

Cervical Cancer Prevention in Peru: Lessons Learned from the TATI Demonstration Project



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Pan American Health Organization, 2006



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Introduction

Cervical cancer is an important public health problem worldwide. It is the second most common cancer among women, ranking first in many developing countries. Of 468,000 new cases and 233,000 deaths of invasive cervical cancer estimated for the year 2000, 80% occurred in less developed countries (1). Screening by conventional cytology has had an impact on reducing cervical cancer rates in many developed countries, but this same impact has not been observed in developing countries (2).

In Peru, cervical cancer is the leading cause of cancer deaths among women. The estimated incidence rate for cervical cancer is 48.2 per 100,000 and the estimated mortality rate is 24.6 per 100,000 (3). Screening services have been in place for over 30 years and cervical cancer is a declared national priority.

Since 1998, Peru has put in place the National Plan for the Prevention of Gynecological Cancer. The plan includes strategies for cervical cancer prevention as well as breast cancer prevention. In 2000, the Ministry of Health developed the "Manual of Standards and Procedures for the Prevention of Cervical Cancer", which includes conventional cytology as the screening technique, as well as Visual Inspection with Acetic Acid, and cryotherapy as a treatment method for precancerous lesions.

The screening services in Peru, however, have had several inherent challenges (4). Women have been screened opportunistically and those women most at risk of developing the disease, women aged 35–50 years, have not been systematically screened. In addition, there have been challenges with the cytology tests such as a high proportion of inadequate samples, limited laboratory infrastructure and personnel to process the samples in a timely manner, and sub-standard quality control procedures. Furthermore, the follow up care after abnormal cytology screening has been poor, as there have been unusually long delays in obtaining cytology test results, women may not have been informed of their screening test results and treatment has not been accessible (5).

Recognizing these systemic challenges, the Peru Ministry of Health solicited the support of the Pan American Health Organization and PATH to investigate methods that could improve the effectiveness of the cervical cancer screening program. To this end, a cervical cancer demonstration project was developed, named TATI (acronym for the Spanish term *tamizaje y tratamiento inmediato*). The Region of San Martín was selected for the TATI demonstration project, as this is an area of low resources with limited access to health services, organized by well established health networks with high levels of community participation. The TATI project was implemented during the period May 2000– December 2004. This report summarizes the methods, results and lessons learned from the TATI demonstration project.

TATI Demonstration Project

An effective cervical cancer prevention program consists of three service delivery components that must be linked together: community information and education, screening services, diagnostic and/or treatment services (6). With this in mind, the TATI project was developed to put this model in place and to test a 'see, triage and treat' approach in the Region of San Martín, a low resource setting

Goals

The project aimed to screen 80% of women aged 25–49 years in the San Martín region over a three year period, using a see, triage and treat approach. The screening method was Visual Inspection with Acetic Acid (VIA), the triage method was Visual Inspection with Acetic Acid Magnified (VIAM), and the treatment of precancerous lesions was by cryotherapy. The project objectives were as follows:

- to assess the effectiveness of VIA as a screening test and the effectiveness of VIAM as a triage test;
- to assess the effectiveness of cryotherapy treatment for pre-cancerous cervical lesions delivered by primary care physicians; and
- to evaluate the cost and feasibility of incorporating visual inspection screening methods and cryotherapy in the routine delivery of women's health services at the primary care level.

The TATI demonstration project also included a research sub-component to evaluate the use of two additional cervical cancer screening tests: human papillomavirus (HPV) DNA testing by hybrid capture and liquid-based cytology (LBC).

Organization of Clinical Health Services

The Regional Health Authority of the Department of San Martín (DIRES) is organized into 10 health networks. The region has a total of 56 primary health care centers, each with at least one general practitioner, and 280 health posts staffed by non-physicians. There are two referral centers located in Tarapoto (Hospital Banda of Shilcayo and the Maternal and Perinatal Hospital)

The DIRES incorporated cervical cancer screening and treatment services into the basic package of women's health services. For the TATI project, each health network designated a TATI intervention team, composed of 1–4 trained midwives and 1 primary care physician. A total of 12 teams were assembled to deliver screening and immediate treatment services. A total of 30 primary health centers were equipped to provide quality services, and these were designated as the base health centers for the TATI project.

In these base health centers, the TATI intervention teams served the target population through routine health services, as well as through special campaigns. During these campaigns, the TATI

intervention teams traveled out to other primary health care centers to deliver screening and treatment services. All campaigns were carried out according to a semi-annual plan prepared by each health network.

For diagnosis and treatment services at the secondary level of care, referral centers were organized for colposcopy and treatment with LEEP, cold-knife conization or hysterectomy. The referral centers were staffed by a gynecologist re-trained in colposcopy and treatment methods. Two referral centers were initially established in two main urban areas: Moyobamba covering the north of the region and Tarapoto covering the remaining areas. A third center was later added in the town of Mariscal Cáceres, to cover the southern part of the region. For the remote province of Tocache, a multidisciplinary team of a gynecologist, anesthesiologist and support personnel periodically traveled to serve those women who required specialized treatment and did not have access to secondary level health care.

Cancer treatment was provided by the National Institute of Neoplastic Diseases (INEN) in Lima for those women detected with cancer in the TATI project. The Peruvian Cancer Foundation arranged for women receiving cancer treatment to have accommodation as well as social and emotional support. The DIRES coordinated the referral process for these women, working with INEN and the Peruvian Cancer Foundation.

The DIRES provided the managerial, administrative and logistical support to guarantee operations of the TATI intervention teams. In this regard, a coordinator in each health network was designated to provide the necessary support for the implementation of the TATI project activities.

For project monitoring, supervision and on-going quality assurance, a local TATI project office was established. Project staff collected data and maintained a project database; monitored and reported on the project's progress; provided technical support and supervision to the TATI intervention teams; and coordinated services with the health networks and the DIRES. The coordination of services between the primary, secondary and tertiary level of care was managed by each health network, with support from the local TATI project office. The local TATI coordinator also monitored the process for the cytology tests to ensure results were returned to the health center for appropriate follow-up.

The cytology laboratory services in the region were centralized into one regional laboratory, located in Tarapoto. To this end, several cytology laboratories were closed, and the capacity of the regional laboratory was strengthened by sending cytotechnicians for retraining at INEN and providing additional equipment and supplies.

Training of Health Providers

The competencies and abilities of health providers are critical for the delivery of quality screening and treatment services. Therefore, the TATI project involved training and reinforcing skills of the 35 primary care physicians and 48 midwives who formed the TATI intervention teams. Over a five day practical and theoretical course, midwives were trained in performing VIA and re-trained in taking a Pap test. Physicians were trained in performing VIAM, taking a biopsy sample and doing cryotherapy. Both midwives and physicians were also re-trained in general aspects of female anatomy, cervical cancer prevention, diagnosis and management of sexually transmitted infections, infection control, and communication and counseling skills.

A total of 3 training courses were held during the project period. The first training was conducted by a team of international and national gynecologists proficient in the screening and treatment methods. The subsequent trainings were performed by previously trained health providers from the San Martín region and gynecologists from INEN.

The curriculum was based on the technical competencies necessary for screening and treatment. All trainees were tested on the first day of the course on their knowledge regarding cervical cancer prevention and screening techniques. Participants were instructed on the screening methods; they initially practiced on anatomical models using learning guides and verification lists and they later examined women under the direct supervision of the trainers. The clinical practice was complemented with interactive sessions where providers would review and discuss cases using photographs of cervixes. At the end of the training course, the providers were evaluated with a final test.

The first training session was followed by two months of practice in health centers, supervised by gynecologists from INEN. A case review session was held at the end of the two months. During the project, the teams were visited periodically by one of the trainers to discuss cases and provide feedback. In addition, periodic sessions were held with all the teams to discuss problem areas identified by the trainees themselves.

To reinforce the skills of providers for secondary level care, 4 gynecologists were retrained in colposcopy and treatment with LEEP and cold cone biopsy during a three month course at INEN. The course included clinical rotations as well as supervised practice in screening, diagnosis and treatment methods. Upon their return to San Martín, these gynecologists were responsible for the supervision of the TATI intervention teams. Periodically, the gynecologist would meet with these teams to evaluate special or difficult cases.

Community Participation

An important component of the TATI project was to develop community strategies for promoting the prevention of cervical cancer among women in the target age group. Prior to initiating the project, staff members completed an assessment of community-based health promotion experiences and expertise in the region. Through this assessment two local non-governmental organizations (Project Hope and Manuela Ramos) and the Ministry of Health's Information Education and Communication Department were identified as having valuable experiences to contribute to the development of a strategy for encouraging women to voluntarily seek cervical cancer prevention services. The project brought these three organizations together in a participatory process to develop the overall community promotion strategy including the development of information, education and communication (IEC) materials, women's education sessions, and a training approach. The goals of this component of the project were:

- To provide women with education and information so they could make informed decisions about preventing cervical cancer and obtaining high-quality services;
- To foster a social environment that encouraged and supported women to seek cervical screening; and
- To ensure that women who underwent screening and treatment were satisfied with the services they received.

The strategy consisted of providing women with information, education, and community support to allow them to make an informed decision about how they can prevent cervical cancer and demand high-quality services. The strategy was based on the involvement of community members and on shared responsibility for community health between health personnel and community members. High-level support from the Community Promotion Department of the DIRES was essential to successfully implement this approach.

To increase community awareness, about 80 promotion teams, each made up of one local health center staff member and one community leader, reached 34,884 women aged 25 to 49 and their families with cervical cancer prevention information through community awareness-raising events and a series of small group education sessions held throughout the region. These teams also organized and supported the activities of more than 60 community advisory groups—which included leaders and representative authorities—to provide educational messages and motivate women to undergo screening. A key component of these community activities was coordinating promotional efforts with the clinical services—ensuring that women received consistent messages in their communities and at the clinic, and knew where and when to seek services.

The training of these promotion teams in educational methodologies was a key component. Training workshops were organized at least once a year and covered the practical aspects of community education activities. Initially, facilitators from the DIRES and the TATI project team demonstrated how to run educational sessions and prepare educational materials. The trained health promoters then led the subsequent training sessions with their peers.

To make services more acceptable, the TATI project team trained midwives and physicians who provide cervical screening in communication and counseling skills, helping them understand women's concerns. The team also implemented a continuous quality-improvement mechanism in which trained clinic staff systematically measured client satisfaction. Exit interviews and participatory mechanisms for responding to feedback allowed the program to identify and address concerns before they became obstacles to care. Client feedback also helped health providers improve patient privacy, client confidentiality, and informed-consent processes and helped ensure that services were accessible to women.

Screening and Treatment

Since November 2000, consenting women in the target age group of the project, who attended reproductive health services at any of the designated health centers for the TATI project, were screened for cervical cancer. All women were screened using two methods: conventional cervical cytology (the Pap test) and Visual Inspection with Acetic Acid (VIA). Although VIA was the test being modeled, the DIRES requested that conventional cytology be continued at least until the project was completed. For those women classified as VIA positive, a triage test with Visual Inspection with Acetic Acid Magnified (VIAM) was subsequently performed to triage women for treatment. A subset of women in the TATI project was also screened with two additional tests, for research purposes: the HPV DNA test and liquid-based cytology.

A trained midwife first saw women, counseled them about the screening procedure, performed a gynecological examination and performed two screening tests:

- 1) the Pap test: a sample of cervical cells was collected in the area of the squamo-columnar junction using an Ayre spatula. The collected cells were smeared onto a glass slide and fixed. The slides were sent to the regional laboratory in Tarapoto to be processed.
- 2) VIA: the cervix was clearly visualized and a 5% solution of acetic acid was applied to the cervix. After waiting one minute, the cervix was examined and observed for aceto-white lesions. The VIA test was considered positive if acetowhite lesions with clear borders were observed in or close to the transformation zone, or negative otherwise.

Women with a VIA negative test were asked to return to the health center in two months time to receive the results of their Pap test. Women who were negative on VIA and had a normal Pap test were advised to be screened again after an interval of three years, according to the Ministry of Health guidelines. However, VIA negative women who had high grade squamous intraepithelial lesions (HSIL) or worse on the Pap test were referred for colposcopy. If the Pap test was classified as inadequate, atypical squamous cells of unknown significance (ASCUS) or low grade squamous intraepithelial lesions (LSIL), the woman was asked to return for a repeat Pap smear in 6 months, in keeping with the national guidelines.

On initial visualization of the cervix, if the midwife observed a lesion suggestive of invasive cancer, the woman was referred directly to a gynecologist for further evaluation.

Women with a VIA positive test were referred to the primary care physician for a re-examination using the VIAM test. The primary care physician performed the triage examination using an AviScope™, a monocular device providing a 4x magnification. The VIAM test was considered positive if acetowhite lesions with clear borders were observed in or close to the transformation zone, and negative otherwise. Women with a VIAM positive test and eligible for treatment with cryotherapy were counseled and offered immediate treatment. Women were considered eligible for cryotherapy if the lesion was entirely visible and did not cover more than 75% of the cervix, nor extend into the endocervix or vagina, nor show any evidence of invasive cancer.

Women who were eligible for cryotherapy and who signed an informed consent for the treatment had a punch biopsy of the lesion taken prior to cryotherapy to rule out cancer and, for research purposes, to obtain a definitive diagnosis. Biopsy samples were sent to a pathology laboratory for diagnosis. If a woman did not accept immediate treatment, she was asked to return at a later date for the results of her biopsy test to discuss treatment options.

Women who were not considered eligible for cryotherapy treatment, that is if the lesion covered more than 75% of the cervix, involved the endocervical canal or vagina, or was suggestive of invasive cancer were referred to one of the three regional colposcopy centers for diagnosis and treatment as indicated by standard guidelines.

Cryotherapy was performed by the primary care physician with carbon dioxide gas, using a Wallach LL100 Cryosurgical system™ with a 200 mm probe and defrost device. The probe was placed on the cervix so that the lesion was entirely covered; it was then frozen in two periods, of three and five minutes duration, with an interval of 5 minutes thawing between them. To prevent problems of blockage, the freeze, clear, freeze method was employed with clearing occurring every 15 seconds for the entire duration of each freeze. The procedure was complet-

ed when the doctor visualized the “frozen ring”, a white area around the probe. After treatment, women were requested to remain under observation for at least 30 minutes at the health center and instructed to return or contact the nearest health post in case of fever, discharge with a bad odor, or pelvic pain. In addition, they were given written instructions with pictorial illustrations, as well as dates for future appointments at one month, three months, six months and one year after treatment. Women with cervicitis on inspection of the cervix were given antibiotics after cryotherapy, according to the national health guidelines.

One week following cryotherapy treatment, women were visited at home by a health worker or returned to the health center for an interview by a health worker. This was to identify any potential problems associated with treatment. At this time, women were also encouraged to ask any questions. The need for sexual abstinence during the first four weeks after cryotherapy was also reinforced.

At one month after cryotherapy treatment, a midwife or a physician saw women to verify that there had been no major complications. A gynecological examination was only performed if clinically indicated. At three months and twelve months post-cryotherapy treatment, a gynecological examination was performed by a midwife to assess whether the cervix had healed and the VIA and a Pap test were performed. If the tests were negative, women were instructed to return for screening in three years time. However, if the VIA test or Pap test was positive, the woman was referred to a gynecologist for diagnosis and treatment as indicated.

Research Sub-component

A research study was nested into the TATI project and involved testing 5,460 women during the first year with additional screening tests of liquid-based cytology (LBC) and HPV DNA testing. The test results were reported back to women some months later. Health personnel contacted women positive on either test, who had not previously been treated based on the results of the other screening tests.

For LBC, cervical samples were obtained using the SurePath test which involved collecting cervical cells with a Rovers-Cervex® brush and immediately placing the cells in a tube containing CytoRich® preservative liquid. A cervical sample was also taken for HPV DNA testing, using the Hybrid Capture II test. Collected samples were immediately stored in tubes containing Digene Sample Transportation Medium (STM).

LBC and HPV samples were stored at the health center in a refrigerator for up to a week before being sent in thermal boxes by courier to the TATI office where they were refrigerated. Periodically, the LBC samples were sent to the cytology laboratory at INEN and HPV samples were sent to a laboratory in London, England for processing.

Results from this research sub-component on the performance characteristics of the various screening tests are reported separately in a scientific publication.



Results

Population Coverage

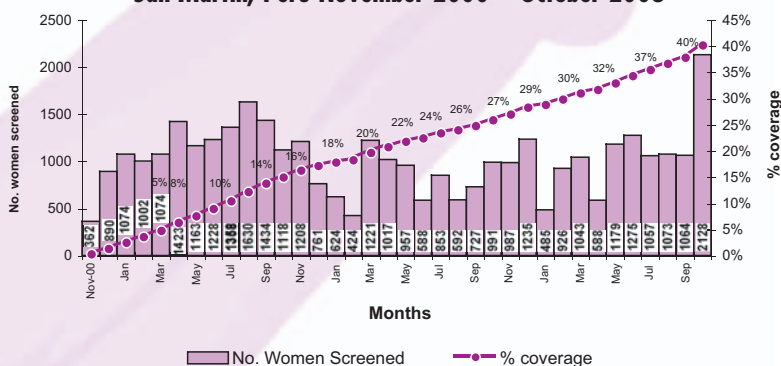
Coverage of screening services is an important factor in the success of a cervical cancer prevention program. An 80% coverage of the target age group has been recommended in the past (7) and therefore, this project had a goal of covering approximately 91,000 women aged 25-49 years of age in San Martín.

The screening services were conducted over a 3 year period, November 1, 2000 to October 31, 2003. A total of 36,759 women from the target group were screened, which represents coverage of 35%, below the project goal of 80% coverage. Nonetheless, a very important achievement was that 19% of these women were screened for the first time in their lives, reporting never having had a Pap test, as illustrated in Table 1.

Another important achievement, was that 45% of the women screened were in the at risk age group of 35-49 years of age, which is the age group most often difficult to reach with screening services. Through the TATI project, a total of 542 women were diagnosed with pre-cancer and treated, preventing cervical cancer from developing in these women; 126 women were diagnosed with cervical cancer and were provided with treatment at INEN. Other significant achievements include the improvement in follow up care and the development of a sustainable and replicable model for cervical cancer prevention.

An average of 1,021 women were screened monthly, although there was a variation in the number of women screened each month over the duration of the project (Graph 1). Several factors affected the monthly screening coverage, such as a dengue outbreak in the main cities of San Martín in January 2001 which coincided with decreased screening activity. In February 2002, a yellow fever epidemic and heavy rainfall affected the region and health workers had to prioritize yellow fever control efforts. After this event, screening activity never reached the levels of the initial year; with the exception of the last month in which the health promotion teams intensified efforts to recruit women. Again, in January 2003 a yellow fever outbreak led to decreased screening activity.

**Graph 1: Monthly Screening Coverage in the TATI Project
San Martín, Peru November 2000 – October 2003**



Source: TATI project database

**Table 1: Characteristics of Women Screened in the TATI Project
San Martín, Peru November 2000 – October 2003**

	Number of Women	Percentage
Total Women Screened	36,759	100.0
Age		
25-29	10,609	28.9
30-34	9,428	25.6
35-39	7,795	21.2
40-44	5,321	14.5
45-49	3,606	9.8
Years of Education		
0	2,226	6.1
1-6	19,799	54.1
7-11	11,135	30.4
12+	3,466	9.5
Number of Previous Pap Tests		
None	6,876	18.7
1	12,483	33.9
2	8,299	22.6
3	4,997	13.6
4	2,211	6.0
5+	1,893	5.1
Parity		
None	876	2.4
1	4,008	10.1
2	8,090	22.0
3	7,777	21.1
4	5,576	15.1
5	3,651	9.9
6+	6,781	18.4
Ever used hormonal contraception	15,297	41.6

Source: TATI project database

**Table 2: Screening Coverage by Health Network in the TATI project
San Martín, Peru November 2000 – October 2003**

Health Network	Target Population of Women 25-49 years of age	Women aged 25-49 years screened in TATI (%)
Mariscal Caceres	10,605	21.3
Rioja	13,744	26.2
San Martín	24,950	28.0
Lamas	3,569	29.5
Tocache	13,708	31.2
Moyobamba	15,933	32.4
Bellavista	6,782	39.3
El Dorado	4,362	43.0
Picota	4,522	47.6
Huallaga	3,949	58.8
DIRES*	5,559	79.2

Source: TATI project database

* DIRES includes the population catchment areas of the Hospital Banda of Shilcayo and the Maternal Perinatal Center in Tarapoto

**Table 3: What most influenced women to participate in the TATI project
San Martín, Peru November 2000 – October 2003**

	Number of women	Proportion (%)
Mass media: TV/radio/magazine	1,045	2.9
Education session or awareness raising meeting in women's organizations	8,636	23.6
Education session or awareness raising meeting in health centers	5,352	14.6
Relative/neighbor who had been screened	2,667	7.3
Individual contact with a health professional	8,437	23.0
Contact with the TATI project team	4,412	12.0
Other	1,013	2.7

Source: TATI project database

In order to understand what motivated women to participate in the TATI project, health center staff asked women who attended the screening services how they learned of those services and what factors most influenced their decision to be screened. The results are indicated in Table 3. A total of 21,986 women reported having had contact with the health promotion teams that were involved in raising awareness among women in the community about the TATI project. Among those women who came for screening for the first time, the majority said they did so because of educational or awareness-raising sessions in health centers and women's organizations. Only a small percentage of women screened identified mass media as their main source of information and factor affecting their decision.

In addition, to better identify factors associated with women's participation in screening programs, a study was carried out among 156 screened and 155 unscreened women randomly selected from among those who had had contact with an outreach worker. Results from this small study indicated that the strongest predictor of screening status was prior experience with Pap smear screening. Women's satisfaction with services at the health facility was also a strong predictor of screening attendance. When compared with women who reported they treat themselves at home when sick, women who reported they first seek care at a health facility were over two times as likely to seek screening. Similarly, wealthier women were significantly more likely to be screened. Another strong predictor of screening status was the number of screened women that a woman knew; the odds of a woman being screened increased about 10% for each extra screened woman she knew. Among previously screened women, the odds that she went for screening significantly increased if she had attended an awareness-raising session or had a husband who was supportive of the screening program.

Performance of Screening and Triage Tests

A total of 6,473 (17.6%) women were classified as VIA positive and were subsequently referred to a medical doctor for triage by VIAM. On the Pap test, a total of 593 women had an abnormal result (ASCUS or worse) and the positivity rate for the Pap test was 1.6%.

The positivity rate of VIA decreased with age from 25% in women under 40 years to 20% in older women. Similarly, the positive rate for the combination of VIA with VIAM decreased from 11% in women aged 25-29 to 7% in those 45-49 years of age.

In detecting precancerous lesions of high grade or worse, the VIA test demonstrated much better sensitivity than the Pap test, but poorer specificity (Table 4). As could be expected, the VIA test combined with the Pap test showed an improvement in sensitivity over the VIA test alone, but the specificity did not improve.

**Table 4: Performance of the Screening Tests in the TATI Project
San Martín, Peru November 2000 - October 2003**

Screening Test	Sensitivity (%)	Specificity (%)
VIA	52.6 (44.4 - 60.6)	76.4 (75.2 - 77.5)
Pap	27.2 (19.9 - 35.5)	98.7 (98.3 - 98.9)
VIA/Pap combined	69.2 (61.0 - 76.5)	73.1 (71.7 - 74.3)

Source: TATI project database

On triage, 5,899 women who were classified as VIA positive had a VIAM test performed by a general practitioner; 3,121 women were classified as negative and 2,732 women were classified as positive by VIAM. The triage test with VIAM performed by the physician eliminated over half of the women classified as VIA positive. The positivity rate for the VIAM test was 46.5% in this population pre-screened with VIA (Table 5).

**Table 5: Women Served in the TATI Project
San Martín, Peru November 2000 - October 2003**

Activity	Number of women	Proportion (%)
No. women screened	36,759	100
No. women VIA positive	6,473	17.6
No. women suspicious for cancer upon exam by VIA and referred to colposcopy	109	0.3
No. women screened with VIAM	5,899	16.0
No. women suspicious for cancer upon exam by VIAM and referred to colposcopy	46	0.1
No. women VIAM negative	3,121	8.5
No. women VIAM positive	2,732	7.4
No. women treated with cryotherapy following VIAM exam	1,398	3.8
No. women referred to colposcopy following VIAM exam	1,241	3.4
No. women examined by colposcopy	1,131	3.1

Source: TATI project database

Completion of Care

The main advantage of using the VIA test is that the screening test result is available immediately. This reduces the number of visits to the health center and reduces the chances of women being lost in the process of obtaining test results and completing their care. Nonetheless, in the TATI project, there were several steps in the screening and treatment process which created opportunities to lose women to follow up care. Approximately 9% of women were lost in each of the transition steps from screening to diagnosis: from the VIA test to the triage test; from the VIAM test to cryotherapy treatment; and from the VIAM test to diagnosis with colposcopy (Table 6). This was despite the attempts made by the Ministry of Health personnel and TATI project staff to identify and contact women who did not complete their care.

From diagnosis to treatment, a larger proportion of women were lost to follow up care. Of the 561 women with colposcopy indications for treatment of precancerous lesions, 247 women (44%) did not return to the health facility to complete their care (Table 6).

Nevertheless, the proportion of women lost to follow up in the TATI project is smaller in comparison to the previous situation in San Martín. In a one year period, in the Pap-based screening program of San Martín, 75% of women screened with abnormal Pap test results did not complete their diagnosis and/or treatment (5).

**Table 6: Completion of Care for Screening, Diagnosis and Treatment
of Precancer in the TATI Project
San Martín, Peru November 2000 - October 2003**

Procedure	Number of Women	Proportion (%)
VIA positive women referred for VIA exam		
exam completed same day	1,559	24.1
exam within 2-90 days	3,134	48.4
exam after 90 days	1,206	18.6
did not attend exam	574	8.8
VIAM positive women eligible for cryotherapy treatment		
treatment completed same day	1,178	76.6
treatment within 2-90 days	145	9.4
treatment after 90 days	89	5.8
did not attend for cryotherapy	125	8.1
VIAM positive women referred for colposcopy		
colposcopy completed same day	227	18.3
colposcopy within 2-90 days	591	47.6
colposcopy after 90 days	313	25.2
did not attend for colposcopy	110	8.9
Colposcopy to Treatment of Precancer		
treatment indicated on first colposcopy	197	--
did not attend for treatment	87	44.2
biopsy indicated on first colposcopy	364	--
did not attend for biopsy result and follow up colposcopy	119	32.7
treatment indicated on follow up colposcopy	193	--
did not attend for treatment	41	21.2

Source: TATI project database

Cryotherapy Treatment

Of the women screened positive by VIA/VIAM, cryotherapy was recommended for 1,537 women (56%), of whom 1,398 women actually received the treatment. Another 1,241 women (44%) who were screened positive by VIA/VIAM were referred to a gynecologist for a colposcopy evaluation. Nine percent of these women did not attend the colposcopy exam and were lost to follow up care at this stage. The large proportion of referrals to the gynecologist was due to several factors including the extension and severity of the lesion, the uneasiness of the primary care doctor in treating with cryotherapy, malfunctioning or unavailable equipment, or women not accepting cryotherapy treatment.

The biopsy results of women treated with cryotherapy are shown in Table 7. Of the women treated, 22% were diagnosed with a cervical lesion of low grade or worse and the majority of cases were determined to be cervicitis, metaplasia, and condiloma or HPV infections. Only 0.1% of women were initially under treated (i.e. had unrecognized invasive cancer at the time of cryotherapy). In younger women, aged 25-29 years, 8% were diagnosed with moderate grade lesions or worse compared to 12% of older women, aged 30 - 49 years, who were diagnosed with moderate grade lesions or worse.

The effectiveness of the cryotherapy treatment to eliminate the precancerous lesions is under analysis at the time of writing this document. These results will be reported separately.

**Table 7: Histopathology Results of VIA/VIAM Positive Women
Treated with Cryotherapy in the TATI Project
San Martín, Peru November 2000 - October 2003**

Biopsy result	Age Group (in years)					Total
	25-29	30-34	35-39	40-44	45-49	
Insufficient sample	12 (2.5%)	17 (4.1%)	8 (2.8%)	7 (5.6%)	3 (4.1%)	47 (3.4%)
Normal	34 (7.1%)	29 (7.1%)	26 (9.0%)	11 (8.8%)	10 (13.7%)	110 (8.0%)
Cervicitis	123 (25.7%)	107 (26.1%)	74 (25.6%)	38 (30.4%)	27 (36.9%)	369 (26.8%)
Metaplasia	124 (25.9%)	86 (20.9%)	57 (19.7%)	27 (21.6%)	8 (10.9%)	302 (21.9%)
Condiloma/HPV	81 (16.9%)	70 (17.1%)	52 (17.9%)	21 (16.8%)	8 (10.9%)	232 (16.9%)
Low grade dysplasia	63 (13.1%)	44 (10.7%)	37 (12.8%)	8 (6.4%)	6 (8.2%)	158 (11.5%)
Moderate dysplasia	18 (3.8%)	26 (6.3%)	17 (5.8%)	6 (4.8%)	6 (8.2%)	73 (5.3%)
Severe dysplasia	12 (2.5%)	20 (4.9%)	7 (2.4%)	3 (2.4%)	4 (5.5%)	46 (3.3%)
Cancer in situ	10 (2.1%)	9 (2.2%)	8 (2.7%)	4 (3.2%)	1 (1.3%)	32 (2.3%)
Microinvasive cancer	0 (0%)	0 (0%)	2 (0.7%)	0 (0%)	0 (0%)	2 (0.1%)
Result missing	1 (0.2%)	2 (0.5%)	1 (0.3%)	0 (0%)	0 (0%)	4 (0.2%)
No sample taken	-	-	-	-	-	23 (1.6%)
TOTAL	476	404	284	124	71	1398

Source: TATI project database

Women's Satisfaction with Cryotherapy Treatment

A study was performed to examine cryotherapy experiences among women who received treatment for cervical intraepithelial neoplasia. The sample consisted of all women receiving cryotherapy as part of the TATI project during a 4-month period (July–October 2001). Two hundred and twenty-four women were interviewed. Structured interviews were conducted to collect information about the adequacy of information provision, women's satisfaction with cryotherapy, their ability to comply with post cryotherapy recommendations and condom use, their experience with cryotherapy side effects, and their satisfaction with cryotherapy follow-up.

User satisfaction with cryotherapy treatment was generally good. Eighty five percent of women who answered the question stated that their level of satisfaction with their treatment was satisfactory. Five percent reported that they were somewhat satisfied and nine percent stated that they were not satisfied with their cryotherapy experience. Among women who reported they were satisfied with their treatment the most commonly cited reasons were that they did not feel pain during the treatment, they felt well cared for, and/or they were improving their health. About one-half of the women who stated that their level of satisfaction with their treatment was either bad or indifferent also noted that they had unanswered doubts or questions about cryotherapy.

The majority of women perceived that their male partners/husbands were supportive of their treatment, either financially or emotionally. In an important minority of cases, women were engaging in sex earlier than 30 days after treatment, primarily due to partner pressure to resume sex and the woman's inability to successfully negotiate abstinence from sex. These couples were not always able to use condoms. Although none of these women subsequently reported signs of infection, this suggests that providers must develop creative ways to encourage either abstinence or condom use among all women who receive cryotherapy treatment.

Vaginal discharge was reported as an "annoyance" by almost two-thirds of the women (65%). While some women described simply "being wet" or experiencing "abundant liquid," others were disconcerted by the discharge and, in some cases, found it to be emotionally distressing. To avoid such emotional distress, providers should be encouraged to counsel women prior to treatment about the possibility of abundant vaginal discharge following the procedure, reassuring them that this is normal.

Overall, since most women felt satisfied with their cryotherapy treatment along several different dimensions, this supports the conclusion that cryotherapy is an acceptable treatment procedure for women.

Continuous Quality Improvement Mechanism

In the project, we evaluated the effectiveness of a client feedback process aimed at improving client satisfaction with cervical cancer screening services. This iterative process featured a client exit interview with specific items to measure the extent of client satisfaction, data tallying at the clinic level, and feedback sessions to review the compiled interview data and develop an action plan for addressing identified client concerns. Data were collected over a two-week period approximately every six months at 13 participating facilities and included a total of 1,508 exit interviews during three observation periods.

Problems identified by clients at these exit interviews included lack of privacy, poor access, lack of understanding about informed choice, and difficulty obtaining clear and accurate information. Results from a multivariate analysis showed that, while overall satisfaction levels were quite high, a modest reduction in overall dissatisfaction levels was observed over time; the most improvement occurred among the smaller health clinics and was less noteworthy at the larger hospitals. Significant improvements were noted with room privacy and with explanations about what the screening services consisted of and the informed consent form.

Action plans provided some illustrative examples of ways in which exit interview information was used to improve provider performance. During the first observation period, information from interviews and feedback sessions indicated that lack of privacy during the examination was a concern at some health centers. The health providers at those centers responded by putting locks on doors and placing envelopes for client charts on the outside of examination rooms to reduce unnecessary interruptions. In addition, clients at several health centers expressed lack of understanding about the informed consent process and reported having unanswered questions about the examination itself.

After this performance area was noted across several health centers, health providers in those centers recommitted to the use of informational, educational, and communication (IEC) materials and other aids during counseling sessions. Clinicians also agreed to use additional counseling techniques to verify client understanding of the procedure and the informed consent process. Feedback from women also indicated dissatisfaction with long waiting times. Several centers reorganized and adopted an appointment-based system to reduce waiting time. Clients subsequently registered less dissatisfaction in these areas in later client exit interviews. This evaluation demonstrated that the client feedback process identifies and helps to resolve specific quality of care issues.

Costs of Screening and Treatment

The costs of the screening methods and treatment procedures were calculated as part of the TATI project (8). Results are based on the first 5,460 women who received care between November 2000 and May 2002.

The direct costs of VIA were US\$1.60, for the Pap test US\$3.42 and for VIAM, US\$4.40 (Table 8). Cryotherapy was the least expensive of the treatment procedures (Table 9). The cost of cryotherapy was estimated at US\$8.18 dollars while cost estimations for LEEP and cold cone were US\$27.28 and US\$ 561.38 respectively. Estimations of one year treatment and follow up costs for cryotherapy (US\$77.34) and LEEP (US\$96.44) were less costly than treatment with cold cone (US\$630.50)

Women's costs of transportation, time traveling to and from the health facility and waiting time varied accordingly with the type of health care facility where women sought care. Cost ranged from US\$ 1.22 to reach a health center to US\$ 12.03 to reach a provincial hospital by car, and US\$169.46 to reach the tertiary care hospital in Lima (8).

Indirect costs show that women, who receive care at the health center close to where they live, would have a modest expenditure associated with the screening visit, as compared to the expenditure associated with utilizing other health centers and hospitals. If we consider these

**Table 8: Cost of Cervical Cancer Screening Procedures in the TATI Project
San Martín, Peru November 2000 - May 2002**

	Single screening procedures			Sequential	
	VIA	PAP	LBC	HPV	VIA(M)
Unit Cost (US\$)	1.60	3.42	3.92	25.00	4.40
Percentages by component					
Personnel (%)	33	34	19	3	51
Supplies (%)	34	17	16	22	25
Equipment ^a (%)	31	14	12	2	23
Laboratory ^b (%)	...	32	51	72 ^c	...
	100	100	100	100	100

... not applicable

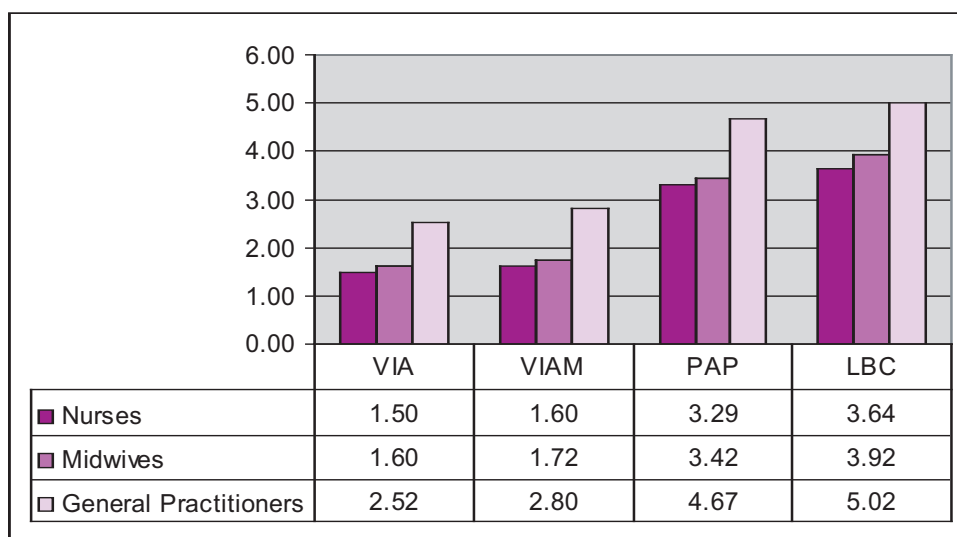
a. Refers to the clinical equipment used to take the sample or perform the clinical exam

b. Includes the personnel, supplies and equipment for laboratory procedures

c. Includes transportation costs of HPV DNA samples and freeze rooms

Source: Gordillo, A. Cost and performance of screening tests and costs of treatment of cervical cancer: San Martín region, Peru. Washington: PAHO; 2005.

**Graph 2: Cost of Screening Procedures by Health Professionals in the TATI Project
San Martín, Peru November 2000 - May 2002**



Note: general practitioners costs also include the presence of a health assistant during the procedure.

Source: Gordillo, A. Cost and performance of screening tests and costs of treatment of cervical cancer: San Martín region, Peru. Washington: PAHO; 2005.

**Table 9: Cost of Treatment Procedures for Precancer in the TATI Project
San Martín, Peru November 2000 - May 2002**

Activity	Cryotherapy	LEEP	Cold cone
	(US\$)	(US\$)	(US\$)
Procedure	7.6	26.7	104.8
Laboratory tests	20.57
Medication	0.58	0.58	55.01
Hospitalization	381.00
Sub total cost of procedure	8.18	27.28	561.38
One year control and follow up			
Follow up visits	27.76	27.76	27.76
Follow up procedures: PAP smear, colposcopy, biopsy	41.40	41.40	41.40
Total cost per procedure, one year	77.34	96.44	630.54

Source: Gordillo, A. Cost and performance of screening tests and costs of treatment of cervical cancer: San Martin region, Peru. Washington: PAHO; 2005.

costs multiplied times two, three or four visits, they become an important element for defining women's attitudes toward completing the screening and treatment process. The number of times a woman is required to return to the health center may influence her decision to complete the care algorithm.

These cost assessments were applied to computer-based modeling, along with data from similar projects of the Alliance for Cervical Cancer Prevention, in order to assess the cost-effectiveness of various cervical cancer screening strategies. The most clinically effective and cost-effective strategies were determined to be those that improved links between screening and treatment services, through reduced number of visits to the health center or improved follow up strategies, and that relied on less laboratory infrastructure than conventional cytology. Screening women with visual inspection or HPV DNA testing in a one-visit or two-visit approach, once in a lifetime at about 35 years of age would reduce the lifetime risk of cancer by 25-36% and cost less than \$500 per year of life saved. Two screenings in a lifetime, at age 35 years and 40 years of age with visual inspection or HPV DNA testing in a one-visit or two-visit approach is also a very cost-effective strategy with a reduction in lifetime risk of cervical cancer of an additional 40% (11). These strategies were determined to be cost-effective alternatives to the three-visit conventional cytology based screening programs in low resource settings.



Lessons Learned and Implications for Policy and Practice

Target Age Group

The TATI project included screening younger women, aged 25–29 years which offers an opportunity to examine whether it is worthwhile to include this age group in the screening policy. Of women in this age group, 40 (8.4%) had biopsy confirmed lesions of moderate grade or worse. This is compared to the 113 women (12.8%) aged 30–49 years who had a biopsy confirmed lesion of moderate grade or worse. These results indicate that it may be cost-effective to exclude the 25–29 year age group in the screening policy and concentrate the resources and programmatic efforts on reaching a high coverage of women aged 30 years and older.

Strategies to Achieve High Screening Coverage

Achieving 80% coverage within a screening program requires intensive, on-going information, educational and promotional activities and a sufficient health workforce and capacity to deliver services that meet women's needs. As we observed in the TATI project it is challenging to meet such a high coverage goal. Some of the reasons for this include:

- Health personnel trained in visual inspection and cryotherapy treatment methods were not present in all the health establishments; therefore the service capacity was restricted to those centers with trained staff and to screening campaigns.
- Often the doctors were not scheduled for screening at the same time as the midwives, which meant that those women who screened positive were not able to be evaluated on the same day and had to return for triage and treatment.
- The number of providers trained in the screening and treatment methods was not commensurate with the population size.
- The number of screening campaigns was not sufficient to cover eligible women, particularly in the rural settings.
- The heavy workload of primary care health providers meant that there was limited time to conduct screening.
- The numerous infectious disease outbreaks diverted resources away from screening activities.
- The intensity of the promotional activities could have been insufficient to encourage more women to seek screening services.

A number of factors affected coverage. Notably, those health networks with more intensive educational activity achieved a larger coverage than those with less activity; the availability of screening services based in a health network positively affected participation totals; and smaller health networks achieved a greater coverage than larger health networks.

Based on these lessons, the following strategies are recommended:

- The community education and outreach strategies used in the TATI project should be continued and expanded, with particular emphasis on the larger health networks
- Additional midwives and primary care physicians should be trained in visual screening methods and cryotherapy treatment in order that all health centers in the region have the capacity to deliver screening and treatment services in primary care settings;
- A continuous quality improvement method, using the client feedback process should be continued in order to improve quality of care and women's satisfaction. With increased satisfaction, more women are likely to attend screening services and complete their care.

Screening and Triage Tests

The Pap test performed locally in San Martín had a very low sensitivity compared to the VIA test, although the Pap test had better specificity. The combination tests of VIA and Pap showed an improvement in sensitivity compared to VIA alone, but at the cost of reduced specificity. In addition, the combination of VIA and Pap testing would increase the costs of screening by \$3.42 per test compared to VIA alone.

This project demonstrated that the main advantages of using VIA as a screening test in a low-resource setting like San Martín is the ability to give immediate results to women, thus limiting the loss to follow up care. It also demonstrated better performance as a screening test than the Pap test, it was easily administered by trained midwives, and because it has less infrastructural requirements than the Pap test, it costs less to administer.

Triage by the primary care physician using VIAM reduced the number of screen positive women who needed treatment by about 50%. To better understand whether the effects of the triage step were due to the VIAM procedure or to the fact that a physician performed the test rather than a trained midwife, a subsequent study was conducted after the TATI project. In this study, women were randomized to triage by a physician using VIAM and to triage by a physician using VIA, followed by colposcopy by a gynecologist. The results of the study show that the value of triage is in having a trained physician examine the women, and the magnification device (the Aviscope) had no discernable advantage over VIA. Therefore, triage can be done by physicians repeating the VIA exam before deciding on treatment, rather than using VIAM.

Cost-effective Screening and Treatment Strategy

The most cost-effective strategy, based on the modeling exercise using cost data from the TATI project, is a one visit or two visit approach using visual inspection and cryotherapy. This approach identifies more women with high grade lesions, costs less than conventional cytology screening, links the screening services to treatment for precancer, reduces the number of visits required to the health services and therefore reduces the proportion of women lost to follow up care.

In the TATI project where we tested the screen, triage and treat approach, we learned that one visit to complete care was not always possible. Only 24% of women with VIA positive test results were seen the same day by the doctor for triage and treatment. However, when women were re-examined by the doctor to confirm the presence of cervical lesions and receive treatment on the same day, 76% of women eligible for cryotherapy treatment received treatment that day.

Some of the reasons that one visit screen, triage and treat were not achieved are that the medical doctor may not have been available in the health center at the time of the screening visit; women may have chosen to consult their husbands or family members prior to making a decision of whether to accept treatment; and the occasional malfunctioning of the cryotherapy equipment.

Nonetheless, the screen, triage and treat approach with a one visit or two visit strategy has proven very useful to reduce the loss of women to follow up care. We observed a significant improvement in the proportion of screen positive women who received appropriate diagnosis and treatment. In the TATI project, approximately 92% of VIA positive women were followed up with either a confirmatory test or diagnostic test as indicated. Also 91% of VIAM positive women received treatment with cryotherapy and 56% of women examined by colposcopy received follow up treatment. This situation compares favorably to the situation in the region prior to the TATI project, where only 25% of women with abnormal Pap test results received appropriate follow up diagnosis and/or treatment (5).

Quality Assurance

Regular and consistent quality assurance is important for all screening tests, and particularly for VIA due to its subjective nature. In the TATI project, there was considerable variation in the proportion of VIA tests called positive among the trained midwives, which ranged from 7%-43%. There was also a variation in the VIA positivity rate, according to the number of VIA tests performed by the midwife. Midwives who performed less than 500 tests had a VIA positive rate of 23.7%; whereas those who performed 500-1000 tests had a positivity rate of 20.5%; and those with 1,000-2,000 tests had a positivity rate of 14.9%.

This indicates that it is very important to have a quality control process in place to assure that the VIA test, like the Pap test, is being accurately interpreted with minimal variation in interpretation among the many providers.

Processes that can be implemented to assure the quality of the VIA test are as follows:

- Systematically monitor the positivity rate of VIA among the providers and offer feedback to the providers with consistently high and low positive rates;
- Offer periodic refresher courses on VIA with patient or photographic case reviews, particularly for those health providers with high and low positive rates;
- Perform supervisory visits to observe providers carrying out the VIA test and to offer immediate feedback;
- Institute a feedback mechanism from the gynecologist to the provider regarding results of women referred for colposcopic evaluation;
- Integrate quality assurance procedures for VIA testing as part of the routine quality assurance methods used in reproductive health services.

Engaging Communities in Cervical Cancer Prevention

We also identified several lessons for those working to engage communities in a cervical cancer prevention program. First, decision makers must recognize the value of community promotion efforts and ensure a supportive environment for promotion activities. Second, community

leaders and Ministry of Health staff must work together to coordinate promotion and clinical activities. Third, promotion efforts should work through existing community groups, and support these groups in achieving shared goals. Fourth, client satisfaction measures can be effectively used to assess treatment acceptability. And last, the impact of promotional activities must be monitored so that their value is recognized. These lessons are important to consider in achieving a high coverage in the screening program, which is crucial to its effectiveness.

Lessons Learned in Health Promotion

Through the experiences of the community participation strategy, the following lessons have been learned:

- community health promotion teams composed of health personnel and a community leader is valuable for IEC activities;
- training helps to empower the community health promotion teams;
- educational activities with women's groups facilitate community participation in screening programs;
- designating a lead facilitator for the community health promotion teams helps to ensure continuity of activities.

What was beneficial for the health promotion activities in San Martín was to have health workers and a leader of the community integrated into a health promotion team. The community leaders supported health workers with comprehension of the language and customs of local community members, and health workers supported the community leaders with their health training, making community members feel confident about the accuracy of the information and the safety of the activities. The health promotion teams strengthened their capacities and abilities, and have become an element of the Ministry of Health that can ensure generations of healthy behaviors. This joint effort also provided the opportunity for empowerment of community leaders and active community participation.

The periodic trainings of health promotion teams were opportunities for learning and led to improvements in their job satisfaction and status, since they were able to develop new skills and benefit their community. This was observed in the empowerment of both the community leader and health workers, as they were recognized as having valuable health information to share by people and organizations in the community.

The educational activities which were delivered through the community groups were also very beneficial. These activities were convened by the president of the groups and they strengthened and empowered women by providing information and knowledge.

Designating a facilitator in every health network guaranteed closer monitoring of the health promotion teams and allowed for training of new team members, as personnel changed. This helped with the frequent personnel changes which took place throughout the health sector and allowed for the continuity of community promotion activities.

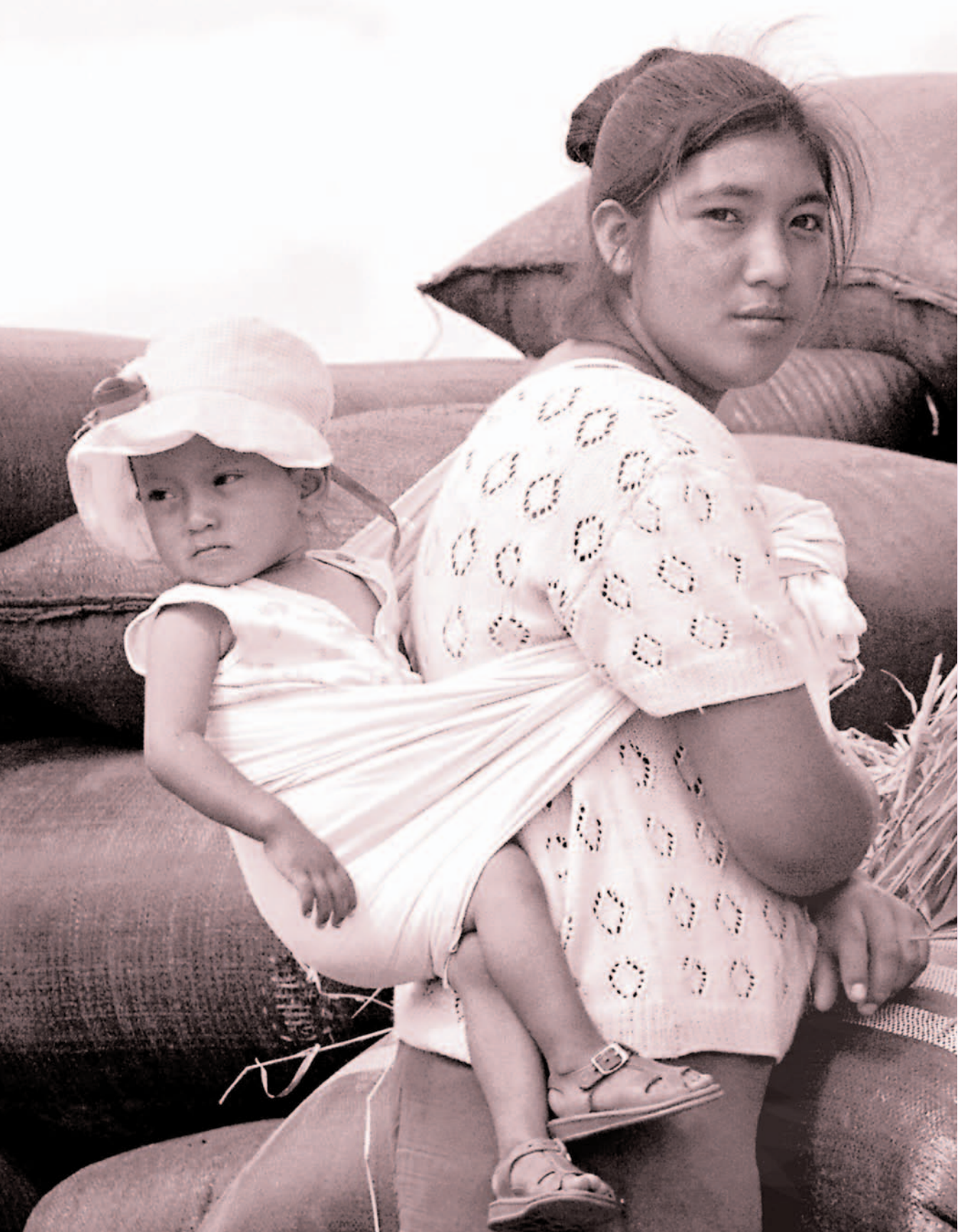
The supportive supervision methodology used to monitor the health promotion teams guaranteed improvements in their abilities and capacities, and strengthened the success of their activ-

ities. The monitoring was sometimes viewed as an inspection, but gradually the teams accepted the new monitoring method which aimed to support promotion teams in building their capacity to work effectively with their communities.

Resources Needed to Operate a Program

Based on the experiences of the TATI program, it is feasible to implement a cervical cancer prevention program in Peru using the screen, triage and treat approach with VIA testing by midwives, triage and cryotherapy treatment by general practitioners in primary care centers. Appropriate resources need to be allocated to the program and this includes the following:

- Ongoing promotional IEC campaigns and health committees in each health network to reinforce messages of screening among women at risk;
- At least 2 midwives and 1 general practitioner trained in VIA and cryotherapy treatment in place in each of the health centers of the health networks;
- On-going screening and treatment campaigns to rural health posts where the presence of medical doctors is lacking;
- Continued strengthening of the referral mechanisms and improvement of the access and availability to diagnosis/treatment services in the colposcopy centers;
- Strengthened inter-institutional mechanisms with the tertiary care level, for referral and counterreferral of women detected with cancer;
- Having at least 1 person in each health network to be responsible for coordination of services, overseeing quality assurance of screening tests, monitoring and supervision in the screening program;
- An information system for cervical cancer program management and patient follow up, ideally integrated in the routine health information system. This would register women participating in the screening program, the test results, and follow up diagnosis and treatment results and would include systematic 'alarms' to identify women who have not completed follow up testing and treatment.
- An adequate budget to cover the estimated costs for personnel, equipment, and supplies for screening and treatment procedures, sufficient to meet the needs of the estimated number of women in the target population;
- Sufficient amount of supplies and equipment for carrying out screening and treatment procedures in all health establishments;
- Permanent mechanisms for overall program monitoring, supervision and evaluation.



Conclusions

The TATI project demonstrated that it is safe, feasible and affordable to incorporate VIA testing and cryotherapy treatment into the routine women's health services at the primary care level. While the project did not meet its full coverage target, it reached many women who had never previously been served and achieved better test sensitivity and treatment completion than previously achieved by the cytology based program.

It is possible to implement a sustainable cervical cancer screening program in a low resource setting, and it would be feasible to replicate a program based on screening with VIA to other regions of the country.

We learned that community promotion activities can make a measurable difference in the success of this new public health intervention. In addition to these measurable outcomes, promotion teams reported changes in the equity of relationships with their partners, experiencing a new respect by community members, and initiating active roles in community politics. This is illustrated in the video "Changing Women's Lives Through Community Participation" which documents the experiences of three community promotion team members (9).

Mechanisms to increase participation of hard to reach women should be an integral and sustainable part of a prevention program. Additionally, a screen, triage and treat approach with the VIA test and cryotherapy treatment in primary care settings can be effective to help solve the problem of cervical cancer in a very practical way with little additional infrastructure. It is still early to conclude whether this approach will, in the long term have a significant impact on the incidence and mortality rates of cervical cancer. Only additional studies that evaluate the long term effectiveness of the VIA test and cryotherapy treatment can provide the answers.

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Annex

Doctors, midwives, community health promoters and other health personnel involved in the implementation of the TATI project.

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Mena Sobrado, Norma
Mestanza Veintemilla, Alina
Miñano Chong, Ericka
Morales Elescano, Efraín
Moreno Samaniego, Sergio Gustavo
Mori Díaz, Elena
Mori Reátegui, Isabel
Mori Vilacorta, Yolanda
Morón Pastor, César
Muñoz Huanqui, Ana Marcia
Najar Ríos, Estefita
Navarro Macedo, Silvia
Nolasco Aguirre, Augusto Christian
Obando Rojas, Julia Elizabeth
Orbe Flores, Diocelina
Orizano Falcon, Irene
Paitan Alegria, Jackeline
Palomino Capcha, Aquilina
Perdomo Solsol, Alvaro
Perez Kuga, Manuel
Pérez Ramírez, Lita
Pérez Saona, Rosa Margarita
Pinedo López, Evila
Pinedo Ruiz, Evelyn
Portocarrero García, Lidy
Ramírez Ayala, Fernando
Ramírez Ramírez, Lenny
Ramirez Rivera, Rosa Dorita
Ramírez Villanueva, Angela Esther
Ramos Moreno, Daniel

Reátegui Flores, Katherin
Rengifo Arévalo, Leysi
Rengifo Campos, Roger
Reyes Chávez, Carlos
Reyna Vasquez, Diego Aquiles
Rodríguez Aspajo, Sofia
Rodríguez Gomez, Jorge
Rodríguez Vela, Teresa
Rojas Haya, Dolibeth
Ruiz Cabrera, Emma Dionisia
Ruiz Gómez, Javier Rosario
Saavedra Bardales, Yvonita
Saavedra García, Jessy
Saavedra Salazar, Marco Antonio
Salazar Rengifo, Norma
Saldaña Cardenas, Socorro
Salvador Sanchez, Noelia
Sánchez Arnao, Walter
Sánchez García, Rosario
Sanchez Sotomayor, Anderson
Sangama Pinchi, Edith
Sinti Flores, Selmith
Suárez Acosta, Moisés
Suarez Huaccha, Marlene
Tello Hidalgo, Ivan
Tello Ramirez, Hilda
Tuanama Vela, Doris
Vargas Daza, Lloy
Vargas Sánchez, Rossana Marisol
Vargas Vargas, José
Vásquez Macedo, Rosa
Vasquez Pinedo, Rocio
Vela Del Aguila, Carlos
Vela López, Miguel Antonio
Vela Orihuela, Felipe
Velásquez Salcedo, Celia
Villacorta Rodriguez, Rocio
Villarreal Barbaran, Enrique
Zambrano Barbaran, Eduardo
Zamora Santillan, Milton
Zuñiga Carpio, Luis Antonio