



## Water, Sewage and Garbage: what do we want to know with the household surveys of IBGE?<sup>1</sup>

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### Abstract

The text aims to discuss sanitation on the household surveys conducted periodically by the Brazilian Institute of Geography and Statistics - IBGE, specifically focusing on questions relating to the form of water supply at home, the type of domestic sewage and the disposal of household garbage. These issues are the object of specific questions, present in the main household surveys conducted by the Institute - Population Census, Pesquisa Nacional por Amostra de Domicílios (National Household Survey) (PNAD) and Pesquisa de Orçamentos Familiares (Consumer Expenditure Survey) (POF) – each one with a certain frequency and amplitude sample. In this paper, the questions of each of these surveys are examined comparatively in order to identify similarities and differences in their formulation and in their concepts, with possible effects on the results. In its conclusion, the text proposes a unique formulation in the questions of the three surveys and, by comparisons with research in other Latin American countries and United Nations recommendations, suggests some new questions, with objective of improving the collection of information on the sanitary and environmental conditions of the households in the country.

**Keywords:** sanitation, environmental conditions, sustainability

### 1. Introduction

There are three main household surveys conducted by the Brazilian Institute of Geography and Statistics (IBGE), the official organ of production statistics of Brazil. The first is the Demographic Census (IBGE 2010), which covers the entire national territory and collects information about the entire population and households, is conducted every ten years and contains two types of questionnaires (Basic and Sample). Another is the Pesquisa Nacional por Amostra de Domicílios (National Household Survey) PNAD (IBGE 2013), annual (except for the years in which it conducts the Census) and permanent, investigating general characteristics of the population, education, work, income, households, among many other themes. Lastly, the Pesquisa de Orçamentos Familiares (Consumer Expenditure Survey) POF (IBGE 2008), with varying regularity and reference periods, some up to 12 months, investigates the composition of household budgets, from the research of consumer habits, allocation of expenses and income distribution, according to the characteristics of households and persons.

The three surveys repeat certain topics of person's characteristics and on characteristics of households. Our goal is to compare how some of the characteristics of households have been investigated in these three surveys. We want to discuss the theme 'Sanitation', specifically focusing on the questions regarding the type of domestic sewage, the form of water supply at home and the disposal of household garbage. The questions are examined in each of these surveys comparatively, to identify similarities and differences in their formulation and in their concepts, as these differences may have

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effects on the results, interfering on the comparability in some cases. The idea is to propose, in the topic of sanitation, a unique formulation in the categories of the three surveys, including expanding the scope of some of them, with the view of improving the collection of information on the sanitary and environmental conditions of the households in the country.

Let's see the questions on each subject, in each of these studies. It is important to note that the sequence of questions varies from one survey to another, as well as the formulation of the questions and response options for each of them. For the purpose of the reviews of this text we decided to adopt the sequence given in the Census and therefore we start with the part about the sewage.

## 2. Bathroom and Sanitation

The three surveys begin their research about sewage with the questions regarding the existence, or not, of bathroom or toilet; if it is, or not, exclusive use of the home and, if so, the existing quantity. However, the way the questions are asked, the sequence of them and the separation between bathroom and toilet, do not always coincide.

In the case of the Demographic Census, the question is:

*2.02 - How many bathrooms, which are used exclusively by the residents, are there in this household?*

It is important to note that the question comes with an instruction to consider "bathroom" only the room that has a shower (or bath) and toilet. Note the question of the Census contains actually three questions: if the household has a bathroom, whether it is for the exclusive use of the home and how many are there. By filling out the amount of bathrooms in these conditions, we go to the question about the type of sewage.

In case there is no bathroom in accordance with the concept, or in the case of an existing bathroom been used for more than one household, should register zero (0) in the amount of bathrooms and then pass to the next question.

*2.03 - Do you use a toilet or cesspit/outhouse, including those located in the ground or in the property?      \_\_\_ YES      \_\_\_ NO*

The question comes with an instruction to consider the positive response only if the place is surrounded by walls (of any material). Note that this question should be answered in a positive way (YES) for the home that has a full bathroom - but not for the exclusive use.

In other words, in the case of a positive answer to the question 2.03 of the Census, one does not know if the household has shared use of a bathroom with another household, if it has a toilet, or if it only has one cesspit to deposit stool into the land. Note that each of these situations has a different kind of sanitary and environmental condition.

The following question to 2.03 investigates the type of existing sewer, and is answered only in the event of a positive answer to 2.02 or 2.03. In the event that the answer is negative to the latter, the question of sewage is skipped.

The investigation of the PNAD does not distinguish toilet from bathroom. The difference between households, about this room, is just the issue of privacy or not. Let's see the questions in PNAD.

*15 - In this home, or in the property, is there a bathroom or a toilet? YES NO  
(If YES, goes to the question 16; if NO, skip to the question 18, that investigates garbage)*

*16 - This bathroom or this toilet is of use:  
\_\_\_ Household only (follow 16a) \_\_\_ Common to more than one household (pass to 17)*



16a) *How many bathrooms or toilets does this home have?  
(register the number)*

As it is, the positive answer to the question 15 gives inaccurate information. In other words, we cannot know, exactly, what the household has: if it has a bathroom, if it has a toilet or, simply, if it has a cesspit/outhouse. In any case, the answer is always YES. Furthermore, in the case of the item 16a, we do not know if the number registered refers to the bathroom, to the toilet, or to the set of bathroom and toilet (or WC).

Finally, the POF, just as the Census, brings the themes together in the same question: exclusive use and the number of bathrooms and toilets. The difference from the Census, however, is that POF, like PNAD, confuses bathroom and toilet. POF contains a single question on this subject.

*10 - How many bathrooms or toilets does this home have for exclusive use?  
(register the number)*

So, we can conclude, about the questions that investigate bathroom and toilet, their exclusive use in the household and their quantity in each household: the three studies provide different information, which interferes with the comparability of the results.

In the research about the type of sewage, which comes immediately after the question about bathroom or toilet, the questions are very similar, although we can see differences in the various alternatives they present.

Question of the Census:

*2.04 – The sewer bathroom or toilet leads to:  
1 - General network sewage or rain water system    2 – Septic tank  
3 - Rudimentary tank    4 - Ditch  
5 - River, lake, or ocean    6 - Another*

Question of the PNAD:

*17 – What form of sewage system does this bathroom (s) or toilet (s) use?  
1 - Sewage disposal system or rainwater  
2 - Septic tank connected to the sewage disposal system or rainwater  
3 - Septic tank not connected to the sewage disposal system or rainwater  
4 - Rudimentary tank    5 - Ditch  
6 - Straight into the river, lake, or ocean    7 - Another way (specify)*

Question of the POF:

*11 – What form of sewage system does this bathroom (s) or toilet (s) use?  
1 - Sewage disposal system or rainwater    2 – Septic tank    3 - Rudimentary tank    4 - Ditch  
5 - Straight into the river, lake or ocean    6 - Another way    7 – Doesn't have*

The questions of PNAD and POF, about the type of sewage, are equal. The Census has a different wording but it does not compromise the understanding of what we want to investigate. For the response alternatives, however, there is an important difference in the PNAD. The "septic tank" has two possibilities (connected or not connected to the sewage disposal system or rainwater). In several cases it was found, in the field, that the informant did not have enough knowledge to answer this question.

This fact, which has already been noted several times in the field, is open for reflection: is the resident the most appropriate informant to answer questions about sanitation? If he is, are the questions



formulated comprehensively for informants of all educational levels? Does the training, in the form and time in which it is taught, bring sufficient and necessary content to guide the interviewer?

This type of question allows us to reflect about the possibility of changing the wording of some questions in order to allow a more precise answer from the informant, in order to obtain more robust information on sanitary conditions of the households in the country.

### 3. Water supply

The research about household water supply has important differences mainly between the Census and the other two studies, both in the formulation of the questions, like in multiple choice questions and even in the sequence in which the questions are asked.

PNAD and POF investigate, first of all, whether the household water is piped or not:

*(PNAD) 11 – Does this household have water piped to, at least, one room?*  
 YES (go to 12)  NO (pass to 13 – only in PNAD)

*(PNAD) 12 - The water used in the household comes from:*  
 General distribution network  Artesian well or spring  
 Another source (specify) ..... (POF does not ask for specification)

The POF closes here its inquiry about water supplies, while the PNAD continues with two more questions:

*13 – Is the water used in this household piped from a general distribution network to the property?*  YES (pass to 15)  NO (go to 14)

*14 – Does the water used in the home come from an artesian well or spring located on the property?*  YES  NO

Note that the question 13 must be answered only by the informants who responded negatively to the question 11. And the Question 14 is directed only to those who answered negatively to 11 and 13. The goal of this sequence, in the PNAD, is primarily to investigate whether water gets piped into the interior of the household. After this, comes the question about the origin of the water used. Anyway, the sequence looks confusing. The formulation of the Census, quite different in this sequence and in the alternatives, in this case, seems to be more straightforward and objective.

*2.08 - The form of water supply used in this home is:*  
 General network distribution  Well or spring in the property  
 Well or spring outside the property  Car tanker  
 Water stored in rain tanks  Rainwater stored otherwise  
 Rivers, ponds, lakes and streams  Other

*2.09 – In this household, is there running water (piped)?*  
 Yes, in at least one room  Yes, only on property or land  No

It is observed that the Census presents questions in a more logical sequence and with more disaggregated alternatives. And it asks first, from where the water supply comes to the home; and after, if it is piped to the home or only the property or land.

### 4. Garbage

The questions that investigate the disposal of the household garbage are very similar in all three studies, both in regards to the formulation of the question, as well as in response alternatives. The



Census and PNAD formulate the same question about garbage, in other words, "*The garbage of this home is:*" and then present the alternatives. The question of POF is a little different: "*What is the destination of the garbage?*". Note that in the case of the question of POF, we can argue about the possibility that there may be some confusion regarding the understanding of the question, because "destination" can be understood as the place where the garbage is finally deposited by the company that collects it, be a "dump" or a landfill.

As to alternatives, it appears that in this case, the Census and POF have the same list of possibilities, the difference being due to the options of PNAD.

Census and POF:

*Collected directly by housekeeping*

*Burnt (in the property)*

*Placed in a vacant lot*

*Placed in housekeeping bucket*

*Buried (in the property)*

*(It has) Another destination*

PNAD does not mention "bucket" in the second alternative but "*Collected indirectly*"; and joins "burned and buried" in the same alternative. They are differences that do not even have important impact on the results, mainly because the answers in "burned" and "buried" can be added, allowing the comparison of Census and POF data with PNAD data. The alternative "*Collected indirectly*", however, can allow a different understanding of "placed in housekeeping bucket" and hamper comparisons.

## 5. International comparisons

In order to give strength to the suggestions that we want to do, we tried to examine, although not exhaustively, surveys made by other countries in Latin America (LA) (ex. INEGI 2010) and UN recommendations (UN 2008) for population and housing census, with respect to the topics covered here. With regard to international recommendations, it was found that IBGE has served them satisfactorily. In matters related to sewage, for example, recommendations are met as to the distinction between sewage, septic tank and rudimentary tank, and the existence of exclusive or shared bathroom; and with respect to water, which it has come from and whether it is piped into the housing unit, among some of the most important recommendations.

Among the questionnaires applied in the main countries of the region (Argentina, Chile, Colombia, Mexico, Peru, Uruguay and Venezuela were consulted), some questions seemed to us very interesting, and could be included, at least in sample surveys of IBGE. This is the case, for example, of a question about the type of discharge used in the bathroom or toilet (with water released by direct discharge, or by means of buckets); about the water usage, if it is filtered or boiled; and how often is usually available at home (the idea, in this case, would be to check if there is lack of water). And finally, in the case of garbage, if the household separates the garbage (with the goal of recycling) and, especially, if the organic garbage is for composting to a future use in agriculture. It is also worth investigating the frequency of collection, as recommended by the UN.

Comparing the UN recommendations with the questionnaires of Latin American countries some conclusions were reached. The UN recommendations are an important point of reference, but they have the limitation of being very focused on the reality of poor countries in Asia and Africa, and therefore emphasize points with little relevance for the Latin American countries, such as garbage collection by self-appointed collectors and shared use, or not, of piped water, leaving aside more details about the garbage disposal. In LA countries is clear, for example, that the bath and toilet site characteristics are poorly researched, unlike sewer disposal, perhaps because the latter is more directly related to public policy and collective (and not individual) well-being. To our surprise three Latin American countries (Argentina, Uruguay and Peru) do not inquiry about the garbage disposal in the Census. This is a point that deserves further investigation.

## 6. Conclusions

The comparison made here about the questions related to basic sanitation, make clear that it is



It is important to standardize the writing of the questions and the answer choices in the PNAD, POF and Population Census. Regarding the bathroom, it seems important to distinguish between bathroom, toilet and hole for stool, keeping the question of the quantity of each of them, and whether they are of exclusive use, or not. But the questions have to be disaggregated to avoid confusion between the various types and their exclusive use.

About sewage, the question of PNAD seems the most complete because distinguishes different types of outflow from the septic tank. Anyway, the doubt remains about if the resident would be the most appropriate informant to answer this kind of question. As for the water supply and piping, the writing of this item in the Census seems clearer and more direct. Finally, as for the garbage, a few changes must be made to standardize the question, preferably according to the Census and the POF.

In short, only part of what is important to know about water, sewer and garbage is in the surveys of IBGE and the Latin American countries cited here. Important gaps need to be addressed, as the conditions of the bathing place, type of toilet, garbage collection frequency and receiving water. This last point is particularly important for Brazil, which is currently experiencing water stress.

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