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Working practices and integration of primary health care doctors in remote rural areas in Brazil: a qualitative study

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Abstract

Health care challenges in remote rural municipalities (RRMs) emphasize the importance of primary health care (PHC) and require an expanded scope of practice. Doctors are key actors in this context. The aim of this study was to explore the level of integration of doctors in RRMs and working practices. We conducted a qualitative study involving semi-structured interviews with 46 PHC doctors working in 27 RRMs in Brazil. Content analysis was performed, resulting in the identification of categories of analysis grouped under three core dimensions: doctor training and experience; comprehensive care and timely access; and the community-based approach. Doctors working in RRMs were mainly recent graduates with limited experience who had undertaken their degree outside Brazil, and care was focused on the individual. The findings also revealed weak sociocultural adaptation and a harsh working environment and issues related to social status that reinforced prejudice against rurality and poverty. Practice was limited in scope and care tended to be oriented towards acute problems, disease-centered and focused on the biomedical model of medicine. Barriers to the delivery of comprehensive care include both structural constraints, such as poor facilities and centralization of services in administrative centers, and the lack of professional competencies necessary for PHC in these areas. The findings point to the need to promote an expanded scope of practice in PHC delivery in RRMs, with major public investment in the promotion of training and strengthening career pathways in these areas.

Keywords Primary health care, Health knowledge, attitudes, practice, Doctors, Rural health

Background

The provision of health care in rural and remote areas is a challenge for universal health systems around the world. The health workforce is a critical element of service delivery in these areas and the shortage and high turnover of professionals, notably doctors, is a recurring challenge. In a world of growing urbanization, the movement of health workers tends to follow global market trends, characterized by an exodus from remote, rural and peripheral areas towards towns and cities, where technical resources and knowledge are concentrated [1, 2].

It could be said that working in rural and remote areas constitutes a "counter-exodus" of doctors and other

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health professionals. Health care in these areas tends to be limited to primary care services, which are tasked with providing comprehensive, timely, and longitudinal care integrated with other levels of care. However, specialist and hospital care are generally absent in sparsely populated areas, being disproportionately concentrated in regional hubs or capitals [3–5].

Health care practices in remote rural areas need to be tailored to the local context, considering aspects such as geographical isolation and environmental, historical, cultural, and social factors [3, 6, 7]. The characteristics of rural areas mean that health facilities need to provide a broader set of services, requiring health professionals such as nurses and community health workers, as well as physicians, to be knowledgeable and skilled in advanced practices [3, 7, 8]. Interpersonal and intercultural skills, community participation, multidisciplinary teamwork, and intersectoral collaboration are important competencies in these areas [6, 7]. According to Wakerman et al. [9], the more remote communities are, the greater the need for economic and political incentives and the greater the incentive for the development of comprehensive health services.

In Brazil, the National Primary Health Care Policy [10] outlines a set of competencies for professionals working in the country's main model of Primary Health Care (PHC), the Family Health Strategy (FHS). Yet, apart from a limited number of FHS teams working in riverine communities, the PHC policy does not define specific competencies for PHC teams working in rural and remote areas [11, 12].

The FHS envisages the delivery of community-based health care anchored in the four essential primary care attributes (access, longitudinality, comprehensiveness and coordination), as well in family centeredness, community orientation and cultural competence, based on Starfield [13]. These attributes mean that PHC must be close to communities to represent users' first point of care in the health system, providing them with care throughout their lives, meeting most of their health needs and coordinating care with other services in the health system. In addition, PHC must expand its vision beyond the individual and address the family, the community and the cultural aspects related to health care [13]. Moreover, amounting to standard Family Health Strategy practice in remote rural areas, family and community medicine, as a specialty within the field of family health, encompasses both general primary care competencies and those specific to rural health care, such as person-centered clinical care, the contextualized approach and expanded scope of practices [6, 14].

However, health education and training, particularly of doctors, still follows the biomedical and hospital-centric paradigm and little emphasis is placed on PHC in the country's public health system, the Unified Health System [*Sistema Único de Saúde* (SUS)] [15, 16]. In addition, medical practice in Brazil is strongly self-regulated, focusing on private practice and a public-private sector mix [17, 18], which is not conducive to working in rural settings.

One of the policies to address the shortage of doctors in rural and peripheral areas is the More Doctors Program, which is considered the most successful and far-reaching initiative of its kind in the country [8, 18, 19]. The More Doctors Program has had a major impact in rural and remote municipalities (RRMs) and sparked intense debate, particularly due to the employment of Cuban doctors under a cooperation agreement with the Pan American Health Organization [8, 19]. These doctors represented 80% of the around 18,500 More Doctors Program professionals employed up to the end of 2018, when Cuba terminated the agreement in the wake of Jair Bolsonaro's victory in the presidential elections and the new administration's rejection of Brazil-Cuba relations. Studies have shown that, in contrast to Cuban doctors, Brazilian doctors working in the More Doctors Program after 2019 were predominantly fresh graduates, who are more likely to leave a rural workplace [8].

The More Doctors Program led to an increase in the number of medical graduates [8], resulting in a sharp rise in the number of doctors in the country, which stood at 500,000 in 2020. However, a mere 5% of doctors in Brazil work in rural municipalities outside metropolitan regions, which together have a population of 44 million people, meaning that the density of doctors in these areas is 0.59 per 1000 population, revealing persistent health inequities [17].

Faced with the challenges to guaranteeing health care in remote rural areas, the focus of this study is to analyze the working practices of medical doctors in RRMs in Brazil. The literature on rural health still gives few empirical perspectives on care practices, especially in low- and middle-income countries such as Brazil [7]. This article aims to contribute to this gap through a nationwide qualitative study, providing an in-depth look at medical practices in remote rural contexts. In order to understand how medical practices are shaped, it is also necessary to examine the training and experience of doctors as part of their process of integration to work in remote rural contexts. According to the WHO [1], analysis and planning of medical work in rural areas must take into account the component of integration into the context. In our study, the understanding of the working practices of doctors in RRMs was based on international literature [1, 7] and guided by the attributes of PHC [13]. In addition, the premises of the FHS in Brazil, which emphasize comprehensive and holistic clinical care combined

with a community approach [10, 12], were considered as expected working practices in Brazilian PHC.

Therefore, the aim of this study was to explore the level of integration of FHS doctors into RRMs and their working practices. The article sought to examine the extent to which these professionals are equipped with the knowledge, attitudes and skills required to provide health care in these areas. In addition, it aimed to outline the main challenges of providing health care in remote rural areas of Brazil.

Methods

This paper is part of a broader study titled "*Atenção Primária à Saúde em Territórios Rurais Remotos no Brasil*" (Primary Health Care in Remote Rural Areas in Brazil), which analyzed the organization of PHC in the country's RRMs [20]. The 323 Brazilian RRMs were categorized according to their socioeconomic, demographic and health characteristics, and divided into six regional clusters: "*Vetor Centro-Oeste*", "*Matopiba*", "*Norte Minas*", "*Norte Águas*", "*Norte Estradas*" and "*Semiárido*". Nine of RRMs were not included in the clusters because they are geographically isolated from the other regions. Various aspects of the RRMs were analyzed to organize the clusters, such as geographical location, economic activities, transport routes, population data, social indicators and health care indices. A total of nineteen indicators were used and described by Bousquat et al. [4].

In order to explore PHC in depth in the different realities of Brazil's remote rural context, a qualitative multiple-case study was carried out with a purposive sample of RRMs selected from the six clusters. In each research cluster, two or more municipalities were chosen that corresponded to the most frequent socioeconomic, demographic and health characteristics among the RRMs in the respective area. One or more atypical municipalities were added, i.e. municipalities with more unusual features in the area. The aim was to ensure that different realities of the RRMs were included. This procedure resulted in a sample made up of 27 RRMs distributed across the six previously defined areas. The methodology and sampling procedures are described in Bousquat et al. [4].

The data were collected in 2019 using interviews with key informants. The interviewers were all from the research team (including the authors) and partners from local universities. These interviewers were men and women, professors or doctoral students, with at least a master's degree. They were all trained to use the interview guide, take field notes after the interviews and were coordinated by four senior researchers from the research team, with many years of doctoral and qualitative research experience. The interviewers had no previous relationship with the participants, and they informed the participants about their focus on understanding PHC in RRMs.

In each of the 27 municipalities, we interviewed two family health doctors working in primary care clinics: one working in a clinic in the municipality's administrative center and one working in a clinic in a remote sparsely populated area outside the center. The doctors were nominated by the municipal health managers, who were previously contacted by telephone to agree to the research and organize the interviews. The final sample comprised 46 participants, eight less than expected due to refusals and the unavailability of some doctors. The losses did not compromise the design of the study or the representativeness of the six clusters, since it was possible to ensure interviews both in the administrative center and in the remote areas of the municipalities of all clusters. Therefore, the data collected were considered sufficient to achieve the objectives of the study and to draw the necessary conclusions.

We conducted semi-structured interviews using a multi-dimensional interview guide built around the following themes: interviewee characteristics, access, clinic facilities, work processes, interculturality, level of contact with specialist/hospital care, transport, urgent care, health workforce, intersectoral collaboration, community participation, antenatal, childbirth and postpartum care, cervical cancer prevention and treatment of high blood pressure [21]. The guide was pilot tested. The interviews were done face-to-face at the doctors' workplace, with no one else present besides the participants and the researchers. They lasted an average of one and a half hour. No interviews were repeated. The interviews were audio-recorded, transcribed and later added to the study database, where participants were anonymized by codes. Review of the transcripts by the participants was available on demand. Although no one asked for the transcripts to be returned, partial results were discussed with the participants in online group meetings in 2021.

A thematic and deductive qualitative content analysis was conducted according to Flick [22]. Three basic stages were carried out: pre-analysis, exploration of the material and interpretation. Initially, the first author organized the data by region and location of the clinics (in the administrative center of the municipality or in remote areas outside the center) and did a floating reading of the material in order to get closer to the data and inform the next stage.

Secondly, the same author, with the support of the second author, structured the material into categories, based on an integrative review of the literature on primary care in rural areas [7] and on the available data. These previous categories were: professional development, care and monitoring of priority groups, emergency care, advanced practice, mental health approach, family-centeredness,

Table 1 Categories of analysis: family health strategy doctors' level of integration and working practices in RRMs

Dimensions	Categories
Doctor training and experience	Years of professional experience and employment
	Competencies acquired during professional experience
	Professional qualifications
	Sociocultural adaptation
Comprehensive care and timely access	Patient tracking
	Investigation and monitoring of health problems
	Therapeutic practices
	Collective actions
	Unscheduled care
	Approach to mental health
Community-based approach	Family centeredness
	Cultural competence
	Intersectoral collaboration
	Community participation
	Team planning

Source: the authors

interculturality, community participation, intersectoral collaboration, and team planning. The first author coded all the content of the interviews into these categories using NVivo® software and generated in total 1904 codes.

Finally, after further analysis and interpretation by all authors, these categories were revised and grouped into three core dimensions: doctor training and experience; comprehensive care and timely access; and community-based approach. The resulting dimensions and their respective categories are shown in Table 1. Throughout the results, we illustrate the content with excerpts of the interviews that represent the six clusters of RRMs and both the administrative center of the municipalities and the remote areas outside the center.

Results

Doctor training and experience

Years of professional experience and employment: recently qualified and employed under the More Doctors Program.

The respondents were predominantly young and male. Forty-four of the respondents were Brazilian, one was Cuban, and one was Peruvian. Most of the sample did their medical degree outside Brazil: half in Bolivia and six in other Latin American countries (Cuba, Paraguay and Peru). Most of the participants were new graduates working in the More Doctors Program as their first job out of college. More Doctors Program doctors accounted for 63% of the participants and worked mainly in the Amazon. Half of the overall sample were not registered with a Regional Medical Council and more than two thirds had been working in the health team for less than one year (Table 2).

Table 2 Profile of family health doctors working in the selected remote rural municipalities, Brazil 2019

PROFILE	*N*	%
Age (years)		
24–30	21	45.7
31–40	17	37.0
41 and over	8	17.3
Sex		
Female	16	34.8
Male	30	65.2
Country of study		
Bolivia	23	50.0
Brazil	17	37.0
Cuba, Paraguay, Peru	6	13.0
Time since graduation		
Less than one year	11	23.9
1–2 years	19	41.3
3–5 years	7	15.2
6 or more years	9	19.6
Length of time working in the team		
Less than one year	32	69.6
1–3 years	9	19.6
More than 3 years (6–15 years)	5	10.9
Type of employment		
More Doctors Program	29	63.0
Statutory	5	10.9
Other (fixed-term contract, self-employed, cooperative)	12	26.1
R**egistered in a regional medical council**		
Yes	23	50.0
No	23	50.0
Employment outside the Family Health Strategy*		
Not employed outside the Family Health Strategy	33	71.7
Employed outside the Family Health Strategy	13	28.3
Specialty training*		
No specialty training	38	82.6
Family and Community Medicine	3	6.0
Psychiatry	1	2.2
Clinical specialties (internal medicine, cardiology, dermatology, neurology)	4	8.7
Surgical specialties (general surgery, colorectal surgery, vascular surgery)	2	4.3
Health administration	1	2.2
Total	**46**	**100.0**

*Total greater than number of interviewees due to multiple responses

Source from the database of the study *"Atenção Primária à Saúde em territórios rurais remotos no Brasil"*

More than 70% of the respondents were not employed outside the Family Health Strategy (Table 2), as employment outside the PHC is not permitted for doctors employed under the More Doctors Program not registered with a Regional Medical Council. In contrast, doctors registered with a Regional Medical Council tended to seek outside employment, generally in the region. In addition, doctors who had validated or were expecting to validate their degree and subsequently apply for

registration with a Regional Medical Council mentioned that they could leave the region.

> *They have already invited me to work in the hospital, but since I'm not registered in the Regional Medical Council, I can't work outside the clinic. It would be good for me [...] The day I get my Regional Medical Council registration, I'll consider their proposal. Whether I stay [in the municipality] or not will depend on their offer (5PA9MED2).*

Competencies acquired during professional experience: more experienced doctors a role model for responsiveness in primary care.

More experienced doctors were an important source of advice and guidance for younger doctors, helping them with their professional development and to deal with the challenges of working in rural and remote areas. These doctors were also more critical of the poor working conditions in RRMs, highlighting that they hinder performance and limit responsiveness.

> *Because now that I'm getting used to things, I'm getting to know what the people are like, what the community needs. So, at first it was a bit difficult for me, because I used to live in a huge capital city and I stuck myself in the middle of nowhere, a bit difficult [...]. Especially since I did my degree in another country, where it's totally different. Until I got used to it ... And I'm more comfortable now. I always share ideas with the more experienced doctors here, Dra. C., Dr. H.; and we always come up with a solution (5PA9MED2).*

More experienced doctors (three or more years of experience) had worked in small towns and large urban centers in other states where they accumulated a broad range of experience – generally in primary care and hospital shift work – and acquired skills in areas such as surgery, delivery and a variety of clinical specialties. This experience encompassed not only techniques, but also the systematization of practices and identification of patient needs.

> *That's what I say, right? I have 15 years of experience. So, experience makes a big [difference]... You have a road map in your head, you already know how to examine the patient, what to examine, how to do the examinations, it's much easier (6BA3MED1).*

While providing a certain peace of mind at a later stage of their careers, the main reasons more experienced doctors choose to work in a RRM were relatives living in the region, prestige, recognition, sense of responsibility toward the local community and the possibility of working with an extended scope of practice, which is a requirement in rural settings.

These doctors reported greater responsiveness to patients' needs, reducing referral rates and, as a result, attracting patients from other health teams. They provided services in their areas of expertise that are beyond the scope of the Family Health Strategy, including treatments that are often unavailable in the region's referral centers. For this reason, they enjoyed some privileges and held a certain level of political capital.

> *Most of the demand that we have in the municipality comes to me, both because of trust and level of responsiveness. I can deal with a variety of problems and conditions without having to refer patients. For that reason, even the manager is different with me. I see more [patients] and my working hours are slightly longer [...] He makes a small effort for me to have a higher salary. I don't earn what a doctor of Family Health Strategy earns, I earn a bit more because of my responsiveness to the population. [...] So, I stay here mainly because of the salary. [...] But also because I like the town (6BA3MED1).*

Professional training: limited and discontinuous.

Specialty training was the exception rather than the rule, even among doctors with more years of experience. None of the interviewees working in the Amazon were specialists. Only eight participants had completed specialty training, either via a residency or a postgraduate training program. Three doctors, two of whom did their medical degree in Cuba, had multiple specialties. Three doctors said they had done specialty training in family and community medicine but had not received the certificate (Table 2).

More Doctors Program physicians are entitled to one day's training leave per week to undergo an online postgraduate course on family health. One of the training and work support strategies adopted by the More Doctors Program is academic supervision. Consisting of monthly meetings and the provision of remote support by supervisors, this initiative contributes to the improvement of clinical practices.

The lack of training opportunities at local level was compensated by the provision of courses in state capitals and regional health hubs by universities and state governments. These courses were provided on a sporadic or monthly basis, depending on the region. Long travel times were mentioned to be a barrier to attending longer courses.

> *For example, in March I went to Montes Claros to do a very good course on cutaneous leishmaniasis. There are courses from time to time. The pro-*

fessionals often don't want to go, but they do give [courses]. It's tiring to go to Montes Claros, you know. (2MG5MED2).

Online training was the main form of qualification; however, lack of time was a limiting factor. Due to long travel distances to accredited training institutions, several professionals sought continuing education opportunities on their own initiative and using their own funds, focusing on online specialty training programs that do not provide a recognized specialist qualification. Training was also driven by market demand created by the shortage of doctors and poor availability of services in rural areas.

P: Colposcopy and biopsy services aren't provided here, right? R: No, not even privately. Colposcopy, not yet. I'm going to offer [the service]. P: Is there a demand for it? R: Yes, there is. It's one of the next things I want to do. I want to do the course. I'm going to look into it (3MA25MED1).

Sociocultural adaptation: weak; harsh working environment.

None of the doctors were from the municipalities where they worked. Some had chosen to live in the RRM or region because they had relatives who lived there. While the respondents recognized some positive aspects of the process of adapting to living in a RRM and cultural differences, they tended to make comparisons between the local conditions and way of life of the municipality and those of their home town, displaying undertones of discrimination and prejudice.

The people from [the state] of Amazonas are really lazy. [...] I thought that this program [the cash transfer scheme Bolsa Família] was a real blessing for people [...] but there are people that just [sit around and] wait the whole month. [...] A girl, I think aged around 23, 25 [said] "Doctor, I'm starving, I haven't got any food, there's nothing to eat at home." While you feel sorry [for her] [...] for God's sake, there is an endless amount of land to plant on, the river, igarapés (4AM17MED1).

One of the reasons doctors did not settle into the RRM was limited access to social services and leisure, leading to feelings of loneliness and helplessness. In the beginning, the respondents, especially the young doctors, found it hard to adapt to the food, living conditions, being away from the family and the culture shock of seeing social inequalities firsthand.

My main challenge was leaving my family and coming to a place I didn't know, that's difficult to get to. To get here and be thrown in at the deep end. Thank God that I was welcomed with open arms, but it was difficult for me. Like "my God, what am I doing in this place"? On the first day I began to cry and cry. I started to freak out, calling my mum: "Mum, I'm going to leave, I'm going to quit! It's not working out for me" (5PA9MED2).

So, the difficulty of the logistics of living in the outback, where there are no shopping malls, where there's nowhere nice to go, no leisure options... Here leisure is bathing in the river. It's difficult for those who are financially...Are like, how can I say, stable, right? It's more for those at the beginning of their career, for those who are trying to climb up the ladder (4AM17MED1).

Some of the respondents said that they felt welcomed by the population and that living and working in the RRM was a remarkable learning experience. The experience of living in other municipalities or countries helped them adapt to their new environment and some participants developed an affinity with the local way of life. In contrast, other interviewees saw a stark difference between rural and urban areas, referring to the latter as "civilized".

Comprehensive care and timely access

Patient tracking: "*Patient tracking? I don't think so...*".

The interviews showed that few doctors were concerned with patient tracking to attract and follow up patients. In general, this task was the responsibility of nurses and mediated by community health workers. An exception to this rule was antenatal care; nonetheless, failings in this process led to delayed follow-up, posing a risk to patient health. Some interviewees reported visiting patients who had abandoned follow-up because they felt embarrassed, including antenatal patients and patients with tuberculosis and sexually transmitted infections.

During health interventions in the community such as Hansen's disease and women's health campaigns, health teams, including doctors, were mobilized to invite the local community and promote participation in activities. However, some doctors reported that patient tracking was of limited effectiveness because patients often failed to turn up to scheduled appointments due to geographical barriers to access, especially in more remote communities where patients have difficulty getting to the clinic. Other factors limiting the effectiveness of patient tracking reported by the interviewees included incomplete and out-of-date registrations and difficulty locating patients, especially migrants. Some doctors believed patient tracking was unnecessary, because the community is kept constantly informed, relying on patients to seek timely care at the clinic.

Patient tracking? I don't think so… I think it's kind of not very necessary, because we already do the work of informing [the community], asking, of telling people to come to follow-up. I don't really think there is any need (4AM17MED1).

Investigation and monitoring of health problems: under-resourced.

Limited resources were available for the investigation and monitoring of health problems. In general, laboratory test samples were collected in the municipality's administrative center. Despite being limited, availability was considered adequate by most of the doctors. The participants working in the state of Pará highlighted major difficulties, such as the lack of simple tests such as blood counts, meaning it was necessary to prioritize pregnant women and endemic diseases. All interviewees mentioned that patients frequently paid out-of-pocket to do tests in other municipalities.

Tests are a really complicated issue here. Because, for example, patients with high blood pressure and diabetes have to request tests every three to six months depending on the protocol; however, these tests are done privately. Some manage to go to the clinic in Itaituba [a major city in the region] or to R. [a neighboring municipality], but the municipality itself doesn't offer these tests to the community. Just for pregnant women and, even then, they are very specific (4PA12MED2).

Diagnostic tests, such as rapid tests for sexually transmitted infections, pregnancy tests, blood glucose tests, pap smears and, to a certain extent, ultrasounds, were generally available, but predominantly in the administrative center, and lacked the resources for accessible and effective provision. For example, ultrasounds depended on specialists visiting the municipality, rapid tests required training to be carried out, blood glucose tests often lacked functioning glucose meters and test strips, and pap smears were not returned in a timely manner because municipalities have little access to laboratories. These problems highlighted weaknesses in comprehensive care and meant that patients often had to pay out-of-pocket for the tests.

The most underserved communities were those in more remote areas outside administrative centers, especially in the Amazon. In these communities, real Family Health Strategy coverage is particularly low, with generally only people living closer to clinics being able to access health services. While mobile health services such as floating clinics – widely recognized as having major potential in the Amazon – partially addressed these problems, they were infrequent, weakening the longitudinality of care. Test shortages, delays and long travel distances for testing hindered timely investigation and monitoring, leading to uncertainty and doctor and patient demotivation.

We get a bit frustrated. I even talked about it with D. [nurse], yesterday actually. A patient of ours was feeling abdominal pain: I asked for an ultrasound and she couldn't afford to do it privately. […] I didn't wait for the ultrasound [offered by the SUS]. I sent her to Lacerda [a referral center] and it was a tubal pregnancy! If I had held the woman here, she would have died. […] So, I say to D. that our hands are kind of tied. Because here it's the Family Health Program, but it's a Family Health Program in which we do everything, because there's only us. And you see that and get frustrated because you want to solve things but can't. If I had had an ultrasound machine, I would have done it here, I would have seen it (1MT26MED1).

Therapeutic practices: poor facilities and shortage of supplies, limited scope of practices.

The doctors prescribed medicines offered by the SUS, despite knowing there were shortages. Prescriptions were limited to the list of medicines available under public pharmaceutical assistance programs, dispensed only in administrative centers. All interviewees mentioned that vaccines and essential medicines for pregnant women were readily available.

Medicine shortages meant that patients had to purchase medicines, adversely affecting comprehensive care and the effectiveness and credibility of primary care services. Therapeutic strategies were affected by access difficulties, resulting in medication stockpiling by families, self-medication and the use of inappropriate medicines. In rare cases, medicines were dispensed in clinics or facilities in the villages by community health workers.

In some RRMs, vaccines were made available through occasional campaigns and mobile services, generally in the administrative center with restrictions on operating hours. The treatment of tuberculosis and Hansen's disease, despite protocols for observed treatment, was also centralized in some of the municipalities; however, in most RRMs drugs for these diseases were dispensed in clinics.

The only big failing is with respect to medicines, you know? That are at times… are almost always not available… Because there's this issue with tendering, these things, you know? […] They are all here in J.B. [administrative center], which is a little centralized here in J.B. P: So, people with Hansen's disease have to come here to get the medicine? R: That's right, but what happens in these cases is that the patient takes

a month's supply of medicine. They take [the medicine] and then they always have to come back for us to do an assessment (3PI21MED1).

The doctors performed simple procedures in the clinics, such as stitching and cerumen removal; however, these services varied considerably across RRMs, with these types of procedures being less frequent in clinics in more remote areas outside administrative centers due to lack of supplies, facilities and backup care. In administrative centers, simple procedures were often carried out in health centers or urgent care centers. Some doctors working outside the administrative center performed these procedures in the clinic due to the long travel distances to the main town. Procedures such as canthoplasty, drainage of abscesses and minor skin surgery were less common in these areas.

When there is a problem, we try to do as much as possible. Infiltration let's say, when the patient has arthrosis, a knee problem, doing an infiltration, stitches (5PA15MED2).

The doctors provided individual advice and guidance to patients regarding disease prevention and lifestyle changes. However, some interviewees revealed a more top-down approach to patient-doctor communication, mentioning that patients were not very "enlightened". Communication was prescription-based and doctors did not provide an opportunity for patient participation. Many interviewees reported low adherence to medical advice and a clash between traditional knowledge and technical knowledge and language. The challenge of changing habits to promote health was compounded by lack of longitudinality. Nonetheless, interviewees highlighted the important role played by doctors in encouraging healthy habits, especially in collaboration with nurses through health education activities.

The doctors commented that the main aim of the Family Health Strategy was disease prevention and health promotion, although some interviewees highlighted that work processes tended to adopt a disease-centered approach rather than focus on longitudinality. This contradiction was attributed to the fragile care system, doctor shortages, access difficulties in vast areas and excessive consultation workload.

What's the objective of primary care today? Prevention and health promotion. Today, we very rarely manage to do disease prevention and health promotion. We do secondary and tertiary disease prevention [prevention after the disease has already set in]. Treating high blood pressure, preventing it from developing into a heart attack, a stroke, or damaging major organs; no, we treat the disease itself (2MG7MED2).

Collective actions: lack of emphasis.

Few doctors organized disease prevention and health promotion groups. Collective actions led by nurses were developed predominantly as part of Ministry of Health campaigns and programs. Some doctors developed group activities in waiting rooms, while others organized "*grupões*" (large groups), providing shared medical appointments when the clinic had a full supply of medicines, including guidance in the form of talks emphasizing different aspects of diseases and risk factors. In general, while limited in number, these initiatives were implemented by multiprofessional teams in coordination with other government sectors and with the support of the local community.

Some doctors recognized the importance of these actions, viewing them as a payment of a "debt" owed by the Family Health Strategy, given that the overarching priority of the program is disease prevention and health promotion. However, health education tended to focus on individual actions, taking a lifestyle/behavioral approach to health promotion.

There are no educational activities, but we provide advice. The advice is individual (6BA4MED2).
The turnout to talks, to whatever we do, is low. […] There are [group activities], but I don't think these groups, these talks, these things work […] You tell a person with high blood pressure to take up walking, cut down on salt; all diet-related. And they don't do it. It's the region, it's regional; rich food, high in fat, you know? A lot of salt. And there's alcohol on top of that. People with diabetes… Adherence is very low (2MG6MED2).

Unscheduled care: the main activity of doctors.

The findings show that doctors spent most of their time delivering unscheduled care to patients with acute problems, dealing with a range of cases from common conditions such as fever to traumatic injuries. The latter were widely reported by the interviewees and often resulted from workplace and traffic accidents, especially in more remote areas outside administrative centers. Agricultural work-related acute musculoskeletal pain was also highlighted, together with accidents involving venomous animals, especially in clinics in areas in more remote areas outside administrative centers. Some of the doctors associated acute problems with patient habits, such as smoking corn straw cigarettes in Minas Gerais and eating wild game in the Amazon.

Doctors highlighted challenges in monitoring and following up chronic conditions. However, according to the

interviewees, potentially preventable complications arose due to lack of adherence to drug therapy and medical advice regarding lifestyle changes.

> *"Where are the tests?", "Ah, I left them at home". I thought [she meant] the house here, but it's the house in the country, 110 km away! So, she goes to her house at the weekend to get the tests and comes back the next week. That's another week on, from 34 to 35 weeks [of gestation]. And no, it's not just her, it's various people. [At] 39 weeks, me saying: "Look girl, you can't go to the country. You can't ride a horse. You can't ride a motorbike", "OK doctor, I won't". Half an hour later and the ambulance calls saying "Look, I'm going to pick up a pregnant woman. Hundred and twenty kilometers. Leaking amniotic fluid. Riding a horse at 39 weeks!" (2MG7MED2).*

Some doctors reported treating serious cardiovascular events in the clinic – mainly due to lack of availability of services at urgent care centers – as well as serious pregnancy complications and assessment of labor progress. Others had delivered babies in the clinic due to longs travel distances to the maternity hospital. According to some doctors, the Family Health Strategy tended to be more oriented towards unscheduled care and acute problems because of the high demand for urgent care in the municipalities, meaning that they felt overburdened.

> *Today I can say to you that you wouldn't think I was a doctor of Family Health Strategy, I'm more like an emergency doctor. Because I just solve [blood] pressure problems and send [patients] away. There's no continuity because there is no way of seeing these patients every day. […] There are areas that go three or four months without seeing a doctor due to the distance from other areas. […] How do I turn to a patient whose pressure is 200/100 mmHg and say: "No, I'm only going to see 18 reception tickets"? Or to a child with a temperature of 39 °C "Look, I'm not going to see you"? We get here early to be able to see 18–20 tickets; but we never do, it's always 30, 32 tickets (2MG7MED2).*

Approach to mental health: limited skills.

To the doctors' surprise, there was considerable demand for mental health care in the Family Health Strategy of the RRMs, ranging from psychotic disorders to dependence on benzodiazepines. Alcohol abuse was a common problem highlighted in the north of Minas Gerais, where the production of *cachaça*, a spirit made from the fermentation and distillation of sugar cane juice, is a tradition. Most doctors received support from psychologists and/or, to a lesser extent, psychiatrists, generally from psychosocial care centers outside the municipality.

A large proportion of the doctors were not equipped with the skills necessary to deal with mental health problems. Some doctors reported that they did not have an affinity with the area, while others mentioned that patients had very high expectations, demanding psychosocial support that they had not been professionally prepared to give.

> *There are things that happen that you don't find in books. Like in the area of, how can I say, in the area of dealing with people. Because, since this is like a backwater, doctors are seen almost like a God. We don't just solve health problems, we also deal with the psychological side, resolving various types, various factors as well. So that's a bit complicated in itself (3PI20MED2).*

Some of the interviewees' comments carried undertones of prejudice, including the use of terms such as "addicts" and "rebellious children", associating mental problems with low education levels and labelling developmental delays in children or epilepsy as psychiatric disorders. Some, albeit few, doctors organized group mental health initiatives to prescribe anti-anxiety drugs, provide support for people with drinking and drug problems and develop more broad-ranging health promotion activities addressing psychosocial problems.

Community-based approach

Family centeredness: limited by the focus on the individual.

The findings reveal a low level of family centeredness in medical practice. While a number of doctors reported that appointments and home visits were attended by family members (generally women), there was no evidence of a more systematic approach to care involving dimensions relating to family, the local context and the patient as a person. On the other hand, some doctors followed up successive phases of the family life cycle, such as antenatal, postpartum and infant care, strengthening their bond with the community.

The doctors showed that they took a timely individualized approach to pregnancy and sexually transmitted infections prevention; however, adolescent girls were often prevented by their family from using contraception, hampering this approach. Teenage pregnancy and machoism were problems highlighted by the interviewees, although some doctors displayed prejudice, for example, in relation to the start of sexual activity.

> *[Teenagers] start having sex very early here; and [guess] what happens? This municipality's a bit*

male-dominated and patriarchal; mothers and daughters don't have much freedom to say: "Dad, I want to start using contraceptives". They [just] don't. So, what happens? They start getting pregnant, pregnant, pregnant (3PI21MED1).

In general, contraceptives and rapid sexually transmitted infections tests were readily available in clinics; however, these supplies were often underused due sexual shame. Some doctors promoted sexual and reproductive health groups in schools or with women attending antenatal care. Others addressed family planning at an individual level, identifying the need to improve group interventions.

There's a lack of family planning. So much so that they are getting pregnant [again] within a year or even less [after giving birth]. They say that the population in Brazil is decreasing. Not here! Not here, especially among teenagers. There's a lack of planning, so they get pregnant [snapping of fingers]! (3MA25MED1).

Cultural competence: underdeveloped.

Doctors rarely recognized the specific needs of indigenous and traditional peoples. One of the doctors commented that "all the population here is 'normal'". As a rule, the Family Health Strategy (FHS) and clinics were not tailored to the local context. According to one of the doctors: "the team is here to care for everybody in the same way".

Traditional knowledge and practices were common. Sometimes patients would use traditional remedies first before resorting to the FHS, with many people, especially the older generation, trusting these practices more than those recommended by the family health team. The use of home-made remedies prepared from plants and animals in the form of brews, concoctions and patches, and prayer-healing handed down through generations was common.

Following guidance received under the More Doctors Program, some doctors said they respected traditional practices and cultural differences and were even involved in activities such as medicinal herb gardens. However, in addition to adopting caution due to known risks, almost all the doctors expressed reservations and distanced themselves from traditional knowledge, rejecting traditional practices and associating them with "lack of education". None of the doctors mentioned the integration of traditional healers into care provision.

Lots of brews, lots of plants that become brews [laughs]. There are even some medicines that are restricted use because of the culture, because in their culture a certain brew resolves [the problem]. So, they prefer to use the brew. What I mostly see here are brews. I give advice at the clinic. Even in groups, I try to give advice on self-medication, on the use of these substances that are not backed up by research. I try to make this very clear (2MG7MED1).

Intersectoral collaboration: driven by federal programs.

Intersectoral collaboration with social services and the local education department was led by nurses and, to a lesser extent, community health workers. According to the doctors, their role was limited to supporting group activities and consultations in the local community after they had been scheduled. Actions developed in conjunction with social services included patient transport, food and prescription assistance. These actions were less frequent in more remote areas outside administrative centers. Some doctors believed that social problems fell outside the scope of health care.

We talk to the CRAS [Social Assistance Reference Center]. There are some cases like… These days we are using [the center] a lot. Because of drugs, dysfunctional families, neglect. There are things that I say like: "Guys, [the] health [service] has its limits. From this point on social services have to deal with it" (3MA25MED1).

Family Health Strategy actions in schools were mentioned frequently. Carried out once or twice a year generally by other members of the health team, these actions rarely involved doctors. Besides these actions, driven largely by federal government initiatives such as the *Bolsa Família*, a cash transfer scheme, and school health programs, examples of intersectoral collaboration were rare. The development of partnerships and activities in the community was hampered by lack of institutional resources, particularly in more remote areas outside administrative centers.

Community participation: little emphasis in medical practice.

Only two doctors took part in municipal health councils. Some doctors encouraged patients during appointments to demand improvements to local health care services. Most of the interviewees mentioned that patients were present in political bodies; however, some doctors reported that patient participation in municipal health councils was limited and most were not aware of the importance of these councils for the Family Health Strategy (FHS).

Some of the interviewees mentioned that people in rural areas were generally "apathetic", "apolitical" or "ignorant". The few associations that doctors were aware of were linked to local churches, but with little or no

involvement of representative from the FHS and health services. Exceptionally, some doctors established partnerships with religious leaders, especially those working with socially vulnerable groups.

The doctors also highlighted the problem of clientelism, involving mainly councilors and local government managers. They mentioned that patients had easy access to local politicians to request individual benefits such as transport, tests and appointments, interfering in professional autonomy, taking away control of appointment scheduling and compromising the management of scarce resources.

> *The culture is very different, excessively paternalistic and we are not used to that. There is a lot of political interference. A patient hurt his back lifting a garbage can and wants an x-ray and I have to refer him because the mayor asked. […] So, he calls the Municipal Health Secretary and he turns up here. There is indeed a lot of interference (1MT26MED2).*

Doctors were in frequent contact with local politicians, being sought after by local government managers and councilors seeking updates on the local health situation. Some doctors called on local politicians and managers to improve working conditions, with many reporting that their demands were ignored and others suffering political retaliation or not making requests for fear of retaliation.

Team planning: infrequent and limited doctor participation.

According to the doctors, health teams held meetings with varying frequency because teams were small and in contact on a daily basis and meetings hampered care. Most of the doctors did not attend meetings or took part only occasionally.

Few clinics had electronic patient records. Those that did experienced difficulties due to poor information and communication technology facilities and internet connectivity, hampering the recording of patient information. Data were compiled centrally, not treated and not returned to Family Health Strategy (FHS) professionals. Few doctors knew how many patients there were in priority groups or were able to describe FHS goals and indicators, with some highlighting that this failing was a challenge in delivering quality care.

> *Look, I can tell you that we don't even set priorities. We treat patients on a case-by-case basis. There's no strategy [like]: "Ah, this month I'm going to work with high blood pressure, next month we're going to work with…". There's no strategy (1MT26MED2).*

The main findings are synthesized in Table 3.

Discussion and conclusions

Main conclusions

The findings suggest that the performance of doctors was generally limited by the lack of a specific approach to PHC in RRMs in Brazil and by factors related to training and experience and medical practice, manifesting the professionals' way of being and acting in these setting.

It is evident that competencies of doctors developed before and after working in RRMs are manifest in a dialectic praxis [23]. Competencies can be understood as knowledge, skills and attitudes or, in other words, the effective application of knowledge to work [24]. The way doctors acted in response to demands and work conditions were strongly driven by how they developed their skills and attitudes to respond to health problems and practice medicine in the Family Health Strategy in RRMs.

Another interesting finding was that care delivery tended to focus on the individual level based on the biomedical model of medicine, sometimes reinforced by the organization of work processes. The findings highlight the high level of responsiveness of some doctors and the promotion of healthy habits, although the approach was still far from person-centered care [15].

Our study focused on the profile of doctors entering the More Doctors Program almost one year after the Cuban doctors left the program due to the Bolsonaro administration's (2019–2022) position on the initiative. The vast majority of doctors were Brazilian, from outside the RRM and had done their medical degree outside the region and mostly outside the country. In other countries, the hiring of foreign doctors to work in rural and remote areas is a common recruitment strategy [1]. However, our findings show that most of the doctors employed in RRMs were recent graduates and some had yet to validate their degree and did not have specialty training.

These doctors felt insecure in their new sociocultural environment, with employment in RRM resembling a form of "exile". They were forced to seek their own identity in the region – or territoriality, as Santos [2] puts it. The search for professional identity in remote rural settings was also described by Allan et al. [25] in Australia, with professionals also highlighting problems related to isolation and privacy.

The doctors experienced settings in which social rights were, to a large extent, beyond the reach of the population. The discriminatory attitudes expressed by the doctors, which are repeated in rural health settings around the world [26, 27], reaffirm the notion of rurality as being at odds with urbanity [3]. Doctors referred to working in primary care in RRMs as a "non-place" [2], reflecting their self-image of their high social status.

The findings reveal tensions in doctor-patient communication, with the former taking a prescriptive and authoritarian stance, often challenged by non-adherence

Table 3 Main findings regarding PHC doctors' integration and working practices in RRMs. Brazil, 2019

Doctor training and experience	
Recently qualified and employed under the More Doctors Program	Most of the doctors had been working in the RRMs for a short period of time, were recently qualified and did their degree outside Brazil, mainly in Bolivia.
	Almost two-thirds were employed under the More Doctors Program and half were not registered with a regional medical council.
	Doctors registered with a Regional Medical Council tended to seek other work opportunities, working shifts in hospitals and primary care services in the region, bringing experiences from their work in these settings to their work in the RRM.
More experienced doctors a role model for responsiveness in primary care	The few more experienced doctors had acquired skills in areas such as surgery, delivery and a variety of clinical specialties.
	Experienced doctors were an important source of advice and guidance for younger doctors, helping them deal with the challenges of working in primary care in rural and remote areas
	Experienced doctors centralized demands, mainly in their areas of expertise, showed a higher level of responsiveness to patient's needs, created bonds with the local community and held a certain level of political capital.
Limited and discontinuous professional training	Specialty training was the exception rather than the rule, with exceptional cases of doctors with multiple specialties.
	More Doctors Program doctors had more permanent training opportunities, with online training, academic supervision to enhance clinical practices and training leave.
	A varying range of training courses were offered by universities and state governments with the support of the local health department; however, long travel times were a barrier to participation.
	Online training was the main form of qualification, with some doctors seeking courses and specialty training on their own initiative often motivated by the possibility of providing private services to supplement their income.
Weak sociocultural adaptation and harsh working environment	Most of the doctors had difficulty settling in, finding that working in primary care in RRMs did not live up to their expectations and characterizing urban areas as "civilized".
	Some doctors suggested that RRMs were inferior to urban areas and other regions of the country, while others attributed vulnerability to people's attitudes.
	Most doctors were not from the RRM, working in the municipality they were posted to by the More Doctors Program; however, some chose to work in the municipality because they had relatives in the region, except in the Amazon.
	Many doctors had difficulty adapting in the beginning due to the distance from their family, local conditions and ways of living and the culture shock of seeing social inequalities firsthand.
Comprehensive care and timely access	
Limited patient tracking	Few doctors encouraged patient tracking together with the health team to attract and follow up patients. An exception to this rule was antenatal care.
Limited investigation and monitoring of health problems	Limited diagnostic resources were available for the investigation and monitoring of health problems. Communities in more remote areas outside administrative centers were the most underserved, especially in the Amazon.
Therapeutic practices hindered by poor facilities, lack of supplies and limited scope of practices	The supply of medicines offered on the SUS prescribed by doctors was often irregular and dispensing was generally centralized, meaning that communities in more remote areas outside administrative centers tended to be underserved and hampering the follow up of non-communicable and communicable chronic diseases (for example, tuberculosis and Hansen's disease).
	Doctors performed simple procedures in clinics, although the range of procedures varied from RRM to RRM and services tended to be concentrated in health centers or urgent care centers in administrative centers.
	Doctors provided individual advice and guidance to patients on disease prevention and lifestyle changes; however, work processes tended to adopt a disease-centered approach and doctor-patient communication was top-down, with little opportunity for patient participation.
Little emphasis on collective actions	Few doctors developed collective actions, focusing more on individual care.
Emphasis on unscheduled care	Work processes placed emphasis on unscheduled demand, focusing on immediate individual care.
	People living in communities outside administrative centers were more vulnerable to acute problems resulting from agricultural work and traffic accidents, especially traumatic injuries, and deterioration of clinical conditions due to failings in health surveillance, lack of adherence to drug therapy and poor access to care services.
	Some doctors treated serious cardiovascular events and delivered babies in the clinic due to poor access to urgent care and maternity services.
Limited skills for dealing with mental health problems	There was considerable demand for mental health care; however, doctors were not equipped with the skills necessary to deal with the wide range of mental health problems.

Table 3 (continued)

Community-based approach	
Family centeredness limited by the focus on the individual	Health care was focused on the individual, without taking into account family relations or the health of family members who participated in care.
	Some doctors followed up successive phases of the family life cycle, creating a bond with families.
	Doctors provided advice on sexual health and family planning taking an individualized approach to pregnancy and sexually transmitted infections prevention; however, doctors mentioned that this approach was often hindered by cultural issues, highlighting high rates of teenage pregnancy and machoism.
Underdeveloped cultural competence	Doctors rarely recognized the specific needs of indigenous and traditional peoples.
	Many doctors respected traditional knowledge and practices as complementary and integrative medicine; however, almost all expressed reservations and none of the doctors mentioned the integration of traditional healers into care provision.
Intersectoral collaboration driven by federal programs	Doctors supported activities coordinated and led by nurses and community health workers with the social services and education departments driven by federal government programs.
	Joint actions tended to focus on social assistance.
Little involvement in spaces of community participation	Doctors maintained distant relations with local health councils and community leaders.
	Local government managers and councilors interfered in work processes in response to individual patient requests.
	Doctors were important actors in local politics related to the organization of health services.
Fragile health team planning	Few doctors attended infrequent health team meetings.
	Doctors did not use output and outcome and health region data and indicators to analyze the health situation.

Source: the authors

due to access, sociocultural and economic factors. The findings show that medical paternalism prevails in RRMs, even though society is increasingly demanding a horizontal approach to communication in care settings, particularly in the context of primary care, where patients should have a high level of autonomy over their health [28].

Training constraints in RRMs compounded the challenges in optimizing performance. Access to undergraduate and postgraduate health training is a key challenge in attracting and retaining health workers in rural and remote areas [1, 26, 27]. Our findings show that the potential of online education should be further explored, which is consistent with the conclusions of other studies [1, 8, 27].

The acquisition of competencies through professional experience was an important attribute in RRMs. The high level of responsiveness of more experienced doctors is consistent with the findings of Stralen et al. [8]. However, fragmented disease-centered care approaches learned in hospital settings were reproduced in primary care services. This practice, underpinned by a biotechnology rationale [23], highlights the need to promote a shift from the traditional model of primary care to a family-oriented patient-centered approach [16].

Another constraint on doctor performance was the shortage of diagnostic and therapeutic resources, which were only sufficient to provide minimum basic services. The delivery of care focused on unscheduled demand and acute problems to the detriment of health promotion. Limited doctor involvement in patient tracking and collective activities is inconsistent with a broader approach to primary care in which doctors should play a key role [29, 30].

Service structure was an important factor influencing practices. Services were characterized by poor administrative support and financial resource shortages, with the latter being concentrated in the administrative center, resulting in the isolation of other areas of the health system and the prioritization of more immediate health problems. The Family Health Strategy was practically an extension of urgent care centers and small hospitals in the administrative center. The high demand for services with limited availability led to a care backlog, resulting in patient deterioration and the need for more complex interventions, exacerbating social determinants of health in RRMs, especially in more remote areas outside administrative centers in the Amazon. These findings are similar to those of Garnelo et al. [11].

Poor facilities and shortages of equipment and supplies are common in primary care services in poor countries, reflecting the peripheral position of primary care in health systems [7]. The delivery of effective primary care requires major and continuous investment. The high cost of primary care in rural and remote areas due to diseconomies of scale is a subject of debate around the world [31]. Brazil lacks specific policies to guarantee resources for the maintenance of primary care infrastructure and promote care models that address the specific challenges of providing health care in RRMs [5]. Furthermore, policies that seek to promote universal access to comprehensive primary care are threatened by power struggles in the country [18]. The development of professional guidelines for the Family Health Strategy and investment in professional training, particularly in RRMs, focusing on welcoming, health surveillance, responsiveness and individual and collective longitudinal care [18], is vital to rescue the broader concept of family care.

The psychosocial and community-based approach was weak. Doctors' attitudes were inconsistent with the understanding of health as a complex phenomenon that extends beyond the biological dimension [23], with professionals having a reductionist view of health, the patient and the family and community system.

Tentative psychosocial support actions were driven by national policies, with few doctors assimilating the purpose of mental health programs. The little they did in terms of intersectoral actions, planning or cultural competence was in response to external requirements.

Many doctors displayed an ambivalent attitude, with the experience of local living conditions often awakening a realization of the need for a more community-based approach. They also recognized relevant social determinants of health such as machoism and clientelism. However, the interviewees also displayed strong prejudice in relation to rurality and poverty and a posture that sought to maintain their status in the hierarchy and vertical relationships, which Santos [32] calls abyssal thinking.

The findings also show that, in addition to doctors having a generally biomedical background with limited community health skills, the shortage of doctors in RRMs was a determining factor in the adoption of a disease-centered and less community-oriented approach oriented towards the individual. Another aspect evident from the findings is that services tended to be centralized in administrative centers due to difficulties visiting more remote rural areas (long travel distances, poor transport and the need to remain in the clinic to cover shifts when other doctors are on their days off). Addressing health workforce shortages and improving the care organization model is therefore vital to incorporate the community-based approach into the everyday practice of doctors in remote rural areas.

The development of an expanded scope of practice is hindered not only by organizational constraints, but also the attitudes of professionals, who tend to focus on care at the individual level, often resulting in the maintenance and reproduction of social inequalities without addressing the underlying social determinants of health [33]. Although doctors were key actors in the health system in RRMs, apart from rare exceptions, they were not integrated into the community. According to Carroll et al. [34], the key enabler for re-orienting disease-centered remote acute care models is integration and community participation.

Implications for education and policies

It is important to highlight two key elements to expand the scope of practices and promote the integration of doctors in PHC in RRMs. The first is the urgent need for medical training in primary care at different levels, with curriculum content and practices that are specific to the rural context. Promoting family and community medicine at national level, anchored in the principles of the Alma-Ata Declaration and person-centered care based on the attributes described by Starfield [13], would be step forward [16, 27]. However, it is important to ensure that family and community medicine is oriented towards the public health system, given that the private sector is playing an increasing role in this medical specialty [18].

In this respect, it is important to create policies that provide incentives for residency programs and specialty training in family and community medicine for students and professionals from rural areas, considering the challenges in retaining doctors from outside RRMs. Additional training provided by the Brazilian Society of Family and Community Medicine in rural medicine and broader residency programs [14] are key elements that contribute to improving training oriented towards rural populations. It is also important to develop training proposals that favor the accumulated knowledge of professionals who deal with remote rural areas on a daily basis, promoting training with and for these professionals based on the practices they develop in rural areas to promote the decolonization and ecology of knowledge [32].

The second element is the need to develop family health care models that are specific to rural and remote areas, together with the development of a health workforce provision and career plan that considers the specific features of primary health care in RRMs [5, 12]. Our findings also reveal the need to strengthen career pathways to provide job stability, an attractive and fair salary and working conditions, and value rural health workers, with working arrangements cutting across all three levels of government (municipal, state and federal) in order to address the problem of limited resources at local level and clientelism.

Even with these plans, remote rural areas require the ongoing emergency provision of health workers, demanding mechanisms that ensure an adequate supply of doctors in primary care services and other areas of the health system, with the strategic participation of state and regional health authorities. The once far-reaching More Doctors Program model consisting of three core elements (emergency provision – including foreign health workers with expertise in primary care – training and infra-structure improvements) should be readopted [18, 19].

Limitations and open perspectives

Study limitations include the use of a national sample, meaning it was not possible to assess regional approaches and patterns, which warrant further research. The diverse range of geographical, sociocultural, family and local and regional health system contexts pose specific challenges for medical practice in primary care services in RRMs. Future research should consider the perspectives of other

actors, including health managers, nurses, community health workers and patients to complement analyses of practices in primary care services in RRMs.

The findings of this study revealed that doctors working in RRMs generally had limited experience and that care was limited in scope, focused on the individual and disease-centered, reinforcing the notion of selective primary health care. However, it is important to highlight that this does not detract from the important role these doctors play in health care delivery in these areas. The findings point to the need to promote an expanded scope of practice in PHC delivery, requiring major public investment in the promotion of training and strengthening of career pathways in the SUS, particularly in remote rural areas.

Abbreviations

PHC	Primary Health Care
FHS	Family Health Strategy
SUS	Unified Health System [*Sistema Único de Saúde*]
RRM	Rural and remote municipality

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Author contributions
CMF and LG participated in the conceptualization, design of the study, analysis and interpretation of data. CMF, LG, PFA and MCRF participated in the acquisition of data. CMF wrote the original draft. The paper was edited and reviewed by CMF, LG, PFA, MCRF. All authors have read and approved the manuscript.

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Data availability
Data are available on request due to privacy restrictions. The datasets generated and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate
All methods and procedures were carried out in accordance with the Declaration of Helsinki. Ethical and the approval was obtained from the Human Research Ethics Committee of the Sergio Arouca National School of Public Health, the Oswaldo Cruz Foundation (Approval No. CAAE92280918.3.0000.5240/ Opinion No 2.832.559). All participants provided written informed consent and all procedures were followed in accordance with the ethical standard of Sergio Arouca National School of Public Health.

Consent for publication
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The authors declare no competing interests.

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