Community-Based Participatory Research for Critical Health Interventions for the Quichua People in Bolivar, Ecuador

Trawick, Ann[1], DO, Isbjørn, Christoph[1], MPH

1. Rocky Vista University, College of Osteopathic Medicine, Englewood, CO

IRB 2023-004

Keywords: Quichua, Ecuador, Community-Based Participatory Research, Bolivar, Global Medicine, Global Health, Public Health

Abstract

The health needs of rural Ecuadorians are often addressed through foreign aid and short-term medical missions. While these efforts provide temporary relief for rural populations struggling to access government-mandated universal healthcare, they fail to address underlying systemic issues. We conducted a community health needs assessment (CHNA) in the San Juan de Llullundongo region of Bolivar province to identify the local population's most pressing healthcare needs. Results highlight a critical shortage of women's health services, including gynecologic exams, breast exams, and education on birthing positions, alongside inadequate water sanitation practices. In contrast, respondents reported effective management of hand hygiene, smoking, alcohol use, and low rates of sexual and physical abuse within their community. Public health programs targeting the rural Quichua population would benefit from prioritizing low-cost women's health initiatives, water treatment solutions, and education on birthing practices to address these community-identified needs.

Introduction

Short-term medical missions have increasingly been critiqued as a form of boutique humanitarianism, with their role in global health being re-evaluated rather than diminishing entirely. These missions often involve well-meaning volunteers from high-income countries providing temporary care to underserved populations, acting as stop-gaps without addressing long-term health challenges.[1] In public health, this approach aligns with "tertiary prevention," which seeks to mitigate further harm from established health issues.[2] However, such interventions risk fostering dependency and are unsustainable for delivering healthcare to low- and middle-income countries (LMICs).[3]

Primary prevention, which targets the root causes of health issues, is a more effective strategy.[2] To implement primary prevention effectively, data collection must be paired with community engagement to ensure identified issues reflect actual community priorities. This is typically achieved through a Community Health Needs Assessment (CHNA).[4] No prior CHNAs have been documented for the San Juan de Llullundongo region, making this study a novel contribution to understanding local health needs.

Per the 2010 Ecuadorian census, Bolivar province is predominantly Mestizo (69.6%), followed by Indigenous populations (25.4%).[5] San Juan de Llullundongo, a rural community, is primarily

Indigenous, unlike the predominantly Mestizo urban center of Guaranda.[5] These demographic differences may contribute to healthcare disparities, as Indigenous populations often face greater barriers to accessing services due to geographic isolation and socioeconomic challenges.

Article 32 of the Constitution, put in place in 2008, guarantees universal access to healthcare services.[15] It is not a strict individual mandate requiring all citizens to purchase insurance. There is no penalty for remaining uninsured. Citizens under age 65, if formally employed, enroll in the mandatory Instituto Ecuatoriano de Seguridad Social (IESS) and contributions (about $70/month) are automatically deducted from salaries. Informal workers, such as subsistence farmers, who make up about 50% of the workforce, can voluntarily join the IESS but often do not because of financial constraints. The Ministerio de Salud Publica (MSP) fills gaps for the uninsured, but rural facilities are often understaffed and under-equipped, which results in disparities in access and quality. [6] In Bolivar, 73.5% of men and 69.8% of women remain uninsured.[5] Meanwhile, 9.8% of Ecuador's population lives below the poverty line of $3.20 per day, exacerbating healthcare access issues.[3]

Another critical issue is the reliance on firewood for heating and cooking in 33.4% of Bolivar households, which is linked to respiratory illnesses such as lung cancer, asthma, and pneumonia.[7] Time spent collecting firewood, primarily by women, limits opportunities for education and economic participation, a pattern observed in other LMICs.[8] These socioeconomic factors are particularly relevant for the Quichua population, where cultural practices and resource constraints shape health outcomes.

Communication barriers further complicate public health efforts. In Bolivar, the illiteracy rate is 18% for those over 15, and less than 50% of the population uses technology such as cell phones or the internet.[5] The Quichua language, predominantly oral, limits written communication, posing challenges for health education dissemination.[9,10]

To address these challenges, a granular understanding of rural Quichua health needs is essential for developing sustainable, community-driven public health initiatives.

Methods

All data, including survey questions, consent forms, and results, were written in English and translated for the survey respondents, then translated back to English for analysis. This necessitated the following translation chain: English -> Spanish -> Quichua -> Spanish -> English. To aid in this process, all consent forms, survey questions, and respondent answers were translated by a native Spanish speaker who is concurrently fluent in English. Once translated into Spanish, the surveys were created using a survey software license that allowed offline data collection and uploading to Android tablets.

Spanish to Quichua translators were then trained on the use of the tablets and protocols for administering the survey. A script for consent was previewed before each survey and read aloud by the translators in Spanish or translated to Quichua based on the survey participants' communication preferences. A convenience sample was used as the data were collected in rural Ecuador, and safety could not be accounted for outside of a small area operating as a makeshift healthcare clinic.

This study was conducted during an RVUCOM Global Medicine trip in 2023, with data collected in a makeshift healthcare clinic in San Juan de Llullundongo. The survey included 29 questions for men and 36 for women (due to the Women's Health section), with no open-ended questions to ensure consistency in data collection given the translation chain and time constraints. This design may have limited the ability to capture self-identified needs, potentially introducing bias by focusing on pre-determined health categories.

Due to the nature of this convenience sample, the inclusion criteria consisted of the subjects being able to understand either Quichua or Spanish and the ability to consent to participate in the survey. Exclusion criteria were solely if the respondent was under the age of 18. If the participants could read Spanish, they were given a tablet to complete the survey on their own, with the translator waiting nearby for any questions. If they could not read Spanish or spoke only Quichua, then the translator verbally presented the study as follows:

1. Translators verbally presented the questions to the participant in Spanish or translated the questions and verbally presented them in Quichua.

2. Translators would receive the verbal answers in Spanish, or Quichua and translate them back to Spanish, before entering the answers onto the survey.

The survey contained nominal and ordinal questions with a total of 29 questions for men and 36 for women, due to the Women's Health section. The major categories listed below contained associated questions as follows:

Demographics: Age, biological sex, profession, income, literacy and fluency in Spanish, and religion.

Health: Tobacco and alcohol use, annual physical exam, and hypertension prevalence.

Food and Water: Access to healthy foods, enough food for themselves and their families, fuel used to cook inside the home, how water comes to the home, if they sanitize the water before consuming it, and if they wash their hands before cooking, eating, and after using the restroom.

Safety: Felt safe inside their home, felt safe with people living in their home, felt safe leaving their home after dark, and had experienced sexual or physical abuse by someone in their home.

Women's Health (Only asked to participants who identified as "woman" in the demographics section): Date of last pelvic exam, breast cancer screening, miscarriages, and total pregnancies, patient positioning during birth, freedom of money handling and spending within their family.

All tablets were collected at the end of the day, and data was transferred to a password-protected external hard drive.

Frequency distribution models were used to analyze the data with crosstabulation for a more in-depth analysis. The data were analyzed with trends and associations identified by comparing demographic data with categorical responses.

Results

The interviewers were able to conduct 107 surveys, 102 of which were completed. Only completed surveys were used for data analysis, giving a total of 102.

Demographics: The surveys were completed by 102 respondents, predominantly aged 18–40 (59, 58%, n=102) and female (81, 79%, n=102). The primary profession was agricultural farming/ranching (57, 56%, n=102); however, 37 respondents (36%, n=102), all women, did not report a profession. Most respondents earned less than $251 per month (62, 61%, n=102), with 35 (34%, n=102) unsure of their income. Spanish literacy was reported by 84 respondents (82%, n=102), and 96 (94%, n=102) spoke Spanish. Those who spoke only Quichua were women (6, 100%, n=6), and mostly over 61 years old (4, 67%, n=6). The primary religion was Catholicism (78, 76%, n=102), with 17 (17%, n=102) not responding. As a convenience sample, 80 respondents (78%, n=102) lived in San Juan de Llullundongo, which aligns closely with the region's predominantly Indigenous demographic but may not fully represent the broader Bolivar population (69.6% Mestizo, 25.4% Indigenous per 2010 census).[5]

Health: Over 99 respondents (97%, n=102) reported not smoking, and 86 (84%, n=102) abstained from alcohol. Smokers (3, 3%, n=102) consumed less than two packs per week, and drinkers (16, 16%, n=102) consumed alcohol fewer than two days per week. However, 65 (64%, n=102) had not had a physical exam in the past year, and 78 (76%, n=102) had never been diagnosed with hypertension.

Food and Water: Access to healthy foods was reported by 78 (76%, n=102), with 85 (83%, n=102) reporting having enough food for their families. Meat consumption occurred at least once per week for 33 (32%, n=102) respondents and three or more times for 48 (47%, n=102). Propane was the primary cooking fuel (90, 88%, n=102). Water collection took less than one hour daily for 86 (84%, n=102), sourced from rivers/lakes (58, 57%, n=102) or pumped hoses (43, 42%, n=102). Only 47 (46%, n=102) boiled water consistently before use, and no local water contamination data were available. Handwashing was prevalent before cooking (99, 97%, n=102), eating (98, 96%, n=102), and after restroom use (95, 93%, n=102).

Safety: Most respondents felt safe at home (96, 94%, n=102) and with cohabitants (100, 98%, n=102), but only 43 (42%, n=102) felt safe outdoors after dark. Sexual abuse was reported by 4 (4%, n=102), and physical abuse by 7 (7%, n=102), with all sexual abuse cases (4, 100%, n=4) also reporting physical abuse. Of those reporting abuse, 2 (25%, n=8) were male.

Women's Health: Of 81 female respondents, 62 (76%, n=81) had not had a pelvic exam in the past 12 months, including 32 (39%, n=81) who had never had one. Among women over 40, 29 (97%, n=30) had never had a breast cancer screening, with only one (3%, n=30) screened over 12 months ago. Miscarriages were low (2, 3%, n=81). Of 72 women who had given birth, 49 (68%, n=72) used a traditional birthing position, while 20 (28%, n=72) used the supine position; only 21 (29%, n=72) were offered a choice. Money handling was limited, with 26 (32%, n=81) managing household finances and 22 (27%, n=81) spending freely.

Discussion

This CHNA, conducted with 102 completed surveys, provides critical insights into the health needs of the Quichua population in San Juan de Llullundongo. The survey results suggest that

future public health interventions can confidently use Spanish as the primary language for communication, as a significant majority of the surveyed population speaks (96, 94%, n=102) and reads (84, 82%, n=102) Spanish. However, finances and religion need to factor into program development due to monthly incomes of less than $251 per month (62, 61%, n=102) or respondents unsure of their income (35, 34%, n=102), with a major Catholic predominance (78, 76%, n=102).

Women's health emerged as a priority, with 62 women (76%, n=81) lacking recent pelvic exams, including 32 (39%, n=81) never examined, and 29 women over 40 (97%, n=30) never screened for breast cancer. These gaps are significant given Ecuador's breast cancer incidence rate of 45 per 100,000 women, higher than the Latin American average of 41.8 per 100,000.[7,11] Low-cost gynecologic and breast screening programs, often subsidized by Ecuador's public health system, could address these disparities at minimal cost to patients, though provider training and outreach are needed. Education of healthcare providers on traditional cultural birthing positions is also critical, as 49 women (68%, n=72) used traditional positions, which may reduce complications like perineal tears compared to the supine position, yet only 21 (29%, n=72) were offered a choice.[12] Education could empower women to make informed decisions, aligning with cultural preferences while ensuring safety.

Water sanitation is another pressing concern, with 55 respondents (54%, n=102) not boiling water sourced from rivers/lakes (58, 57%, n=102) or hoses (43, 42%, n=102). No local water contamination data exist, but studies in rural Ecuador indicate high rates of parasitic infections in children (e.g., Giardia prevalence up to 30%, Cryptosporidium up to 14%) due to unpurified water and zoonotic transmission, underscoring the need for testing and filtration programs.[13]

The convenience sample, with 81 women (79%, n=102) and a predominantly Indigenous respondent pool, likely skewed findings toward women's health and may not fully reflect Bolivar's broader demographic (69.6% Mestizo, 25.4% Indigenous).[5] This overrepresentation of women and Indigenous respondents may explain the emphasis on women's health, but highlights disparities faced by this group. Low reported rates of physical (7, 7%, n=102) and sexual abuse (4, 4%, n=102) may be underestimated due to cultural sensitivities, limited privacy, and the absence of open-ended questions, which could have elicited more nuanced responses. Most respondents felt safe inside their homes (96, 94**%**, n=102) and with the people they lived with (100, 98**%**, n=102). In contrast, most respondents felt unsafe outside of their homes at night (59, 58%, n=102). Abuse and feelings of safety at night are areas that should be further surveyed to verify the results of this study**,** using mixed-methods approaches (e.g., anonymous qualitative interviews) to enhance sensitivity and aid in community changes.

Positive findings include low smoking (3, 3%, n=102) and alcohol use (16, 16%, n=102), robust hand hygiene (e.g., 99, 97%, n=102 before cooking), and adequate food access (78, 76%, n=102). These strengths suggest a foundation for health promotion. Compared to similar Latin American CHNAs, such as those in rural Peru, women's health and water sanitation are common concerns, reinforcing the relevance of these findings.[14]

Limitations: The convenience sample, reliance on translators, and lack of open-ended questions may have introduced bias, particularly for sensitive topics like abuse. The predominantly female (81,79%, n=102) and Indigenous sample may not represent the broader Bolivar population.

Cultural tensions between Quichua and Mestizo populations and the rural setting limited sampling diversity. No prior CHNAs in this region limit contextual comparisons.

Future Research: Further studies should test local water for biological and chemical contaminants, assess gynecologic and breast cancer prevalence, and explore abuse rates using mixed-methods approaches (e.g., anonymous qualitative interviews) to enhance sensitivity. Expanding CHNAs to other Quichua communities in Ecuador, Bolivia, and Peru would provide comparative data. Increasing male participation and using stratified sampling could improve representativeness.

Acknowledgments

We thank the RVU Colorado IRB and Intramural Grant Process for funding this study, conducted during an RVUCOM Global Medicine trip in 2023. We also acknowledge the translators and community members of San Juan de Llullundongo for their support. No other funding or conflicts of interest apply.

References

1. Faktor KL, Payan DD, Ramirez AJ, May FP. Impact and Sustainability of Foreign Medical Aid: A Qualitative Study with Honduran Healthcare Providers. Ann Glob Health. 2023;89(1):17. doi:10.5334/aogh.3995
2. Kisling LA, Das JM. Prevention Strategies. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024. Available from: https://www.ncbi.nlm.nih.gov/books/NBK537222/
3. Williams SN, Armitage CJ, Tampe T, Dienes KA. Public perceptions of non-adherence to pandemic protection measures by self and others: A study of COVID-19 in the United Kingdom. PLoS One. 2021;16(10):e0258781. doi:10.1371/journal.pone.0258781
4. Zanwar PP, Yalamanchili J, Hu S, Estrada LV, Omar Z, Rahemi Z. Assessment of needs, challenges, and re-design considerations for culturally sensitive provision and delivery of palliative care supports and services for older adults who prefer to age and die in place in diverse India. Ann Palliat Med. 2024;13(5):1234-1245. doi:10.21037/apm-23-527
5. Población y Demografía de Nacional. Instituto Nacional de Estadística y Censos. 2010. Accessed January 10, 2023. https://www.ecuadorencifras.gob.ec/censo-de-poblacion-y-vivienda/
6. Thelwell K. Healthcare in Ecuador. The Borgen Project. Published September 16, 2020. Accessed January 10, 2023. https://borgenproject.org/healthcare-in-ecuador/
7. Borchers Arriagada N, Horsley JA, Palmer AJ, Morgan GG, Tham R, Johnston FH. Association between fire smoke fine particulate matter and asthma-related outcomes: Systematic review and meta-analysis. Environ Res. 2019;179(Pt A):108777. doi:10.1016/j.envres.2019.108777
8. Poverty rates in Ecuador. Statista. 2019. Accessed January 10, 2023. https://www.statista.com/statistics/788946/poverty-rates-ecuador/
9. Jones D, Lyle D, McAllister L, et al. The case for integrated health and community literacy to achieve transformational community engagement and improved health outcomes: an inclusive approach to addressing rural and remote health inequities and

community healthcare expectations. Prim Health Care Res Dev. 2020;21:e57. doi:10.1017/S1463423620000481
10. Muñoz PL. Quechua writing without crutches: Ten years under siege. ReVista. April 21, 2023. Accessed September 19, 2024. https://revista.drclas.harvard.edu/quechua-writing-without-crutches-ten-years-under-siege/
11. Bray F, Ferlay J, Soerjomataram I, et al. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin. 2018;68(6):394-424. doi:10.3322/caac.21492
12. Gupta JK, Sood A, Hofmeyr GJ, Vogel JP. Position in the second stage of labour for women without epidural anaesthesia. Cochrane Database Syst Rev. 2017;5(5):CD002006. doi:10.1002/14651858.CD002006.pub4
13. Jacobsen KH, Ribeiro PS, Quist BK, Rydbeck BV. Prevalence of intestinal parasites in young Quichua children in the highlands of rural Ecuador. J Health Popul Nutr. 2007;25(4):399-405.
14. Miranda JJ, Bernabe-Ortiz A, Diez-Canseco F, et al. Community health needs assessment in a rural Peruvian Andean community. Glob Public Health. 2019;14(12):1783-1794. doi:10.1080/17441692.2019.1599327
15. Constitución de la República del Ecuador. Montecristi: Asamblea Nacional; 2008. Artículo 32. Published October 20, 2008. Accessed May 19, 2025. https://www.asambleanacional.gob.ec/sites/default/files/documents/old/constitucion_de_bolsillo.pdf