**ORIGINAL PAPER**

# Effects of Urban Violence on Primary Healthcare: The Challenges of Community Health Workers in Performing House Calls in Dangerous Areas

Hugo Cesar Bellas[1] · Alessandro Jatobá[1] · Bárbara Bulhões[2] · Isabella Koster[3] · Rodrigo Arcuri[4] · Catherine Burns[5] · Kelly Grindrod[5] · Paulo Victor R. de Carvalho[6]

## Abstract
Community health workers in developing countries usually perform house calls in degraded and violent territories. Thus, in this paper we study the effects of urban violence in the performance of CHWs in poorly developed territories, in order to understand the challenges of delivering care to dangerous communities in developing countries. We conducted telephone surveys for 5 months in 2017, within a systematic sample of 2.000 CHWs based on clinics distributed along the health regions of the city of Rio de Janeiro, Brazil. We completed 766 interviews, approximately 40% of the sample, 86% man and 14% women. Most participants are 30 to 39 years old (35%), followed by 27% of 40 to 49 years old participants. As CHWs work on the sharp end of the healthcare system, responsible for outreaching, community education, counseling, and social support, our study presents contributions to government and management levels on working conditions inside communities, constraints in assistance, and difficulties in implementing primary care policies.

**Keywords** Community health workers · Primary health care · House calls · Exposure to violence

## Introduction

The Declaration of Alma-Ata [1, 2] is a milestone for implementation and institutionalization of the role of the Community Health Worker (CHW) in most countries, proposing to expand what it termed "primary health care" to vulnerable communities and to balance the triad of poverty, inequality, and community health [3–5]. As defined by this document, "primary health care" involves, in addition to the health sector, all aspects of national and community development. This is a more expansive definition than the term often encompasses. In fact, the Alma-Ata Declaration states that primary health care "relies, at local and referral levels, on health workers, including physicians, nurses, midwives, auxiliaries and community workers as applicable, as well as traditional practitioners as needed, suitably trained socially and technically to work as a health team and to respond to the expressed health needs of the community [2]."

CHWs have been recognized as key agents in expanding primary care throughout the world, particularly in economically disadvantaged nations [6]. Currently, there are more than 5 million CHWs active in more than 180 countries. Although their job descriptions vary, common characteristics of their work involve activities outside of health facilities, engaging directly with people in their homes, neighborhoods, communities, and other nonclinical spaces [7]. However, as noted by Singh and Sullivan [6], the deployment of CHWs must be "evidence-based, community responsive, and context specific".

✉ Alessandro Jatobá
alessandro.jatoba@fiocruz.br

1   Centro de Estudos Estratégicos, Fundação Oswaldo Cruz – FIOCRUZ, Rio de Janeiro, RJ, Brazil

2   Instituto de Medicina Social, Universidade do Estado do Rio de Janeiro - UERJ, Rio de Janeiro, RJ, Brazil

3   Escola Nacional de Saúde Pública Sergio Arouca - ENSP, Fundação Oswaldo Cruz - FIOCRUZ, Rio de Janeiro, RJ, Brazil

4   Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ, Brazil

5   University of Waterloo, Waterloo, ON, Canada

6   Instituto de Engenharia Nuclear - IEN, Comissão Nacional de Energia Nuclear, CNEN, Rio de Janeiro, RJ, Brazil

Of concern is the deployment of CHWs in settings where high crime rates affect quality of life [8–10]. Low-income communities in "third-world" countries are quite often affected by urban violence, typically as a result of criminal activity such as drug trafficking, gunfire, robberies, etc. [11, 12]. These communities commonly experience significant social marginalization. Thus, despite the good intentions behind programs that extend social services into these neighborhoods through home visits and other site-based services, doing so also exposes CHWs (and, secondarily, their vehicles, computers, etc.) to dangerous conditions [13–15].

In this study, we explore the kinds of services provided by CHWs during house calls in poorly developed areas, in order to better understand the effects of urban violence on their working conditions. We believe this study contributes to the development of best practices, as can be informed by a better comprehension of contending with potential danger while delivering neighborhood-based social assistance. This work can support policymakers and local administrations in developing policies geared toward improving social services in these regions.

We conducted structured telephone surveys with 766 CHWs, sampled representatively from those districts in Rio de Janeiro, Brazil, where urban violence and crime rate indicators have consistently been quite high over the past few decades. These are districts that have become increasingly difficult for authorities to manage in terms of law enforcement [16–18].

This article is divided into six sections. Following this introduction, we provide some contextualization on the role of CHWs. In "Methods", we present our methods. In "Results and Discussion" we show our results and discuss them. Finally, in "Conclusion", we present our conclusions.

## The Role of Community Health Workers

Despite the difficulties in formulating a common understanding of CHWs' role across quite different realities around the world, it is possible to identify common aspects of their practices: (a) their status as members of the communities where they work and thus strong identity ties to those whom they assist; (b) conducting interventions in the areas of health education, disease prevention, and data collection; and (c) promoting existing health care services within vulnerable, low-income populations [3, 19–21].

In Canada and the US, CHWs are responsible for promoting equity in access to healthcare, focusing on vulnerable populations such as low-income, elderly, migrants, and indigenous communities. However, although their identity ties with their communities help understanding, connecting, and committing to health promotion in contexts of socioeconomic deprivation, this also entails marginalization of

the workforce itself—thus hampering their ability to perform their role within the health system [22]. Furthermore, there also is some uncertainty concerning their actual role within that health system, given their low wages and limited training [23]. A similar scenario exists in developing countries such as South Africa, India, and Brazil [24–26].

With these issues in mind, the Declaration of Alma-Ata defined the delivery of what was termed "primary health care." This declaration served as an early basis for the development, within the Western hemisphere (e.g., Brazil, Guatemala, Nicaragua, Honduras, Peru, and other nations), of large-scale CHW programs in the 1970s and 1980s. In Brazil, the role of the CHW was created in June 1991 through implementation of the Community Health Workers' Program by the Brazilian Ministry of Health. This initiative established that CHWs should be recruited from within the communities they would serve. In so doing, the aim was to promote a positive impact on quality of life and health education, with a focus on maternal and childhood health and acting as a link between people's health care needs and the improvement of living conditions in vulnerable and poor communities [27, 28].

In 1994, the Community Health Workers Program was reformulated and integrated into the Family Healthcare Programme. In 1996, this became the Brazilian Family Healthcare Strategy. In 2006, the Family Healthcare Strategy served as the basis for the Brazilian Primary Health Care National Policy [29]. This policy adds new assignments to CHWs' function (e.g., following up on appointments for patients with chronic conditions such as diabetes and hypertension; control of infectious diseases such as tuberculosis and Hansen's Disease; and actions for health education and health promotion).

It is important to note that, in Brazil, the profession of CHW was formally created only as of 2002. Minimum requirements for entering the profession are: (a) an elementary school education level; (b) residence established within the community served; and (c) completion of the basic qualification course for CHWs. The CHW's weekly schedule, per regulations, should comprise a maximum of 40 h; as well, recruitment should be undertaken directly by municipalities. In January 2018, a new policy was published increasing the set of assignments as well as the minimum admission requirements for CHWs.

In Brazil, CHWs' salaries are close to the Brazilian minimum wage. In addition, CHWs are entitled by law to a hazard exposure compensation equivalent to an additional 30% increase in salary. Still, their total wage remains below that commonly paid to CHWs in other developing countries. In addition, CHWs in Brazil face significantly adverse working conditions [14, 30, 31].

These various policy reformulations illustrate the attention the Brazilian legislature has given in recent times to

professionalization of the CHW program. The reforms reflect acknowledgment—not only of these service providers' impact in delivering social and healthcare services to vulnerable communities—but also their relevance within the Brazilian Family Healthcare Strategy.

## Methods

A trained interviewer began the structured telephone interview by collecting the CHW's profile, including information on his/her experience and education. Following that, the interviewer asked the participant four questions on how urban violence interferes with the provision of primary care (or not). Participants were asked to respond to each question using a scale from "No interference" to "Excessive interference." In particular, the interviewer focused on the respondent's experience of violence in the following areas: (a) the CHW's relationships with his/her client population; (b) how the CHW maintains patient information; (c) how the CHW accomplishes his/her quota of house calls; (d) how the CHW schedules and performs emergency actions. Questions were preceded by control questions, that is, participants had to confirm that violence interferes in some form or fashion with performance of their job duties before answering the corresponding questions. In addition, we asked participants about how violence interferes with his/her ability to perform daily activities and whether he/she considered violence to be a major cause of distress. These final questions used a five-option scale, from "Strongly agree" to "Strongly disagree".

### Research Design

As of April 2017, Rio de Janeiro had 4871 registered CHWs (almost 2% of the approximately 260,000 registered CHWs in Brazil). The sample thus estimates a sampling error of 2% and a significance of 95% in a population of 4871 CHWs. Based on such parameters, the minimum required sample size was 1300. The estimated loss was approximately 30%, mostly comprised of refusals and missing data due to registration failures. The final sample consisted of 2000 CHWs. Each participant's contact information is in the records of the Brazilian National Registration of Healthcare Organizations (maintained by the Ministry of Health), and their identities are kept in secrecy.

As the primary healthcare clinics in Rio de Janeiro are distributed across districts, we aimed for a sample that represented all districts in the city. In order to ensure that all districts were represented in the sample, we carried out implicit stratification of the units in their respective districts and chose CHWs by systematic sampling. Computer Assisted Telephone Interviews (CATI) with the sampled CHWs took place from May to September 2017. Interviewers underwent a 4-h training led by the research team in order to understand the research settings, aims, and data collection procedures.

Pretesting occurred with a random sample of 30 CHWs, across 7 days, in order to assess methodological aspects such as the structure of the questionnaire, time spent in surveying, language aspects, the feasibility of analysis methods, etc.

## Limitations

Results are limited to the quality of CHWs' contact information available in the Brazilian National Registration of Healthcare Organizations. In order to increase the likelihood of reaching participants, the research team contacted clinics and asked their managers to update information on their working CHWs.

## Results and Discussion

Of the 30 CHWs who were identified to be invited to the pilot survey, 13 completed the survey, 5 had inaccurate contact information, and 12 could not be reached or could not participate during the term of pilot testing. No changes to the survey were needed after piloting, but it was useful for anticipating challenges in reaching CHWs and identifying the need to build awareness of the study among the CHW communities and networks.

Of the first sampling of 1300 CHWs, 338 were prevented from participating by the clinic where they were based. Of the remaining 962 CHWs in the sample, 385 (40%) were excluded, either due to inaccurate contact information, unanswered calls, or because the CHW did not wish to participate. A second sample of 700 CHWs was identified, of which 168 were prevented from participating by their clinic and 280 provided inaccurate contact information, failed to answer calls, or declined to participate. As a result, we had a total of 766 completed interviews, which represents approximately 40% of the original sample. It included 86% women and 14% men. Thirty-five percent of participants were 30 to 39 years old; 27% were 40 to 49 years old. Further, 86% of participants stated that they did not undergo any professional training to work as a CHW.

Table 1 shows that 64% of interviewees agreed that urban violence prevents them from performing their daily activities in their assigned territory. Moreover, almost 70% reported that urban violence is a major cause of emotional distress, 28% reported experiencing "excessive interference" from urban violence in their mental health, and 17% expressed "strong interference."

In addition, approximately 40% of CHWs interviewed (296 in total) stated that they faced difficulties in maintaining patient data (registering new patients and keeping patient data current). Table 3 presents these findings. It shows that

**Table 1** Urban violence prevents CHWs from performing in the territory

|  | Constraints to daily activities in the territory | | Violence is the major cause of emotional distress | |
|---|---|---|---|---|
|  | # | % | # | % |
| Strongly agree | 350 | 46 | 340 | 45 |
| Agree | 139 | 18 | 125 | 16 |
| Disagree | 48 | 6 | 82 | 11 |
| Strongly disagree | 182 | 24 | 58 | 8 |
| Indifferent | 47 | 6 | 154 | 20 |
| Total | 766 | 100 | 759 | 100 |

approximately 34% claimed "Excessive interference" of urban violence in maintaining patient data. An additional 30% reported "Strong interference" or "Interference" from potential violence as a constraint against fully completing patient registrations.

Another finding in this study concerns complaints by patients about scheduled procedures and assistance in emergencies. Results showed that 86% (624) of CHWs receive constant complaints from patients concerning the quality of assistance during emergencies and/or problems in scheduled medical procedures. Table 2 displays data that support these findings: more than 30% CHWs claim "Excessive interference" by the threat of violence as a reason for problems performing scheduled procedures and assisting in emergencies. A full 18% reported "Strong interference" on this item.

Concerning the accomplishment of goals in performing house calls, approximately 52% of participants stated that it was difficult for them to spend sufficient time with their entire caseload of families. Table 2 displays the amount

of interference they attributed to urban violence as a factor preventing them from providing adequate house calls within their territory. The majority of participants (almost 60%) reported "Excessive," "Strong," or "Slight" interference from violence in accomplishing their quota of assigned house calls.

With respect to their relationship to the community they serve, 35% of participants stated that urban violence does not affect the positive relationship between the community and the healthcare system. However, 24% of participants claimed "Interference," 13% claimed "Strong interference," and 5% claimed "Excessive interference."

In Table 3, we provide a summary of the analysis of participant perceptions regarding the influence of dangerous conditions on their daily performance and participant profile (i.e., formal training, additional courses related to the profession, and total years of education).

We can see in Table 3 that, among the participants who strongly agree that violence affects their daily work, more than 80% did not undergo any kind of training to work as a CHW. Yet, as discussed briefly above, there are regulations regarding the profession. These include specific courses of training as the minimum requirement for serving as a CHW. Among the participants who underwent training, 42% reported that danger in their assigned territory was a big issue for them on a daily basis. Moreover, among the CHWs who underwent other courses, 43% strongly agreed that violence affects their daily work.

Regarding education, among the participants who strongly agreed that violence was an issue for them, the majority of participants were high school graduates. The ones who strongly disagreed were primarily high school graduates. Among the CHWs with a college degree, 58% strongly agreed that violence affected their daily work.

**Table 2** Frequencies

|  | Interference of violence in maintaining patient data | | Interference of urban violence in performing scheduled procedures and assisting emergencies | | Interference of violence in the accomplishment of patient visiting goals | | Interference of violence in the relationships between healthcare professionals and the community | |
|---|---|---|---|---|---|---|---|---|
|  | # | % | # | % | # | % | # | % |
| Excessive interference | 99 | 34 | 195 | 31 | 208 | 30 | 35 | 5 |
| Strong interference | 38 | 13 | 110 | 18 | 91 | 13 | 84 | 13 |
| Interference | 51 | 17 | 95 | 15 | 101 | 15 | 153 | 24 |
| Little interference | 27 | 9 | 47 | 8 | 75 | 11 | 74 | 11 |
| Very little interference | 16 | 5 | 39 | 6 | 53 | 8 | 79 | 12 |
| No interference | 65 | 22 | 137 | 22 | 157 | 23 | 230 | 35 |
| Total respondents to this question | 296 | 100 | 623 | 100 | 685 | 100 | 655 | 100 |

**Table 3** Effects of violence in daily work x participant profile

| | Constant exposure to violence is a major issue on the performance of daily activities in the territory | | | | | | | | | | | | | | |
| | Graduated specific CHW training | | | | Graduated other CHW courses | | | | Education | | | | | | | |
| | Yes | | No | | Yes | | No | | Elementary | | High school | | College (enrolled) | | College (graduate) | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Strongly disagree | 19 | 30% | 163 | 23% | 27 | 26% | 155 | 23% | 2 | 67% | 119 | 24% | 33 | 20% | 23 | 27% | 182 |
| Disagree | 2 | 3% | 46 | 7% | 5 | 5% | 43 | 7% | 0 | 0% | 26 | 5% | 14 | 8% | 6 | 7% | 48 |
| Indifferent | 5 | 8% | 42 | 6% | 8 | 8% | 39 | 6% | 0 | 0% | 31 | 6% | 14 | 8% | 2 | 2% | 47 |
| Agree | 11 | 17% | 128 | 18% | 20 | 19% | 119 | 18% | 0 | 0% | 97 | 20% | 35 | 21% | 5 | 6% | 139 |
| Strongly agree | 27 | 42% | 323 | 46% | 45 | 43% | 305 | 46% | 1 | 33% | 221 | 45% | 73 | 43% | 50 | 58% | 350 |
| Total | 64 | 100% | 702 | 100% | 105 | 100% | 661 | 100% | 3 | 100% | 494 | 100% | 169 | 100% | 86 | 100% | 766 |

Furthermore, among those who only completed elementary school as formal education, 67% disagreed strongly that violence affects their work. However, we must highlight that the number of participants with such low education was quite small (only three participants out of 766).

The data in Table 4 indicate, with respect to maintaining patient information, that participants who reported "No interference" from dangerous conditions also stated that this factor did not prevent them from accomplishing their goals. However, a full 80% of participants reported "Excessive interference" in both maintaining patient data and the accomplishment of their goals it is important to underscore that 57% of CHWs claimed they feel hampered accomplishing their goals.

With respect to the performance of scheduled procedures and responding to emergencies, 76% of the participants reported "Excessive interference" as a result of difficulties in gathering/maintaining patient data. Only 3% of participants who reported "Excessive interference" stated that a reduced ability to gather/maintain patient information had no effect on performance of their scheduled and/or emergency activities. Moreover, 81% of those who claimed "No interference" in deriving patient information also claimed "No interference" (of inadequate patient records) in their performing scheduled and emergency-based activities.

## Conclusions

Bringing quality care to people in violent, impoverished, and indigent neighborhoods is a substantial challenge when implementing universal healthcare systems—particularly in developing countries such as Brazil. Although violence is primarily a social issue rather than a specific individual health condition, it definitely concerns the health of people, as it poses risks to people's lives and wellbeing, hampers the delivery of care and, overall, places stress on the healthcare system [18, 32, 33].

Our study provides important insight into some of the challenges policymakers face in delivering adequate social and healthcare services to people who reside in communities plagued by violence. We have shown that some aspects of care are hampered by such conditions, especially in neighborhoods of lower socioeconomic status. As CHWs are responsible for outreach, community education, counseling, and social support, our study provides informative guidance on factors that compromise their ability to optimally perform their duties. This, hopefully, can assist government entities as well as local managers in improving policies and procedures for the delivery of social and healthcare services.

This study shows that CHWs are a unique kind of social worker, coping with a diverse range of essential social determinants that affect the health of the population significantly, such as inequity and the unbalanced distribution of wealth.

Many frontline workers (such as teachers, nurses, social workers, and physicians) manage to adapt to stress when delivering public services [34, 35]. Our case study shows that CHWs are exposed to urban violence nearly daily. This quite likely increases their mental workload, stress, and fatigue—all factors that can interfere in their decision-making capacity. The result can be a compromise in their ability to deliver optimal care.

Our results show that urban violence interferes in many aspects of CHWs' activities, from planning to execution. For instance, every morning after arriving at the primary care clinic, Brazilian CHWs decide their routes based on the most updated information they have on the context of the territory. These routes must necessarily take into account conflicts among gangs and between gangs and the police. However, since the information on the territory conditions is usually outdated, CHWs often must adjust their routes on the go. Moreover, if conditions become unsafe, CHWs prioritize house call procedures, based on their acquired knowledge of families' health and social history.

Although such adaptations help CHWs to perform their activities, their work is still bound to some prescriptions.

**Table 4** Violence interference in patient information x the accomplishment of goals and performance of scheduled and emergency actions

**Effects of violence on the management of patient information**

*Effects of violence in the accomplishment of goals*

| | No interference | | Very little interference | | Little interference | | Interference | | High Interference | | Excessive interference | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No interference | 40 | 71% | 9 | 41% | 2 | 6% | 2 | 5% | 1 | 4% | 4 | 4% | 58 |
| Very little interference | 6 | 11% | 5 | 23% | 4 | 11% | 0 | 0% | 1 | 4% | 0 | 0% | 16 |
| Little interference | 2 | 4% | 4 | 18% | 15 | 43% | 3 | 8% | 0 | 0% | 1 | 1% | 25 |
| Interference | 8 | 14% | 3 | 14% | 9 | 26% | 21 | 57% | 3 | 12% | 3 | 3% | 47 |
| High interference | 0 | 0% | 0 | 0% | 2 | 6% | 7 | 19% | 14 | 56% | 12 | 12% | 35 |
| Excessive interference | 0 | 0% | 1 | 5% | 3 | 9% | 4 | 11% | 6 | 24% | 80 | 80% | 94 |
| Total | 56 | 100% | 22 | 100% | 35 | 100% | 37 | 100% | 25 | 100% | 100 | 100% | 275 |

**Effects of violence in performing scheduled and emergency actions**

| | No interference | | Very little interference | | Little interference | | Interference | | High Interference | | Excessive interference | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No interference | 42 | 81% | 5 | 33% | 2 | 10% | 5 | 13% | 2 | 4% | 3 | 3% | 59 |
| Very little interference | 5 | 10% | 7 | 47% | 3 | 15% | 0 | 0% | 0 | 0% | 1 | 1% | 16 |
| Little interference | 1 | 2% | 3 | 20% | 11 | 55% | 4 | 10% | 5 | 11% | 0 | 0% | 24 |
| Interference | 3 | 6% | 0 | 0% | 1 | 5% | 19 | 49% | 18 | 39% | 4 | 4% | 45 |
| High interference | 1 | 2% | 0 | 0% | 1 | 5% | 7 | 18% | 12 | 26% | 14 | 15% | 35 |
| Excessive interference | 0 | 0% | 0 | 0% | 2 | 10% | 4 | 10% | 9 | 20% | 71 | 76% | 86 |
| Total | 52 | 100% | 15 | 100% | 20 | 100% | 39 | 100% | 46 | 100% | 93 | 100% | 265 |

Public services are usually bound to specific rules regarding performance of their duties. The Brazilian Primary Care Policy, for example, establishes parameters such as the number of houses CHWs must visit per month. As a result, social workers (as government workers), are bound to policies, regulations and quotas that, by and large, fail to consider the need for adaptations such as our findings shows. As some literature [34, 36] indicates, rules and regulations are developed to *prevent* adaptations, notwithstanding that this ignores the reality of how their work, by necessity, is accomplished. Therefore, when policymakers establish regulations and guidelines, there should be a requirement that these incorporate the need to adapt to circumstances encountered in the field. This might involve, for example, stronger coordination with law enforcement as a means of helping CHWs feel safer as they go into particularly dangerous neighborhoods.

In that regard: the CHWs we interviewed stated they are not informed by local law enforcement regarding crime data. This lack of adequate background or current information increases the risk of injuries, stressful situations, fatigue, and mental overload.

In sum, understanding how urban violence affects the work of CHWs enables more informed decisions regarding the development, elaboration, and implementation of primary care networks in affected regions. This can lead to productive conversations and policymaking, leading not only to (a) a better understanding of how primary care might address social determinants of health efficiently, and (b) how to design an optimal integrated health system.

Likewise, collaborative and intersectoral efforts are needed to deal with territory characteristics and social indicators such as inequality, neglected diseases, and violence. Addressing local problems demands integrated actions within society and government. Skills in the fields of healthcare and social services are essential, but not sufficient to handle the social complexities of poorer, developing countries.

Our study helps to highlight the role of CHWs as social workers—especially in impoverished areas—mediating the relations between the population and health services, working toward integration of the delivery system. Understanding major difficulties faced by workers, particularly in lower-class and indigent neighborhoods, can be helpful in the elaboration of public policies and improvement of social indicators.

## Compliance with Ethical Standards

**Research Involving Human Participants/Informed Consent** Regarding scientific research involving human beings, this study was conducted in accordance with the ethical principles of the Resolution No. 466/2012 of the Brazilian National Council of Health Care/Brazilian Ministry of Health and approved by ethics committees. Therefore, all participants had to express their agreement with to informed consent terms read by the telephone interviewer. In addition, participants had the option of receiving a copy of the informed consent terms by email. Moreover, participants' confidentiality was ensured as their responses were not identified.

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