Healthcare Access and Health Beliefs of the Indigenous Peoples in Remote Amazonian Peru

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Abstract. Little is published about the health issues of traditional communities in the remote Peruvian Amazon. This study assessed healthcare access, health perceptions, and beliefs of the indigenous population along the Ampiyacu and Yaguayacu rivers in north-eastern Peru. One hundred and seventy-nine adult inhabitants of 10 remote settlements attending health clinics were interviewed during a medical services trip in April 2012. Demographics, health status, access to healthcare, health education, sanitation, alcohol use, and smoke exposure were recorded. Our findings indicate that poverty, household overcrowding, and poor sanitation remain commonplace in this group. Furthermore, there are poor levels of health education and on-going barriers to accessing healthcare. Healthcare access and health education remain poor in the remote Peruvian Amazon. This combined with poverty and its sequelae render this population vulnerable to disease.

INTRODUCTION

Loreto, Peru's northernmost province, has a population of approximately one million people spread across a landmass of 37 million hectares (approximately one-third of the land area of Peru), of which 98% is covered by the Amazon jungle.¹ Forty-five percent live in the regional capital of Iquitos,² with the remainder dwelling in over 2,000 small, often remote, river-edge communities along the Amazon.³ Land transport within the region is extremely limited and most communities are only accessible by boat. Previous studies have indicated that 49% live in poverty⁴ with very limited access to healthcare facilities providing diagnostic services or inpatient care. These may be several days' travel away. In addition to the remote locations of these communities, new challenges consistent with climate change patterns are emerging: in Spring 2012, the region experienced unprecedented flooding, with river levels reaching 23% higher than the seasonal average,⁵ whereas in 2010, the region suffered record-low river levels, resulting in the complete isolation of many communities located on the headwaters of smaller rivers.^{6,7}

Trauma and infectious disease, specifically diarrheal illness, malaria, and tuberculosis remain the major contributors to morbidity and mortality in the region.^{8–10} Although Peru is a rapidly developing economy with an evolving healthcare benefits system, this has yet to improve conditions for those isolated in rural communities, which receive poor healthcare provision.¹¹ A paucity of medical resources and deeply embedded cultural beliefs mean that rural Amazon communities are heavily reliant on traditional medicine, use of plants and spiritual healers.^{12,13} Although some herbal remedies have a true pharmacological effect on disease, the use of traditional medicine has also been seen as a barrier to use of evidence-based treatment of diseases such as tuberculosis.^{14,15}

In 1999, a study of healthcare beliefs in indigenous and campesino communities on the Apayacu and Orosa rivers in Loreto found evidence of poor healthcare access, low levels of education, and lack of basic sanitation.³ Approximately 20% of the population had never seen a doctor, and 70% reported

that they would be unable to see a doctor if required, with financial constraints a greater barrier than distance. Forty-seven percent had used a traditional healer. We set out to re-evaluate health in this isolated region and to assess how health beliefs, perceptions, and practices have changed in the last 13 years.

MATERIALS AND METHODS

Structured interviews were conducted with 179 patients 15 years of age and over attending mobile health clinics operated by Project Amazonas in April 2012. The expedition served remote communities along the Ampiyacu and Yaguayacu rivers in Loreto, Peru. The communities visited were inhabited primarily by Bora, Huitoto, and Ocaina indigenous peoples, along with a scattering of mixed heritage (mestizo) residents and other indigenous ethnic groups.

Interviews were conducted in Spanish by two Spanish-speaking researchers, using a structured survey tool. Informed written consent was obtained from all participants.

The interview included questions on basic demographics, healthcare access and health status, health education and perceptions, sanitation, use of alternative medicine, alcohol use, and smoke exposure. (See Appendix 1 for English translation version of survey). Interviewers were trained in conducting the survey objectively, obtaining data without coaching or suggestion. To minimize variation between interviewers both interviewers conducted a pilot survey on the same patient to ensure consistency.

Data was entered using Microsoft Office Excel 2007 (Microsoft Corp., Redmond, WA) and analyzed using GraphPad Prism version 6.02 for Windows (GraphPad Software, San Diego, CA). Means, medians, and ranges were calculated for continuous variables and categorical variables were analyzed using Fisher's exact test. A *P* value of 0.05 was taken as the level of statistical significance.

RESULTS

Demographics and socioeconomic factors. Of the 179 people surveyed, 55.1% were female (Table 1). The mean number of children born to each individual was 4.0 (range 0–12). Child mortality was high, with 38.4% (*N* = 58) of parents reporting the death of ≥ 1 child; 57.0% (*N* = 102) lived in a

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TABLE 1
Demographics of the study population

Variable		All (number [%])	Men (number [%])	Women (number [%])
N		179	80	99
Age: median (range)		38 (15–81)	47 (16–81)	35 (15–70)
Marital status	Single	32 (18.4)	18 (22.5)	14 (14.1)
	Cohabiting	84 (46.9)	36 (45.0)	48 (48.5)
	Married	54 (30.2)	20 (25.0)	34 (34.3)
	Widowed	7 (3.9)	4 (5.0)	3 (3.0)
	Divorced	2 (1.1)	2 (2.5)	0
Education	None/less than primary education	54 (30.2)	18 (22.5)	37 (37.4)
	Primary education completed	97 (54.2)	44 (55.0)	52 (52.5)
	Secondary education completed	21 (11.7)	17 (21.3)	10 (10.1)
Type of work	Agriculture	89 (49.7)	50 (62.5)	39 (38.3)
	Fishing or hunting	26 (14.5)	18 (22.5)	8 (8.1)
	Domestic	30 (16.8)	0	30 (30.3)
	Unemployed	12 (6.7)	8 (10.0)	4 (4.0)
	Logging	6 (3.4)	4 (5.0)	2 (2.0)
	Crafts	22 (12.3)	0	22 (22.2)

home consisting of a single room with their extended family. 87.7% ($N = 157$) reported earning < 1 US\$ per day; 49.7% ($N = 89$) worked in agriculture. Across the study population, 30.2% ($N = 54$) had not completed primary education, with 54.2% ($N = 97$) having completed primary education and no further education. Eight percent ($N = 15$) were illiterate and could not sign their name. There was evidence of improved educational standards in the younger generations. In those < 30 years of age ($N = 69$), 17.4% ($N = 12$) had not completed primary education, and 30.4% ($N = 21$) had completed but not progressed beyond primary education.

Healthcare access. Access to healthcare was poor and 38.5% ($N = 69$) of respondents reported never having consulted a doctor; 57.0% ($N = 102$) stated they had previously been unable to seek medical attention when necessary, with lack of money and distance required to travel representing key barriers. (Table 2). Nonetheless, 91.6% ($N = 164$) had received at least one vaccination in their lifetime.

Use of traditional medicine. Prevalence of alternative medicine practitioners was high, and 83.2% ($N = 149$) had sought opinion from a healer or used traditional medicine in the past year; 76.0% ($N = 136$) believed traditional medicine to be equal or superior to Western medicine (Table 3).

Sanitation and health risk behaviors. Of the 80.4% ($N = 144$) that agreed boiling water prevents disease, 45.8% ($N = 82$) boiled their drinking water “sometimes” or “never.” Furthermore, 25.7% ($N = 46$) of families did not have access to a latrine. Although 27.9% ($N = 50$) of the population were current tobacco smokers, the number of cigarettes smoked

TABLE 2
Healthcare access and factors limiting access to healthcare

Variable	Percentage (%)
Have never seen a doctor	38.5
Have experienced difficulty seeing a doctor because of:	
Distance	51.0
Money	96.1
Time	5.9
Lack of availability of doctor	9.8

TABLE 3
Traditional medicine use and beliefs regarding traditional as compared with Western medicine among respondents

Variable	Percentage (%)
Have used traditional medicine in the last year	83.2
Believe traditional medicine to be:	
Better than Western medicine	30.2
Equal to Western medicine	45.8
Worse than Western medicine	24.0

was low, with three being the mean number of pack years (1 pack year is equal to smoking 20 cigarettes per day for 1 year) smoked. Awareness of the health impact of smoking was good, and 90.9% ($N = 70$) of smokers and ex-smokers believed smoking to be bad for their health. Although there was relatively little exposure to cigarette smoke, exposure to smoke from cooking was high, and 81.0% ($N = 145$) reported that their house filled with smoke when cooking (Table 4). There was little use of alcohol and good awareness of its health impact; 35.8% ($N = 64$) of respondents drank alcohol and of these 73.4% ($N = 47$) drank monthly or less; 78.1% ($N = 50$) of these believed alcohol was bad for health.

Health education and perceptions. Health education was poor: only 50.3% ($N = 90$) knew that mosquitoes transmit malaria and 28.5% ($N = 51$) knew that human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS) is transmitted by sexual contact. 95.0% ($N = 170$) used a mosquito net at night when sleeping, although likely for comfort rather than informed disease prevention. Only 22.9% ($N = 41$) knew that condoms could prevent the spread of HIV/AIDS (Table 5). A comparison of our findings with those of a previous study³ of healthcare access, health beliefs and practices in Loreto is summarised in Table 6.

DISCUSSION

This study assessed healthcare access, education, and beliefs in indigenous communities along the Ampiyacu and Yaguasyacu rivers in Loreto, north-eastern Peru. We found that the majority of the populations, who live below the poverty line, remain relatively neglected from a health perspective, with deficits in education and access to healthcare professionals. Compared with the most recent study of a similar cohort over a decade ago, we identified some evidence of improved healthcare access for this population.

Despite the extreme geographical isolation of the Loreto region, there have been hopes for improved health access since a 2001 reorganization of Peruvian national healthcare. This aimed to create a centrally coordinated, but regionally governed universal healthcare system, providing specifically for children, pregnant woman, and impoverished adults, organized around the Seguridad Integral de Salud (SIS). In addition, the Millennium Development Goals specified that by

TABLE 4
Alcohol consumption and smoking among respondents

Variable	All	Men	Women
Consume alcohol (%)	35.7	52.5	21.2
Consume alcohol regularly (weekly or more) (%)	9.5	17.5	4.0
Smoke (%)	27.9	52.5	7.1
Mean number of pack years smoked	3	3	1

TABLE 5
Health beliefs and practices among respondents*

Variable	Number (%)
Believe vaccines prevent disease	159 (88.8)
Believe that malaria is spread by mosquitoes	90 (50.3)
Use a mosquito net every night	170 (95.0)
Believe that HIV/AIDS is spread by sexual contact	51 (28.5)
Believe that condoms can prevent HIV/AIDS spread	41 (22.9)
Believe boiling water prevents disease	144 (80.4)

*HIV = human immunodeficiency virus; AIDS = acquired immunodeficiency syndrome.

2015 every child should be able to complete primary schooling, that universal access to reproductive health should be guaranteed, and that people should have an opportunity to earn at or above the global poverty rate of \$1.25 per day.^{16,17}

Our study found evidence of significant on-going challenges with access to basic medical care, albeit with signs of improvement over the last decade. We found that 57% of the study participants stated they had been unable to see a doctor when necessary, compared with 72% in 1999. This may represent steadily developing links to urbanized regions, with canoes increasingly motorized, halving travel times to larger settlements such as Iquitos. Despite the extremely remote geography of these settlements, however, financial constraints are still perceived to be a far greater barrier than distance, similar to the previous study.

Although we noted improved understanding of key health education messages, the levels of formal school education remain poor. Nationwide, primary and secondary school level education is mandatory, with recent national figures quoting 95% attendance at primary school and 78% completing secondary education.¹⁸ However, in rural areas this is complicated by difficult access to schools, children being kept at home to work in agriculture, and poor school staffing levels. Teachers in rural Peru are trained centrally before being dispatched to rural outposts in their second year. These posts are unmonitored and highly isolated, and as such, teachers' motivation to stay is often low. Although anecdotal, we encountered several schools that were unstaffed, with parents reporting that a teacher had not been posted there for months or even years.

Fifty-seven percent of the population reported living in a shared single room with their extended families, with evident

implications for transmissible disease. A high proportion reported indoor air pollution from solid fuel use in the home. This is now recognized as a major threat to health in developing countries, and linked to ~1.5 million deaths annually.¹⁹ Furthermore, 100% of the study population had no access to safe/piped water or to sewage services.

Understanding of infectious disease transmission remains low, although there is some evidence of improvement since 1999; 46% ($N = 82$) boiled their drinking water only "sometimes" or "never." In our study 50% understood that mosquitoes transmit malaria and 90% that vaccines serve to prevent disease, compared with 34% and 57%, respectively, in 1999; 92% had received a vaccine during their lifetime and 95% were using mosquito nets. However, understanding of HIV and malaria transmission was low, a worrying fact given that Loreto is classified by the World Health Organization (WHO) as a grade III zone as a result of its high frequency of chloroquine-resistant malaria, and malarial incidence remains high.²⁰

Traditional medical practices such as curanderismo (herbalism) and shamanism remain widespread, with 80% of respondents having consulted a shaman in the preceding 12 months. The Loreto region is one of the most species-rich and diverse areas in the world, with ~300 tree species per hectare.²¹ Bark, leaves, roots, fruits, and seeds are used to treat ailments of the digestive tract, pain, dermatological, and respiratory disorders, and concoctions to purge the patient from "impurities."²² Many of these compounds are biologically active—in one study, 23 of 31 crude plant species tested showed evidence of antibiotic activity,¹² whereas in another, 7 of 14 demonstrated anti-plasmodial activity, with low cytotoxicity,²³ lending scientific support to indigenous knowledge and acknowledging a role for plants in modern medicine.

Our small study has intrinsic limitations. Although we estimate that we sampled ~40% of the local population 15 years of age or over, sampling bias may be present, because of questioning the group who self-presented to a health clinic. There was a slight bias to female respondents (55%). Furthermore, the survey was conducted in the context of a busy clinic and a non-confidential environment, perhaps impacting on the quality of the responses.

TABLE 6
Comparison of healthcare access and barriers; use and perception of alternative medicine and health beliefs and practices to Nawaz and others*

		Nawaz and others (number [%])	Brierley and others (number [%])	P value
Are you able to see a doctor when you need to?	Yes	47 (27)	77 (43)	$P = 0.0025^*$
	No	125 (73)	102 (57)	
Barrier	Distance	47 (36)	91 (51)	$P = 0.01^*$
	Money	80 (61)	172 (96)	
	No doctor	5 (4)	10 (6)	
Do you know a healer in your area?	Yes	101 (58)	103 (58)	NS
	No	74 (42)	76 (42)	
Have you used a healer?	Yes	81 (47)	143 (80)	$P < 0.0001^*$
	No	92 (53)	36 (20)	
Perception of healer	More effective	42 (26)	39 (29)	NS
Have you ever had malaria?	Yes	99 (57)	139 (78)	$P < 0.0001^*$
	No	75 (43)	40 (22)	
Drink alcohol	Yes	85 (48)	64 (36)	$P = 0.02^*$
	No	92 (52)	115 (64)	
History smoking	Yes	69 (41)	77 (43)	NS
	No	100 (59)	102 (67)	
Boil water	Yes	91 (56)	96 (54)	NS
	No	71 (44)	83 (46)	

*Denotes statistical significance.

CONCLUSION

Despite evidence of improvement over a 13-year period since the last systematic survey of this population, lack of access to healthcare and poor levels of health education are key factors rendering this isolated people vulnerable to disease.

Received September 22, 2013. Accepted for publication October 27, 2013.

Published online November 25, 2013.

Note: Supplemental Appendix appears at www.ajtmh.org.

Acknowledgments: We thank Esteban Hubner for his help in proof-reading the Spanish questionnaire and Haq Nawaz, author of Health Risk Behaviors and Health Perceptions in the Peruvian Amazon. (*Am J Trop Med Hyg* 2001;65(3):252–256) for the contribution of unpublished data.

Financial support: This work was supported by Christ Church College, Oxford; The University of Oxford Medical School, and Project Amazonas Inc. of Fort Lauderdale, Florida.

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