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Missing data and other challenges in assessing inappropriate marketing of baby foods in the Russian Federation: a cross-sectional study

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ABSTRACT

Objectives We used the WHO draft nutrient profile model (NPM) to evaluate baby foods targeted at infants and young children (IYC) aged 6–36 months in the Russian Federation to assess their suitability for marketing.

Design A cross-sectional study in Moscow (Russian Federation).

Setting Nutrition information of baby food was primarily collected from retailer websites, with some complementary data from physical stores. Both specialist stores for IYC and general supermarkets were included.

Participants Two hundred and thirty baby food products targeted to IYC were selected. Breastmilk substitutes and products targeted at children over 3 years old were excluded.

Main outcome measures Per cent of missing nutrition data, per cent of products with added sugar or sweetener and exceeded sodium or salts, per cent of products marketed as suitable for IYC under 6 months.

Results Most products were 'ready-to-eat', including fruit (n=42, 18.5%) and vegetable (n=29, 12.8%) purees, meat, fish or cheese purees (n =26, 11.5%); 'dry or instant cereal/starchy foods' (n=27, 11.9%), including predominantly dry cereals, 'juices and other drinks' (n=26, 11.5%). 95% (n=219/230) of products were missing total sugar information, 78% (n=180/230) were missing either sodium or salt, and 25% (n=57/230) were missing total fat. Among products with sugar and sodium information, 41% (n=94/230) included added sugar or sweeteners, and 48% (n=24/50) exceeded the NPM sodium threshold. 40% of products (n=92/230) were marketed as suitable for IYC aged under 6 months.

Conclusion Baby foods marketed for IYC showed a high per cent of missing nutrition information and disparity with WHO's guidelines for complementary feeding, age of introduction, sugar and salt content. Stronger regulation is needed in this area to minimise higher risk of non-communicable diseases (NCDs) in later life.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ This study of baby foods on the Russian market is the first of its kind to look at both nutrition and labelling in this region.
⇒ Large sample size.
⇒ Highlights clear policy gaps to target improvement efforts.
⇒ Study focuses on Moscow and surrounding areas so may not be representative of the whole country, particularly more remote areas.
⇒ Data on all nutrients were not fully available so some criteria could not be fully tested.

INTRODUCTION

Non-communicable diseases (NCDs) are a major global public health problem, accounting for 71% of all deaths.[1] The European Region is the worst affected WHO region, where NCDs, particularly diabetes, cancer, chronic respiratory disease and heart disease, cause almost 90% of all deaths.[2]

Evidence shows that obesity is a leading risk factor for NCDs, and this affects a worrying proportion of adults and children across the WHO European Region, including the Russian Federation.[3] In 46 of the 53 countries of the Region, more than 50% of the population and 1 in 3 children is living with overweight and/or obesity.[4] In the Russian Federation 1 in 3 children is living with overweight and 1 in 10 children is living with overweight.[4] Evidence shows that children who are living with overweight and obesity are likely to track into adulthood and increase NCD risk at a relatively younger age.[5]

Infants and young children (IYC) are a vulnerable group for overweight and obesity. WHO recommends exclusive breast feeding for the first 6 months of life and that infants start receiving complementary foods at 6 months of age in addition to breast milk.[6] IYC aged 6–36 months are at a critical developmental stage where eating habits are established throughout the start of complementary feeding. They are more vulnerable because they have no agency in the foods they

are given and unhealthy habits formed in this stage could become set, leading to unhealthy dietary choices in later life. The foods available on the market and to which IYC are exposed can play a major role in the development of good eating habits and minimising lifelong NCD risk (cardiovascular diseases such as stroke, myocardial infarction and hypertension, diabetes, cancer). However, many commercially available complementary foods (hereby referred to as baby foods) are inappropriately marketed.

In 2019, the WHO Regional Office for Europe developed a draft nutrient profile model (NPM) for ending the inappropriate promotion of baby foods for IYC in Europe to prevent marketing to IYC of foods high in energy, fats, free sugars and salt.[7] Nutrient profiling is the science of classifying or ranking foods according to their nutritional composition for reasons related to preventing disease and promoting health.[8] The draft NPM can be used to guide decisions on the appropriateness of baby foods for marketing. Pilot studies using the NPM found that many baby foods were marketed as suitable from 4 months of age, which clearly contradicts the WHO recommendation to exclusively breastfeed for the first 6 months of life.[9] In addition, many baby foods had misleading product names, and the majority were overly sweet, which reinforces sweet preference in IYC. Approximately one-third of energy in baby foods came from sugar, and most products had over 10% of their energy from sugar.

This evidence suggests that updated guidelines are needed to ensure public health recommendations are not undermined by inappropriate marketing. A previous study found a lack of appropriate labelling of food items marketed on children's TV channels in Russia. In addition, many of these product advertisements did not comply with WHO guidelines.[10] However, there is a knowledge gap in investigating this in Eastern Europe and Central Asian countries. This paper will address this gap by using the draft NPM to assess the suitability for marketing of baby foods for IYC aged 6–36 months in the Russian Federation.

METHODS

Data collection and analysis

This study used a cross-sectional design to assess the suitability for marketing of baby foods targeting IYC aged 6–36 months of age on the market in Moscow, the Russian Federation. Baby foods were defined as all foods and beverage products specifically marketed as suitable for feeding IYC aged 6–36 months. The inclusion criteria were food products recommended for IYC aged 3–36 months labelled with words 'baby', 'infant', 'toddler' or 'young child'; or where the label included an image of a child who appears to be younger than 3 years of age, such as a baby feeding with a bottle; or in any other way presented as being suitable for IYC aged under 3 years. The inclusion criteria accepted products marketed for infants under 6 months to capture those products that were intended for IYC but were inappropriately targeted at those under 6 months old. This study excluded breastmilk substitutes or any kinds of milk or other product on the market to replace breastmilk, products not explicitly marketed for children aged under 3 years, and vitamin and mineral food supplementations.

Sampling

Two hundred and thirty baby food products across different product categories were included in this study to achieve as representative a sample as possible of products available in the Moscow region. This area has a population of 20 million, which is 14% of the Russian Federation. Many of the brands available in this area also distributed throughout the country. The range of products is the same both in on-line stores and general supermarkets. All major supermarket chains in Moscow stock baby food products; therefore, both specialist shops for IYC and general supermarkets were included. Information from baby food labels was gathered primarily from retailer websites, with some supplements from physical stores. Analysis of these websites enabled the identification of the most frequents brand names. For the analysis, we did not include companies that produce only products that function as breast-milk substitutes (including formula milk, follow-on formula milk, so-called growing-up milks and fortified toddler milk). The remaining companies (11 brands) available on the Russian market were selected. Products were grouped into the food categories specified in the draft NPM (table 1). Among the assortment of each brand, food products were selected corresponding to the food categories (if possible, a product type from each food category for each brand names were sampled).

Coding

Information on the general and labelling characteristics was gathered, in addition to nutritional information. This included information source, product name, product brand, product package size, company name, food category, ingredients, nutrient composition, any health or nutrition claims and other labelling information. Information on the nutrient composition of the products was also gathered. All information was recorded and coded using a preset spreadsheet (online supplemental material 1). Although ingredients must be included on the label, it is not mandatory for products in the Russian Federation to include nutrition information on sodium or salt, trans fat and sugar. Therefore, salt and sugar may appear on the label as ingredients, but the nutritional value may not be present. However, this information was included where available.

Data entry and analysis

In this study, a preset Microsoft Excel spreadsheet was used to record product data. The spreadsheet consisted of eight sheets, including instruction sheet, product registration sheet, food category key, nutrient summary, label summary, company nutrient summary, company

Table 1 Food category

1.Dry, powdered and instant cereal/starchy food	1.1 Dry or instant cereals/starch
2.Soft-wet spoonable, ready-to-eat foods, typically smooth or semipureed packaged in jars or pouches and can be spoon-fed	2.1 Dairy-based desserts and cereal products 2.2 Fruit purée with or without addition of vegetable, cereals or milk 2.3 Vegetable only purée 2.4 Puréed vegetables and cereals 2.5 Puréed meal with cheese (but not meat or fish) mentioned in the name 2.6 Puréed meal with meat or fish mentioned as first food in product name 2.7 Puréed meals with meat or fish (but not named as the first food in product name) 2.8 Purées with only meat, fish or cheese in name of product
3.Meals with chunky pieces, often sold in trays or pots for older infants and young children	3.1 Meat, fish or cheese-based meal with chunky pieces 3.2 Vegetable-based meal with chunky pieces
4.Dry finger foods and snacks	4.1 Confectionery, sweet spreads and fruit chews 4.2 Fruit (fresh or dry whole fruit or pieces) 4.3 Other snacks and finger foods
5.Juices and other drinks, products are typically packaged in bottles, cans or tetrapaks and can be poured or served to infants as a drink in cups with/without spouts.	5.1 Single or mixed fruit juices, vegetable juices or other non-formula drinks 5.2 Cow's milk and milk alternatives with added sugar or sweetening agent

label summary and nutrient thresholds. Data analysis was conducted by the in-country team in coordination with the WHO European Office for Prevention and Control of NCD Office. The NPM uses both nutrient thresholds and labelling guidance to determine whether products are suitable for marketing to IYC aged 6–36 months in this research. It was developed and piloted using data from 2634 baby foods across 10 countries. Descriptive analyses of the number of products overall and within product categories and analyses of products' performance against the NPM and labelling requirements were undertaken.

A deeper investigation into missing nutrition information was made using data from countries involved in the pilot studies (Denmark, Spain and the UK) on which the NPM was developed and countries that have subsequently applied the NPM to their own markets.[9] A leading company with equivalent products in each of the countries was selected and the level of nutrition information provided on the pack was compared.

Patient and public involvement

Patients and the public were not involved in the conduct of this study.

RESULTS

Most of the sample consisted of products from the categories: 'ready-to-eat products', including fruit (n=42, 18.5%) and vegetable (n=29, 12.8%) purees, meat, fish or cheese purees (n=26, 11.5%); 'dry or instant cereal/starchy foods' (n=27, 11.9%), including predominantly dry cereals, 'juices and other drinks' (n=26, 11.5%). The researchers did not find on the Russian market food products for children of the age group of 6–36 months of several categories: 'vegetable puree with the addition of cereals' (2.4), 'mashed cheese with cheese that does not contain meat or fish' (2.5), 'vegetable dish base with pieces' (3.2) 'fresh or dried whole fruits' (4.2).

Food labelling results

Many products had missing nutrition information on the label; therefore, these products could not be assessed against the NPM. Consequently, a full assessment of the suitability of baby foods on the Russian market could not be conducted and no products could be said to meet all requirements for the NPM. However, a secondary and useful assessment was made: the adequacy of information provision on the label of baby foods on the Russian market. Most notably, 95% (n=219/230) of products were missing information on the amount of total sugars, 78% (n=180/230) were missing the amount of either sodium or salt, and 25% (n=57/230) were missing total fat (table 2). In addition, 95% (n=218/230) of products were missing saturated fats. Although this is not required for the NPM, it is an important broader labelling information issue (table 2). In comparison, only 1% (n=4) products were found missing any nutritional information

Table 2 Proportion of products in the Russian Federation with missing nutrition information

Missing nutrition information	Total products	%
Total sugar	219	95
Salt or sodium	180	78
Total fat	57	25
Saturated fats	218	95
Marketed to IYC <6 months	92	40

IYC, infants and young children.

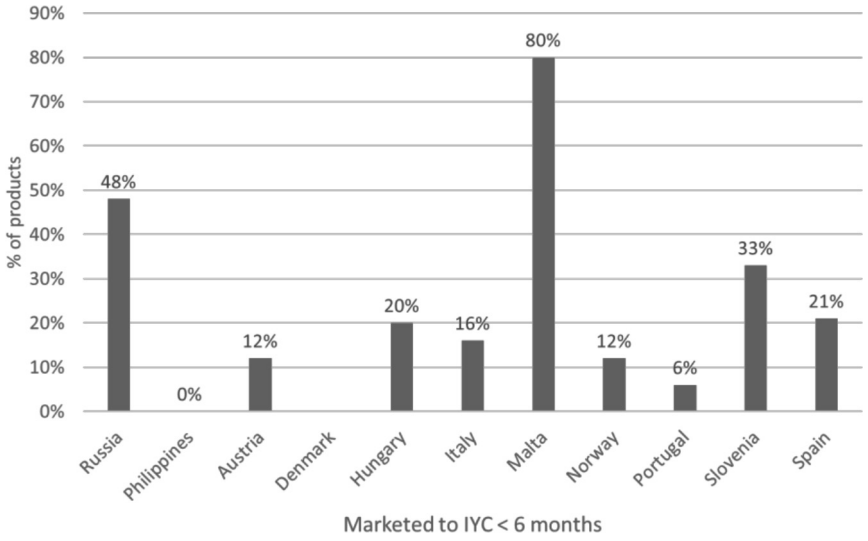

Figure 1 A cross-country comparison of a leading brand's baby food product marketed to IYC under 6 months. IYC, infants and young children.

among the 320 products sampled in the Danish pilot study (table 2).

Despite few products having sugar information on the label, 41% (n=94/230) of products included added sugar or sweeteners (sucrose, dextrose, fructose, glucose, maltose, galatose, trehalose, syrup, nectar, honey, barley malt/ malted barley, malt extract, molasses) in the ingredients list. In products where salt was listed in the ingredients, 7% (n=16/44), the amount was included in the label. Among products that provided sodium or salt values, 48% (n=24/50) exceeded the NPM threshold. In terms of the product format, over half of products, 56% (n=129/230), were for consumption in purée form.

In addition, 40% (n=92/230) of products were explicitly marketed as suitable for IYC younger than 6 months, either including a minimum age under 6 months, or images or text suggesting that the product is suitable for babies under 6 months old (table 2).

Cross-country comparison of missing information

Figure 1 shows that in the majority of countries, some of a leading brand's baby food products were marketed as suitable for IYC younger than 6 months. Although the porridges included in this study (n=26) include information on the amount of sodium, overall products collected in Russia showed the highest number of missing sugar (92%, n=37) and salt (75%, n=30) information from the label compared with other countries, despite all being from the same company (figure 2). The majority of countries other than the Russian Federation had no missing total sugar and salt information. The only exception was the Philippines; however, the missing per cent for total sugar and salt were 6% (n=2) and 3% (n=1), respectively—much lower than that in the Russian Federation (figure 2).

DISCUSSION

In the Russian Federation pilot study, 230 products marketed for IYC were collected for analysis. A high prevalence of missing total sugar, salt or sodium and saturated fat values were observed from data, although there was a high percentage of products containing added sugar or sweeteners and excess salt.

The major driver of these findings is the Russian legislation on food labelling. Mandatory information to be included on the product label are ingredients list, energy, protein, total carbohydrates and total fat. There is no requirement to state the amount of salt, total sugar or saturated fat. For this reason, sugar may be in the list of ingredients, but the label will not state the amount of total sugar. This absence of information on the amount of sugar and salt has already been identified as a substantial obstacle in evaluating products advertised on child and adolescent television channels, where 20% of the products were not classified[10]

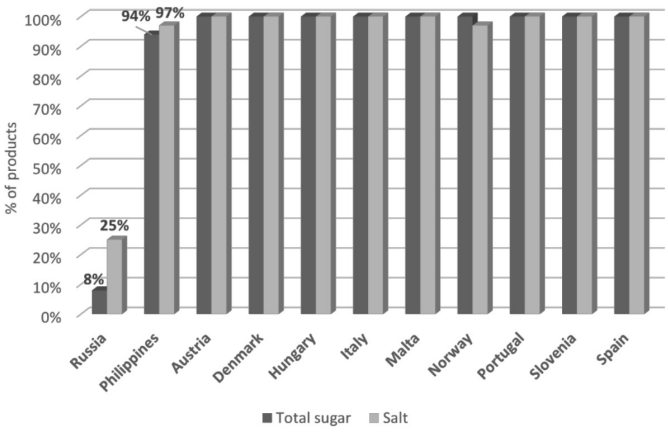

Figure 2 A cross-country comparison of a leading brand's baby food product portfolio for infants and young children aged from 3 to 36 months.

Around half of the analysed products were marketed as suitable for IYC under 6 months. The high percentage of baby foods with missing data meant that no products passed the NPM, and therefore, no products could be deemed suitable for marketing to IYC aged 6–36 months. In addition, the large number of products with added sugar or sweeteners and with excess salt indicates that many baby foods on the market in the Russian Federation are not suitable to be marketed for consumption by this age group.[10]

Added sugar increases the energy density of baby food products while also being relatively deficient in nutrients, and this could contribute to increased risk of overweight and obesity in childhood, adolescence and adulthood.[11] In children and adolescents in the Russian Federation in 2016, 23.8% of boys and 17.8% of girls were living with overweight and obesity.[12] In adults, this was 68.9% of males and 60.1% of females.[13] Evidence shows that obesity in childhood is more likely to track into adulthood and increase the risk of the early onset of some NCDs.[5] In addition, overly sweet foods at an early stage develops sweet preferences in children, making them more likely to consume high-sugar foods throughout childhood and later life.[9]

About half of baby foods in the study that included information on salt content on the label exceeded the threshold specified in the NPM hence the need to regulate salt content in baby foods. As with sugar, IYC who have earlier exposure to high sodium foods may develop preferences for salty foods and find transitioning to lower sodium foods later in life more challenging.[14] In addition, a low-sodium diet during infancy has been associated with lower blood pressure during infancy and childhood.[15]

NCDs are currently the leading cause of morbidity and mortality and are responsible for 87% of deaths in the Russian Federation.[16] It is clear that greater regulation is needed to improve nutrition information provision and enable consumers to make healthier choices, thereby protecting this vulnerable group and reducing future NCD risk. Compared with the EU countries that piloted the NPM, the Russian Federation showed a much higher prevalence of baby foods unsuitable for marketing to IYC aged 6–36 months. This difference was driven by missing nutrient content on their food labels. It shows that different regulations in different countries allows for different information provision and inequity in the ability of consumers or parents to determine the nutritional content of the food they are buying for their children. Stronger regulation and polices for better labelling of foods in general is needed, and especially targeted at this age group to empower parents to make informed, healthier choices for their babies.

Strengths and weaknesses

A strength of this study is its established, uniform sampling strategy and the relatively large number of baby food products sampled across the NPM product categories. This provides a comprehensive and relatively representative evaluation of baby foods on the market in Moscow, the largest city in the Russian Federation.

- However, the nutrient information relied on product labelling, which has been shown to be incomplete. Future funding could enable studies to lab analyse baby food products. This would generate more complete and reliable data on which to assess baby food products against the NPM in its entirety.

This study clearly shows the need for greater, coordinated regulation for information provision to inform healthier choices and to limit the inappropriate marketing of baby foods in the Russian Federation. Many aspects of food labelling regulation are based on the supranational level of Eurasian economic union, where markets overlap, rather than the national level of the Russian Federation. Further studies replicating these methods in other Eurasian economic union countries, as well as other Central Asian and Eastern European countries would be beneficial in building an evidence base and paving the way for strong policy development on a supranational, national and regional basis.

CONCLUSION

In this study, baby foods on the market in Moscow, the Russian Federation for IYC aged 6–36 months showed a high per cent of missing data, particularly compared with other countries in the Region. Many products also had high level of sugar and salt. Excessive sugar and salt intake during early life may lead to a higher NCD risk in their later life, particularly obesity and related NCDs. Greater resources should be put into policy development to strengthen regulation of the baby foods market in the Russian Federation, to improve the nutrition and health prospects of this vulnerable group.

Contributors DM, HLR and AK conceived and designed the study. AK supervised data collection, management and validation. DM and AA collected data and conducted the statistical analyses. SL and QC drafted the manuscript with support from HLR and AK. HLR and AK advised on the analyses, helped interpret the data and contributed to the development of the manuscript. MV, OD and DM provided technical oversight. All authors read and approved the final manuscript. The corresponding author attests that all listed authors meet authorship criteria and that no others meeting the criteria have been omitted.The Corresponding Author has the right to grant on behalf of all authors and does grant on behalf of all authors, a worldwide licence to the Publishers and its licensees in perpetuity, in all forms, formats and media (whether known now or created in the future), to (1) publish, reproduce, distribute, display and store the Contribution, (2) translate the Contribution into other languages, create adaptations, reprints, include within collections and create summaries, extracts and/or, abstracts of the contribution, (3) create any other derivative work(s) based on the Contribution, (4) to exploit all subsidiary rights in the contribution, (5) the inclusion of electronic links from the contribution to third party material whereever it may be located; and, (6) licence any third party to do any or all of the above. KW acts as guarantor.

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