Perceived quality assessment of the health services offered to riverine communities in Brazilian Amazon

Duarcides Mariosa
Pontifical Catholic University of Campinas (PUC-Campinas)

Pedro Henrique Mariosa
Research and Professor at Environment and Culture Institute
Federal University of Amazonas

Orandi Mina Falsarella
Research and Professor at Pontifical Catholic University of Campinas (PUC-Campinas) Center for Economy and Administration, Sustainability Postgraduate Program Brazil.

Renato Ribeiro Nogueira Ferraz
Graduate Program in Public Policy (PPG-PP) at Mogi das Cruzes University (UMC) - Mogi das Cruzes, SP.

Henrique dos Santos Pereira
Research and Professor at Graduate Program of Environmental Sciences and Sustainability of Amazon; Agrarian Sciences College, Federal University of Amazonas

Abstract

In line with the UN 2030 Agenda for Sustainable Development Goals, Public Health Policies follow in Brazil criteria of universality, completeness, and equity formulated to ensure access to health services in adequate quantity and quality for the entire population. To evaluate the quality of services provided in health units, it is essential, however, to make methodological considerations concerning the use of proper instruments and techniques to achieve accuracy and precision when evaluating effectiveness from users´ perspective. Mainly where health care is precarious or in need of adjustment, properly constructed indicators can become excellent management tools. This paper aims to analyze the specificities of the perception of the quality of health services offered to residents of the riverine communities of the Tupe Sustainable Development Reserve (SDR), Manaus, Amazonas, Brazil. The methodological approach follows a descriptive and ecological case study, based on field research with original data collection of fixed residents, aged over 18 years, by applying structured questionnaires and analyzing the results according to the SERVQUAL methodology. In the present study, the impact of previous experiences of attending on the quality of health service evaluation was taken into consideration. In the SDR of Tupe respondents positively rated all items. Nevertheless, when previous experience exists, a different pattern of perception was detected. Based on these results, we suggest that the quality perception of health has to do with

competitiveness, associated with the performance standard on the offer available to the customer.

Keywords: ServQual; Sustainability Indicators; Health Services Evaluation; Decision making

1. Introduction

Health is a multidimensional phenomenon, complex and of fundamental importance for the quality of human existence (Mujica-Mota et al., 2015). In particular, about the Amazon region, pandemic events, such as the covid19 (Castro et al., 2020; Daspett et al., 2020); epidemic, such as dengue (Fares et al., 2015; Pinto et al., 2016); and endemic, such as malaria (Ferreira & Castro, 2016), are expressions in the health area resulting from a systemic imbalance in the relationship between man, environment and society.

The pain, suffering and anguish that loss of health can cause to the other members of group, makes that the respective socio-cultural forms seeks to explain the occurrence of diseases, and considers their treatment and the inherent healing processes. In this way that, historically and collectively constructed, different sectors or levels of health care are installed, creating various social groups or sectors responsible for restoring the original state or before the moment of crisis. Helman (2007) lists the three main sectors with which societies linked to the pathological conditions they affect: the sectors of informal, popular and professional health care, which in deep regions, in pre-capitalist development stages or with full access to economic, technological and social resources indicates which one of the sectors is more present than the others.

In this study, we intend to analyze how the riverine residents evaluate the quality of health services, of the professional type, provided by the public authorities. This approach, of course, entails theoretical, methodological, and operational options that should be considered in heath management.

Initially, this happens because decision making in an organizational environment has a practical and immediate character. The managers use a set of indicators and instruments evaluative that allows getting the maximum efficiency the relationship between costs and benefits of the products and services; effectiveness in the best relation between the objectives set and the results achieved ; and effectiveness to resolves the problems identified sustainably and definitively (Jannuzzi, 2016; Tanaka and Tamaki, 2012).

Secondly, because health is not just the absence of disease, rather being much more the synthesis of a range of determinants that transcend the biological and reaches the ambiance economic, social, political and culture in which are inserted the subjects (Berkman, Kawachi, & Glymour, 2014). The importance of health is widely recognized in the various multilateral instances that discuss the fundamental rights of the human person and in international organizations that regulate and guide the actions of the Member States to ensure the implementation of practices leading to the achievement of a better, universal, equitably extensive and sustainable quality of life (United Nations, 2015). Among the Sustainable Development Goals of Agenda 2030 of the United Nations (2015) the number 3, that focuses on the theme of "Health and Wellness", claims to ensure a healthy life and promote well-being for all, at all ages. Among the specific objectives, in goal 3.8, the universal health care coverage is pursued, including the protection of the financial risk, access to essential quality health services and access to essential medicines and vaccines safe, effective, with quality and affordable for all (United Nations, 2015).

Thirdly, because in Brazil, since the promulgation of the Magna Carta in 1988, and anticipating the guidelines proposed by the United Nations in 2015 , the Public Health Policies follow criteria of universality, completeness, and equity formulated to ensure access to health services of adequate quantity and quality for the entire population. Surpassing any limits or despite any socio-spatial specific condition (Paim, Travassos, Almeida, Bahia, & Macinko, 2011). The legal guarantee of access is not, however, synonymous with its immediate enjoyment (Santos, Marques, & Duarte, 2011). In addition to the physical structure required to assist users, the logistics supporting activities involves specialized staff, support materials, appropriate equipment, as well as the existence of material, financial and human resource management processes. Whereas, in general, when it comes to public funds, this supporting is often scarce and heterogeneously distributed (Bovaird, 2015; Medeiros, Araújo-Souza, Albuquerque-Barbosa, & Clara-Costa, 2010).

Finally, it should be considered that monitoring and assessing quality in health services, to achieve the sustainable development goals proposed by Agenda 2030, requires, in turn, the use of appropriate instruments, techniques, and methodologies for this purpose. Quality assessment occurs under the epistemological complexity of qualitative evaluations and of how to establish the adequacy of relations between the object (health services) and its representation (the quality of services offered). In this challenge, it must be observed that the relationship between the "perceived quality" and "quality" is not given directly. "The qualitative measurement is a derived measure, which does not take place directly on the phenomenon of interest, but on the manifestations of this phenomenon" (Pereira, 2001, p. 67).

Thus, if on the one hand, any reference made to the quality of the services provided in the health area derives from the evaluation of the material, human resources and organizational structures available to the user; on the other, it requires considerations taken from the sociocultural universe that permeates the relationships between the "client-user" and the service provider unit, which impact differently on how clients perceive the quality of health services received. In order to analyze the main factors that interfere in the perception of the quality of health services, this study proposes to adapt and exploratory apply the SERVQUAL instrument, developed from 1985 by A. Parasuraman, Valarie Zeithaml, and Leonard Berry, in users of healthcare, located in an environmentally protected area near the city of Manaus, in Brazilian Amazon region.

For the accomplishment of this objective and presentation of the results, the article was divided into four parts. In the first part, we present the general lines of the theoretical framework adopted in the study. After, the methodological procedures used are detailed, describing how the field of study was delimited, the informants' choice and comprehensiveness and the data collection, treatment, and analysis techniques. Then search results are offered for analysis in the form of tables, figures, and graphs and systematized according to their statistical properties. Finally, the main findings of the research are discussed considering the bibliography selected and referenced in the paper. The article is concluded with the presentation of limits, contributions, and possibilities of expansion of the study.

2. Theoretical references for quality assessment in services

In management decision-making processes, and even before discussing the use and application of

mechanisms to evaluate the perception of health services, it is necessary to clarify what is meant by "quality" when it measures the perception of the client-usuary about the requirements and procedures to achieve the previously defined management objectives.

Quality may have different meanings, depending on the criteria used to define it (Mitra, 2016). Synthesizing a generalist proposal, Garvin (2002) considers quality as any coordinated activity to direct and control an organization with the goal of enabling the improvement of their products/services in order to ensure the complete satisfaction of customer needs related to what is being offered, or, overcoming their expectations. To make quality manageable the author (Garvin, 2002, p. 22–24) indicates and problematizes five forms of approach, defined as follows: 1) the transcendent, a quality that is only perceived by experience; 2) based on the quality related to the technical characteristics of the product; 3) the user-based, quality from the consumer's perspective is the what suits them best; 4) that is based on production, quality directly linked to the offer of the product or the package of services; and 5) the placed on the value, quality entirely based on cost and price relationship.

Fadel and Regis Filho (2009), in their turn, highlight the important managerial contribution brought using tools of perception of customer-user quality in public services. This may be the first step for the manager to design operational strategies that will lead to continuous improvement actions with better professionals who are oriented to meet the expectations of those looking for service. In the field study that subsidized the work, the authors observed that from the research carried out with the so-called "internal clients" - the employees of the researched service - the technical quality is the most relevant for the researched professionals, while for patients, aspects such as the way care is provided or the treatment they receive from professionals become more visible (Fadel & Regis Filho, 2009).

In fact, is complex to be measured objectively the perception that users and customers have about the quality in the service sector. And therefore, it demands innovative strategies and forms of the theoretical and methodological approach to the issue. One tool that enables this assessment is the SERVQUAL model proposed by Parasuraman, Zeithaml, and Berry. (Pena, Silva, Tronchin, & Melleiro, 2013).

The SERVQUAL instrument bases theoretically on the differential found between, first, the expectations of excellence of consumers and users of the service offered and, after, their perception of these services when delivered. As a management tool, it enables the assessment of quality improvements over time, assisting in identifying specific service elements that require development, as well as pointing out training opportunities for staff involved in the activity (Parasuraman, Zeithaml, & Berry, 1985).

In its original conception (Parasuraman, Zeithaml, & Berry, 1988) the SERVQUAL model examines five dimensions, considered by the authors as essential for assessing the quality of services provided:

a) **Tangibility**, which relates to infrastructure. Refers to the physical elements, equipment, and personnel, considered in their external presentation and appearance, such as furniture, office, forms, employee physical appearance, clothing and uniforms, material, and physical disposition.
b) **Reliability**, which is the certainty or confidence in the performance or functionality of the service offered. Ability to perform the service well, performing precisely what was promised, on the given date.

c) **Understanding**, Readiness, or Promptitude, that is, the ability to respond rapidly, to serve service users promptly. Ability to quickly understand the problems and difficulties of the users and respond it positively.
d) **Safety**, or the ability to inspire and convey credibility and trust. Warranty of providers to respond appropriately to user needs for the knowledge and courtesy on service.
e) **Empathy**, which is understood as care, the individualized attention that accompanies the service provider in their work.

In applying the model, SERVQUAL research is a process composed of three distinct and sequential moments. With questions related to the five dimensions of quality, the users are asked to offer their perception about the given industry, how they would imagine an ideal service unit or company. Then the same questionnaire is repeated, but now assessing how the actual performance of the company or service unit that is being analyzed. Finally, the results obtained at moment 1 (ideal) are compared with moment 2 (real).

The creators of the SERVQUAL instrument argue that service expectations are subjectively constructed by users from three sources: a) past experience in using the service or in units providing similar services; b) specific personal needs, which usually vary from user to user; and c) the world of word of mouth communication, where their perception is socially calibrated or adjusted with and from the impressions collectively shared by service users. (Parasuraman, Zeithaml, and Berry, 1985). Note that the referential universe of subjectivities, as it is exposed by the authors of SERVQUAL, it is socially built (Gonçalves & Sousa, 2015).

3. Methodological procedures for assessing the quality of health services in the SDR of Tupe

This is an exploratory, descriptive, and ecological study, based on field research (Fachin, 2006). The original data were collected with residents aged 18 and over who lived in the five riverine communities of the Sustainable Development Reserve of Tupe (SDR of TUPE), Manaus, Amazonas, and health service users provided at local units. Data were collected by applying structured questionnaires, systematic observations, and analysis of results according to the SERVQUAL methodology.

The area selected for study is in the Brazilian Amazon. Flanking the left bank of the Rio Negro, the SDR of TUPE is an area of environmental protection located in the rural zone of Manaus. Its 12,000 hectares, even though territorially spacious, house few fixed habitants within its limits. About 1800 people, distributed in six communities, five riverine ones (Tatulândia, São João do Tupe, Julião, Livramento, and Agrovila) and one rural settlement in the hinterland (Central). The present study only covers the riverine communities of the SDR of TUPE, a traditional population that receive this name because of the influence of the rhythm of the waters on their way of life. Thus, providing the conditions for the construction of a similar or with few collective variations in their social representations (Serra, 2002).

The object of study is the perception that community members point out regarding the quality of services provided by local health units. Throughout the SDR of TUPE area, care to the population is offered only

in the form of primary care, composed of the essential health units (BHU) and Primary Team Care, Family Health and Endemic Control. The SAMU 192 (Mobile Emergency Assistance Service) and Emergency Care Units (UPA) provide the intermediate care levels are provided. Finally, the medium and high complexity of care performed in hospitals, all located in the urban area of Manaus. In the Livramento community is located the UBS (Nossa Senhora do Livramento Rural Health Post), which is also responsible for attending the Agrovila and Julião communities. At UBS, it is possible to provide primary assistance in the programs of Pediatrics, Gynecology, General Practice, Nursing, Dentistry, and Social Assistance. The team of professionals consists of 02 doctors, 03 nursing technicians, 02 dentists, 02 oral health agents, 06 community health agents, and 03 endemic agents. They are responsible for providing services such as reception, social program monitoring, blood pressure, and blood glucose measurement, primary emergency care, medical and nursing consultation, dental consultation, dressing, malaria and leishmaniasis control, health education, vaccination, inhalation, reproductive planning, home visits, dermatological examination, collection of laboratory tests, referrals to specialties, and provision of primary medicines. In each community, there is a community health agent responsible for providing urgent care to the population, complemented by the team, from Monday to Friday in the Livramento community; on Wednesdays in the Agrovila community and on Thursdays in the Julião community. The health care services provided in the communities in the SDR of Tupe, like Tatulândia and São João do Tupe, happen by the Fluvial Health Post. A traveling unit of the Municipal Health Secretariat that serves the riverine population with equipment, services, and human resources also available at the Livramento health unit.

The sample universe of this study is the permanent residents on the riverine communities SDR of Tupe: Tatulândia, São João do Tupe, Nossa Senhora do Livramento, Julião and Agrovila, aged eighteen years or older. The selection of the informants was made at random and the recruitment developed as follows.

Initially, 620 buildings located in SDR of TUPE riverine communities were identified by their respective geographic coordinates and spatial distribution. Then, using Microsoft Excel software resources, 248 addresses were randomly selected, considering the minimum statistical confidence interval of 95%, sampling error of 5% and observing the proportionality of the spatial concentration of the residences. In the Agrovila community, 176 properties identified in the initial survey, 62 were selected; in the Julião community, from128, 55 were selected; In the Livramento community of 194, 64 were selected; in the São João do Tupe community, from 111, 52 were selected; and in the Tatulândia community, of the 15 properties found, all 15 were selected.

The questionnaire was built in a semi-structured form, containing in the first part questions about the individual characteristics of the informant, like gender, marital status, place of residence, education, occupation, own and family income; information about the health unit or units that frequently attended enters or knows; and in the second part specific issues involving the perception of health services in the local health units where they are usually accompanied, according to Table 1.

Table 1 - Questions and the perception dimensions of the Quality of Service Performance in Health Unit

Item	Dimension	Query	Perfomance Perception
1	**Tangibility**: Describe to infrastructure. These are the physical elements, equipment, and personnel, considered in their external presentation and appearance, such as furniture, office, forms, employees' physical appearance, clothing and uniforms, equipment and physical disposition.	Q5	Health unit staff look good (Clean and well dressed).
2		Q11	The health unit features modern equipment.
3		Q14	The facilities of the health unit are attractive, comfortable and organized.
4		Q20	User guides and health unit forms feature quality.
5	**Confiability**: Certainty or confidence in the performance or functionality of the service offered. Ability to perform the service well, executing with precision the promised, on the given date.	Q4	Services are provided in a way right the first time.
6		Q12	The health unit custody the attendance records and registration data of customers without errors.
7		Q17	Healthcare facility staff adopt a stance that inspires confidence in clients.
8		Q19	The health unit meets the agreed deadlines.
9	**Understanding**: Ability to respond immediately, to promptly serve service users. Ability to quickly understand users' problems and difficulties and respond positively.	Q6	There is the immediate care of the customers.
10		Q7	Health facility staff are always free to respond to customer requests.
11		Q10	Health unit staff correctly report the release and completion times of procedures.
12		Q13	Health facility staff always show a willingness to help customers.
13	**Safety**: Ability to inspire and convey credibility and trust. The assurance furnish by the knowledge and courtesy of service providers to respond appropriately to user needs.	Q3	Healthcare facility staff are well trained to serve clients.
14		Q8	Health facility staff are cordial with clients.
15		Q15	The health facility understands the specific needs of its clients.
16		Q18	Health facility staff have the knowledge to answer customer questions.
17	**Empathy**: It is the care, the individualized attention that accompanies the service provider in their work.	Q1	The health unit the client's interests are treated as a priority.
18		Q2	The opening hours are convenient for customers.
19		Q9	Health unit clients receive individual attention.
20		Q16	It is perceived an interest in solving customer problems.
(1)	(2) (3)	(4)	(5) (6) (7)
Disagree Strongly			**Agree Strongly**

Source: Adaptation of the SERVQUAL Model (Parasuraman et al., 1988)

Data collection occurred through interviews conducted by teams previously oriented and trained to contact informants, after the presentation, and signing of informed consent. The application of the questionnaires to the residents obeyed the criteria: a) exclusive to the selected houses; b) intended only for the permanent residents of the houses chosen in this way; c) excluding, therefore, temporary residents, vacationers or from other locations; d) interviewing only residents over the age of 18 found in the residences. The study found 103 respondents who, to each question read by the interviewer in the instrument, assigned a value from 01 (strongly disagree) to 07 (strongly agree). Eventually, given the answers “I don't know” or “I don't want to answer”, the respective fields were left blank and excluded from the analysis as “not informed”.

The original data were systematized through measures of centrality, means, and relative frequency and arranged in comparative tables for analysis of the results. Hair (2006) observe that on sample surveys, using the Likert scales, the number of respondents must be at least five times the number of questions. For the instrument applied, with 20 questions answered by 103 selected respondents, this criterion was met, allowing data analyzed according to the principal component factor analysis method. Using the SPSS 22 (Statistical Packet for Social Sciences) software, the Kaiser-Meyer-Olkin sampling adequacy tests (KMO test) and Bartlett's sphericity tests were applied to determine whether the factor analysis method could be used. And the internal reliability test of data (Cronbach's alpha), to verify that the data did not contain significant biases.

The data collected were interpreted according to the percentage variability relations of the answers given

to the questions of the Adapted Servqual Instrument. The criteria for selecting were the form of care, if by the fixed Health Post or if in a Floating Unit, and whether the respondent knows or not two or more care units.

4. Evaluation of the perception of quality of health services offered in the riverine communities from SDR of Tupe, Manaus, Amazonas

In the studied area, health care is provided to the local population by the basic health units (BHU Livramento), Primary Care Teams, Family Health, and Endemic Control, and the Basic River Health Unit (BSHU). The complexed cases receive care at the Manaus health units, by prior appointment or, in emergencies, by the SAMU speedboat since access between the communities of the Tupe and Manaus SDR is possible solely by the river. Residents at the communities of Livramento, Agrovila, and Julião receive assistance from the health clinic located in the Livramento. The residents of the São João and Tatulândia communities receive by local health agents and, sporadically, due to the not always favorable conditions of displacement, equipment, and material and human resources, by vessels or river health units that assist the riverine communities of the inland Amazon.

The questionnaire applied to residents collected individual information about the health unit or units they attend or know, with specific questions involving the perception of health services in the local health units where they usually attended.

The Kaiser-Meyer Olkin sampling adequacy test (KMO test) showed a value of 0.808. According to Pereira (2004), if this value is above 0.800 indicates a good fit for the factor analysis. The significance of Bartlett's Sphericity test showed less than 0.001, meaning that there is a probability level very suitable for the correlation between variables. We used Cronbach's alpha test to verify the degree of internal consistency of the scale. Considering that the value found was 0.761, which indicates an accuracy of 76.1%, we understood that the table is adequate for the proposed study. For more excellent reliability of the test, were evaluated all 20 instrument variables in their contribution to change the final value of Cronbach's Alpha, the results achieved were between 0.721 and 0.761, which once again demonstrates the internal consistency of the scale applied.

After tabulation, the values attributed by users of health services offered to residents of the Tupe Sustainable Development Reserve's riverine communities, on a LIKERT scale from 1 (totally dissatisfied) to 7 (fully satisfied) for the characteristics of Tangibility, Reliability, Understanding, Safety, and Empathy, predicted in the SERVQUAL methodology, reached numbers between 5.523 and 5.960, confirming average approval rates for the quality of services offered around 81.84%, according to Table 2.

Table 2 - Values and average response given by groups of residents of riverine communities to the questions that make up the SERVQUAL instrument adapted for measuring the perceived quality of health services in the SDR of Tupe

STATISTICAL PARAMETERS	TANGIBILITY				
	Q5	Q11	Q14	Q20	AVERAGE
N	103,00	101,00	103,00	99,00	**101,500**
Average	6,66	4,86	5,17	6,19	**5,720**
Standard deviation	1,12	2,42	2,28	1,50	**1,829**
STATISTICAL PARAMETERS	RELIABILITY				
	Q4	Q12	Q17	Q19	AVERAGE
N	102,00	100,00	102,00	99,00	**100,750**
Average	5,63	6,36	6,02	5,32	**5,833**
Standard deviation	1,82	1,53	1,74	2,25	**1,836**
STATISTICAL PARAMETERS	UNDERSTANDING				
	Q6	Q7	Q10	Q13	AVERAGE
N	103,00	99,00	101,00	103,00	**101,500**
Average	4,76	5,72	5,57	6,04	**5,523**
Standard deviation	2,35	1,84	1,99	1,67	**1,962**
STATISTICAL PARAMETERS	SAFETY				
	Q3	Q8	Q15	Q18	AVERAGE
N	102,00	102,00	101,00	101,00	**101,500**
Average	5,98	6,31	5,39	6,16	**5,960**
Standard deviation	1,84	1,46	2,09	1,61	**1,750**
STATISTICAL PARAMETERS	EMPATHY				
	Q1	Q2	Q9	Q16	AVERAGE
N	101,00	102,00	102,00	97,00	**100,500**
Average	5,16	5,20	6,28	5,79	**5,608**
Standard deviation	2,33	2,14	1,51	1,93	**1,978**

Source: Data collected from the SDR of TUPE riverine communities, Manaus, Amazonas, July 2015.

In another analysis, no significant differences were observed when collected data set were separated into two groups of clients-users of health services: those who received care only in the health units in the SDR of Tupe and, therefore, without comparison; and those who received care in 2 or more health units and, thus, with reference service for comparison.

As shown in Table 3, using the LIKERT scale from 1 (totally dissatisfied) to 7 (fully satisfied) for the characteristics of Tangibility, Reliability, Understanding, Safety, and Empathy, predicted in the SERVQUAL methodology, the final average values range from 5,899 for respondents who did not have previous comparison and 5,764 for those who had been seen at two or more health units.

Table 3 - Summary values and average response given by groups of residents of coastal communities with unparalleled service in another health facility and the experience of being treated at two or more health care units

QUALITY DIMENSION		TANGIBILITY	RELIABILITY	UNDERSTANDING	SAFETY	EMPATHY	TOTAL
WITHOUT COMPARISON	N	24.75	24.50	24.25	24.50	24.25	**24.45**
	Average	**5.72**	**5.89**	**5.67**	**6.13**	**6.07**	**5.89**
2 OR MORE UNITS	N	58.50	57.75	58.50	58.50	58.00	**58.25**
	Average	**5.65**	**5.91**	**5.61**	**6.03**	**5.60**	**5.76**

When we applied the Paired T-test to the data set collected, the results are not conclusive, according Figure 01. The means test for the answers given by the groups of residents at riverine communities compares the group that does not have a previous contact and a second group with the experience of being attended in 2 or more units. It cannot assume that there is a significant difference between the means of assessment given by the groups (1. which received attended in 1 single unit. 2. which received attended in 2 or more), as indicated by the test results: T = 1.419 and p-value = 0.172.

RESULTS	
T statistics	1.418862
Degrees of freedom	19
P-value	0.172136
Sample Average 1	5.8985
Sample Average 2	5.7635
Standard Deviation of Differences	0.425509
Size of Samples	20
Alternative Hypothesis Different from	0
Level of Confidence	95%
Inferior limit	(-) 0.064144
Upper limit	(-) 0.020788

Figure 1 - Paired t-test applied to the ratings of the quality of health services perceived by groups of residents at riverine communities that do not have a previous contact and a second group with the experience of being attended in 2 or more units. Source: Data collected from the SDR of Tupe riverine communities, Manaus, Amazonas, July 2015.

Finally, significant differences were found when we analyze the same set of data collected but separating the customers-users of health services among the two groups. 1) who attended the health facilities in Basic Health Units (BHU Livramento); 2) those who received care provided by the Fluvial Health Post, the Basic River Health Unit (BSHU), a traveling unit of the Municipal Health Secretariat. Applying the LIKERT scale from 1 (totally dissatisfied) to 7 (totally satisfied) for the Tangibility, Reliability, Understanding, Safety and Empathy characteristics, provided for in the SERVQUAL methodology, the final mean values of each of the quality dimensions ranged from 5.465 and 5.703 for respondents who were attended at BSHU and between 5.535 and 6.040 for those who had been attended at BHU Livramento, as shown in Table 4.

Table 4 - Values and means of answers given to questions of the SERVQUAL instrument by groups of residents of riverine communities with care at Basic River Health Unit (BSHU) and with the experience of being attended at Basic Health Unit (BHU) Livramento.

UNIT	STATISTICAL PARAMETERS	TANGIBILITY				
		Q5	Q11	Q14	Q20	AVERAGE
BSHU	N	25.00	24.00	25.00	25.00	**24.75**
	AVERAGE	6.56	6.08	5.36	4.75	**5.69**
BHU LIVRAMENTO	N	78.00	75.00	78.00	76.00	**76.75**
	AVERAGE	6.69	6.22	5.11	4.89	**5.73**
UNIT	STATISTICAL PARAMETERS	RELIABILITY				
		Q4	Q12	Q17	Q19	AVERAGE
BSHU	N	25.00	24.00	25.00	25.00	**24.75**
	AVERAGE	5.63	5.91	5.48	5.20	**5.55**
BHU LIVRAMENTO	N	77.00	76.00	77.00	74.00	**76.00**
	AVERAGE	5.62	6.49	6.19	5.36	**5.91**
UNIT	STATISTICAL PARAMETERS	UNDERSTANDING				
		Q6	Q7	Q10	Q13	AVERAGE
BSHU	N	25.00	25.00	25.00	25.00	**25.00**
	AVERAGE	5.11	5.71	5.20	5.85	**5.46**
BHU LIVRAMENTO	N	78.00	74.00	76.00	78.00	**76.50**
	AVERAGE	4.64	5.71	5.69	6.10	**5.53**
UNIT	STATISTICAL PARAMETERS	SAFETY				
		Q3	Q8	Q15	Q18	AVERAGE
BSHU	N	25.00	25.00	25.00	25.00	**25.00**
	AVERAGE	5.83	6.35	4.91	5.72	**5.70**
BHU LIVRAMENTO	N	77.00	77.00	76.00	76.00	**76.50**
	AVERAGE	6.02	6.29	5.54	6.31	**6.04**
UNIT	STATISTICAL PARAMETERS	EMPATHY				
		Q1	Q2	Q9	Q16	AVERAGE
BSHU	N	25.00	25.00	25.00	25.00	**25.00**
	AVERAGE	5.00	5.39	6.39	5.44	**5.55**
BHU LIVRAMENTO	N	76.00	77.00	77.00	72.00	**75.50**
	AVERAGE	5.21	5.12	6.24	5.91	**5.62**

Source: Data collected from the SDR of TUPE riverine communities, Manaus, Amazonas, July 2015.

The Paired T-test applied to the means of the answers given by the groups (1) who attended the health facilities in Basic Health Units (BHU Livramento) and 2) those who received care provided by the Basic River Health Unit (BSHU)) is shown in Figure 2. The test results (Statistics T = - 2.376, and p-value = 0.0282) indicate that there is a 97.18% chance that differences in the means of evaluations are not due to random.

RESULTS	
T statistics	(-) 2.376095
Degrees of freedom	19
P-value	0.02816911
Sample Average 1	5.593
Sample Average 2	57.675
Standard Deviation of Differences	0.3284329
Size of Samples	20
Alternative Hypothesis Different from	0
Level of Confidence	95%
Inferior limit	(-) 0.3282113
Upper limit	(-) 0.020788

Figure 2 - Paired t-test to the ratings of the quality of health services ratings perceived by both groups of users served on two Health Service Units in the SDR of Tupe, July 2015. Source: Data collected from the SDR of TUPE riverine communities, Manaus, Amazonas, July 2015.

Examining in a color map (figure 3), we can see how are spatially distributed the different mean assessments of the perception that residents of riverine communities have about the quality of health services in the SDR of Tupe, allowing to evaluate in each of the communities which dimension of the SERVQUAL model has the perception of high quality and where improvement is needed.

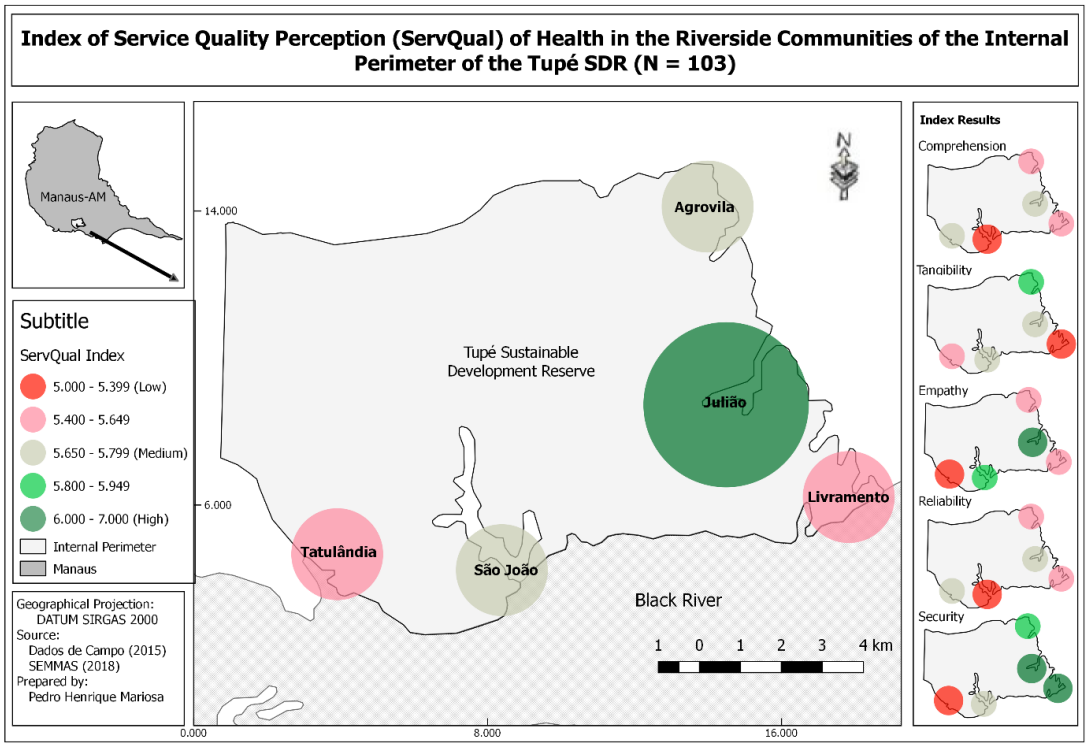

Figure 3 - Summary of indicators and outcomes by Quality of Service Perception (ServQual) indicator by Community. Source: Data collected from the SDR of TUPE riverine communities, Manaus, Amazonas, July 2015.

In the present study, it observed the impact of previous experiences of attending on regarding the quality of service. Especially in the Livramento, Tatulândia, Agrovila and São João do Tupe communities, the means of quality perception are lower than those obtained among the clients-users of the Julião communities health services. Analyzing each dimension, Julião has a perception quality index above 5.650 and Tatulândia below 5.799 in all dimensions of the SERVQUAL model.

As shown in Figure 3, when discussing the quality, we must also recognize the fact that service operations are always of even greater complexity and unexpected. The most diverse factors impact on the reference values used to evaluate the quality of services offered. They do not resume the physical elements, equipment, and personnel of the service unit. Much less the ability to perform the service well, delivering with precision what promised, on the given date. Or the ability to quickly understand users' problems and difficulties and respond positively, inspiring, and imparting credibility and trust. Or offering care, the individualized attention that accompanies the service provider in their work.

5. Conclusions

In the study, whose partial results here were presented, it was observed that measuring the quality offered in health services requires the use of instruments, techniques, and appropriate methodologies specially designed for this purpose. It occurs because we handle whit epistemological complexity of qualitative assessments, and in how to establish the relationships of adequacy between the object and its representation. In the case presented, the quality perception measurement was performed using a metric offered by the researcher to the client-user to learn their assessment, adapted from the SERVQUAL methodology. The investigation showed, by numerical indicators, how the comparative references impact the perception of the quality of health services offered by the Government in the Tupe SDR. If the study suggests that any reference to the quality of health care services should include the material, human, and organizational resources made available to the user, on the other side, it requires considerations taken from the sociocultural universe of relations between the “customer-user” and the service unit.

The methodological model, techniques, and instruments used in this work, as a management tool, allow subsidizing quality evaluations over time, helping to identify specific elements of the service that require improvement, as well as pointing training opportunities for the personnel involved in the project activity.

In fact, the discussion about quality puts the customer before what Karl Albrecht called the “moment of truth” (Freitas, 2005) or “service cycle” (Gianesi & Correa, 1994). That is, the service offered is not exclusively associated with the idea of what carries the customer to go to the service provider. But in finding a solution to your problem, he will go through a series of experiences that will directly influence your concept of attendance. Or if the conditions or manner of dislocation do not meet the arrival objectives, or when arriving the reception has problems of flow in the service, or yet troubles with the attendant, who for some reason is not attentive to the expectation of the client/user, will have a different experience from the purpose for which you went to the service desk.

Additionally, the strategy of the offered operation demands specific attention that often disregarded in public institutions. Especially in places where the quality parameters are perceived without previous experience, there is no reference or counterpart capable of providing the customer with the opportunity of

comparison. The quality as a strategy has to do with competitiveness. And this is associated with the performance standard of the offer available to the customer. If there is no competitiveness, the quality will be related to control in the supervisory sense, where it starts from a defined performance standard and seeks within the limits of available resources to meet the requirements of the protocols.

The main contribution of the study is to demonstrate that the relationship between the "perception of quality" and "quality" is not given directly. The qualitative measurement is a derived measure, which does not correspond directly to the phenomenon of interest but through the manifestations of this phenomenon. We must say, however, the conclusions are yet provisory, limited to the cases analyzed. Definitive affirmations require the continuity of studies in other service units and different similar territorial situations for purposes of consolidation and evaluation of the instruments and techniques indicated here.

6. References

Berkman, LF, Kawachi, I., & Glymour, MM (2014). Social epidemiology. Oxford University Press.

Bovaird, T. (2015). Public management and governance (3 d). Routledge. https://doi.org/10.4324/9781315693279

Castro, F. de, Lopes, G. R., & Brondizio, E. S. (2020). The Brazilian Amazon in Times of COVID-19: From crisis to transformation? Ambiente & Sociedade, 23, e0123. https://doi.org/10.1590/1809-4422asoc20200123vu2020l3id

Daspett, Mendonça, F., Soares Rocha, S., Pimenta Pinheiro, D. L., & Vilges de Oliveira, S. (2020). Região Norte do Brasil e a pandemia de COVID-19: Análise socioeconômica e epidemiológica. Journal Health NPEPS, 5(1), 20–37. https://doi.org/10.30681/252610104535

Fachin, O. (2006). Fundamentals of methodology. Sao Paulo (SP): Saraiva.

Fares, R. C. G., Souza, K. P. R., Añez, G., & Rios, M. (2015). Epidemiological Scenario of Dengue in Brazil. BioMed Research International, 2015, 1–13. https://doi.org/10.1155/2015/321873

Fadel, MAV, & Regis Filho, GI (2009). Quality perception in public health services: a case study. Journal of Public Administration, 43 (1), 7–22.

Feather, MM, Silva, EMS of, Tronchin, DMR, & Melleiro, MM (2013). The use of the quality model of Parasuraman, Zeithaml and Berry in health services. Journal of the USP School of Nursing, 47 (5), 1227–1232. https://doi.org/10.1590/S0080-623420130000500030

Ferreira, M. U., & Castro, M. C. (2016). Challenges for malaria elimination in Brazil. Malaria Journal, 15(1), 284. https://doi.org/10.1186/s12936-016-1335-1

Freitas, ALP (2005). Quality in services in the context of competitiveness. Online Production Magazine, 5 (1), 1–24.

Garvin, DA (2002). Managing quality, the strategic and competitive vision. Rio de Janeiro: Qualitymark.

Gianesi, IGN, & Correa, HL (1994). Strategic service administration: operations for customer satisfaction. Sao Paulo: Atlas.

Gonçalves, HM, & Sousa, CP de. (2015). Articulations between social representations and subjectivity: a study of national production between 2000 and 2010. Revista Educação e Contemporânea, 12 (27), 258–288.

Hair, JF (Org.). (2006). Multivariate data analysis (6th ed). Upper Saddle River, NJ: Pearson Prentice Hall.

Helman, C. (2007). Culture, health, and illness (5th ed). Hodder Arnold; Distributed in the U.S.A. by Oxford University Press.

Jannuzzi, P. de M. (2016). Monitoring and Evaluation of Social Programs: an introduction to concepts and techniques. Campinas - SP: Line.

Medeiros, FA, Araújo-Souza, GC, Albuquerque-Barbosa, AA, and C. Clara C., I. (2010). Reception in a Basic Health Unit: the user satisfaction in focus. Rev public health, 12 (3), 402–413.

Mitra, A. (2016). Fundamentals of quality control and improvement (Fourth edition). Hoboken, New Jersey: Wiley.

Mujica-Mota, RE, Roberts, M., Abel, G., Elliott, M., Lyratzopoulos, G., Roland, M., & Campbell, J. (2015). Common patterns of morbidity and multi-morbidity and their impact on health-related quality of life: evidence from a national survey. Quality of Life Research, 24 (4), 909–918. https://doi.org/10.1007/s11136-014-0820-7

Paim, J., Travassos, C., Almeida, C., Bahia, L., & Macinko, J. (2011). The Brazilian health system: history, advances, and challenges. The Lancet, 377 (9779), 1778–1797. https://doi.org/10.1016/S0140-6736(11)60054-8

Parasuraman, A., Zeithaml, VA, & Berry, L. (1985). A Conceptual Model of Quality Service and Its Implications for Future Research. Journal of Marketing, 49 (4), 41–50. https://doi.org/10.2307/1251430

Parasuraman, A., Zeithaml, VA, & Berry, LL (1988). Servqual: A Multiple-Item Scale For Measuring Consumer Perc. Journal of Retailing, 64 (1), 12.

Pena, M. M., Silva, E. M. S. da, Tronchin, D. M. R., & Melleiro, M. M. (2013). The use of the quality model of Parasuraman, Zeithaml and Berry in health services. Revista Da Escola de Enfermagem Da USP, 47(5), 1227–1232. https://doi.org/10.1590/S0080-623420130000500030

Pereira, JCR (2001). Qualitative data analysis: methodological strategies for health, human and social sciences. Sao Paulo: EDUSP: FAPESP.

Pereira, JCR (2004). Qualitative data analysis: methodological strategies for health, human and social sciences. Campinas: Edusp.

Pinto, R. C., Castro, D. B. de, Albuquerque, B. C. de, Sampaio, V. de S., Passos, R. A. dos, Costa, C. F. da, Sadahiro, M., & Braga, J. U. (2016). Mortality Predictors in Patients with Severe Dengue in the State of Amazonas, Brazil. PLOS ONE, 11(8), e0161884. https://doi.org/10.1371/journal.pone.0161884

Santos, FB dos, Marques, LAM, & Duarte, HG (2011). Fundamental Rights: the search for its realization. Legal Framework, Rio Grande, XIV, (92).

Serra, NOR (2002). AT THE WATER Rhythm AT THE WATER Rhythm. Magazine Presence for Education, Culture and the Environment, VI (24), 13.

Tanaka, OY, & Tamaki, EM (2012). The role of evaluation for decision making in health service management. Science & Collective Health, 17 (4), 821–828. https://doi.org/10.1590/S1413-81232012000400002

United Nations. (2015). Transforming our world: the 2030 agenda for sustainable development. Rio de Janeiro: United Nations in Brazil. Retrieved from http://nacoesunidas.org/pos2015/agenda2030/