



Oct 10, 2024

Waiting time and ways of accessing specialized health services in public hospitals in Ecuador

 [PLOS One](#)

✓ Peer-reviewed method

DOI

<https://dx.doi.org/10.17504/protocols.io.261ge5z7wg47/v1>

Marcelo Armijos Briones¹, Estefanía yala Aguirre¹, Sammy Figueroa Intriago¹

¹Universidad de Especialidades Espíritu Santo

PLOS ONE Lab Protocols
Tech. support email: plosone@plos.org



Marcelo Armijos Briones

Universidad de Especialidades Espíritu Santo



Create & collaborate more with a free account

Edit and publish protocols, collaborate in communities, share insights through comments, and track progress with run records.

Create free account

OPEN  ACCESS



DOI: <https://dx.doi.org/10.17504/protocols.io.261ge5z7wg47/v1>

External link: <https://doi.org/10.1371/journal.pone.0315149>

Protocol Citation: Marcelo Armijos Briones, Estefanía yala Aguirre, Sammy Figueroa Intriago 2024. Waiting time and ways of accessing specialized health services in public hospitals in Ecuador. **protocols.io**

<https://dx.doi.org/10.17504/protocols.io.261ge5z7wg47/v1>

Manuscript citation:

Briones MA, Intriago SF, Lanata-Flores A, Sellán PB, Toala OM, Aguirre PEA (2025) Protocol: Waiting time and ways of accessing specialized health services in public hospitals in Ecuador. PLOS One 20(4). doi: [10.1371/journal.pone.0315149](https://doi.org/10.1371/journal.pone.0315149)

License: This is an open access protocol distributed under the terms of the **Creative Commons Attribution License**, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited

Protocol status: Working

We use this protocol and it's working

Created: October 01, 2024

Last Modified: October 10, 2024

Protocol Integer ID: 109306

Keywords: Ministry of Public Health (MSP), Institute of Statistics and Census of Ecuador (INEC), Data collection, Data analysis, Specialized health services, efficiency within the healthcare referral process, specialized health services in public hospital, healthcare referral process, medical appointment, hospital staff involvement, accessing specialized health service, public hospital, shorter waiting time, ecuador this study, appointment, hospitals under the ministry, specialized health service, hospital, type of access, forms of access, standardized access, formal referral, correlation between waiting time, specialized medical service, waiting time, public health, ecuador, access, patient, staff

Funders Acknowledgements:

Universidad Espíritu Santo

Disclaimer

To receive approval from the ethics committee for this research, it was necessary to present a letter of interest from the institution where the research was to be conducted. The Ministry of Public Health did not provide the aforementioned letter, therefore, all data collection will be carried out outside the hospitals. As it is a public space, approval from this institution is not necessary.

Abstract

This study aims to determine the waiting time and the forms of access to specialized health services in public hospitals in Ecuador. A representative sample of 32 hospitals under the Ministry of Public Health was considered, with 26 selected by convenience. Data will be collected using a structured questionnaire. Patients will be asked about the number of days they waited for their medical appointments and the method used to schedule their appointments. The study distinguishes between standardized access, based on Ecuador's formal referral and counter-referral system, and non-standardized access methods, such as personal connections or hospital staff involvement.

We expect to identify a correlation between waiting times and the type of access to specialized medical services, with non-standardized access potentially leading to shorter waiting times. This research may highlight disparities in the system and suggest areas for improvement in equity and efficiency within the healthcare referral process.

Attachments



[Carta de Aprobación....](#)

442KB



[Cuestionario de reco...](#)

313KB

Guidelines

Background:

Ecuador's health system is characterized by a mix of public and private entities, with the Ministry of Public Health (MSP) playing a central role in its operation and evaluation. The system includes a chapter on health in the Constitution, recognizing health as a human right, and has seen the construction of the Comprehensive Public Health Network (1). However, there are challenges such as the workload of physicians, concerns about the availability and quality of medicines, and a perceived disconnect between governance and service delivery (2). Despite constitutional guarantees for healthcare access, the dominance of the biomedical model and top-down policy enforcement have led to issues in addressing health epidemics in rural areas (3). Faith-based healthcare providers (FBHPs) have historically been significant, but their current role in the national health system requires further understanding (4). In summary, Ecuador's health system is a complex interplay of the public and private sectors, with constitutional commitments to health as a human right and ongoing efforts to improve public health infrastructure. However, the system faces significant challenges, including resource limitations, healthcare provider burnout, and the need for better integration of various health services and innovative systems. Addressing these issues is crucial for the system's reliability and health outcomes in the Ecuadorian population (5). For example, to improve system reliability, Ecuador created the national referral and counter-referral subsystem, which, among other things, aims to make specialized care more efficient, leaving the first level of care as the gateway to the national health system and regulating access to specialized health services for those who need it.

The referral and counter-referral system in Ecuador, as described in the context provided, is part of a healthcare framework that was reformed following the 2008 Constitution, which guaranteed access to healthcare for all citizens (3). This system involves the process of referring patients from lower-capacity institutions to higher-complexity institutions for specialized care and diagnoses and then counter-referring them back to the original institution with specific diagnoses and treatment plans (6). However, the system faces challenges owing to the dominance of the biomedical model and the administrative state's top-down enforcement of health policies, which has led to a focus on emergency care rather than a continuous care model (3). Interestingly, despite the constitutional guarantee and allocation of resources towards healthcare, community-based studies have indicated that the public healthcare system has struggled to effectively address health epidemics, suggesting a disconnect between policy and practice (3). This situation underscores the importance of establishing functional links between healthcare centers with varying complexities to ensure continuity of care (7). In summary, the referral and counter-referral system in Ecuador is a critical component of the healthcare process designed to facilitate the movement of patients through different levels of care. However, the effectiveness of the system is hindered by the prevailing healthcare model and administrative practices that do not adequately support continuous and community-based care (3,7). To improve the system, there is a need for a more integrated approach that bridges the gap between policy and community needs, ensuring that the referral process is not just a handover but part of a continuum of care.

Inquiry into waiting times and forms of access to specialized medical services in public hospitals in Ecuador is a multifaceted issue. This research aims to discern the relationship between the mode of access—whether

through formal channels or informal networks—and the duration patients wait for specialized consultations. The context provided by Briones et al. (2024) is particularly relevant, as it directly investigates waiting times in Ecuadorian public hospitals and identifies informal access as a potential factor in scheduling delays (8). Contradictory findings emerge when considering the broader literature on waiting times for health care services. While some studies suggest that socioeconomic status does not significantly affect waiting times for certain services (9), others indicate that lower socioeconomic status is associated with longer waits (10,11). In summary, the relationship between access forms and waiting times for specialized medical services in Ecuadorian public hospitals is complex and is influenced by various factors, including informal access networks, socioeconomic status, and external events. Evidence suggests that while formal processes may lead to longer waiting times, informal networks can expedite access, albeit potentially exacerbating inequities (8). To fully understand the dynamics at play, it is crucial to consider the broader context of healthcare access and waiting times, as illuminated by the referenced international studies.

Understanding the time that users of public hospitals in Ecuador wait for specialized medical care is crucial for improving the country's healthcare system. This information can help policymakers and healthcare providers identify areas that require improvement and allocate resources more effectively. Previous studies have shown that patients in Ecuador often face long waiting times for medical appointments, with some patients waiting months to see a specialist. However, there is limited research on the specific time that users of public hospitals in Ecuador wait for specialized medical care. There is a lack of research on the time that users of public hospitals in Ecuador wait for specialized medical care and how they access these services. This study aims to fill this knowledge gap by providing detailed information on waiting times and referral systems in Ecuadorian public hospitals.

This study is essential for understanding the challenges faced by the Ecuadorian healthcare system and identifying ways to improve the delivery of specialized medical care. This study provides valuable insights for policymakers and healthcare providers by examining waiting times and referral systems in public hospitals. What is the average waiting time for specialized medical care in public hospitals in Ecuador and how are patients accessing these services?

This study aimed to determine the average waiting time for specialized medical care in public hospitals in Ecuador and to examine the referral and counter-referral systems used by patients to access these services. It is hypothesized that patients in public hospitals in Ecuador face long waiting times for specialized medical care, and the referral and counter-referral systems do not efficiently manage patient appointments.

Materials

The surveys will be carried out by an external company with a national presence. The sponsoring institution will cover all costs resulting from this contract.



Safety warnings

 The security situation in Ecuador, combined with the lack of approval from the Ministry of Health to enter public hospitals, represents a risk for the interviewers and a certain degree of rejection by users when answering the survey is expected.

Ethics statement

This research project was reviewed and approved by the Ethics Committee for Research on Human Beings of ITSUP with the number 1718079732. The ethics committee is registered in the Office for Human Research Protections with the number RB00014260

Before start

According to Ecuadorian and institutional legislation of the sponsoring University, the research project is ready to be carried out.

Method

- 1
 - The research design for this study is a cross-sectional survey design.
 - The research method used in this study is a structured questionnaire survey.
 - The study participants will be patients who have undergone specialized medical consultations in the 26 public hospitals in Ecuador.
- 2

Inclusion Criteria:

Inclusion criteria for this study will be patients who have undergone specialized medical consultations in the 26 public hospitals in Ecuador.
- 3

Exclusion Criteria:

Exclusion criteria for this study will be patients who are unable to provide informed consent, patients who are unable to understand the questionnaire, and patients who have undergone specialized medical consultations in private hospitals.
- 4
 - For the sample calculation in each hospital, the Epi Info application was used with the following parameters: confidence level 95%, margin of error 5%, event prevalence 82% because, according to the Briones 2024 study, this number of appointments in public hospitals in the province of Manabí in Ecuador are by standardized scheduling.
 - The number of visits to the Outpatient Clinic areas, the area where specialized medical care is provided in the country's public hospitals, was taken from the data of the Ecuadorian Ministry of Public Health on its website.
 - The morbidity care data for the month of August 2023 was taken as a reference whenever data from that year existed; when not, they were taken from the last year available as shown in **Table 1**.

	A	B	C	D	E
	Table 1. Stratification of proportional sampling of users who attend medical consultations of specialties in public hospitals in Ecuador				
		Hospital	Number of morbidity care visits in August	Year	Sample
	1	Alfredo Noboa Montenegro General Hospital	2289	2022	200



	A	B	C	D	E
	2	Ambato General Hospital	11858	2023	215
	3	Dr. Verdi Cevallos Balda General Hospital	7212	2023	212
	4	Enrique Garces General Hospital	9748	2023	214
	5	Esmeraldas South General Hospital – “Delfina Torres de Concha”	3454	2023	206
	6	Francisco de Orellana General Hospital	3450	2022	206
	7	Guasmo South General Hospital	1908	2016	196
	8	Gustavo Dominguez General Hospital	6423	2023	212
	9	Homero Castanier Crespo General Hospital	1581	2016	192
	10	Isidro Ayora General Hospital	508	2021	153
	11	José María Velasco Ibarra General Hospital	6169	2023	211



	A	B	C	D	E
	12	Julius Doepfner General Hospital	1772	2023	195
	13	Latacunga General Hospital	10468	2023	214
	14	León Becerra General Hospital	2662	2022	202
	15	Liborio Panchana Sotomayor General Hospital	3527	2023	206
	16	Luis Gabriel Davila General Hospital	3263	2023	205
	17	Hospital General Macas General Hospital	2566	2022	202
	18	Marco Vinicio Iza General Hospital	4969	2023	210
	19	General Martin Icaza General Hospital	3152	2022	205
	20	Pablo Arturo Suarez General Hospital	14388	2023	216
	21	Hospital General Puyo General Hospital	4319	2023	208

	A	B	C	D	E
	22	General Rodriguez Zambrano General Hospital	1876	2023	196
	23	Vicente De Paul General Hospital	5680	2023	211
	24	General Teofilo Davila General Hospital	5577	2023	211
	25	Vicente Corral Moscoso General Hospital	2187	2020	199
	26	General Teaching Provincial Hospital of Riobamba	6946	2023	212
	Total	127952		5309	

Data Collection:

- 5
- The data collection instrument was a semi-structured survey containing a total of 30 questions with an average duration of 8 minutes to be answered.
 - The questions were divided into several sections, the first containing social, demographic and economic information, the second containing ethnic and cultural information and the third containing information on the method of access and waiting time for specialized medical care.
 - For the first and second sections, questions taken from the Health and Nutrition survey forms carried out periodically by the Institute of Statistics and Census of Ecuador (INEC) were used.
 - Because of this, these questions did not need to be validated since they are essentially descriptive questions such as age, sex, place of residence, among others, as shown below in the table 2:

A	B	C	D
Table 2. Questions and response options for the sections: social, demographic and economic information and ethnic and cultural information			
Questions from the first section in Spanish	Answer options	Questions from the first section in English	Answer options
Edad	Número de años de vida cumplidos hasta la fecha de la encuesta	Age	Number of years of life completed up to the date of the survey
Sexo	Femenino o masculino	Sex	Female or male
Nivel de instrucción formal alcanzado	Ninguno, primaria, secundaria, tercer nivel o cuarto nivel	Level of formal education achieved	None, primary, secondary, third level or fourth level
Cuáles son los ingresos promedios de su hogar (colocar la cifra aproximada de los ingresos de todas las personas que viven en su casa, no es necesario un valor exacto)	Cantidad de dinero en dólares que percibe la familia al mes	What is the average income of your household (insert the approximate figure of the income of all the people who live in your house, an exact value is not necessary)	Amount of money in dollars that the family receives per month
Cuántas personas viven en su casa (coloque el número de personas que viven en la vivienda del encuestado)	Cantidad de personas viven de forma permanente en su hogar	How many people live in your house (insert the number of people who live in the respondent's home)	Number of people living permanently in their home
Área de residencia	Urbano o rural	Area of residence	Urban or rural
Vive en la misma provincia en la que está	Si o no	Do you live in the same province as the	Yes or no



A	B	C	D
el hospital		hospital?	
De ser no ¿Por qué no se atendió en su provincia?	No hay el especialista que necesito; este hospital queda más cerca de mi residencia; un médico le agendó en este hospital;otra razón	If not, why were you not treated in your province?	The specialist I need is not available; this hospital is closer to my residence; a doctor made an appointment for me at this hospital; other reason
Provincia de residencia	Alguna de las 23 provincias continentales del Ecuador	Province of residence	Any of the 23 continental provinces of Ecuador
Desde su residencia hasta el hospital ¿Cuánto tiempo le tomó llegar al hospital? (colocar el dato en minutos)	El tiempo en minutos que le tomó llegar hasta el hospital	From your residence to the hospital, how long did it take you to get to the hospital? (insert the data in minutes)	The time in minutes it took to get to the hospital
En total ¿Cuánto gastó en transporte para llegar al hospital? (colocar el valor en dólares del gasto por persona de ida y vuelta)	El valor en dólares que gastó para llegar al hospital	In total, how much did you spend on transportation to get to the hospital? (insert the dollar value of the round-trip expense per person)	The amount in dollars spent to get to the hospital
Section on ethnic and cultural information			
Autoidentificación étnica (preguntarle al encuestado cuál es su etnia)	Mestizo, blanco, indígena, negro, afroecuatoriano, mulato, montuvio, otro	Ethnic self-identification (ask the respondent what their ethnicity is)	Mestizo, white, indigenous, black, Afro-Ecuadorian, mulatto, montuvio, other
Cuál es su lengua materna (explique que se	Kichwua; Waorani; Shuar; Achuar; Cha'pala;	What is your native language (explain that	Kichwua; Waorani; Shuar; Achuar; Cha'pala;



A	B	C	D
trata de su idioma original, el que usa como primera lengua para comunicarse en casa)	Awapit; Español; otra	this is your original language, the one you use as your first language to communicate at home)	Awapit; Spanish; other
Escriba la otra lengua	Se escribe el nombre del otro idioma mencionado por el paciente en forma textual	Write the other language	The name of the other language mentioned by the patient is written verbatim
¿Alguien en el hospital con quien haya hablado, conocía su idioma? (se refiere a alguna persona que le informó algo respecto a su cita médica)	Si o no	Did anyone at the hospital you spoke to know your language? (refers to someone who told you something about your medical appointment)	Yes or no
¿Cree usted que su etnia es un obstáculo al momento de agendar una cita? (se busca comprender si durante el agendamiento tuvieron dificultades en el proceso por su lengua o etnia)	Si; no; tal vez	Do you think your ethnicity is an obstacle when scheduling an appointment? (to understand if during the scheduling process you had difficulties due to your language or ethnicity)	Yes; no; maybe
¿Cree usted que su lengua materna es un obstáculo al momento de recibir la atención médica? (se busca comprender si en citas anteriores tuvieron dificultad para explicar su situación al especialista)	Si; no; tal vez	Do you think your native language is an obstacle when receiving medical care? (to understand if in previous appointments you had difficulty explaining your situation to the specialist)	Yes; no; maybe

- 6
- For the third section, questions were asked about the forms of access and the waiting time for specialized health services.
 - In this section, we began by asking the reason for attending the hospital, because, in the area of specialty consultation, specialized procedures such as ultrasounds, x-rays, among others, are also considered and we were interested in measuring the waiting time for these procedures as well.
 - The questions in this section are similar to those applied in the INEC Questionnaire in its national surveys, however, when modified to meet the objective of this research, they went through a process of validation of the clarity and consistency of the questions asked by the research team and related researchers.
 - The process was carried out with a pilot study in three hospitals in the country, one in each geographic region (coast, mountains and Amazon).
 - A total of 322 people were surveyed in hospitals in the 3 geographic regions of the country, who answered two questions after answering the questionnaire: Was there any question that you did not understand? and Did any question seem confusing or ambiguous? With yes or no response options. When the answer was Yes, the question why was asked.
 - The answers were tabulated and analyzed with Pearson's Chi Square test and Z Test for comparison of proportions.
 - Table 3 describes the social, demographic and cultural characteristics of the participants in the validation.

A	B	C
Table 3. Characteristics of the population participating in the validation of the consistency of the questions in the questionnaire (n 322)		
	N	%
Total	322	100,0
Gender		
Female	213	66,1
Male	109	33,9
Age group		



A	B	C
18 to 25 years	40	12,4
26 to 40 years	124	38,5
41 to 55 years	95	29,5
56 to 70 years	53	16,5
71 years and older	10	3,1
Income quintile		
Quintile 1	105	32,6
Quintile 2	156	48,4
Quintile 3	45	14
Quintile 4	11	3,4
Quintile 5	5	1,6
Education		
None	14	4,3
Primary	99	30,7
Secondary	167	51,9
Third level	40	12,4
Fourth level	2	0,6
Area of residence		
Urban	251	78,0

A	B	C
Rural	71	22,0
Ethnicity		
Mestizo	299	92,9
Indigenous	12	3,7
Afro-ecuadorian	2	0,6
Montuvio	9	2,8
Language		
Spanish	311	96,6
Kichwua	6	1,9
Shuar	5	1,6
Geographic region		
Sierra	77	23,9
Coast East	110	34,2
Oriente	135	41,9

A balance was sought among participants due to the cultural disparity between regions in Ecuador. The results of the responses with the statistical tests mentioned above are shown in Table 4 and 5.

- 7
- This type of validation was chosen because the purpose of this questionnaire is to measure the waiting time in days and to find out whether or not people use the referral and counter-referral system stipulated in the Ecuadorian Health Model, knowing the origin of the medical appointment.
 - Both measurement scales were considered psychometric, that is, they can be measured objectively by asking the population directly (12).

- Because of this, it is not necessary to develop a series of questions to determine a construct.
- The latter is used when the measurement scales are psychophysical, such as when it is required to measure the level of satisfaction, the quality of medical care, among others.

8

	A	B	C	D	E	F	G	H
	Table 4. Responses to the question “Were there any questions you did not understand?” from the people who participated in the validation of the consistency and understanding of the questions that made up the survey applied							
	Were there any questions you did not understand? (n 324)							
	No		Yes		Total		pvalor	
	N	%	N	%	N	%		
Gender							0,131 ⁺	
Female	188a	88,3	25a	11,7	213	100		
Male	102a	93,6	7a	6,4	109	100		
Age group							0,344 ⁺	
18 to 25 years	36a	90	4a	10	40	100		
26 to 40 years	107a	86,3	17a	13,7	124	100		
41 to 55 years	89a	93,7	6a	6,3	95	100		
56 to 70 years	48a	90,6	5a	9,4	53	100		

	A	B	C	D	E	F	G	H
	71 years and older	10a	100	0a	0	10	100	
	Income quintile							0,572†
	Quintile 1	91a	86,7	14a	13,3	105	100	
	Quintile 2	143a	91,7	13a	8,3	156	100	
	Quintile 3	42a	93,3	3a	6,7	45	100	
	Quintile 4	10a	90,9	1a	9,1	11	100	
	Quintile 5	4a	80	1a	20	5	100	
	Educational							0,472†
	None	13a	92,9	1a	7,1	14	100	
	Primary	93a	93,9	6a	6,1	99	100	
	Secondary	148a	88,6	19a	11,4	167	100	
	Third level	34a	85	6a	15	40	100	

	A	B	C	D	E	F	G	H
	Fourth level	2a	100	0a	0	2	100	
	Area of residence							0,185+
	Urban	229a	91,2	22a	8,8	251	100	
	Rural	61a	85,9	10a	14,1	71	100	
	Ethnicity							0,434+
	Mestizo	267a	89,3	32a	10,7	299	100	
	Indigenous	12a	100	0a	0	12	100	
	Afro-ecuadorian	2a	100	0a	0	2	100	
	Montuviso	9a	100	0a	0	9	100	
	Language							0,533+
	Spanish	279a	89,7	32a	10,3	311	100	
	Kichwua	6a	100	0a	0	6	100	
	Shuar	5a	100	0a	0	5	100	

	A	B	C	D	E	F	G	H
	Geographic region							0,000 [†]
	Sierra	74a	96,1	3b	3,9	77	100	
	Coast East	85a	77,3	25b	22,7	110	100	
	Oriente	131a	97	4b	3	135	100	

Each letter in the subscript denotes a subset of the Were there any questions you didn't understand? categories whose column proportions do not differ significantly from each other at the .05 level.
† Refers to the p-value of Pearso's chi-square test
‡ Refers to the p-value of Fisher's Exact Test

- In Table 4, it is possible to observe that in the coastal region or Ecuadorian littoral, the people who participated in the validation had some difficulties when understanding some of the questions.
- When they were asked about what the difficulty was, all of them answered "the problem of the ethnic group." It is quite likely that this is because in this geographic region of Ecuador, the inhabitants are not familiar with their ethnic group, which is mostly montuvia or mestizo.
- In contrast, in the Sierra and Amazon regions, the inhabitants, a good proportion of whom are indigenous, who have historically grouped themselves into peoples and nationalities, even recognized in the country's political constitution, have a much clearer understanding of the issue.
- To minimize errors in the responses to this variable, the interviewers were instructed to explain the issue in detail to the participants.

9

	A	B	C	D	E	F	G	H
	Table 5. Responses to the question "Were any questions confusing or ambiguous?" from the people who participated in the validation of the consistency and understanding of the questions that made up the survey applied							
	Were any questions confusing or ambiguous? (n 324)							

	A	B	C	D	E	F	G	H
		No		Yes		Total		Pvalor
		N	%	N	%	N	%	
	Gender							1,000†
	Female	208a	97,7	5a	2,35	213	100,00	
	Male	106a	97,2	3a	2,75	109	100,00	
	Age group							0,689†
	18 to 25 years	39a	97,5	1a	2,5	40	100,0	
	26 to 40 years	119a	96,0	5a	4,0	124	100,0	
	41 to 55 years	94a	98,9	1a	1,1	95	100,0	
	56 to 70 years	52a	98,1	1a	1,9	53	100,0	
	71 years and older	10a	100,0	0a	0,0	10	100,0	
	Income quintile							0,408†
	Quintile 1	102a	97,1	3a	2,9	105	100,0	



	A	B	C	D	E	F	G	H
	Quintile 2	152a	97,4	4a	2,6	156	100,0	
	Quintile 3	45a	100	0a	0	45	100,0	
	Quintile 4	10a	90,9	1a	9,1	11	100,0	
	Quintile 5	5a	100	0a	0	5	100,0	
	Educational							0,789†
	None	14a	100,0	0a	-	14	100,0	
	Primary	97a	98,0	2a	2,0	99	100,0	
	Secondary	161a	96,4	6a	3,6	167	100,0	
	Third level	40a	100,0	0a	-	40	100,0	
	Fourth level	2a	100,0	0a	-	2	100,0	
	Area of residence							0,838†
	Urban	245a	97,6	6a	2,4	251	100,0	

	A	B	C	D	E	F	G	H
	Rural	69a	97,2	2a	2,8	71	100,0	
	Ethnicity							1,000†
	Mestizo	291a	97,3	8a	2,7	299	100,0	
	Indigenous	12a	100,0	0a	0,0	12	100,0	
	Afro-ecuadorian	2a	100,0	0a	0,0	2	100,0	
	Montuivio	9a	100,0	0a	0,0	9	100,0	
	Language							1,000†
	Spanish	303a	97,4	8a	2,6	311	100,0	
	Kichwua	6a	100,0	0a	0,0	6	100,0	
	Shuar	5a	100,0	0a	0,0	5	100,0	
	Geographic region							0,664†
	Sierra	74a	96,1	3a	3,9	77	100,0	
	Coast East	108a	98,2	2a	1,8	110	100,0	

	A	B	C	D	E	F	G	H
	Oriente	132a	97,8	3a	2,2	135	100,0	

Each letter in the subscript denotes a subset of the Were there any questions you didn't understand? categories whose column proportions do not differ significantly from each other at the .05 level.

† Refers to the p-value of Pearso's chi-square test

‡ Refers to the p-value of Fisher's Exact Test

- Table 5 shows the responses to the question about the ambiguity of the questionnaire. Since this was the second question, the interviewers had already previously explained to the participants who previously had doubts regarding ethnicity what it was about.
- Apparently, this explanation was sufficient for the majority of the participants to fully understand the questionnaire in this second question.
- This gave the necessary confidence to decide that the explanation that the interviewer would give to the participants about the question, with greater emphasis on the coastal region, would be sufficient to avoid errors.

10 Data Analysis:

Data will be analyzed using descriptive statistics and inferential statistics.

11 Statistical Analysis:

- Statistical analysis will include the calculation of means and standard deviations for continuous variables and the calculation of frequencies and percentages for categorical variables.
- For the statistical analysis, it is intended to make a comparison of the average time of specialized medical care, both for an appointment with a specialist and for the procedure, to then relate it to the social, demographic, economic variables and especially with the way in which the user accessed the appointment.
- To do so, the normality of the Waiting Time variable will be tested with the Kolmogorov-Smirnov test. If the result is normal, parametric tests such as ANOVA (post hoc Tukey), T test and Pearson correlations will be used depending on the independent variable to be analyzed.
- If the result is not normal, Kruskal-Wallis, Mann-Whitney and Spearman will be used.
- The variable Form of Access will also be considered as dependent and will be analyzed with Pearson's Chi square.
- This variable will allow the creation of a new, but dichotomous variable that will be called Standardized Access.



- For this, the response options to the variable Form of Access: Through a friend or family member and through a person who is not a friend or family member, will be considered as Not Standardized and, the options: through a referral from a doctor at a health center, through a specialist from this or another hospital and through an appointment at the hospital or by phone call, will be considered as Yes Standardized.
- With this variable, we intend to perform a logistic regression to obtain Odds Ratios that help us better analyze the relationship with the independent variables.

12

- For all tests, a significance level of 0.05 will be used as a reference.
- The statistical program SPSS version 25 will be used.
- Approval Statement/Ethics Statement: This study has been approved by the Institutional Review Board (IRB) of the research institution (CEISH – ITSUP) 1718079732. Informed Consent Statement: Informed consent will be obtained from all study participants before they complete the questionnaire.

Protocol references

1. Lucio R, Villacrés N, Henríquez R. Sistema de salud de Ecuador. Salud Publica Mex [Internet]. 2011 [cited 2018 Dec 16];53:s177–87. Available from: http://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S0036-36342011000800013&lang=pt
2. Ortiz-Prado E, Fors M, Henriquez-Trujillo AR, Cevallos-Sierra GH, Barreto-Grimaldos A, Simbaña-Rivera K, et al. Attitudes and perceptions of medical doctors towards the local health system: a questionnaire survey in Ecuador. BMC Health Serv Res [Internet]. 2019;19(1):363. Available from: <https://doi.org/10.1186/s12913-019-4211-1>
3. Rasch D, Bywater K, Rasch D, Bywater K. Health Promotion in Ecuador: A Solution for a Failing System. Health N Hav [Internet]. 2014 Apr 2 [cited 2024 Aug 20];6(10):916–25. Available from: <http://www.scirp.org/journal/PaperInformation.aspx?PaperID=44628>
4. Ullauri A, Olivier J. The historical contribution of faith-based health providers in the Ecuadorian health system: an overview of the evidence. Dev Pract [Internet]. 2017 Jul 4 [cited 2024 Aug 20];27(5):670–83. Available from: <https://www.tandfonline.com/doi/abs/10.1080/09614524.2017.1327029>
5. Zaitseva E. Reliability analysis methods for healthcare system. 3rd International Conference on Human System Interaction, HSI'2010 - Conference Proceedings. 2010;211–6.
6. Ministerio de Salud Pública del Ecuador. Norma Del Subsistema De Referencia, Derivación Contrareferencia, Referencia Inversa Y Transferencia Del Sistema Nacional De Salud. Vol. SNGSP-DNN, Ministerio de Salud Pública - MSP. 2013. 1–35 p.
7. Borrás C, Cadman P. Patient Referral to Secondary and Tertiary Health Care Levels. In: Borrás C, editor. Defining the Medical Imaging Requirements for a Rural Health Center [Internet]. Singapore: Springer Singapore; 2017. p. 135–46. Available from: https://doi.org/10.1007/978-981-10-1613-4_9
8. Briones MA, Velásquez AB, Santos RZ, Rodríguez MS. The Reality of Scheduling Specialized Medical Appointments in Public Hospitals in Manabí, Ecuador. Revista de Gestão Social e Ambiental [Internet]. 2024 May 6 [cited 2024 Jun 24];18(9):e06640. Available from: <https://rgsa.openaccesspublications.org/rgsa/article/view/6640>
9. Yu S, Byles J. Waiting times in aged care: What matters? Australas J Ageing [Internet]. 2020 Mar 1 [cited 2024 Aug 19];39(1):48–55. Available from: <https://onlinelibrary.wiley.com/doi/full/10.1111/ajag.12665>
10. Sanmartin C, Berthelot JM, McIntosh C. Determinants of Unacceptable Waiting Times for Specialized Services in Canada. Healthcare Policy. 2007 Feb 15;2(3).
11. Abásolo I, Negrín-Hernández MA, Pinilla J. Equity in specialist waiting times by socioeconomic groups: evidence from Spain. The European Journal of Health Economics 2013 15:3 [Internet]. 2013 Aug 2 [cited 2024 Aug 19];15(3):323–34. Available from: <https://link.springer.com/article/10.1007/s10198-013-0524-x>
12. Arribas MCM. Diseño y validación de cuestionarios Formación continuada El cuestionario es un instrumento para la recogida de información, diseñado para cuantificarla y universalizarla. Vol. 5, Matronas Profesión. 2004.