The surveillance framework of water and the reporting of fluoride concentration indicators*

O modelo de vigilância da água e a divulgação de indicadores de concentração de fluoreto

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ABSTRACT Water surveillance is an essential strategy to ensure safety and high quality standards for human consumption. Among the parameters, fluoride stands out. The objective of this study was to describe the surveillance framework of water quality and present a proposal of indicators and dissemination of information to the population regarding the fluoride concentration indicators. Based on main scientific evidences, it is explained the importance of maintaining the parameter under control in the supplies systems and it is presented a concise description of the water surveillance framework in Brazil, showing that the design does not offer indicators for longitudinally monitoring the parameter or visibility to all those who have right to information. Next, the operational and technical foundations of Public Water Supply Fluoridation Surveillance System are presented, a proposal to improve the framework. Indicators to the dissemination of the information are described, arguing that the Country has resources and conditions to overcome the precariousness of information on fluoride concentration and on the coverage of water fluoridation in all units of national territory.

KEYWORDS Public policy. Surveillance. Drinking Water. Fluorides.

RESUMO *A vigilância da água é uma estratégia essencial para assegurar padrões de segurança e qualidade para o consumo humano. Entre os parâmetros de qualidade, destaca-se o fluoreto. O objetivo deste estudo foi descrever o modelo de vigilância da qualidade da água e apresentar uma proposta de indicadores e disseminação das informações à população com relação ao parâmetro fluoreto. Com base nas principais evidências científicas, explica-se a importância de se manter o parâmetro sob controle nos sistemas de abastecimento e apresenta-se uma descrição sumária do modelo de vigilância da água no Brasil, mostrando que o desenho não oferece indicadores para monitorar longitudinalmente o parâmetro nem a visibilidade a todos os que têm direito à informação. Em seguida, apresentam-se as bases técnicas e operacionais do Sistema de Vigilância da Fluoretação da Água de Abastecimento Público, uma proposta para aprimoramento do modelo. Indicadores para disseminação das informações são descritos, argumentando-se que o País dispõe de recursos e condições para superar a precariedade das informações sobre a concentração de fluoreto e sobre a cobertura da fluoretação da água em todas as unidades do território nacional.*

PALAVRAS-CHAVE *Política pública. Vigilância. Água potável. Fluoretos.*

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Introduction

Having safe water available for human consumption is claimed by all people and is a strategic purpose of governments, expressed by the implementation of public policies that aim at sanitation as an important pillar for social protection. Despite water being a public good essential for life, and although its importance is widely acknowledged worldwide, this human right is not granted for large population groups. According to the report issued in 2008 by the Program for Monitoring Water and Sanitation Supply, maintained by the World Health Organization and by the United Nations Children Fund –, some 900 million people worldwide did not have access to safe water, 17.2 million of which lived in Brazil[1].

An important strategy for improving the quality of water supply systems is surveillance[2]. Surveillance in public health may be defined as an articulated system of actions that insure data collection, analysis and interpretation involving specific heath events that affect populations, there included the prompt dissemination of results for all those who are responsible for both prevention and control[3]. Surveillance on public water supply should be part of that system, aimed at insuring security and quality standards acceptable for human consumption, pursuant previously established health goals. Surveillance does not replace or release the responsibility of water treatment enterprises or companies in carrying out their own operational controls[2].

Among the parameters for determining water quality standards, the fluorine ion (fluoride) stands out. Along with other parameters, such as turbidity, residual chlorine, colimetry, toxic agents and mercury, the fluoride is an important indicator, as the values of its concentration in water may represent either protection or risk to dentition health. A recent critical review on risks to human health resulting from fluoride in the water did confirm that the only association, at population level, with concentrations under 4.0 mg F/L, occurred with dental fluorosis, a disorder of the enamel development that occurs during tooth formation, characterized by hypo-mineralization and wider porosity of the region immediately below the dental enamel surface .

In Brazil, from 1977 on, the health sector is in charge of both the surveillance and the control of the water quality, besides the concentration of fluoride in the water, which is one of the physiochemical characteristics of normative interest[4]. Since 1986, when the Ministry of Health created the National Program for Surveillance of Water Quality for Human Consumption [Programa Nacional de Vigilância de Qualidade de Água para Consumo Humano] (Federal Executive Order Nr. 92.752/86), a number of initiatives have been adopted meant to define directives and to implement actions in an organic structure. The most recent version of this Program[5] is based on a framework that enables data to be inserted into an information system specially created to reach this purpose – the Information System for Surveillance of Water Quality for Human Consumption [Sistema de Informação de Vigilância da Qualidade da Água de Consumo Humano – Sisagua] –, aimed at enabling the correlation between environmental and epidemiological information. As it is fed in monthly basis, this is a timely system that allows for immediate response. Nevertheless, it does not offer indicators for longitudinally monitoring the quality of fluoride concentration levels in the water destined to public supply, nor visibility to all those who have the right to information concerning results reached to by the enormous effort that sanitation departments in charge of controlling water quality endeavor for obtaining surveillance data.

This article is aimed at describing the water surveillance framework, and at presenting a proposition on indicators and on enabling information to reach people concerning the fluoride parameter.

Methods

Based on the most relevant scientific evidence and on official documents from the Ministry of Health, besides normative provisions related to water quality surveillance, a range of knowledge are summarized in order to keep fluoride levels in the water under control in supply systems; and a brief description is provided on the surveillance framework of water quality for human consumption now being developed in Brazil. Next, technical and operational grounds of the Surveillance System of Water Fluoridationfor Public Supply – the Vigifluor System [Sistema de Vigilância da Fluoretação da Água de Abastecimento Público] – are described, a proposal for improving the framework; indicators used to provide longitudinal monitoring of the public policy; and a platform for spreading information to all those who are interested.

The relevance of controlling the fluoride level to assure water quality

The idea that controlling the fluoride level in water for human consumption is important goes back to the first half of the twentieth century, when, thanks to different studies and initiatives, the straight relation was established between the fluoride concentration in the water for human supply and the occurrence of dentition problems. The evaluation of epidemiological observations by different researchers made it clear, on the one side, the correlation between increasing levels of fluoride in the water and occurrence rates of dental fluorosis (a formation defect of the dental enamel); on the other side, the relation between concentration values of fluoride from 0.7 to 1.2 mgF per liter (mgF/L) in supply water and low levels of dental caries (a disease characterized by progressive mineral loss of dental tissue due to acids produced by bacteria adhered to the dental surface when daily exposed to fermentable carbohydrates in the regular diet, particularly sucrose) amidst child population[6].

Such findings boosted the first mapping records of fluoride concentration naturally occurring in supply water. In the United States of America (USA), in the middle 1930's, a publication pointed out some 300 areas distributed over 23 different states where fluoride concentration in the water was potentially prejudicial for child dentition[7]. In Brazil, by the end of the first half of the twentieth century, covering the state of São Paulo, was published the first study producing a map of fluoride concentration in consumption water[8]. In some Brazilian cities, studies started in 1970 confirmed the straight relation between the prevalence of dental fluorosis and being exposed to high fluoride concentration[9].

Because it is a problem of significant recurrence limited to one same locality, this kind of fluorosis was named chronic endemic dental fluorosis[7]. Youngsters affected present a number of psychosocial problems that tend to jeopardize their professional future and life quality. For all those aspects, and even more, because it represents a stigmatizing condition in the family, in school and in the working ambiance, and a factor of social exclusion, chronic endemic dental fluorosis is considered a serious public health problem that requires immediate intervention by sanitation authorities, in order to protect the population. That is why water used for human consumption, whatever it may be, must be periodically investigated as to the level of natural occurrence of fluoride. In the USA, the inclusion of fluoride into the list of substances under regulation took place in 1962. In Brazil, the first legal countrywide provision establishing limits for the natural occurrence of fluoride was passed in 1977. Over the years, potability levels have

been updated. Like most countries that count on normative provisions[4], in our country the maximum level allowed for water to be considered safe for human consumption is 1.5mg of fluoride per liter of water[10].

The use of fluorides as a public health technology for preventing dental caries started in 1945 and 1946 respectively in the USA and Canada, with four pioneering studies whose main purpose was to investigate the effectiveness of the initiative[6]. In those researches, the fluoride concentration was artificially adjusted in the water for public supply in some cities in order to reach the adequate proportion (optimal concentration considering benefits/risks), while in other cities the fluoride content was kept the same naturally present in the water, considered insufficient for caries prevention. Once its efficacy and safety were proved, the population strategy for preventing dental caries was spread, little by little. Along with immunization, safety devices for controlling traffic and in working locations, control activities of infectious diseases, acknowledging smoking as harmful to health, consumption of healthier and safer food and better family planning, the fluoride adjustment in the water supply was considered one out of the ten most important public health measures of the twentieth century[4].

Therefore, besides the concern about the natural occurrence of fluoride, more and more evidence indicated that, in order to assure effectiveness to the public policy of water fluoridation, considering the dental caries prevention amidst the population, an adequate control system would be required. This concern was remarked by researchers in the USA[11,12], and also by Brazilian researchers and sanitarians[13-15] some years after Law Nr. 6.050/74 was passed, determining the water fluoridation where treatment stations are available.

In Brazil, one of the first and most important studies on the theme was carried out in 1979, in the city of Araraquara, state of São Paulo. After examining permanent dentition of 7-to-12 year old students, Vasconcellos[13] noticed that the occurrence of dental caries among those who were born and always resident in the city was more frequent that expected for a community to whose public water supply was fluoridated for 16 years already. Moreover, for the period from 1978 to 1982, data for that city showed discontinuity of the level of fluoride concentration in the public water supply.

That remark was an alert for specialists at the time, confirming the need of surveillance on the fluoridation as a means to care for the adequate concentration to be maintained in order to assure effectiveness concerning tooth decay prevention.

The surveillance on water used for human consumption may be performed by auditing data produced by water supply companies, or yet by means of direct observation, examining water samples from the distribution system[2].

Once the dental caries prevention that results from water fluoridation can only be measured some years after its implementation, Brazilian specialists have recommended the surveillance to be carried out by organisms not directly responsible for the water treatment (the principle of external control), by means of direct evaluation of water samples collected at the distribution system[15,17], so as to assure the quality of the process, information validity and reliability to reach oral health goals.

Following the dissemination of basic information on sanitary surveillance systems of water fluoridation at the municipal level[2], a number of initiatives and research results were reported on monitoring of fluoride concentration in public water supply in different Brazilian cities.

Among the various results observed, two aspects shared by a number of studies should be highlighted: the first one refers to the discontinuity of the measure characterized by concentration values that deviate from what is defined by the regulatory standard, and

not reaching the values indicated for caries prevention in many localities[18]. This finding, common to different studies, reinforces the warnings by many researchers about the need for widening surveillance systems on the public supply water fluoridation. Even though there might be no risk of dental fluorosis, the population would be deprived from the maximum benefit provided by the fluoride concentration at the optimal level in the water.

The second point refers to the improvement of the quality of fluoridation systems that followed the implementation of a surveillance system and data reporting. Specialists have showed that the surveillance system leads to positive effects on the fluoridation quality of public water supply[19-22]. Therefore, technically safer conditions would be created for obtaining oral health goals at the population level.

Moreover, two studies should be highlighted for their national reach. In their investigation on Brazilian capital cities, Cesa et al.[23] found that, out of seventeen that adjusted the fluoride concentration in the water since 2005, seven reported collecting samples for fluoride analysis, and only five of these did consolidate results at the Sisagua.

This information system was developed by the National Program of Surveillance on Environmental Health Related to the Quality of Water for Human Consumption [Programa Nacional de Vigilância em Saúde Ambiental Relacionada à Qualidade da Água para Consumo Humano – Vigiagua][5], under the coordination of The Health Surveillance Department [Secretaria de Vigilância em Saúde – SVS] of the Brazilian Ministry of Health, aimed at producing, analyzing and reporting data on water quality for human consumption, according to potability standards, creating conditions for both municipal and state health departments to perform the surveillance on water quality.

When analyzing data provided by the Ministry of Health related to the system feeding for 2008, Frazão et al.[24] found evidence of underfeeding and absence of data required for surveillance actions. Of all Brazilian municipalities, 3,489 (62.7%) were not officially registered in the system, or did not feed it at least four times per year as to the fluoride parameter. Lack of registration and system feeding were associated to municipalities with poorer indicators as to sanitation, economy and human development. Problems were found in Sisagua's structure and its use by municipalities. Therefore, the authors concluded that data available were not sufficient for the surveillance of water fluoridation, thus recommending changes in the system, aimed at improving it and making it possible to reach its goal.

The framework of surveillance of water quality for human consumption

An important landmark for the control of water quality in Brazil was the First Pan-American Conference of the Quality of Water for Human Consumption [I Conferência Panamericana sobre Melhoria da Qualidade da Água para Consumo Humano], in October 1975, which brought together in the city of São Paulo technicians and professionals from different South American countries. That same year, Law Nr. 6.229/1975 was passed, creating the National Health System [Sistema Nacional de Saúde], redefining fields of action for federal departments. Based on that law, the Federal Executive Order Nr. 79.637/1977 was issued, assigning jurisdiction to the Ministry of Health to produce rules and potability standards to water used for human consumption.

In 1986, under Federal Executive Order Nr. 92.752 of the National Program of Surveillance of Water Quality for Human Consumption, conditions were created for

bringing closer different actors and organizations concerned about the theme (state health departments, basic sanitation corporations, organs of environmental control, universities, reference laboratories, sanitation corporations associations etc.). As the 1988 Constitution came into force, followed by Law Nr. 8.080/90, debates were urged about actions decentralization. Since then, a number of initiatives have been undertaken, meant to define guidelines and to put actions into one common structure. As the Ministry of Health was re-structured and the SVS was created, in 2003, the area of Surveillance on Environmental Health [Vigilância em Saúde Ambiental – VSA], an organ of the National Health Foundation [Fundação Nacional da Saúde – Funasa], was incorporated to the SVS. VSA actions related to the quality of water for human consumption became part of the National Surveillance System on Environmental Health [Sistema Nacional de Vigilância em Saúde Ambiental – SNVSA], to be performed by means of a national program shared by states, municipalities and the Federal District. Those actions must grant autonomy to the different governmental levels and must be adapted to different regional and local realities, considering the socio-cultural, geographic and economic diversity of the Country[25]. Since the first decade of the twenty-first century, the national surveillance program, under the coordination of the Ministry of Health, has been carried out under a new structure regarding its formulation elements and implementation activities[26].

The Vigiagua, approved in 2005, is based on guidelines of the Unified Health System [Sistema Único de Saúde], established by the 1988 Federal Constitution, and ruled under Law Nr. 8.080/90, on three reference lines: (a) the concept that water quality must be assured not just by actions for operational control, carried out by the company responsible for treating the water and for managing supply systems and alternative solutions, but mainly for surveillance actions maintained by authorities in the public health area; (b) the idea that surveillance activities consider the entire row of activities – from fountainheads, different water supply forms, either individual or collective, under public or private management, and all the way through the consumption point inside domiciles; and (c) the idea that data and information on the quality of water for human consumption and risks involving health must be available to all citizens. That control is supported by resources provided by state laboratories, private ones or at the service of corporations. Sanitation authorities must have periodical access to data and information produced by the operational control[5].

It is crucial for sanitation organs to develop monitoring activities concerning the quality of the water provided and consumed by the population, carrying out direct evaluation of water samples, which is also a means to validate information on its quality. This conceptual distinction was presented in Administrative Act Nr. 518, edited in 2004 by the Ministry of Health. The control of the quality of the water for human consumption was defined as

> a set of activities continuously carried out by those responsible for the system operation or alternative solution for water supply, meant to verify if inhabitants are provided with potable drinking water, yet assuring such condition will be maintained[27(267)].

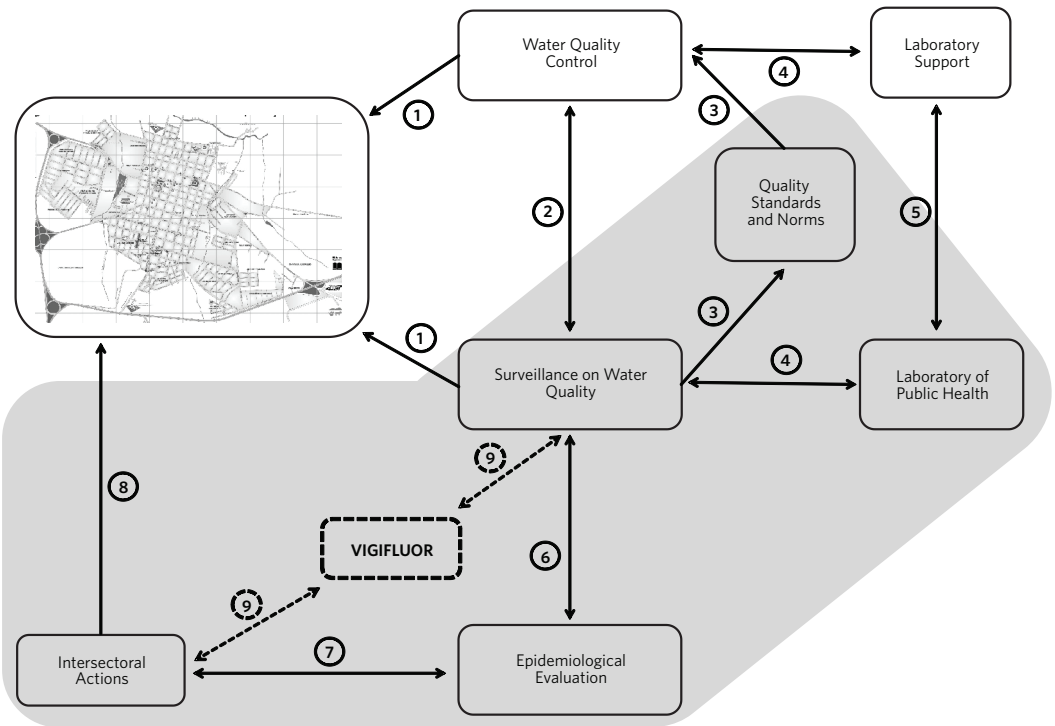
On the other hand, the surveillance on the quality of water for human consumption was defined by a

> set of actions continuously adopted by the public health authority in order to verify if the water consumed by inhabitants fulfills this Norm, and to evaluate the risks that supply systems and alternative solutions represent for human health[27(267)].

Such distinction stresses that surveillance actions must subsidize decision making by the sanitary authority as to the need and the opportunity of adopting interventional measures, either preventive or corrective.

Figure 1 represents the general framework of monitoring activities of physical, chemical and microbiological parameters carried out by both the companies responsible for water treatment and the environmental surveillance authorities. The territory, with its geographic, rural and urban characteristics, is shown on the left upper corner. Activities and aspects under sanitary authorities' responsibility are on the gray area, in order to differ them from activities and aspects under the responsibility of grantees in charge of services rendering. Both service renderers responsible for the operational control and surveillance organs carry out water sample collection in the territory (item 1) and share data/information concerning inspection and auditing activities (item 2). Both entities make use of laboratory-provided resources for physical, chemical and microbiological analysis (item 4), which must compose a national network of laboratories working in mutual cooperation (item 5). Sanitary authorities are in charge of the process of updating norms and quality standards (item 3), promoting interaction with epidemiological surveillance organs, formulating hypotheses of intersectoral actions (item 7) as well as participative planning to implement required actions in the territory (item 8).

Figure 1. Framework of monitoring activities of water quality in relation to physical, chemical and microbiological parameters



Despite those efforts, not all sanitary organs did include in their agenda the activities required for the surveillance of fluoride concentration in the water based on external control data, i.e., those produced by organs not directly responsible for the water treatment. Based on the analysis of data provided by the Ministry of Health for Brazilian municipalities in 2018, concerning the Sisagua, a study showed that only 37.3% (2,075) of them counted on records with monthly surveillance data (at least four months over the year) on fluoride concentration in the water. Moreover, in 89 municipalities (10 of them with at least 50 thousand inhabitants) the average concentration of fluoride informed exceeded 1.544 mg F/L, thus requiring immediate action by organs in charge of water quality surveillance; and in 445 municipalities, average values varied from 0.945 to 1.544 mg F/L, requiring planning and the adoption of corrective measures in the short term[24].

Considering that data from the National Research on Basic Sanitation, carried out in 2008, suggested that more than 3.3 thousand Brazilian municipalities were beneficiary of the public policy of water fluoridation, one may suppose that there is an important gap to assure the surveillance of fluoride concentration in the water supply, which, to be overcome, will largely depend on efforts to be shared in the above-mentioned Program, aiming at its improvement. This aspect will be discussed next, as the Vigifluor System is detaileed, showing the contribution it may offer (as indicated in *figure 1*, item 9).

The Vigifluor System

As already mentioned, the surveillance program design requires both operational control data and surveillance data to be inserted into an information system especially created on that purpose (Sisagua). The idea is to permit the investigation of the correlation between environmental and epidemiological information. Technical and legal basis for the system to operate as expected[10] are available and must be improved, in order to assure state health departments may keep qualified technical personnel, proper equipment and updated technologies that favor high advisement and support capability and, when required, to carry out the analysis of fluoride concentration in the water, according to health needs in each region. Considering that water is a public interest good, those responsible for the system or for the alternative collective solution for water supply for human consumption must fulfill requirements under the Law of Access to Information, Nr. 12.527, as of November 18, 2011. Besides, studies show that the fluoride concentration from the treatment outlet to the distribution system may vary according, among other aspects, to the kind of supply system – isolated or mixed, treatment station and/or deep tubular well[28]. Also important are problems in the hydraulic equipment or in variations of the water flow (outflow) along the distribution system over the city, besides exhausting speed of sparsely distributed reservoirs that are not connected to each other[29]. For that reason, the control must be performed in both the treatment outlet and the distribution system. Because feeding takes place monthly, this is a timely surveillance system, allowing for immediate action. Immediate intervention is even more convenient as the health risk for the population is more serious. In this sense, once non-conformity values compared to the standard required for the fluoride parameter are identified, surveillance authorities responsible for water supply systems may adopt preventive measures to identify causes and demand corrections. Nevertheless, just a small number of cities publicize reports that summarize data over the year and the main public interest occurrences.

Unlike certain microbiological and physical-chemical parameters, for which non-conformities in one single day may

represent immediate risk for the population, in case of fluoride parameter, it takes weeks, or even months, depending on the degree of non-conformity, to pose risks to the dental health. According to a consensual technical document produced by specialists in the area, very low values (<0.544 mg F/L) and very high values (>1.544 mg F/L), if maintained for weeks or months, may represent, on the one side, greater risk of dental caries, and on the other side, greater risk of dental fluorosis, proportional to the magnitude of the non-conformity[30].

A systematic review of the scientific literature involving Brazilian studies revealed that most non-conformity situations concerning fluoride concentration did not represent immediate health risk for the population, as they referred to hypo-fluoridation situations – that is, fluoride level below the recommended for preventing dental caries[18]. Despite such evaluation, monthly data obtained when following the Program in each municipality have inestimable value, and should not be discarded or abandoned in database and electronic files of surveillance agencies. Offering a tool for summarizing those data, in order to compose a basis of indicators with free access and making visible the results of this enormous effort made by surveillance organs of the Unique Health System, is one of the purposes of the Vigifluor System.

The Vigifluor System is a device that results from a multi-centric research project that brought together researchers from different Brazilian states, aimed at complementing the framework that guides the surveillance program ongoing in the country, taking into account the scientific evidence that, in order to assure effectiveness to the public policy, it is crucial to assure adequate levels of fluoride concentration in the water, so as to enable the maximum benefit concerning caries prevention, with minimum risk concerning dental fluorosis[30]. This is about an electronic platform for inserting data on the concentration of fluoride in the public water supply, for a specific year and city, including accredited agents, production of indicators and wide disclosure in computer networks.

With the Vigifluor System in place, it is possible to: (a) render visible the enormous effort to obtain surveillance data, made by sanitary organs in charge of controlling the water quality; (b) longitudinally monitor the quality of fluoride concentration levels in the water supplied by public systems; (c) provide the country with a social innovation technology, meant to ensure control quality, information validity and reliability to reach oral health goals, which are vital aspects for managing the public policy.

As it produces public health indicators at the municipal level, freely accessible to all internet users, the Vigifluor System may be useful to raise inhabitants' awareness and to subsidize considerations on different aspects of the public policy of water fluoridation.

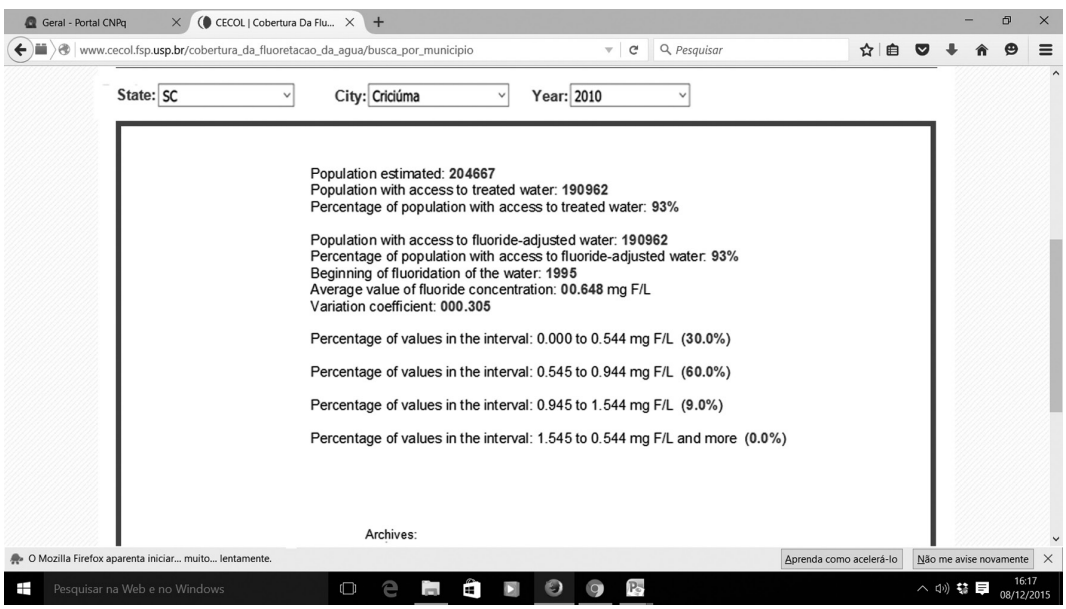
Because epidemiological consequences of the adjustment of fluoride concentration in the water can only be measured some years after the procedure is carried out, it is important to create technology in the computers network that allows for yearly summarizing data, so as to produce information on the quality of fluoridation systems of water supply operating in the country. As the fluoride present in the water is a factor that, depending on its concentration, may either protect or offer risk to dentition, counting on valid and reliable information on the exposure conditions to that substance is an important contribution, not only for the management of the public policy, but also for the production of scientific evidence on determinant factors of trends as to caries distribution and dental fluorosis, conditions to which information on the exposure level to fluoride present in the water from public supply systems is crucial.

Therefore, this is not a tool to replace the role of information systems already in place,

but, on the contrary, it is meant to appraise the adequate use and to enable data analysis as indicated in *figure 1*, item 9, so as to produce useful information to come along with both the expansion and the qualification of water fluoridation systems in Brazil. As shown in *figure 1,* the Vigifluor System enables to anticipate potential epidemiological effects. Besides, those are essential information for interpreting variations in dental caries distribution and to follow effectiveness and safety of the public policy.

The time gap needed to insert data into the electronic page of the city does not exceed 20 minutes, provided the Vigifluor agent accredited holds numerical values of fluoride concentration over the year, already inserted into the first column of an Excel electronic spreadsheet. According to the 'Guidelines for Accrediting the Vigifluor Program Agent' ['Manual de Credenciamento do Agente do Programa Vigifluor'] (www.cecol.fsp.usp.br), the agent will define the date and fill in the blanks related to the population assisted with safe water, the population assisted with fluoride-adjusted water, the year fluoridation was began, and fill in the spreadsheet previously prepared. The system will automatically complete the necessary calculations and will give in return six indicators: the average value resulting from values obtained in samples related to the respective year; the variation coefficient represented by the ratio between standard deviation and average value; and the proportion of values for the samples in four concentration intervals (mg F/L): 0.000 to 0.544; 0.545 to 0.944; 0.945 to 1.544; >1.544 (*figure 2*). Moreover, there is an option to report documents of public interest on the electronic page of the city, such as technical reports that certify data source responsibility.

Figure 2. Representation of electronic page with indicators as presented by the Vigifluor System



As already mentioned, indicators provide information on the ongoing public policy over the year for one certain city. The System users obtain validated information on the population supplied with fluoride-adjusted water, on the average concentration level adopted and the coefficient of values variation near the average. Municipalities whose fluoridation system keeps high proportion of samples in the interval of values that represent the maximum benefit concerning dental caries, with minimum risk as to dental fluorosis (0.545 to 0.944 mg F/L), correspond to those with high level of public policy quality.

It may also be noticed a number of gaps between the program formulation and its implementation at the municipal level[31]. As to the fluoride parameter, many doubts occur among health leaders, as well as among surveillance technicians and agents. In order to subsidize participants of the Vigifluor, technical documents were produced on the accreditation of agents, and protocols on locations identification, collection and analysis of water samples (available at: http://www.cecol.fsp.usp.br/artigos / artigos/DocTecnicos).

Considering the Sisagua, one can therefore infer the complementary character of the Vigifluor System, aimed at information production that might help bringing up the situational diagnosis of the public supply system about fluoride concentration, and the population assisted with fluoride-adjusted water for human consumption. In this context, the complementariness of the systems contributes with a conscious decision-making and the implementation of both preventive and corrective actions to be carried out by due public health authorities. Considering the need to overcome information precariousness on fluoride concentration in water for human consumption, as well as on data related to areas assisted with water fluoridation in the country, the implementation of the system now being developed should necessarily be granted number one priority. ■

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