

Guide for the adaptation, validation, application and analysis of data from the “NOVA 27 UPF Categories Tracker” in Ecuador

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Antecedentes

Background information

Overweight and obesity have reached alarming levels worldwide and they affect all age groups. Furthermore, according to the World Health Organization (1), overweight and obesity will continue to rise in the following decade. It is estimated that the population of children under the age of 5 will increase worldwide from 33.3 million in the year 2000 to 39 million in 2030. The prevalence of obesity among children age 5 to 19 was 20% or more in various countries in the Pacific, Eastern Mediterranean, Caribbean and the Americas. Also, overweight children are at greater risk of being overweight or obese in adulthood. On the other hand, there were 1,900 million overweight adults in 2020, and obese adults reached 0.6 million that same year. Obesity is one of the main risk factors in various chronic diseases, including diabetes, cardiovascular diseases, hypertension and stroke, as well as various types of cancer. (2)

The costs of obesity and associated diseases are on the rise. The estimated cost of health services globally reaches US\$ 990 billion per year, which equals more than 13% of the entire health care budget. Indirect costs of obesity include declining productivity, disability, lost years of life and a reduced quality of life. It is estimated that the combined direct and indirect costs of health care make up nearly 3.3% of the total GDP in countries. (3)

Although the main cause of overweight and obesity is an energy imbalance between caloric consumption and expenditure, in summary it is the result of an increase in the intake of high-calorie foods and a decrease in physical activity, issues that are often the consequence of associated environmental and social changes. (1) The consequences of this shift in consumption and physical activity patterns are reflected not only in increased overweight and obesity, but also in non-communicable diseases such as cardiovascular diseases —mainly heart disease and stroke— diabetes, psychomotor disorders and some forms of cancer, all of which result in reduced life quality and premature death. (4, 5)

To face the global rise of these health issues, there are numerous actions that should be taken to reverse this trend. One of them is continuous monitoring of changes in the population's consumption patterns, to uphold policies and programs that protect good nutrition practices, support healthy local food production, as well as also ensuring access to the entire population.

In this context, tools that allow us to monitor shifts in the population’s consumption patterns are essential, given that the increase in consumption of ultra-processed foods and beverages containing high levels of fat, salt and sugar, as well as low contents of essential nutrients, is detrimental to healthy diets in which minimally processed fresh foods are predominant —namely, fruits and vegetables that have been consumed for thousands of years in various population groups. (6)

To carry out this monitoring, the “Nova 27 UPF Categories Tracker” is presented as an easy-to-apply instrument. This instrument can be implemented and analyzed quickly, and it also provides data on the consumption patterns of ultra-processed foods and the ratio of calories derived from their consumption. This information is useful to monitor the population’s diet behavior and to define and evaluate intervention policies and programs aimed at protecting healthy nutrition. It also allows to compare population groups within a country and between countries.

This tool may be implemented alone or as a module for existing periodic data collection surveys, such as intake and expenditure surveys, employment surveys and food safety surveys, among others.

The tool presented in this document can replace “24-hour reminder” surveys when the UPF caloric intake in the 24 hours prior is to be estimated and if the purpose is to have prompt information that allows to monitor the consumption patterns of these products. Its advantages are that it allows for easy application and data analysis, and can obtain prompt and reliable results for decision making. (7-9)

In comparison, applying a “24-hour reminder” survey —the gold standard for estimating food consumption— is more complex and costly. Moreover, collected data requires complex analysis in order to estimate the population’s food consumption. (10) Therefore, not all countries are able to implement a “24-hour reminder” survey for frequent monitoring activities of UPF consumption. Thus, the “NOVA 27 UPF Categories Tracker” is a low-cost and easy-to-implement alternative.

The set of documents presented here offers tools that facilitate the application of this instrument in a specific population or at a national level, either online or in person, to monitor caloric intake and caloric content of UPF.

This tool was designed and validated in Brazil, (11) but in order to apply it to other population groups, it was adapted for use and validation in Ecuador. This allows application of the instrument to other contexts by following the recommendations outlined in this document.

“NOVA 27 UPF Categories Tracker”

The results from the process of adaptation, application, field work, as well as data analysis and validation showed that the tracker can be applied in Ecuador, in other population groups and in other countries by following the steps described later in this document. Thus, its use is recommended for estimating UPF food and beverage consumption and caloric value in the studied population’s diet. This recommendation may be very important in other countries if they decide to design and implement programs aimed at promoting healthy nutrition.



This set of instruments will allow us to standardize the procedures to be applied in different population groups, either as a stand-alone survey or as a module of surveys to which the tracker can be added—for example, expenditure or employment surveys, etc.

Originally, the instrument was designed to be self-administered. However, in Ecuador it was applied online. This methodology was also validated for its application in other contexts. This means that the tracker can be applied both in person and online.

Once the instrument is validated, its application does not require special resources or extended times for its analysis and interpretation. (11) The data collected with this instrument provides a high degree of comparability over time, between similar population groups and between countries. (12)

The simplicity of its application provides information that—if collected periodically—allows us to monitor the consumption patterns of ultra-processed foods. This information may be relevant for the formulation of policies, strategies and advocacy programs for healthy nutrition and associated policies.

In essence, the instrument collects data on the consumption of UPF in the 24 hours prior to the interview, in adults over the age of 18, through a list of ultra-processed products grouped into 27 categories, which in turn are grouped into 3 large categories of ultra-processed products. In the first category these groups include beverages such as flavored sodas, flavored yogurts, flavored milks and powdered milk, which are presented in 8 subcategories. The second category includes ultra-processed foods consumed in the day prior replacing a regular meal, grouped into 12 subcategories. The third category includes sweet or salty snacks, also consumed in the day prior, and are grouped into seven subcategories.

Steps for its implementation

Definition of the environment where the “NOVA 27 UPF Categories Tracker” will be implemented.

Once the decision to implement the tracker has been made, either as a stand-alone or as part of a more complex survey, choices about surveyors’ training must be made; the application of the instrument in a sub-sample or the total sample; implementation schedule, either as a stand-alone or as part of a more complex survey; the instrument’s design, whether it is in-person or online, and how to store the data. That is, all steps for the implementation of the tool must be followed prior to the selection and training of surveyors, which is the last activity before field work. Ensuring the implementation of these steps is an essential task to obtain and analyze data successfully.

Adaptation

The tracker used in the country was originally designed and validated in Brazil. (11) In order to use it in Ecuador, two previous steps were taken: the survey was translated from Portuguese into Spanish and the relevance of using the 24 UPF categories in the survey designed in Brazil was analyzed.

To this end, the database of the “24-hour reminder” survey was used, which was applied in the National Nutrition Survey (ENSANUT) 2012. (13) The category corresponding to the NOVA classification was assigned to each food. (14, 15) Next, an additional list of ultra-processed products that were not registered in the “24 hour reminder” survey from ENSANUT 2012 was added. With this more comprehensive list, the 3 categories of ultra-processed products and the corresponding 27 subcategories were established; as described in the General Guidelines document for statistical validation of the tracker, which will be presented later in this document.

After taking these steps, the “24-hour reminder multi-step method” survey was adjusted with the aim of ensuring its applicability in Quito. The data collection categories and the viability of applying the 5 multi-steps were reviewed. (16)

To ensure the proper application of the tracker and the 24-hour survey, the instrument was applied to a trial group consisting of 10 men and women above the age of 18. This activity allowed for identification and verification of the names of the ultra-processed products that are sold and consumed with different names and packagings. The surveyors’ degree of understanding of these instruments, as well as the application time and the data collection and recording process were also evaluated.

Two nutritionists were then surveyed to determine the degree of information they need in order to properly apply the tracker and the “24-hour reminder multi-step method” survey and their ability with the NOVA food classification. This activity showed that the surveyors need specific training to be able to recognize foods according to certain degree of processing, that is, according to the NOVA classification (14,15), and to be able to apply the multi-step method in the 24-hour survey.

The instruments were adjusted and the final version was designed using the information gathered in these activities. (17) This validation allowed us to determine that the 27-step tracker and the “24-hour reminder” survey can be applied in Ecuador, being certain that true data will be collected.

Back-up material for the surveyor. “Atlas of Standardized Foods and Beverages”

In order to apply the “NOVA 27 UPF Categories Tracker” and the “24-hour reminder multi-step method” survey, designing an “Atlas of Standardized Foods and Beverages” was necessary (Annex 1). This atlas contains a collection of photographs of foods and beverages grouped into 5 categories and a food coding table. When shown to the survey respondents, they were asked to recognize the foods and beverages consumed the previous day, identifying the photograph of the product and the amount or volume ingested. These 5 categories are:

1. Cooking ingredients
2. Standardized food portions
3. Dishes prepared at home or at restaurants
4. Ultra-processed products and beverages
5. Snacks
6. Food coding



After completing the adaptation of the instruments, as well as of the tracker with the 27 subcategories and the “24-hour reminder multi-step method” survey, and once the “Photographic Atlas of Standardized Foods and Beverages” was prepared, training for the surveyors began.

Training

The training included the materials and instruments designed for this study, the list of foods gathered in the 2012 “24-hour reminder” survey classified following NOVA, (18) the list of ultra-processed products not listed in the “2017 Food Composition Table” and the “Photographic Atlas of Standardized Foods and Beverages”.

At the end of the training, the surveyors were evaluated on their ability to identify ultra-processed products consumed locally and differentiate them from other non-ultra-processed foods and beverages, as well as on their use of the NOVA classification to all foods reported in the “24-hour reminder” survey, using the Food Atlas, and conducting the interview within the set schedule while establishing good relations with the interviewees.

Survey application

After completing the training phase, an interview schedule was planned with the people who agreed to take part in the study. They were visited virtually following the interview schedule.

Data analysis

Once data was collected, the database was cleaned and the statistical analysis was carried out, which showed that the instruments adapted to Ecuador were valid and can be applied in other contexts by following the recommendations set forth in this document.



References

- (1) World Health Organization. WHO Discussion Paper: Draft recommendations for the prevention and management of obesity over the life course, including potential targets [Internet]. Geneva: World Health Organization; 2021 [cited on June 20, 2023]. Available at: <https://www.who.int/es/publications/m/item/who-discussion-paper-draft-recommendations-for-the-prevention-and-management-of-obesity-over-the-life-course-including-potential-targets>
- (2) NCD Risk Factor Collaboration (NCD-RisC). Worldwide trends in body-mass index, underweight, and obesity from 1975 to 2016: a pooled analysis of 2416 population-based measurement studies in 128.9 million children, adolescents, and adults. *The Lancet*. 2017; 390(10113):P2627-2642. Available at: [https://doi.org/10.1016/S0140-6736\(17\)32129-3](https://doi.org/10.1016/S0140-6736(17)32129-3)
- (3) Studies. The heavy burden of obesity: the economics of prevention [Internet]. 2019 [cited on June 20, 2023]. Paris: OECD Publishing. Available at: <https://www.oecd.org/health/the-heavy-burden-of-obesity-67450d67-en.htm>
- (4) World Health Organization. Obesity and overweight. Descriptive notes [Internet]. 2021 [cited on June 20, 2023]. Available at: <https://www.who.int/es/news-room/fact-sheets/detail/obesity-and-overweight>
- (5) The GBD 2015 Obesity Collaborators. Health effects of overweight and obesity in 195 countries over 25 years. *New England Journal of Medicine*. 2017; 377:13-27. Available at: <https://doi.org/10.1056/NEJMoa1614362>
- (6) Pan American Health Organization. Ultra-processed food and drink products in Latin America: Sales, sources, nutrient profiles, and policy implications. Washington, DC: PAHO, 2019.
- (7) Martinez JC, Alles B, Touvier M, Hercberg S, Mejean C, San-Cristobal R et al. Contribution of ultra-processed foods in the diet of adults from the French NutriNet-Sante study. *Public Health Nutrition*. 2018; 21(1):27–37. Available at: <https://doi.org/10.11606/s1518-8787.2021055002473>
- (8) Wang L, Martínez Steele E, Du M, Pomeranz JL, O'Connor LE, Herrick KA, Luo H et al. Trends in consumption of ultraprocessed foods among US youths aged 2-19 years, 1999-2018. *JAMA*. 2021; 326(6):519-530. Available at: <https://doi.org/10.1001/jama.2021.10238>
- (9) Climent-Mainar C, Martínez-González M, Salas-Salvadó J, Corella D, Schröder H, et al. Integrative development of a short screening questionnaire of highly processed food consumption (sQ-HPF). *International Journal of Behavioral Nutrition and Physical Activity*. 2022; 19, 6. Available at: <https://doi.org/10.1186/s12966-021-01240-6>



- (10) Namanjeet Ahluwalia N, Dwyer J, Terry A, Moshfegh A, Johnson, C. Update on NHANES dietary data: focus on collection, release, analytical considerations, and uses to inform public policy. *Advances in Nutrition*. 2016; 7:121–34. Available at: <https://doi.org/10.3945/an.115.009258>
- (11) dos Santos Costa C, Rocha de Faria F, Tiemann Gabe K, Fleury Sattamini I, Khandpur N, Marrocos Leite FH, Martínez Steele E et al. Escore Nova de consumo de alimentos ultraprocesados: descrição e avaliação de desempenho no Brasil. *Revista Saude Publica*. 2021; 55,13. Available at: <https://doi.org/10.11606/s1518-8787.2021055003588>
- (12) Conway JM, Ingwersen LA, Moshfegh AJ. Accuracy of dietary recall using the USDA five-step multiple-pass method in men: An observational validation study. *Journal of the American Dietetic Association*. 2004; 104, 595-603. Available at: <https://doi.org/10.1016/j.jada.2004.01.007>
- (13) Freire WB, Ramírez-Luzuriaga MJ, Belmont P, Mendieta MJ, Silva-Jaramillo MK, Romero N et al. Tomo I. Encuesta Nacional de Salud y Nutrición de la Población Ecuatoriana de Cero a 59 Años. ENSANUT 2012. Quito: Ministerio de Salud Pública/Instituto Nacional de Estadísticas y Censos, 2014.
- (14) Monteiro CA, Cannon G, Moubarac J-C, Bertazzi Levy R, Louzada MLC, Constante Jaime P. The UN decade of nutrition, the NOVA food classification and the trouble with ultra-processing. *Public Health Nutrition*. 2018; 21(1):5-17. Available at: <https://doi.org/10.1017/S1368980017000234>
- (15) Monteiro CA, Cannon G, Levy RB, Moubarac J-C, Louzada MLC, Rauber F, Khandpur N et al. Ultraprocessed foods: What they are and how to identify them. *Public Health Nutrition* 2019, 22(5):936-941. Available at: <https://doi.org/10.1017/S1368980018003762>
- (16) Moshfegh AJ, Rhodes DG, Baer DJ, Murayi T, Clemens JC, Rumpler WV et al. The US Department of Agriculture automated multiple-pass method reduces bias in the collection of energy intakes. *American Journal of Clinical Nutrition*. 2008; 88:324 –332. Available at: <https://doi.org/10.1093/ajcn/88.2.324>
- (17) Conway JM, Ingwersen LA, Vinyard BT, Moshfegh AJ. Effectiveness of the US Department of Agriculture 5-step multiple-pass method in assessing food intake in obese and non-obese women. *American Journal of Clinical Nutrition*. 2003; 77, 1171. Available at: <https://doi.org/10.1093/ajcn/77.5.1171>
- (18) Freire WB, Belmont Guerrón P, Jiménez E, Román D, Burgos E. Lista de alimentos, preparaciones y bebidas que se consumen en Ecuador según la clasificación NOVA 2017. *Bitácora Académica USFQ*. 2017; 5:1-126. Available at: <https://revistas.usfq.edu.ec/index.php/bitacora/article/view/1766>