






# BMJ Open Ecuadorian healthcare professionals' perspectives on attributes of asthma care coordination: a qualitative study

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## ABSTRACT

**Objective** This study explored the attributes of asthma care coordination from the perspective of healthcare professionals at different levels of care in Ecuador.

**Design** Qualitative descriptive study. The Integrated Health Networks Model was the theoretical framework of reference. Narrative analysis was used to identify significant phrases from the interviews.

**Setting** Healthcare professionals involved in the care of patients with asthma in primary care, specialists, emergency and management in three Ecuadorian cities between 2019 and 2021.

**Participants** 25 healthcare professionals participated in semistructured in-depth interviews. Convenience sampling was used.

**Results** Participants highlighted the scarce use of institutional documents for the referral of asthma patients from the first level to specialists and vice versa, duplication of tests and medical prescriptions, and lack of appointment availability that limits access to specialised care. From the first level, they considered that specialists do not return patients and specialists stressed that the first level does not have enough training to follow asthma patients. Managers highlighted the system's inability to assign appointments on time and failures in administrative processes for follow-up. Emergency professionals did not have access to the medical records of patients suffering from asthma attacks.

**Conclusions** The lack of shared objectives and effective communication between different levels of care for the follow-up of asthma patients were attributes of asthma care coordination perceived by healthcare professionals at different levels of care in Ecuador. The Ecuadorian health system should consider these to improve its performance.

## INTRODUCTION

WHO has been promoting the integrated healthcare services (IHCSs) centred on the primary healthcare model for more than four decades. An IHCS combines physicians, hospitals and other medical resources, guided by a health plan, to provide comprehensive medical care for its users and to coordinate

## STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ This qualitative study is the first to focus on healthcare professionals' perspectives on the coordination of asthma care, based on the Integrated Health Services Network theory.
- ⇒ The study employed semistructured, in-depth interviews with health professionals done through teleconferencing during the COVID-19 confinement period.
- ⇒ In-depth qualitative interviews facilitated an exploration of the attributes of care coordination during the periods of lockdown and social distancing during the COVID-19 pandemic.
- ⇒ This study did not consider continuity of care which relates to patient and caregiver perspectives that would require a distinct methodological approach.

hierarchical levels of the health system.<sup>1</sup> Care coordination (CC) is, ideally, the harmonious connection of all the services necessary to care for a patient throughout an illness and to achieve a common goal without conflicts.<sup>2</sup> Ideally, the healthcare team should perceive that there is coherence and unity in the care provided to each of their patients over time and that it is consistent with the patient's medical needs and personal context.<sup>3</sup>

The CC attributes encompass various elements aimed at ensuring seamless, patient-centred and effective healthcare delivery across the continuum of care, such as clinical information coordination (clear governance structure and leadership support, interprofessional collaboration and structured teamwork to address patient needs), clinical management coordination (developing comprehensive and individualised care plans that consider the patient's health status, goals, follow-up and ensuring continuity of care during transitions between hospital to home, primary care to specialty care),

and, administrative coordination (referral and counter-referral protocols and strong and timely communication among healthcare professionals and organisations within the network).<sup>4</sup> However, the lack of coherence and coordination of care remains a challenge.<sup>5</sup> These asymmetries seem to be particularly evident in the care of non-communicable chronic diseases.

Ecuador, a middle-income country in Latin America with just over 17 million inhabitants, bases its health system on the IHCS. The Ecuadorian national health system, like those of several Latin American countries, recognises a quality crisis in healthcare and the need to address the limited knowledge about the characteristics of CC.<sup>6</sup>

Our special interest is in asthma CC. In Ecuador, the prevalence of children's asthma ranges from 10% to 20%,<sup>7,8</sup> against an estimated rate of about 14% of children worldwide (2022). Asthmatic patients usually receive initial care at the first level of care by family or general practitioners, or if it is a crisis, in the emergency department. They are then transferred to a specialist for diagnostic tests and to adjust control treatments or address specific medical situations. The patient should then return to the first level for follow-up. For this process, standardised forms are available as part of the medical record; however, in Ecuador, the electronic medical record is not interoperable. Although there are studies on the epidemiology of asthma in Ecuador,<sup>8–11</sup> studies on attributes of asthma CC are lacking.

The management of asthma symptoms is a global and dynamic problem and the need for an efficient collaborative relationship between primary care clinics, specialists and emergency rooms is recognised.<sup>12</sup> Based on this lack of information, we set out to explore the attributes of CC for asthma in an IHCS, from the perspective of healthcare professionals at different levels of care.

## METHODS

### Qualitative approach and research paradigm

A descriptive qualitative study, using narrative analysis, which aims to understand how healthcare professionals construct meanings of their experiences on a specific topic,<sup>13</sup> in our case, the attributes of CC, with asthma as a tracer diagnosis. The theoretical categories, in accordance with the theoretical framework on CC within the IHCS, served as the focus for the textual corpus. This analysis encompassed three predetermined categories: clinical information, clinical management and administrative coordination, the definitions are shown in [table 1](#). The authors have worked with the principle highlighted by Braun and Clarke regarding the behaviour of a qualitative study, who point out that qualitative research is always evolving and dynamic and researchers should be open to change in any planned activity if these changes follow the research objectives.<sup>14</sup> Based on these characteristics, we had to modify the logistics of data acquisition due to the presence of the COVID-19 pandemic that occurred

**Table 1** Characteristics of the participants

Characteristics	Participants (n=25)
Sex	
Female	15 (60%)
Male	10 (40%)
Age (years)	
Mean (SD)	42.3 (15.8)
Range	25–65
Healthcare level	
Primary care	9 (36%)
Specialised care	7 (28%)
Emergency care	5 (20%)
Managers or directors	4 (16%)
Time of professional experience	
>5 years	22 (88%)
<5 years	3 (12%)
Source of financing for health units	
Public	20 (80%)
Private	5 (20%)

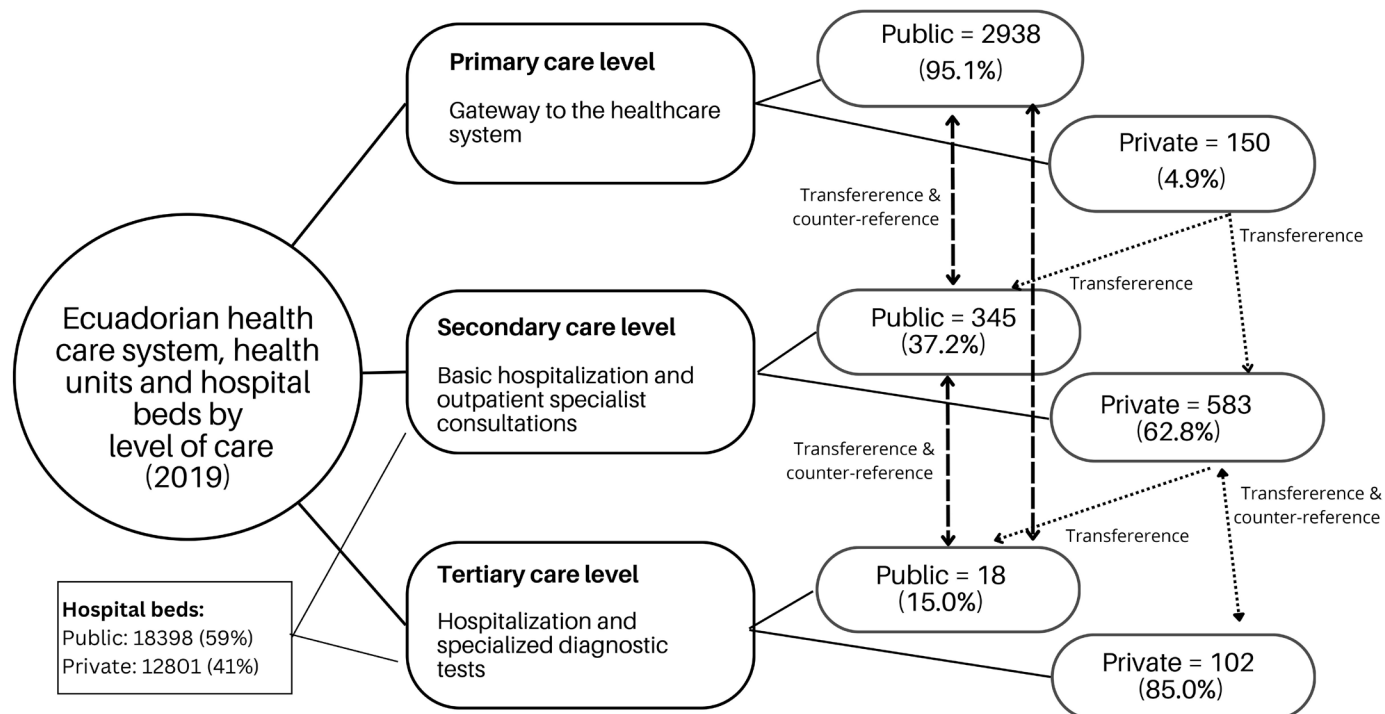
from the fourth month of fieldwork planning. Apart from that, after transcription of the interviews, immersion in the data, application of the coding system of meaningful phrases and linking the codes according to the theoretical framework, we recognised one emergent category, which was defined as a pattern that arises naturally during the study and was not predetermined.

### Researcher characteristics and reflexivity

The researchers, although not previously acquainted with the participants, possessed a solid understanding of the Ecuadorian IHCS based on their previous research and clinical practice. The research team consistently maintained reflexivity throughout the analysis, writing, recording and discussion of theoretical categories. Quality control was further ensured through triangulation involving both the theoretical framework and the researchers' reflection. To avoid potential bias, the researchers underwent training in conducting in-depth interviews, analysing qualitative data narratively and understanding the capabilities and limitations of NVivo software.

### Context

Ecuador bases the standardisation of functioning for health facilities on three levels of care whose definitions, structure and functioning are detailed in the Manual of the Comprehensive Care Model of the National System of Community and Intercultural Family Health in force since 2012.<sup>15</sup> The first level represents the gateway to the various health services and is usually staffed by new graduates in health sciences or by the youngest family doctors. The second level of care corresponds to general hospitals,



**Figure 1** A diagram of Ecuadorian healthcare system (2019). The thick dashed line shows the bidirectional transfer within the public health system, between the first and second levels, as well as between the first and third levels. The thin dashed line shows the transfer from the private to the public system, as detailed in reference 15.

attended by basic specialists. The third level of care corresponds to establishments that provide specialised outpatient and hospital services and solve highly complex health problems. In 2019, Ecuador had 4148 healthcare establishments, of which 80% were public, 125 (3%) were general hospitals and 18 (0.4%) were specialised hospitals (figure 1). There also were 54 centres that include basic emergency care, obstetric delivery rooms, laboratories and basic specialities that can care, for example, for patients with asthma or respiratory therapy. Providers in the national healthcare system are financed by public funds (43%), the insurance of affiliated workers (35%) and private funds or out-of-pocket payments (22%).<sup>16</sup>

In 2019, the qualitative component of the ‘Asthma Attacks Causes and Prevention Study in Latin America (Asthma Attack)’ study<sup>17 18</sup> was collaboratively developed with partners from the UK, Brazil and Ecuador. This component focused on gathering insights from healthcare professionals regarding their experience of asthma CC across different care levels.<sup>17</sup> It took place in the same three Ecuadorian cities (Quito, Cuenca and Portoviejo) as the quantitative components of the study, chosen based on the anticipated prevalence of asthma and the presence of all three levels of healthcare. Figure 2 shows the cities and levels of healthcare participation.

### Units of study

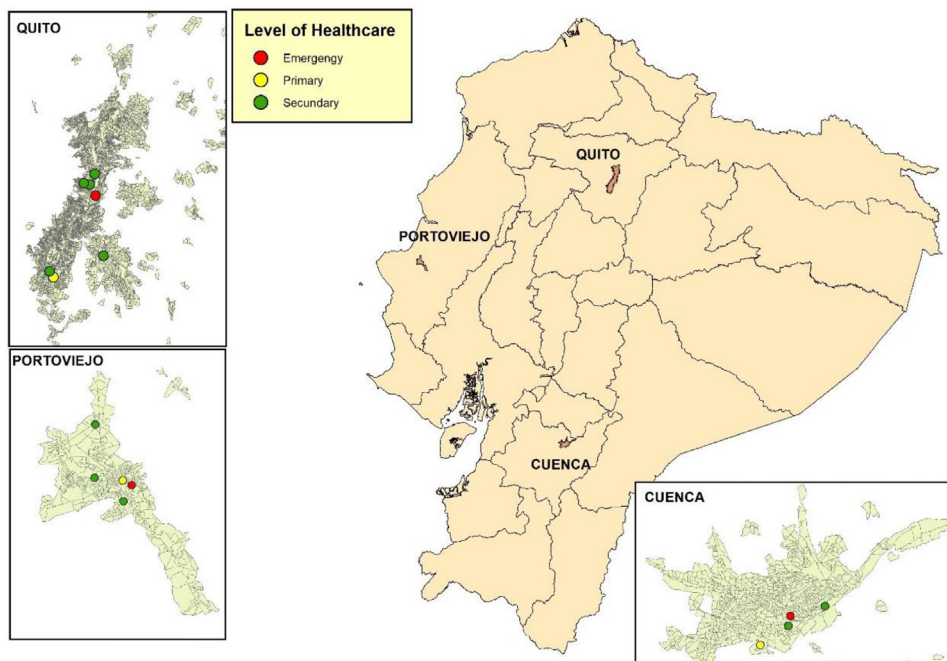
The study units were categorised into four profiles: ‘primary care’ included primary care healthcare professionals, ‘specialised care’ comprised specialist doctors and nurses, ‘emergency care’ consisted of emergency room

professionals irrespective of hospital unit complexity who have cared for patients with asthma and ‘managers or directors’ encompassed healthcare managers or directors from various care levels. The levels of care were considered irrespective of the source of funding for each level.

### Participants and sampling

Participants were sought based on the following characteristics: (1) played a crucial role in strengthening the resilience of the health system to respond to various challenges and<sup>19</sup> (2) sought the diversity of healthcare professionals’ views on effective governance of a health system.<sup>20</sup> Sampling was by convenience, guided by theoretical and feasibility considerations to ensure in-depth and comprehensive information and, snowballing was used to achieve the sample.<sup>21</sup> Inclusion criteria were (1) having insights into the study’s focus on asthma and CC, (2) involvement in caring for asthma patients at any care level, (3) a minimum of 6 months of experience in the healthcare service and (4) holding managerial positions in either first-level health units or hospitals. Excluded from the study were healthcare professionals on leave (vacation, sick leave or maternity), as well as those who declined to participate. 63 professionals (doctors, nurses and managers) were eligible for inclusion, 38 professionals did not participate due to unwillingness, lack of time and fear of reprisals due to coinciding hospital audits during the study period. The sample comprised 25 participants.





**Figure 2** Cities and levels of care where participants were located.

### Data collection methods, instruments and technologies

Participants were contacted by telephone and email through gatekeepers who not only served as key informants but also facilitated researchers' access and participant selection.<sup>22</sup> Gatekeepers provided contact information, and participants received study details and consent forms. Interviews were scheduled at the participants' convenience. Anonymity was maintained through coding based on profile. In-depth interviews were conducted using a semistructured guide (see online supplemental file 1), involving two researchers—one as the interviewer and the other as an observer. The interview questions were concise, open-ended and neutrally worded. The interview team took notes on the topics discussed after the interview. Initially, the plan was to record interviews with a portable recorder but, due to the COVID-19 pandemic, interviews were conducted via the Zoom platform, and audio recordings were used. The semistructured guide pilot was developed between November 2019 and February 2020. The interviews were conducted between June 2020 and February 2022 and lasted between 20 and 60 min (mean 42, SD 14). Interviews were audiorecorded and transcribed professionally in Spanish. The characteristics of the participants are listed in [table 1](#).

### Coding tree

The definitions of the theoretical categories are presented in [table 2](#).

### Data analysis

The analysis of the interviews consisted of two researchers coding the significant phrases by deductive coding from the theoretical categories derived from the CC approach, followed by consistency checks by four different

researchers. The emerging category was derived by identifying patterns and recurrences in the data while respecting the interview's specificity and the participants' perspectives. NVivo software was used to support these processes. For the presentation of results, the Consolidated criteria for Reporting Qualitative research and the Standards for Reporting Qualitative Research guidelines were used.<sup>23 24</sup>

### Techniques to enhance trustworthiness

The general conceptual perspective through which we interpreted and analysed the narratives was Alfred Schutz's social phenomenology, which focuses on the meanings derived from the intersubjective experiences between interviewers and interviewees.<sup>25 26</sup> This approach leads to an understanding of socially contextualised and individually meaningful actions, emphasising that individuals' actions are based on motivations linked to goals shaped by accumulated experiences. This perspective allowed us to improve the reliability and rigour of data collection procedures, reflecting on how our background, experiences and perspectives might influence the research process and outcomes.<sup>27 28</sup>

We present the transcripts to the participants for comment or correction. The adequacy of the sample size was assessed against the theoretical context, with concurrent review and analysis, and based on the replication of information and the achievement of data saturation, that is, when additional data no longer contributed substantially to the understanding of each theoretical category.<sup>29</sup>

### Patient and public involvement

None.

**Table 2** Description of the coding tree

Category	Definition
Clinical information coordination Referral between levels of care and information use from previous episodes and biopsychosocial situations for the current patient attention. How the professionals transmit to each other information, link previous events with the current ones and direct attention to the needs of the patient	Information exchange about the patient between different services and levels through formal mechanisms or informal communication.  Use of information about the circumstances and events of the patient previously attended at a care level, to guide the clinical decisions about a current event in which the patient receives care at a different level.
Clinical management coordination The provision of attention in a sequential and complementary way, among a shared attention plan by the different care levels and participant services	It refers to the accurate follow-up of the patient during transitions from a level of care to another (eg, from the first level of attention after a hospital discharge, either from an emergency or specialist consultation).  Medical attention if the medical condition worsens, requiring timely medical attention from a different place.  Implies similar objectives of treatment among the different professionals from the first and specialised levels of medical attention, or among the different specialties that provide attention to the patient.
Administrative coordination The coordination of the patient's access along the care continuum according to their needs	The administrative circuits in which the patient transmits to obtain healthcare attention and the regularisation of the care flows (consults, diagnostic tests, treatment) for a concrete intervention among the different levels of complexity of the Integrated Health Services Network.

## RESULTS

### Theme 1: clinical information coordination

The participants indicated that there are forms for the transfer of clinical and psychosocial information, such as test requests, test results and treatment. However, these are specific to each hospital or healthcare centre.

The third-level paediatric hospitals do not handle the same medical history system, so the information is duplicated - (Primary care doctor)

The reference and counter-reference sheet are part of the registration system created and supervised by the Public Health System - (Secondary care medical director)

Although the participants recognised that it is mandatory to fill out the clinical transfer form and to consider the transferred information, there was mistrust of the content in the documents, especially by specialist doctors when received from the first level of care. Although forms were usually paper based, in some institutions, the review and consultation processes were more efficient because they used electronic systems.

Often, the referral from the first level does not come so explicitly for many reasons. At the first level, they do not have the diagnostic means - (Secondary care medical director)

Here [silence] we have [silence] an interlinked computer system so that the doctors can verify or corroborate the data on the referral sheet with the system - (Emergency care nurse)

Within some first-level care units, between primary and emergency care, the forms are often absent or insufficient and so are supplemented or replaced by direct

communication or scheduling of specialist appointments without a form.

The form is generally incomplete, and it is quickly filled out with just four lines from the clinical chart, so the information is insufficient - (Emergency care doctor)

What could happen with this document is that it is not filled out when the crisis is brief, so sometimes it is not completed at all - (Emergency care doctor)

### Theme 2: clinical management coordination

Primary care participants said that the severity of asthma required the participation of all three levels of care and the patient's family. They stated that no team was responsible for the patient's follow-up. The responsibility for asthma patient follow-up was often delegated to the initial attending doctor, irrespective of their qualifications, experience or resource availability.

Follow-up depends on several factors, on us as primary care providers, on the patient, and on the secondary level. So, when one of these three fails, there is inadequate follow-up, and patients fail to adhere - (Primary care and management doctor)

The person who attends the patient during his or her crisis is responsible for the follow-up - (Primary care doctor)

For specialists, the follow-up of an asthma patient depended on the severity of the clinical picture, which also determined who accompanied the patient during the transfer. Some specialists believed that they should be responsible for the follow-up of all asthma patients due to the lack of experience of primary care doctors.

The majority of patients shouldn't even need to be at the speciality level [if they were managed better in primary care]. The problem is that the primary care physician or paediatrician doesn't try to reach a diagnosis - (Secondary care doctor)

The initiative is taken [by the primary care physician] without communication, that is, changing a patient's medication without fully examining the reasons for its initial administration - (Secondary care medical director)

Specialist doctors faced challenges when attempting to engage in patient follow-up, as this responsibility was typically assigned to another healthcare professional or a patient's relative.

Sometimes different doctors or rural doctors [general physician] arrive who, due to their lack of experience, does not manage this pathology, or when the patient arrives, they may confuse it with another type of condition - (Emergency care nurse)

Each doctor in each institution manages this type of patient differently, so there may be a deficit in a general guideline for treating this type of patient - (Secondary care medical director)

Emergency secondary care staff acknowledged that each doctor followed up with asthma patients resulting in their specialty and level of care. Managers mentioned that, in some health institutions, follow-up was done by family physicians but not all health units had family physicians, which limited follow-up of asthmatic patients.

Doctors conduct follow-up, but only through outpatient medical consultation. It cannot be done through the emergency department - (Emergency primary care nurse)

There are family doctors, but not in all health centres, nor in all operational units of the primary level - (Secondary care medical director)

Participants said there was a lack of clear objectives between primary and secondary healthcare, causing disparities in medical criteria for asthma care and action plans. This led to care delays and reduced the effectiveness of tests and treatments, primarily due to a knowledge gap between primary care professionals in managing asthma, which resulted in divergent approaches across care levels. From the perspective of secondary care providers, primary care providers lacked confidence in managing asthma. Primary care professionals, however, said that specialists sometimes disregarded the information they provided when referring patients.

As specialists, it makes us a bit nervous to discharge these patients because, after having them well-controlled, when we send them to primary care, they return with a relapse or require hospitalisation - (Secondary care doctor)

There are specialist colleagues who do not read the referral sheet. They do not appreciate the work that we do here, so there is no support - (Primary care doctor)

### Theme 3: administrative coordination

Participants from different levels of care agreed that there were barriers to administrative coordination, such as the use of different forms, making the transfer of clinical information inefficient.

It is a system that is not efficient when it comes to booking a consultation or appointment because, remember, there should not only be a referral and counter-referral, but that is not done here - (Secondary care medical director)

The limitation, as I mentioned, lies in the hospital shifts; the appointments are frequently postponed... - (Primary care and management doctor)

The lack of referral and counter-referral protocols for asthmatic patients does not allow healthcare professionals who show interest in their patient's care to access information. The means of communication were phone calls, text messages and emails, which tended to be an instant communication means of transferring clinical information and concrete intervention among different levels. This administrative circuits are frequently based on partnership and friendship.

It is not the lack of communication itself. It is the lack of optimised management in the referral and counter-referral protocol - (Secondary care medical director)

Sometimes we find out over the phone who is on duty on the other side, if anyone is informed about the situation - (Secondary care doctor)

### New code that emerged from the codification framework

One emerging theme was identified based on patterns of ideas in the data from the in-depth interviews: perceptions about economic resources and CC. The follow-up consults are often delayed which, for those who have limited economic resources, leads to worsening illness when waiting for medical attention, while those who can afford it seek medical assistance with private health services for a second opinion about their asthma status.

Sometimes the primary level of care fails in many aspects, particularly in relation to health care delivery - (Emergency care nurse)

In private practice, there is no time limit, [...], what I always aim for is that the patient is attended to and receives good care (Secondary care doctor)

Participants discussed the variability of care continuity in public health services, highlighting its dependence on the availability of appointments and medications, which was a problem when resources were scarce. CC for asthma

prevention was mainly accessible to those with financial means to access private healthcare services.

Getting an appointment at a health centre [public health] is almost like trying to reach the moon - (Secondary care medical director)

What I have noticed is that patients always value the care they receive at a private clinic - (Emergency primary care nurse)

## DISCUSSION

This study investigated the perspectives of healthcare professionals at different levels of CC for asthma, a chronic disease which requires good treatment adherence, based on good coordination and continuity of care.<sup>30</sup> The attributes of CC are organised into three main characteristics. The first one is clinical information coordination. Health professionals emphasised the need for public policies to address the problematic transfer of clinical information, which confused care levels. They highlighted the presence of formal transfer mechanisms such as referral criteria and forms within and between healthcare levels, but with limited use, underscoring challenges in information transfer. Aller *et al* described the main elements of clinical information transfer as being the flow of information and the adequacy of information sharing.<sup>28</sup>

A study in a setting different from the Ecuadorian health system, such as the USA, found that the presence of care coordinators in care units facilitated information exchange.<sup>31</sup> A study conducted in England involving health administrators on the interoperability of electronic health records concluded that for optimal CC, the health system would require a renewed focus on compliance with data standards and strengthening interorganisational collaboration, among other things.<sup>32</sup> While Ecuador does not have an interoperable medical record, it has been interesting to identify similar barriers in the various studies.

The second one is clinical management coordination. Aller *et al*'s study on quantitative indicators of clinical management coordination organised them into four groups: consistency of care through diagnostic tests and medication, provision of care at the most appropriate level, completion of the diagnostic process, follow-up after hospital discharge and accessibility at all levels of care.<sup>28</sup> Our qualitative study showed that professionals from different levels acknowledged the need to work as a team to treat asthma and highlighted the role of the family doctor at the primary level of care. However, the lack of expertise in asthma patient follow-up, the absence of shared objectives between care levels and the limited availability of specialist appointments in the healthcare system, particularly in publicly funded services, are critical barriers to effective clinical management coordination. These issues are similar in one study developed in an outpatient clinic of an Ecuadorian specialised hospital and in another realised in Canada, both found problems

with the appointment scheduling process, which is neither publicised nor standardised.<sup>33 34</sup> Participants opined that patients' relatives often assumed responsibilities like appointment scheduling and transferring clinical information between care levels, which are unlikely to be adequate. A systematic review of 77 qualitative studies between 1972 and 2017 on asthma care concluded that healthcare professionals should ensure that they communicate a clear diagnostic strategy and treatment plan so that parents and caregivers understand the pathway to an accurate diagnosis, relationships with healthcare professionals should have a collaborative approach, ensure adequate time, continuity of care and regular follow-up.<sup>35</sup>

The last attribute is administrative coordination. Participants revealed that they use informal communication channels such as personal phones and email to facilitate rapid patient transfers across care levels, consistent with prior research on technology's role in clinical CC.<sup>36 37</sup> Previous studies have identified a lack of two-way communication between primary and specialised care when transferring patients with chronic diseases.<sup>38</sup> To ensure successful care transitions, healthcare professionals should advocate for systematic approaches to care transfers within their organisations, adopting best practices and promoting effective communication.<sup>39</sup>

Participants in this study acknowledged that despite efforts to transform health services in Ecuador, political decision-making and active governance by the state are required to achieve progress in CC, strategies previously recognised by Cosavalente-Vidarte *et al* and Pedraza.<sup>40 41</sup> These challenges are shared in Latin America. Health systems in Latin America are characterised by a lack of coordination between different levels of care, duplication of services and infrastructure, unused capacity and provision of health services in inappropriate locations.<sup>42-44</sup>

Health reform in Ecuador has promoted the creation of a primary care model with a special focus on vulnerable groups and health inequities; however, as Santoro Lamelas mentioned, the history of a dispersed healthcare system, the tradition of biomedical models of health practices, and structural inequities remain significant challenges,<sup>45</sup> and, on the other hand, the lack of cooperation between care providers in Latin America health systems poses a challenge for effective CC.<sup>46</sup>

This study had several limitations. (1) During the COVID-19 pandemic, participants had strict work timetables, which made it difficult to schedule interviews and caused delays in arranging interviews, as well as delays in rescheduling. (2) During 2020, some hospitals in Ecuador underwent audits of their management so some health professionals were unwilling to participate in the study out of fear of repercussions. (3) This study did not consider the analysis of the theoretical categories according to the different sources of financing of the health units (public, private and labour insurance); in either case, if considered, the results could be modified. (4) This study did not consider the second pillar of IHCN, which is continuity of care. This considers the



perspective of patients and caregivers and has its own methodology for studying it.<sup>47</sup>

## CONCLUSIONS

Among healthcare professionals, there is a lack of trust in the content of referral documents, particularly among specialist physicians when they receive clinical information from primary care. The use of disconnected information systems across care levels hinders the efficient transfer of clinical patient information. The responsibility for monitoring patients with asthma is often assigned to the initial treating physician, regardless of their training, experience or resource availability. Addressing chronic disease management within a quality framework poses a challenge for healthcare levels, highlighting the need to strengthen CC.

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**Contributors** The study design was developed by NCR-S, RF, AR-S, PC and AC in consultation with the Asthma Attack Group. The interviews were conducted by AR-S and EG. AR-S and EG conducted the narrative analysis, which was cross-checked by MJC-C, JM-Y, GG-U, RF, CB, ALBdO, GPP, MB and NCR-S. NCR-S and EG drafted the manuscript. All authors critically revised the manuscript, making substantial contributions and approving the final version. NCR-S is the guarantor. The AI technology used was ChatGPT. We used it to ask for the translation of some quotes from the study participants. The request was made with this question: Confirm this sentence '...', in British English. The sentences were subsequently reviewed and corrected by one of the British English-speaking researchers. Finally, the sentences were reviewed by two researchers to ensure the accuracy of the translated context.

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**Ethics approval** The study protocol received approval from the Ethics Committee of Hospital Docente de Calderón (CEISH-HGDC 2019-001) in Ecuador, adhering to World Medical Association and Declaration of Helsinki guidelines. A researcher safeguarded participants' identities. All participants provided informed consent, both verbally and in writing, for study participation and audio recording via video calls, with full disclosure of the research's purpose.

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## Supplement 1

### **Ecuadorian health workers' qualitative perspectives on attributes of asthma care coordination**

#### **In-depth Interview Guide: Care Coordination**

1. To begin with, I would like to get your opinion on the functioning of the health system in this health district.
2. How would you define coordination between primary care and specialised care?
3. What is your opinion on the coordination of care between services?
4. What elements are facilitating care coordination, why, and how does it influence the quality of care?
5. What elements are hindering care coordination, why, and how does it affect the quality of care?
6. What is the role of the first level of care in the care of a patient with asthma? What is your opinion on how they are performing this role? What could be improved?
7. How do professionals at different levels of care communicate to treat patients with asthma? What do you think? Why? What would you improve?
8. How is clinical information about the asthma patient transmitted between first level and specialised care? What clinical information about the patient is shared? What is your opinion about this information?
9. What tools do the levels of care use to communicate the clinical conditions of asthma patients when they go from the first level to specialised care and vice versa? What do you think? How do these tools contribute to care coordination?
10. What makes the use of these instruments easier, what makes them more difficult and why?
11. What suggestions do you have for improving care coordination between services?