

Provision and utilization of basic maternal healthcare during the pandemic in Ecuador: The health workers' perspective

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ABSTRACT

Context: Ecuador was one of the most affected countries in Latin America during coronavirus disease 2019 (COVID-19). Its health system already faced financing and organizational problems before the pandemic. **Aims:** To analyze the effects of the pandemic on the provision and utilization of maternal health services in units of the Public Health of Ecuador as perceived by the health personnel. **Material and Methods:** This is a mixed methods study with two rapid evaluation cycles. The first cycle collected information during January–March and the second one during April–June, 2021. An online questionnaire and semistructured interviews were applied to professionals involved in the management and provision of maternal health programs. Both instruments explored provision and utilization of maternal health services. Questionnaires were processed using SPSS and descriptive statistics. Interviews were exported to *Atlas-Ti* and were codified using the explored categories. **Results:** A total of 207 health workers participated in the first cycle, and 200 in the second one. They recognized that during the pandemic, healthcare personnel were reduced by more than 30% due to the presence of risk factors among them as well as the lack of budget for new contracts. The availability of materials and supplies was also reduced by nearly 50%, mainly due to the lack of budget. The demand for maternal healthcare in public health units was reduced because people feared being infected by COVID-19 and nearly 25% goes to the private sector. **Conclusions:** The pandemic has had a negative effect on the provision as well as utilization of maternal healthcare services. Nevertheless, health professionals implemented diverse strategies to reduce this negative effect on maternal care.

Keywords: COVID-19, Ecuador, facilities and services utilization, health system, human resources, maternal health services

Introduction

The health system of Ecuador includes the Public Health Ministry (PHM), in charge of the population living in conditions of vulnerability, and the Social Security System (SS) for the population working in the formal sector of the economy and the private sector.^[1] In recent years, the health system faced several

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problems like deficient public investment, limited development of first-level and primary healthcare, imbalance in generational turnover, reduction of health manpower, and a restrictive institutional culture.^[2] Besides, this fragilization increased the population's dissatisfaction regarding health services.^[3,4]

The coronavirus disease 2019 (COVID-19) pandemic arrived in this context. The first 90 days were characterized by low testing levels (1.5 per 1000 inhabitants) and accelerated increase of cases. This placed the country in the first position among the Latin American in terms of mortality and the second place regarding lethality (mortality 187.8 vs 43.1 per million; lethality 8.6% vs 3.4%).^[5] Ten months after the onset of the pandemic, healthcare in the public sector suffered a 30% reduction due to the closure of external consultation mobility restrictions and fear of contagion among the population,^[6] all of which produced the procrastination of care, mainly concerning chronic conditions, reproductive as well as maternal and infant care.^[7]

Maternal healthcare already faced important gaps before the pandemic.^[8] In 2018, the prenatal care coverage was 83.3% (87% urban, 75% rural), institutional delivery was 95.6% (98% urban and 90% rural), while the unmet demand of family planning was 8.1% (7.49 urban and 8.84% rural).^[9] Even though the analysis of the effects of the pandemic is complex, Roberton's conceptual framework [Figure 1] offers an overview and recognizes that two dimensions are affected in health services, provision and the utilization of healthcare.^[10] The intermediate effect is on maternal health programs' coverage, while the final effect is the increase of maternal mortality. Regarding health services provision, the model proposes to study the availability of health personnel, supplies, and equipment, and regarding services utilization, the demand and access to them.^[10] Under this framework, it is necessary to study the health system's response during the pandemic^[11] in order to know its strengths and vulnerabilities for maintaining the maternal programs capacity in the middle of the crisis.^[12]

The COVID-19 pandemic had a significant negative impact on maternal mortality in Ecuador; 74.2% of maternal deaths occurred in units of Ministry of Public Health.^[13] Despite 74% of healthcare personnel knows maternal care regulation, the implementation was insufficient. During the pandemic, pregnant women expressed feelings and thoughts, such as fear, concern, frustration, and stress, among others, which influenced their decision to attend or not at prenatal checkups.^[14,15] However, there is no evidence about how the pandemic affected maternal care services,^[16] and even less is known about the perspectives of healthcare workers who lived through the pandemic.

The objective of this article is to analyze the effects of the pandemic on the provision and utilization of maternal health services from the perspective of the health personnel in units of the Public Health Ministry of Ecuador.

Material and Methods

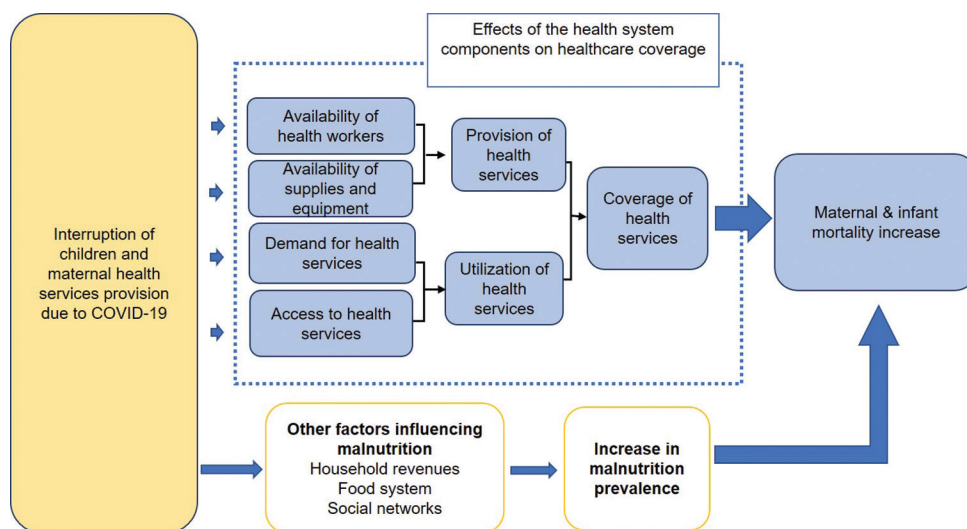
Study setting

The study was developed in the primary health facilities of five provinces of Ecuador Guayas and Manabí (Cost), Pichincha (Sierra), and Napo and Sucumbíos (Amazonía).

Study design

A mixed concurrent study (quantitative, qualitative) was carried out using the rapid cycle assessment model.^[17] Two cycles were applied, the first one between January and March and the second one between April and June, 2021.

Inclusion criteria: We consider three criteria to include participants: 1) Role and Experience: Health workers should involve in maternal health programs (managers or services delivery). 2) Experience Duration: Work in maternal programs



Source: Adapted from Roberton et al. Early estimates of the indirect effects of the COVID-19 pandemic on maternal and child mortality in low-income and middle-income countries: a modelling study. *Lancet* 2020

Figure 1: Conceptual framework of the effects of the pandemic

more than 1 year prior to the application of the questionnaire or interview. 3) Consent: They must agree to participate in the study.

Sample size

Quantitative information: A total of 207 health professionals answered the complete questionnaire in the first cycle and 200 in the second one.

Qualitative information: A semistructured interview was applied to decision makers (one national coordinator and three coordinators at regionals levels) and operational personnel (six health workers who provide maternal care).

Data collection

We sent an email inviting health professionals to participate in the study. Prior to participating, they were asked to read a brief description of the research. Participants who agreed to participate received a link to fill out a questionnaire adapted from the COVID-19 Maternity Survey. It explored general information of participants, availability of human and material resources, provision and utilization of maternal health services, and innovations introduced during the pandemic. The questionnaire was developed on the SurveyMonkey platform.

Participants for the interviews were contacted by a research professional with deep knowledge of maternal health, who explained the objective of the study and invited them to participate. Interviews were held using ZOOM or Google Meet, and participants were asked to record the interview. The interviews explored the same information of the questionnaire. The interviews were transcribed into Word, and three of them were selected haphazardly to ensure their fidelity to the audios. Transcripts were exported to Atlas-Ti for analysis.

Data analysis

Questionnaires were processed using SPSS; percentages and chi2 values were estimated. We presented a general description of the participants, the perception of availability of human resources, supplies and materials, and demand and access to maternal health care.

The information from the interviews was coded according to the dimensions of availability of human resources, supplies and materials, and demand and access to maternal health care. To codify, a content analysis was performed. The discourse was triangulated with the questionnaire responses.

Ethical issues

The research protocol was approved by the Research Ethics Committee of the National Institute of Public Health of Mexico (CI/2020/653 on October 19, 2020) and by the Research Unit of the Ministry of Public Health of Ecuador (Ministerial Agreement 00104-2020 on February 25, 2021).

Results

General description of the participants

A total of 207 maternal health workers participated in the first cycle, and 200 in the second one. No statistical differences were found between the health care workers' characteristics in the first and second cycles. More than 74% are women, approximately 70% are between 21 and 40 years old, 54% work in urban health units, more than 66% work in the first level of care units, one third are midwives and the other third are physicians, and more than 58% worked in the Sierra and Costa regions [Table 1].

Provision of health services

Availability of human resources

More than 40% (n = 101; n = 82) of the participants recognized the reduction of maternal health personnel in both cycles. 65.3% (n = 66) in the first cycle and 46.3% (n = 38) in the second cycle perceive that the reduction surpassed 30%. The main causes of personnel reduction mentioned in the interviews were the presence of risk factors among the health personnel (diabetes, obesity, hypertension, elderly people, or personnel with under five children at home). Percentages were 38.8% (n = 59) in the first cycle and 30.5% (n = 32) in the second cycle. The perception of the lack of financial resources to hire new personnel to support the pandemic increased from 22.4% (n = 34) in the first cycle to 26.7% (n = 28) in the second cycle. Regarding their perception of their capacity to provide care for confirmed COVID-19 cases

Table 1: General description of maternal health personnel. Ecuador 2021

Characteristics	Cycle 1 (n=207)		Cycle 2 (n=200)		P
	n	%	n	%	
Sex					
Male	48	23.2	51	25.5	0.587
Female	159	76.8	149	74.5	
Age					
21 to 40 years	144	69.6	144	72.0	0,221
41 to 60 years	60	29.0	56	28.0	
Over 60 years	3	1.4	0	-	
Origin					
Urban	112	54.1	108	54.0	0.983
Rural	95	45.9	92	46.0	
Health Unit					
Hospital	18	8.7	59	29.5	0,000*
Health center	176	85.0	132	66.0	
Other	13	6	9	4.5	
Profession					
Nurse	26	12.6	36	18.0	0.240
Obstetrix (Midwives)	83	40.1	68	34.0	
Physician	79	38.2	83	41.5	
Other	19	9.2	13	6.5	
Region					
Costa (Guayas y Manabi)	70	33.8	75	37.5	0.098
Sierra (Pichincha)	50	24.2	61	30.5	
Amazonía (Sucumbios y Napo)	87	42.0	64	32.0	

*P<0,05

among pregnant women, in the first cycle, 15% (n = 31) considered that they had excellent competences, while, in the second cycle, the figure increased to 19% (n = 38) [Figure 2].

Regarding obstacles to attending the workplace of maternal health personnel, 78.2% (n = 162) in the first cycle and 52% (n = 104) in the second cycle considered the reduction of public transport. Besides, 10.1% (n = 21) in the first cycle and 12% (n = 24) in the second mentioned having faced acts of mistreatment and discrimination while using public transport.

To improve the availability of human resources, 71.4% (n = 148) of the personnel with risk factors in the first cycle and 50% (n = 100) in the second were assigned to provide care and follow-up pregnant women by telephone. Even though more than half of the personnel received training to provide telephone care in both cycles, 85% (n = 176) in the first cycle and 80% (n = 160) in the second did not receive the necessary equipment for this task (telephone, computer, Internet).

In the interviews, maternal health personnel in disperse areas in the second cycle mentioned the coordination with neighborhood leaders, community midwives, and primary care technicians (TAPs, for its Spanish initials) to implement home visits.

Availability of supplies and materials

Seventy-seven percent (n = 140) of the health personnel in the first cycle and 69% (n = 138) in the second one perceived that the availability of supplies and material for maternal health programs was reduced by up to 50%. In both cycles, approximately 70% (n = 153; n = 142) recognized this was due to financial restrictions, 12% (n = 26 both cycles) mentioned that the request was not made in a timely manner, and almost 12% (n = 24; n = 26) said the problem was the lack of personnel in charge of the distribution. Medications for pregnant women reported as unavailable were folic acid, iron, some laboratory supplies, and antibiotics for urinary tract infections. Concerning the availability of protection material, in the first cycle, more than 40% of the personnel mentioned the lack of aprons and polymerase chain reaction (PCR) tests for the health personnel as well as for the users of maternal health programs. 22.2% (n = 46) in the first cycle and 23% (n = 46) in the second cycle perceived a minimal availability of protective material for the provision of maternal health programs. Only 26.6% (n = 48) and 25% (n = 46) of them felt they were properly protected in both cycles, respectively. This perception was not significantly modified in the second cycle [Table 2].

In the interviews, the majority of them confirmed the lack of protective materials, which was more intense in the first cycle. The majority of health personnel reported the existence of obsolete instruments and equipment for the provision of care and the follow-up of pregnant women through virtual means.

First Cycle	Second Cycle
Primary care technicians have been a key element to offer maternal health in remote communities. Nevertheless, they have faced job instability, as they were not guaranteed a permanent contract. (PS: C:AP 6:11)	Some contracts of Primary care technicians were cut and so we had to appeal to community organizations. (PS: B:AP 13:10)

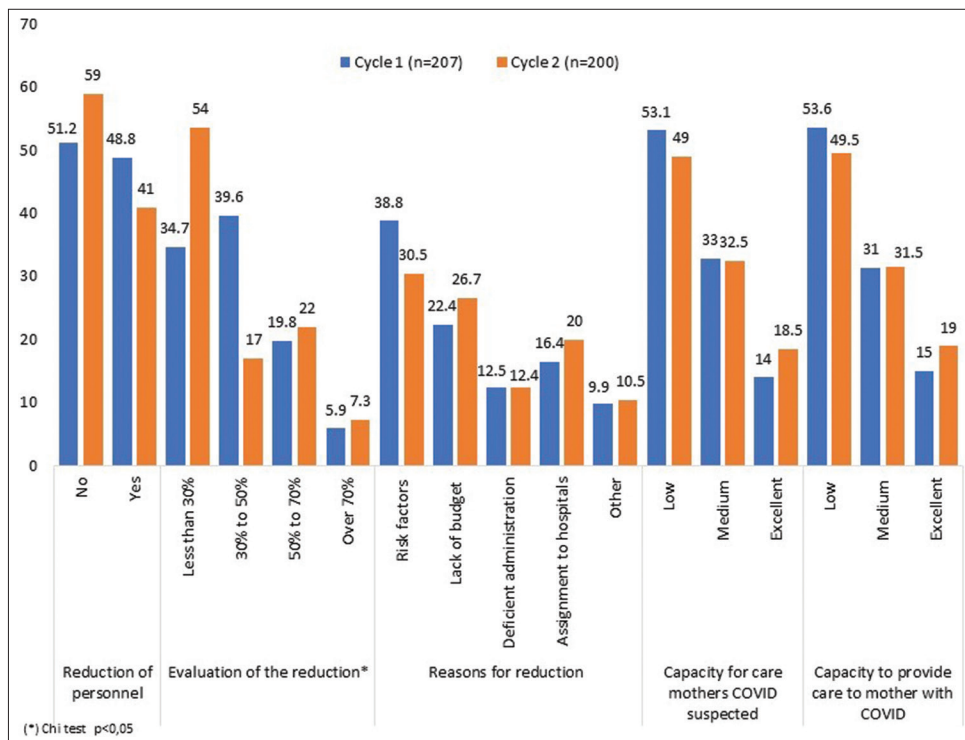


Figure 2: Perception of the reduction of personnel during the pandemic, Ecuador 2021

Table 2: Perception of the availability of supplies and materials for maternal health provision. Ecuador 2021

Availability of supplies and materials	Cycle 1 (n=207) n (%)			Cycle 2 (n=200) n (%)			P
	Never/Some times	Frequently	Almost always/Always	Never/Some times	Frequently	Almost always/Always	
Alcohol Gel	60 (29.0)	37 (17.9)	110 (53.1)	59 (29.5)	45 (22.5)	96 (48.0)	0.445
Soap and water - hand washing	54 (26.1)	44 (21.3)	109 (52.7)	53 (26.5)	39 (19.5)	108 (54.0)	0.907
Masks	73 (35.3)	38 (18.4)	96 (46.4)	63 (31.5)	46 (23.0)	91 (45.5)	0.470
Aprons	89 (43.0)	41 (19.8)	77 (37.2)	82 (41.0)	35 (17.5)	83 (41.5)	0.649
Gloves	62 (30.0)	45 (21.7)	100 (48.3)	73 (36.5)	40 (20.0)	87 (43.5)	0.373
PCR test for users	96 (46.4)	51 (24.6)	60 (29.0)	90 (45.0)	35 (17.5)	75 (37.5)	0.095
PCR test for personnel	100 (48.3)	40 (19.3)	67 (32.4)	98 (49.0)	32 (16.0)	70 (35.0)	0.652
Inputs (cleaning materials for facilities)	65 (31.4)	47 (22.7)	95 (45.9)	70 (35.0)	39 (19.5)	91 (45.5)	0.639

First Cycle	Second Cycle
Protective equipment was focused on hospital care. It was very difficult to obtain it for maternal care in first level units. This is why we preferred not to attend the units until the appropriate protective equipment was guaranteed. (PS-SM_8_55:45)	We are insisting on the importance of purchasing protective equipment. this has been partially solved with donations. (PS_SM_S_55:20)

Utilization of health services

Demand for maternal health services

Health workers highlighted the reduction of maternal healthcare demand; in the first cycle, the reduction was 10% in obstetric emergencies (n = 21) and deliveries (n = 23) and from 15% to 20% on general consultation, prenatal care, immunization, postpartum care, and health education. The largest reduction was perceived in contraception, which reached 28% (n = 58; n = 56). In the second cycle, the reduction was smaller in all maternal health programs. It is important to point out there was a high percentage of virtual care and the perceived shift of demand to the private sector, especially for obstetric emergencies and deliveries in both cycles [Table 3].

On the other hand, the health personnel reported that at the beginning of the pandemic, the demand for maternal health programs was almost null. They recognize that women stopped attending the health units because they were afraid of COVID-19 contagion. Later, there was a slight increase in the demand, but the perception of a higher risk of COVID-19 infection in the health units did not change because the women's perception was that the health personnel did not have the necessary material to protect themselves and that the virus was spreading in the health care units. The demand for maternal health services started to grow when the health personnel implemented healthcare provision in open spaces and after the population received the first dose of anti-COVID-19 vaccination.

Cycle I	Cycle II
At the beginning of the pandemic, women were frightened and stopped coming for care, and even deliveries decreased. The services were empty. (PS_SM_S_55:2)	Women started coming to the health center when consultations took place outside the unit and after the first dose of COVID vaccine was applied. (PS_SM_M_25:2)

Access to health services

Organizational changes were implemented to facilitate access to maternal healthcare services facilitating social distancing; 70% (n = 145) of the health personnel perceived these changes in the first cycle and 37% (n = 74) in the second one. Nevertheless, only 29.7% (n = 43) in the first cycle and 2.7% (n = 2) in the second cycle considered these changes to be adequate. They recognize several measures like new signage at the entrance for people with and without COVID-19; the establishment of special waiting rooms for pregnant women suspicious or confirmed COVID-19; and new schedules, especially in primary health facilities, telephone assistance, prescheduled appointments, and home visits [Figure 3].

In the interviews, health personnel recognized that the accessibility to healthcare for mothers decreased due to the closure of healthcare facilities at the beginning of the pandemic, due to the women's perception of inadequate protection of healthcare personnel, and because of the prohibition to attend health facilities with an accompanying person. Despite the availability of virtual assistance, the health personnel reported that a few women attended because many of them considered this kind of care to be incomplete and impersonal since it did not permit them to establish a relationship with the provider and their phone plans did not allow video calls.

Cycle I	Cycle II
At the beginning of the pandemic, many primary health facilities were closed. Women called by phone to ask the date to come, but we don't have an answer to this question. We offer virtual attention but many of them don't accept (PS_C_24:12)	I proposed virtual attention, but many women did not attend the meeting. Because the phone plans are limited to receiving calls and, in other cases, the women said "I don't like virtual care, I feel uncomfortable". (PS_B_18:10)

Discussion

The perception of the health personnel emphasized the reduction of over 30% of the health personnel availability for maternal healthcare during the pandemic. However, the perception of the lack of personnel was higher in the first cycle, when it was mainly due to the presence of the risk factors. The perception of health workers is consistent with other reports, although we estimated the

Table 3: Perception of the demand of maternal health services during the pandemic. Ecuador 2021

Type of activity	Cycle 1 (n=207)		Cycle 2 (n=200)		P
	n	%	n	%	
General consultation to pregnant women					
Reduced	32	15.5	27	13.5	0.323
Maintained	121	58.5	109	54.5	
Virtual care	54	26.1	62	31.0	
Prenatal care					
Reduced	42	20.3	30	15.0	0.506
Maintained	110	53.1	115	57.5	
Virtual care	53	25.6	54	27.0	
Immunization to pregnant women					
Reduced	45	21.7	30	15.0	0.265
Maintained	109	52.7	122	61.0	
Virtual care (appointment)	44	21.3	41	20.5	
Doesn't know	9	4.3	7	3.5	
Obstetric emergencies					
Reduced	21	10.1	16	8.0	0.141
Maintained	129	62.3	137	68.5	
Other health institutions	50	24.2	46	23.0	
Doesn't know	7	3.4	1	0.5	
Delivery care					
Reduced	23	11.1	13	6.5	0.435
Maintained	116	56.0	119	59.5	
Other health institutions	48	23.2	47	23.5	
Doesn't know	20	9.7	21	10.5	
Postpartum care					
Reduced	33	15.9	22	11.0	0.322
Maintained	120	58.0	132	66.0	
Virtual care	52	25.1	45	22.5	
Health education					
Reduced	43	20.8	25	12.5	0.037*
Maintained virtually	114	55.1	133	66.5	
Other means	48	23.2	42	21.0	
Contraception					
Reduced	58	28.0	56	28.0	0.804
Maintained	109	52.7	105	52.5	
Virtual care	39	18.8	39	19.5	

*P<0,05

lack of health personnel in 2850 (3.12%) during the pandemic.^[18] We found differences in the percentage of personnel reduction because our estimations are based on the perception of the health personnel and focus on maternal health programs personnel, while estimates for Ecuador consider all health personnel. In Argentina, Mexico, and other countries in the region, other studies documented that the reduction of health personnel was due to risk factors.^[19-21] In Perú, between 30% and 40% of the health personnel stopped working due to risk factors,^[22] and their resistance to provide care was due to their fear of COVID-19 contagion.^[18]

Although this study was not aimed at measuring job stress, we included a question related to it and nearly 45% of the personnel reported high stress. We consider that the reduction of human resources implied that many tasks and actions fell on a reduced number of health workers. Several studies reported that health

personnel were overloaded with important consequences on their physical and emotional health.^[23-25] One study in Ecuador reported that around 90% of nursing and physicians suffered from burnout syndrome. Additionally, physicians reported emotional exhaustion and depersonalization.^[26,27]

In our study, a large percentage of health workers reported problems in getting public transportation at the beginning of the pandemic, a problem that increased the reduction of health personnel. Approximately 10% of the health personnel reported mistreatment and discrimination in public transportation. This event was reported in other contexts, with up to 67% of incidents of COVID-19 pandemic-related violence, harassment, or stigmatization against healthcare workers.^[28,29] These events increased the levels of stress and exacerbated psychological sequelae resulting from moral injuries.^[30] The main explanations were the communities' fear and misinformation about how the virus spreads as well as misplaced anger.^[31]

Health workers in Ecuador recognized the limited availability of supplies and protective materials to provide care for women during the pandemic, especially in primary health facilities. This scenario was somewhat expected since the lack of supplies such as vaccines, folic acid, iron, and laboratory exams had been previously reported due to the budget cuts and health expenditure reduction.^[32] Regarding the availability of protective equipment, high international demand for these materials was observed,^[33,34] and the existing production capacity was not sufficient to meet this large demand.^[35,36]

In our study, a large percentage of health workers pointed out that the reduction of the demand for healthcare in maternal health programs was mainly explained by the fear of women to get COVID-19 in health facilities. One study in Latin America found that the population's fear of COVID-19 contagion was a predictor factor of the decrease in the maternal healthcare demand.^[37] Other studies estimated a 56% reduction in the provision of essential services in 2020 and 41% in 2021.^[38] Regarding maternal health emergency obstetric care, it decreased by 10%, while prenatal, obstetric, postnatal, and newborn care and nutritional support for pregnant and postpartum women were reduced by 25% to 50%.^[39,40] In 2020, the interruption of reproductive and maternal health services had a negative impact on healthcare coverage in 35% of the countries in the Americas, and it increased to 43% in 2021. This reduction was from 38% up to 45% in prenatal care and from 16% up to 26% in institutional delivery.^[38] Nevertheless, it is important to point out that the demand for maternal health services began to improve as soon as the anti-COVID vaccination started.

Finally, health workers in our study perceived that the access to maternal healthcare in Ecuador was reduced during the pandemic. They recognized that the main barriers were the reduction of health personnel. In Perú, 7000 health centers were closed because of the lack of health personnel and protective equipment.^[22] In Ecuador, many strategies were implemented to improve maternal

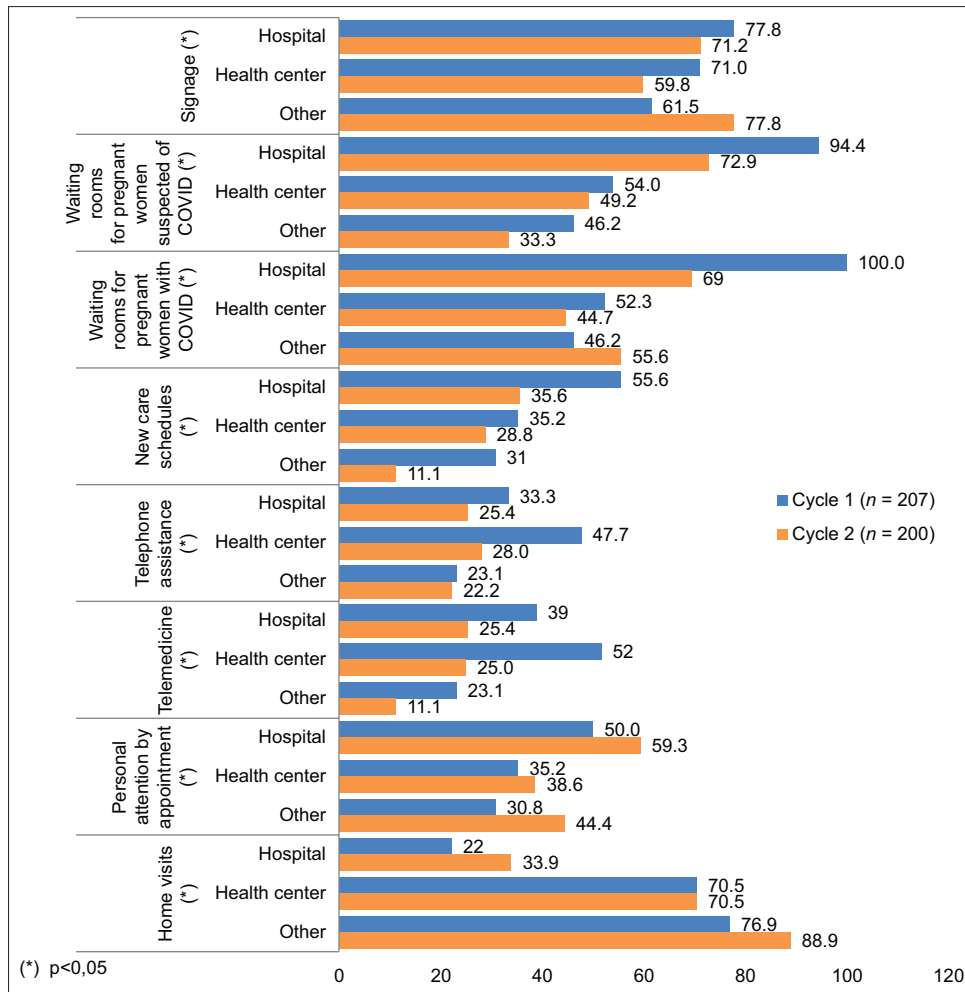


Figure 3: Changes in the healthcare offer to improve access to maternal health programs, Ecuador 2021

health access; one of the most important was the use of virtual media. Virtual media were used to deliver health attention in 88% of the countries in the region.^[38] To avoid COVID-19 contagion, women were not allowed to attend the health centers with an accompanying person; yet, health workers reported women's disapproval of this strategy. So, they immediately implemented home visits to provide care and healthcare delivery in open spaces. These changes are good examples of the resiliency of the health system during the pandemic.

Limitations

We had a limited number of health workers who answered the questionnaire, even though several reminders were sent and they expressed fear of COVID-10 contagion in face-to-face interviews. Besides, very few accepted to participate in online interviews because of the government restriction to make any declaration without formal authorization.

Conclusion

According to health workers' perceptions, during the pandemic in Ecuador, there were significant problems in basic maternal

healthcare. They faced a drastic reduction in the availability of health personnel and supplies as resources were redirected to address the pandemic. Additionally, a decrease in the utilization of maternal health programs was reported as some pregnant women decided not to visit primary health facilities due to fear of COVID-19 infection. Nevertheless, health professionals implemented several strategies to improve coverage using both face-to-face and virtual means. However, virtual means was not fully accepted by the women because they felt like impersonal care. These findings highlight the need to design strategies to provide maternal care services, especially at the primary care level during crises, to ensure both the availability of resources and accessibility to care in order to avoid negative impacts on maternal health.

Ethical policy and Institutional Review board statement

This project was approved by the Research Ethics Committee (CI/2020/653 October 19, 2020) and the Research Unit of the Ministry of Public Health (*Acuerdo Ministerial* 00104-2020, February 25, 2021). All participants gave their informed consent for the questionnaires and the interviews.

Data availability statement

The data set used in the current study is available on request from

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Conflicts of interest

There are no conflicts of interest.

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