Original research

Pan American Journal of Public Health

# Health-worker barriers to syphilis screening in pregnant women in Bolivia's Los Andes Network*

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**Suggested citation (Original article)** Tinajeros F, Rey Ares L, Elías V, Reveiz L, Sánchez F, Mejía M, et al. Barreras del personal de salud para el tamizaje de sífilis en mujeres embarazadas de la Red Los Andes, Bolivia. Rev Panam Salud Publica. 2017;41:e21

**ABSTRACT**

**Objective.** *Identify health-worker barriers that keep pregnant women who receive prenatal care from being screened for syphilis (Los Andes Health Network, Bolivia).*

**Methods.** *Semi-structured interviews were done with 46 health care providers and 249 clinical health records of pregnant women were analyzed in eight public health facilities in the Los Andes Network.*

**Results.** *Health-worker barriers to syphilis screening in pregnant women included personnel's lack of time to raise awareness about the benefit of syphilis screening; some mentioned that syphilis tests should only be done in facilities that attend deliveries and have a laboratory; lack of communication between clinicians and laboratory personnel; and problems with provision of supplies and reagents. The clinical record review found that only 55.4% of clinical health records contained syphilis laboratory results and only 37.4% of perinatal clinical histories had records of laboratory results. The interviews found that providers believe that syphilis screening is done in 100% of pregnant women receiving prenatal care.*

**Conclusion.** *Syphilis screening is not being done according to Bolivia's strategy for the elimination of congenital syphilis, and is not done on more than half of pregnant women in prenatal care with perinatal clinical history records. This is not perceived by health professionals and can become a barrier to syphilis screening in pregnant women.*

**Keywords** Mass screening; syphilis; prenatal care; pregnancy; Bolivia.

Syphilis is a global public health problem, with an estimated 12 million people and 1.39 to 2.0 million pregnant women infected each year (1, 2). Infection tends to be asymptomatic in pregnancy and can cause stillbirths, perinatal death, or serious neonatal infections. However, simple and profitable options for detection and treatment during pregnancy can eliminate most of these complications (3). In 2007, the World Health Organization (WHO) published "The Global Elimination of Congenital Syphilis: rationale and strategy for action", guidelines aimed at increasing global access to syphilis testing and treatment of pregnant women. By 2014, more than 40 countries were giving the syphilis test to 95% of pregnant women during their prenatal visits (4). However, although progress has been made, many countries still need to prioritize the prevention and treatment of vertically transmitted syphilis. In 2012, syphilis affected 360,000 pregnancies, with consequences such as fetal death, neonatal death, prematurity, and infected newborns (5).

In Bolivia, a study conducted by the Population Council in the country's four largest maternity clinics (Santa Cruz, La Paz, Cochabamba, and El Alto) and in 37

* Official English translation provided by the Pan American Health Organization. In the case of discrepancy between the two versions, the Spanish original shall prevail.

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rural communities found prevalence rates ranging from 3.5% to 6.7% in urban areas and from 1% to 15% in rural areas (6). This demonstrated that proper syphilis screening in pregnant women is a priority and that timely and appropriate treatment prevents congenital syphilis (7) in nearly 100% of cases (8).

El Alto is a city in the department of La Paz, located in western Bolivia on the altiplano plateau at an elevation of 4 000 meters above sea level. In 2015 it had 925 064 inhabitants. It has 50 first-level public health facilities, three second-level hospitals, and one third-level hospital, which are spread out over five health networks. The Los Andes Health Network is comprised of eight first-level public facilities, a second-level hospital, and a third-level hospital. This health network covers 222 724 inhabitants. Prenatal care for pregnant women includes syphilis screening through Comprehensive Health Insurance (Seguro Integral de Salud–SIS) at first-level centers. A guidebook on this topic is available.

In 2013, the Los Andes Health Network handled an estimated 6 381 pregnancies, attended 5 642 institutional deliveries, and provided prenatal care to 4,882 pregnant women (3,118 before the fifth month and 1 764 after the fifth month). This means that 13.5% of pregnant women directly give birth with no prior prenatal care, putting their health at great risk: if they have syphilis, vertical transmission is not diagnosed in time and cannot be prevented.

Because of certain problems in syphilis screening during prenatal visits, there is a gap between the total number of pregnant women who receive prenatal care and the total number who are screened for syphilis. In addition, there are still problems in the reporting of maternal syphilis cases at certain health centers. This study attempts to understand existing barriers to syphilis screening in pregnant women.

## METHODS

The research is part of "Improving Program Implementation through Embedded Research (iPIER)", a new initiative developed by the Alliance for Health Policy and Systems Research (AHPSR) in collaboration with the Pan American Health Organization (PAHO). The iPIER model places program implementers at the center of the research process in order to understand the barriers in health systems that obstruct implementation, and to identify solutions. Implementation research, integrated into existing processes, supports the effectiveness of health programs and policies by using research conducted as a part of the implementation process. A detailed description of the use of this research methodology can be found in the iPIER concept paper (9).

Barriers are defined as the challenges that people face in accessing health services (10). Contributing factors may be time, distance, paperwork, the number of times they need to return, or conversely, the favorable conditions created by the health system for receiving a given service. According to Donabedian, accessibility is a "mediating factor" between the ability to produce services and the actual consumption of such services (11).

The objective of this study was to identify health worker barriers to syphilis screening in pregnant women during prenatal care in the Los Andes Health Network, and to analyze the factors that limit the availability of rapid syphilis tests. Figure 1 schematically illustrates the problem that gave rise to this project, as well as implementation strategies and expected programmatic changes.

The work team was comprised of an investigator and consultant specializing in sexually transmitted infections (STIs) and the human immunodeficiency virus (HIV), an STI investigator and pediatrician at the Los Andes Municipal Hospital, the director of the Los Andes Health Network, three professionals who interviewed health providers, and an administrative team from the Fundación Colectivo Cabildeo. This combination of expertise facilitated decision-making based on the research findings.

The research protocol was submitted to the PAHO Ethics Review Committee (PAHOERC) for approval.

This study used mixed methods (qualitative and quantitative). The qualitative component included semi-structured interviews of health providers in the Los Andes network to learn about and understand barriers to syphilis screening (including supplies, ordering of tests, available time, follow-up, and coverage analysis, among others). The interviews were conducted by psychologists and educational specialists with experience in qualitative studies, who were trained in the protocol. The criteria for selecting interviewees were: being a Ministry of Health official or having worked at a facility in the Los Andes Network for at least six months (director, physician, nurse, biochemist, and pharmacist). Interviews were scheduled with six providers at each health center, until saturation was achieved.

Forty-six (46) health professionals were interviewed: eight directors, seven physicians, 16 nurses, seven biochemists, and eight pharmacists.

The interviews were recorded and transcribed in their entirety.

The qualitative data analysis was performed using an analysis matrix, coding key words that were repeated in the interviews or that stood out as being relevant.

The quantitative component was analyzed by reviewing clinical prenatal care records between January and August 2015. These records were selected through a systematic random sampling process. The sample size (294) was calculated using EpiDat® software based on a universe of 2,940 pregnant women receiving prenatal care, assuming that around 70% of pregnant women were tested for syphilis in 2013 (Los Andes network coverage report, 2013) with a 95% confidence interval (CI95%) and a 5% margin of error.

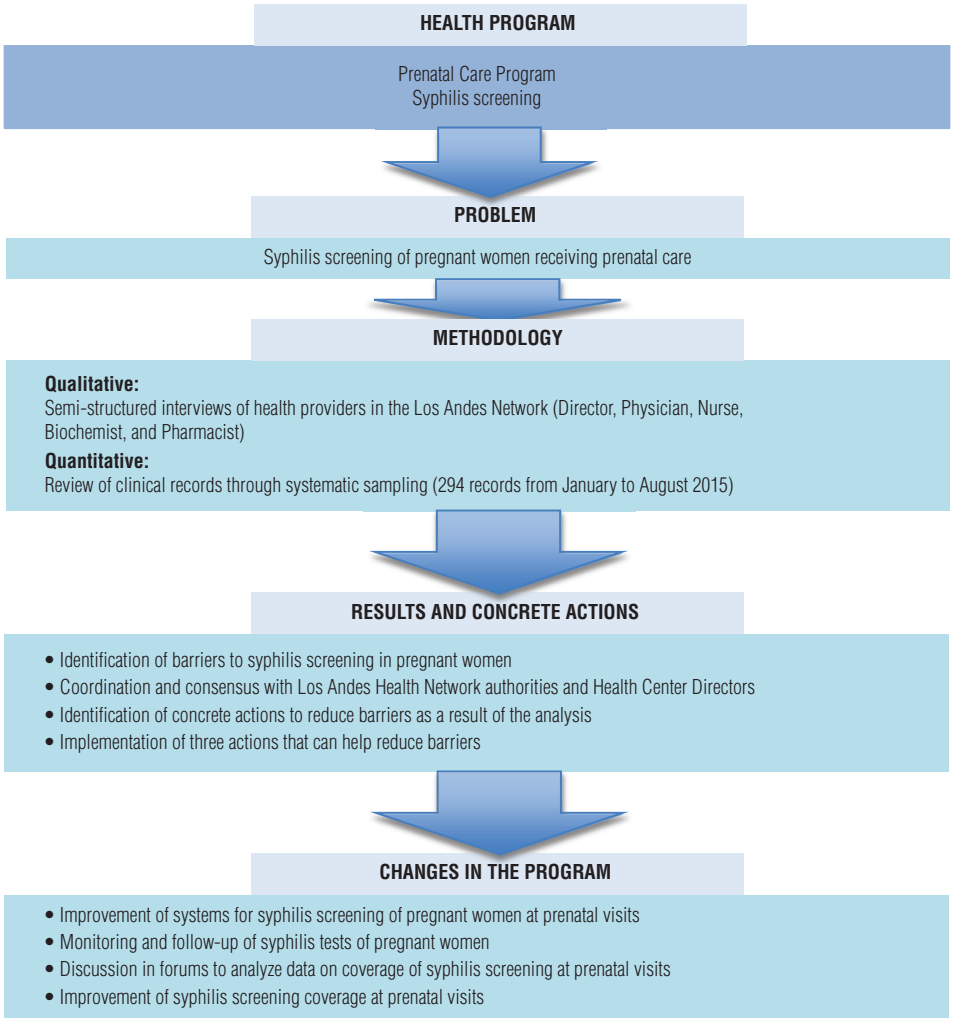
The data extracted from clinical records at the eight health centers in the Los Andes Network were entered into an Excel® database with drop-down lists. Data was analyzed using Epi Info 7®. The p-value was calculated based on $X^2$ with a 95% confidence interval to determine if the differences encountered were statistically significant.

## RESULTS

All 294 clinical records were from the first prenatal visit, 63% prior to the fifth month of pregnancy and 37% after the fifth month.

The 46 semi-structured interviews revealed that health providers believed that 100% of pregnant women who received prenatal care were screened for syphilis. Some of the interviewees said that treatment time was not sufficient. They said that syphilis testing should only be done in centers with attended births and a laboratory, and not in centers that only provide prenatal care. It was also mentioned that at Data Review Committee (DRC) meetings, these issues are only quickly and superficially

**FIGURE 1. Study flow chart: Barriers to syphilis screening in pregnant women in Bolivia's Los Andes Network, 2015.**




addressed, with no detailed follow-up (Table 1). One of the factors that restrict the supply of rapid tests is the delay in receiving disbursements to purchase tests and supplies, resulting in stock-outs.

There is little communication between clinicians and laboratory personnel regarding the type of syphilis tests performed, which may change over time. The majority of the interviewees link barriers to syphilis screening with a lack of knowledge and the short amount of time pregnant women have for their prenatal visit (Table 1).

All (100%) of the interviewees say they request syphilis screening tests. However, the review of the 294 clinical records revealed that only 55.4% contained syphilis laboratory results. A separate analysis of each center indicated the following percentages of clinical records that include test results: Alto Lima III 61.7%, Alto Lima IV 45.8%, Outpatient Referral Center 61.1%, Germán Busch 62.1%, Huayna Potosí 67.3%, Puerto Mejillones 40.0%, Santa Rosa de Lima 13.3%, and Villa Ingenio 51.1%, all of which are part of the Los Andes Health Network (Table 2).

A review of the perinatal clinical records of pregnant women shows that only 37.4% of syphilis laboratory results are recorded (Figure 2), with the lowest figure in Alto Lima III (14.7%) and the highest in Villa Ingenio (55.5%).

## DISCUSSION

As can be observed, all of the interviewees say that pregnant women are screened for syphilis. However, only 55% of the reviewed clinical records contain syphilis laboratory results, and only 37% of perinatal clinical records include syphilis laboratory results. This gap means that a pregnant woman who was screened for syphilis (12) at a prenatal visit may not receive this information. This entails the risk that if she gives birth at another health center, she might not receive the appropriate care or necessary follow-up for her newborn child, which could result in repeating tests that were already performed. For this reason, it is important to record syphilis test results in perinatal clinical records.

It is likely that syphilis screening coverage rates are actually much higher. However, recording to the test results in perinatal clinical records is a way of providing verifiable evidence, which is why there should be better follow-up to ensure the inclusion of this data in clinical records and perinatal cards. To prevent stock-outs, healthcare staff should plan ahead for test and supply requisitions, taking into account health system management times.

**TABLE 1. Barriers to syphilis screening in pregnant women during prenatal visits at health centers in the Los Andes Network, El Alto, Bolivia, 2015**

| Category of analysis | Statements made by interviewed people |
|---|---|
| Laboratory tests during prenatal visit | "*As I said, it's done for almost all pregnant women during their prenatal visit; the tests are done in the laboratory; sometimes out of fear of having their blood taken once or twice, not all women who had the lab tests come back.*" (I5. Biochemist)<br>"*Out of 100% of women, 98% come back with a 2% result. In some cases I have seen that* they *don't do it, they say they don't have time, they have to take care of their children, go to school, there's no family support.*" (I8. Physician)<br>"*I think that this priority is more appropriate in places with attended deliveries and a laboratory, not at the centers where we don't do it because there could be double venipuncture, but there could be a rapid test, perhaps for emergencies.*" (I18. Biochemist)<br>"*We sometimes have stock-outs of rapid tests, because the disbursement is delayed and the quoting and procurement process takes time, so we are left with no supplies or tests.*" (I15. Biochemist) |
| Barriers to syphilis screening during prenatal visit | "*It would be ideal to have a little more time. Sometimes, due to demand or because we have to deal with different situations at the same time, we don't have time for proper counseling and awareness raising.*" (I39. Physician)<br>"*The consultation time is hard; we have to estimate at least 20 minutes to see a new woman.*" (I12. Nurse)<br>"*We didn't have any rapid syphilis tests for months and until they bought some for us we had to borrow them from another health center, we try to find solutions.*" (I35. Nurse)<br>"*So another barrier is people's lack of knowledge; if we insist that they come back at a specific time, they don't do it.*" (I42. Physician) |
| Analysis of syphilis screening of pregnant women at data review committee meetings | "*Currently, at the numerous monthly meetings we are having, the data is only very superficially addressed.*" (I20. Health center director) |
| Attitude of health providers | "*But health workers are in fact willing to improve syphilis screening; it's a necessity.*" (I23. Nurse)<br>"*Based on the desire we all have to achieve coverage, we have to try to enforce the law because we set a goal for ourselves and if we do not reach it, it's because we aren't trying hard enough; for example, the fact that we do not have syphilis diagnosed to date … is possibly due to the fact that we are not trying hard enough.*" (I36. Physician) |

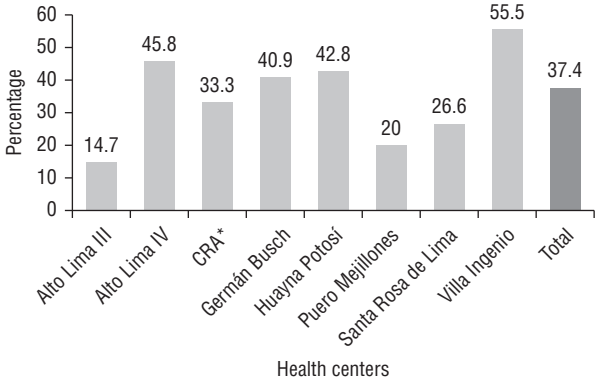
I = interviewee

**TABLE 2. Total number and percentage of clinical records with syphilis laboratory results. Los Andes Health Network, El Alto, Bolivia, 2015**

| Health center | Number | Percentage (%) | CI95% |
|---|---|---|---|
| Alto Lima III | 34 | 61.7 | 43.5-/77.8 |
| Alto Lima IV | 24 | 45.8 | 25.5-/67.1 |
| CRA | 36 | 61.1 | 43.4-/76.8 |
| Germán Busch | 66 | 62.1 | 49.3-/73.7 |
| Huayna Potosí | 49 | 67.3 | 52.4-/80.1 |
| Puerto Mejillones | 25 | 40.0 | 21.1-/61.3 |
| Santa Rosa de Lima | 15 | 13.3 | 1.6-/40.4 |
| Villa Ingenio | 45 | 51.1 | 35.7-/66.3 |
| Total | 294 | 55.4 | 49.5-/61.2 |

CI95% = 95% confidence interval; CRA = Outpatient Referral Center

**FIGURE 2. Total number and percentage of perinatal clinical records with syphilis laboratory results, Los Andes Health Network, El Alto, Bolivia, 2015**




*CRA = Outpatient Referral Center

In addition, significant differences ($p < 0.05$) have been observed between first-level facilities with no laboratories (46.8%, CI95% 37.9-55.3) and second-level centers with laboratories (63.5%, CI95% 49.7-74.5). Based on these findings, we can say that syphilis tests are more likely to be performed in second-level facilities than in first-level facilities, and that results will be recorded in clinical records, primarily the perinatal card.

Health workers need to be better educated with regard to syphilis, since the latent phase of the disease can last many years (13). Health workers' perception that all women are being screened for syphilis and that the gap in coverage is the responsibility of the pregnant woman does not help to close the gaps. The impact could be greater if the system's weaknesses and limitations were recognized, while working to disseminate information and promote prenatal care for pregnant women, especially emphasizing the importance of syphilis screening and its preventive effect on newborn health (14). Health workers at every center should ensure follow-up and monitoring based on their specific circumstances, with a more in-depth discussion on the subject of syphilis

at quarterly DRC meetings with health authority leaders. This should serve as a catalyst for the health system, as demonstrated by the experience in other countries (15).

This study made it possible to identify barriers and learn about the reality of syphilis screening in the Los Andes Network, which led to the implementation of concrete actions for improvement. One of the limitations of the study was that pregnant women were not interviewed. Only health workers in the Los Andes Network were interviewed, and the results could not be extrapolated to all El Alto health facilities. Even so, it provides a starting point for recommendations and could in the future be extended to other El Alto and national networks, and could include pregnant women.

Although some weaknesses have been identified in the syphilis screening process for pregnant women, especially in the recording of results in clinical records, it must be noted that the majority of the health facilities do have certain strengths such as infrastructure, trained staff, and a positive attitude towards improving integrated syphilis/HIV screening in pregnant women. It should be recalled that a pregnant woman's adherence to health system procedures largely depends on the quality of care provided during prenatal visits, delivery, and puerperium by trained and informed health professionals (16).

The immediate actions for closing gaps were implemented after reviewing the findings. These actions were: the inclusion of a column to record syphilis tests in prenatal care records, as well as follow-up, monitoring, and supervision of screening by staff at each health center (17). An analysis of this subject at DRC meetings will help improve coverage on a sustainable basis so that all pregnant women will receive proper care and monitoring and their babies will be free of congenital syphilis (18), with the corresponding financial impact (19). According to the WHO, strengthening health systems by improving one or more functions will help optimize health, resulting in better access, coverage, quality, and efficiency in syphilis testing in pregnant women (20).

The results of the study helped raise awareness among health providers and authorities in the Los Andes Health Network regarding the importance of syphilis screening in pregnant women and the monitoring of coverage rates. It can be concluded that the study results had a positive impact and helped to recognize the need for closer tracking and monitoring through the identification and implementation of several concrete actions aimed at improving the coverage of syphilis screening in pregnant women and the recording of results.

## Conclusion

Syphilis screening is not being done according to Bolivia's strategy for the elimination of congenital syphilis, and is not performed on more than half of pregnant women in prenatal care, a situation not perceived by health professionals. These findings could be used to design interventions aimed at achieving optimal screening levels, taking into account the barriers and facilitators identified in the study and implementing actions to monitor syphilis testing, which could be extended to other health networks in El Alto, Bolivia.

**Conflicts of interest.** None declared by the authors.

**Disclaimer.** The opinions expressed in this manuscript are the responsibility of the author and do not necessarily reflect the criteria or the policies of the *RPSP/PAJPH* and/or PAHO.

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Manuscript received on 29 April 2016. Revised version accepted for publication on 20 October 2016.

**RESUMEN**

## Barreras del personal de salud para el tamizaje de sífilis en mujeres embarazadas de la Red Los Andes, Bolivia

***Objetivo.*** Identificar barreras del personal de salud por las cuales las embarazadas que asisten al control prenatal no se realizan el tamizaje de sífilis (Red de Salud Los Andes, Bolivia).

***Métodos.*** Se realizaron 46 entrevistas semiestructuradas a proveedores de salud y se analizaron los registros de 249 expedientes clínicos de embarazadas de ocho establecimientos públicos de salud de la Red Los Andes.

***Resultados.*** Entre las barreras del personal de salud para el tamizaje de sífilis en embarazadas se identificaron el tiempo insuficiente del personal para sensibilizar sobre el beneficio del tamizaje de sífilis, algunos mencionaron que las pruebas de sífilis se deberían hacer solo en centros donde atienden partos y tienen laboratorio, la poca comunicación entre el personal de la consulta médica y laboratorio, así como también problemas de abastecimiento de suministros y reactivos. En la revisión de expedientes clínicos se observó que 55,4% contaba con los resultados de laboratorio de sífilis en sus expedientes y solo 37,4% de historias clínicas perinatales contaba con registro de resultados de laboratorios. A través de las entrevistas, se pudo observar que los proveedores perciben que el tamizaje de sífilis se realiza al 100% de las embarazadas que asisten al control prenatal.

***Conclusión.*** El tamizaje para sífilis no se está realizando según lo establecido en la estrategia de país para la eliminación de la sífilis congénita, y no llega a más de la mitad de embarazadas en control prenatal con registros en las historias clínicas perinatales. Esto no es percibido por los profesionales de la salud y puede transformarse en una barrera para el tamizaje de sífilis en mujeres embarazadas.

**Palabras clave** Tamizaje masivo; sífilis; atención prenatal; embarazo; Bolivia.