made to try and tackle these issues:

- Stricter definition of age groups to be included (although the analyses had only compared comparable data within age groups);
- Where necessary include an explanation for a low response rate and explain that it may result in selection bias;
- Share lessons between countries on effective strategies for approaching families and schools to maximise participation;
- Reconsider whether to include datasets where there has been a low response rate;
- Collect basic information on schools and children that refuse to participate (e.g., geographical location, age, gender, examiners' visual assessment of under/over/normal weight, socio-economic status, etc.);
- Take extreme care not to stigmatise obese children – avoid the word obesity in the information for parents, referring instead to health, well-being and/or quality of life;
- Efforts to ensure close involvement of teachers, those best placed to be advocates for participation in the study, were strongly recommended;
- When communicating with schools and parents, great care should be taken to explain and emphasise the anonymity of data.

There is also a strong case that the data collection process needs to become more efficient and that timetables need to be more strictly adhered to. The last data set for 2012-13 was transmitted for analysis in 2016. It was agreed that WHO would set a deadline for receipt of datasets and that data received after that date would not be accepted. For the fourth round (2015-16) data a deadline of December 2016 was proposed. WHO is happy to participate in discussions with Ministries etc., if this would help to facilitate timely data collection.

It was suggested that the WHO website for COSI needs to be revamped and updated. Dissemination should also be an important part of an initiative like COSI and the website is a key tool. WHO agreed that the website needs attention and will make this a priority.

There was some discussion of the trend comparisons between the first and third rounds. The analyses presented were very preliminary and relatively simple. There is a need to go into much greater depth and, for example, include comparisons with the second round. There was clarification that in these analyses prevalence of 'overweight' includes obesity.

It was suggested that countries should use the COSI data to reach out to other government departments, such as the Ministry of Education and the Ministry of Finance. In Portugal, for example, the COSI data are being used in discussions about the recent reduction of time allocated to physical education in schools. A costing exercise based on the social and economic

costs associated with the current prevalence of childhood obesity could be a powerful tool for engaging with the finance ministry. It is important to remember that COSI is a monitoring initiative and it is important to share and disseminate the data.

There was some short discussion of the relative merits of the WHO and IOTF cut-offs. It was agreed that the discussion would continue separately and the item could then be put on the wider agenda.

## **JANPA in brief**

Maria Hassapidou, ATEI-Thessaloniki, Greece, presented a brief overview of JANPA, the European Joint Action to contribute to halting the rise of overweight and obesity in children.

JANPA is a Joint Action across Europe on nutrition and physical activity that started in 2015 and will continue until 2017. It will help Member States to halt the rise of overweight and obesity in children and adolescents by 2020. It focuses on nutrition and physical activity policies and best practices targeting childhood and adolescence.

Twenty-five of the 28 EU Member States plus Norway are involved in JANPA, either as partners or collaborating stakeholders. A total of 39 institutional partners and 13 collaborating stakeholders are involved.

Through sharing, identification and selection of best practices within participating countries, JANPA aims to:

- estimate and forecast the economic costs of overweight and obesity in children;
- improve the implementation of integrated interventions to promote healthy nutrition and physical activity for pregnant women and families with young children;
- contribute to healthier child care in family, kindergarten, pre-school and school environments;
- improve the way in which nutritional information about foods is collected and used by public health authorities, stakeholders and families.

JANPA is organised in seven work packages – three horizontal work packages (coordination, dissemination, evaluation) and four technical work packages (economic rationale, information and reformulation, healthy environments and early interventions).

Viktorina Anna Kovacs, National Institute of Pharmacy and Nutrition, Hungary, gave some information on the work package on healthy environments in kindergartens and schools by integrated approaches, being led by Hungary. The idea is to give decision-makers a tool and provide them with examples of good practices on which to draw. Participants were urged to send information about policies and best practices in relation to national initiatives on health promotion in kindergartens and schools.

JANPA's approach is based on assumptions that a life-course approach is necessary, that policies and interventions stem from a multi-sectoral approach and that nutrition and physical activity are related to social conditions. The reduction of social inequalities is considered a crucial aspect of JANPA. Social and political mobilisation is needed to facilitate actions and their coherence at various levels to improve nutrition and physical activity among children in Europe. Such

initiatives require partnerships and networks, mainly between public health professionals, regional and local authorities, educational institutions, communities, universities, food industry, non-profit organisations and associations.

All Member States are called on to contribute to the JANPA objectives by promoting public health policies and encouraging healthy lifestyles

JANPA has a website ([www.janpa.eu](http://www.janpa.eu)) and sends out a regular newsletter and this will be sent to all COSI participants in future (or subscribe at <http://janpa.eu/news/newsletters.asp>).

## **Childhood obesity as a priority for EU Presidency**

Charmaine Gauci, Ministry for Health, Malta, described Malta's work on childhood obesity as a priority for its forthcoming EU presidency between January and June 2017.

The Presidency will pursue a strategic approach will explore the EU Action Plan on childhood obesity 2014-2020 to halt the rise in childhood obesity in the EU by 2020. This gives a mandate to develop a mid-term evaluation next year. Malta is working with the European Commission on this mid-term review and to identify where there are good practices as well as areas of concern. The main expected outcome is a report which reviewing practices and how the EU and Member States can step up actions on childhood obesity. This will feed into Council conclusions.

Another area to be tackled is public procurement. A number of government entities procure food, including schools, hospitals and workplaces. A tool to help with the tendering process for procuring food for schools, etc., will be developed to enable procurement of healthy foods. The focus will be on schools. A technical meeting will be held 23-27 February 2017.

Victoria Farrugia Sant'Angelo, the Principal Investigator for COSI in Malta, announced that Malta has offered to host the COSI meeting in 2017 back-to-back with the EU Presidency Childhood Obesity Workshop in Malta from 20-21 February 2017.

João Breda thanked Malta for the generous offer to host this meeting and welcomed the idea of a COSI meeting back to back with the Presidency workshop.

## **Working group session on publications, reporting, data dissemination and communication**

João Breda gave an overview of forthcoming publications and support at the Regional level to introduce the working group session on publications.

The WHO COSI report on implementation of round 1 and round 2<sup>2</sup> has been very successful – it features on WHO's bestsellers list. There have also been seven published scientific international

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<sup>2</sup> World Health Organization Europe. WHO European Childhood Obesity Surveillance Initiative-Implementation of round 1 (2007/2008) and round 2 (2009/2010). Trudy Wijnhoven, Joop van Raij, João Breda. WHO (Eds). WHO Regional Office for Europe, 2014. Available at [http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0004/258781/COSI-report-round-1-and-2\\_final-for-web.pdf](http://www.euro.who.int/__data/assets/pdf_file/0004/258781/COSI-report-round-1-and-2_final-for-web.pdf)

publications and more are in preparation. In addition, there have over 15 interesting national publications and 25 national reports. Papers which link to other areas where WHO has priorities (e.g., breastfeeding and appropriate complementary feeding) are really very useful.

Participants were encouraged to continue and expand production of papers at the national level. They were also urged to use WHO, which might be able to provide some support to produce publications.

There is a case for taking a more strategic approach to publications. Some publications in preparation include papers on breastfeeding, correlation with family co-morbidities, severe obesity and soft drinks.

A form has been developed for submission of proposals and these will be circulated during the working groups. The approach to publications is changing. Those who propose a paper need to take some leadership and to write and organise the paper, then send the draft to all other authors. More than one author per country is now allowed, in line with international authorship rules. Authorship will be agreed upon a paper-by-paper basis.

ISS in Italy, which is responsible for data cleaning and merging, will lead the analysis and the group which proposes the paper will write it.

The planned publications over the next 12 months include:

- Prevalence and trends in overweight and obesity in Europe and by country – ISS, Italy will lead this analysis.
- Waist/height ratio in relation to BMI - it is still to be decided whether this would be on prevalence and trends or a more methodological paper.
- Paper to widen the inequalities analysis beyond the five countries examined in the IJO paper just published. It is probably worth delaying this until after the next round of data collection. This could look at distributional factors including north-south, urban-rural, socio-economic status.
- Urban-rural divide – Gregor Starc, Slovenia, to take the lead on this paper. WHO will facilitate interaction between countries that collected these data and will support the data analysis.

All other proposals are most welcome.

There is a proposal to have a writing workshop – the publication group will meet later in the year to work on the drafts of three to four inter-country publications. This will be a trial and if it is successful as a way of working will be continued in future years.

### *Discussion*

It was suggested that it would be interesting to look at sampling issues, the estimation phase and the implications for the outcomes. It is important that the corrected values (after WHO has checked the data) will be sent back to the countries. Otherwise there is a risk of conflicting figures between inter-country and national papers. If the countries have to wait too long then

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they are impatient to publish their own national papers. There was a question about how this can be dealt with. One part of the solution might be to observe the agreed timetables more strictly. In that case, for example, cleaned data might be sent back to countries much more quickly.

It was agreed it would be interesting to produce an international paper looking at the methodological issues.

The publications working group has organised one telephone conference to discuss some of these issues. It was proposed that a second telephone conference be organised in early September to discuss prioritising papers and making plans for a writing workshop in October/November. It is important to get the right balance between being sufficiently dynamic and flexible as well as having some due processes and sticking to agreed timetables.

It will be important to issue more publications to disseminate the findings of this important work.

### *Working groups*

The group split into four working groups are these were asked to provide comments and suggestions on the following:

- Publication form
- Sampling design and estimation strategy form
- Data dissemination, and
- Communication

The comments and suggestions from the working groups combined are summarised below.

### *Publication form*

- There was a suggestion that information be sent out about which country has participated in which round of data collection.
- Suggested to circulate a list of topics to all the participants to generate inter-country specific evaluations.
- Need to clarify who will analyse data – Italy or the country leading the publication?

### *Sampling design and estimation strategy form*

- It is too early to take any final decision on this form. It needs to be discussed back in-country with those people responsible for the sampling.
- To add to the first line, where the country is described, a place to indicate which forms the country will complete for the data collection round in question.
- Some explanatory notes are required for individual points (e.g., sampling unit, stratification, etc.) and contact details for someone to whom questions can be addressed.
- Inclusion of examples for each question would be valuable.

### *Data dissemination*

- The COSI website needs to be revitalised, made more comprehensive and more visible.

- National websites and national information are also important, papers should include short abstracts in English.
- The COSI website should have all the international publications to date and the abstracts in English of international conferences relevant to this work.
- Proposal to have a form that should be completed by all countries (in English).
- There should be links to national pages from the COSI website.
- Simple guidelines for preparing national reports (format, an outline template, how to describe results, etc.) would be helpful for new countries.
- It was suggested that organising workshops on data analysis for PhD students would be useful for future work on the data in countries.
- Consider choosing a particular date for launching data, as the HSBC does, for example. It could be possible, for example, to get a special issue of particular journal that could provide an opportunity for a European launch of the data. There was discussion about whether an obligatory simultaneous launch of this type is really necessary. The focus of the COSI message means that it is easy to generate a lot of interest in the national data, irrespective of whether it is part of a European launch. It may well be possible to pursue both approaches (a European launch and separate national launches).

#### *Communication*

- Factsheets or leaflets for COSI are needed (e.g., similar to those prepared by Italy for use in-country). Italy has offered to prepare a draft in English that can be translated and adapted for dissemination and communication.
- An online newsletter on COSI website, with information on forthcoming meetings, news from the COSI network, etc. could be useful.
- A list of stakeholders from each country that support COSI should be compiled.
- Improve knowledge of publications (international and also national ones) and, where possible, copies of abstracts.
- Sustainability is also an important issue that needs to be emphasised.

#### *Proposed publications*

The list of proposed papers is not exhaustive, some new publication topics were proposed and the following comments were made for the publication group's consideration:

- The prevalence paper is very important – all COSI countries should participate;
- The paper on soft drinks is of particular interest (Portugal, Hungary, Malta and Croatia expressed interest);
- Waist circumference and BMI is a very interesting topic (Hungary offered to lead);
- Inequalities paper – There was a question about whether it is only to be based on the family questionnaire;
- Severe obesity – there was a lot of interest, especially from Southern European countries, and Portugal offered to lead;
- A paper on urban/rural differences would be interesting for some of the countries (Macedonia, Romania, Slovakia, Serbia) (Slovenia offered to lead);
- A paper on physical education classes and nutritional status could be interesting;
- A paper on transport to school, physical activity and sedentary behaviour is another one to think about.

João Breda thanked participants for all the proposals and suggestions and promised that WHO would take them on board. In relation to the analysis of the data, WHO considers that it can provide support with most of the analysis, with support from other countries such as Italy. Of course, this does not impede countries from talking to each other and exploring sharing of datasets. A country taking leadership on a paper proposed, therefore, does not have to conduct all the complex analysis.

There was clarification that, ideally, scientific papers on national data should be published at the same time as the international ones are published, but if that is not possible it should not impede countries in publishing their national data.

## **Improving physical activity surveillance in the context of COSI**

Gregor Starc, University of Ljubljana, introduced a discussion on improving physical activity surveillance in the context of COSI.

A new way of considering history is to think about times pre-internet (B.3W) and after the internet and new technologies have taken hold (A.3W). What can be done to measure physical activity? In B.3W times there was no technology for objective tracking of physical activity and studies relied on self-reporting. In the A.3W world the situation has not improved greatly, despite the existence of an abundance of technologies (smartphones, smart bracelets, pedometers, accelerometers, etc.). The problem is that data is simply not comparable. Another problem is that short-term efforts to measure physical activity are actually interventions to promote physical activity (e.g., when a child is given a smart bracelet for a short time). For these reasons, Slovenia is planning to do surveillance of physical activity over a one-year period.

Plotting the 'roaming space' of children over the generations illustrates how children's scope for exploring their physical environment has diminished. Children do not eat that much more than they did half a century ago, but they do move considerably less than they did half a century ago. This is why physical activity is also very important.

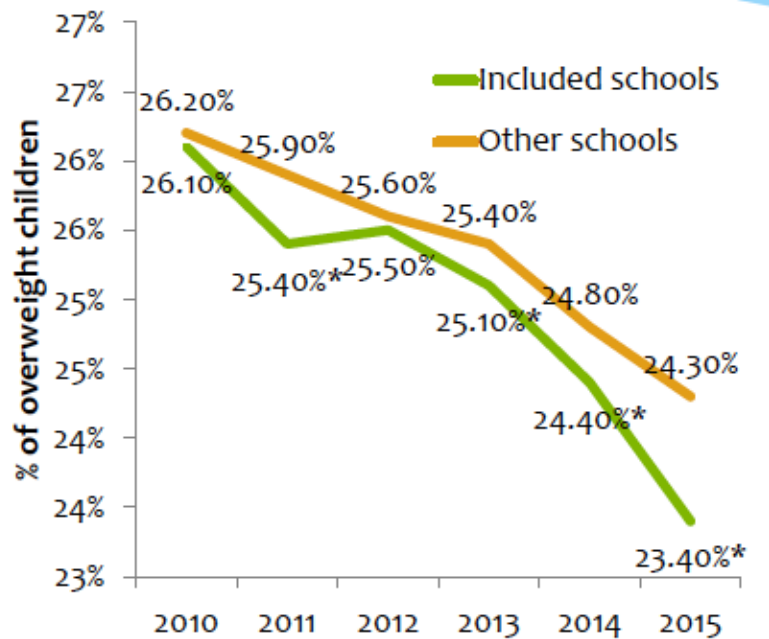
COSI currently includes a few questions about physical activity/inactivity, but there is no information on frequency, intensity or type of physical activity. One solution would be to reform the questionnaires. One questionnaire that has done well when calibrated with objectively measured physical activity is the CLASS questionnaire from Australia. It can be adapted to the national context to reflect the popular sports, etc. This separates out the week and weekend for physical activity. The same can be done for physically inactive activities.

Another solution for indirect measurement of physical activity is to test the physical efficiency (fitness) of children. Hungary is already measuring physical fitness and Serbia is planning to start soon. Perhaps this can be explored for COSI.

In Slovenia, obesity and pre-obesity in 7 to 14 year olds increased from 1993 to 2010. In 2010/11, an intervention was launched in schools whereby 30,000 children were given two extra hours of physical education in school (five hours in total). Immediately after the intervention the levels of both overweight and obesity dropped compared to the predicted levels based on the trend. The percentage of physically unfit children dropped even faster than the changes in obesity and overweight prevalence. There were improvements in all schools, but the improvements were greater in the included schools (Figure 15). Children in the Healthy Lifestyle

schools also had greater improvements in general endurance. A crude calculation of the economic impact of this greater endurance for the 30,000 children in the Healthy Lifestyle schools is 3,630,400 economic benefit in terms of productivity (above the cost of the intervention and not including health savings). The proportion of children in Healthy Lifestyle schools seeking help from a health professional for acute illness decreased from 2011 to 2015.

**Figure 15** Changes in the percentage of overweight children in Healthy Lifestyle versus other schools



It is fundamentally important, therefore, to collect information on physical activity and to consider both sides of the energy equation.

### *Discussion*

It was agreed that physical inactivity and sedentary behaviour is a very big problem, so the options to improve data collection on this issue are very interesting to explore. Physical activity surveillance is, however, a very tough challenge, even in adults and will be even more so in children. WHO now has quite good, validated self-report instruments in adults which monitor duration, intensity and domain and get an approximation of how active adults are. WHO is also doing some objective measurement of physical activity alongside self-report. In relation to the COSI age group, however, it raises some questions. It is important to consider why this would be added. The outcome data is already there – i.e., it is already clear that the children are overweight or obese – so what would we be measuring for COSI? In this age group, the self-reported questions are challenging. There was clarification that the questions would be answered by the parents. It could be more interesting for this age group to consider the domain-specific activity rather than the total amount. Data on the number of hours of physical activity at school is already available, so it could be more interesting to find out about transport-related physical activity and/or leisure-time physical activity. It is important to avoid adding a huge number of additional questions for parents, and therefore to focus on questions that would add value in this context, namely those that would drive interventions. In this approach, one of the most obvious areas

would, therefore, be transport-related physical activity – the proportion of children going to school by car is certainly of great concern in many countries.

There was clarification that this would be substitution of two questions with two new questions that are formulated differently to better capture the picture on physical activity. On the other hand, these questions are broken down into a many sub-questions.

In Italy, some additional questions have been addressed to 8-year-old and 9-year-old children on outside play and sport in the previous day. It is interesting to consider that children possibly give more accurate answers than parents and the possibility of some piloting some simple questionnaires for children, including the youngest, is worth exploring.

The challenge is to consider how to improve the data we are currently collecting. The current questions do not provide any useful information. It is fundamental to consider what the data will be used for – and thus to focus on driving policy – and it is also important to find the right balance between comprehensiveness and brevity, especially given the concerns about response rate. Rather than considering ‘what would we like to know’ we should consider ‘what might be able to change?’ and ‘what data would feed into that?’ Data that clarifies whether children are more active during the week or at weekends, for example, can orient policy interventions towards, for example, families, school curricula or transport.

In conclusion, it appears that a question in the current instrument is not sufficiently discriminating and is inappropriate, but this question can be addressed as part of the ongoing process of revisiting and fine-tuning the questionnaires. WHO will take that on board and start a review process early next year – including an objective analysis of what works – and bring an options paper to the wider group at a later date. Since we do have some time before the next round of data collection, it would be valuable to do some pre-testing of any new questions and the revised questionnaire in a small group of parents before the data collection. This is interesting also to consider collaboration with the WHO-European Commission joint validation process on physical activity measurement in around six countries in the region over the next two years.

With respect to how to use COSI for other purposes, the observation from JANPA has been about the dearth of properly evaluated policies. COSI has given us the possibility to use an existing infrastructure and a flexibility to be able to add information in order to evaluate national policy initiatives.

The European Commission’s previous support for provision of support from WHO to Member States to facilitate the implementation of COSI has now ended. There is a strong case, however, that Member States still need WHO’s support for COSI implementation and this is a costly process.

## **Sugar as a risk factor for dental caries and obesity**

Dr Paula Vassallo, Health Promotion and Disease Prevention Directorate, Malta, presented an overview on sugar as a risk factor for dental caries and obesity.

A major issue with sugar is the fact that it is so ubiquitous in processed foods and the fact that, given all of its different forms, and therefore descriptions on labels, for many people the sugar is

hidden. Of the 600,000 items in the American food supply, 74% have added sugar (sucrose, high fructose corn syrup).

Sugar consumption is associated with a number of health problems. Dental caries presents a significant health burden – untreated dental caries ranks first as the primary cause of years lived with disability and oral conditions collectively affect 3.9 billion people worldwide, according to the Global Burden of Disease study. The economic burden of dental disease is immense with average annual expenditure on dental care in the EU totalling around 81.5 billion euros between 2008 and 2012.

The production of dental caries from sugars in adults is very slow, but the process is much more rapid in children. Nursing caries, due to feeding sweet drinks in feeding bottles or dummies, is still a problem of real concern. A number of factors are involved in the aetiology of dental caries – from consumption of sugar to the social determinants such as socioeconomic status. It is vital to focus on decreasing the causes of caries.

There is a great deal of strong evidence, from multiple sources and a variety of types of studies, incriminating sugars in the aetiology of dental caries. The consensus view of diet and dental caries is that the influence of the diet is more important after the teeth have erupted and that frequency of intake and amount consumed are closely correlated. WHO issued new sugar guidelines in 2015:

- WHO recommends reduced intake of free sugars throughout the life-course (strong recommendation).
- In both adults and children, WHO recommends that intake of free sugars not exceed 10% of total energy (strong recommendation).
- WHO suggests further reduction to below 5% of total energy (conditional recommendation).

To put this into context, 5% of energy should be equivalent to 25 g of sugar or 6 teaspoons per day, an amount that it is very easy to exceed in a day.

In addition, countries with low free sugars intakes should not increase intakes. The recommendation to further limit free sugars intake to less than 5% of total energy is further based on the recognition that dental caries tracks from childhood to adulthood in order to minimize lifelong risk of dental caries, the consumption of free sugars should be as low as possible.

A link between caries and other aspects of health has long been identified. There is a significant relationship between obesity and dental caries in children from industrialized countries. On the other hand, caries in primary dentition (among young children) is associated with early childhood malnutrition – research found that children with untreated caries weighed less and that eliminating dental pain and sepsis that impairs children's ability to eat and sleep improves children's growth and weight gain. Untreated dental decay, therefore, should be considered an important co-factor affecting child growth.

The relationship between high consumption of free sugars and obesity is also of concern. The association is primarily mediated through contribution to the energy density of the diets and a risk of reduction in intake of foods containing more nutritionally adequate diets. A 2012

systematic review concluded that intake of free sugars or sugar-sweetened beverages is a determinant of body weight.

Sugar-sweetened drinks are known to be a key source of sugar in the diet, and consumption of soft drinks and fruit drinks has increased dramatically in recent decades. There are now 2,000 different non-alcoholic beverage brands in the EU market, which totals 123 billion litres per year. This increases to 9,000 if all the different flavours are taken into account, and to 100,000 options if all the size and packaging variants are considered.

It is now time, therefore, for evidence-based action, taking into account the principles of the Ottawa Charter, by designing upstream interventions to address the root of the problem and by involving the whole of government and whole of society. It is also important to take into account barriers at the individual, social and societal levels.

A number of actions are recommended:

- Lowering the amount of free sugars in food and drinks;
- Restricting the marketing of sugar-containing products;
- Tightening of advertising restrictions on high sugar foods;
- Reducing the amount of sugar-containing food and drinks sold (possibly through a sugar tax);
- Advising, educating and helping people to consume less sugar;
- Reducing the actual amount of sugar produced in Europe.

In conclusion, it is time to look at adopting an integrated common risk factor strategy, working together to reduce sugar consumption to combat NCDs.

### *Discussion*

There was much discussion about the challenges posed by fruit juices. In some countries there is a trend for carbonated sodas to change and contain higher quantities of fruit juices, but with higher levels of sugars. In fact, the biggest problem for oral health is the consumption of fruit juices, through contribution to both dental caries and erosion. Advice to the public should be that, if they drink juice, they should drink it with a meal and it should be diluted.

There is some concern that fruit juice is still included in the EU School Fruit Scheme (although Malta has succeeded in banning fruit juice from all its schools). It remains a problem that people give children sweetened fruit juice as a healthy drink. There should be a role for consumer bodies to change public opinion, and ultimately decision-makers' opinions, towards juices. It is also an issue that needs to be included in the curricula of future health professionals.

There was an urgent request for the details of all the relevant references to be shared with participants in order for them to address the guidelines in their countries which, in many cases, do recommend use of unsweetened juices in schools. Portugal is combining the school fruit scheme and the school milk scheme. Currently, this permits fruit to be replaced with fruit juice, which is very worrying. It is important to remember that the EU School Fruit Scheme is agreed by Ministers of Agriculture, and it seems that the inclusion of fruit juice will go ahead, despite objections raised by WHO and other health advocates. Although the scheme is fixed at the

European level and it has increased funding, it is now up to countries to adjust the scheme at the national level to exclude juices.

For COSI participants, it is important to feed intelligence of this sort into policymakers.

The UK Ministry of Health has recently announced plans to introduce a tax on sugar-sweetened beverage. It will be very interesting to monitor not only how this tax affects consumption but also how its very existence impacts on the discourse about taxes, sugars, healthy eating. It may well be possible to ramp up this level of public and political interest and translate it to action on fruit juices.

## **Concluding remarks**

João Breda summarised the main impressions of the meeting and the take home messages. There had been two very intensive days of discussion, clearly showing the success and progress made by COSI. There was clear recognition of COSI's strengths and weaknesses and the areas which need to be improved in the future, including coordination and dissemination of data/communication. The risks associated with rapid expansion and growth were also acknowledged, and the need to manage the enlargement process carefully underlined.

There was a call for COSI to be both more efficient and more accurate in its work. As part of this, it will be very important to provide WHO with datasets, analysis and other information on time in future.

A very strong message emerged that the website needs to be improved.

The discussion on publications and priorities was very helpful, clear for taking forward.

There is also a need to improve the protocol in some ways, and this was acknowledged.

It is clear that COSI is being used as a policy tool, and it appears that COSI is inspiring policy development and there are early signs of a positive impact of some of these policies in a few countries.

Dr Breda conveyed sincere thanks to the hosts, in particular the COSI Principal Investigator Professor Peterkova and the Ministry of Health from the Russian Federation. Thanks were all conveyed to all COSI participants for all their efforts, to the advisers for the input, to the team from the WHO Regional Office for the impeccable logistics and organization, and to the interpreters for all their work.



*Annex 1*

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