Cervical Cancer Prevention in the Cusco Region, Peru: Improving Access to Care through the Use of Mobile Clinics

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Background

Cervical cancer is the number one cause of cancer death in Peruvian women 15 to 64 years old, with annual incidence rates estimated between 48.2 and 115.4 cases per 100,000 women, which is much higher than the rest of South America (28.6 cases per 100,000) and the US (8.4 cases per 100,000). Peru already has a disproportionately high rate of cervical cancer compared to most other parts of South America, and this rate is expected to increase by 2020. It is also estimated that one of thirty-five women living in the capital city, Lima, will develop cervical cancer. Outside of major metropolitan areas, the outlook for impoverished women living in rural regions such as the Andes Mountains is much worse. To put the problem in perspective, it is estimated that 5% of emergency room visits in rural areas arise from advanced cervical cancer complications. In contrast with cervical cancers detected in developed countries, the majority of Peruvian women with cervical cancer are diagnosed at late, advanced stages when treatment options are limited and survival rates are poor.

The reasons for Peru's extremely high rates of cervical cancer are multifactorial. Though the Pap test can provide simple and effective screening for cervical cancer, Peru's screening programs are often ineffective or non-existent. Furthermore, deficient infrastructure and the relatively high expense of medical care results in less than 2% of the population that can afford preventive services such as cervical cancer screening. Diagnostic laboratory services are hindered by absent quality control and uniform standards, lack of properly trained personnel, and inadequate materials and supplies. Women diagnosed with abnormal Pap results often endure lengthy follow-up intervals which result in patient noncompliance or loss to follow-up care. Because of a lack of providers properly trained to diagnose and treat precancerous disease, the few women who have access to care often receive overly aggressive treatment of precancerous

disease (total hysterectomy), resulting in greater risk for unnecessary morbidity. Finally, lack of access to care creates significant barriers to women residing in rural or remote regions such as the Andes Mountains.

Previously, the Peruvian Ministry of Health has focused on maternal mortality and family planning as two of its priority areas for funding. Because the government's focus has been on obstetrical care and outcomes, gynecologic care has been limited and given minimal financial resources. Therefore, proper preventive care of gynecologic cancer is a rare privilege for most Peruvian women. In contrast with women from developed nations, the majority of Peruvian women do not receive the preventative cancer screenings they need to prevent and provide early diagnoses of cervical cancer.

Goals

Due to the lack of early detection and subsequent high rates of cervical cancer in Andean Peru, improved quality and accessibility of secondary cervical cancer prevention efforts are needed. Many poor indigenous women living in isolated regions are unable to travel to distant healthcare facilities. Yet these women travel to local produce markets on a weekly basis to either sell or purchase food and other items. The provision of health services where women congregate should remove the major obstacle to care.

We hypothesize that improved accessibility can be achieved through the use of mobile clinics and that these screenings will have a significant impact on disease detection and subsequent management. This study was designed to determine the impact of accessible cervical cancer prevention efforts in indigenous Peruvian women living in the Andes Mountains. Through the use of surveys, we assessed barriers to preventative healthcare access as well as

knowledge and beliefs regarding Pap smears and cervical cancer. This study will help public health officials as they determine what steps should be taken next in this region to lower cervical cancer rates.

Methods

After receiving a Pap smear, women aged 16-65 were asked to participate in a brief questionnaire study. Pap smears and questionnaires were administered at the CerviCusco clinic in Cusco, in Ministry of Health buildings in small towns and villages in the Cusco region, and in mobile clinic tents in markets. The questionnaire consisted of 26 questions regarding demographic information, the difficulty of traveling to receive Pap smears, and knowledge/ opinions about cervical cancer and Pap smears. Women either completed the questionnaire on their own in Spanish, orally in Spanish, or orally in Quechua through an interpreter. Pap smear test results were sent to the women after one month. Those with an abnormal test were invited to come to Cusco for follow-up treatment, commonly a colposcopy or Loop Electrosurgical Excision Procedure (LEEP).

Results of the surveys were tallied and entered into a database. All statistical analyses were performed using SAS 9.2 and statistical significance was assessed using an alpha level of 0.05. Among those women who completed the survey, questionnaire items were examined for differences by the clinic where they received their Pap test (CerviCusco clinic or mobile clinic tent) and by language spoken (Quechua, Spanish, or both). Chi-square tests and one-way analysis of variance (ANOVA) were used to examine differences between the clinic types and languages spoken, including cervical cancer knowledge scores and scores related to the difficulty of traveling to receive the Pap smear exam.

Results

Responses were analyzed for differences between participants' reported language(s) spoken (see Table 1). Those who only spoke Quechua (20.2%) primarily lived in rural villages while those who only spoke Spanish (18.1%) primarily lived in Cusco. Most of the women who reported they spoke both languages (61.7%) lived in rural areas, many of whom had limited oral/ written communication skills in Spanish. An enormous education gap exists by language spoken: Spanish-only speaking women were much more likely to have at least a high school education (83.8%) than those who spoke only Quechua (9.5%). Language spoken is therefore a measure of both the level of education and geographic location of women surveyed which likely account for most of the differences seen between Quechua- and Spanish-speaking women. Women who spoke Spanish were more likely to use contraception, specifically birth control pills or condoms. Those who spoke Quechua or both languages and used contraception were more likely to use Depo-Provera injections. Quechua-only speaking women were less likely to have received a previous Pap exam than other women and were less likely to have received exam results if they had received one. Quechua speaking women walked further and spent less time driving to receive Pap exams than other women. They also were less likely to rate Pap tests as important or being helpful to prevent cervical cancer and were less likely to be willing to return for future Pap tests or see the importance of pursuing follow up care if they had an abnormal result.

Table 1

Differences between language spoken

Measure	Response	Overall	Quechua	Spanish	Both	p-value
Language – n (%)		2970 (100)	601 (20.2)	537 (18.1)	1832 (61.7)	

Table 1

Differences between language spoken

Measure	Response	Overall	Quechua	Spanish	Both	p-value
Education – n (%)	None	399 (13.3)	228 (39.7)	10 (1.9)	155 (8.6)	<0.0001
	Primary	1190 (39.7)	292 (50.9)	74 (14.2)	800 (44.5)	
	HS	1039 (34.6)	48 (8.4)	255 (49.0)	694 (38.6)	
	College	372 (12.4)	6 (1.1)	181 (34.8)	149 (8.3)	
Methods of Birth Control: No Contraception – n (%)	No	1231 (41.1)	214 (37.0)	240 (45.9)	725 (40.5)	0.0106
	Yes	1768 (59)	364 (63.0)	283 (54.1)	1066 (59.5)	
Birth Control Pills – n (%)	No	2724 (90.8)	544 (94.1)	456 (87.2)	1631 (91.1)	0.0003
	Yes	275 (9.2)	34 (5.9)	67 (12.8)	160 (8.9)	
Injection – n (%)	No	2409 (80.3)	459 (79.4)	447 (85.5)	1417 (79.1)	0.0047
	Yes	590 (19.7)	119 (20.6)	76 (14.5)	374 (20.9)	
Condoms – n (%)	No	2814 (93.8)	557 (96.4)	456 (87.2)	1704 (95.1)	<0.0001
	Yes	185 (6.2)	21 (3.6)	67 (12.8)	87 (4.9)	
Ever had a Pap – n (%)	No	1013 (34.1)	258 (44.9)	157 (31.0)	569 (31.8)	<0.0001
	Yes	1959 (65.9)	317 (55.1)	350 (69.0)	1218 (68.2)	
If Yes: Results Received – n (%)	No	609 (30.2)	139 (42.9)	95 (25.8)	341 (27.6)	<0.0001
	Yes	1406 (69.8)	185 (57.1)	273 (74.2)	896 (72.4)	
How many Pap tests? – mean (SD)		2.1 (2.4)	1.4 (1.1)	2.8 (3.3)	2.1 (2.3)	<0.0001
Hours walked for last Pap? – mean (SD)		1.2 (3.2)	1.7 (2.3)	1.3 (6.5)	1.1 (2.0)	0.0236
Hours in car for last Pap? – mean (SD)		1.5 (4.6)	0.7 (2.0)	2.1 (4.7)	1.5 (4.9)	0.0169
Hours walking today for Pap – mean (SD)		1.1 (2.4)	1.6 (2.1)	0.9 (2.1)	1.0 (2.6)	0.0004
Hours in car today for Pap? – mean (SD)		0.8 (2.4)	0.4 (0.8)	1.2 (3.1)	0.8 (2.5)	0.0055

Table 1

Differences between language spoken

Measure	Response	Overall	Quechua	Spanish	Both	p-value
How important are Pap tests – n (%)	Not Important	33 (1.1)	16 (2.9)	0 (0.0)	15 (0.8)	<0.0001
	Somewhat Important	249 (8.3)	83 (14.9)	37 (7.1)	126 (7)	
	Very Important	2705 (90.6)	458 (82.2)	486 (92.9)	1656 (92.2)	
Can Pap tests help prevent cervical cancer? – n (%)	No	92 (3.1)	43 (7.9)	10 (1.9)	34 (1.9)	<0.0001
	Yes	2870 (96.9)	504 (92.1)	508 (98.1)	1751 (98.1)	
Would you return in the future for another similar Pap test? – n (%)	No	89 (3.1)	29 (5.3)	11 (2.1)	43 (2.5)	0.0014
	Yes	2819 (96.9)	516 (94.7)	502 (97.9)	1692 (97.5)	
If your Pap test is abnormal, how important would it be to go to the doctor to see why? – n (%)	Not Important	37 (1.3)	17 (3.3)	1 (0.2)	18 (1)	<0.0001
	Somewhat Important	244 (8.5)	70 (13.7)	41 (8.0)	127 (7.3)	
	Very Important	2605 (90.3)	425 (83.0)	473 (91.8)	1603 (91.7)	

Data was also analyzed for differences between Pap exam locations (see Table 2). Women either received exams at the CerviCusco clinic, inside another building (usually a Ministry of Health Building; data not reported), or a mobile clinic tent in a marketplace. Mobile clinic tents were set up in various markets in Cusco and in small rural villages that did not have a Ministry of Health building. Women seen at CerviCusco were more likely to speak only Spanish, make more money, and have a college degree than those seen in tents. They also had fewer children and were more likely to use condoms and other forms of contraceptives. These women at CerviCusco were more likely to have had a previous Pap exam, have received the results, and have had an abnormal result than those seen in tents. Women seen in a tent may have had to

travel a shorter distance for their Pap exam than for their last exam. Women at the mobile tents also were more likely to report that it was very easy for them to come for their Pap exam than women seen at CerviCusco.

Table 2

Differences between Pap locations

Measure	Response	Overall	Tent	CerviCusco	p-value
Location – n (%)*		897 (30.3)	624 (21.1)	273 (9.2)	
Age – mean (SD)		39.5 (11.8)	40.6 (12.4)	38.8 (11.8)	0.0516
Language – n (%)	Quechua	601 (20.2)	43 (7.3)	18 (7.0)	<0.0001
	Spanish	537 (18.1)	152 (25.6)	128 (49.8)	
	Both	1832 (61.7)	398 (67.1)	111 (43.2)	
Income in soles – n (%)	<1000	1978 (68.4)	346 (61.7)	130 (51.6)	0.0064
	1001-5000	609 (21.1)	127 (22.6)	61 (24.2)	
	>5001	303 (10.5)	88 (15.7)	61 (24.2)	
Education – n (%)	None	399 (13.3)	38 (6.2)	12 (4.5)	<0.0001
	Primary	1190 (39.7)	195 (32.0)	45 (16.7)	
	HS	1039 (34.6)	285 (46.8)	111 (41.3)	
	College	372 (12.4)	91 (14.9)	101 (37.6)	
Number of children – mean (SD)		3.5 (2.4)	3.2 (2.4)	2.5 (2.0)	<0.0001
Methods of Birth Control:					
No Contraception – n (%)	No	1231 (41.1)	194 (32.1)	109 (41.3)	0.0087
	Yes	1768 (59.0)	411 (67.9)	155 (58.7)	
Condoms – n (%)	No	2814 (93.8)	566 (93.6)	231 (87.5)	0.0029
	Yes	185 (6.2)	39 (6.5)	33 (12.5)	
Ever had a Pap – n (%)	No	1013 (34.1)	194 (32.8)	54 (20.3)	0.0002
	Yes	1959 (65.9)	398 (67.2)	212 (79.7)	
If Yes:					
Results Received – n (%)	No	609 (30.2)	123 (29.6)	33 (15.2)	<0.0001
	Yes	1406 (69.8)	292 (70.4)	184 (84.8)	
What were the results? – n (%)	Normal	1253 (89.5)	262 (88.5)	144 (78.3)	0.0025
	Abnormal	147 (10.5)	34 (11.5)	40 (21.7)	

Table 2

Differences between Pap locations

Measure	Response	Overall	Tent	CerviCusco	p-value
How many Pap tests? – mean (SD)		2.1 (2.4)	2.4 (2.6)	3.2 (3.4)	0.0016
Hours walked for last Pap? – mean (SD)		1.2 (3.2)	1.1 (6.2)	1.0 (2.1)	0.6573
Hours in car for last Pap? – mean (SD)		1.5 (4.6)	1.5 (3.7)	1.8 (3.5)	0.5166
Hours walking today for Pap – mean (SD)		1.1 (2.4)	0.8 (3.1)	1.2 (3.4)	0.2803
Hours in car today for Pap? – mean (SD)		0.8 (2.4)	1.2 (3.4)	1.3 (1.8)	0.6219
Would you return in the future for another similar Pap test? – n (%)	No	89 (3.1)	20 (3.3)	1 (0.4)	0.0109
	Yes	2819 (96.9)	585 (96.7)	257 (99.6)	
How easy was it to come for this Pap test? – n (%)	Not Easy	293 (10.0)	46 (7.7)	43 (16.2)	<0.0002
	Somewhat Easy	813 (27.8)	159 (26.8)	92 (34.7)	
	Very Easy	1818 (62.2)	389 (65.5)	130 (49.1)	

*2058 (69.6%) of surveys were administered in a building, which have not been included in this analysis

Conclusions

The goal of this study was to pilot a program to reduce the extraordinarily high rate of cervical cancer among rural Peruvian women by improving access to screening through the use of mobile clinic tents. Most of these mobile clinics were well attended, likely because they were easier for women to come to because of their more convenient location. This is especially significant because many of these women had either never received a prior Pap smear or had never seen the results of prior tests. Quechua-speaking women, who mainly live in rural mountainous areas, were less likely to understand how and why Pap smears are important than women who spoke Spanish. This likely contributes to the lower rates of Pap exams among women who speak Quechua.

There were several limitations to the study. First, there were some issues with the translation of the study into Spanish. The process of revising the questionnaire by native Spanish speakers and back-translating was shortchanged because of time constraints and an IRB deadline. This left a few questions poorly worded and one question that was thrown out due to the necessity for study coordinators to provide alternative wordings that lacked internal consistency. Additionally, the process of using local untrained interpreters to give the questionnaire orally to women who only spoke Quechua was problematic. We had a video that was designed to be shown to women who only spoke Quechua, but due to lack of electricity, adequate space, and a reliable speaker system in most of the clinic locations, it was only occasionally used. Instead, local clinic staff and bilingual patients assisted in the administration of the questionnaire in Quechua. These women were unfamiliar with survey research and often led their questions and helped participants select what they thought was the most desirable answer. Because of the differences in survey administration by language, several of the questions were not included in our results of differences between language groups. Despite the instructions of study coordinators, women often worked in groups to complete the questionnaire as well. Because of these things, actual knowledge regarding cervical cancer and the Pap smear procedure is likely significantly lower than our results indicates and reported differences need to be appreciated conservatively.

Although the study had some limitations, many of the results can still be used to gain an idea of the receptivity of Peruvian women in the Cusco region to mobile clinic tents and a general understanding of their knowledge regarding cervical cancer and Pap smears. The use of mobile clinic tents seems like it could be an effective method for improving access to preventative cervical cancer screenings for underserved Peruvian women and should be

researched more thoroughly. Additional research needs to be conducted to determine how to best address the lack of understanding regarding the role of Pap exams in cervical cancer prevention in Quechua-speaking regions as well.

Personal Reflections

I very much enjoyed my experiences in Peru. Although at times I was frustrated with the administrative inefficiencies of being part of a clinic in Cusco, I learned that having a proactive attitude allowed me to get the most out of my experience. For the first week or two, I timidly asked how I could help and where I was needed. Sometimes I waited to be asked to go on a campaign the following day or help out in the CerviCusco clinic. As I started telling the staff and other volunteers which campaigns and clinics I wanted to work on and made myself available, I found that I was busier and having more varied clinical and research experiences. I not only did Pap exams and survey administration, but I assisted in Loop Electrosurgical Excision Procedures (LEEP) and colposcopies, spent a day in a wound care clinic, shadowed a high altitude physician, and helped set up new mobile clinic campaigns in marketplaces. I also learned to be more flexible and have patience while adjusting to a lifestyle that runs at a slower pace with many days off for holidays. I had the opportunity to be part of a parade on one of these holidays that was a highlight of my trip.

I also learned much about conducting survey research in another language and culture. I had recently taken a global research methods class where we discussed common pitfalls, logistical complications, and other issues regarding survey research in a global context. Unfortunately, I was not able to design the survey research project on which I worked. The project was in its second and final year and so we were not able to make any changes. I learned

firsthand the value of spending some extra time upfront in study and questionnaire design to prevent headaches and ongoing frustration down the line. For example, being meticulous with translation and back-translation of the questionnaire by native speakers and utilizing focus groups to ensure questions are worded well and will not need added clarification is well worth the time and effort. Additionally, formatting the questionnaire so it is easy to follow and providing answer choice categories that are appropriate for all participants are important take-aways from this project.

My time in Peru was a great combination of hands-on clinical work, survey research, and cultural experiences. I was able to practice my Spanish, visit incredible Incan ruins, and swap stories with locals and fellow travelers. I got violently ill and experienced the importance of refrigeration, clean water, and proper medical care. I immersed myself in another culture and learned how people in Andean Peru live and work. I was tutored by other medical students, local clinical staff, and experienced physicians while performing over 100 Pap exams. I also learned how to design better questionnaires to facilitate survey research with less frustrations and more reliable results. I had a great experience in Peru and am looking forward to my next global health experience, wherever it may be.

A local nurse providing cervical cancer and Pap smear education to women waiting for their exams.

Administering a questionnaire in Maras.

Emma administering a questionnaire in Maras.

Getting ready for the Inti Rami (winter solstice) parade in Cusco. We handed out women's hygienic pads with information regarding the CerviCusco clinic.

In Maras, with a gynecological oncologist from Miami, who was incredibly knowledgeable and also somewhat ridiculous.

A mobile clinic tent in a markplace in Quillabamba.