

## Supplementary Material S1: HBM4EU BPA Study protocol.



science and policy  
for a healthy future

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## HBM4EU – BPA Study protocol

### Urinary Levels of Bisphenol A (BPA) Among European Women and Major Determinants

#### 1 Background

Bisphenols are anthropic substances characterized by the presence of 2 hydroxyphenolic functional groups. More than 15 substances belong to this group and among them, Bisphenol A (BPA) or 4,4'-(propane-2,2-diyl)diphenol (CAS N°80-05-7) is the most used and produced in Europe. The production of BPA in 2006 was about 1.6 million of tons in Europe and 3.8 million tons worldwide. In human biomonitoring (HBM) studies, BPA is the most frequently used substance to assess bisphenol exposure. Therefore, by now, using existing data involves focusing on BPA data. Although bisphenol F and S data are rising in recent biomonitoring surveys, there is not yet enough data to include these others compounds.

BPA is an endocrine disruptor and has been suspected to increase the risk of breast cancer following gestational or neonatal exposure. Studies have shown associations between BPA and adverse health outcomes in perinatal, childhood, and adult health outcomes, including reproductive and developmental effects, and metabolic diseases (both of which are associated with prenatal and postnatal exposure) (Rochester 2013). Other studies have shown evidence of effects in the offspring of parents exposed to BPA during pregnancy (Ribeiro et al. 2017). Moreover, adults with occupational exposure to BPA have more often higher levels of detected BPA than those with non-occupational exposure. Regulatory action on BPA has been taken at the EU level under REACH (1907/2006/EC). Some countries have imposed some restrictions under their national legislation, such as in France for the ban of BPA in baby bottles since 2011 and in food or drink containers and cooking utensils since 2015.

BPA has been widely used in the plastics industry for over 50 years. It is involved in the synthesis of polycarbonates, which are used in various plastic-based manufactured products such as food containers, recycled bottles, glasses; and in the synthesis of epoxy resins, which are used for coatings and protective films that cover cans and tins. BPA is also used for thermal papers labeling, in dental sealants and medical devices, and also found in personal care products (Geens et al. 2011, 2012; Machtinger et al. 2018). Human exposure to BPA can also occur through clothing textiles, especially those manufactured from polyesters (Xue et al. 2017). There is considerable evidence in the literature that a large majority of the human population is exposed to BPA, including vulnerable populations (e.g. pregnant women, children) (Casas et al. 2013; Covaci et al. 2015; Frederiksen et al. 2014; Gerona et al. 2016; Philips et al. 2018).

There are different routes of contamination to BPA in humans, mainly via dietary intake in the general population, but also via water, air, house dust, and skin (Vandenberg et al. 2007; Lv et al. 2017). The half-life of BPA in humans is relatively short (~6h), so urinary levels can only reflect recent exposure. Compared to blood serum, urine sampling is the most used matrix for dosing of BPA because minimally invasive. BPA is largely excreted in both free and conjugated forms. The measurement of total and conjugated forms of BPA present the advantage of dealing with possible external contamination during the assay and to better assess the metabolized form of the substance.

During the last decade, a large number of studies on BPA exposure have been conducted in European countries. These studies included different targeted populations (general population, mother-child/newborn pairs, or pregnant women) but women are by far the most frequently studied population. Most of the studies have dealt with a single measurement of BPA in blood or in urine (more often in urine). There is still a lack of consensus on how to deal with multiple samples in order to estimate the correct level of exposure. In the absence of a recent large harmonized survey of BPA exposure in Europe, human biomonitoring (HBM) data could be used to evaluate the general level of BPA exposure across European countries.

## 2 Objectives

As the majority of available European data concern levels of urinary BPA in women, the objective of the work will be to describe the level of exposure to BPA among European women and to identify the major determinants of exposure in this population. The research questions that the study aims to address are:

- a) What is the current level of exposure to BPA among European women?
- b) Which major determinants contribute to the difference in BPA exposure levels among women?

## 3 Methods

### 3.1 Study design

To conduct this study, we need to obtain individual or aggregated data from biomonitoring surveys that include women in Europe (from general population surveys or targeted on mother/newborn or mother/child pairs populations, or in pregnant women) and that have analyzed BPA in urine samples. The studies may be prospective or cross-sectional, national or regional surveys that have also collected via a questionnaire variables on potential determinants of BPA exposure levels (including individual characteristics and potential sources of BPA exposure). Statistical analyses will be carried out on combined data from different eligible European studies.

The approach that will be used for data analysis will be as follows:

Identify the characteristics of each study (target population, variable of interest collected, data collection mode, data collection period, sample design, availability of individual data).

Analyze these characteristics and compare them across selected countries.

Select the appropriate statistical method for the data analysis (pooled or separate approach): there are two ways to compute estimates for a combination of survey data when each target population is assumed to be finite. First, one could compute separate estimates for each survey and then combine them afterwards by some sort of weighted average (this is called the separate approach). The second way to combine surveys is to pool the data, adjust the survey weights, and proceed as if the combined sample were simply one larger sample (this is called the pooled approach). The pooled approach should only be used when it can be assumed that the characteristics and areas of interest are similar from one survey to the next.

#### 3.1.1 Biological samples

Due to the data availability, the study will focus on urine samples only and will not also include blood samples. In order to take into account the urinary dilution, only studies with data on BPA measurement and urinary creatinine, specific gravity, or osmolality should be selected. Additional analytical information on the measured form of BPA (total, free and conjugated forms) will also be collected from study investigators to assess external contamination of BPA.

#### 3.1.2 Inclusion criteria

Our study aims to include all cross-sectional studies (repeated or not) and prospective studies in the EU that assess urinary BPA exposure, including adult women regardless of physiological status. Prospective birth

cohort studies where maternal urinary BPA levels are available are also eligible, as are studies of pregnant women. To focus on current exposure, sample collection should have taken place between 2008 and 2015 (the current period for which most of the studies on BPA exposure are available from the HBM4EU metadata overview).

For studies focusing on the general population, including both males and females or the mother-child or mother-newborn population, only data on women should be collected.

### 3.1.3 Exclusion criteria

Non-targeted studies in the general population cannot be included (e.g., clinical populations, institutionalized mothers, occupational studies). Occupational status with a potential for exposure to BPA in the general population is not considered to be as an exclusion criterion. However, this information should be considered in the analysis of the determinants of exposure.

### 3.1.4 Studies to be used

Based on the available HBM4EU metadata from the metadata overview file (update version of 27/06/2018), we have already identified eighteen datasets from fourteen countries (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Israel, Lithuania, Norway, Slovenia, Spain, Sweden, United Kingdom) that could provide BPA exposure data and that included women.

## 3.2 Variables to be collected

Information on the desired variables on BPA exposure to be collected is shown in the Appendix (Table S1), which also includes the accompanying variables needed for the statistical analyses. The final list of variables will be set based on the availability of data within the various selected studies.

The chemical of interest is the urinary conjugated BPA concentration. This is less affected by external contamination by free BPA. If information is not available from the majority of eligible studies, then the study will focus on total BPA concentration.

Accompanying variables consist of all variables (mandatory or optional) needed to study of the determinants of exposure to BPA. A preliminary work will be done to check which raw variables are available in the eligible studies and on which type of format. Where necessary, different coded variables from different studies could be harmonized in the same way (e.g. dietary variables).

Determinants include all variables that may explain the BPA exposure levels in the studied population, whether individual and socio-demographic characteristics (sex, age, country) or potential sources of

exposure to BPA (lifestyle, household environment, dietary habits and other individual characteristics). 114  
These variables will be selected from those in the harmonized codebook developed within the Work Package 115  
10 (WP10) team as part of the research questions for BPA. Depending on the availability of collected variables 116  
from the selected studies, we will have to harmonize variables between different data collections and 117  
ultimately select those that will be used. 118

### 3.3 Statistical analysis 119

#### 3.3.1 Data handling 120

The assumption of normality of the BPA concentration will first be checked and a transformation of the 121  
variable will be performed if necessary. 122

Irrespective of the method used to combine of survey data, single or multiple imputation methods will be 123  
preferred to handle missing questionnaires data and missing data due to the limit of detection and/or limit 124  
of quantification (i.e. chemical levels below the LOD or LOQ). Studies for which the LOD/LOQ is no longer 125  
available from the study investigator can only be selected if a very small sample size of urinary BPA 126  
concentrations were below the fixed values of the LOD/LOQ (e.g., < 5%). 127

It is still remains unclear which adjustment method is best to take into account urinary dilution depending 128  
on the chemical substance and the target population studied. This study could be an opportunity to 129  
investigate this issue in the lesser extent. However, in the main analyses, creatinine or specific gravity should 130  
be included as a separate independent variable in the multiple regressions (Barr et al. 2005). 131

As urinary dilution may be affected by the pregnancy status (MacPherson et al. 2018), the impact of this 132  
outcome on urinary BPA levels will also be specifically analyzed. 133

#### 3.3.2 Descriptive statistics of study population and level of exposure 134

Descriptive statistics of BPA (percentiles and geometric means) will be reported for the whole population 135  
and by age group. Descriptive results will be described according to unadjusted raw values ( $\mu\text{g/L}$ ) and 136  
adjusted values for urinary creatinine ( $\mu\text{g/g}$  of creatinine) and urinary specific gravity ( $\mu\text{g/L-SG}$ ) or 137  
osmolality ( $\mu\text{g/L}$ ). 138

Descriptive analyses will include data on demographic and socioeconomic characteristics and BPA exposure. 139  
The association between BPA levels (continuous variable) and descriptive variables (continuous or 140  
categorical determinants) will be tested using t-test or univariate regression. 141

The statistical approach that will be used for the calculation of the current BPA exposure level of the study population will ultimately depend on the type of data available in the selected studies (see section 3.1).

### 3.3.3 Identify determinants of exposure

The determinants of BPA exposure will be investigated using multivariable regression analysis. A Generalized Linear Models (GLM) will be used. For variables looked in a continuous way, penalized spline functions will be used to assess the shape of the relationships between BPA and these continuous determinants of BPA levels.

The number of determinants factors to be assessed and included in the statistical model will depend on the availability of variables in the selected study. Two types of determinants (accompanying variables) will be studied:

- 1°) individual factors that can explain differences in BPA levels (age, BMI, social status, physiological status ...); and other individual predictors (place of residence, year of sampling, season ...);
- 2°) external factors that may be a source of exposure to BPA, related to lifestyle including dietary factors (smoking, consumption of canned products ...).

## 4 Organisation, publication and time schedule

### 4.1 Organisation

All countries identified from the IPCHEM with urinary BPA exposure studies involving women (as targeted population or component) will be invited to participate.

The French Public Health Agency, ANSP (*Agence Nationale de Santé Publique*) is responsible for coordinating the study protocol. Each data collection will be asked to assign a researcher to participate in the study protocol working group. The final number of countries participating in this study may vary before the start of the study, depending on the availability, comparability and fit of designs from different studies.

Principal investigators of eligible studies invited to participate in the present protocol will be asked to verify the accuracy of the information about their respective studies provided in the Metadata overview. If they agree to participate in the protocol, they will be asked to confirm whether they are willing to share individual data or only aggregated data.

Individual data will be needed from each data collection. The source data will be stored in the HBM4EU Repository and analyzed by ANSP. Before using of the data, data transfer agreements should be signed by

the data owner/provider and data use agreements should be signed by the persons who will actually have access to the data.

## 4.2 Publication

Considering submission of any papers for publication and/or abstracts for conferences, the procedures described in the HBM4EU Publication Policy will be followed. Regarding the use of data, the HBM4EU Data Policy sets the requirements for the acknowledgement of the Data Owner/Data Provider. At least 30 calendar days prior to submitting any papers for publication using data that are provided to HBM4EU partners via the HBM4EU repository, the lead author shall contact the Data Provider by sending a title, abstract, and author list. The Data Provider is entitled to request to include 2 co-authors in scientific publications of results considering the provided data. The Data Provider will be consulted as early as possible.

A publication will be developed from the analyses and results in this protocol. In accordance with the EU studies that will ultimately be included in this study, scientists and/or researchers from the institutions responsible for the data used will be asked whether they are interested in participating as co-authors.

## 4.3 Permissions and ethical issues

To obtain permission to use the data, ANSP has to submit a proposal that includes, but is not limited to, the purpose of the data use, the named lead data user and other data users, the required studies, variables, sampling timeframe, and a start and end data for performing the analyses.

The WP leader verifies the fit of the purpose with the HBM4EU objectives and checks whether the same analyses are not yet performed by other consortium partners. Depending on the conditions set out by the Data Provider in the HBM4EU data transfer form, the Data Provider is consulted to either approve or refuse the proposal. Upon approval of the proposal, the lead data user and each other data user shall complete and sign the HBM4EU Data Access and Use Agreement. Upon signing the agreement, the lead data user and other data users obtain the necessary permissions to access the data via a dedicated section of the HBM4EU repository and to perform the data analyses for the purpose specified in the approved proposal. Data analyses and the presentation of papers should adhere to good epidemiological practice and the STROBE guidelines. Signing the data access and use agreement, the data user agrees to abide by the rules set out in the agreement, accepts the terms and conditions of the HBM4EU repository, and accepts the HBM4EU Data Policy. This includes, but is not limited to, protection of the study participants identity, safeguard to not share the data with unauthorized people (anyone not signed a data use agreement linked to the approved

proposal), commitment to upload all derived variables, analysis pipelines, intermediate results, and/or 199  
results to the repository upon analysis to a section of the repository dedicated to this agreement, 200  
commitment to not store the data on any place that is accessible by others, commitment to securely destroy 201  
all data related to the proposal stored outside the repository – including all possible back-ups as well as 202  
(intermediate) results from the analysis – at the latest at the end-date of the approved proposal, commitment 203  
to follow the procedures regarding publication and/or dissemination of results. All details are available in 204  
the documents mentioned above. 205



5 Appendix

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**Table S1.** List of principal and accompanying variables for the characterization of BPA exposure levels among European women and for identifying key determinants of BPA exposure levels.

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Variable name	Variable description	Remark/Encoded information
<b>Sample</b>		
matrix	matrix of the sample	urine-spot = US, urine-24h = UD, urine-morning =UM
lab	abbreviation name of laboratory in which samples were analyzed	
method	name of analytical method used	
tube	type of tube used for sample	should allow to appreciate the risk of contamination
samplingnumber	number of samples for one individual	integer numbers
samplingyear	year of sample collection	integer numbers
samplingmonth	month of sample collection (1 is the first month of the year)	1 = January, 2 = February, 3 = March, 4 = April, 5 = May, 6 = June, 7 = July, 8 = August, 9 = September, 10 = October, 11 = November, 12 = December
samplingtime	time of day of sample	1 = morning, 2 = afternoon, 3 = evening
crt	concentration of creatinine in urine of the sample	if matrix = 'US' OR matrix = 'UD' OR matrix = 'UM'
sg	specific gravity of urine of the sample	if matrix = 'US' OR matrix = 'UD' OR matrix = 'UM'
uvolume	urine volume	if matrix = 'US' OR matrix = 'UD' OR matrix = 'UM'
<b>Data</b>		
		measured values (X) of bpa or fbpa or cbpa are given: if LOD as well as LOQ is known: - 1 for $X < LOD$ - 2 for $LOD \leq X < LOQ$ if LOQ is known, but LOD is not: - 3 for $X < LOQ$ if LOD is known, but LOQ is not: - 1 for $X < LOD$
bpa	total BPA level measured in the sample	
fbpa	free BPA (unconjugated) level measured in the sample	

cbpa	conjugated BPA level measured in the sample	
bpa_lod	lod of total BPA associated with the measurement of the sample	Lod: limit of detection
fbpa_lod	lod of free BPA associated with the measurement of the sample	Loq: limit of quantification
cbpa_lod	lod of conjugated BPA associated with the measurement of the sample	
bpa_loq	loq of total BPA associated with the measurement of the sample	
fbpa_loq	loq of free BPA associated with the measurement of the sample	
cbpa_loq	loq of conjugated BPA associated with the measurement of the sample	
<b>Subject</b>		
Id_subject	ID of the subject	individual ID for each related subject
gaweeks_m	gestational weeks of the mother at sample taken	integer numbers
pregnancy	gestational status of the subject at sampling	0 = no, 1 = yes
country	country of residence of the subject according to ISO 3166-1 alpha-2 at sampling	Source: <a href="http://publication.europa.eu/mdr/ressource/authority/country/html/countries-eng.html">http://publication.europa.eu/mdr/ressource/authority/country/html/countries-eng.html</a> Use the 2-letter code (ISO 3166-1 alpha-2), e.g. 'BE' = Belgium.
nuts1	NUTS Level 1 of residence of the subject: (Nomenclature of Territorial Units for Statistics), by regional level, version 2016 (NUTS 2016) at sampling	Source: <a href="http://ec.europa.eu/eurostat/ramon/documents/nuts/NUTS_2016.zip">http://ec.europa.eu/eurostat/ramon/documents/nuts/NUTS_2016.zip</a> P e.g. code 'BE2' = VLAAMS GEWEST (Flemish region); Note: nuts is not available for all countries. In that case, please provide "subdivision".
nuts2	NUTS Level 2 of residence of the subject: (Nomenclature of Territorial Units for Statistics), by regional level, version 2016 (NUTS 2016) at sampling	Source: <a href="http://ec.europa.eu/eurostat/ramon/documents/nuts/NUTS_2016.zip">http://ec.europa.eu/eurostat/ramon/documents/nuts/NUTS_2016.zip</a> P e.g. code 'BE21' = prov. Antwerpen (Province of Antwerp); Note: nuts is not available for all countries. In that case, please provide "subdivision".
nuts3	NUTS Level 3 of residence of the subject: (Nomenclature of Territorial Units for Statistics), by regional level, version 2016 (NUTS 2016) at sampling	Source: <a href="http://ec.europa.eu/eurostat/ramon/documents/nuts/NUTS_2016.zip">http://ec.europa.eu/eurostat/ramon/documents/nuts/NUTS_2016.zip</a> P

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subdivision	subdivision of country of residence of the subject according to ISO 3166-2 at sampling	<p>e.g. code 'BE211' , 'BE212', 'BE213' = three subregions of the province of Antwerp; Note: nuts is not available for all countries. In that case, please provide "subdivision".</p> <p>Source: <a href="https://www.iso.org/obp/ui/#search">https://www.iso.org/obp/ui/#search</a></p> <p>Provide only when NUTS classification is not available for the country; click on English short name of the country, to gather the ISO 3166-2 code (e.g. 'BE-VAN' = Antwerpen); provide the highest possible resolution (e.g. not BE-VLG (Vlaams Gewest / Flemish region), which is a parent subdivision of BE-VAN).</p>
birthplace	country of birth	<p>1 = Europe, 2 = North America, 3 = South/Central America, 4 = Africa, 5 = Asia/Middle East, 6 = Australia</p>
occupationstatus	Current labour status	<p>Carrying out a job or profession, including unpaid work for a family business or holding, including an apprenticeship or paid traineeship, etc. /// Full time /// Part time // Unemployed // Pupil, student, further training, unpaid work experience // in retirement or early retirement or has given up business // permanently disabled // in compulsory military or community service // fulfilling domestic tasks // other inactive person</p>
occupation	Industrial sectors	<p>Agriculture, forestry and fishing // Mining and quarrying // Manufacturing // Electricity, gas, steam and air conditioning supply // Water supply, sewerage, waste management and remediation activities // Construction // Wholesale and retail trade, repair of motor vehicles, motorcycles // Transportation and storage // Accommodation and food service activities // Information and communication // Financial and insurance activities // Real estate activities // Professional, scientific and technical activities // Administrative and support service // Public administration and defense, compulsory social security // Education // Human health and social work activities // RTS, entertainment and recreation //Other service activities</p>
ageyears	age in years of the subject at sampling	<p>integer number; birth date is not used to reduce risk of re-identification</p>
isced	education level of the subject (ISCED scale) at sampling	<p>1 = low education (ISCED 0-2), 2 = medium education (ISCED 3-4), 3 = high education (ISCED &gt;=5)</p>

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smoking	smoking status of the subject at sampling	0 = no, 1 = yes (current smoker)
smoking_cigday	number of cigarettes per day	if smoking = 1 (yes)
smoking_passive	current passive exposure to cigarette smoke by the subject at sampling	0 = no, 1 = yes
population	subject belongs to general population	0 = no, pregnant women, 1 = no, occupationally exposed, 2 = yes (general population)
ses_participant	socioeconomic status of the participant at sampling	1 = A (highest SES), 2 = B (2nd highest SES), 3 = C (average SES), 4 = D (below average SES), 5 = E (lowest SES)
residence_year	starting year for residence in current place	integer number
degurba	degree of urbanisation of residence at sampling of the subject	1 = densely populated area (cities), 2 = intermediate density area (towns or suburbs), 3 = thinly populated area (rural area)
height	height of the subject at sampling	use for BMI calculation. number of digits (decimal): 3/1
weight	weight of the subject at sampling	use for BMI calculation number of digits (decimal): 3/1
<b>Lifestyle</b>		
watertap	drinking water from the tap (yes/no)	0 = no, 1 = yes
watertap_freq	frequency of drinking tap water	0 = never, 1 = rarely (<1 time/month), 2 = sometimes (<= 1 time/week), 3 = often (2-3 times/week), 4 = very often (4-6 times/week), 5 = everyday (> = 7 times / week)
waterbottled	drinking water from bottled source (yes/no)	0 = no, 1 = yes
waterbottled_freq	frequency of drinking bottled water	0 = never, 1 = rarely (<1 time/month), 2 = sometimes (<= 1 time/week), 3 = often (2-3 times/week), 4 = very often (4-6 times/week), 5 = everyday (> = 7 times / week)
waterwell	drinking water from well source (yes/no)	0 = no, 1 = yes
waterwell_freq	frequency of drinking well water	0 = never, 1 = rarely (<1 time/month), 2 = sometimes (<= 1 time/week), 3 = often (2-3 times/week), 4 = very often (4-6 times/week), 5 = everyday (> = 7 times / week)
plastic_dishes2	use of plastic crockery/dishes (yes/no)	0 = no, 1 = yes
plastic_dishes	use of plastic crockery/dishes (frequency)	0 = never, 1 = rarely (<1 time/month), 2 = sometimes (<= 1 time/week), 3 = often (2-3 times/week), 4 = very often (4-6 times/week), 5 = everyday (> = 7 times / week)

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plastic_film2	use of plastic film (yes/no)	0 = no, 1 = yes
plastic_film	use of plastic films for food (frequency)	0 = never, 1 = rarely (<1 time/month), 2 = sometimes (<= 1 time/week), 3 = often (2-3 times/week), 4 = very often (4-6 times/week), 5 = everyday (> = 7 times / week)
plastic_kettle2	use of plastic kettle (yes/no)	0 = no, 1 = yes
plastic_kettle	use of plastic electric kettles (frequency)	0 = never, 1 = rarely (<1 time/month), 2 = sometimes (<= 1 time/week), 3 = often (2-3 times/week), 4 = very often (4-6 times/week), 5 = everyday (> = 7 times / week)
mixers2	use of mixers (yes/no)	0 = no, 1 = yes
mixers	use of food mixers (frequency)	0 = never, 1 = rarely (<1 time/month), 2 = sometimes (<= 1 time/week), 3 = often (2-3 times/week), 4 = very often (4-6 times/week), 5 = everyday (> = 7 times / week)
plastic_containers 2	use of plastic containers (yes/no)	0 = no, 1 = yes
plastic_containers	use of plastic containers for heating foods in microwave (frequency)	1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = very often, 6 = everyday
thermalpaper	use of thermal papers	0 = no, 1 = yes; examples of thermal paper products (occupational exposure): receipts from cash registers, transportation tickets such as for trains and airlines, entertainment tickets, parking tickets, lottery tickets, self-adhesive labels and tags, fax paper
medicaldevice	use of plastic medical devices	0 = no, 1 = yes; examples: transfusion/infusion bag, hemodialysis, newborn incubators
dentalsealant	have a dental sealant	0 = no, 1 = yes
contacts2	use of contacts (yes/no)	0 = no, 1 = yes
contacts	use of contact eye lenses (frequency)	0 = never, 1 = rarely (<1 time/month), 2 = sometimes (<= 1 time/week), 3 = often (2-3 times/week), 4 = very often (4-6 times/week), 5 = everyday (> = 7 times / week)
personalcare2	use of cosmetics, personal care products (yes/no)	0 = no, 1 = yes
personalcare	use of cosmetics, personal care products (frequency)	0 = never, 1 = rarely (<1 time/month), 2 = sometimes (<= 1 time/week), 3 = often (2-3 times/week), 4 = very often (4-6 times/week), 5 = everyday (> = 7 times / week)
inside_hour	number of daily hours typically spent inside per day	Integer number

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plasticfloor	have a plastic floor covering in the house	0 = no, 1 = yes
drinks_bottled2	drinks beverages contained in plastic bottles (other than water) (yes/no)	0 = no, 1 = yes
drinks_bottled	all beverages contained in plastic bottles (other than water) (frequency)	0 = never, 1 = rarely (<1 time/month), 2 = sometimes (<= 1 time/week), 3 = often (2-3 times/week), 4 = very often (4-6 times/week), 5 = everyday (> = 7 times / week)
sportswear2	wearing sport clothes in polyester and/or elastane (yes/no)	0 = no, 1 = yes
sportswear	wearing sport clothes in polyester and/or elastane (frequency)	0 = never, 1 = rarely (<1 time/month), 2 = sometimes (<= 1 time/week), 3 = often (2-3 times/week), 4 = very often (4-6 times/week), 5 = everyday (> = 7 times / week)
physical_activity 2	practice of a physical activity (yes/no)	0 = no, 1 = yes
physical_activity	practice of a physical activity (frequency)	0 = never, 1 = rarely (<1 time/month), 2 = sometimes (<= 1 time/week), 3 = often (2-3 times/week), 4 = very often (4-6 times/week), 5 = everyday (> = 7 times / week)
food_packaged	all food in contact with plastic packaging	Depending on the completeness of the data (type of packaged food products and frequency of consumption) from the questionnaire these data could be transformed for analysis into tertiles or constructed in order to have comparable groups.
food_canned	all canned food (e.g. canned food: canned soups, canned fish, canned tuna, canned vegetables, canned fruits, canned tomato)	Depending on the completeness of the data (type of packaged food products and frequency of consumption) from the questionnaire these data could be transformed for analysis into tertiles or constructed in order to have comparable groups.
drinks_canned	all canned drinks (e.g. canned drinks: canned soda, canned juices)	Depending on the completeness of the data (type of packaged food products and frequency of consumption) from the questionnaire these data could be transformed for analysis into tertiles or constructed in order to have comparable groups.

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