# Inter Tribal Council of Arizona, Inc.



Sexually Transmitted Disease, Tuberculosis, and HIV Surveillance among American Indians in Arizona, Nevada, and Utah

Tribal Epidemiology Center

Sexually Transmitted Disease (STD), Human Immunodeficiency Virus (HIV) and Tuberculosis (TB) Surveillance among American Indians in Arizona, Nevada, and Utah

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	Surveillance amona American Indians in Arizona, Nevada, and Utah

On behalf of the Inter Tribal Council of Arizona, Inc. (ITCA) Tribal Epidemiology Center (TEC), ITCA TEC is pleased to present the Sexually Transmitted Disease (STD), Tuberculosis (TB), and Human Immunodeficiency Virus (HIV) Surveillance among American Indians in Arizona, Nevada, and Utah Report.

This surveillance report was prepared in response to STD, TB, and HIV concerns among Tribal communities within the Phoenix and Tucson Indian Health Service Areas. The TEC utilized data from the Arizona Department of Health Services Bureau of Epidemiology and Disease Control, Nevada Division of Public and Behavioral, and Utah Department of Health, Bureau of Epidemiology to construct the report.

This surveillance report highlights incidence rates of STD, TB, and HIV detection rates among the American Indian population within Arizona, Nevada, and Utah.

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# **PURPOSE**

The purpose of the Sexually Transmitted Disease (STD), Human Immunodeficiency Virus (HIV) and Tuberculosis (TB) Surveillance among American Indians in Arizona, Nevada, and Utah is to address disparities that are present in the Phoenix and Tucson Indian Health Service Areas. This report focuses on STD, HIV, and TB among American Indians/Alaska Natives (AI/AN). This report demonstrates the current trends in incidence rates of STD, HIV, and TB detection rates using data requested from state notifiable disease surveillance systems.

# INTRODUCTION

This is the first publication of the report *Sexually Transmitted Disease (STD), Human Immunodeficiency Virus (HIV), and Tuberculosis (TB), Surveillance among American Indians in Arizona, Nevada, and Utah* by the Inter Tribal Council of Arizona, Inc. (ITCA) Tribal Epidemiology Center (TEC). This surveillance report demonstrates the current trends in STD, HIV, and TB incidence and detection using data requested from state notifiable disease surveillance systems among American Indians and Alaska Natives (AI/ANs) in Arizona, Nevada, and Utah.

The surveillance data analyzed in this report is extracted from the Center for Disease Control and Prevention (CDC) National Notifiable Disease Surveillance System (NNDSS) compliant surveillance systems of Arizona (AZ), Nevada (NV), and Utah (UT)<sup>1</sup>. A notifiable disease is any disease that is required by law to be reported to government authorities.

It is mandatory that reportable disease cases be reported to state and territorial jurisdictions when identified by a non-tribal health provider, hospital, or laboratory. This type of required reporting uses personal identifiers and enables the states to identify cases where immediate disease control and prevention is needed. Each state has its own laws and regulations defining what diseases are reportable. The list of reportable diseases varies among states and over time. Some tribes have established public health codes that allow such reporting of individually identifiable data to state health departments from tribal health providers and hospitals. Indian Health Service (IHS) facilities report diseases to state health departments.

It is voluntary that notifiable disease cases be reported to the Centers for Disease Control and Prevention (CDC) by state and territorial jurisdictions without direct personal identifiers for nationwide aggregation and monitoring of disease data. Regular, frequent, timely information on individual cases is considered necessary to monitor disease trends, identify high risk populations or geographic areas, assess and formulate prevention and control strategies, and formulate public health policies. The list of notifiable diseases varies over time and by state. The list of nationally notifiable diseases is reviewed and modified annually by The Council of State and Territorial Epidemiologists (CSTE) and CDC. Every nationally notifiable disease is not necessarily reportable in each state. CSTE has recommended that state health departments report cases of selected diseases to NNDSS. Every year, case definitions are updated using CSTE's Position Statements.

The identification and classification of STD, HIV, and TB cases is based on case definitions. A case definition is a set of uniform criteria used to define a disease for public health surveillance. Case definitions enable public health professionals and researchers to classify and count cases consistently across reporting jurisdictions. These definitions should not be used by healthcare providers to determine how to meet an individual patient's health needs.

This publication includes age-adjusted incidence and detection rates for chlamydia, gonorrhea, syphilis, HIV, and tuberculosis among AI/ANs from three different states, including Arizona, Nevada, and Utah. Incidence rates tell us about the new cases of disease in a population and the risk of disease. Age-adjusted incidence rates can be compared across states when data collection methods are similar.

STD, HIV and TB surveillance data for AI/ANs are used by key Tribal leaders, community health representatives (CHRs), health care providers (e.g., Indian Health Services, and other clinicians and nurses), and researchers to focus prevention efforts, plan programs, allocate resources, and develop public health policies. This report is organized into ten main sections:

- Purpose
- Introduction
- Executive Summary
- Analysis Highlights
- Action Items
- Technical Notes
- References
- Appendix
- Statistical Notes Table
- Glossary

The Analysis Highlights includes sexually transmitted diseases (STD), human immunodeficiency virus (HIV), and tuberculosis (TB). The STD included in this report are chlamydia, gonorrhea, and syphilis. Other rarer STD were not included in this report, but additional analyses of rarer STD diseases can be provided to ITCA TEC Tribal partners upon special request for additional information by contacting us directly at: TECinfo@itcaonline.com.

# EXECUTIVE SUMMARY

This surveillance report demonstrates the current trends in sexually transmitted diseases (STD), human immunodeficiency virus (HIV), and tuberculosis (TB) incidence and detection rates using data requested from state notifiable disease surveillance systems among American Indians and Alaska Natives (AI/ANs) in Arizona, Nevada, and Utah.

Overall, there were more cases of chlamydia, gonorrhea, and syphilis, reported among AI/ANs in Arizona compared to Nevada and Utah. Gonorrhea rates declined from 2007, to 2010, in all three states, reflecting a nationwide decline. However, there was an increase in cases from 2010, to 2012, in Arizona AI/AN (233 cases to 563), Nevada AI/AN (a two-fold increase in cases), and Utah AI/AN (a two-fold increase in cases). From 2007-2012, primary, secondary, and all stages of latent syphilis were higher in AI/ANs in Arizona than in AI/ANs in Utah and Nevada (610 for all stages in Arizona vs. less than 10 in Nevada and Utah). Arizona also had the highest number of non-AI/AN cases (N=5371) as compared to Nevada (N=1690), and Utah (N=284).

HIV is a growing concern in many tribal communities, especially in light of access to care and anti-retroviral therapy adherence challenges in rural and underserved areas. In 2012 in Arizona there were 74 reported HIV cases in AI/ANs and 56 were newly diagnosed. Nevada and Utah reported less than ten HIV cases. For AI/ANs in Arizona, the number of HIV cases detected between 2007 and 2012 varied from 37 to 74. In Nevada AI/ANs, the number of cases detected fluctuated but remained under ten. In Utah, AI/ANs HIV case detection had highest number of cases reported in 2012, but the count was below 10 cases. None of the states showed a clear data trend.

Tuberculosis is an ongoing concern in tribal communities nationwide. In 2012, there were 15 TB cases reported in Al/ANs in Arizona, less than ten in Nevada, and in Utah there were less than 10 cases. Cases of TB among Al/ANs in Arizona increased from 14 in 2007, to 29, in 2009 and have declined from 2009, to 2012. Cases of TB among Al/ANs in Nevada never increased above ten in any year from 2007, to 2012. In Al/AN in Utah there were ten reported cases in 2007-2012, with most of the cases reported in 2011, to 2012.

This report outlines areas for action among the following groups: individuals, tribal communities, tribal health care providers, tribal leaders, tribal researchers, and non-tribal public health professionals. All of these groups working together can help reduce the burden of STD, HIV, and TB within tribal communities.

# **ANALYSIS HIGHLIGHTS**

# STD, HIV, and TB Nationally

In 2012, the national incidence rate for chlamydia among the American Indian/Alaska Native population was 728 per 100,000, the national gonorrhea incidence rate among the American Indian/Alaska Native population was 125 per 100,000, and the syphilis incidence rate was 3 per 100,000. Nationally, the HIV detection rate in 2011 was 9 and the HIV infection, stage 3 (AIDS) detection rate was 6 per 100,000. The incidence rate for TB in 2012 for AI/AN was 6 per 100,000 (Table 1)<sup>2-4</sup>.

# Table 1. National STD and TB age-adjusted incidence rates, 2012, and HIV and Syphilis detection rates, 2011, per 100,000 for American Indian/Alaska Native

Disease	Age-Adjusted rate		
Sexually Transmitted Diseases			
Gonorrhea <sup>a,b,c,d</sup>	125		
Chlamydia <sup>a,b,c,d</sup>	728		
Syphilis <sup>a,b,c,d</sup>	3		
ні			
Newly Detected HIV <sup>a,b,c,d</sup>	9		
Newly Detected HIV Infection, Stage 3 (AIDS) <sup>a,b,c,d</sup>	6 <sup>c</sup>		
Tuberculosis			
Tuberculosis <sup>a,b,c,d</sup>	6		
<sup>a</sup> Age-adjusted to the 2000 U.S. Standard Population; <sup>b</sup> Data from Centers for Disease Control and Prevention. <sup>c</sup> STD and TB data is for 2012. <sup>d</sup> HIV data is from 2011			

# Chlamydia

Nationally, between 2007, and 2012, chlamydia rates have trended upward for all race and ethnic groups except Asians (Figure 1). AI/AN had the second highest chlamydia incidence rates in all years <sup>2</sup>.



FIGURE 1. CHLAMYDIA AGE-ADJUSTED INCIDENCE RATES PER 100,000 BY RACE/ETHNICITY 2007-2012

#### Gonorrhea

Nationally, between 2007, and 2012, gonorrhea rates have trended upward for AI/AN, downward for non-Hispanic blacks, and remained relatively stable for all other race and ethnic groups. AI/AN had the second highest rates out of all race and ethnic groups (Figure 2)<sup>2</sup>.





# **Syphilis**

Nationally, between 2007, and 2012, primary and secondary syphilis rates fluctuated for non-Hispanic blacks and remained relatively stable for all other race and ethnic groups (Figure 3)<sup>2</sup>.



FIGURE 3 PRIMARY AND SECONDARY SYPHILIS AGE-ADJUSTED INCIDENCE RATES PER 100,000 BY RACE/ETHNICITY 2007-2012 HIV

Nationally, between 2008, and 2011, HIV detection rates have remained relatively stable for all race and ethnic groups (Figure 4)<sup>3</sup>.



#### FIGURE 4. HIV AGE-ADJUSTED DETECTION RATES PER 100,000 BY RACE/ETHNICITY 2008-2011

<sup>a</sup> CDC reports Asian and Native Hawaiian/Pacific Islander as two distinct groups for HIV, HIV, stage 3 (AIDS), and tuberculosis

# HIV Infection, Stage 3 (AIDS)

Nationally, between 2008, and 2011, AIDS incidence rates have remained relatively stable for all race and ethnic groups (Figure 5)<sup>3</sup>.



FIGURE 5: HIV INFECTION, STAGE 3 (AIDS) AGE-ADJUSTED INCIDENCE RATES PER 100,000 BY RACE/ETHNICITY 2008-2011

<sup>a</sup> CDC reports Asian and Native Hawaiian/Pacific Islander as two distinct groups for HIV, HIV, stage 3 (AIDS), and tuberculosis

#### **Tuberculosis**

Nationally, between 2007, and 2012, tuberculosis incidence rates have decreased for Hispanics, Asians, Native Hawaiians/Pacific Islanders. and non-Hispanic blacks. Rates trended slightly upward for American Indians/Alaska Natives and multiple race individuals. Rates remained stable for non-Hispanic whites (Figure 6)<sup>4</sup>.



FIGURE 6.TUBERCULOSIS AGE-ADJUSTED INCIDENCE RATES PER 100,000 BY RACE/ETHNICITY 2007-2012

<sup>a</sup> CDC reports Asian and Native Hawaiian/Pacific Islander as two distinct groups for HIV, HIV, stage 3 (AIDS), and tuberculosis

# STD, HIV, and TB in Arizona

In 2012, the Arizona chlamydia age-adjusted incidence rate among the AI/AN population was 958 per 100,000 (95% CI: 925-990).The incidence rate ratio (IRR) for AI/AN compared to non-AI/AN was 2.1 This indicates that a racial disparity is present for chlamydia incidence in Arizona. The Arizona gonorrhea age-adjusted incidence rate among the AI/AN population was 165 per 100,000 (95% CI: 151-179). The IRR for AI/AN compared to non-AI/AN was 1.7. This indicates that a racial disparity is present for gonorrhea incidence in Arizona. The Arizona non-congenital syphilis age-adjusted incidence rate among the AI/AN population was 27 per 100,000 (95% CI: 20-34). The IRR for AI/AN compared to non-AI/AN was 1.7. This indicates that a racial disparity is 1.7. This indicates that a racial disparity is present for gonorrhea incidence in Arizona. The Arizona non-congenital syphilis age-adjusted incidence rate among the AI/AN population was 27 per 100,000 (95% CI: 20-34). The IRR for AI/AN compared to non-AI/AN was 1.7. This indicates that a racial disparity is present for gonorrhea incidence in Arizona (Table 2).

In 2012, the Arizona HIV age-adjusted detection rate among the AI/AN population was 25 per 100,000 (95% CI: 19-31) The detection rate ratio (DRR) for AI/AN compared to non-AI/AN was 1.4. This indicates that a racial disparity is present for HIV detection in Arizona for AI/AN.

In 2012, the Arizona emergent HIV age-adjusted detection rate among the AI/AN population was 20 per 100,000 (95% CI: 14-25) (Table 2). The IRR for AI/AN compared to non-AI/AN was 1.8. This indicates that a racial disparity is present for emergent HIV detection in Arizona for AI/AN.

In 2012, the Arizona tuberculosis age-adjusted incidence rate among the AI/AN population was 6 per 100,000 (95% CI: 3-9) (Table 2). The IRR for AI/AN compared to non-AI/AN was 1.8. This indicates that a racial disparity is present for tuberculosis incidence in Arizona for AI/AN  $^{5}$ .

TABLE 2. ARIZONA STD AND TB AGE-ADJUSTED INCIDENCE RATES AND HIV DETECTION RATES PER 100,000 AND RATE RATIOS BY DISEASE FOR AMERICAN INDIAN/ALASKA NATIVE, 2012

DISEASE	IR/DR	95% Cl <sup>b</sup>	IRR/DRR AI/AN:NON-AI/AN	
	Sexually Trai	nsmitted Diseases		
Gonorrhea <sup>a, b, c</sup>	165	151-179	1.7	
Chlamydia <sup>a, b, c</sup>	958	925-990	2.1	
Syphilis <sup>a, b, c</sup>	27	20-34	1.7	
		ніх		
Newly Detected HIV <sup>a, b, c</sup>	25	19 – 31	1.4	
Emergent HIV <sup>a, b, c</sup>	25 <sup>c</sup>	14 – 25	1.8	
Tuberculosis				
Tuberculosis <sup>a, b, c</sup>	6	3 – 9	1.8	
<ul> <li><sup>a</sup> Age-adjusted to the 2000 U.S. Standard Population; <sup>b</sup> Data from Arizona Department of Health Services, Office of Disease Integration Services.</li> <li><sup>c</sup> Data is restricted to the Phoenix and Tucson IHS Service Areas only</li> <li>Abbreviations:</li> <li>IR: incidence rate; DR: detection rate; IRR: incidence rate ratio; DRR: detection rate ratio AIAN: American Indian/Alaska Native; Non-AI/AN: Not</li> </ul>				

# Chlamydia

In Arizona from 2007, to 2012, the age-adjusted chlamydia incidence rates are statistically significantly higher in AI/AN than non-AI/AN. Incidence rates trended upward for both groups during this time period (Figure 7)<sup>5</sup>.



FIGURE 7. CHLAMYDIA AGE-ADJUSTED INCIDENCE RATES PER 100,000 BY COMPARING AI/AN TO NON-AI/AN 2007-2012

## Gonorrhea

In Arizona from 2007, to 2008, the age-adjusted gonorrhea incidence rates are similar in AI/AN and non-AI/AN. Incidence rates trended upward for both groups between 2009 and 2012, but the increase was more dramatic in AI/AN than in non-AI/AN (Figure 8)<sup>5</sup>.





# **Syphilis**

In Arizona from 2007, to 2012, the age-adjusted non-congenital syphilis (i.e. all cases that were not congenital) incidence rate is statistically significantly higher in AI/AN than non-AI/AN. Incidence rates trended upward for both groups during this time period (Figure 9)<sup>5</sup>.





#### HIV

In Arizona from 2007, to 2012, the age-adjusted detection rates of HIV declined sharply in Al/AN and slowly in non-Al/AN populations in Arizona. In 2012, there was an increase in HIV detection rates in Al/AN (Figure 10)<sup>5</sup>.



FIGURE 10. HIV AGE-ADJUSTED DETECTION RATES PER 100,000 BY COMPARING AI/AN TO NON-AI/AN 2007-2012

## **Tuberculosis**

In Arizona from 2007, to 2008, the age-adjusted incidence rate of TB was nearly identical for AI/AN and non-AI/AN in Arizona. From 2008, to 2010, there was a dramatic increase in TB in AI/AN. That difference in rates between AI/AN and non-AI/AN decreased from 2010, to 2012, but remained statistically significant (Figure 11)<sup>5</sup>.





# STD, HIV, and TB in Nevada

In 2012, the Nevada chlamydia age-adjusted incidence rate among the AI/AN population was 423 per 100,000 (95% CI: 354-491). The incidence rate ratio (IRR) for AI/AN compared to non-AI/AN was 0.9. This indicates that a racial disparity is not present for chlamydia incidence in Nevada. The Nevada gonorrhea age-adjusted incidence rate among the AI/AN population was 55 per 100,000 (95% CI: 30-80). The IRR for AI/AN compared to non-AI/AN was 0.6. This indicates that a racial disparity is not present for presen

From 2007, to 2012, the Nevada non-congenital syphilis age-adjusted incidence rate among the AI/AN population was 3 per 100,000 (95% CI: 0.6-4). The IRR for AI/AN compared to non-AI/AN was 0.2. This indicates that no racial disparity is present for non-congenital syphilis incidence in Nevada. The years were collapsed into a single rate due to the small number of cases to protect confidentiality (Table 3, Figure 14).

From 2007, to 2012, the Nevada HIV age-adjusted detection rate among the AI/AN population was 5 per 100,000 (95% CI: 3-7). The detection rate ratio (DRR) for AI/AN compared to non-AI/AN was 0.3. This indicates that no racial disparity is present for HIV detection in Nevada. The years were collapsed into a single rate due to the small number of cases to protect confidentiality (Table 3, Figure 14).

From 2007, to 2012, the Nevada tuberculosis age-adjusted incidence rate among the AI/AN population was 4 per 100,000 (95% CI: 0.9-7). The IRR for AI/AN compared to non-AI/AN was 1.0. This indicates that no racial disparity is present for tuberculosis incidence in Nevada. The years were collapsed into a single rate due to the small number of cases to protect confidentiality (Table 3, Figure 14)<sup>6</sup>.

TABLE 3: NEVADA AGE-ADJUSTED INCIDENCE RATES AND HIV DETECTION RATES PER 100,000 AND RATE RATIOS BY DISEASE FOR AMERICAN INDIAN/ALASKA NATIVE, 2012

DISEASE	IR/DR	95% CI <sup>b</sup>	IRR/DRR AIAN:NON-AI/AN	
Sex	ually Transmitted D	iseases		
Gonorrhea <sup>a, b, c</sup>	55	30-79	0.6	
Chlamydia <sup>a, b, c</sup>	423	354-491	0.9	
Syphilis 2007-2012 <sup>a, b, c, d</sup>	3	0.6-4	0.2	
HIV				
Newly Detected HIV 2007-2012 <sup>a, b, c, d</sup>	5	3 – 7	0.3	
	Tuberculosis			
Tuberculosis 2007-2012 <sup>a, b, c, d</sup>	4	0.9 – 7	1.0	

<sup>a</sup> Age-adjusted to the 2000 U.S. Standard Population; <sup>b</sup> Data from Arizona Department of Health Services, Office of Disease Integration Services. <sup>c</sup> Data is restricted to the Phoenix and Tucson IHS Service Areas only

<sup>d</sup> Small numbers. Rates may be unstable.

Abbreviations:

IR: incidence rate; DR: detection rate; IRR: incidence rate ratio; DRR: detection rate ratio AIAN: American Indian/Alaska Native; Non-AI/AN: Not American Indian/Native American

# Chlamydia

In Nevada from 2007, to 2011, the age-adjusted chlamydia incidence rates were statistically significantly lower in AI/AN than non-AI/AN. Chlamydia age-adjusted incidence rates sharply increased for AI/AN in 2012, but remained lower than non-AI/AN rates (Figure 12)<sup>6</sup>.



FIGURE 12. CHLAMYDIA AGE-ADJUSTED INCIDENCE RATES PER 100,000 BY COMPARING AI/AN TO NON-AI/AN 2007-2012

# Gonorrhea

In Nevada from 2007, to 2012, the age-adjusted gonorrhea incidence rates were statistically significantly lower in AI/AN than non-AI/AN. For both groups, age-adjusted gonorrhea incidence rates sharply increased in 2012 but AI/AN remained lower than non-AI/AN rates (Figure 13)<sup>6</sup>.



FIGURE 13. GONORRHEA AGE-ADJUSTED INCIDENCE RATES PER 100,000 BY COMPARING AI/AN TO NON-AI/AN 2007-2012

## HIV, Syphilis, and TB

In Nevada from 2007, to 2012, the age-adjusted HIV and syphilis incidence rates were statistically significantly lower in AI/AN than non-AI/AN. Age-adjusted TB rates were nearly identical (Figure 14)<sup>6</sup>.



# FIGURE 14. SYPHILI, AND TUBERCULOSIS AGE-ADJUSTED INCIDENCE RATES AND HIV DETECTION RATE PER 100,000 BY COMPARING AI/AN TO NON-AI/AN, 2007-2012

# STD, HIV, and TB in Utah

In 2012, the Utah chlamydia age-adjusted incidence rate among the AI/AN population was 292 per 100,000 (95% CI: 251-332). The incidence rate ratio (IRR) for AI/AN compared to non-AI/AN was 1.2. This indicates that a racial disparity is present for chlamydia incidence in Utah. The Utah gonorrhea age-adjusted incidence rate among the AI/AN population was 25 per 100,000 (95% CI: 12-39). The IRR for AI/AN compared to non-AI/AN was 1.3. This indicates that a racial disparity is present for gonorrhea incidence in Utah (Table 4).

From 2007, to 2012, the Utah non-congenital syphilis age-adjusted incidence rate among the AI/AN population was 3 per 100,000 (95% CI: 0.4-5). The IRR for AI/AN compared to non-AI/AN was 1.4. This indicates that a racial disparity is present for non-congenital syphilis incidence in Utah. The years were collapsed into a single rate due to the small number of cases to protect confidentiality (Table 4, Figure 15).

From 2007, to 2012, the Utah HIV age-adjusted detection rate among the Al/AN population was 4 per 100,000 (95% CI: 2-6). The detection rate ratio (DRR) for Al/AN compared to non-Al/AN was 0.9. This indicates that no racial disparity is present for HIV detection in Utah. The years were collapsed into a single rate due to the small number of cases to protect confidentiality (Table 4, Figure 15).

From 2007, to 2012, the Utah tuberculosis age-adjusted incidence rate among the AI/AN population was 8 per 100,000 (95% CI: 3-14). The IRR for AI/AN compared to non-AI/AN was 7. This indicates that a racial disparity is present for tuberculosis incidence in Utah. The years were collapsed into a single rate due to the small number of cases to protect confidentiality (Table 4, Figure 15)<sup>7</sup>.

TABLE 4. UTAH AGE-ADJUSTED INCIDENCE RATES AND HIV DETECTION RATES PER 100,000 AND RATE	RATIOS BY DISEASE
FOR AMERICAN INDIAN/ALASKA NATIVE, 2012	

DISEASE	IR/DR	95% CI <sup>b</sup>	IRR/DRR AIAN:NON-AI/AN
Sexua	ally Transmitted Dise	ases	
Gonorrhea <sup>a, b, c</sup>	25	12-39	1.3
Chlamydia <sup>a, b, c</sup>	292	251-332	1.2
Syphilis 2007-2012 <sup>a, b, c, d</sup>	3	0.4-5	1.4
	HIV		
Newly Diagnosed HIV 2007-2012 <sup>a, b, c, d</sup>	4	2-6	0.9
Tuberculosis			
Tuberculosis 2007-2012 <sup>a, b, c, d</sup>	8	3 – 14	7
<sup>a</sup> Age-adjusted to the 2000 U.S. Standard Population; <sup>b</sup> Data from Arizona Department of Health Services, Office of Disease Integration Services. <sup>c</sup> Data is restricted to the Phoenix and Tucson IHS Service Areas only			

<sup>d</sup> Small numbers. Rates may be unstable.

Abbreviations:

IR: incidence rate; DR: detection rate; IRR: incidence rate ratio; DRR: detection rate ratio AIAN: American Indian/Alaska Native; Non-AI/AN: Not American Indian/Native American

# Chlamydia

In Utah from 2007, to 2012, the age-adjusted chlamydia incidence rates were higher in AI/AN than non-AI/AN in 2012. In 2007, to 2009, and 2011 the age-adjusted incidence rates of chlamydia in AI/AN did not differ significantly from non-AI/AN rates. In 2010, the rates were lower in AI/AN than non-AI/AN (Figure 15)<sup>7</sup>.





## Gonorrhea

From 2007, to 2012, the age-adjusted gonorrhea incidence rates were not statistically significantly different in AI/AN and non-AI/AN. For both groups, age-adjusted gonorrhea incidence rates sharply decreased from 2007, to 2009, remained stable from 2009, to 2011, and increased from 2011, to 2012 (Figure 16)<sup>7</sup>.



FIGURE 16. GONORRHEA AGE-ADJUSTED INCIDENCE RATES PER 100,000 BY COMPARING AI/AN TO NON-AI/AN 2007-2012

## HIV, Syphilis, and TB

In Utah the age-adjusted HIV detection rates from 2007, to 2012, were not statistically significantly different in AI/AN and non-AI/AN. The TB and syphilis age-adjusted incidence rates from 2007, to 2012, were statistically significantly higher for AI/AN (Figure 17)<sup>7</sup>.



FIGURE 17. SYPHILIS, AND TUBERCULOSIS AGE-ADJUSTED INCIDENCE RATES AND HIV DETECTION RATE PER 100,000 BY COMPARING AI/AN TO NON-AI/AN, 2007-2012

# **ACTION ITEMS**

# Individuals

Individuals can help reduce the burden of STD, HIV, and TB in their communities through avoiding risky behaviors, getting screened, seeking care early, and following their treatment plan. Below are some specific actions individuals can take to reduce STD, HIV, and TB in their communities:

- Practice safe sex and injection practices by using condoms and clean "works".
- Avoid exposure to blood or body fluids by using standard precautions at work and at home.
- Get screened for HIV and STD after any risky sexual exposure or before having sex with a new partner.
- See a healthcare practitioner if you exhibit symptoms of TB (e.g. severe cough that lasts 3 weeks or longer, pain in the chest, coughing up blood or sputum -phlegm from deep inside the lungs, weakness or fatigue, weight loss, no appetite, chills, fever, sweating at night).
- If you have been diagnosed with HIV or TB, regularly take your medication and stay in contact with your healthcare provider.

# **Tribal Communities**

Tribal communities can help reduce the burden of STD, HIV, and TB through enacting and enforcing codes that allow better monitoring of disease and that protect the confidentiality of those infected. Below are some specific actions tribal communities can take to reduce STD, HIV, and TB in their communities:

- Develop tribal codes that protect confidentiality of people living with HIV.
- Develop tribal codes that prevent discrimination and stigma based on HIV status.
- Develop tribal codes that allow infectious disease reporting from tribally-run facilities to state health departments to ensure more complete data.

# **Tribal Health Care Providers**

Tribal health care providers can help reduce the burden of STD, HIV, and TB ensuring that prevention, testing and treatment services are widely and readily available. Below are some specific actions tribal health care providers can take to reduce STD, HIV, and TB in their communities:

- Improve screening for gonorrhea and chlamydia following the 2010 CDC STD treatment guidelines<sup>8</sup>.
- Improve screening for HIV in tribal communities by making rapid testing readily available.
- Use expedited partner therapy for partners of chlamydia and gonorrhea cases.
- Improve patient follow-up to ensure medication compliance for TB and HIV patients.
- Provide appropriate medications for occupational (PEP) and non-occupational post-exposure (nPEP, includes sexual exposure) prophylaxis.
- Conduct outreach to community on availability and benefits of nPEP and the need for starting treatment within hours of exposure and no more than 72 hours after exposure.

# **Tribal Leaders**

Tribal leaders can help reduce the burden of STD, HIV, and TB in their communities through supporting the enactment and enforcement of codes that protect those who are infected and to allow reporting of notifiable diseases to better monitor trends. Below are some specific actions tribal leaders can take to reduce STD, HIV, and TB in their communities:

- Support tribal codes that protect confidentiality of people living with HIV.
- Support tribal codes that prevent discrimination and stigma based on HIV status.
- Support tribal codes that allow infectious disease reporting from tribally run facilities to state health departments to ensure more complete data.

# **Tribal Researchers**

Tribal researchers can help reduce the burden of STD, HIV, and TB through conducting studies to identify the sources of disease disparities and testing interventions to address those disparities. Below are some specific actions tribal researchers can take to reduce STD, HIV, and TB in AI/AN communities:

- Improve understanding and test the causes of HIV, STD, and TB disparities
- Develop, improve, culturally appropriate interventions to reduce the burden of HIV, STD, and TB in tribal communities
- Improve understanding of stigma based on HIV status and its impact on testing and access to care

# **Non-Tribal Public Health Professionals**

Non-tribal public health professionals can help reduce the burden of STD, HIV, and TB in tribal communities through assisting tribes with disease reporting and improving race/ethnicity reporting. Below are some specific actions tribal researchers can take to reduce STD, HIV, and TB in AI/AN communities:

- Work to improve AI/AN surveillance data with tribes, Indian Health Service, and Tribal Epidemiology Centers
- Work with tribes, Indian Health Service, and Tribal Epidemiology Centers to conduct data quality checks for race/ethnicity data to reduce misclassification.

# **TECHNICAL NOTES**

# **Data Barriers**

There were a number of data barriers and limitations faced in the development of this report. For Arizona AI/AN denominator data, all AI/AN are included in the state population estimate, not just those in the Phoenix and Tucson service areas, so those living in the Navajo Service Area were included in the denominator but excluded from some of the numerators. This likely resulted in an underestimation of the true rates. In addition, the data in this report is not directly comparable to the state reported and nationally reported counts and rates for AI/ANs because Hispanic AI/ANs are included as AI/ANs in this report. In other reports, Hispanic AI/ANs are classified as Hispanic. This primarily affects the Arizona AI/AN counts and rates. It is known that race/ethnicity, particularly among American Indians is often misclassified, or American Indians are considered a different race/ethnicity group. The race/ethnicity misclassification likely under reports the number of cases among American Indians. The lower number of cases would then lower the incidence rate of among American Indians. In Nevada 34% and 30% in Arizona of STD cases were classified with unknown race, which may result in fewer AI cases being identified. In Utah, over 90% of STD cases had a race classification. Disease cases with a race classified as unknown, missing, other, or unspecified multiple race were considered non-AI in this report which may not be an accurate representation of cases' race or ethnicity. At the time of writing, none of the surveillance systems had formally investigated misclassification of race/ethnicity among American Indians. One final limitation was that although all three states use the same case definitions to identify cases, not all cases are classed in the same way. For example, Arizona is the only state in this report that collects information on emergent HIV. In Nevada and Utah, it is unknown whether the cases were emergent. For this reason, only newly detected HIV cases are reported in Nevada and Utah.

# National Notifiable Disease Surveillance System (NNDSS)

Effective public health surveillance begins at the local- and state-health department levels. The health departments work with a variety of healthcare providers, including laboratories, hospitals, and private providers to obtain case reports on many infectious and some non-infectious diseases. Each state has laws mandating that providers report cases of certain diseases to state and/or local health departments. These data provide the direction and scope of many state and local health department activities, from detecting individual cases and controlling outbreaks to implementing prevention and intervention activities. State health departments support national public health surveillance by voluntarily sharing a portion of their case specific data with CDC through daily or weekly reporting, depending on the public health urgency of the disease.

CDC's National Notifiable Diseases Surveillance System (NNDSS) is a standardized reporting system that gives public health officials the capability to monitor the occurrence and spread of diseases<sup>1</sup>. A key component of NNDSS is the National Electronic Disease Surveillance System (NEDSS). NEDSS provides data and information technology (IT) standards, support, and leadership to state, local, and territorial health departments that in turn provide CDC with aggregate data on nationally notifiable diseases and conditions. NEDSS's capabilities are used to support reportable disease surveillance by improving information sharing between healthcare providers and health departments and between states and CDC, support Electronic Laboratory Reporting (ELR) as part of the Meaningful Use initiative to improve public health disease reporting, and increase information sharing and system interoperability between state health departments to improve multi-state disease detection and containment.

# National Notifiable Disease Surveillance System Data Sources

# NEDSS/NBS

The National Electronic Disease Surveillance System (NEDSS) facilitates electronically transferring public health surveillance data from the healthcare system to public health departments<sup>1</sup>. It is a conduit for exchanging information that supports NNDSS. Today, when states and territories voluntarily submit notifiable disease surveillance data electronically to CDC, they use data standards and electronic disease information systems and resources supported in part by NEDSS. This ensures that state data shared with CDC are submitted quickly, securely and in an understandable form. NEDSS defines the content (i.e., disease diagnosis, risk factor information, lab confirmation results, and patient demographics) of messages sent using the HL7 messaging standard and implements content standards that the healthcare industry currently uses (e.g., LOINC as the standard for transmitting laboratory test names and SNOMED as the standard for transmitting test results) for increased interoperability between states. This standardization makes the disease reported by every state comparable with each other. The NEDSS Base System (NBS), a CDC-developed information system, helps jurisdictions manage reportable disease data and send notifiable diseases data to CDC using Public Health Information Network (PHIN) standards. Arizona, Nevada, and Utah use a NEDSS-compatible system to send case notifications to NNDSS. To be considered NEDSS compatible, information systems must meet these requirements:

- Disease data entry directly through an Internet browser-based system. This creates a database accessible by health investigators and public health professionals.
- Electronic Laboratory Reporting (ELR) enables labs to report cases to health departments, integration of multiple health information databases into a single repository, and electronic messaging capabilities. This way states can share information efficiently with CDC and other health agencies.

# Electronic Laboratory Reporting (ELR)

Electronic Laboratory Reporting (ELR) is the automated transmission of laboratory-related data from commercial, public health, hospital, and other labs to state and local public health departments through an electronic health records (EHR) system or a Laboratory Information Management System (LIMS)<sup>1</sup>. ELR helps identify reportable conditions determined by confirmatory testing and supports case reporting at the state or local level. ELR is used by laboratory providers to help them meet state reportable diseases laws mandating that providers report cases of specified diseases to the health department. ELR supports overall public health surveillance by helping improve the timeliness and accuracy of case reporting and confirmation to state and local health departments. It also supports national public health surveillance by improving the timeliness and accuracy of notifiable disease data voluntarily shared by states with CDC.

# National Electronic Telecommunication Surveillance System

Before using the National Electronic Disease Surveillance System (NEDSS), CDC developed and used the National Electronic Telecommunications System for Surveillance (NETSS)<sup>1</sup>. NETSS is a computerized public health surveillance information system that provided CDC with weekly data regarding nationally notifiable diseases. NETSS continues to be used by reporting jurisdictions that are transitioning to the more robust NEDSS. A barebones approach for providing basic data and information, NETSS file content was not changed or updated substantially since NETSS launched in 1990. Most reporting prior to 2012 from Arizona, Nevada, and Utah utilized NETSS.

## **HIV Case Surveillance**

Using a uniform surveillance case definition and report form, all 50 states, the District of Columbia, and six U.S. dependent areas (American Samoa, Guam, Northern Mariana Islands, Puerto Rico, Republic of Palau, and the U.S. Virgin Islands) report confirmed diagnoses of HIV infection and AIDS to CDC<sup>3</sup>. Case reports from these jurisdictions are sent to CDC after removal of personal identifying information. As of April 2008, all jurisdictions had implemented confidential name-based HIV infection reporting. However, jurisdictions need to report 4 years of name-based surveillance data to CDC before the data can be statistically adjusted for reporting delays and missing risk-factor information. HIV reporting provides information on demographic characteristics (i.e., sex, race/ethnicity, age, and place of diagnosis), transmission category (mode of exposure), initial immune status, and viral load.

## HIV Incidence Surveillance

In 2004, as an extension of HIV case surveillance activities, CDC first funded selected state and local health departments to begin data collection for HIV incidence surveillance<sup>3</sup>. The jurisdictions funded were Alabama, Arizona, California, Chicago, Colorado, Connecticut, District of Columbia, Florida, Houston, Indiana, Los Angeles County, Louisiana, Massachusetts, Michigan, Mississippi, New Jersey, New York, New York City, North Carolina, Philadelphia, San Francisco, South Carolina, Texas, Virginia, and Washington. State and local health departments that conduct HIV incidence surveillance collect testing and treatment history information as a part of routine surveillance activities. These data are sent to CDC after removal of personal identifying information. In addition, incidence surveillance coordinators at state and local health departments work closely with commercial/private, public, and hospital-based laboratories to acquire leftover diagnostic blood specimens to test for recent infection. By applying additional tests to leftover blood specimens from persons newly diagnosed with HIV infections in a given year. Data from jurisdictions participating in HIV incidence surveillance, are stratified by age, race/ethnicity, sex, and transmission category, describe the number of new HIV infections in the United States.

# Tuberculosis Surveillance Systems

The Tuberculosis Information Management System (TIMS) is a surveillance and case management software application used by TB control programs throughout the United States, the District of Columbia, and various U.S. reporting areas in the Pacific and Caribbean<sup>1,4</sup>. TIMS was retired January 1, 2009, and by December 2010, all TIMS users transitioned to NEDSS Base System (NBS) Tuberculosis Program Area Module.

The National Electronic Disease Surveillance System (NEDSS) Base System (NBS), Tuberculosis Program Area Module (TB PAM) has been in production since December 19, 2008. Data from the NBS TB PAM is now being transferred to CDC using HL7 messaging, version 2.5. The NBS TB PAM includes the revised RVCT with features for validating surveillance data, basic reports, and electronic lab reporting. A patient management module will not be included. CDC has developed the electronic Report of Verified Case of Tuberculosis (eRVCT) application. This system includes the revised RVCT (2009) and HL7 messaging, version 2.5. The eRVCT has completed beta testing and is in production. Additional features such as reports will be available in later revisions. Arizona uses a state-built surveillance system that is TB PAM compliant.

# Relationship Between Tribes, State, and National Surveillance

Reporting by tribal healthcare providers and facilities to state and local health authorities is dependent on the tribal health codes and the tribal reporting requirements. IHS facilities will report notifiable conditions to state and/or local health departments under the provisions of state statutes, codes and/or regulations to the extent permitted by law<sup>9-11</sup>. Laboratories that receive specimens from tribal health care facilities are required to report positive tests to the state and/or local health authorities. All cases reported to local and state health departments are reported through NNDSS.

# **Case Definitions**

A case definition is set of uniform criteria used to define a disease for public health surveillance. Case definitions enable public health professionals to classify and count cases consistently across reporting jurisdictions, and are not to be used by healthcare providers to determine how to meet an individual patient's health needs<sup>12</sup>. Therefore, not all clinically diagnosed cases are included. Any disease counts extracted from a surveillance system likely under-estimate the burden of disease in the population.

The list of reportable conditions varies by state, the Council of State and Territorial Epidemiologists (CSTE) has recommended that state health departments report cases of selected diseases, including STD, HIV, and TB, to NNDSS. Every year, case definitions are updated using CSTE's Position Statements. They provide uniform criteria of nationally notifiable infectious and non-infectious conditions for reporting purposes. The case definitions for the conditions in this report are presented in Appendix A.

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# **APPENDIX A**

The case definitions for the chlamydia, gonorrhea, syphilis, HIV, and tuberculosis are reprinted in their entirety<sup>12</sup>. If cases definitions changed during the reporting period, both definitions are presented and the change(s) detailed at the end of that disease section.

# Chlamydia

Definition updated 6/2009

# **Clinical description**

Infection with *Chlamydia trachomatis* may result in urethritis, epididymitis, cervicitis, acute salpingitis, or other syndromes when sexually transmitted; however, the infection is often asymptomatic in women. Perinatal infections may result in inclusion conjunctivitis and pneumonia in newborns. Other syndromes caused by *C. trachomatis* include lymphogranuloma venereum (see Lymphogranuloma Venereum) and trachoma.

# Laboratory criteria for diagnosis

Isolation of *C. trachomatis* by culture, OR Demonstration of *C. trachomatis* in a clinical specimen by detection of antigen or nucleic acid

# Case classification

Confirmed: a case that is laboratory confirmed

# Chlamydia trachomatis, genital infections 1996-2009 Case Definition

# **Clinical Description**

Infection with Chlamydia trachomatis may result in urethritis, epididymitis, cervicitis, acute salpingitis, or other syndromes when sexually transmitted; however, the infection is often asymptomatic in women. Perinatal infections may result in inclusion conjunctivitis and pneumonia in newborns. Other syndromes caused by C. trachomatis include lymphogranuloma venereum (see Lymphogranuloma Venereum) and trachoma.

# Laboratory Criteria for Diagnosis

Isolation of C. trachomatis by culture, OR Demonstration of C. trachomatis in a clinical specimen by detection of antigen or nucleic acid

# **Case Classification**

# Confirmed

A case that is laboratory confirmed

<u>Change in definition</u>: Name of condition changed from "Chlamydia trachomatis, genital infections" to "Chlamydia trachomatis, infections". The new definition is no longer specific to genital infections.

# Gonorrhea

# **Clinical description**

A sexually transmitted infection commonly manifested by urethritis, cervicitis, or salpingitis. Infection may be asymptomatic.

# Laboratory criteria for diagnosis

Isolation of typical gram-negative, oxidase-positive diplococci (presumptive Neisseria gonorrhoeae) from a clinical specimen, OR

Demonstration of *N. gonorrhoeae* in a clinical specimen by detection of antigen or nucleic acid, OR Observation of gram-negative intracellular diplococci in a urethral smear obtained from a male.

# Case classification

*Probable:* a) demonstration of gram-negative intracellular diplococci in an endocervical smear obtained from a female or b) a written morbidity report of gonorrhea submitted by a physician

Confirmed: a case that is laboratory confirmed

# HIV

The definition applies to all HIV variants (e.g., HIV-1 or HIV-2) and excludes confirmation of HIV infection through diagnosis of AIDS-defining conditions alone. For surveillance purposes, a reportable case of HIV infection among adults and adolescents aged >13 years is categorized by increasing severity as stage 1, stage 2, or stage 3 (AIDS) or as stage unknown.

# Criteria for HIV Infection

# Laboratory Criteria

Positive result from an HIV antibody screening test (e.g., reactive enzyme immunoassay [EIA]\*) confirmed by a positive result from a supplemental HIV antibody test (e.g., Western blot or indirect immunofluorescence assay test).

OR

Positive result or report of a detectable quantity (i.e., within the established limits of the laboratory test) from any of the following HIV virologic (i.e., non-antibody) tests<sup>†</sup>:

- -- HIV nucleic acid (DNA or RNA) detection test (e.g., polymerase chain reaction [PCR])
- -- HIV p24 antigen test, including neutralization assay
- -- HIV isolation (viral culture)

# Other Criterion (for Cases that Do Not Meet Laboratory Criteria)

HIV infection diagnosed by a physician or qualified medical-care provider§ based on the laboratory criteria and documented in a medical record. Oral reports of prior laboratory test results are not acceptable.

## **Case Classification**

**Confirmed**: case meets the laboratory criteria for diagnosis of HIV infection and one of the four HIV infection stages (stage 1, stage 2, stage 3, or stage unknown). Although cases with no information on CD4+ T-lymphocyte count or percentage and no information on AIDS-defining conditions can be classified as stage unknown, every effort should be made to report CD4+ T-lymphocyte counts or percentages and the presence of AIDS-defining conditions at the time of diagnosis. Additional CD4+ T-lymphocyte counts or percentages and any identified AIDS-defining conditions can be reported as recommended.

## HIV Infection, Stage 1

No AIDS-defining condition and either CD4+ T-lymphocyte count of >500 cells/ $\mu$ L or CD4+ T-lymphocyte percentage of total lymphocytes of >29.

# HIV Infection, Stage 2

No AIDS-defining condition and either CD4+ T-lymphocyte count of 200--499 cells/ $\mu$ L or CD4+ T-lymphocyte percentage of total lymphocytes of 14--28.

## HIV Infection, Stage 3 (AIDS)

CD4+ T-lymphocyte count of <200 cells/ $\mu$ L or CD4+ T-lymphocyte percentage of total lymphocytes of <14 or documentation of an AIDS-defining condition:

- Bacterial infections, multiple or recurrent\*
- Candidiasis of bronchi, trachea, or lungs
- Candidiasis of esophagus<sup>+</sup>
- Cervical cancer, invasive§
- Coccidioidomycosis, disseminated or extrapulmonary
- Cryptococcosis, extrapulmonary
- Cryptosporidiosis, chronic intestinal (>1 month's duration)
- Cytomegalovirus disease (other than liver, spleen, or nodes), onset at age >1 month
- Cytomegalovirus retinitis (with loss of vision)+
- Encephalopathy, HIV related
- Herpes simplex: chronic ulcers (>1 month's duration) or bronchitis, pneumonitis, or esophagitis (onset at age >1 month)
- Histoplasmosis, disseminated or extrapulmonary
- Isosporiasis, chronic intestinal (>1 month's duration)
- Kaposi sarcoma†
- Lymphoid interstitial pneumonia or pulmonary lymphoid hyperplasia complex\*†
- Lymphoma, Burkitt (or equivalent term)
- Lymphoma, immunoblastic (or equivalent term)
- Lymphoma, primary, of brain
- Mycobacterium avium complex or Mycobacterium kansasii, disseminated or extrapulmonary<sup>+</sup>
- Mycobacterium tuberculosis of any site, pulmonary, †§ disseminated, † or extrapulmonary †

- Mycobacterium, other species or unidentified species, disseminated<sup>+</sup> or extrapulmonary<sup>+</sup>
- Pneumocystis jirovecii pneumonia†
- Pneumonia, recurrent†§
- Progressive multifocal leukoencephalopathy
- Salmonella septicemia, recurrent
- Toxoplasmosis of brain, onset at age >1 month<sup>+</sup>
- Wasting syndrome attributed to HIV

\* Only among children aged <13 years. (CDC. 1994 Revised classification system for human immunodeficiency virus infection in children less than 13 years of age. MMWR 1994; 43[No. RR-12].)

+ Condition that might be diagnosed presumptively.

§ Only among adults and adolescents aged >13 years. (CDC. 1993 Revised classification system for HIV infection and expanded surveillance case definition for AIDS among adolescents and adults. MMWR 1992; 41[No. RR-17].)

Documentation of an AIDS-defining condition supersedes a CD4+ T-lymphocyte count of >200 cells/µL and a CD4+ T-lymphocyte percentage of total lymphocytes of >14. Definitive diagnostic methods for these conditions are available in Appendix C of the 1993 revised HIV classification system and the expanded AIDS case definition (2) and from the National Notifiable Diseases Surveillance System (available at <a href="http://www.cdc.gov/epo/dphsi/casedef/case\_definitions.htm">http://www.cdc.gov/epo/dphsi/casedef/case\_definitions.htm</a> ).

## HIV Infection, Stage Unknown

No information available on CD4+ T-lymphocyte count or percentage and no information available on AIDSdefining conditions. Every effort should be made to report CD4+ T-lymphocyte counts or percentages and the presence of AIDS-defining conditions at the time of diagnosis.

# **Syphilis**

Syphilis is a complex sexually transmitted disease that has a highly variable clinical course. Classification by a clinician with expertise in syphilis may take precedence over the following case definitions developed for surveillance purposes.

# Syphilis, primary

#### **Clinical description**

A stage of infection with Treponema *pallidum* characterized by one or more chancres (ulcers); chancres might differ considerably in clinical appearance.

#### Laboratory criteria for diagnosis

Demonstration of T. pallidum in clinical specimens by darkfield microscopy, direct fluorescent antibody (DFA-TP), or equivalent methods

#### **Case classification**

**Probable:** a clinically compatible case with one or more ulcers (chancres) consistent with primary syphilis and a reactive serologic test (nontreponemal: Venereal Disease Research Laboratory [VDRL] or rapid plasma reagin [RPR]; treponemal: fluorescent treponemal antibody absorbed [FTA-ABS] or microhemagglutination assay for antibody to T. *pallidum* [MHA-TP])

Confirmed: a clinically compatible case that is laboratory confirmed

#### Syphilis, secondary

## **Clinical description**

A stage of infection caused by T. pallidum and characterized by localized or diffuse mucocutaneous lesions, often with generalized lymphadenopathy. The primary chancre may still be present.

#### Laboratory criteria for diagnosis

Demonstration of T. pallidum in clinical specimens by darkfield microscopy, DFA-TP, or equivalent methods

#### **Case classification**

Probable: a clinically compatible case with a nontreponemal (VDRL or RPR) titer ≥4

Confirmed: a clinically compatible case that is laboratory confirmed

Syphilis, latent

#### **Clinical description**

A stage of infection caused by T. pallidum in which organisms persist in the body of the infected person without causing symptoms or signs. Latent syphilis is subdivided into early, late, and unknown categories based on the duration of infection.

#### **Case classification**

**Probable:** no clinical signs or symptoms of syphilis and the presence of one of the following:

No past diagnosis of syphilis, a reactive nontreponemal test (i.e., VDRL or RPR), and a reactive treponemal test (i.e., FTA-ABS or MHA-TP)

A past history of syphilis therapy and a current nontreponemal test titer demonstrating fourfold or greater increase from the last nontreponemal test titer

# Syphilis, early latent

#### **Clinical description**

A subcategory of latent syphilis. When initial infection has occurred within the previous 12 months, latent syphilis is classified as early latent.

## **Case classification**

**Probable:** latent syphilis (see Syphilis, latent) in a person who has evidence of having acquired the infection within the previous 12 months based on one or more of the following criteria:

Documented seroconversion or fourfold or greater increase in titer of a nontreponemal test during the previous 12 months

A history of symptoms consistent with primary or secondary syphilis during the previous 12 months A history of sexual exposure to a partner who had confirmed or probable primary or secondary syphilis or probable early latent syphilis (documented independently as duration <1 year)

Reactive nontreponemal and treponemal tests from a person whose only possible exposure occurred within the preceding 12 months

## Syphilis, late latent

## **Clinical description**

A subcategory of latent syphilis. When initial infection has occurred >1 year previously, latent syphilis is classified as late latent.

## **Case classification**

**Probable:** latent syphilis (see Syphilis, latent) in a patient who has no evidence of having acquired the disease within the preceding 12 months (see Syphilis, early latent) and whose age and titer do not meet the criteria specified for latent syphilis of unknown duration.

#### Syphilis, latent, of unknown duration

#### **Clinical description**

A subcategory of latent syphilis. When the date of initial infection cannot be established as having occurred within the previous year and the patient's age and titer meet criteria described below, latent syphilis is classified as latent syphilis of unknown duration.

#### **Case classification**

**Probable:** latent syphilis (see Syphilis, latent) that does not meet the criteria for early latent syphilis, and the patient is aged 13–35 years and has a nontreponemal titer ≥32

#### Neurosyphilis

Note: Since neurosyphilis can occur at almost any stage of syphilis, between 1996 and 2005, it was classified and reported as one of several mutually exclusive stages of syphilis. In 2005, the Division of STD Prevention requested that STD control programs discontinue classifying and reporting neurosyphilis as a distinct stage of

syphilis. Since 2005, if the patient has confirmed or probably neurosyphilis, the case should be reported as the appropriate state of syphilis and neurological manifestations should be noted.

## **Clinical description**

Evidence of central nervous system infection with T. pallidum

#### Laboratory criteria for diagnosis

A reactive serologic test for syphilis and reactive VDRL in cerebrospinal fluid (CSF) Case classification

## **Case classification**

**Probable:** syphilis of any stage, a negative VDRL in CSF, and both of the following: Elevated CSF protein or leukocyte count in the absence of other known causes of these abnormalities Clinical symptoms or signs consistent with neurosyphilis without other known causes for these clinical abnormalities

Confirmed: syphilis of any stage that meets the laboratory criteria for neurosyphilis

# Syphilis, late, with clinical manifestations other than neurosyphilis (late benign syphilis and cardiovascular syphilis)

# **Clinical description**

Clinical manifestations of late syphilis other than neurosyphilis may include inflammatory lesions of the cardiovascular system, skin, and bone. Rarely, other structures (e.g., the upper and lower respiratory tracts, mouth, eye, abdominal organs, reproductive organs, lymph nodes, and skeletal muscle) may be involved. Late syphilis usually becomes clinically manifest only after a period of 15–30 years of untreated infection.

#### Laboratory criteria for diagnosis

Demonstration of T. pallidum in late lesions by fluorescent antibody or special stains (although organisms are rarely visualized in late lesions)

#### **Case classification**

**Probable:** characteristic abnormalities or lesions of the cardiovascular system, skin, bone, or other structures with a reactive treponemal test, in the absence of other known causes of these abnormalities, and without CSF abnormalities and clinical symptoms or signs consistent with neurosyphilis

Confirmed: a clinically compatible case that is laboratory confirmed

Comment

Analysis of CSF for evidence of neurosyphilis is necessary in the evaluation of late syphilis with clinical manifestations.

# Syphilitic Stillbirth

## **Clinical description**

A fetal death that occurs after a 20-week gestation or in which the fetus weighs >500 g and the mother had untreated or inadequately treated\* syphilis at delivery

## Comment

For reporting purposes, syphilitic stillbirths should be reported as cases of congenital syphilis.

# Syphilis, Congenital

## **Clinical description**

A condition caused by infection in utero with *Treponema pallidum*. A wide spectrum of severity exists, and only severe cases are clinically apparent at birth. An infant or child (aged <2 years) may have signs such as hepatosplenomegaly, rash, condyloma lata, snuffles, jaundice (nonviral hepatitis), pseudoparalysis, anemia, or edema (nephrotic syndrome and/or malnutrition). An older child may have stigmata (e.g., interstitial keratitis, nerve deafness, anterior bowing of shins, frontal bossing, mulberry molars, Hutchinson teeth, saddle nose, rhagades, or Clutton joints).

## Laboratory criteria for diagnosis

Demonstration of *T. pallidum* by darkfield microscopy, fluorescent antibody, or other specific stains in specimens from lesions, placenta, umbilical cord, or autopsy material

# **Case classification**

**Probable:** a condition affecting an infant whose mother had untreated or inadequately treated\* syphilis at delivery, regardless of signs in the infant, or an infant or child who has a reactive treponemal test for syphilis and any one of the following:

Any evidence of congenital syphilis on physical examination

Any evidence of congenital syphilis on radiographs of long bones

A reactive cerebrospinal fluid (CSF) venereal disease research laboratory (VDRL)

An elevated CSF cell count or protein (without other cause)

A reactive fluorescent treponemal antibody absorbed—19S-IgM antibody test or IgM enzyme-linked immunosorbent assay

Confirmed: a case that is laboratory confirmed

#### Comment

Congenital and acquired syphilis may be difficult to distinguish when a child is seropositive after infancy. Signs of congenital syphilis may not be obvious, and stigmata may not yet have developed. Abnormal values for CSF VDRL, cell count, and protein, as well as IgM antibodies, may be found in either congenital or acquired syphilis. Findings on radiographs of long bones may help because radiographic changes in the metaphysis and epiphysis

are considered classic signs of congenitally acquired syphilis. The decision may ultimately be based on maternal history and clinical judgment. In a young child, the possibility of sexual abuse should be considered as a cause of acquired rather than congenital syphilis, depending on the clinical picture. For reporting purposes, congenital syphilis includes cases of congenitally acquired syphilis among infants and children as well as syphilitic stillbirths.

# **Tuberculosis**

# **Clinical Description**

A chronic bacterial infection caused by Mycobacterium *tuberculosis,* usually characterized pathologically by the formation of granulomas. The most common site of infection is the lung, but other organs may be involved.

# **Clinical Criteria**

A case that meets all the following criteria:

A positive tuberculin skin test or positive interferon gamma release assay for M. *tuberculosis* Other signs and symptoms compatible with tuberculosis (TB) (e.g., abnormal chest radiograph, abnormal chest computerized tomography scan or other chest imaging study, or clinical evidence of current disease) Treatment with two or more anti-TB medications A completed diagnostic evaluation

# Laboratory Criteria for Diagnosis

Isolation of M. *tuberculosis* from a clinical specimen,\* OR

Demonstration of M. *tuberculosis* complex from a clinical specimen by nucleic acid amplification test,\*\* OR Demonstration of acid-fast bacilli in a clinical specimen when a culture has not been or cannot be obtained or is falsely negative or contaminated.

# **Case Classification**

# Confirmed

A case that meets the clinical case definition or is laboratory confirmed

# Comment(s)

A case should not be counted twice within any consecutive 12-month period. However, a case occurring in a patient who had previously had verified TB disease should be reported and counted again if more than 12 months have elapsed since the patient completed therapy. A case should also be reported and counted again if the patient was lost to supervision for greater than 12 months and TB disease can be verified again. Mycobacterial diseases other than those caused by M. *tuberculosis* complex should not be counted in tuberculosis morbidity statistics unless there is concurrent tuberculosis.

\*Use of rapid identification techniques for M. tuberculosis (e.g., DNA probes and mycolic acid high-pressure liquid chromatography performed on a culture from a clinical specimen) are acceptable under this criterion.

\*\* Nucleic acid amplification (NAA) tests must be accompanied by culture for mycobacteria species for clinical purposes. A culture isolate of M. tuberculosis complex is required for complete drug susceptibility testing and also genotyping. However, for surveillance purposes, CDC will accept results obtained from NAA tests approved by the Food and Drug Administration (FDA) and used according to the approved product labeling on the package insert, or a test produced and validated in accordance with applicable FDA and Clinical Laboratory Improvement Amendments (CLIA) regulations.

## 1996-2009 Definition

#### **Clinical Description**

A chronic bacterial infection caused by Mycobacterium *tuberculosis,* characterized pathologically by the formation of granulomas. The most common site of infection is the lung, but other organs may be involved.

## **Clinical Criteria**

A case that meets the following criteria:

A positive tuberculin skin test

Other signs and symptoms compatible with tuberculosis (e.g., an abnormal, unstable [i.e., worsening or

improving] chest radiographs, or clinical evidence of current disease)

Treatment with two or more antituberculosis medications

Completed diagnostic evaluation

# Laboratory Criteria for Diagnosis

Isolation of M. tuberculosis from a clinical specimen\*, OR

Demonstration of M. tuberculosis from a clinical specimen by nucleic acid amplification test,\*\*, OR Demonstration of acid-fast bacilli in a clinical specimen when a culture has not been or cannot be obtained

# **Case Classification**

# Confirmed

A case that meets the clinical case definition or is laboratory confirmed

#### Comment(s)

A case should not be counted twice within any consecutive 12-month period. However, cases in which the patients had previously had verified disease should be reported again if the patients were discharged from treatment. Cases also should be reported again if patients were lost to supervision for greater than 12 months and disease can be verified again. Mycobacterial diseases other than those caused by M. tuberculosis complex should not be counted in tuberculosis morbidity statistics unless there is concurrent tuberculosis.

\*Use of rapid identification techniques for M. tuberculosis (e.g., DNA probes and mycolic acids high-pressure liquid chromatography performed on a culture from a clinical specimen) are acceptable under this criterion.

\*\*Nucleic acid amplification (NAA) tests must be accompanied by culture for mycobacteria species. However, for surveillance purposes, CDC will accept results obtained from NAA tests approved by the Food and Drug Administration (FDA) and used according to the approved product labeling on the package insert. Current FDA-approved NAA tests are only approved for smear-positive respiratory

<u>Change in definition</u>: An interferon gamma release assay for M. *tuberculosis* is included in the acceptable tests for tuberculosis screening.

# STATISTICAL NOTES TABLE

MEASUREMENT	TECHNICAL	MEASUREMENT PUBLIC	ΜΕΛΩΙΡΕΜΕΝΤ ΕΩΡΜΙΙΙΑς	
NAME	DEFINITION OF MEASUREMENT	HEALTH USE		
Crude rate <sup>13</sup>	The simplest rate for a population over a specific time period. The number of new cases of disease that occurred during a specific time period in a population at risk without accounting for the differences in the composition of the population.	A crude rate includes time so this is a measure of disease risk for the population.	$\begin{pmatrix} Number of cases \\ \frac{during a specific time period}{American Indian population} \\ during the same time period \end{pmatrix} \times 100,000 \end{pmatrix}$	
Stratified Rate <sup>13</sup>	A crude rate calculated for a specific subgroup or stratum of people within a population. The stratified rate includes the number of new cases of disease that occurred during a specific time period in a population at risk for each subgroup or stratum of interest without accounting for other differences in the composition of the population.	A stratified rate includes time, so this is a measure of disease risk for a specific subgroup in the population (age, race-ethnicity, gender).	Number of cases within a subgroup during a specific time period American Indian population within a subgroup during the same time period	
Age-adjusted Rate <sup>13</sup>	A direct age-adjusted rate is a rate that is calculated to "control" for any differences in the age structure of a population like the US population and American Indian/Alaska Native population.	A age-adjusted rate includes time so this is a measure of disease risk for the population.	Crude Rate x Standard Population = Expected Cases $\left(\frac{\text{Total Expected Cases}}{\text{Total Standard Population}}\right  \times 100,000\right)$	
95% Confidence Intervals <sup>13</sup> (CI 95%)	A range of values defined so that there is a 95% probability that the value of the point estimate, or measure is within it	Used to compare two values to determine if they are different (statistically).	For rates Point estimate $\pm [1.96 \times SE[point estimate]]$ For matched odds ratios Log OR $\pm \left[1.96 \times \sqrt{\frac{1}{b} + \frac{1}{c}}\right]$	
Incidence Rate <sup>13</sup>	The number of new cases per population in a given time period.	Measure of the risk of developing a new condition within a specified period of time.	Number of new cases within a subgroup during a specific time period American Indian population within a subgroup during the same time period	
Incidence Rate Ratios (IRR) <sup>13</sup>	The ratio of two incidence rates. The incidence rate among the exposed proportion of the population, divided by the incidence rate in the unexposed portion of the population, gives a relative measure of the effect of a given exposure.	Incidence rate ratios (IRR) determine if racial disparities are observed in the rates of new cases.	Incidence Rate for American Indians Incidence Rate for for all other races/ethnicities IRR < 1, no disparity IRR > 1, disparity	
Detection Rate <sup>3</sup> HIV only	The number of newly detected cases per population in a given time period	Measure of burden of previously unknown, but not recent conditions within a specified period of time.	Number of newly detected cases within a subgroup during a specific time period American Indian population within a subgroup during the same time period	
Detection Rate Ratios (DRR) <sup>3</sup> HIV only	The ratio of two detection rates. The detection rate among the exposed proportion of the population, divided by the detection rate in the unexposed portion of the population, gives a relative measure of the effect of a given exposure	Incidence rate ratios (IRR) determine if racial disparities are observed in the rates of new cases.	Detection Rate for American Indians Detection Rate for all other races/ethnicities DRR < 1, no disparity DRR > 1, disparity	

# **GLOSSARY**

**AIDS** - acquired immunodeficiency syndrome is a group of diseases resulting from infection with the human immunodeficiency virus (HIV). A person infected with HIV gradually loses immune function, becoming less able to resist aliments and cancers, resulting in eventual death. As of 2009, all CDC HIV surveillance products and reports refer to AIDS as HIV infection, stage 3

Alaska Native – a member or descendant of indigenous peoples in Alaska.

**American Indian** – a member or descendant of indigenous people in the United States; this term is generally used for Native Americans who are members of tribes in all states except Alaska and Hawaii.

Congenital syphilis - syphilis acquired by the fetus in utero.

Count - the number of disease, events, or other health-related occurrences.

**Data** – items of information expressed as measurements or statistics used to learn more about a disease or risk factor. Data are used for calculations, support of evidence, assessments, and often for decision making.

**Detection rate** – the rate at which new cases of disease or health condition are detected by the surveillance system in a population. Distinct from an incidence rate because the onset of disease may have occurred long before it was detected. Distinct from the prevalence rate because it is a newly counted case for the surveillance system. The detection rate is often calculated by the following formula in public health practice:

Detection rate =  $\frac{\text{Number of new cases detected in specified period}}{\text{Total number of persons at risk during this period}} \times 10^{n}$ 

**Electronic laboratory reporting** – the electronic transmission from laboratories to public health of laboratory reports which identify reportable conditions.

**Emergent HIV -** sum of new HIV cases, and new stage 3 HIV (AIDS) cases not diagnosed as HIV infections in any prior calendar year. This is used as an estimate of incidence. Cases of HIV can only be counted as emergent in the year they were first diagnosed with HIV infection.

**Ethnicity** – relating to cultural factors such as a shared creation narrative, ancestry, language, and beliefs. A social group characterized by ethnic affiliation or distinctiveness. Ethnicity is largely self-identified.

HIV - human immunodeficiency virus.

**Incidence rate** – the rate at which new cases of disease or health condition occur in a population. The incidence rate is calculated by the following formula in public health practice:

Incidence rate =  $\frac{\text{Number of new cases in specified period}}{\text{Total number of persons at risk during this period}} \times 10^{n}$ 

**Indian Health Service (IHS)** – U.S. Department for Health and Human Services funded agency responsible for providing health services to American Indians and Alaska Natives. The IHS provides health services for approximately 1.9 million American Indians and Alaska Natives who belong to 566 federally recognized Tribes,

state recognized Tribes, and California Indians in 35 states. The IHS is divided into 12 geographic "Areas" of the United States: Alaska, Albuquerque, Aberdeen, Bemidji, Billings, California, Nashville, Navajo, Oklahoma, Phoenix, Portland, and Tucson.

**Misclassification** – the incorrect assignment of a person, value, or item into a grouping which it should not be assigned.

**National Electronic Disease Surveillance System (NEDSS)** – facilitates electronically transferring public health surveillance data from the healthcare system to public health departments. It is a conduit for exchanging information that supports NNDSS.

**National Notifiable Disease Surveillance System (NNDSS)** - a public health disease surveillance system that gives public health officials powerful capabilities to monitor the occurrence and spread of diseases.

**Phoenix Service Area** – the Phoenix Service Area is one of 12 geographic "Areas" within the Indian Health Service (IHS). The Phoenix Service Area serves the majority of its tri-state "Area" in Arizona, Nevada, and Utah.

**Prevalence** – the proportion of a population that is found to have a specified condition. This measure is often presented as a percentage, a fraction, or the number of cases per 10,000 or 100,000 people.

 $Prevalence = \frac{\text{Number of new and existing cases in specified period}}{\text{Population during the same time period}} \times 10^{n}$ 

**Primary syphilis** - the first stage of syphilis, marked by formation of a painless chancre at the point of infection and by hardening and swelling of adjacent lymph nodes

**Race** – a social construct created to categorize human beings into broad and generic groupings that are self-selected.

**Rate** – a measure of how fast a disease is occurring in the population. Rate is measured by the following formula:

 $Rate = \frac{\text{Number of events in specified period}}{\text{Total population during the same time period}} \times 10^{n}$ 

**Secondary syphilis** – the second stage of syphilis, beginning with the appearance of the dermatologic eruption, slight fever, and various constitutional symptoms

STD – sexually transmitted disease

**HIV infection, stage 3 (AIDS) -** CD4+ T-lymphocyte count of <200 cells/ $\mu$ L or CD4+ T-lymphocyte percentage of total lymphocytes of <14, or documentation of an AIDS-defining condition. Documentation of an AIDS-defining condition supersedes a CD4+ T-lymphocyte count of ≥200 cells/ $\mu$ L and a CD4+ T-lymphocyte percentage of total lymphocytes of ≥14.

**Standard population** – A set population that is used to standardize age-adjusted rates so rates in different populations are comparable.

Statistics – the act of collecting, summarizing, and analyzing data.

**Surveillance** – systematic (orderly) and continuous collection, analysis and interpretation of data, along with the timely dissemination (distribution) of the results to those who have the right to know so that action can be taken.

## TB - Tuberculosis

**Tucson Service Area** – the Tucson Service Area is one of 12 geographic "Areas" within the Indian Health Service (IHS). The Tucson IHS Area provides health care for two Tribes in southern Arizona: the Tohono O'odham Nation and the Pascua Yaqui Tribe