

# Economic and programmatic aspects of congenital syphilis prevention

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**Abstract** A review of the economic and programmatic aspects of congenital syphilis was conducted and recommendations made for improvement of its prevention. Congenital syphilis is a preventable disease and the tools to prevent it have been available for decades. In both industrialized and developing countries, but particularly the latter, the prevention of congenital syphilis by antenatal screening is cost-effective and may be cost-saving. Yet, globally, there are probably >500 000 fetal deaths a year from congenital syphilis, a figure rivalling that from mother-to-child transmission of human immunodeficiency virus (HIV), which receives far greater attention. The reasons that congenital syphilis persists vary, with international and national under-appreciation of the burden of congenital syphilis and insufficient political will to provide effective antenatal screening programmes probably being the main reasons. All causes are amenable to effective intervention programmes. The prevention of congenital syphilis should be a global priority; international agencies and national programmes should be committed to improving antenatal care (ANC) services including syphilis detection and prevention.

**Keywords** Syphilis, Congenital/prevention and control/economics; Syphilis/prevention and control/economics; Prenatal diagnosis/economics; Prenatal care; Pregnancy; Cost of illness; Treatment failure; National health programs/organization and administration (source: MeSH, NLM).

**Mots clés** Syphilis congénitale/prévention et contrôle/économie; Syphilis/prévention et contrôle/économie; Diagnostic prénatal/économie; Soins prénatals; Grossesse; Coût maladie; Echec thérapeutique; Programme national santé/organisation et administration (source: MeSH, INSERM).

**Palabras clave** Sífilis congénita/prevencción y control/economía; Sífilis/prevencción y control/economía; Diagnóstico prenatal/economía; Atención prenatal; Embarazo; Costo de la enfermedad; Insuficiencia del tratamiento; Programas nacionales de salud/organización y administración (fuente: DeCS, BIREME).

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Voir page 408 le résumé en français. En la página 408 figura un resumen en español.

يمكن الاطلاع على الملخص بالعربية في صفحة 408.

## Introduction

In 2001, an estimated 720 000 infants, almost all in developing countries, were born with HIV (1) and few will survive until their tenth birthday. This high mortality in children who will never survive and contribute to society has captured the world's attention. Numerous approaches to intervention based on screening of pregnant women for human immunodeficiency virus (HIV) and prophylaxis or therapy of seropositive women have been investigated and, in industrialized countries, adopted. In developing countries, identification of all infected mothers and institution of prevention of mother-to-child-transmission (PMTCT) programmes, currently using (principally) single-dose antiretroviral prophylaxis for mother and baby, might prevent about one-third to one-half of the 720 000 cases (240 000–360 000 cases) (2).

In sub-Saharan Africa, an estimated two million or more women with active syphilis become pregnant each year; in an

estimated 1 640 000 of them, infection remains undetected during pregnancy (3). Although estimates vary, adverse pregnancy outcomes occur in up to 80% of women with acute syphilis, including stillbirth (40%), perinatal death (20%) and serious neonatal infection (20%) (4). In African countries, syphilis is the leading cause of perinatal mortality (21%) (5). Women with early syphilis are most likely to infect their fetus (6). To identify these women, titres of reaginic antibody are often measured: titres of 1:8 or greater ("high titre") indicate greatest risk (7–9). It is estimated that about half of pregnant women with active infection have "high-titre infection" (7–10). If this estimate is correct, the numbers of fetal deaths in Africa each year from untreated maternal syphilis rival those from HIV infection. Screening pregnant women for syphilis, treating those who are seropositive, and preventing reinfection will be effective if screening is performed early in pregnancy (11, 12). Universal institution of an effective programme to prevent congenital syphilis (CS) could avoid 492 000 deaths in Africa alone

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(1 640 000 (number of infected women) × 0.50 (rate of high-titres) × 0.60 (probability of fetal death) = 492 000). However, the prevention of infant deaths due to syphilis receives lower priority than prevention of those due to HIV infection.

This indifference is not because it is not known how to prevent CS. Prevention of CS is simpler than PMTCT of HIV, and highly cost-effective (13), yet often not carried out in middle-income or low-income countries. This paper reviews the economic rationale for screening pregnant women for syphilis, the reasons why screening is often unsuccessful, and suggests ways forward.

## Economic perspective

As syphilis incidence has fallen in the developed world, questions of whether screening of pregnant women for syphilis should continue to be recommended have resulted in full economic evaluations in the United Kingdom (14) and Norway (15), and partial evaluations in the United Kingdom and Australia (16–18). Despite varied modelling approaches, these analyses all concluded that screening is cost-effective (all evaluations) and cost-saving (full evaluations) at threshold prevalences considerably less than 1%, and should therefore continue.

Syphilis screening in developed countries is cost-effective at very low prevalences because treating CS is expensive. A child with CS is hospitalized, on average, 7.5 days longer than a child without CS (mean cost (2001 dollars) US\$ 5 253) (19). Although no study has followed children with CS to determine ultimate outcome, even an occasional case of neurological damage, as modelled in two analyses (14, 15), raises the mean health-care cost of a case of CS dramatically. When indirect costs (14, 15) are included, the cost of a case of CS escalates sharply. Thus, serological screening of pregnant women, which is inexpensive, is cost-effective even at very low prevalences of maternal infection. Preventing even an occasional case is economically worthwhile. Furthermore, there is the added benefit, uncoded in any analysis, of detecting and treating infection in a woman, so that the consequences of syphilis may be prevented in her (and possibly her partner(s)).

The cost to society of a case of CS exceeds the direct and indirect medical costs, but only one analysis has included intangible costs, i.e. the cost to a family of the death of an infant (14). Babies carry a considerable societal value; this implicit valuation drives programmes for the prevention of HIV infection in infants, and other safe motherhood programmes. While the intangible costs attached to such losses are difficult to model, they must be included, even if implicitly, in economic evaluations of screening of pregnant women for syphilis. Models based on direct medical costs, and even those that include indirect medical costs, significantly underestimate the benefits of screening. The net result of considering such benefits is to push the threshold prevalence of maternal infection for cost-saving screening even lower and accentuate the favourable cost:benefit ratio (14).

Fewer economic evaluations have been made in developing countries, where health-care programmes and costs differ substantially from those in developed countries. In sub-Saharan Africa several economic analyses of direct medical costs indicate that screening is highly cost-effective even at relatively low prevalences, e.g. 1% (20–22); the cost of averting a case of congenital syphilis was US\$ 50–177 (22). In a South African population with a prevalence of syphilis of 6.3% (1.7% with “acute syphilis”, i.e. rapid plasma reagin (RPR) titres of  $\geq$  1:8),

it was shown that screening women using an immunochromatographic strip test on-site is more cost-effective (US\$ 37 per case of congenital syphilis averted) than either on-site RPR testing (US\$ 43 per case averted) or testing at a laboratory (US\$ 111 per case averted) (10). In published studies, converting all fetal consequences of maternal syphilis into disability-adjusted life years (DALYs), the cost per DALY averted is US\$ 4–19 (depending upon assumptions made). This figure compared favourably to the upper value for cost-effectiveness of interventions of < US\$ 193/DALY suggested in 1993 by the World Bank, and showed that congenital syphilis prevention is highly cost-effective (23). This conclusion is supported by a model of the direct and indirect costs of re-screening initially seronegative Thai women in the third trimester (24). Even at the low incidence (prevalence) of 0.07%, similar to that in industrialized countries, the benefit:cost ratio was 2.8.

Seroprevalence rates among pregnant women in developing countries are higher than those in industrialized countries, but those used in the limited modelling work done in the developing world are largely realistic (25). In sub-Saharan Africa 23 recent studies have reported a weighted mean seroprevalence rate of 8.3% (range, 0.9–20.8%); assuming that 80% of the positive serological tests indicated active syphilis, the percentage of women with active syphilis would be 6.6% (range, 0.7–16.6%) (3). Even in countries with low prevalence, because of the additional indirect (and intangible) costs of a case of CS, it is appropriate to conclude that all developing countries should recommend routine screening of pregnant women for syphilis. The issue for the developing world is not whether to screen but how to screen most efficiently.

## Programme perspective

### Why cases of congenital syphilis occur

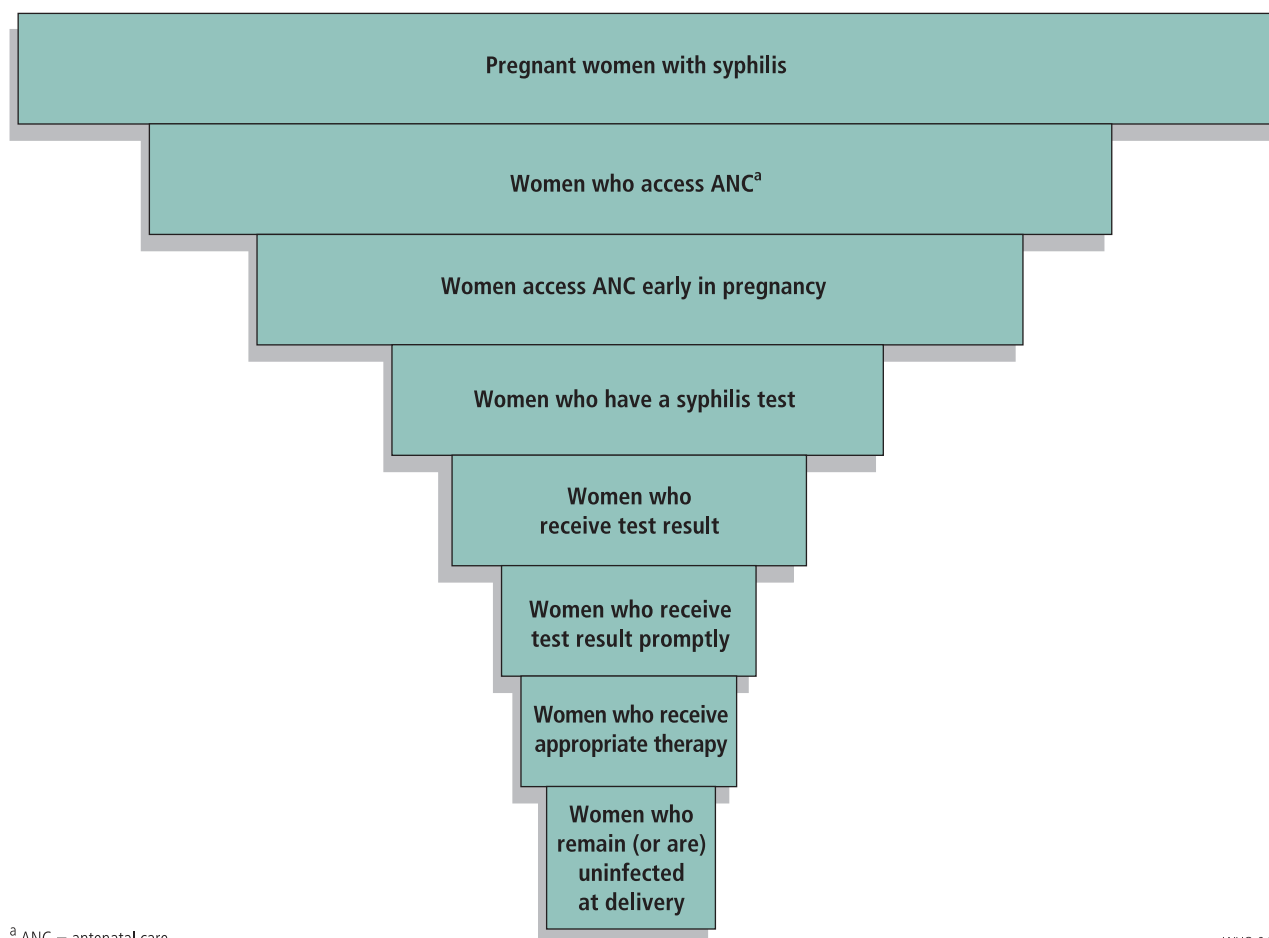
Although the concept of screening pregnant women for syphilis is simple, implementing the programmes often is not. In industrialized countries, despite recommendations for screening early in pregnancy, stillbirths and infections in infants occur. In the United States, where the recommendation is that all women should be screened at the first prenatal visit and, often, subsequently (depending upon risk and State law), between 1992 and 1998, a mean of 135 infants died annually from CS (26). Although as many as 15% of providers fail to routinely screen all women (27), the single biggest contributor to the occurrence of CS is failure to attend for ANC (26, 28). Various other reasons contribute to CS, as exemplified by a recent study from Atlanta, GA, USA (28) (Table 1). Remedying the situation has historically centred on increasing access to ANC together with provider education. More recent efforts in some countries have focused on ensuring that pregnant women have been tested at least once by the time of delivery; some programmes have mandated that women at high risk be tested again in the third trimester and yet again at delivery.

Some studies have shown that the causes of CS in middle- and low-income countries are identical to those in industrialized countries, although the relative importance of each cause varies (29, 30). If individual countries understand their own situation, they can improve their antenatal screening programmes (Fig. 1).

### Preventing congenital syphilis

Understanding the causes of CS in each medical care setting is important because interventions can be made at each step (Fig. 2).

Fig. 1. Congenital syphilis is preventable, either by preventing infection in pregnant women or by detecting infection that does occur. Each bar represents a subset of women in the bar above it, and there is an obstacle between each pair of bars to be overcome. The size of the bar varies between medical care settings and countries



<sup>a</sup> ANC = antenatal care

WHO 04.77

### Preventing infection in women

Congenital syphilis can be prevented, either through prevention or detection of infection in pregnant women. Programmes promoting safer sex or control of sexually transmitted infection in the community will prevent maternal infection. But, if an infected woman becomes pregnant, only screening programmes can prevent the effects of maternal infection on the fetus; these programmes must be implemented, although not necessarily exclusively, during ANC.

### Women must access antenatal care

In developing countries, ANC is often either unavailable or not accessed. In a survey covering an estimated 84% of the population of developing countries, 68% of urban and 39% of rural women were estimated to have access to ANC (31), whereas in 1996, WHO estimated that 68% of women received ANC (32). In sub-Saharan Africa, an estimated 63–73% of pregnant women received ANC, but this may be an overestimate (3, 32).

The reasons for non-attendance for ANC range from fear of medical care to nonexistent services (33). Even if 68% of women access ANC, the benefit to CS prevention is overestimated, because women with syphilis are less likely to access ANC. In industrialized countries, women with syphilis often have other problems, e.g. drug use, that interfere with access to ANC (34). In developing countries, women with syphilis are less

Table 1. Reasons for cases of congenital syphilis, in Atlanta, GA, USA, 1990–93

Reason	Number of cases
No antenatal care	70 (52) <sup>a</sup>
Positive test following previous negative test <sup>b</sup>	27 (20)
Positive test, but no treatment	17 (13)
Therapy failure or reinfection <sup>c</sup>	15 (11)
No test or delayed test	5 (4)
<b>Total</b>	<b>134</b>

Adapted from reference 28.

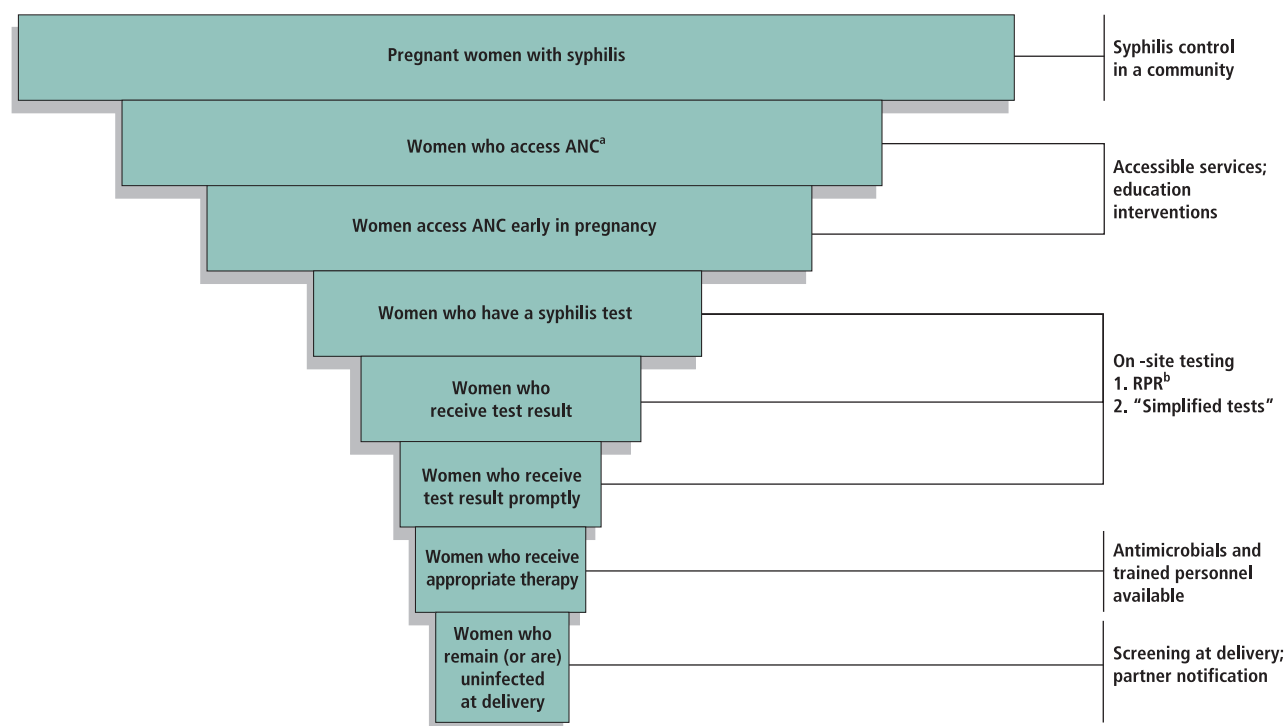
<sup>a</sup> Figures in parentheses are percentages.

<sup>b</sup> These could have been either cases of syphilis acquired during pregnancy or the result of an inaccurate, initial negative test.

<sup>c</sup> Ten women had a fourfold rise in titre following an initial decline in titre, suggesting reinfection; the remainder had an initial indeterminate response to therapy, suggesting treatment failure.

likely than those in industrialized countries to have risk factors (34) that distinguish them from women without syphilis (35, 36). But there is ample evidence that women who deliver an infant with CS did not access ANC (5, 30, 37, 38), and this is probably the major risk factor for CS in the developing world.

Fig. 2. Intervention options targeting each of the general obstacles are listed on the right



<sup>a</sup> ANC = antenatal care

<sup>b</sup> RPR = rapid plasma reagin

WHO 04.78

### Women must access antenatal care early

To prevent CS, women must access ANC early in pregnancy. Although it was once thought that the fetus was protected from infection until the twentieth week of gestation by an effective placental barrier (6) this has recently been found to be untrue. In developing countries, the first ANC visit generally occurs at 5–6 months of gestation (32), too late to effectively prevent CS. In both industrialized and developing countries (26, 28, 37), accessing ANC for the first time in the second half of pregnancy is common among women who have infants with CS (e.g. a mean first attendance at 24 weeks was reported in 158 women with syphilis in South Africa).

### Antenatal care programmes must provide syphilis testing

Many ANC programmes do not provide syphilis testing and there may be no national policy for this. For example, in sub-Saharan Africa, only 17 (77%) of 22 countries have such a policy and most countries lack the practical means to implement it (3). Serological screening for syphilis using standard RPR or venereal disease research laboratory (VDRL) testing requires that a complicated chain of events takes place: equipment and personnel to draw blood, transport of specimens to the laboratory, a properly equipped and functional laboratory, and a system for reporting results back to the clinic. The inability to maintain a syphilis testing service that requires transportation of blood to a centralized laboratory for testing has been identified in numerous studies as a major obstacle. A recent survey of ANC clinics in South Africa found only four (29%) of 14 had a functioning testing system for syphilis, despite a national policy of screening twice during pregnancy; lack of transport was the single biggest obstacle to testing (10).

### Women must receive test results promptly

Results must be returned to the clinic and must reach the woman concerned promptly. For this, women must either return to the clinic or there must be a notification system in place; frequently, neither occur. However, an estimated 90% of pregnant women in developing countries who access ANC once, do so a second time (40), although the second visit may be considerably later than the first. One study in South Africa asked women to return 14 days following blood sampling to receive test results and therapy (39). The mean number of days between sampling and initial therapy was 20, and 19% of women were never treated, presumably because they were never notified — it is likely that in a nonstudy situation these figures would be worse. A confidential system to notify women of their results at home would be an attractive alternative.

The logistical problems with the performance of reaginic antibody tests, e.g. RPR or VDRL at centralized laboratories have led to efforts to promote testing at clinics (decentralized testing). There are difficulties in this approach: staff must be willing, have sufficient time, and be trained to provide testing, and materials must be available and stored appropriately (10, 41, 42). Also, results obtained at clinics differ from those obtained at reference laboratories (7, 8, 10, 41–43). Nevertheless, studies have universally shown that decentralized testing leads to more women with syphilis being detected and treated than centralized testing. Furthermore, it is cost-effective, and nursing staff prefer it (10), making it far more likely to be implemented and sustained.

The difficulties with conducting RPR testing at clinics have led to the development of technologically simple immunochromographic strip tests (44). Although (favourable) results of field trials are only now becoming available (10, 42), initial

results show their simplicity is preferred by nursing staff to reaginic testing (10) and their favourable performance characteristics make them more cost-effective than decentralized reaginic testing (10).

### Notification must result in appropriate treatment

For appropriate treatment, antimicrobials must be available, but this is often not the case (31). The treatment must be available at the ANC clinic, as referral for therapy results in fewer women being treated (only 24.5% of infected women in one study) (38). Where antibiotics are available, therapy must be appropriate. Whether one, two or three weekly doses of penicillin are required for optimal prevention of CS is uncertain (6, 12, 39, 45) but, if several doses are needed (39, 45, 46), many women do not receive them (38, 39, 45, 46).

### Women must remain uninfected during pregnancy

Women who are tested early in pregnancy and found to be seronegative must remain uninfected. Several studies in developing countries have re-tested women who were seronegative earlier in pregnancy at delivery, and found prevalences >1% (Table 2). It is almost certainly cost-effective to determine the prevalences at the time of delivery although the economics of testing at delivery differ from those during pregnancy because stillbirth has been avoided. The cases detected at delivery are likely to be a mixture of incident cases and cases with previously false-negative results. Both occur, and both benefit from treatment of mother and infant (9, 12).

Women treated for syphilis at the beginning of pregnancy are probably at a higher risk of reacquiring syphilis during pregnancy than women without syphilis, either because of failure to notify the partner or because these women have sex in sexual networks in which syphilis occurs. Women treated for syphilis benefit from repeat testing and partner notification (47).

Several studies have shown that women who fail to attend ANC are at higher risk of having syphilis than women who do (5, 26, 42, 48). Women who have no history of having accessed ANC (or having had a serological test during pregnancy) should be tested at delivery.

## Recommended interventions

### International level

At the international level, the prevention of CS should be made a health system priority and the following should be provided: estimates of the global CS burden, active advocacy for CS prevention, assessment of global CS prevention programme policies,

and programme guidance for national prevention programmes. Assessing the global burden of CS and how national health care systems address it, and provision of appropriate programme guidance, will inform advocacy and intervention efforts. Links with international groups, e.g. International Planned Parenthood Federation or other United Nations (UN) agencies, can result in a more focused, coordinated international-level effort. Such efforts led the Pan American Health Association to draft a plan to decrease the rate of CS to <0.5/1000 live births in Latin America (49).

Testing for CS should be added to the recommended essential services for pregnant women. WHO states that, at "a minimum, women should expect and demand tetanus toxoid immunization and iron/folic acid tablets" during pregnancy (50). Yet, the occurrence of fetal infection and death due to CS exceeds that of tetanus: by one estimate, a million pregnancies are affected each year by CS as opposed to 300 000 infants affected by neonatal tetanus (13).

### National level

At the national level, a policy for testing and treating all pregnant women for syphilis should be developed.

A programme of universal testing of pregnant women should be a political and health-care priority. The economic and social consequences of CS strongly argue for its prevention as a priority health-care intervention, and an important ANC intervention. However, few countries have information on syphilis screening during pregnancy. Obtaining this information together with an understanding of the morbidity due to CS and programme problems can alter government policy; e.g. in 1998, after investigating these issues the Bolivian Government decreed that all ANC services, including syphilis testing, would be free of charge (33). However, such programmes, even when successful, require continued political and financial commitment (41).

National programme managers in sub-Saharan Africa have identified the costs to the patient of testing and therapy as major obstacles to testing pregnant women for syphilis (Table 3). Bolivian physicians also identified cost as the biggest obstacle to testing in a population in which 76% of pregnant women accessed ANC services, but only 17% of them were screened for syphilis (33). Testing and treatment for syphilis in pregnant women should be free of charge.

Nevertheless, it is likely that the second most commonly identified obstacle to screening in the African survey, i.e. lack of organization (and location) of services, is actually the most

Table 2. Results of re-testing at delivery women who were seronegative earlier in pregnancy, in selected developing countries

City	Year	Prevalence of syphilis at retesting <sup>a</sup>	Prevalence among all attendees (%)
Durban, South Africa (54)	1993	5/178 (2.8) <sup>b</sup>	11.0
Durban, South Africa (54)	1995	9/329 (2.7)	9.4
Nairobi, Kenya (47)	2000	155/12 414 (1.3)	3.0
Three continents (35)	2002	78/20 320 (0.4)	0.9
Mwanza, United Republic of Tanzania (12)	2002	≥8/1001 (≥0.8)	7.7

<sup>a</sup> Positive by both reaginic and treponemal antibody testing.

<sup>b</sup> Figures in parentheses are percentages.

Table 3. Reported obstacles to universal antenatal syphilis screening in sub-Saharan Africa<sup>a</sup> (n = 21)

Obstacle reported to be important	Number of project managers reporting each obstacle
Cost to patient of testing	10
Organization of services	7
Cost to patient of treatment	6
Transport costs to testing facility	4
Inadequate priority given by ministry of health	3
Social/cultural resistance	3
Holidays, absence of health workers	2
Lack of provider compliance/awareness	2

<sup>a</sup> Based on data from reference 3.

significant obstacle to testing (although lack of priority given by ministries of health certainly contributes). Putting into practice the results of a recent WHO trial, which concluded that the quality of ANC services is as important to perinatal outcome as the number of visits, could help overcome the problem of insufficient services (51).

### National or local level

At the national or local level, antenatal screening for syphilis should be linked to programmes for PMTCT of HIV, and other programmes to improve ANC. As efforts to increase knowledge of HIV serostatus among pregnant women increase, combining programmes for PMTCT of HIV with prevention of congenital transmission of *Treponema pallidum* makes medical, economic and political sense. Evaluation of pilot programmes to look for combined efficiencies would be useful, as would the combination of CS prevention with other ANC programmes, e.g. those seeking to increase ANC attendance.

Community syphilis prevention and control efforts should be reinforced. Theoretically, prevention of CS could occur independently of community control efforts for syphilis if infected women access ANC services with high quality syphilis management components as soon as they know they are pregnant. A complementary strategy is to prevent women from being infected. Improvement of sexually transmitted infection services outside ANC, with strong efforts to notify male partners who are infected, would help achieve this goal. In combination with other prevention measures, such a programme may have led to a decline in syphilis seroreactivity among pregnant women in Nairobi, Kenya (52). In addition, screening at ANC services coupled with partner notification efforts should be viewed as part of a comprehensive, community approach to syphilis control.

### Local level

At the local level, attendance early in pregnancy at ANC should be encouraged. The reasons for non-attendance and late attendance at ANC are amenable to intervention. In Zambia, an inexpensive health education intervention conducted in general

health clinics, centred on syphilis and intended to increase early ANC attendance, resulted in an increase from 9.4% to 42.5% of attendees accessing care within the first 16 weeks of gestation (21).

Laboratory testing should be decentralized. The favorable cost-effectiveness modelling of screening programmes is reduced by ineffective centralized programmes, where the cost of detecting syphilis in a pregnant women may be low (US\$ 66) but, because few women actually receive therapy, the cost of successful treatment of a woman (and, thus, of averting a potential case of CS) is high (US\$ 730) (53). Relative to centralized testing, decentralized testing detects and treats far more infected women and is cost-effective (10).

### Other interventions

On-site testing procedures should be simplified. Although on-site testing has its own problems as discussed above (7, 8, 10), simplified, immunochromographic tests offer a cost-effective alternative to RPR testing (10, 42, 44), even at low prevalences. Development of similar reaginic antigen-based tests, perhaps using a single test strip, would be an important additional tool.

Emphasis on partner notification of seropositive women in ANC should be increased. Notification of male partners is important to their health, and perhaps in preventing reinfection of women. An emphasis on notification of partners of pregnant women with syphilis has been associated with a threefold improvement in pregnancy outcome (47). It may also be an important means of accessing male partners for HIV testing; in one study, 72% of male partners agreed to such testing (47). These men, because they probably have syphilis, are also likely to have HIV.

At the time of delivery, all women should have been tested at least once during pregnancy, and groups at high risk should be retested; i.e. women who were identified as having syphilis earlier during pregnancy or women who are members of groups with high prevalence of syphilis who were earlier seronegative. The latter group includes women who reside in areas where syphilis is highly prevalent (Table 1) and women who may not reside in areas of high prevalence, but have risk factors that place them at particular risk, e.g. sex workers. The common feature of all these groups is that the prevalence of infection is high enough, based upon the economic data discussed earlier, to warrant retesting. Furthermore, testing at delivery can affect not only the outcome of the present pregnancy, but also of future ones.

Pregnant women should be tested at locations other than ANC. Enlarging the concept of CS prevention to include screening at other health care centres, e.g. testing pregnant women attending an urgent care clinic if they have not attended ANC may improve the prevention of CS.

Commitment to quality assurance of programmes should be obtained at the local level. Numerous studies have shown that commitment to continuous quality assurance of syphilis testing within ANC programmes is essential to their success (41, 53). ■

**Conflicts of interest:** none declared.

## Résumé

### Aspects économiques et programmatiques de la prévention de la syphilis congénitale

Les aspects économiques et programmatiques liés à la syphilis congénitale ont été examinés, et des recommandations visant à améliorer la prévention de cette maladie ont été formulées. La syphilis congénitale est une maladie évitable contre laquelle il existe des outils de prévention depuis des dizaines d'années. Dans les pays industrialisés comme dans ceux en développement, mais plus particulièrement dans ces derniers, la prévention de la syphilis congénitale grâce au dépistage anténatal est d'un bon rapport coût-efficacité et peut faire réaliser des économies. Cette maladie provoque cependant selon toute vraisemblance plus de 500 000 morts fœtales par an dans le monde, chiffre avoisinant celui de la transmission mère-enfant du virus de l'immunodéficience humaine

(VIH), qui retient bien davantage l'attention. La persistance de la syphilis congénitale est due à diverses causes, dont les principales sont probablement la sous-estimation tant au niveau national qu'au niveau international de la charge que représente cette maladie et l'insuffisance de l'engagement politique en faveur de programmes de dépistage anténatal efficaces. Tous ces facteurs peuvent relever de programmes d'intervention efficaces. La prévention de la syphilis congénitale doit être une priorité mondiale ; les organismes internationaux et les programmes nationaux doivent s'engager à améliorer les services de soins anténatals, détection et prévention de la syphilis incluses.

## Resumen

### Aspectos económicos y programáticos de la prevención de la sífilis congénita

Se hizo un análisis de los aspectos económicos y programáticos de la sífilis congénita y se formularon recomendaciones para mejorar la prevención de esa enfermedad. La sífilis congénita es una dolencia prevenible, y desde hace décadas se dispone de los medios necesarios para prevenirla. Tanto en los países industrializados como en los países en desarrollo, pero sobre todo en estos últimos, la prevención de la sífilis congénita mediante cribado prenatal es una intervención costoeficaz que puede permitir ahorrar costos. No obstante, a nivel mundial se registran probablemente cada año más de 500 000 muertes fetales por sífilis congénita, una cifra del mismo orden que la correspondiente a la transmisión del virus de la inmunodeficiencia humana (VIH) de la madre al niño,

problema que acapara mucha más atención. La persistencia de la sífilis congénita se explica por varias razones, las más importantes de las cuales son probablemente el escaso reconocimiento nacional e internacional de la carga de sífilis congénita y la falta de voluntad política para ofrecer programas eficaces de cribado prenatal. Todas las causas pueden ser abordadas eficazmente mediante programas de intervención. La prevención de la sífilis congénita debería ser una prioridad mundial, y los organismos internacionales y los programas nacionales deberían comprometerse a mejorar los servicios de atención prenatal incluyendo en ellos la detección y prevención de la sífilis.

## ملخص

### الوقاية من الزهري الخلقي

### الجوانب العملية والاقتصادية للوقاية من الزهري الخلقي

المناعي البشري من الأم للوليد، والذي يلقى اهتماماً أكبر بكثير. وتفاوتت أسباب استدامة الزهري الخلقي، وإن كان أهمها يتمثل في قصور الإدراك على المستوى الوطني والدولي لعبء الزهري الخلقي، وعدم كفاية الإرادة السياسية لتوفير برامج التحري الفعالة قبل الولادة. إن كل مسببات الزهري تستجيب لبرامج التدخل الفعالة، ومن ثم لا بد أن تصبح الوقاية من الزهري الخلقي من الأولويات العالمية، وأن تلتزم الوكالات الدولية والبرامج الوطنية بتحسين خدمات الرعاية في الفترة السابقة للولادة بما فيها تحري الزهري والوقاية منه.

ملخص: تم مراجعة الجوانب العملية والاقتصادية المتعلقة بالزهري الخلقي، وتقديم توصيات لتعزيز سبل الوقاية منه. فالزهري الخلقي من الأمراض التي يمكن توقيها كما أن وسائل الوقاية منه متاحة منذ عدة عقود. وتعتبر الوقاية من الزهري الخلقي، عن طريق التحري في الفترة السابقة للولادة، وسيلة عالية المردود وميسورة التكلفة سواء في البلدان الصناعية أو النامية، ولا سيما البلدان النامية. ولكن على الرغم من ذلك نجد أن عدد وفيات الأجنة السنوية الناجمة عن الزهري الخلقي على مستوى العالم يتجاوز خمسمئة ألف، وهو رقم ينافس عدد الوفيات الناجمة عن انتقال العدوى بفيروس العوز

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