

Community health workers' attitudes, practices and perceptions towards the COVID-19 pandemic in Brazilian low-income communities

Nilson do Rosário Costa^a, Hugo Bellas^b, Paulo Roberto Fagundes da Silva^a, Paulo Victor Rodrigues de Carvalho^{c,*}, Deborah Uhr^d, Cristine Vieira^a and Alessandro Jatobá^b

^a*Escola Nacional de Saúde Pública Sergio Arouca - ENSP, Fundação Oswaldo Cruz – FIOCRUZ, Rio de Janeiro, RJ, Brazil*

^b*Centro de Estudos Estratégicos, Fundação Oswaldo Cruz – FIOCRUZ, Rio de Janeiro, RJ, Brazil*

^c*Instituto de Engenharia Nuclear – IEN, Comissão Nacional de Energia Nuclear – CNEN, Rio de Janeiro, RJ, Brazil*

^d*Universidade Federal Rural do Rio de Janeiro, Rio de Janeiro, RJ, Brazil*

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Abstract.

BACKGROUND: Community Health Workers (CHW) are a category of social workers described in many countries' health systems as responsible for engaging people in their residences and communities, and other non-clinical spaces to enable access to health services, especially in low-income areas. These professionals have been exposed to numerous new risks during the COVID-19 pandemic.

OBJECTIVE: This study describes how the COVID-19 pandemic is perceived by CHWs who work in poor communities or slums in Brazil.

METHODS: We conducted an online survey with a random sample of 775 CHWs operating in 368 municipalities of the 26 Brazilian states. At a confidence level of 95%, results of the survey were subject to a maximum sampling error of 4%.

RESULTS: Our data indicate that the negationist agenda increases the challenges to the performance of CHWs within low-income communities, preventing the consensus on the necessity of social distancing, business closures and other measures to face the COVID-19 pandemic.

CONCLUSION: The pandemic imposes unexpected challenges on the usual modes of interaction of public health officers with poor communities. This study provides evidence that these challenges have been ignored or minimized in Brazilian policy prescriptions for primary care in the face of the COVID-19 pandemic.

Keywords: Primary health care, social distancing, sociocultural territory

1. Introduction

Despite some particularities, Community Health Workers (CHW) are described in many countries' health care frameworks as responsible for engaging people in their residences and communities, and other non-clinical spaces in order to enable access to health

*Address for correspondence: Paulo Victor Rodrigues de Carvalho, D.Sc., Instituto de Engenharia Nuclear – IEN, Comissão Nacional de Energia Nuclear – CNEN, Rio de Janeiro, RJ, Brazil; E-mail: paulov@ien.gov.

37 services, especially in low-income areas [1–4]. The
38 Brazilian National Primary Care Policy highlights the
39 role of the CHWs in performing house calls, promo-
40 tion of health, data collection on health conditions
41 of communities, and active epidemiological surveil-
42 lance [5, 6].

43 The role of CHWs in the framework of Primary
44 Health Care (PHC) is of paramount importance, espe-
45 cially during events that pose pressure over the health
46 system, such as outbreaks, e.g. Dengue, Yellow Fever,
47 Chikungunya, and Zika, H1N1 and more recently,
48 COVID-19. Moreover, CHWs are important in edu-
49 cating the population about measures to mitigate the
50 risk of poor communities becoming massive disease
51 dissemination hotspots [7].

52 The uncontrolled trajectory of the new Coronavirus
53 in Brazil has led to wide concern due to the lack
54 of consensus on how to manage the pandemic in a
55 scenario of negationism of the seriousness of the dis-
56 ease from the government. Still, little is known about
57 how the Brazilian government's erratic conduct has
58 impacted the feasibility of public agents' activity and
59 the adherence of the population to social distancing
60 measures.

61 The Brazilian unified health system (SUS) was cre-
62 ated as a decentralized system, with a pact between
63 the Federal, state, and municipal governments that
64 organized roles and responsibilities and promoted
65 PHC [8]. However, with COVID-19, the federal
66 government has threatened to disqualify the pan-
67 demic prevention measures recommended by some
68 regional and municipal governments, especially the
69 ones related to social distancing and business clo-
70 sures. The Brazilian Supreme Court had to intervene,
71 ratifying the authority of local governments in
72 deciding on isolation, social distancing, and quar-
73 antine, and business closures, rejecting the Federal
74 Executive's attempt to centralize such decisions
75 [9].

76 Prior to the COVID-19 pandemic, coordinated
77 action among the state entities enabled the breadth
78 and effectiveness of PHC in Brazil. Since 1994,
79 as part of Brazil's Family Healthcare Strategy
80 (FHS), municipal governments have offered eco-
81 nomic incentives to doctors who choose to pursue
82 primary care, expanding the provision of health ser-
83 vices and reducing dependence on hospital care. Such
84 policies that support PHC nationally changed how
85 healthcare is funded and delivered, in addition to
86 affecting care practices [10].

87 The growth of the number of CHWs in Brazil is
88 associated with the public health sector's focus on

89 local, decentralized, PHC. Under the FHS, PHC is
90 delivered by multidisciplinary teams, formed with a
91 doctor, a nurse, an orderly, and four to six CHWs.
92 CHWs are the interface between the health team
93 and the population. They organize disease preven-
94 tion and health promotion activities, register patients,
95 provide guidance on the use of services, and conduct
96 house calls to identify high-risk situations. CHWs
97 are recruited among the residents of the community,
98 must be at least elementary educated, 18 years old,
99 and work full-time [11–13].

100 Before recent changes in the Brazilian primary
101 care policy, each FHS team was responsible for a
102 geographical area encompassing 600 to 800 families
103 [13]. CHWs were typically employed as public ser-
104 vants or hired by third sector organizations [11, 12,
105 14]. However, in 2017, when the Ministry of Health
106 published a new policy for PHC with the agreement of
107 state and municipal governments, the presence of the
108 CHW on the PHC team became no longer mandatory
109 [11].

110 Regarding major challenges faced, the litera-
111 ture points out that despite usually living in the
112 area under the responsibility of their primary care
113 clinics, CHWs are not trained to handle highly
114 complex social concerns. Residents of low-income
115 communities in Brazil are typically affected by vio-
116 lence, drug traffic, precarious housing and hygiene
117 conditions, and extreme poverty [15]. Such social
118 complexity is likely to lead to a high incidence
119 of exhaustion and mental disorders among CHWs
120 [14]. Furthermore, CHWs dedicate a large portion
121 of their time to bureaucratic tasks, such as organizing
122 medical records, recording weights during medical
123 appointments, preparing facilities for activities, and
124 organizing queues, leaving behind their role as health
125 educators and promoters.

126 However, even though limited by such difficul-
127 ties, CHWs could still potentially enhance adherence
128 to social distancing in low-income communities.
129 Márcia Castro, for example, recalls that faced with
130 the evident failure to control the pandemic by
131 the end of May 2020, "CHWs could have been
132 employed to identify and isolate infected residents
133 in low-income communities" [16]. Likewise, accord-
134 ing to the Oswaldo Cruz Foundation technical report,
135 CHWs could identify potential cases and their rela-
136 tions and, if possible, contacts they had in the previous
137 14 days, in order to recommend quarantine and
138 other measures to reduce the spread of COVID-19
139 within poor communities. Similarly, CHWs could
140 collect information on how to contact residents

141 via phone and Internet to organize “online visits”
142 [17].

143 Notably however, there are certain barriers to
144 putting CHWs in these roles. In addition to the com-
145 plexity of delivering health to residents in low-income
146 communities in Brazil, there is a political barrier, that
147 the Brazilian Federal government does not
148 consider the COVID-19 pandemic to be an extreme
149 risk event [18].

150 The negationism of the government hinders pub-
151 lic perception of the risk of the pandemic. It therefore
152 weakens the initiatives of state and municipal govern-
153 ments, and populations concerning social distancing.
154 By identifying social distancing as the primary cause
155 of Brazil’s economic problems, negationism mini-
156 mizes the impact of the pandemic on people’s long
157 term health conditions, as risk is determined not
158 only by individual decision-making, but also by col-
159 lective perception of danger and societal dynamics
160 [19].

161 As an additional element that weakens social mobi-
162 lization, it is worth noting that the lack of scientific
163 consensus within the biomedical field on how to con-
164 trol the pandemic, which also enforces negationism.
165 Strictly pharmacological intervention (vaccines and
166 antivirals), which is typically the biomedical cor-
167 nerstone during epidemics, has not been effective
168 in controlling the spread of SARS-CoV-2 or reduc-
169 ing its lethality so far. As observed worldwide, it
170 is up to national governments to implement non-
171 pharmacological solutions that rely on individuals
172 voluntarily adhering to social distancing and business
173 closures.

174 Importantly, the majority of the Brazilian public
175 health community recognizes that delayed adoption
176 of social distancing influenced the rapid spread of
177 SARS-CoV-2 in Spain, Italy, the United Kingdom,
178 France, and the United States. Therefore, Brazilian
179 public health experts endorse and recommend social
180 distancing measures. This consensus may not exist
181 among CHWs, likely due to conflicting sources of
182 information, some of which deny the importance of
183 social distancing measures for controlling the pan-
184 demic.

185 The present work describes how the COVID-
186 19 pandemic is perceived by CHWs who work in
187 poor communities or slums in Brazil as members of
188 the PHC team in the public sector. This study fol-
189 lows an observational and exploratory design, and
190 focuses on understanding the social dynamics of the
191 COVID-19 pandemic within low-income communi-
192 ties.

193 2. Material and methods

194 We followed the “snowball” procedure [20] to
195 distribute a cross-sectional survey to CHWs who
196 reported working in slums. First participants were
197 contacted using a database from a previous research
198 study [15] and were encouraged to share the question-
199 naire with other colleagues. The research included
200 a random sample of 775 CHWs operating in 368
201 municipalities in the 26 Brazilian states. At a confi-
202 dence level of 95%, results of the survey were subject
203 to a maximum sampling error of 4%. The question-
204 naire was adaptable to different screen formats to
205 enable its completion and distribution in different
206 mobile devices.

207 While the survey was online – from May 25 to
208 June 17, 2020 – cases of COVID-19 were mostly
209 community-based, i.e. result of community spread,
210 as opposed to being imported from outside Brazil
211 [21].

212 The research used the terms “slums” and “low-
213 income communities” as synonyms, following their
214 recommended usage in the Brazilian literature [22].
215 Thus, the participant sample included CHWs who
216 self-reported working in “slums and low-income
217 communities”.

218 Notably, in many situations, the use of the term
219 “slums” to designate an area with precarious hous-
220 ing is considered to be pejorative and stigmatizing
221 [23]. Moreover, as Perlman points out, there is no
222 consensual definition for “slums” by public agen-
223 cies and literature. She also argues that it is difficult
224 to precisely estimate the number of residents in a
225 “slum”. However, the author states that a slum can be
226 described as an area inhabited by low-income indi-
227 viduals who perceive themselves as stigmatized and
228 distrust public agencies. In a highly socially unequal
229 country like Brazil, the residents of slums are highly
230 affected by unemployment, lack of political represen-
231 tation, and lack of protection against criminals [24].

232 Leeds and Cavalcanti also point out that the unique-
233 ness of the slums as an urban area in Brazil lies in the
234 fact that they constitute “areas of natural growth,”
235 i.e. they develop unrestrictedly by the institutional
236 regulation of formal cities [23].

237 The collected data included a demographic profile
238 of the participants and their perceptions regarding
239 their own working conditions in the slums, as well
240 as on the receptivity of residents to social distancing
241 measures. We used the perception of safety of CHWs
242 activity in the context of the COVID-19 pandemic at
243 the time of the research, as an explanatory variable to

Table 1

Respondent Profiles and Status of CHWs During the Covid-19 Pandemic in Brazil ($n=775$)

Variable	%	Confidence interval (95%)
Gender		
Female	84	[81; 86]
Male	16	[13; 19]
Schooling		
Completed High School	65	[61; 68]
Completed Higher Education	30	[27; 33]
Completed Middle School	6	[04; 08]
Age		
Equal to or less than 32 years old	10	[08; 12]
41 years or older	50	[46; 54]
50 years or older	20	[17; 23]
Time in the profession		
Works as CHA for 13 years or more	50	[46; 54]
Works as CHA for 20 years or more	20	[17; 23]
Conditions during the COVID-19 pandemic		
Unit working normally	67	[64; 70]
Current salary	96	[94; 97]
Goal of the unit unchanged	27	[24; 30]
Conducted home visit in the last 14 days	76	[73; 79]
Received training to guide social distancing and individual hygiene	34	[30; 37]
The health unit provided personal protective equipment	61	[57; 64]
Cough, fever, tiredness, and shortness of breath in the last 14 days	18	[15; 21]
Feeling of being unsafe while working	87	[84; 89]

Table 2

Social mobilization, fear, and adherence to social isolation in the slums according to the perception of CHWs ($n=775$)

Variable	%	Confidence interval (95%)
Collective mobilization		
No	78	[75; 80]
Yes	22	[19; 25]
Population avoids contact with CHWs		
No	51	[47; 57]
Yes	49	[45; 52]
Fear of attending primary care clinic		
No	33	[29; 36]
Yes	67	[63; 70]
Level of adherence to social isolation		
Low	40	[36; 43]
Medium	46	[42; 50]
High	14	[11; 16]
Determinants of the decision of social isolation in slums		
Had to work	37	[33; 40]
Influence of television and radio	23	[20; 26]
Negationism	13	[10; 15]
Social media	12	[10; 14]
Influence of neighbors	7	[05; 09]
Fear of falling ill	6	[04; 08]
Influence of CHWs	2	[01; 03]

calculate the odds ratio (θ) categorical variables. The mathematical expression for θ for categorical variables is: $\theta = ((a * D) / (b * c))$. Results are reported with 95% confidence intervals.

3. Results

In recent qualitative studies that sample CHWs [11, 12], CHWs were predominantly female and most of them college-educated [11, 25] – despite the only education requirement for CHWs in Brazil is elementary education. Such studies also indicated that the age of CHWs is averagely between 40 and 45 years [25, 26]. As shown in Table 1, the sample of CHWs that participated in this study was predominantly female, with an average age of 43 years, consistent with previous studies. Circa fifty percent of the CHWs have been working as a CHW for more than 13 years. Two out of ten CHWs have been working as a CHW for more than 20 years.

We found that 76% of CHWs performed house calls in the 14 days prior to their response to the sur-

vey, although only a small proportion (34%) received training to advice patients on social distancing and individual hygiene, two important measures against COVID-19 infection.

During the data collection period, COVID-19 was already affecting the functioning of primary care clinics, as 61% of CHWs reported receiving personal protective equipment. A significant proportion of CHWs (18%) reported symptoms of COVID-19 (fever, tiredness, and shortness of breath) in the 14 days prior to their response to the questionnaire (Table 1). Moreover, 87% of participants claimed that they worked while feeling unsafe regarding their exposure to the disease, suggesting that perception of fear was common among CHWs, even though their primary care clinic reduced their assistance goals (only 27% of CHWs reported that the expectation for the accomplishment of assistance goals of their clinic remained the same as before the pandemic).

The majority of CHWs were pessimistic about the spontaneous mobilization of the residents of slums against COVID-19 (Table 2). Only 22% identified some type of collective actions among residents, and 14% indicated that adherence to social distancing was high or very high. On the other hand, 86% indicated that adherence to social distancing was non-existent, very low, low, or regular.

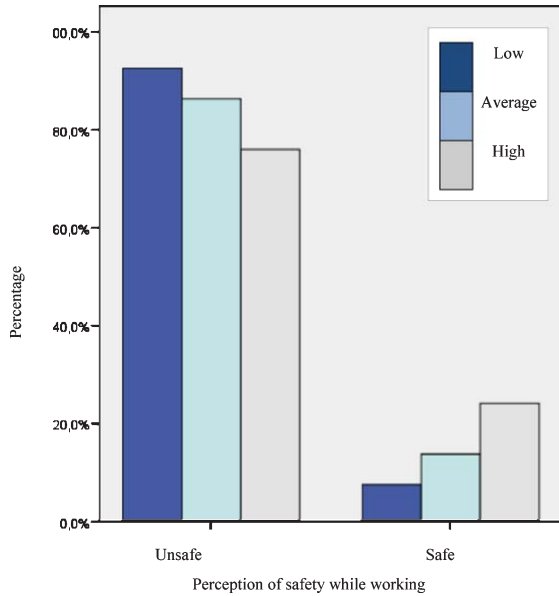


Fig. 1. Work insecurity and adherence of the slum population to social distancing; $n = 775$.

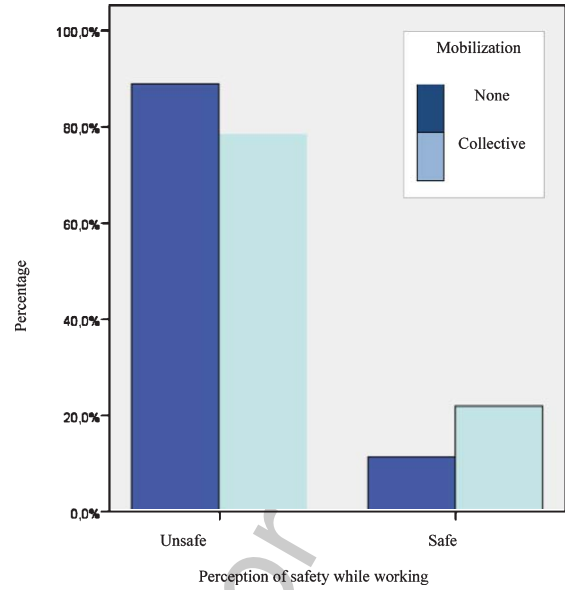


Fig. 2. Insecurity in the activity and collective mobilization of the population in the slums; $n = 775$.

291 The CHWs also claimed that fear regarding the
 292 COVID-19 pandemic was notably spread. Two out of
 293 three participants suggested that patients were afraid
 294 to attend the primary care clinic. Likewise, half of
 295 the informants report that the population had avoided
 296 interacting with them.

297 According to CHWs, the necessity to work, the
 298 influence of traditional media, negationism, and mis-
 299 information on social media are major causes of low
 300 adherence to social distancing. They also perceived
 301 that they have little influence on patient decisions
 302 concerning social distancing. Only 2% of respon-
 303 dents indicated that their counseling are influential
 304 to residents.

305 Figures 1, 2 and 3 show that the perceptions of
 306 being unsafe regarding their exposure to COVID-19
 307 infection among CHWs reduce when the population
 308 adhere to social distancing (Fig. 1) or mobilize spon-
 309 taneously (Fig. 2), or when they report receiving some
 310 kind of training on the measures to face COVID-19
 311 (Fig. 3).

312 Figure 1 shows that the CHWs' fear of getting
 313 infected while carrying out their activities is inversely
 314 proportional to adherence to social distancing. When
 315 adherence to social distancing is low, more than 90%
 316 of CHWs report feeling insecure; when adherence
 317 to distancing is moderate, the number is higher than
 318 85%, and when adherence to distancing is high, it
 319 drops below 80%.

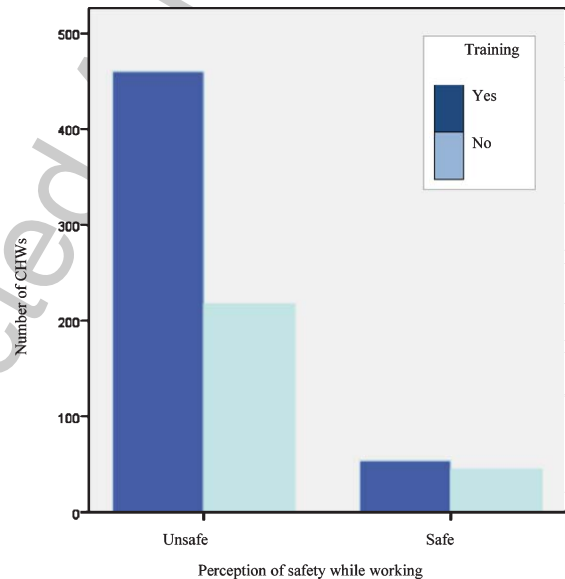


Fig. 3. Insecurity in the activity and training on the COVID-19 pandemic; $n = 775$.

320 The insecurity among CHWs in carrying out their
 321 activities was reduced proportionally when they per-
 322 ceived collective mobilization of the population in
 323 the slums against COVID-19 as high (Fig. 2). When
 324 there was no community mobilization, 85% of the respon-
 325 dents reported perceptions of insecurity, whereas

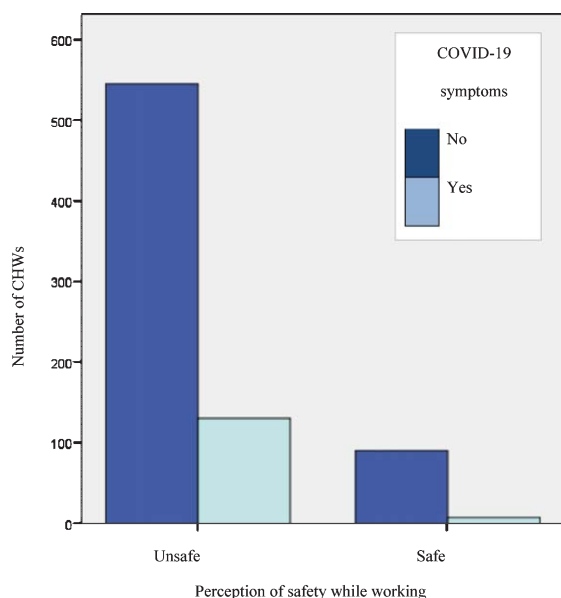


Fig. 4. Work insecurity and symptoms of COVID-19 in the last 14 days; $n = 775$.

when collective mobilization was present in the community, the number was below 80%.

On the one hand, based on CHWs' responses, when there was high collective mobilization among the population, the insecurity of CHWs to develop their activities decreased. However, the values were still quite high, suggesting an elevated degree of awareness among CHWs regarding the risks and consequences of getting sick.

Moreover, the insecurity regarding the possibility of getting infected while carrying out their activities was associated with training on how to handle the COVID-19 (Fig. 3). Among CHWs who received training, the perception of insecurity to perform their work activities was lower than in those who did not receive training. These results highlight the importance of disseminating information among CHWs about COVID-19 and social distancing measures.

We also found that the perception of safety when performing in slums was nearly zero among CHWs who reported cough, fever, tiredness, and shortness of breath in the 14 days prior to their participation in this study (Fig. 4).

Table 3 shows the results of odds ratio calculations in which the dependent variable is work insecurity during the pandemic. The probability that a CHW reports feeling insecure was 2.2 times higher when they perceived that the population was not engaged and 2.6 times higher when they perceived low adher-

Table 3

Odds ratio for the perception of insecurity of CHWs working in slums during the COVID-19 pandemic– Brazil. 2020

Condition informed or perceived by the CHWs	Odds ratio	Confidence interval
Noted that the population avoids contact	1,6	(1,2; 2,1)*
Had no training	1,9	(1,1; 2,7)*
Noted the lack of collective mobilization	2,2	(1,3; 3,7)*
Reports COVID-19 symptoms	2,4	(1,2; 4,3)*
Observed low adherence to social isolation	2,6	(1,2; 4,7)*

*P-value: 0.05.

ence to social distancing measures. We found that the perception of insecurity was significantly affected by whether the CHW perceives that the community avoids them, whether they have received training, and whether they have experienced COVID-19 symptoms.

4. Discussion

Confirming the findings of Lotta [27], this research shows CHWs are highly focused on street-level bureaucracy. The research offers insight into the possibilities and limitations of CHWs' contributions to public health in the context of the recent COVID-19 pandemic, which imposes unexpected challenges on the usual modes of interaction between public health officers and poor communities. This research provides evidence that these challenges have been ignored or minimized in policy prescriptions for PHC, especially regarding the handling of unexpected and adverse events.

Our data indicate that the negationist agenda of the federal, and eventually of state and municipal governments, increases the challenges to the performance of CHWs within low-income communities. The negationism of the federal government, in particular, prevented the consensus on the necessity of social distancing, business closures and other measures to face the COVID-19 pandemic [28].

In this scenario, it is inadvisable to think the pandemic in slums is an issue that only has local solutions. It is essential to consider how the lack of coordination of national, regional, and local initiatives impaired the society as a whole. By the time this research was conducted, slums have especially high rates of COVID-19 [29], evidencing the failure of public policy concerning the pandemic, tragi-

390 cally affecting the low-income population throughout
391 Brazil.

392 We showed that negationism also constrains the
393 activity of CHWs by discouraging spontaneous mobi-
394 lization in poor communities, thus making CHWs
395 feel unsafe in their profession and likewise making
396 residents feel afraid to interact with health profes-
397 sionals. It is noteworthy that most CHWs did not
398 receive training on the risks of COVID-19 from their
399 local or regional health departments. Thus, untrained
400 CHWs reported that they feel insecure when perform-
401 ing their tasks, even their regular ones, those unrelated
402 to facing the pandemic. Moreover, such avoidance
403 of residents in having contact with CHWs indicate a
404 crisis of confidence concerning the structure of the
405 health system on the primary care level.

406 Despite wide broadcast in the traditional media
407 regarding the need to provide personal protective
408 equipment for health professionals, 39% of CHWs
409 reported not receiving any kind of protective equip-
410 ment from their respective clinics, compromising
411 their safety and facilitating the transmission of the
412 new Coronavirus among them and residents. The
413 risks associated with this lack of provision are evi-
414 dent when two out of ten CHWs reported symptoms
415 of COVID-19 infection. Additionally, the majority
416 of symptomatic CHWs reported having performed
417 house calls either way.

418 Current evidence shows that SARS-CoV-2 is trans-
419 mitted through close contact between people. The
420 World Health Organization (WHO) recommends the
421 use of personal protective equipment, not only for
422 professionals who deliver healthcare services in clin-
423 ics, but also for those who deliver home care.
424 According to the WHO, health professionals who
425 treat patients with COVID-19 should always take pre-
426 cautions while in further contact with other people
427 [30–33]. In fact, different kinds of organizations also
428 present difficulties in protecting their workers from
429 the new Coronavirus [34].

430 Although the use of personal protective equipment
431 (PPE) is the most common precaution to prevent
432 infection, other additional precautions may protect
433 health workers and their patients against SARS-CoV-
434 2, such as social distancing and systematic personal
435 hygiene. We showed that only 34% of CHWs received
436 training to advise on the prevention of COVID-
437 19 during home visits. Moreover, once adequately
438 trained, they can educate residents about personal
439 hygiene and cleanliness of the surfaces and possi-
440 bly convince residents that it is important to stay
441 home.

442 Research has suggested that CHWs can provide
443 health surveillance during the pandemic, given their
444 direct interactions with the community's residents.
445 However, holding CHWs accountable for health
446 surveillance should be carried out with caution, as
447 collecting patients' private information is not on the
448 job description of CHWs [35].

449 It is worth remembering that, in the context of
450 the pandemic, the possibility of CHWs interference
451 in the conduct of the population about social dis-
452 tancing is reported in this research as quite low.
453 The low level of education among residents of these
454 communities associated with a large number of unem-
455 ployed and informal workers poses a challenge to
456 wide adherence to social distancing measures, espe-
457 cially while coping with negationist governmental
458 authorities.

459 Four out of ten CHWs perceive that slum residents
460 encounter difficulties in adhering to social distanc-
461 ing because of their need to work. The low coverage
462 of the national income transfer policy, i.e. a federal
463 program to provide economic relief to low-income
464 families, hampers the adherence to social distancing
465 in communities [15, 36, 37]. Loss of income poses
466 difficulties to buy food and other essential goods. The
467 search for informal labor contributes to the circulation
468 of people in the slums, making them particularly vul-
469 nerable to the spread of the new Coronavirus. It is also
470 worth remembering that the poor housing conditions
471 in these communities make it difficult for residents to
472 stay indoors.

473 It is therefore unsurprising that CHWs perceive
474 that social mobilization and adherence to social dis-
475 tancing in slums are minimal. However, this research
476 indicates that when CHWs perceive that there is
477 social mobilization in the community, it significantly
478 reduces their perception of insecurity and fear as they
479 perform their duties.

480 The main limitation of this study concerns the
481 implicit bias in the snowball sampling method. How-
482 ever, the snowball sampling procedure appeared
483 adequate for this study, as the progression of the
484 COVID-19 pandemic hampered the explicit recruit-
485 ment of CHWs. Besides, participants with more
486 connections are more likely to be selected in this
487 sampling approach enhanced the size of the sam-
488 ple. We minimize the bias limitation by extending the
489 data collection period in order to recruit more partici-
490 pants, enabling the sample to be balanced to represent
491 as most regions as possible. Bias was also mitigated
492 as the initial recruiting was randomly made from an
493 existing CHW database comprising the entire CHWs

494 that works in Rio de Janeiro territories, and not from
495 already known agents.

496 5. Conclusions

497 It is possible to conclude that the activities of
498 CHWs in slums during the COVID-19 pandemic
499 present the same complexities that existed before the
500 pandemic, although at a higher level. Transforma-
501 tions of the organization of work and in the work
502 environment affect the workers' perception of inse-
503 curity. The areas where CHWs work are usually
504 marked by constant demographic transformation, a
505 usually high spread of infectious diseases, and a high
506 prevalence of chronic conditions. These dangerous
507 conditions grew stronger during the pandemic, which
508 put even more pressure on the health system, and con-
509 sequently, on the CHWs, who act on the front lines
510 of this complex system.

511 Mass dissemination of information on the extreme
512 risk of COVID-19 in social networks and traditional
513 media could favor receptivity to the work of the
514 CHWs and increase adherence to social distancing
515 in the slums. However, promoting social distancing
516 is not part of the Federal Executive's agenda, even
517 though SARS-CoV-2 has strongly affected Brazilian
518 low-income communities.

519 CHWs are paramount in primary care frame-
520 works in developing countries. Their work within
521 communities varies from advocacy for primary
522 care, socio-economic research, socio-environmental
523 research, and assistance. Therefore, they are espe-
524 cially exposed to harmful situations. However, the
525 COVID-19 pandemic has increased the tensions to
526 which these workers are exposed.

527 This research highlights important aspects con-
528 cerning not only work conditions of CHWs, but
529 also the precarious conditions of the communities
530 where they perform. Thus, this papers contributes to
531 healthcare managers and providers in order to miti-
532 gate aspects that hamper the effectiveness of primary
533 health care in poor communities, improving the qual-
534 ity of health services.

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541 Conflict of interest

542 The authors have no conflicts of interest to declare.

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