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## Assessing compliance with a county board order for third trimester syphilis screening in Maricopa County, Arizona

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### Abstract

**Objectives:** Due to high rates of congenital syphilis, a Maricopa County board order was issued in 2003 to increase prenatal syphilis screening. The provisions of this order included prenatal syphilis screening during the first prenatal visit, to be repeated during the third trimester, and again at delivery. The purpose of the study was to evaluate syphilis screening practices and barriers to screening among obstetric providers.

**Methods:** Maricopa County medical providers who delivered at least 21 infants (97.2% of all deliveries) in 2008 according to live birth records were surveyed by telephone.

**Results:** A total of 146 surveys were completed representing 76% (319/421) of the delivering providers and 83% of delivered infants for 2008. All of the represented prenatal care providers reported testing their patients for syphilis at the first trimester, and 284 (89%) reported screening again during the third trimester.

**Conclusions:** All of the surveyed providers reported screening at least once for syphilis during pregnancy and most reported re-screening during the third trimester as recommended by the Maricopa County board order. Similar public health screening guidance should be considered in areas where congenital syphilis rates are high and/or where syphilis is prevalent among women of childbearing age. A local health order of this type is a simple intervention that can provide practice guidance on emerging health issues.

### Keywords

Syphilis; Congenital; Third trimester screening; STD prevention

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## Background

Congenital syphilis (CS) remains a potentially devastating prenatal infection that may result in stillbirth, adverse birth outcome, and/or permanent malformations of the infant. CS is preventable with early prenatal screening. Women who have a negative syphilis screening test in the first trimester may subsequently become infected prior to delivery. Repeat syphilis testing of the mother during later stages of pregnancy and at delivery is important to identify these newly infected women, particularly because the likelihood of the disease being passed to the unborn infant is higher when the mother becomes infected during pregnancy [1]. Currently, the CDC recommends screening all women in the first trimester of pregnancy as well as repeat testing between 28 and 30 weeks and again at delivery in persons and populations in which the risk or prevalence of syphilis is high [2,3].

Arizona has been in the top five states for highest CS rates for 7 of the previous 8 years. As well, the state had the third highest CS rate in the nation for 2009 (27.3 cases/100,000 live births) despite a drop in primary and secondary cases of syphilis among women during the same time period [2]. Several trends have been identified in this population, including the observation that CS cases in Arizona have been concentrated in Maricopa County (Phoenix), a high percentage have occurred among women of Hispanic ethnicity [4], and 49% of those Hispanic women were non-US citizens [5]. Hispanic women with syphilis in Maricopa County Arizona were less likely to engage in drug use and/or sexually risky behaviors and were more likely to have a male sex partner who reported drug use or anonymous sex according to a recent study by Kirkcaldy et al. [6]. Additional data from this study suggests that 14% ( $N=78$ ) of CS cases occurring during 2004–2008 could have been prevented with a third trimester test [6].

In response to the high number of infants delivered with congenital syphilis in Maricopa County, the county issued a board order in 2003 requesting additional syphilis testing in the third trimester and requiring testing at delivery [7]. The purpose of the current study was to evaluate the syphilis screening practices of prenatal care providers in Maricopa County to measure awareness and implementation of the board order screening guidelines.

## Methods

A list of derived from live birth records of infants delivered in 2008 and reported to the Arizona vital records database. Providers were eligible to be contacted for the survey if they delivered at least 21 infants in 2008. Contact information for providers and providers' offices was obtained from the Arizona Medical Board website or via search engine, Google. The survey was developed by the Arizona Department of Health Services, STD Control Program. Surveys were completed by telephone with either the provider or the provider's representative.

The data set of delivering providers included physicians, certified nurse midwives, physician's assistants, and nurse practitioners. Providers, or their representatives (which included medical assistants and nurses), were asked a series of questions regarding their prenatal syphilis screening practices, specifically whether they screened in the first trimester,

third trimester, and/or at delivery. The number of deliveries performed by each provider was recorded from birth registry data. Survey responses, from both providers and provider representatives, that described clinic screening protocols were generalized to the remaining providers in the practice. The remaining providers in those practices were not contacted directly if a representative of their practice had already been interviewed and reported a clinic-wide screening protocol. Clinics that had multiple providers and an established clinic policy regarding syphilis screening were represented as respondent data points, including the number of deliveries the providers were responsible for according to the information from birth registry data. Clinic and provider demographic data included clinic location, number of providers in each practice, provider type (physician, certified nurse midwife, etc.), number of deliveries performed in 2008, provider specialty, provider practice location, and type of practice (private practice, Indian Health Service (IHS), Federally Qualified Health Care (FQHC), large private health care system, and county medical center). Survey respondents were mailed letters of appreciation, Maricopa County prenatal syphilis screening guidelines, and congenital syphilis prevention posters developed by the Arizona Department of Health Services, following the project completion [8].

In addition, Maricopa County STD surveillance records were reviewed during the period 2000–2010 to quantify the number of women diagnosed with syphilis, the percent of women with syphilis that were diagnosed during pregnancy, and the number of congenital syphilis cases reported prior to and following the implementation of the board order.

Data analysis was performed using Data Excel 2007 and SPSS Version 17, Chicago (IL).

The project protocol was submitted to the Arizona Department of Health Services Human Subjects Review Board (AZ-HSRB 11–007) and determined to be exempt from human subjects review.

## Results

Of 62,667 total deliveries in Maricopa County during 2008, 56,426 (90%) were represented by the interview data. A total of 421 providers delivering 97.2% of the infants in Maricopa County were identified to be eligible for the survey and were contacted by telephone. A total of 146 surveys were completed representing 76% (319/421) of the delivering providers. Clinical providers were interviewed for 27% of the surveys ( $N= 40/146$ ) and 106 survey respondents were provider representatives (73%). Survey responses from both providers and provider representatives that described clinic screening protocols that were generalized to the remaining providers in the practice represented 54% of the total responses (173/319). The remaining providers (102/421, 24%) either had no contact information, had relocated, or were unable to be reached. The vast majority of the providers represented by the survey responses were physicians ( $N= 298/319$ , 93%). Clinical specialties included obstetrics and gynecology ( $N= 274/319$ , 86%), perinatology ( $N= 23/319$ , 7%), and family medicine ( $N= 1/319$ , <1%). The remaining providers represented were certified nurse midwives ( $N= 21/319$ , 7%). The types of clinic practice represented included: private practice ( $N= 253$  (79%)), county (or public) system ( $N= 9$  (3%)), Indian Health Service (IHS) ( $N= 15$  (5%)),

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health care systems ( $N= 26$  (8%), and Federally Qualified Health Care Centers (FQHC) ( $N= 16$  (5%)) (Table 1).

All of the 146 survey respondents representing 319 prenatal care providers reported testing their patients for syphilis at least once during the pregnancy. Of the 146 survey respondents, only 94 (29%) were able to describe syphilis screening in the delivery setting. Of providers represented by the survey responses ( $N= 319$ ), 284 (89%) reported repeating the non-treponemal in the third trimester; 35 (11%) did not re-screen. In univariate analysis, private practice providers were less likely to perform a third trimester syphilis screen (87%) as compared to other practice types (98%,  $p = 0.003$ ). In multivariate analysis controlling for the number of deliveries performed, provider specialty, and provider type (DO, MD, CNM), providers from private practice clinics remained less likely to perform a third trimester syphilis screen ( $p = 0.02$ ).

When stratified by type of respondent, clinics that had a standard clinic policy for syphilis screening had a higher rate of screening in the third trimester. Also, providers were more likely to be aware of the hospital syphilis screening policy at delivery, with only 28% reporting that they did not know the policy compared to 69% of provider representative and clinic policy respondents (Table 2).

Of the 35 survey respondents that reported not screening for syphilis in the third trimester, the most common reasons that they gave for not routinely screening were: perception that their patients were “low risk” (not engaging in high risk behaviors) ( $N= 5$ , 14%), unawareness of the recommendation ( $N= 6$ , 17%), patients were offered testing and refused it ( $N= 2$ , 6%), committee decision or clinic policy not to screen in the third trimester ( $N= 6$ , 17%), and policy of screening only patients who engaged in high risk behavior ( $N= 4$ , 12%). The majority of the respondents did not know why their practice did not perform third trimester screening ( $N= 12$ , 34%). One of the providers mentioned that there were non-citizen mothers in his practice that did not have coverage for third trimester screening through the Federal Emergency Services (FES) Program [9] and could not afford the test.

Fig. 1 displays the trends in diagnosis of syphilis during pregnancy in Maricopa County, 2000–2010. The number of syphilis cases diagnosed among women in Maricopa County declined from cases 334 in 2000 to 119 cases in 2010. Despite this decline, the average percent of cases diagnosed among pregnant women increased from an average of 16% in the period prior to the board order (2000–2002) to an average of 24% during 2003–2010 (50% increase) following the implementation of the board order. In addition, cases of congenital syphilis decreased in Maricopa County during 2000–2010 from a high of 28 reported cases in 2001 to a low of 12 cases in 2009.

## Discussion

These results demonstrate that all of the 2008 delivering providers surveyed reported screening for syphilis at some point during pregnancy, which would be expected considering the current standard of care for prenatal screening and Arizona Revised Statute 36–693 that mandates syphilis screening at the first prenatal visit [10]. These data also show that most

providers report testing a second time during the third trimester which indicates that the county board order is having the desired effect. After board order implementation in 2003, there was an decline in the number of CS cases and an increase in diagnosis of syphilis in pregnant women despite lower rates of syphilis overall in women. This suggests that the board order resulted in earlier identification of mothers with syphilis, allowing them to receive curative treatment and prevent congenital syphilis.

Of the providers that did not report screening in the third trimester, most (88%) were in private practice. Based on the reported reasons for not screening, the perception of low risk in the provider's patient cohort was the most common reported. Other barriers reported were a general lack of awareness of the recommendation, which might require more provider education and increased visibility of the board order, and lack of insurance coverage for the test. The health department mailed educational posters and copies of the board order to all participating providers' offices following the survey completion.

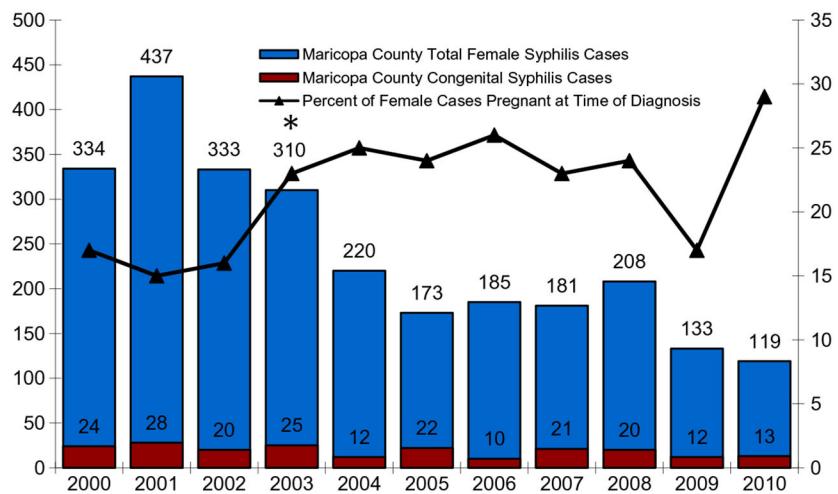
There were several limitations to this study. First, much of the information for specific provider practices was extrapolated from information obtained from the office staff or one of their partners who may not know their actual practice. Next, data on the performance of third trimester testing is not available from previous years, thus changes in screening practices could not be evaluated. Providers delivering less than 20 infants in 2008 may represent a group less likely to perform third trimester testing, thus compliance with screening may have been overestimated. The majority of survey respondents were unaware of the hospital screening protocols and thus were not able to describe syphilis testing at delivery. Finally, hospital delivery staff was not interviewed regarding delivery screening practices, thus these results are not available.

Persistently high CS rates are in part attributable to the lack of prenatal care in many mothers of infants with CS [11]. Further efforts are needed to improve access and uptake of prenatal care among women at risk for syphilis as well as to educate providers on syphilis pre-natal screening recommendations for their patients. An important educational piece for patients and providers to understand is that women who are in monogamous relationships can become infected with syphilis *during* pregnancy based on the partner's risk behaviors [6]. Other studies have found that private insurance, attending a private clinic, and having more than adequate prenatal care puts a patient at risk for not being screened for syphilis at least twice during pregnancy [12]. Many of the providers who did not screen in the third trimester were not aware of the board order and the survey itself was educational. Raising awareness among pregnant women about the importance of frequent testing during pregnancy is also important, particularly in light of how many offices reported patient testing refusal in the third trimester.

Legislation has been effective in increasing syphilis screening rates in other states. Florida passed legislation in 1986 requiring syphilis testing twice during prenatal care, which increased their rates of screening to between 85% and 98% [13]. Areas with emerging congenital and/or female syphilis rates should consider the use of a county-level board order to promote third trimester syphilis screening while awaiting consideration for legislative inclusion of this public and preventive health practice.

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**Fig. 1.**

Total reported syphilis cases among women, percentage of female cases pregnant at time of diagnosis, and number of congenital syphilis cases, Maricopa County 2002–2010.\*The county board order requiring additional prenatal syphilis screening was implemented in 2003.

Descriptions of survey respondents and syphilis screening practices.

Table 1

Type of survey respondents	Number (%) of survey respondents (N = 146)	Number (%) of providers represented by the survey respondents (N = 319)	Number (%) of deliveries represented by the respondents (N = 56,426)
<i>Survey respondent</i>			
Clinical provider	40 (27)	-	-
Provider representative	106 (73)	-	-
<i>Provider type</i>			
Physician	37 (25)	298 (93)	54,556 (97)
Certified nurse midwife	3 (2)	21 (7)	1870 (3)
<i>Clinical specialty</i>			
Obstetrics	138 (95)	274 (86)	52,621 (93)
Perinatology	3 (2)	23 (7)	1876 (3)
Family practice	1 (<1)	1 (<1)	35 (<1%)
Certified nurse midwife	4 (3)	21 (7)	1870 (3)
<i>Practice type</i>			
Private practice	129 (88)	253 (79)	47,753 (85)
County health system	1 (1)	9 (3)	737 (1.3)
Indian health services	1 (1)	15 (5)	861 (1.5)
Healthcare organization	8 (5)	26 (8)	3902 (7)
Federally Qualified health center	7 (5)	16 (5)	3173 (6)
<i>Syphilis screening practice</i>			
Syphilis screening in pregnancy	146 (100)	319 (100)	56,426 (100)
Syphilis screening first prenatal visit	146 (100)	319 (100)	56,426 (100)
Syphilis screening third trimester	120 (82)	284 (89)	49,515 (88)
Syphilis screening delivery	42 (29)	94 (29)	16,999 (30)

**Table 2**

Screening practices by respondent type.

Syphilis screening	Providers (N = 40) N (%)	Provider representative (N = 146) N (%)	Clinic policy (N = 173) N (%)
During pregnancy	40 (100)	106 (100)	173 (100)
First prenatal visit	40 (100)	106 (100)	173 (100)
First trimester	40 (100)	106 (100)	173 (100)
Third trimester	31 (88)	89 (84)	164 (95)
Delivery	26 (65)	16 (15)	52 (30)
Delivery, unknown	11 (28)	73 (69)	119 (69)