ACESS TO DRINKING WATER: COMPLEMENTARY INDICATORS TO MONITORING GOAL 6.1 OF 2030 AGENDA AT LOCAL LEVEL IN BRAZIL

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Abstract: The guarantee of quality drinking water supply, which is a fundamental right inherent to the human being, and the provision of adequate sanitation conditions are essential factors for the safety and protection of health and for the guarantee of basic rights of the population. Among all global efforts with international agendas to combat social inequalities and improvements in basic human rights, the 2030 Agenda for sustainable development stands out, where the issue of Drinking Water and Sanitation is addressed by SDG 6. However, it is essential to take into account that each country has its particularities and specific challenges, which leads to the need to adapt the goals, taking into account the reality of each country. This fact leads to a discussion about complementary indicators to those proposed by the UN and how they can assist in monitoring the goals. In view of the above, the present work proposes to present existing indicators, in conjunction with a proposal for new complementary indicators, to assist the monitoring of SDG 6 of the 2030 Agenda, in particular target 6.1 - By 2030, achieve universal and equitable access to safe and affordable drinking water for all. The study is focused on analyzing the indicator proposed by the UN, for Brazil and for the state of Rio de Janeiro, and SNIS indicators for the county of Rio de Janeiro. In addition, it presents a proposal for new complementary indicators to assist in the discussion. In total, 16 indicators are presented, which 11 of them already exists and 5 are new ones. With the complementary indicators presented, it is possible to highlight the complexity surrounding the situation of adequate access to drinking water in municipal level, which allows us to understand how this factor impacts the population's life. The information presented through the indicators allowed to analyze particularities that involve the issue more broadly, in addition to pointing out factors that influence the discussion and that are not included in the indicator proposed by the UN. With the complementary indicators, the discussion inherent to goal 6.1 becomes more comprehensive and better adapted to the municipal Brazilian level.

keywords: Drinking water; SDG 6; indicators; 2030 Agenda.

INTRODUCTION

The guarantee of quality drinking water supply, which constitutes a fundamental right inherent to the human person, and the provision of adequate sanitation conditions are essential factors for the safety and protection of health and for guaranteeing the basic rights of a population (STS, 2020). Thus, it is important to highlight the global efforts with international agendas to fight social inequalities and improvements in basic human rights, such as access to water. The 2030 Agenda is an important international agenda established by the UN in 2015, where the issue of access to drinking water is present in SDG 6 - Drinking Water and Sanitation -, where the goal 6.1 stands out - "6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all". The indicator proposed by the UN to monitor this target is 6.1.1: Proportion of population using safely managed drinking water services.

In Brazil, this indicator is currently calculated by the Brazilian Institute of Geography and Statistics - IBGE with data from a national household survey called Pesquisa Nacional por Amostra de Domicílios Contínua - PNAD Contínua, what does not allow estimate for local level. In addition, the UN encourages the adaptability of the targets due to the particularities and specific challenges that the countries face, it must be considered that the indicators proposed for their monitoring have little adherence with the Brazilian reality. This finding can be corroborated with two justifications: the proposed indicators do not cover their respective goals in their entirety and complexity and do not consider the availability of official data for their calculation.

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To fill the gap, complementary indicators shall be taken into consideration to assist in monitoring SDG's goals, in addition to those already proposed by the UN, including considering Brazilian policies and government programs (IPEA, 2019). Besides, due to the socioeconomic disparity between Brazilian regions, analyzing what happens at the most disaggregated geographic levels is essential to understand the social reality experienced by the population.

Given the importance of the drinking water in Brazil and aiming to expand the monitoring capacity of goal 6.1, we propose complementary indicators to assist the monitoring of goal 6.1 of SDG 6 of Agenda 2030 at local level, using a continuous data production administrative source, accompanied by an illustration for Rio de Janeiro municipality.

DATA

Public-use data form the National System of Information on Sanitation – SNIS; the Brazilian Integrated System of Health – DATASUS and the Brazilian Institute of Geography and Statistics – IBGE were used. To target goal 6.1, 5 indicators were selected from SNIS and another 3 new indicators were bult on a linear combination of existing indicators or according to variables available on SNIS and DATASUS websites.

SCOPE OF THE APLICATION

The experiment area is the municipality of Rio de Janeiro, given the importance of the megalopolis. The reference period used is the range from 2016 to 2018, which coincides with the year of implementation of the 2030 Agenda and the most recent year for which data are released by the SNIS, respectively.

COMPLEMENTARY INDICATORS

Selected indicators provided by SNIS as well as proposed ones are presented in Table 1 and Table 2, respectively. The first series is composed by 5 indicators: Total water service index (IAA); Urban water service index (IAU); Incidence of non-standard residual chlorine analyzes (ICR); Incidence of non-standard turbidity analysis (IT); and Incidence of non-standard total coliform analyzes (IC). The second one includes: Reason for Urban-Rural Service in Water Supply (RER); Ratio of effective consumption per capita to recommended consumption (RazaoUR); and Proportion of people hospitalized for waterborne diseases (PDVH).

Table 1: Complementary indicators provided by SNIS by reference year

Indicator	Year		
	2016	2017	2018
Total water service index (%) - IAA	99,0	99,2	97,4
Urban water service index (%) - IAU	99,0	99,2	97,4
Incidence of non-standard residual chlorine analyzes (%) - ICR	5,8	0,7	0,5
Incidence of non-standard turbidity analysis (%) - IT	8,0	6,9	10,9
Incidence of non-standard total coliform analyzes (%) - IC	0,8	5,9	8,0

Data Source: National System of Information on Sanitation – SNIS.

IAA indicator is given by the ratio between the population served with water supply and the total population resident in the municipality according to IBGE. Thus, the drop in the proportion between 2015 and 2018 indicates that the municipality is getting farer and farer from reaching goal 6.1 of Agenda 2030. The IAA and the IAU have equal proportions because the municipality of Rio de Janeiro is predominantly urban (IBGE, 2017). In fact, when the data from official surveys are analyzed, the rural population in the municipality of Rio de Janeiro is considered null.

Among the 3 indicators that relate to the quality of the water supplied to the population, only the ICR shows a drop in its proportion. The other two indicators, IT and IC, increased. These indicators can be of great value for the evaluation of the quality of the water supplied and, consequently, in the safety item present in the goal. With that, it is emphasized that the concern should not be centered only in the proportion of the population with service of the water supply service, but also with the quality and safety that the product presents.

Table 2: Complementary indicators proposed by authors by reference year

Indicator	Year		
	2016	2017	2018
Reason for Urban-Rural Service in Water Supply - RazaoUR	NA	NA	NA
Ratio of effective consumption per capita to recommended consumption - RER	2,974	2,974	2,972
Proportion of people hospitalized for waterborne diseases (%) - PDVH	0,0068	0,0059	0,0058

Data Sources: National System of Information on Sanitation – SNIS and the Brazilian Integrated System of Health – DATASUS and Brazilian Institute of Geography and Statistics – IBGE.

Note: NA = Not Applied

The RER indicator shows how much the per capita consumption of the population approaches the value recommended by the United Nations, that is, 110 liters per day per inhabitant. The value considered adequate for this indicator would be 1 or slightly above 1, as it would indicate that the population is consuming the amount of water equal to or above the recommended amount. However, the values for this indicator observed in the municipality of Rio de Janeiro prove a different reality. During the three years analyzed, the RER presented values close to 3, which means that the per capita consumption is close to three times the recommended. The values call attention to an exaggerated consumption, which can lead to waste of water. This issue is not explicitly addressed in goal 6.1, but when discussing equitable access to drinking water, in scenarios in which part of the population does not have access to water in a safe and sufficient manner, it raises the question how this good is used by population served by such a resource. In this case, discussing parsimony in the use of the resource is important.

While part of the population consumes too much water, as in the case of the municipality of Rio de Janeiro, other locations may suffer from a lack of water and have an RER that is much lower than recommended. This adversity highlights the importance of the debate on how access to drinking water is associated with the social inequality that is seen all over the country. Due to the importance of this issue, more studies should be invested in order to ascertain the inequality in consumption per capita by comparing different regions, states or municipalities in Brazil. For this, the RER presents itself as a useful indicator. To add a new dimension to this issue, the RazãoUR indicator is discussed below.

The purpose of RazãoUR is to point out any differentials in serving the urban and rural populations of a given location. To this end, it shows the relationship between the proportion of people served with water supply services in urban centers and in locations outside those centers, that is, in rural areas. As the municipality of Rio de Janeiro does not have a population considered rural, the RazãoUR indicator does not apply to the present study. However, this indicator can be calculated for other locations and assist in discussions and future work. As a contribution, it is recommended to analyze the relationship between the RazãoUR and RER indicator. It is known that in rural areas of Brazil there are fewer offers of water supply services, so the relationship between the RER indicator may point to a consumption below the recommended, while in urban areas the values exceed the recommended.

Within the context of the accessibility of safe drinking water that is included in goal 6.1, it is important to point out what the lack of it can cause in a population. For the calculation of the PDVH indicator, the main diseases related to direct transmission by contaminated water, through ingestion or contact, are considered, according to the National Health Foundation (FNS, 2010): cholera, typhoid and paratyphoid fevers, shigellosis, amebiasis, diarrhea and gastroenteritis of presumed infectious origin, other infectious intestinal diseases, schistosomiasis, leptospirosis and hepatitis A.

DISCUSSION

Due to the socioeconomic disparity between Brazilian regions, analyzing what happens at the most disaggregated geographic levels is essential to understand the social reality experienced by the population. Therefore, it is emphasized the importance of complementary indicators that dialogue

with international sustainable development agendas and that allow monitoring of its goals for the municipal level.

With the complementary indicators presented, it was possible to glimpse the complexity surrounding the situation of adequate access to drinking water, which allows us to understand how this factor impacts on the population's life. The information presented by means of the indicators made it possible to analyze particularities that involve the issue more broadly, in addition to pointing out factors and other variables that influence the discussion and which are not included in the 6.1.1 proposed by the UN. With the complementary indicators, the discussion inherent to goal 6.1 becomes more comprehensive and better adapted to the municipal level. Improving discussions within the scope of policies to encourage the implementation and monitoring of the SDGs at the municipal level can be of great relevance to assist managers and authorities, in addition to encouraging new strategies that will contribute to local development.

It is important to note that the data and variables related to access to drinking water have not been fully explored in the present study. For this reason, more complementary indicators can be developed to assist the monitoring of target 6.1. The SNIS database provides more variables and data for other municipalities in Brazil, which can be used as an input to discuss differences in access to water between municipalities in the same state or comparisons between municipalities in different regions of Brazil. Also, the discussion on complementary indicators to monitor disaggregated levels can be expanded to other goals and other SDGs, which can provide new information and indicate policies to contribute to the sustainable development of the study sites.

Finally, considering the complexity involved in the discussion on universal and equitable access to safe drinking water for all, this paper leaves as its main contribution the suggestion of indicators that can be calculated for the local level and its correlation with the 2030 Agenda. and the SDGs. Furthermore, it is emphasized that the need for data production and monitoring of access to water in Brazil goes far beyond the 2030 Agenda. If Brazil does not reach the goal of universal access to drinking water in 2030, as proposed by the Agenda, it is essential that this issue continues to be a topic of debate and that the maximum effort be invested to guarantee this right for the entire population. Or, even if the goal is reached, this access must be monitored so that there is a guarantee and / or improvement in the quality and equality of the service for all.

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