



2009-2013 MICHIGAN TUBERCULOSIS EPIDEMIOLOGIC TRENDS REPORT



**Michigan Department of Community Health
Bureau of Disease Control, Prevention and Epidemiology
Communicable Disease Division
HIV/Body Art/Tuberculosis/Viral Hepatitis Section
Tuberculosis Control Unit**

*Michigan Department
of Community Health*



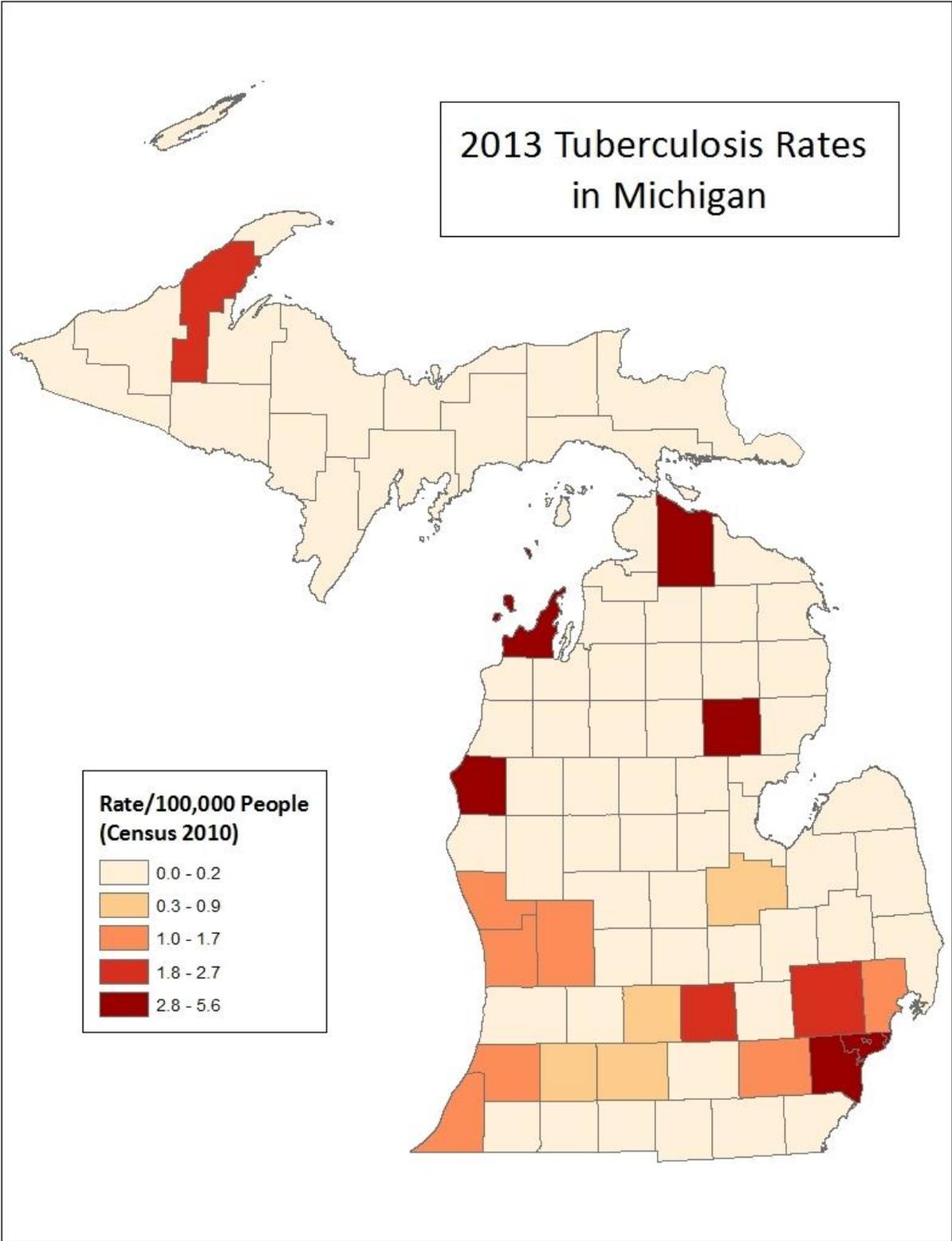
Rick Snyder, Governor
Nick Lyon, Director

December, 2014

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2013 TUBERCULOSIS IN MICHIGAN MAP



MICHIGAN LOCAL HEALTH JURISDICTIONS AND PUBLIC HEALTH PREPAREDNESS REGIONS MAP

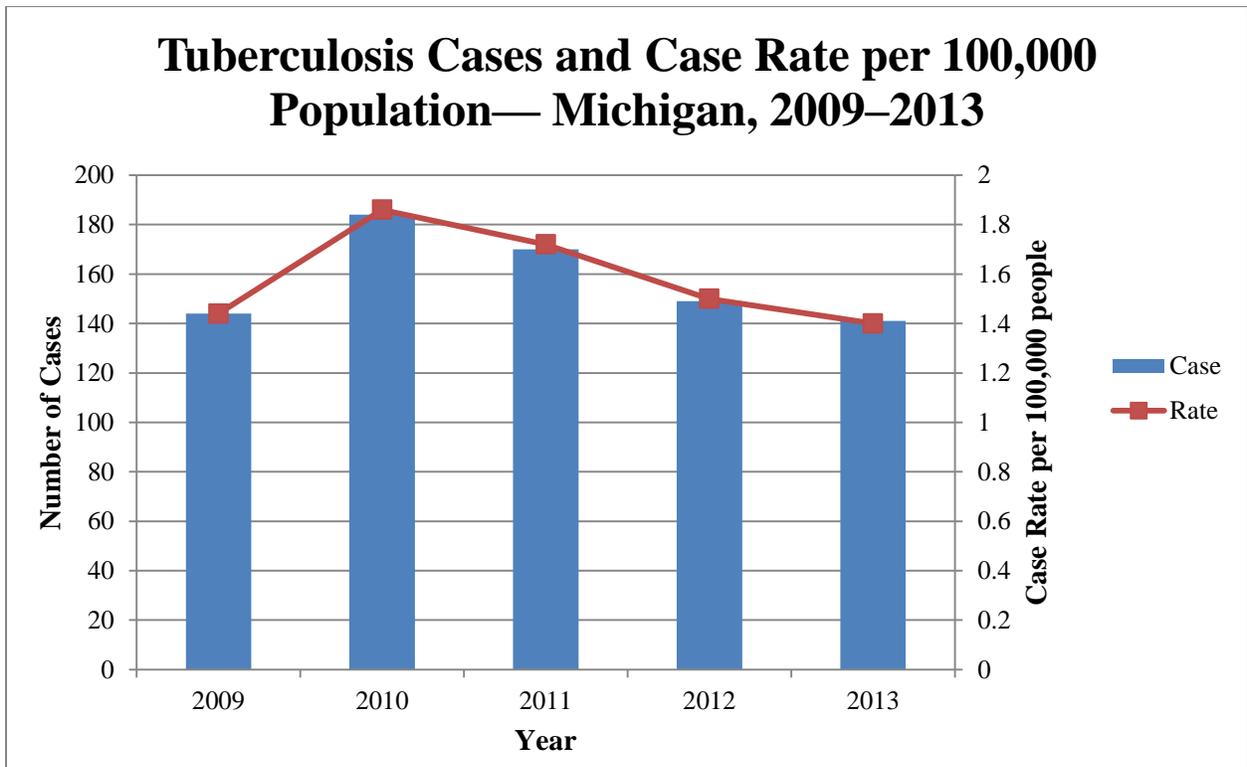


TUBERCULOSIS INCIDENCE

Michigan has experienced an overall decline in tuberculosis (TB) (both in the number of reported cases and the case rate) from 2009 through 2013 (*Panel 1*). The period from 2009 – 2010 was an exception to this trend, in that Michigan reported an unexpectedly low number of cases in 2009 followed by a “rebound” in the number of reported cases in 2010. This phenomenon was observed nationally and extensive analysis by the Centers for Disease Control and Prevention (CDC) indicated that this phenomenon was not indicative of data reporting or data collection gaps. Rather, it appears that in 2009 there were fewer TB cases diagnosed than in 2010 and 2011. One possible explanation for this phenomenon in Michigan is the occurrence of the 2009 influenza outbreak and the possible competition of clinical and public health resources in responding to the influenza outbreak versus identifying and/or diagnosing TB cases. Another possible explanation is the rapid degradation of Michigan’s economy, perhaps resulting in reduced access to or seeking of care. 2013 marked the lowest in the number of reported TB cases and case rate both in Michigan and nationally (9,588 cases and 3.0/100,000).

Panel 1. Tuberculosis Cases and Case Rate per 100,000 Population—Michigan, 2009–2013

Year	Cases	% Change	Rate	% Change
2009	144		1.44	
2010	184	27.78	1.86	28.89
2011	170	-7.61	1.72	-7.54
2012	149	-12.35	1.50	-12.79
2013	141	-5.37	1.40	-6.67



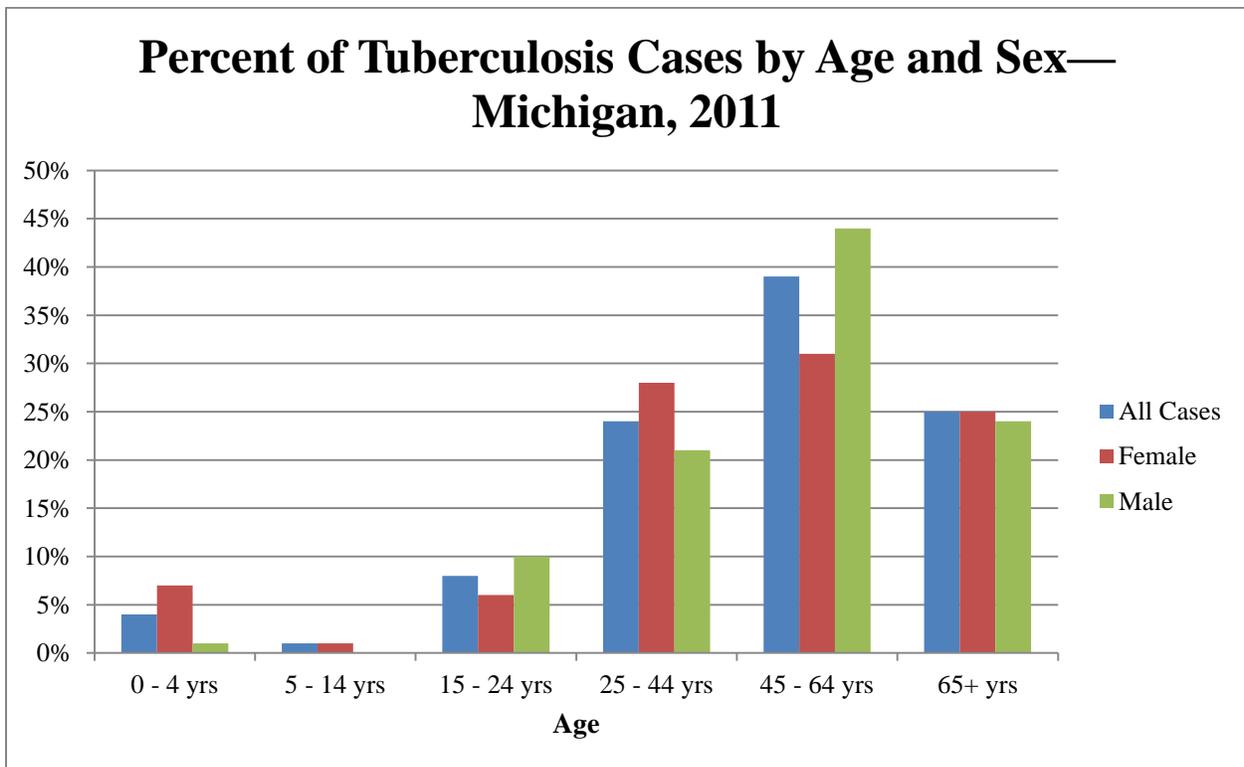
TB DEMOGRAPHICS

TB is an infectious airborne disease that remains a global health problem. There are about nine million new TB cases and around two million deaths associated with TB each year.¹ Due to public health efforts in controlling TB in the United States, TB incidence has declined continuously for more than 20 years. In 2013, there were a total of 9,588 cases reported and a case rate of 3.0/100,000 population in the U.S.² However, there are still many racial and social disparities impacting the burden of TB.

Although the number of TB cases varies annually across different age, sex and racial/ethnic groups, during the past three years the majority of Michigan's TB burden was reported among Asian, Black and Caucasian males aged 25 years and older (*Panels 2a-c, 3a-c*). The 45-64 years age group of consistently had the highest proportions of cases compared to other age groups and contained more male than female cases (*Panel 2a-c*). Pediatric cases (≤ 14 years) and the racial groups of Native Hawaiian or Other Pacific Islander and American Indian or Alaskan Native have constituted a small proportion of the overall TB burden in Michigan. The majority of TB cases were reported from southeast Michigan (*Panels 4a-c, 5a-c*). From 2009 – 2012, the proportions of US-born and Foreign-born cases in Michigan were roughly equal, however in 2013 about 59% of TB cases were foreign-born, similar to the rest of the U.S (*Panel 6*). The most common countries of birth among foreign-born cases were India, Philippines, Bangladesh, Mexico, Iraq, and Vietnam (*Panel 7a-c*). There were regional differences in terms of TB burden, with regions 1, 2N, 2S and 6 reporting greater diversities of age and racial groups compared to other regions in the state (*Panels 4a-c, 5a-c*). Among these regions, regions 2N and 6 consistently reported more foreign-born cases while region 2S reported more US-born cases (*Panel 8a-c*). With the increase of foreign-born cases, local health departments and their TB programs need to consider additional case management training to meet potential barriers such as cultural competency and language.

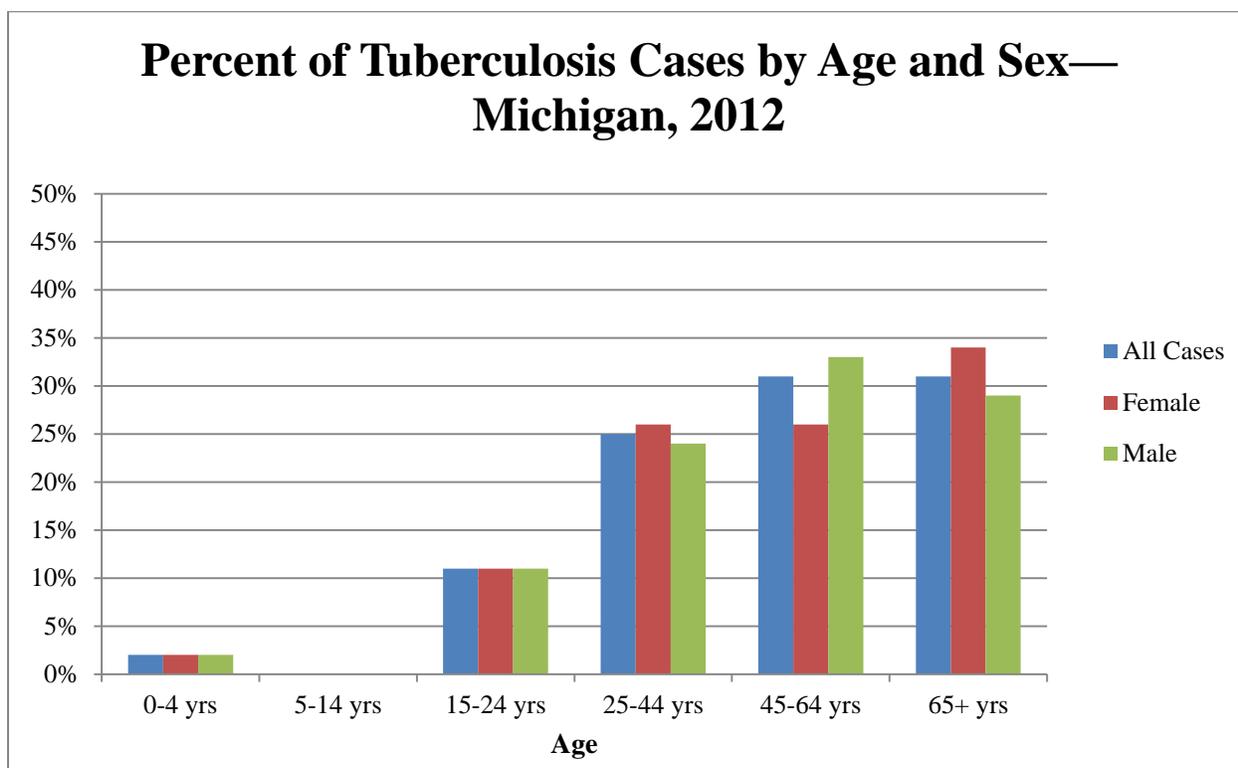
Panel 2a: Number and Percent of Tuberculosis Cases by Age and Sex—Michigan, 2011

	Age in Years												
	All Ages	0-4		5-14		15-24		25-44		45-64		65+	
	No.	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
All Cases	170	6	4	1	1	14	8	41	24	66	39	42	25
Female	67	5	7	1	1	4	6	19	28	21	31	17	25
Male	103	1	1	0	0	10	10	22	21	45	44	25	24



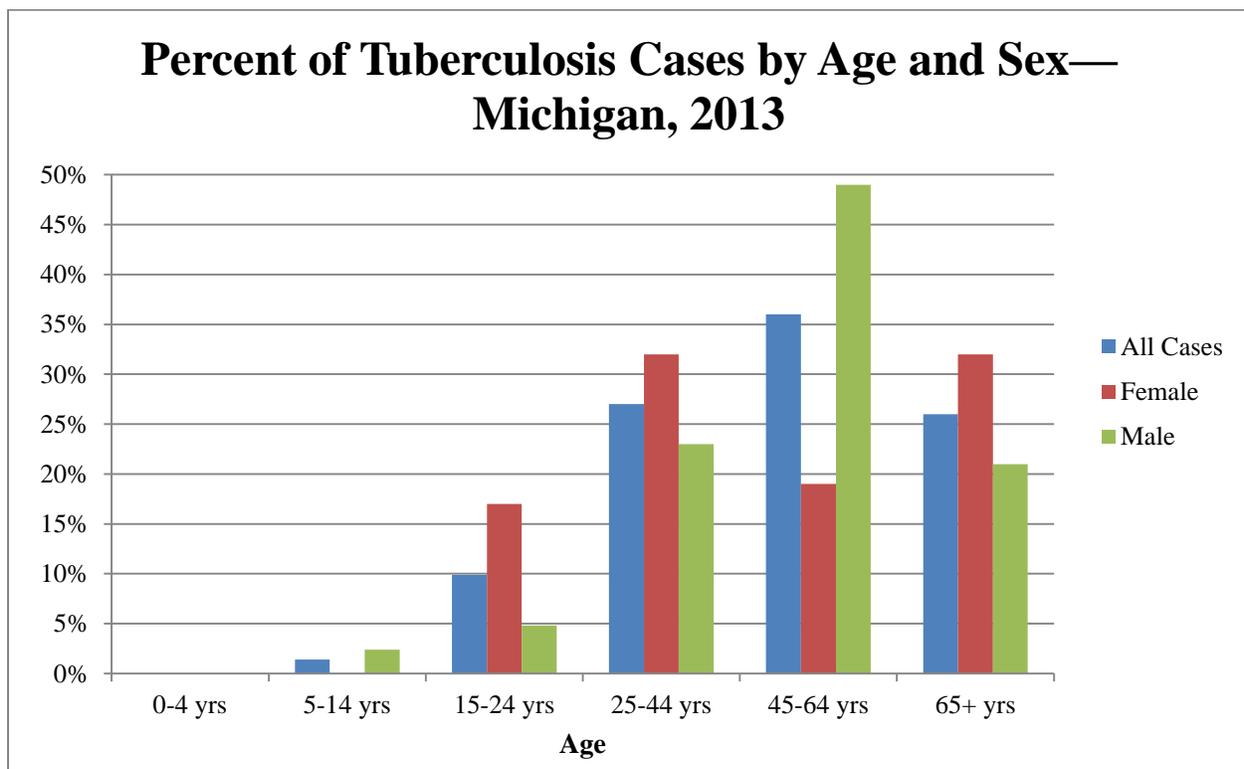
Panel 2b: Number and Percent of Tuberculosis Cases by Age and Sex—Michigan, 2012

	Age in Years												
	All Ages	0-4		5-14		15-24		25-44		45-64		65+	
	No.	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
All Cases	149	3	2	0	0	17	11	37	25	46	31	46	31
Female	53	1	2	0	0	6	11	14	26	14	26	18	34
Male	96	2	2	0	0	11	11	23	24	32	33	28	29



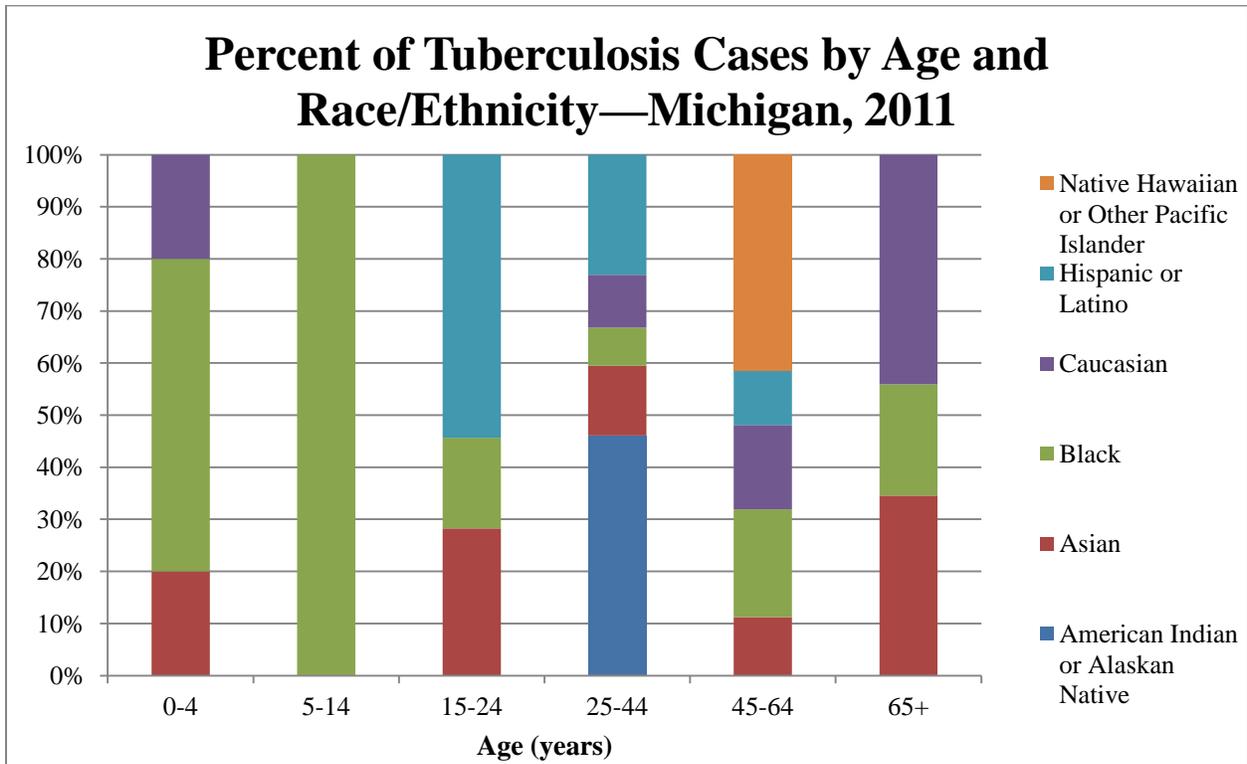
Panel 2c: Number and Percent of Tuberculosis Cases by Age and Sex—Michigan, 2013

	Age in Years												
	All Ages	0-4		5-14		15-24		25-44		45-64		65+	
	No.	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
All Cases	141	0	0	2	1	14	10	38	27	51	36	36	26
Female	59	0	0	0	0	10	17	19	32	11	19	19	32
Male	82	0	0	2	2	4	5	19	23	40	49	17	21



**Panel 3a: Number and Percent of Tuberculosis Cases by Age and Race/Ethnicity—
Michigan, 2011**

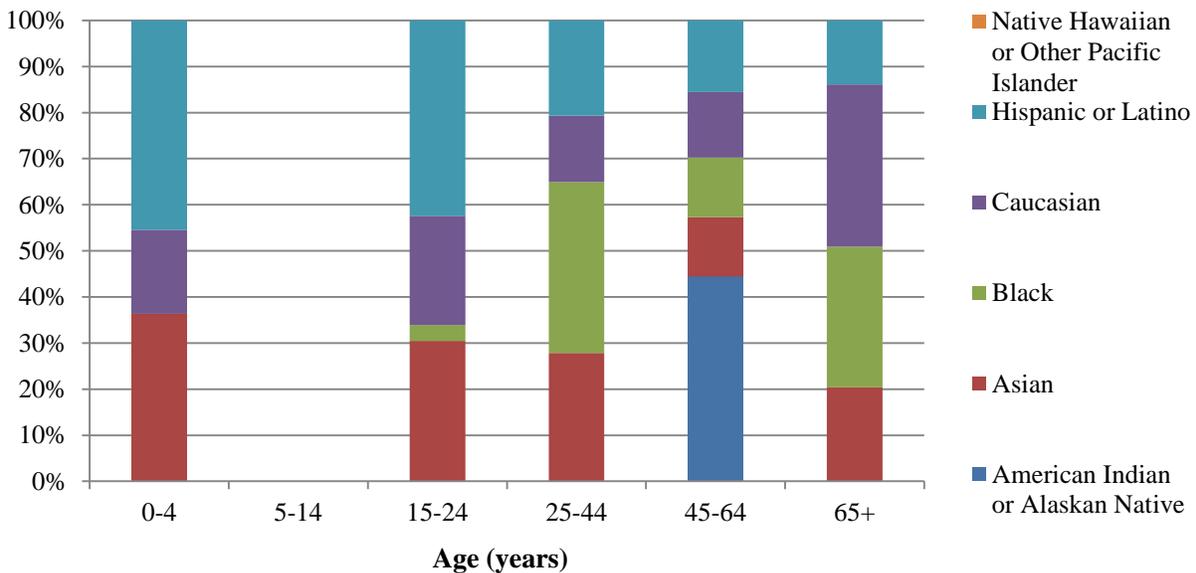
	Age in Years													
	All Ages		0-4		5-14		15-24		25-44		45-64		65+	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
All Cases	170		6	4	1	1	14	8	41	24	66	39	42	25
American Indian or Alaskan Native	1		0	0	0	0	0	0	1	100	0	0	0	0
Asian	48		1	2	0	0	6	13	14	29	13	27	14	29
Black	62		4	6	1	2	5	8	10	16	31	50	11	18
Caucasian	46		1	2	0	0	0	0	10	22	18	39	17	37
Hispanic or Latino	12		0	0	0	0	3	25	6	50	3	25	0	0
Native Hawaiian or Other Pacific Islander	1		0	0	0	0	0	0	0	0	1	100	0	0



Panel 3b: Number and Percent of Tuberculosis Cases by Age and Race/Ethnicity—Michigan, 2012

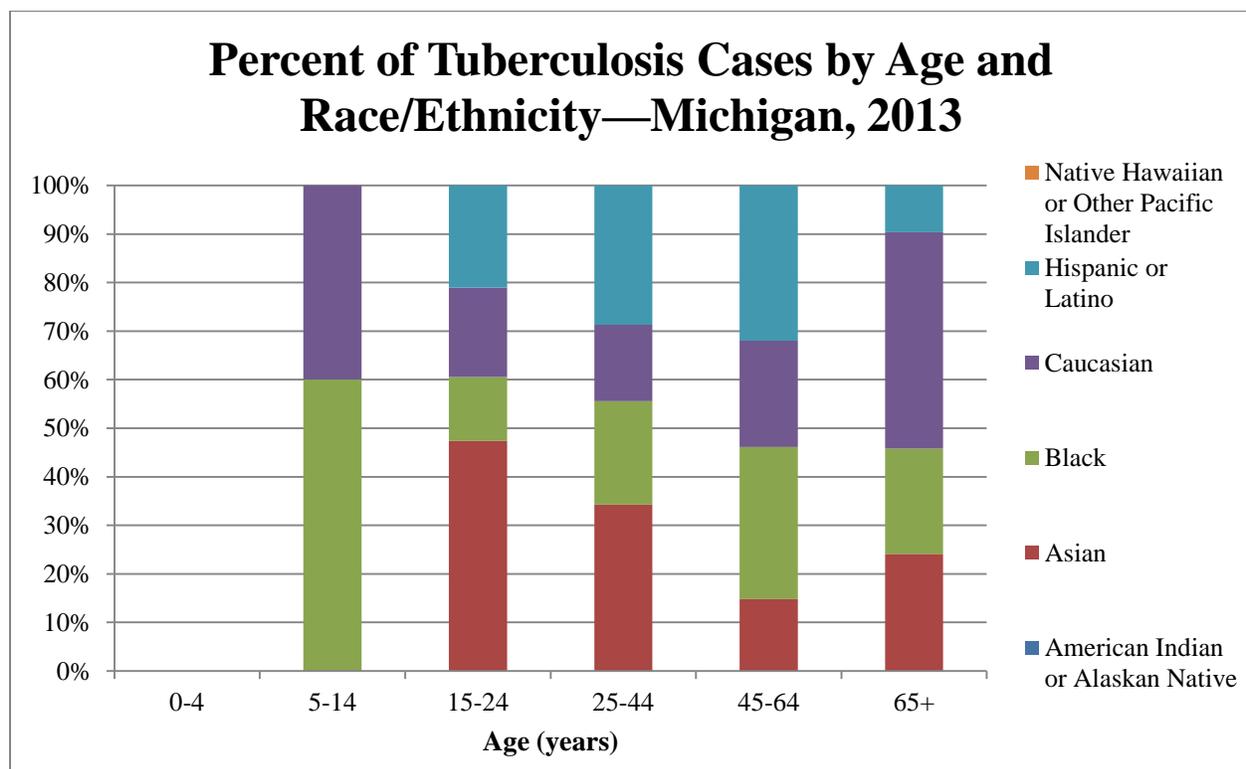
	Age in Years												
	All Ages	0-4		5-14		15-24		25-44		45-64		65+	
	No.	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
All Cases	149	3	2	0	0	17	11	37	25	46	31	46	31
American Indian or Alaskan Native	1	0	0	0	0	0	0	0	0	1	100	0	0
Asian	45	2	4	0	0	8	18	12	27	13	29	10	22
Black	45	0	0	0	0	1	2	16	36	13	29	15	33
Caucasian	56	1	2	0	0	8	14	8	14	78	32	21	38
Hispanic or Latino	20	1	5	0	0	5	25	4	20	7	35	3	15
Native Hawaiian or Other Pacific Islander	0	0	0	0	0	0	0	0	0	0	0	0	0

Percent of Tuberculosis Cases by Age and Race/Ethnicity—Michigan, 2012



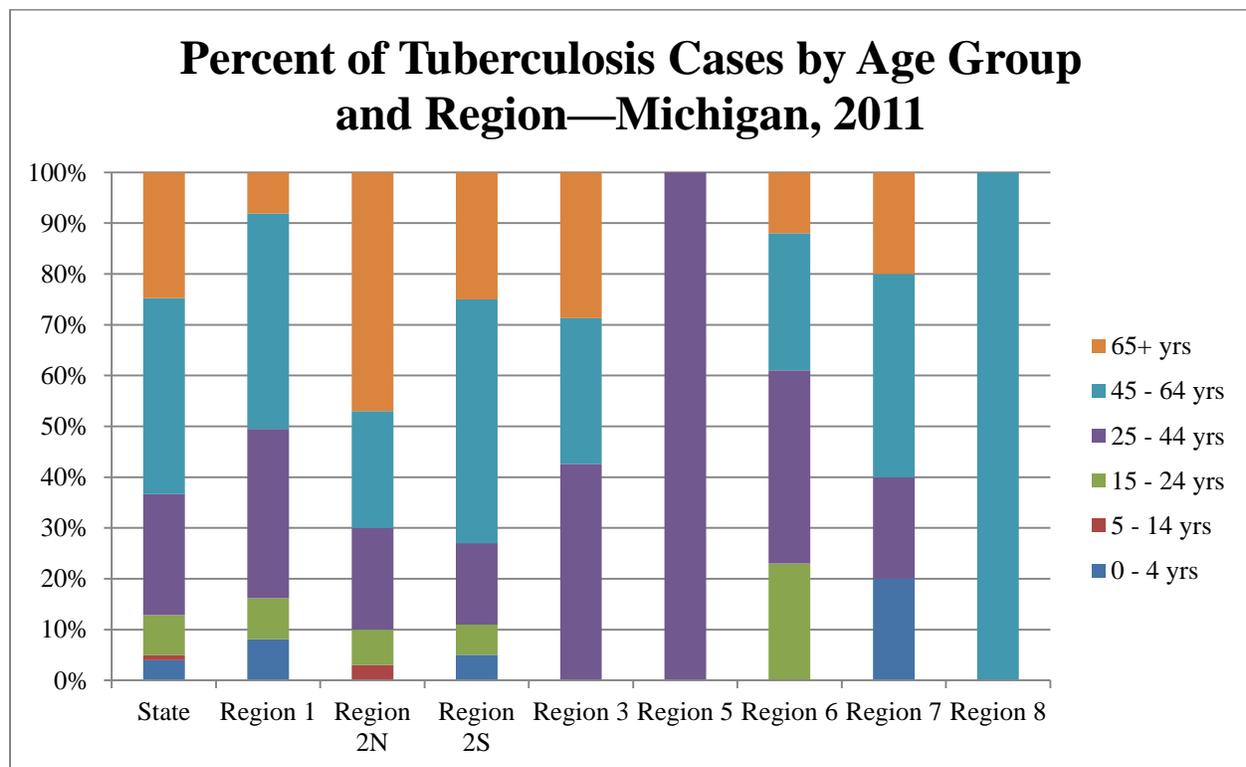
**Panel 3c: Number and Percent of Tuberculosis Cases by Age and Race/Ethnicity—
Michigan, 2013**

	Age in Years												
	All Ages	0-4		5-14		15-24		25-44		45-64		65+	
	No.	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
All Cases	141	0	0	2	1	14	10	38	27	51	36	36	26
American Indian or Alaskan Native	0	0	0	0	0	0	0	0	0	0	0	0	0
Asian	51	0	0	0	0	9	18	19	37	13	25	10	20
Black	40	0	0	1	3	2	5	9	23	21	53	7	18
Caucasian	46	0	0	1	2	3	7	8	17	17	37	17	37
Hispanic or Latino	13	0	0	0	0	1	8	4	31	7	54	1	8
Native Hawaiian or Other Pacific Islander	2	0	0	0	0	0	0	0	0	0	0	0	0



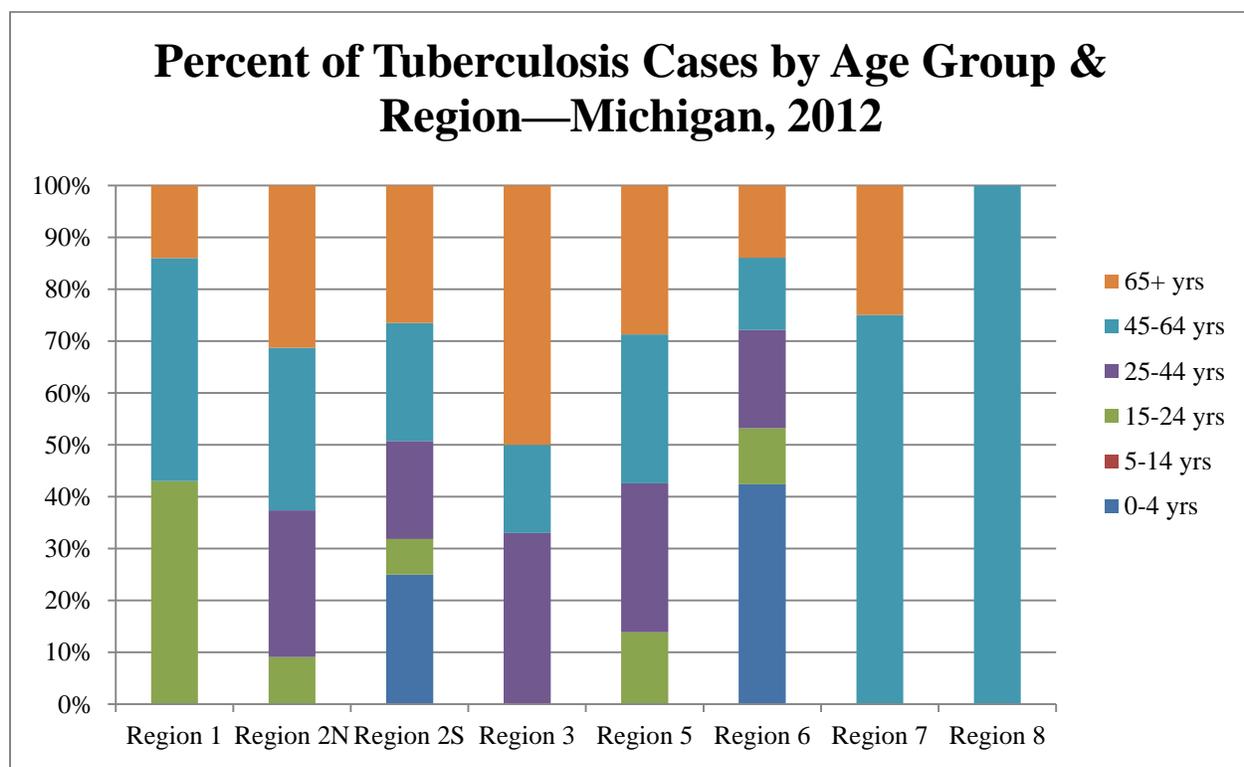
Panel 4a: Number and Percent of Tuberculosis Cases by Age Group & Region—Michigan, 2011

	Age in Years													
	All Ages		0-4		5-14		15-24		25-44		45-64		65+	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
State	170		6	4	1	1	14	8	41	24	66	39	42	25
Region 1	12		1	8	0	0	1	8	4	33	5	42	1	8
Region 2N	30		0	0	1	3	2	7	6	20	7	23	14	47
Region 2S	85		4	5	0	0	5	6	14	16	41	48	21	25
Region 3	7		0	0	0	0	0	0	3	43	2	29	2	29
Region 5	3		0	0	0	0	0	0	3	100	0	0	0	0
Region 6	26		0	0	0	0	6	23	10	38	7	27	3	12
Region 7	5		1	20	0	0	0	0	1	20	2	40	1	20
Region 8	2		0	0	0	0	0	0	0	0	2	100	0	0



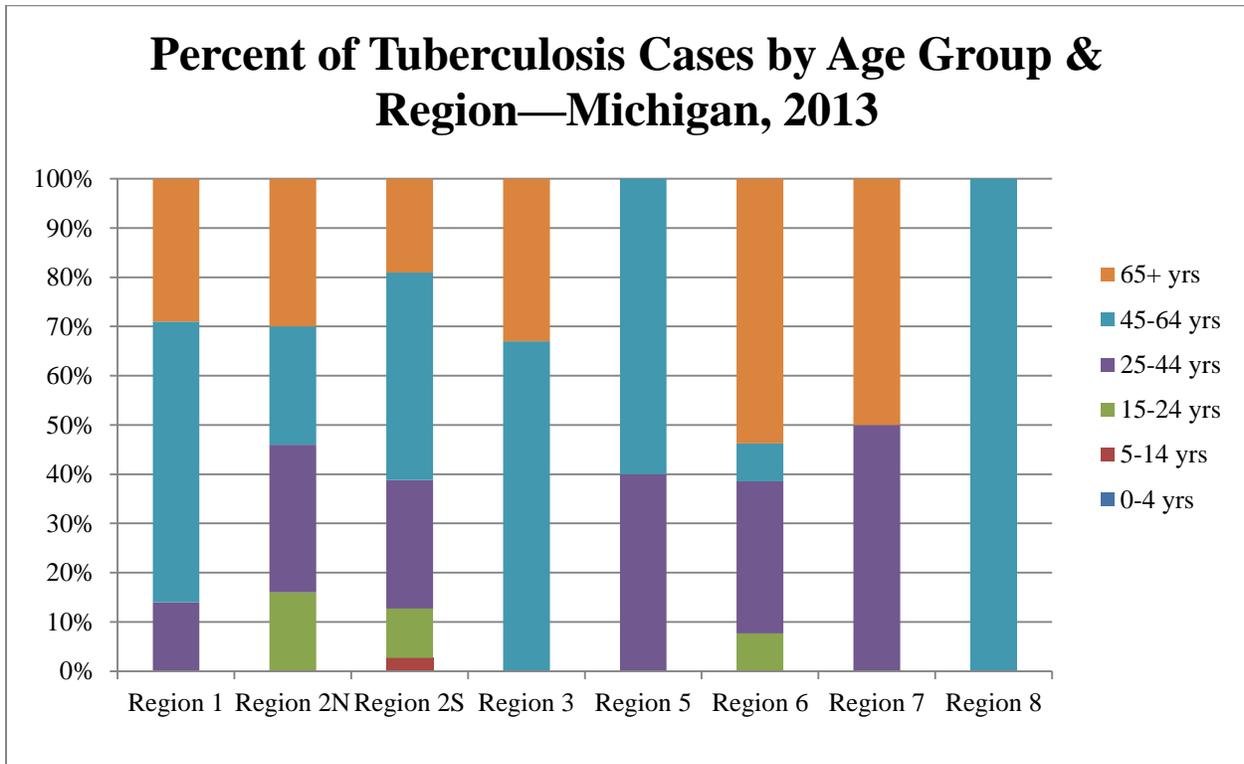
Panel 4b: Number and Percent of Tuberculosis Cases by Age Group & Region—Michigan, 2012

	Age in Years												
	All Ages	0-4		5-14		15-24		25-44		45-64		65+	
	No.	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
State	149	3	2	0	0	17	11	37	25	46	31	46	31
Region 1	7	0	0	0	0	3	43	0	0	3	43	1	14
Region 2N	32	0	0	0	0	3	9	9	28	10	31	10	31
Region 2S	69	1	33	0	0	6	9	17	25	21	30	24	35
Region 3	6	0	0	0	0	0	0	2	33	1	17	3	50
Region 5	7	0	0	0	0	1	14	2	29	2	29	2	29
Region 6	23	2	67	0	0	4	17	7	30	5	22	5	22
Region 7	4	0	0	0	0	0	0	0	0	3	75	1	25
Region 8	1	0	0	0	0	0	0	0	0	1	100	0	0



Panel 4c: Number and Percent of Tuberculosis Cases by Age Group & Region—Michigan, 2013

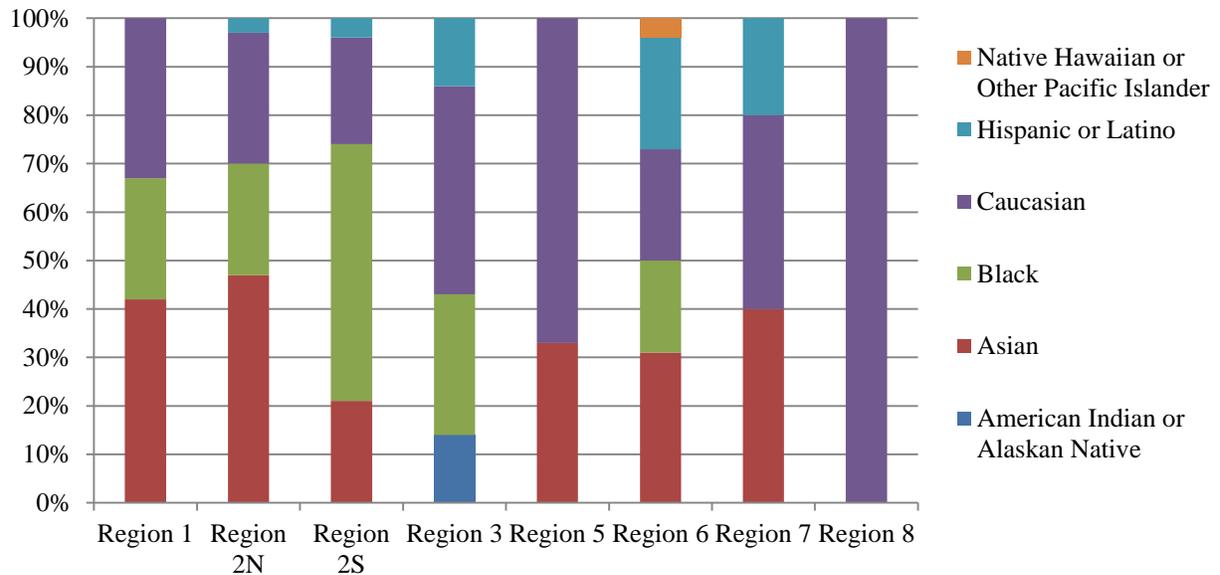
	Age in Years													
	All Ages		0-4		5-14		15-24		25-44		45-64		65+	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
State	141		0	0	2	1	14	10	38	27	51	36	36	26
Region 1	7		0	0	0	0	0	0	1	14	4	57	2	29
Region 2N	37		0	0	0	0	6	16	11	30	9	24	11	30
Region 2S	73		0	0	2	2	7	10	19	26	31	42	14	19
Region 3	3		0	0	0	0	0	0	0	0	2	67	1	33
Region 5	5		0	0	0	0	0	0	2	40	3	60	0	0
Region 6	13		0	0	0	0	1	7	4	31	1	7	7	54
Region 7	2		0	0	0	0	0	0	1	50	0	0	1	50
Region 8	1		0	0	0	0	0	0	0	0	1	100	0	0



**Panel 5a: Number and Percent of Tuberculosis Cases by Race/Ethnicity & Region—
Michigan, 2011**

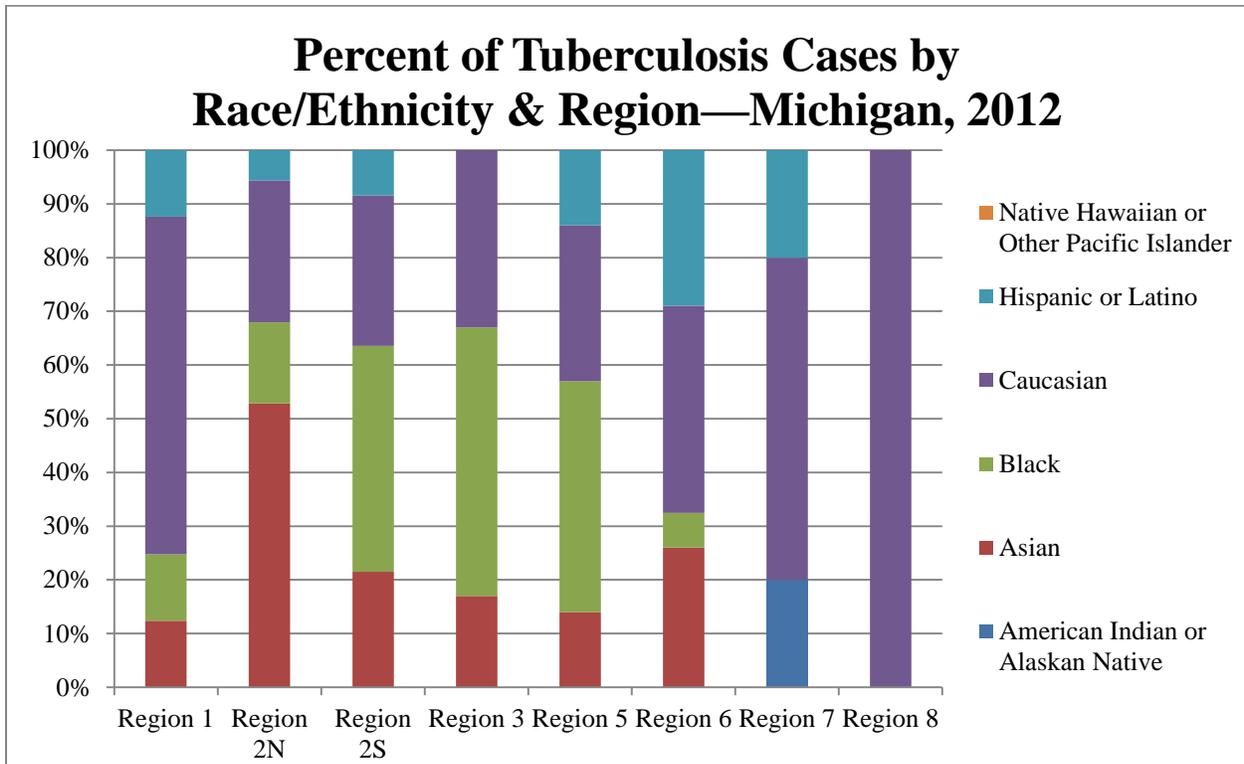
	All Races/Ethnicities No.	Race/Ethnicity											
		American Indian or Alaskan Native		Asian		Black		Caucasian		Hispanic or Latino		Native Hawaiian or Other Pacific Islander	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
State	170	1	1	48	28	62	36	46	27	12	7	1	1
Region 1	12	0	0	5	42	3	25	4	33	0	0	0	0
Region 2N	30	0	0	14	47	7	23	8	27	1	3	0	0
Region 2S	85	0	0	18	21	45	53	19	22	3	4	0	0
Region 3	7	1	14	0	0	2	29	3	43	1	14	0	0
Region 5	3	0	0	1	33	0	0	2	67	0	0	0	0
Region 6	26	0	0	8	31	5	19	6	23	6	23	1	4
Region 7	5	0	0	2	40	0	0	2	40	1	20	0	0
Region 8	2	0	0	0	0	0	0	2	100	0	0	0	0

**Percent of Tuberculosis Cases by
Race/Ethnicity & Region—Michigan, 2011**



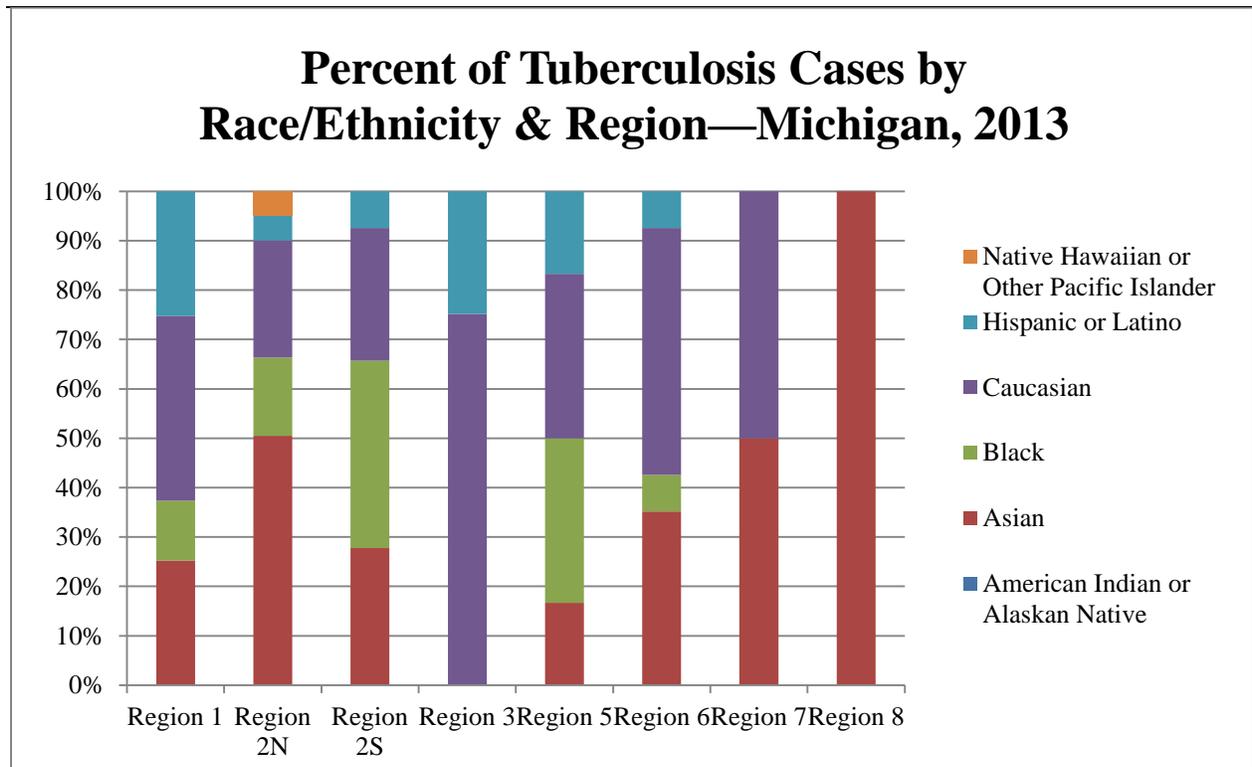
**Panel 5b: Number and Percent of Tuberculosis Cases by Race/Ethnicity & Region—
Michigan, 2012**

	All Races/Ethnicities No.	Race/Ethnicity											
		American Indian or Alaskan Native		Asian		Black		Caucasian		Hispanic or Latino		Native Hawaiian or Other Pacific Islander	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
State	149	1	1	45	30	45	30	56	38	20	13	0	0
Region 1	7	0	0	1	14	1	14	5	71	1	14	0	0
Region 2N	32	0	0	18	56	5	16	9	28	2	6	0	0
Region 2S	69	0	0	16	23	31	45	21	30	6	9	0	0
Region 3	6	0	0	1	17	3	50	2	33	0	0	0	0
Region 5	7	0	0	1	14	3	43	2	29	1	14	0	0
Region 6	23	0	0	8	35	2	9	12	52	9	39	0	0
Region 7	4	1	25	0	0	0	0	3	75	1	25	0	0
Region 8	1	0	0	0	0	0	0	1	100	0	0	0	0



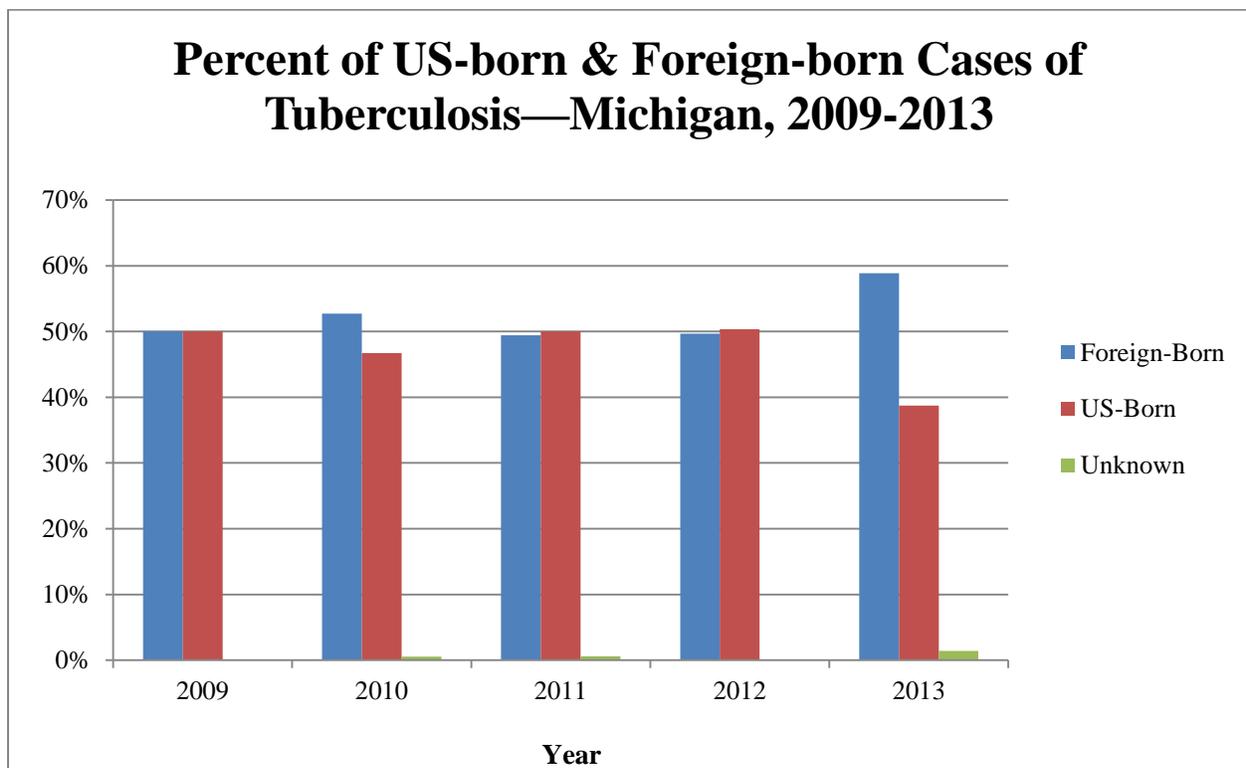
**Panel 5c: Number and Percent of Tuberculosis Cases by Race/Ethnicity & Region—
Michigan, 2013**

	All Races/Ethnicities	Race/Ethnicity											
		American Indian or Alaskan Native		Asian		Black		Caucasian		Hispanic or Latino		Native Hawaiian or Other Pacific Islander	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
State	141	0	0	51	36	40	28	46	33	13	9	2	1
Region 1	7	0	0	2	29	1	14	3	43	2	29	0	0
Region 2N	37	0	0	19	51	6	16	9	24	2	5	2	5
Region 2S	73	0	0	22	30	30	41	21	29	6	8	0	0
Region 3	3	0	0	0	0	0	0	3	100	1	33	0	0
Region 5	5	0	0	1	20	2	40	2	40	1	20	0	0
Region 6	13	0	0	5	38	1	8	7	54	1	8	0	0
Region 7	2	0	0	1	50	0	0	1	50	0	0	0	0
Region 8	1	0	0	1	100	0	0	0	0	0	0	0	0



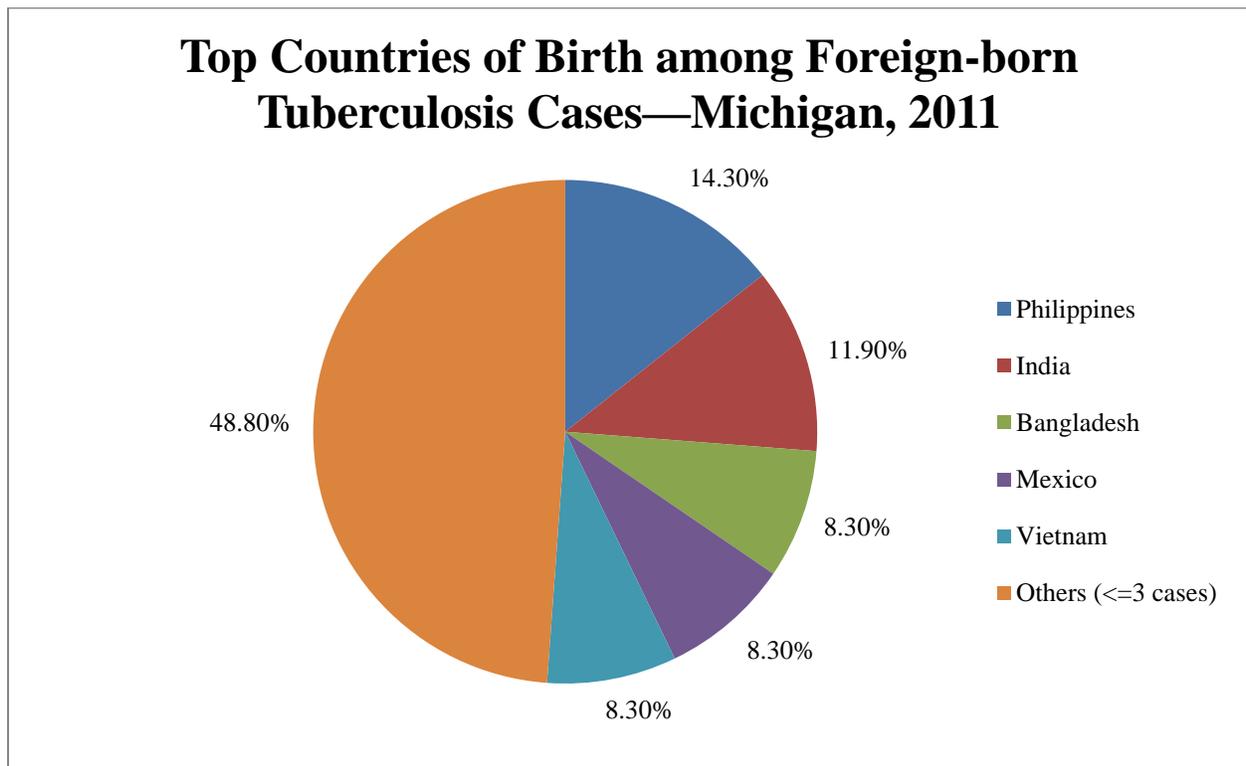
**Panel 6. Number and Percent of US-born & Foreign-born Cases of Tuberculosis:
Michigan, 2009-2013**

Year	Foreign-Born	% of Total	US-Born	% of Total
2009	72	50.00	72	50.00
2010	98	53.26	83	45.11
2011	84	49.41	85	50.00
2012	74	49.66	75	50.34
2013	83	58.87	56	39.71



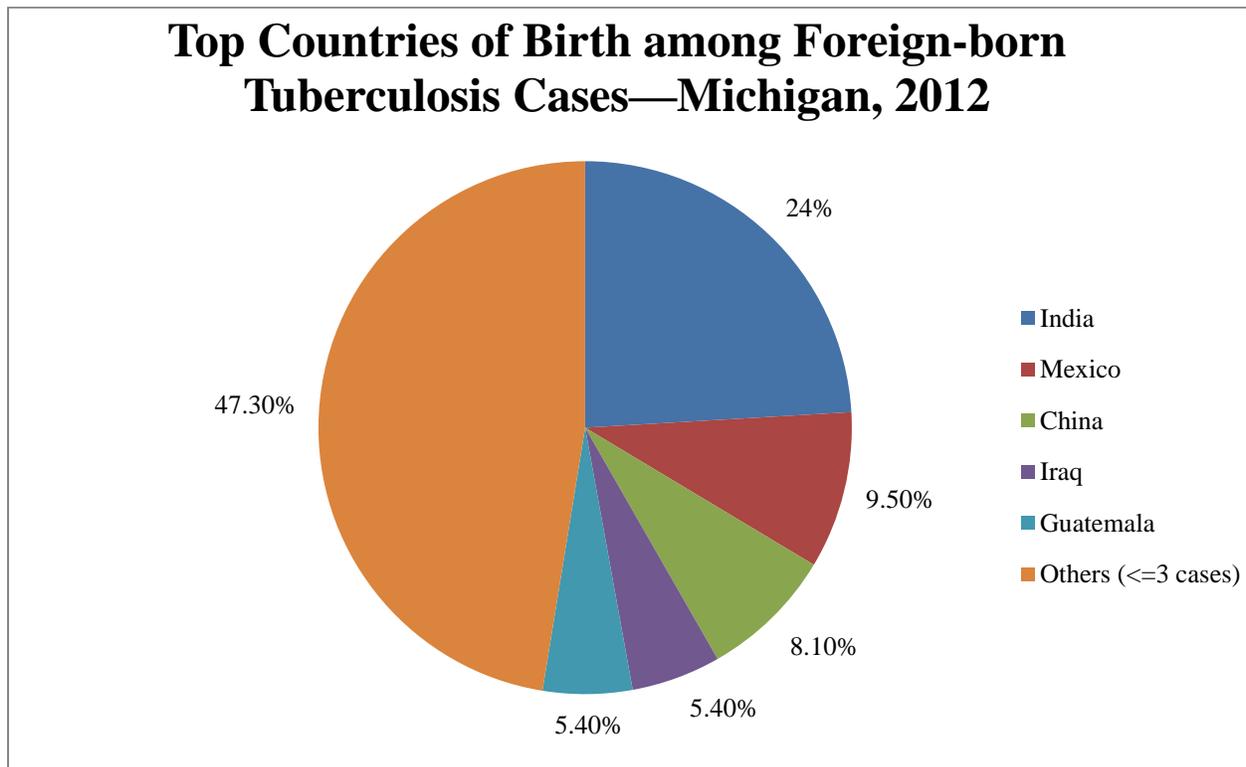
Panel 7a. Top Countries of Birth among Foreign-born Tuberculosis Cases—Michigan, 2011

Country	N	% of total
Philippines	12	14.3%
India	10	11.9%
Bangladesh	7	8.3%
Mexico	7	8.3%
Vietnam	7	8.3%
Others (≤ 3)	41	48.8%



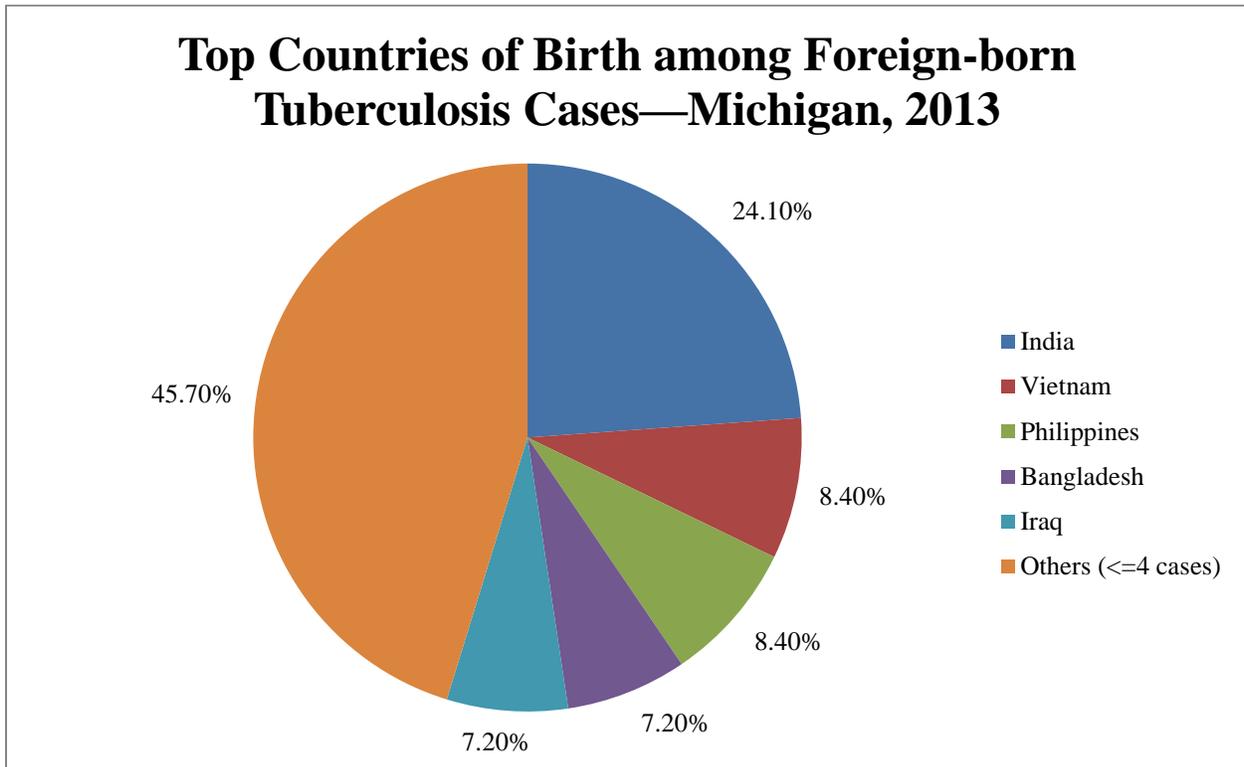
Panel 7b. Top Countries of Birth among Foreign-born Tuberculosis Cases—Michigan, 2012

Country	N	% of total
India	18	24%
Mexico	7	9.5%
China	6	8.1%
Iraq	4	5.4%
Guatemala	4	5.4%
Others (≤ 3)	35	47.3%



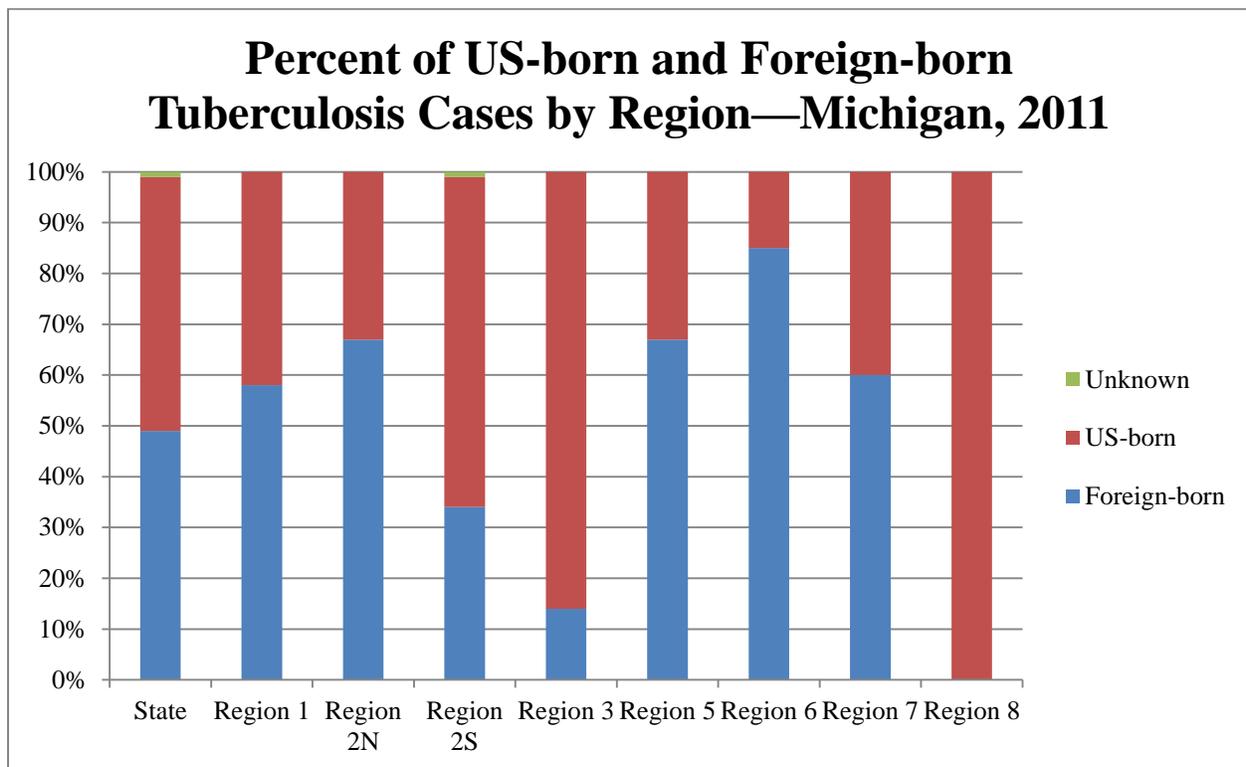
Panel 7c. Top Countries of Birth among Foreign-born Tuberculosis Cases—Michigan, 2013

Country	N	% of total
India	20	24.1%
Vietnam	7	8.4%
Philippines	7	8.4%
Bangladesh	6	7.2%
Iraq	6	7.2%
Others (≤ 4 cases)	38	45.7%



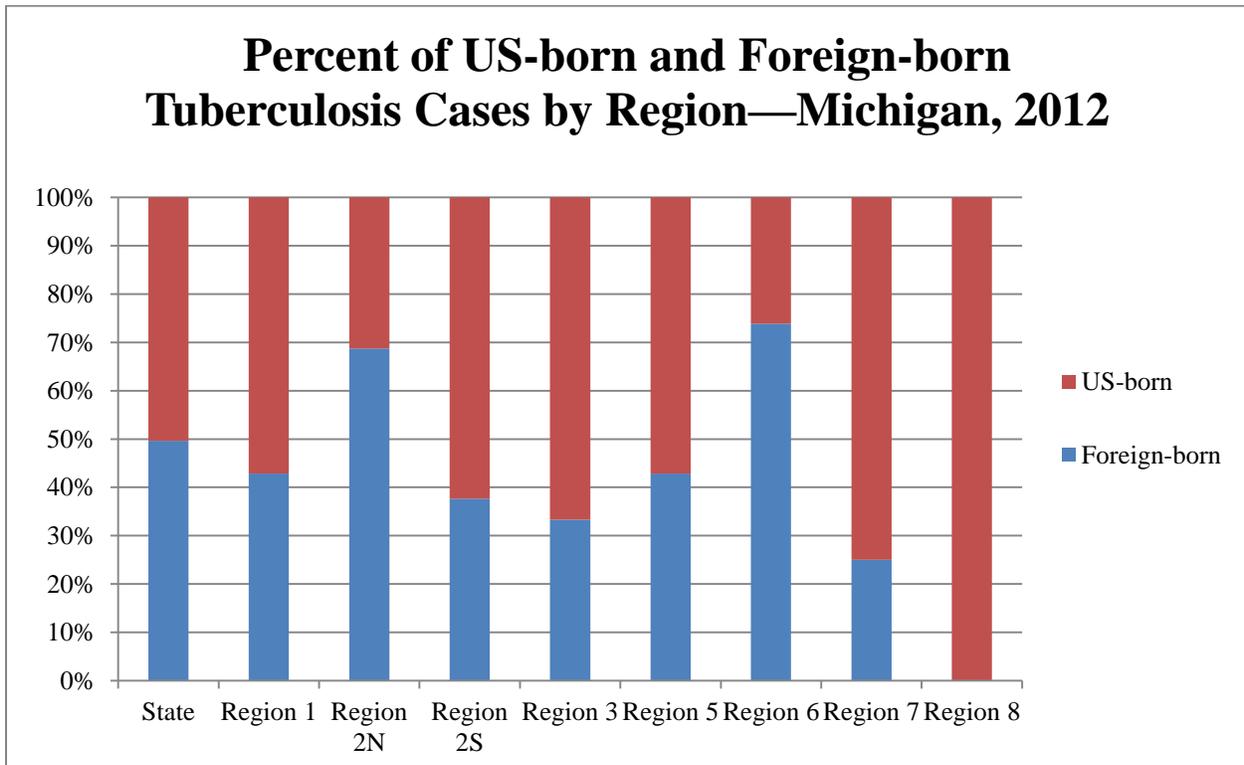
Panel 8a: Number and Percent of US-born and Foreign-born Tuberculosis Cases by Region—Michigan, 2011

	Total	Country of Birth					
		Foreign-born		US-born		Unknown	
		No.	%	No.	%	No.	%
State	170	84	49	85	50	1	1
Region 1	12	7	58	5	42	0	0
Region 2N	30	20	67	10	33	0	0
Region 2S	85	29	34	55	65	1	1
Region 3	7	1	14	6	89	0	0
Region 5	3	2	67	1	33	0	0
Region 6	26	22	85	4	15	0	0
Region 7	5	3	60	2	40	0	0
Region 8	2	0	0	2	100	0	0



Panel 8b: Number and Percent of US-born and Foreign-born Tuberculosis Cases by Region—Michigan, 2012

	Country of Birth						
	Total	Foreign-born		US-born		Unknown	
		No.	No.	%	No.	%	No.
State	149	74	50	75	50	0	0
Region 1	7	3	43	4	57	0	0
Region 2N	32	22	69	10	31	0	0
Region 2S	69	26	38	43	62	0	0
Region 3	6	2	33	4	67	0	0
Region 5	7	3	43	4	57	0	0
Region 6	23	17	74	6	26	0	0
Region 7	4	1	25	3	75	0	0
Region 8	1	0	0	1	100	0	0



Panel 8c: Number and Percent of US-born and Foreign-born Tuberculosis Cases by Region—Michigan, 2013

	Country of Birth						
	Total	Foreign-born		US-born		Unknown	
	No.	No.	%	No.	%	No.	%
State	141	83	59	56	40	2	1
Region 1	7	5	71	2	29	0	0
Region 2N	37	28	76	9	24	0	0
Region 2S	73	37	51	34	47	2	3
Region 3	3	0	0	3	100	0	0
Region 5	5	2	40	3	60	0	0
Region 6	13	9	69	4	31	0	0
Region 7	2	1	50	1	50	0	0
Region 8	1	1	100	0	0	0	0

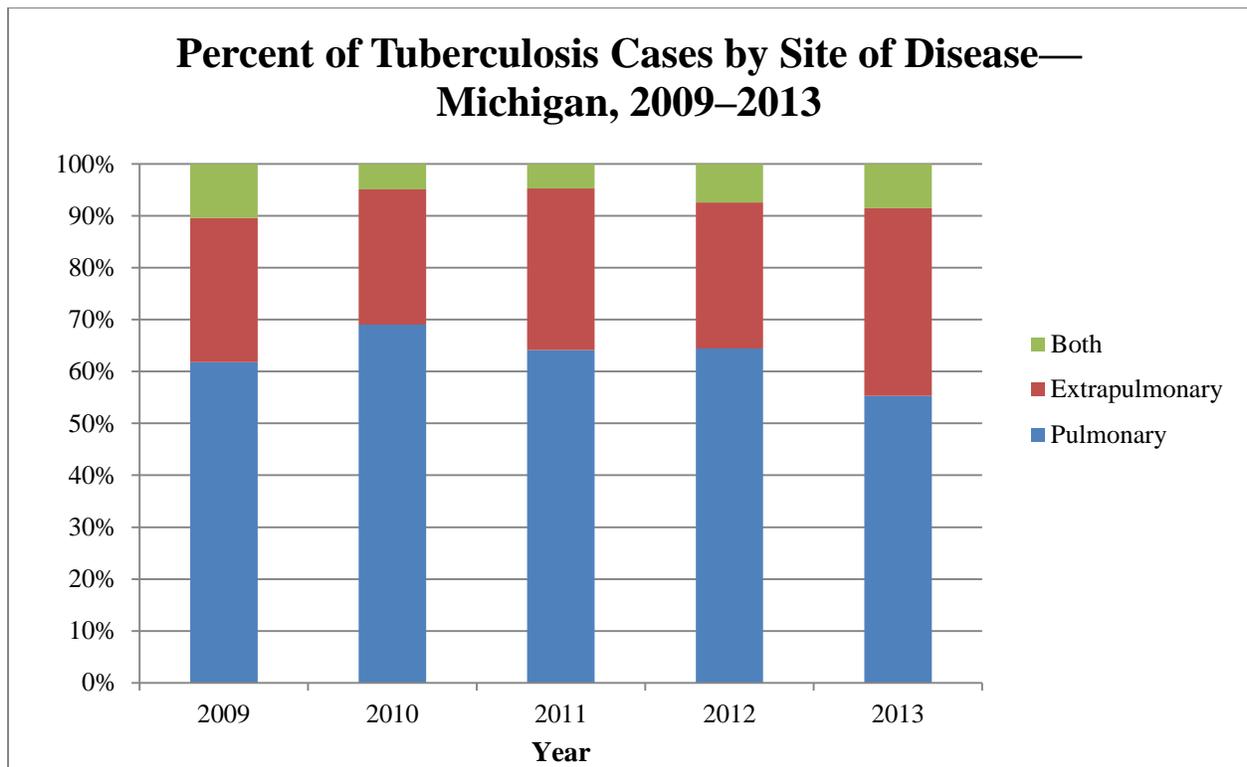
CLINICAL PRESENTATION OF TB

Since 1993, the number of reported TB cases has decreased. However, the decline in reported extrapulmonary TB cases has been slower than in pulmonary TB cases.³ In the U.S., the proportion of extrapulmonary TB increased from 15.7% in 1993 to 21% in 2006.³ Studies have shown that extrapulmonary TB was associated with female sex, foreign birth and HIV-infection.^{3,4} Extrapulmonary TB is generally understood to be non-infectious, and the clinical presentation is very different from pulmonary TB. Since it is often given less attention than pulmonary TB disease, extrapulmonary TB is frequently misdiagnosed. As a result, the global plan to eliminate TB lists increased awareness and knowledge of extrapulmonary TB among healthcare professionals as a priority.⁵

Michigan has experienced an increase in the proportion of extrapulmonary TB cases similar to the national trend. In 2013, the majority of TB cases were diagnosed with pulmonary disease, however nearly 36% of cases were reported with extrapulmonary disease, an increase from about 28% in 2009 (*Panel 9a*). Michigan has also experienced an increase of foreign-born cases in recent years, and foreign birth is a known risk factor for developing extrapulmonary TB.³ Therefore it is important for physicians to evaluate all patients with pulmonary TB for extrapulmonary manifestation of disease. Likewise, physicians should be astute in considering extrapulmonary TB in patients with unusual presentations for whom other diagnoses have been considered and ruled out.

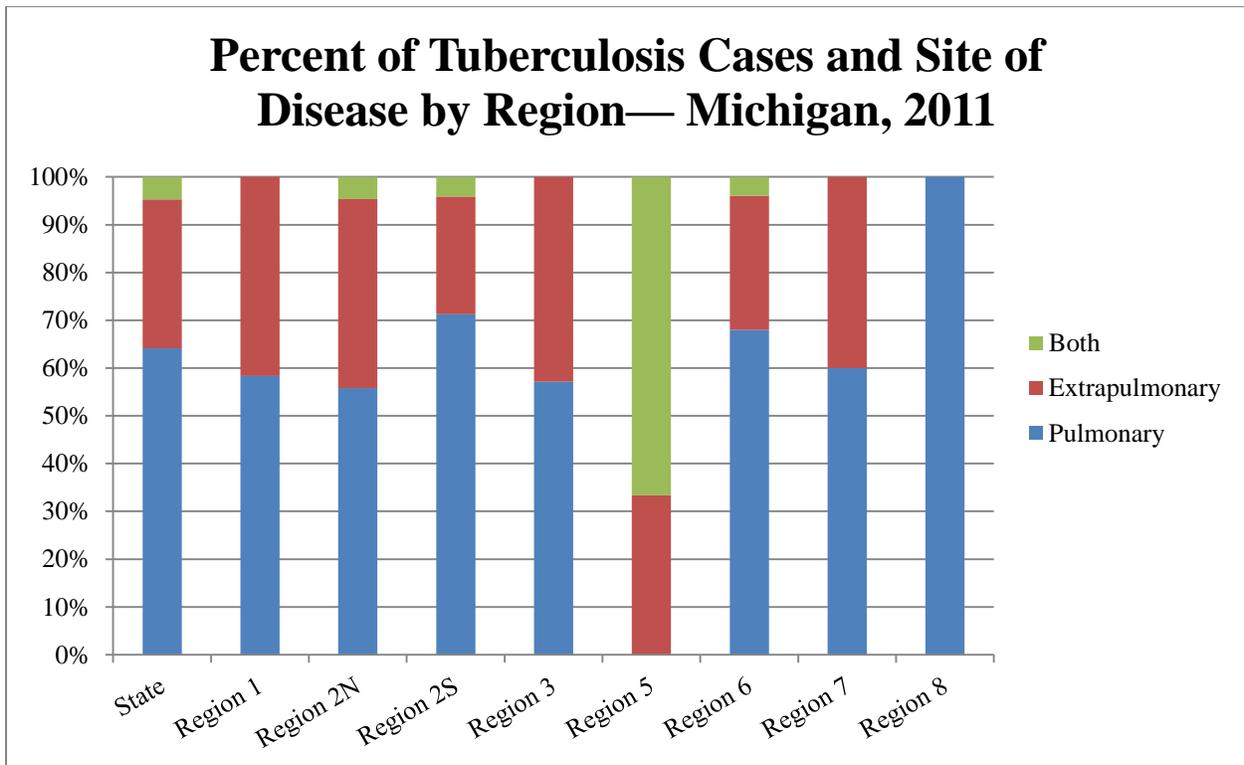
Panel 9a. Number and Percent of Tuberculosis Cases by Site of Disease— Michigan, 2009–2013

	Site of TB Disease						
	Total	Pulmonary		Extrapulmonary		Both	
	No.	No.	%	No.	%	No.	%
2009	144	89	62	40	28	15	10
2010	184	127	69	48	26	9	5
2011	170	109	64	53	31	8	5
2012	149	96	64	53	31	11	7
2013	141	78	55	51	36	12	9



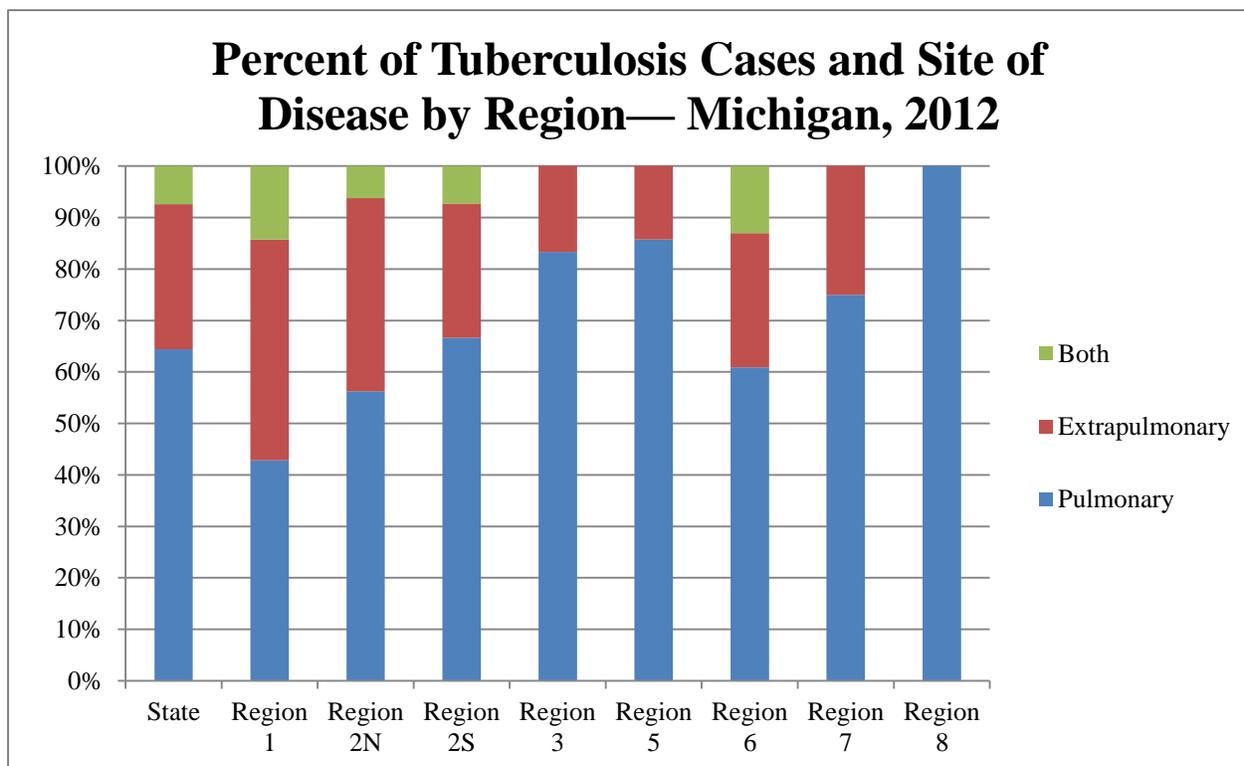
**Panel 9b. Number and Percent of Tuberculosis Cases and Site of Disease by Region—
Michigan, 2011**

	Site of TB Disease						
	Total	Pulmonary		Extrapulmonary		Both	
	No.	No.	%	No.	%	No.	%
State	170	109	64	53	31	8	5
Region 1	12	7	58	5	42	0	0
Region 2N	43	24	56	17	40	2	5
Region 2S	73	52	71	18	25	3	4
Region 3	7	4	57	3	43	0	0
Region 5	3	0	0	1	33	2	67
Region 6	25	17	68	7	28	1	4
Region 7	5	3	60	2	40	0	0
Region 8	2	2	100	0	0	0	0



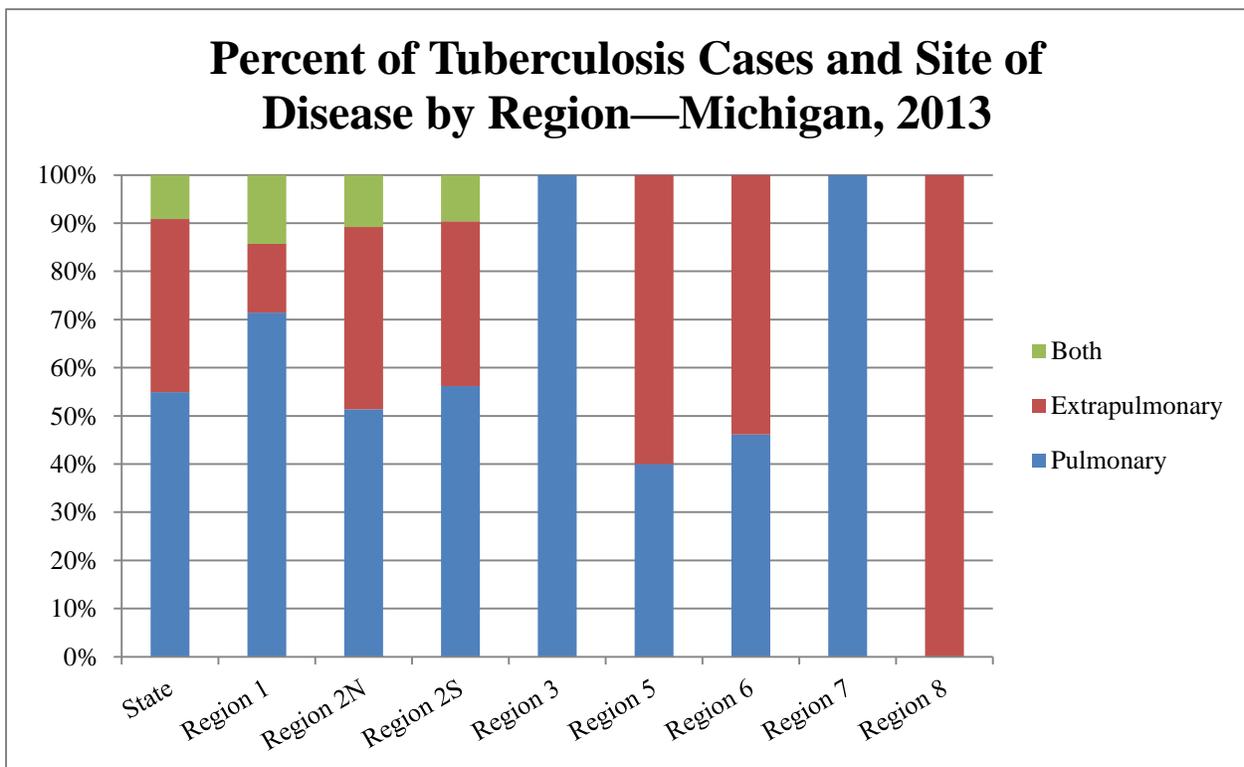
**Panel 9c. Number and Percent of Tuberculosis Cases and Site of Disease by Region—
Michigan, 2012**

	Site of TB Disease						
	Total	Pulmonary		Extrapulmonary		Both	
	No.	No.	%	No.	%	No.	%
State	149	96	64	42	28	11	7
Region 1	7	3	43	3	43	1	14
Region 2N	32	18	56	12	38	2	6
Region 2S	69	46	67	18	26	5	7
Region 3	6	5	83	1	17	0	0
Region 5	7	6	86	1	14	0	0
Region 6	23	14	61	6	26	3	13
Region 7	4	3	75	1	25	0	0
Region 8	1	1	100	0	0	0	0



**Panel 9d. Number and Percent of Tuberculosis Cases and Site of Disease by Region—
Michigan, 2013**

	Site of TB Disease						
	Total	Pulmonary		Extrapulmonary		Both	
	No.	No.	%	No.	%	No.	%
State	141	78	55	51	36	12	9
Region 1	7	5	71	1	14	1	14
Region 2N	37	19	51	14	38	4	11
Region 2S	73	41	56	25	34	7	10
Region 3	3	3	100	0	0	0	0
Region 5	5	2	40	3	60	0	0
Region 6	13	6	46	7	54	0	0
Region 7	2	2	100	0	0	0	0
Region 8	1	0	0	1	100	0	0



TB CASE VERIFICATION, DIAGNOSIS & TREATMENT

The CDC recognizes three criteria by which a case of TB may be verified and counted. Brief descriptions of these criteria are listed below, and further information is available at <http://www.cdc.gov/tb/statistics/reports/2012/appendixA.htm> and <http://www.cdc.gov/tb/statistics/reports/2012/appendixB.htm>.

- I. Laboratory criteria (any of the following)
 - a. Isolation of *M. tuberculosis* complex from a clinical specimen, or
 - b. Demonstration of *M. tuberculosis* complex from a clinical specimen by nucleic acid amplification test, or
 - c. 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.
- II. Clinical case definition (all of the following)
 - a. A positive tuberculin skin test result or positive interferon gamma release assay for *M. tuberculosis*, and
 - b. Other signs and symptoms compatible with TB (e.g., abnormal chest radiograph, abnormal chest computerized tomography scan or other chest imaging study, or clinical evidence of current disease), and
 - c. Treatment with two or more anti-TB medications, and
 - d. A completed diagnostic evaluation.
- III. Provider Diagnosis
 - a. The criteria for laboratory and clinical case definitions are not met, but a diagnosis of TB is made, and
 - b. The patient remains on treatment and shows improvement

From 2009–2013, Michigan consistently reported a majority of cases verified through laboratory criteria (*Panel 10*). In 2013, the majority of cases were verified through laboratory criteria; however, there was an increase in the proportion of cases that were clinically diagnosed. There is also considerable variation among public health regions in the proportion of cases verified under each criteria or definition (*Panel 11a-c*). This variation may reflect differences in protocols or practices among providers for evaluating suspect TB cases, or in preferences of physicians in making a diagnosis of TB in the absence of laboratory or clinical criteria. Local health departments should engage physicians and hospitals in their jurisdictions to assure physicians are aware of all verification criteria for TB and obtain clinical consultation as needed.

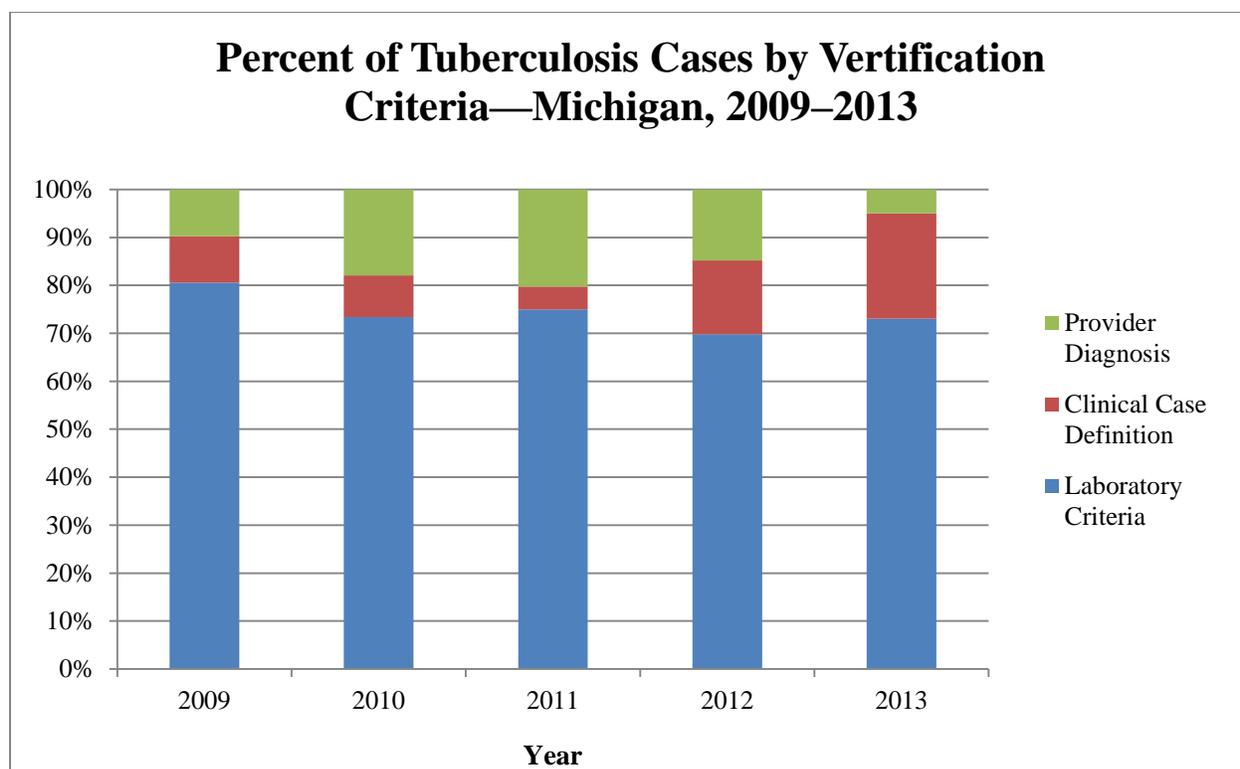
Nearly 71% of TB cases in 2013 exhibited abnormal chest x-rays, while 22% exhibited normal chest x-rays (*Panel 12c*). Only 37% of cases in 2013 were reported with acid-fast bacillus (AFB)-positive sputum smears, while 38% were reported with AFB-negative sputum smears

(*Panel 13c*). Chest x-ray and/or sputum smear findings do not rule in or rule out a diagnosis of TB; physicians should consider TB in the absence of abnormalities on x-ray or positive AFB sputum microscopy if the rest of the clinical picture is compatible with TB. During the past three years, more than 95% of cases living at the time of TB diagnosis were started on appropriate therapy (*Panel 14a-c*). About 85% of eligible cases completed therapy within 12 months in 2012 (*Panel 15*), similar to the national treatment completion average*. Drug susceptibility testing was performed on >94% of culture-positive cases (*Panel 16a-c*); those without drug susceptibility information could be due to data entry error. During this report period, there were more TB cases resistant to isoniazid than rifampin (*Panel 17a-c*). During 2011 and 2012, Michigan experienced 3 cases of multi-drug resistant (MDR) TB; there were no MDR TB cases in 2013.

* Treatment completion is calculated at least one full calendar year after the close of the cohort period. Treatment completion for TB cases reported during 2013 will be calculated during the spring of 2015.

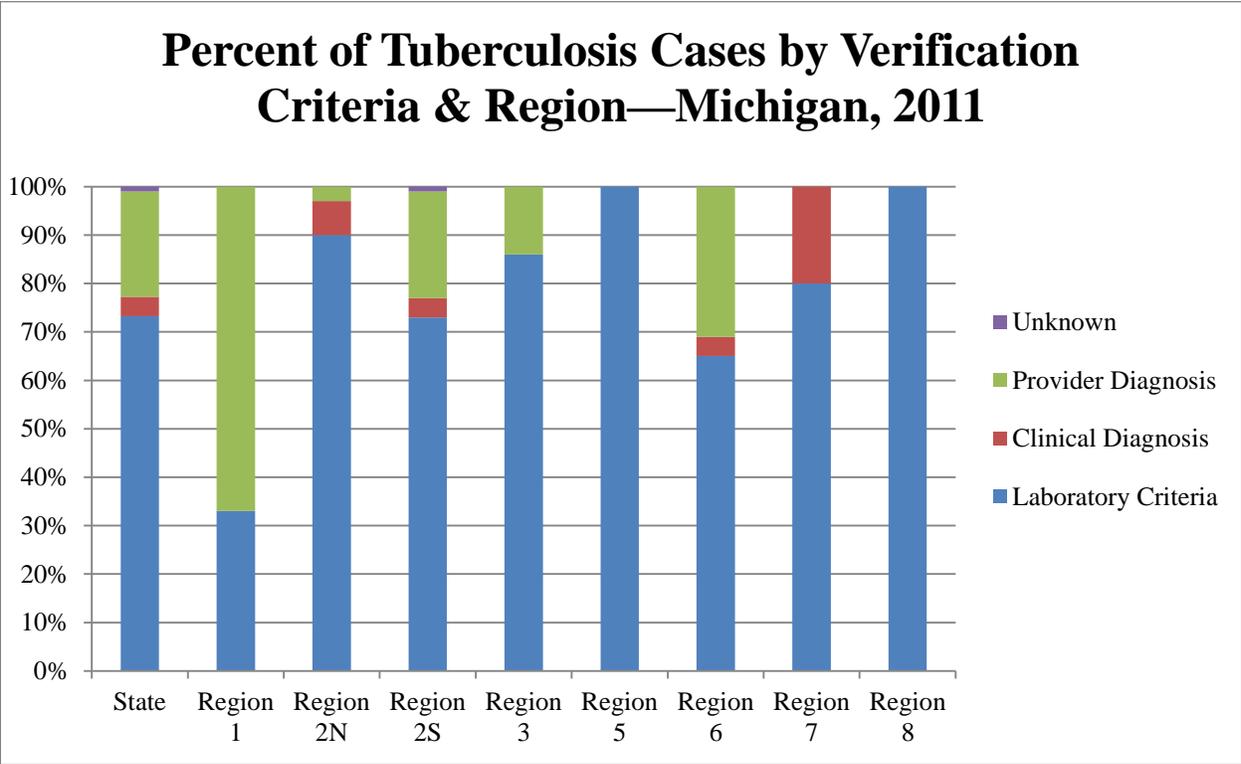
Panel 10. Number and Percent of Tuberculosis Cases by Verification Criteria—Michigan, 2009–2013

Year	Total Cases	Laboratory		Clinical		Provider	
		Criteria	% of Total	Case Definition	% of Total	Diagnosis	% of Total
2009	144	116	81	14	10	14	10
2010	184	135	73	16	9	33	18
2011	168	126	75	8	5	34	20
2012	149	104	70	23	15	22	15
2013	141	103	73	31	22	7	5



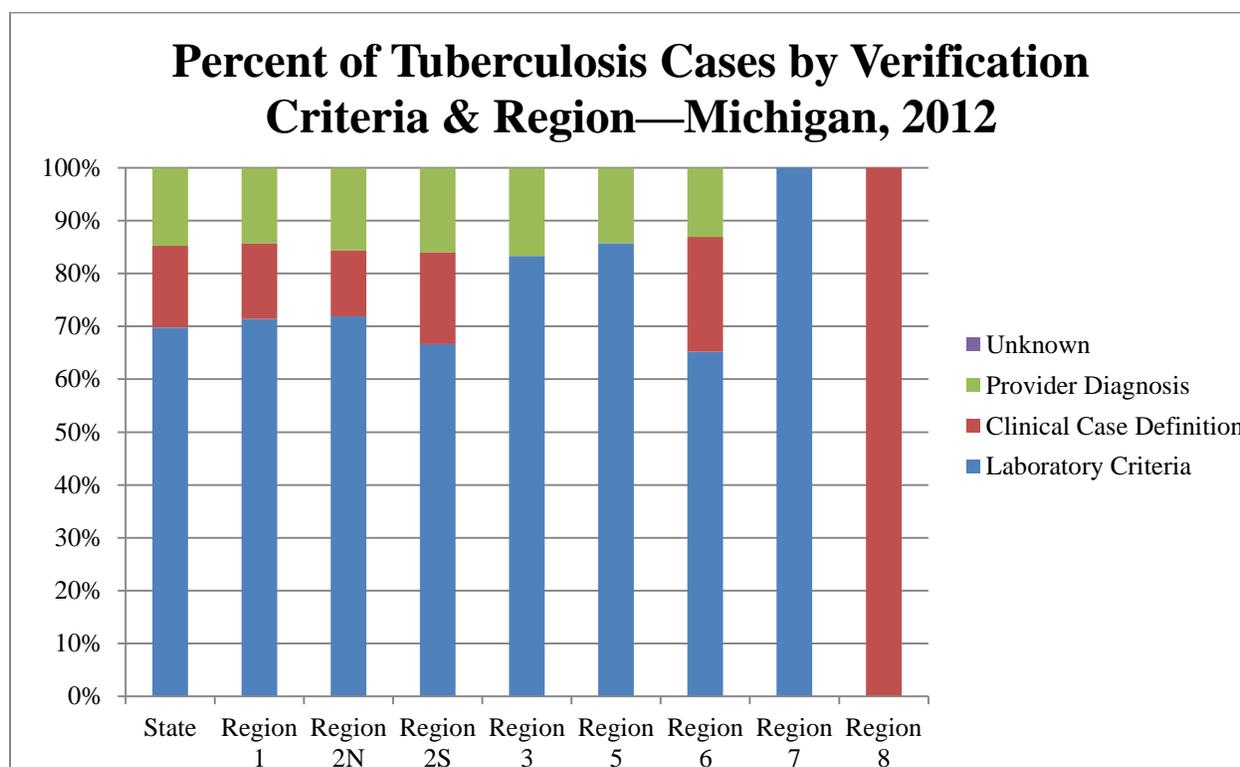
Panel 11a. Number and Percent of Tuberculosis Cases by Verification Criteria & Region—Michigan, 2011

	Total	Verification Criteria							
		Laboratory Criteria		Clinical Case Definition		Provider Diagnosis		Unknown	
		No.	%	No.	%	No.	%	No.	%
State	170	125	74	7	4	37	22	1	1
Region 1	12	4	33	0	0	8	67	0	0
Region 2N	30	27	90	2	7	1	3	0	0
Region 2S	85	62	73	3	4	19	22	1	1
Region 3	7	6	86	0	0	1	14	0	0
Region 5	3	3	100	0	0	0	0	0	0
Region 6	26	17	65	1	4	8	31	0	0
Region 7	5	4	80	1	20	0	0	0	0
Region 8	2	2	100	0	0	0	0	0	0



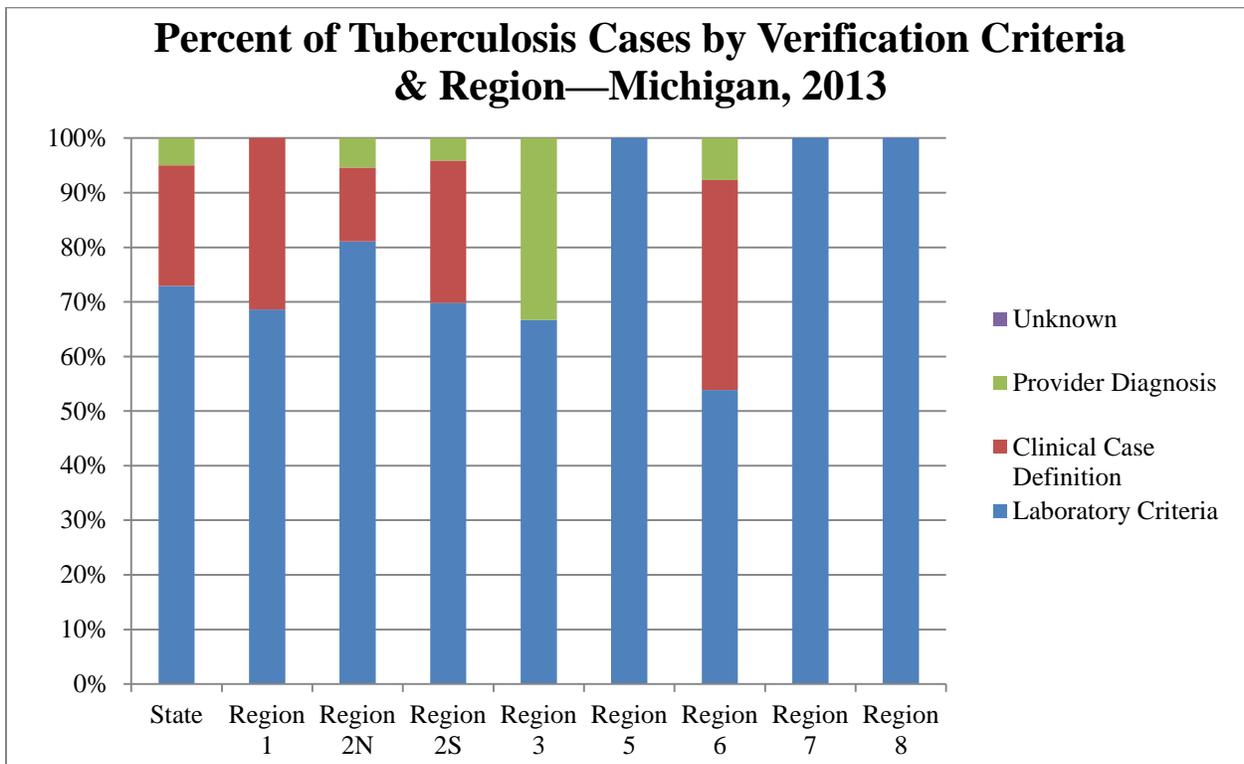
**Panel 11b. Number and Percent of Tuberculosis Cases by Verification Criteria & Region—
Michigan, 2012**

	Total	Verification Criteria							
		Laboratory Criteria		Clinical Case Definition		Provider Diagnosis		Unknown	
		No.	%	No.	%	No.	%	No.	%
State	149	104	70	23	15	22	15	0	0
Region 1	7	5	71	1	14	1	14	0	0
Region 2N	32	23	72	4	13	5	16	0	0
Region 2S	69	46	67	12	17	11	16	0	0
Region 3	6	5	83	0	0	1	17	0	0
Region 5	7	6	86	0	0	1	14	0	0
Region 6	23	15	65	5	22	3	13	0	0
Region 7	4	4	100	0	0	0	0	0	0
Region 8	1	0	0	1	100	0	0	0	0



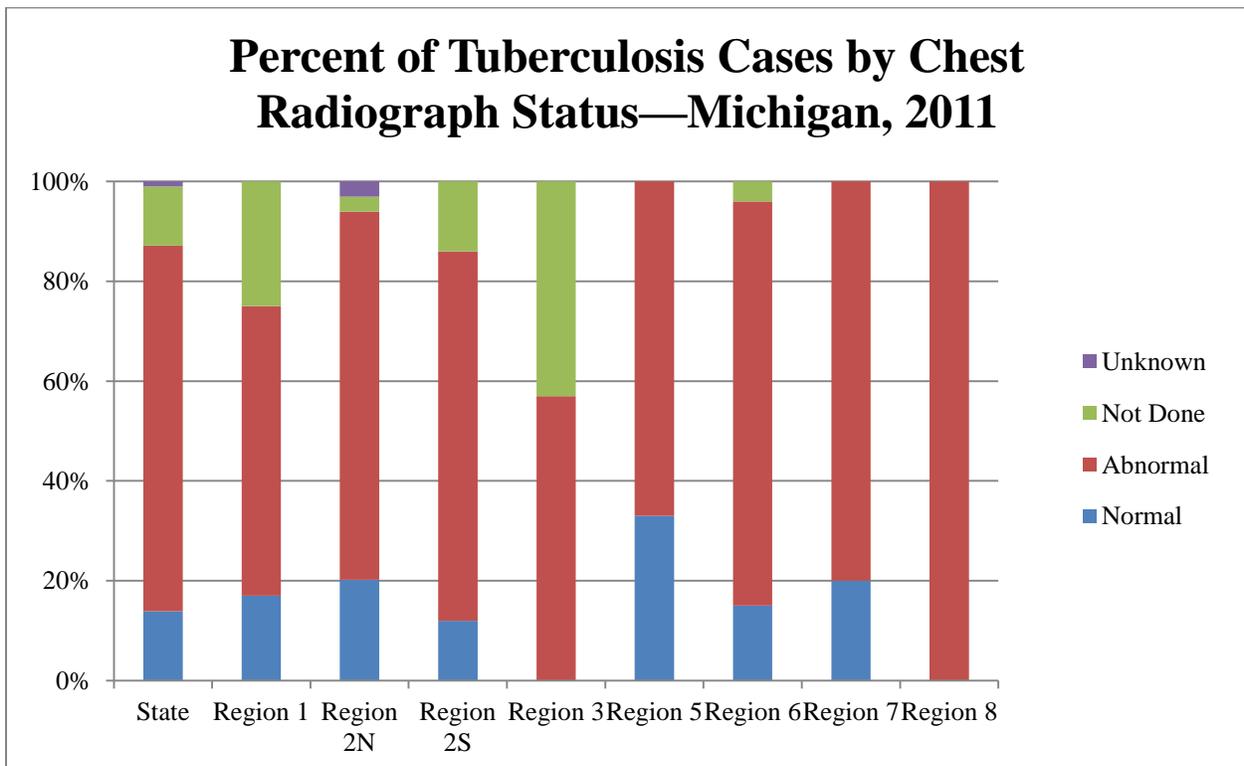
**Panel 11c. Number and Percent of Tuberculosis Cases by Verification Criteria & Region—
Michigan, 2013**

	Total	Verification Criteria							
		Laboratory Criteria		Clinical Case Definition		Provider Diagnosis		Unknown	
		No.	%	No.	%	No.	%	No.	%
State	141	103	73	31	22	7	5	0	0
Region 1	7	5	63	2	29	0	0	0	0
Region 2N	37	30	81	5	14	2	5	0	0
Region 2S	73	51	70	19	26	3	4	0	0
Region 3	3	2	67	0	0	1	33	0	0
Region 5	5	5	100	0	0	0	0	0	0
Region 6	13	7	54	5	38	1	8	0	0
Region 7	2	2	100	0	0	0	0	0	0
Region 8	1	1	100	0	0	0	0	0	0



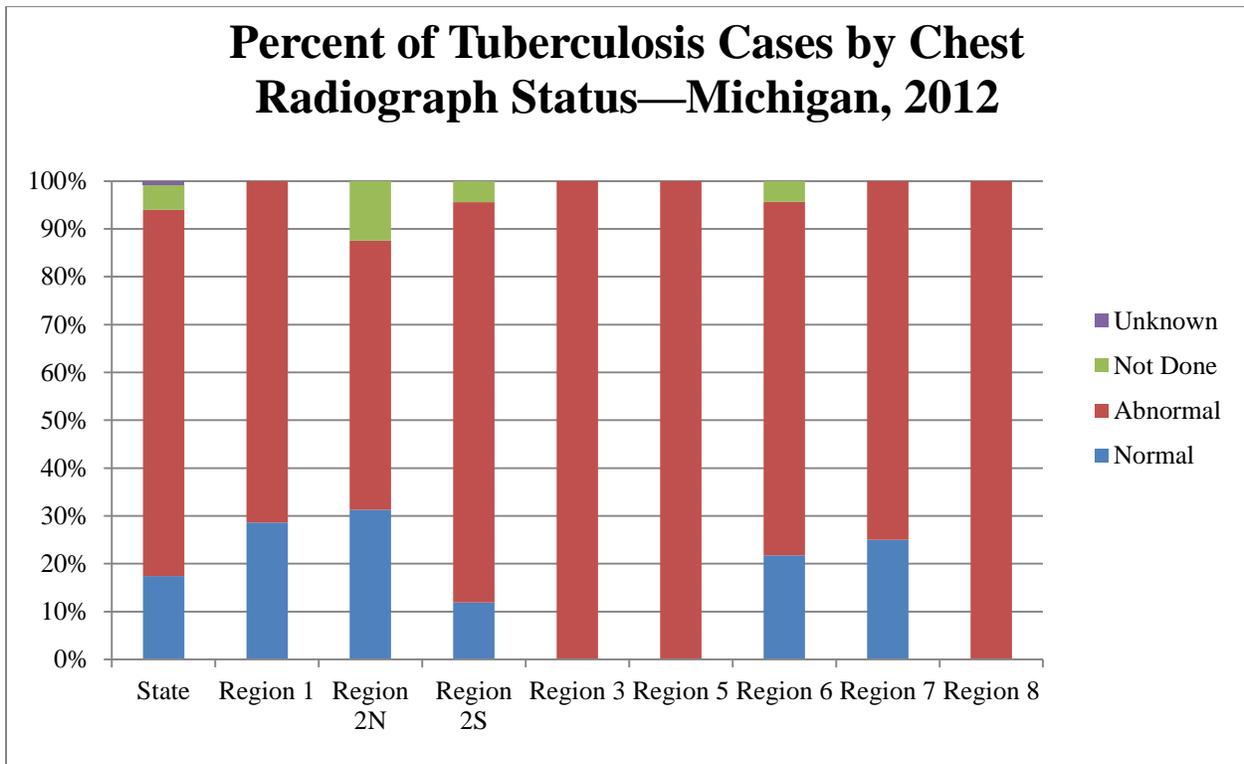
**Panel 12a. Number and Percent of Tuberculosis Cases by Chest Radiograph Status—
Michigan, 2011**

	Initial Chest X-Ray Status									
	Total	Normal		Abnormal		Not Done		Unknown		
	No.	No.	%	No.	%	No.	%	No.	%	
State	170	24	14	125	74	20	12	1	1	
Region 1	12	2	17	7	58	3	25	0	0	
Region 2N	30	6	20	22	73	1	3	1	3	
Region 2S	85	10	12	63	74	12	14	0	0	
Region 3	7	0	0	4	57	3	43	0	0	
Region 5	3	1	33	2	67	0	0	0	0	
Region 6	26	4	15	21	81	1	4	0	0	
Region 7	5	1	20	4	80	0	0	0	0	
Region 8	2	0	0	2	100	0	0	0	0	



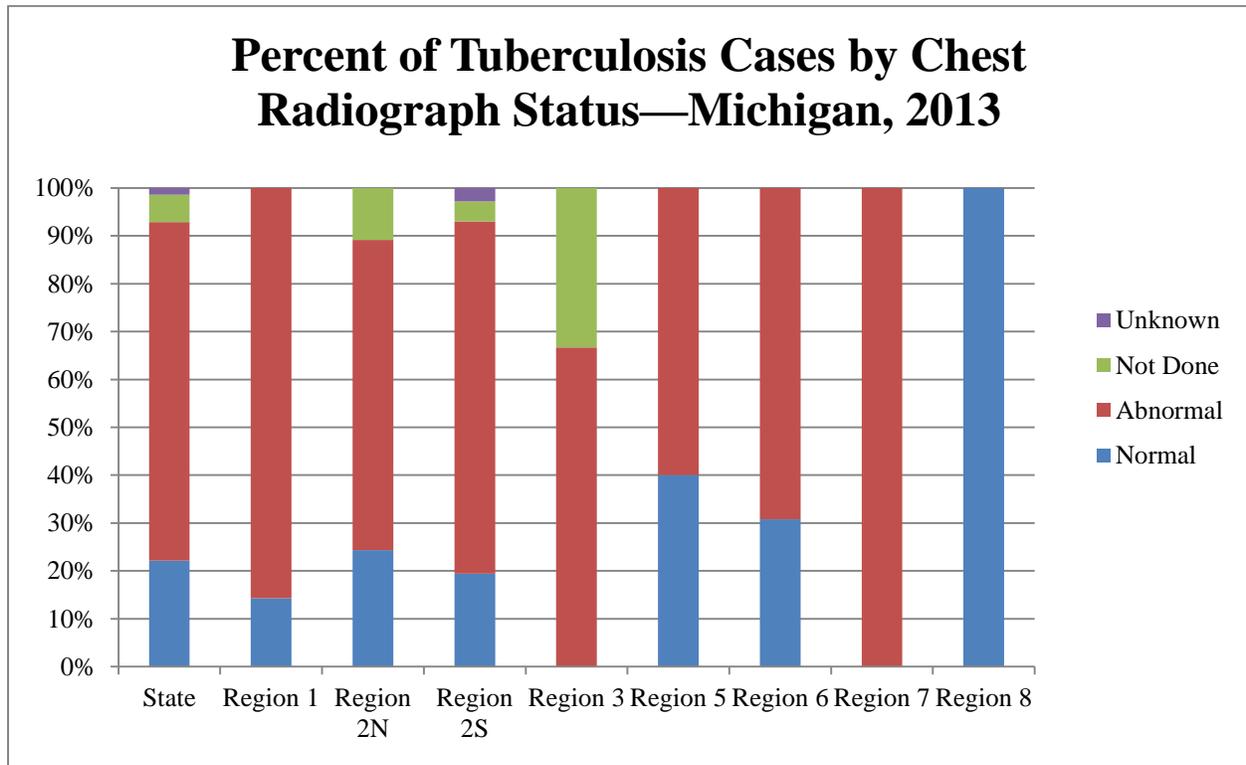
**Panel 12b. Number and Percent of Tuberculosis Cases by Chest Radiograph Status—
Michigan, 2012**

	Initial Chest X-Ray Status									
	Total	Normal		Abnormal		Not Done		Unknown		
	No.	No.	%	No.	%	No.	%	No.	%	
State	148	26	17	114	77	8	5	1	1	
Region 1	7	2	29	5	71	0	0	0	0	
Region 2N	32	10	31	18	56	4	13	0	0	
Region 2S	68	8	12	57	84	3	4	0	0	
Region 3	6	0	0	6	100	0	0	0	0	
Region 5	7	0	0	7	100	0	0	0	0	
Region 6	23	5	22	17	74	1	4	0	0	
Region 7	4	1	25	3	75	0	0	0	0	
Region 8	1	0	0	1	100	0	0	0	0	



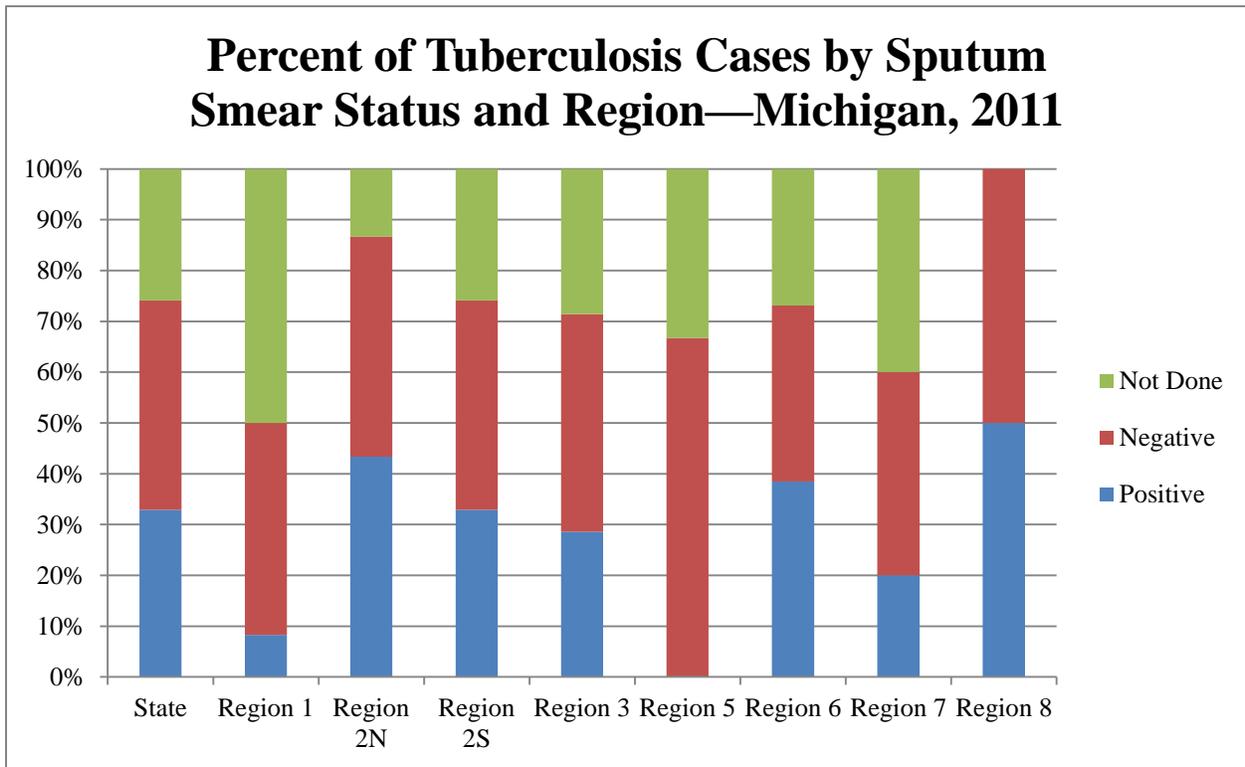
**Panel 12c. Number and Percent of Tuberculosis Cases by Chest Radiograph Status—
Michigan, 2013**

	Initial Chest X-Ray Status								
	Total	Normal		Abnormal		Not Done		Unknown	
	No.	No.	%	No.	%	No.	%	No.	%
State	140	31	22	99	71	8	6	2	1
Region 1	7	1	14	6	86	0	0	0	0
Region 2N	37	9	24	24	65	4	11	0	0
Region 2S	72	14	19	53	74	3	4	2	3
Region 3	3	0	0	2	67	1	33	0	0
Region 5	5	2	40	3	60	0	0	0	0
Region 6	13	4	31	9	69	0	0	0	0
Region 7	2	0	0	2	100	0	0	0	0
Region 8	1	1	100	0	0	0	0	0	0



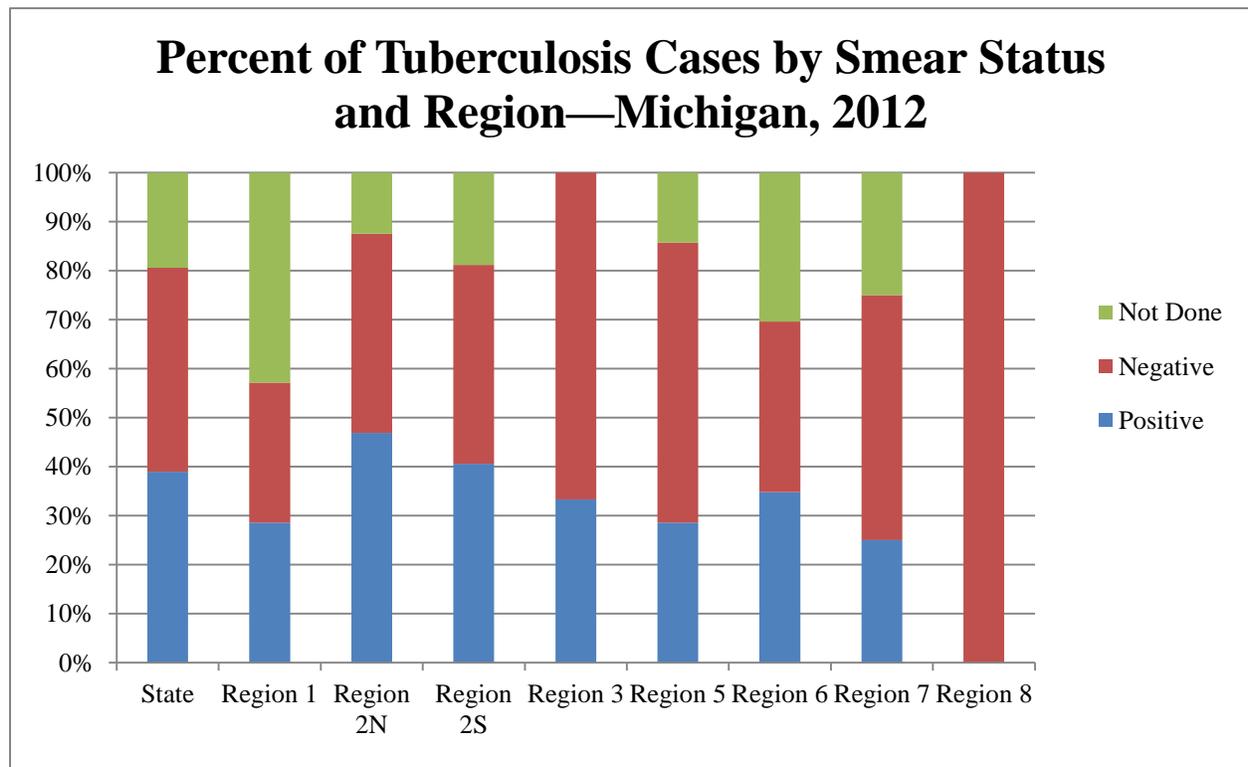
**Panel 13a. Number and Percent of Tuberculosis Cases by Smear Status and Region—
Michigan, 2011**

	Total by Region		Sputum Smear				
	No.	Positive		Negative		Not Done	
		No.	%	No.	%	No.	%
State	170	56	33	70	41	44	26
Region 1	12	1	8	5	42	6	50
Region 2N	30	13	43	13	43	4	13
Region 2S	85	28	33	35	41	22	26
Region 3	7	2	29	3	43	2	29
Region 5	3	0	0	2	67	1	33
Region 6	26	10	39	9	35	7	27
Region 7	5	1	20	2	40	2	40
Region 8	2	1	50	1	50	0	0



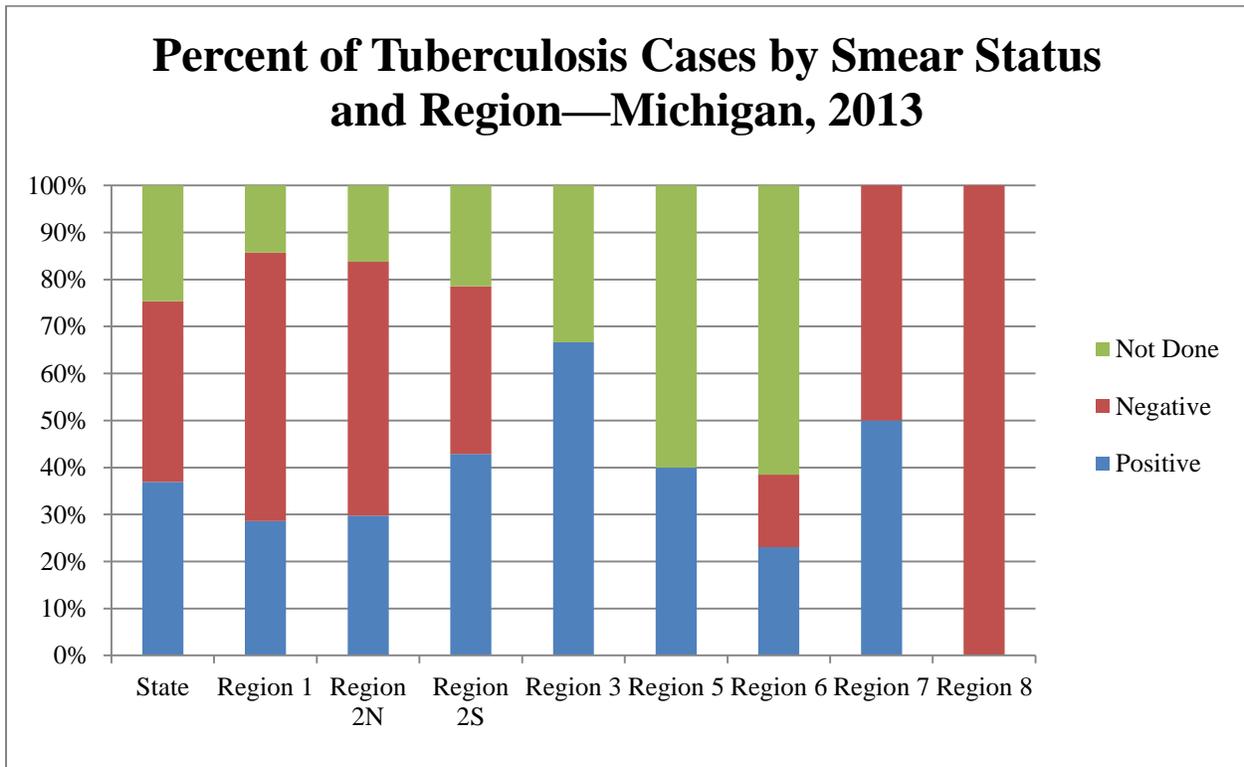
**Panel 13b. Number and Percent of Tuberculosis Cases by Smear Status and Region—
Michigan, 2012**

	Total by Region	Sputum Smear					
		Positive		Negative		Not Done	
		No.	%	No.	%	No.	%
State	149	58	39	62	42	29	20
Region 1	7	2	29	2	29	3	43
Region 2N	32	15	47	13	41	4	13
Region 2S	69	28	41	28	41	13	19
Region 3	6	2	33	4	67	0	0
Region 5	7	2	29	4	57	1	14
Region 6	23	8	35	8	35	7	30
Region 7	4	1	25	2	50	1	25
Region 8	1	0	0	1	100	0	0



**Panel 13c. Number and Percent of Tuberculosis Cases by Smear Status and Region—
Michigan, 2013**

	Total by Region	Sputum Smear					
		Positive		Negative		Not Done	
		No.	%	No.	%	No.	%
State	138	51	37	53	38	34	25
Region 1	7	2	29	4	57	1	14
Region 2N	37	11	30	20	54	6	16
Region 2S	70	30	43	25	36	15	21
Region 3	3	2	67	0	0	1	33
Region 5	5	2	40	0	0	3	60
Region 6	13	3	23	2	15	8	62
Region 7	2	1	50	1	50	0	0
Region 8	1	0	0	1	100	0	0



Panel 14a: Number of Tuberculosis Cases by Status at Diagnosis and Treatment and Region—Michigan, 2011

	Case Status				Treatment at Diagnosis	
	Total	Alive	Dead	Unknown	Alive & Started Therapy	Alive & Did Not Start Therapy
	No.	No.	No.	No.	No.	No.
State	170	168	1	1	166	2
Region 1	12	12	0	0	12	0
Region 2N	30	30	0	0	30	0
Region 2S	85	84	1	0	83	1
Region 3	7	7	0	0	6	1
Region 5	3	3	0	0	3	0
Region 6	26	25	0	1	25	0
Region 7	5	5	0	0	5	0
Region 8	2	2	0	0	2	0

Panel 14b: Number of Tuberculosis Cases by Status at Diagnosis and Treatment and Region— Michigan, 2012

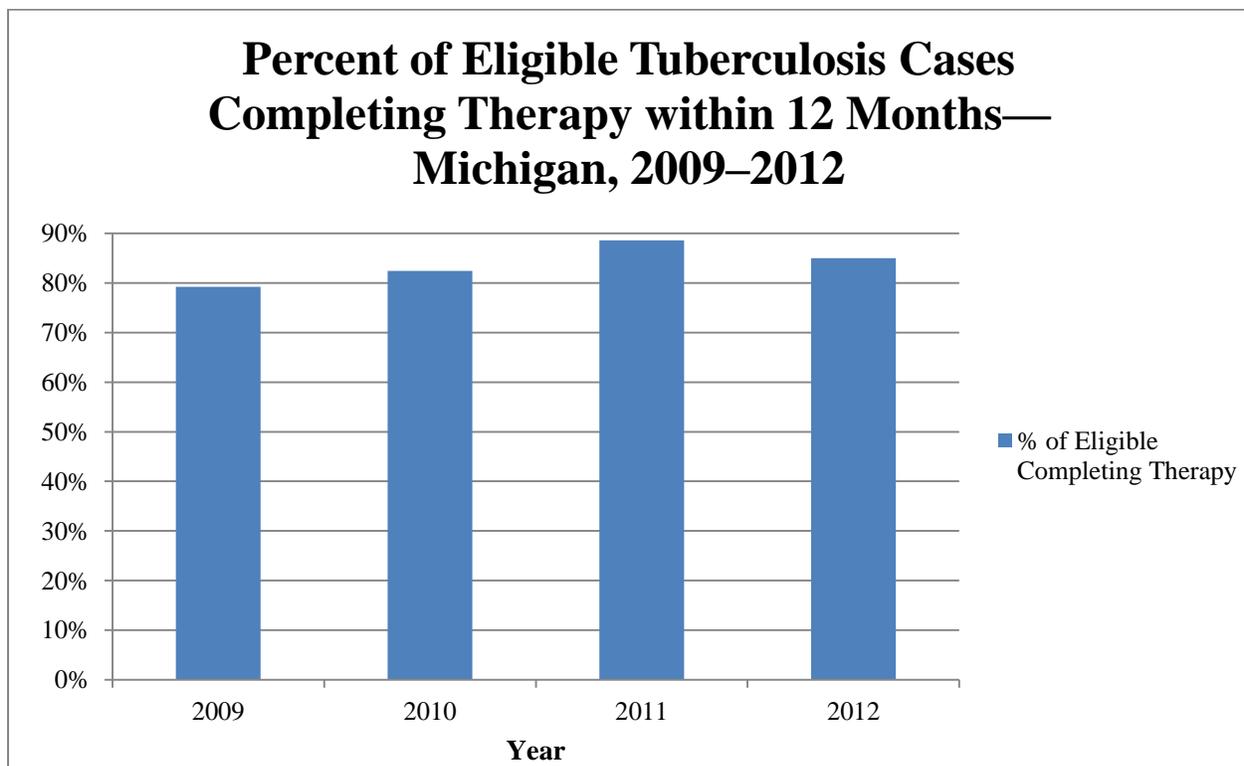
	Case Status				Treatment at Diagnosis	
	Total	Alive	Dead	Unknown	Alive & Started Therapy	Alive & Did Not Start Therapy
	No.	No.	No.	No.	No.	No.
State	149	146	3	0	143	3
Region 1	7	7	0	0	7	0
Region 2N	32	32	0	0	31	1
Region 2S	69	66	3	0	64	2
Region 3	6	6	0	0	6	0
Region 5	7	7	0	0	7	0
Region 6	23	23	0	0	23	0
Region 7	4	4	0	0	4	0
Region 8	1	1	0	0	1	0

Panel 14c: Number of Tuberculosis Cases by Status at Diagnosis and Treatment and Region—Michigan, 2013

	Case Status				Treatment at Diagnosis	
	Total	Alive	Dead	Unknown	Alive & Started Therapy	Alive & Did Not Start Therapy
	No.	No.	No.	No.	No.	No.
State	141	137	2	2	133	6
Region 1	7	7	0	0	7	0
Region 2N	35	35	0	2	36	1
Region 2S	73	71	2	0	68	3
Region 3	3	3	0	0	2	1
Region 5	5	5	0	0	4	1
Region 6	13	13	0	0	13	0
Region 7	2	2	0	0	2	0
Region 8	1	1	0	0	1	0

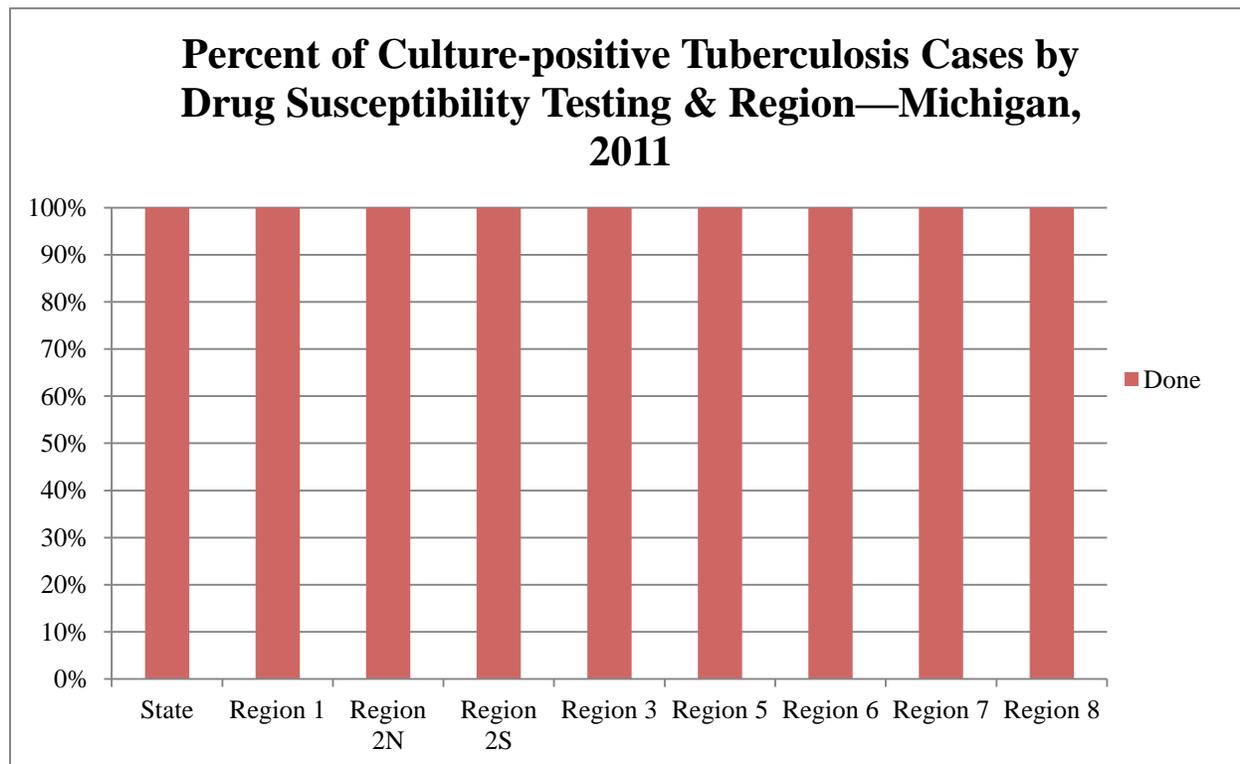
Panel 15. Number and Percent of Eligible Tuberculosis Cases Completing Therapy within 12 Months—Michigan, 2009–2012

Year	Eligible to Complete Therapy	Completed Therapy within 12 Months	% of Eligible Completing Therapy
2009	125	99	79.20
2010	154	127	82.47
2011	140	124	88.57
2012	113	96	85.00



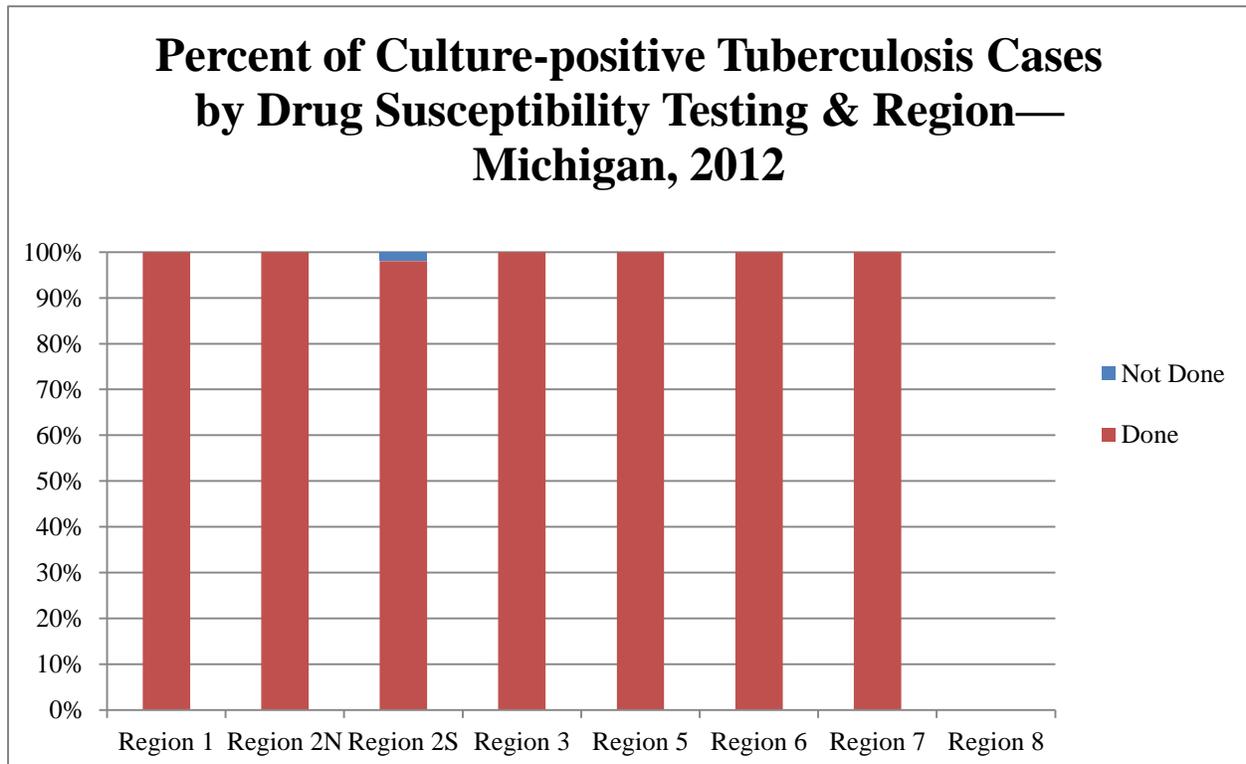
Panel 16a. Number and Percent of Culture-positive Tuberculosis Cases by Drug Susceptibility Testing and Region—Michigan, 2011

	Drug Susceptibility Test Done?						
	Total	No		Yes		Unknown	
	No.	No.	%	No.	%	No.	%
State	122	0	0	122	100	0	0
Region 1	4	0	0	4	100	0	0
Region 2N	36	0	0	36	100	0	0
Region 2S	51	0	0	51	100	0	0
Region 3	6	0	0	6	100	0	0
Region 5	3	0	0	3	100	0	0
Region 6	16	0	0	16	100	0	0
Region 7	4	0	0	4	100	0	0
Region 8	2	0	0	2	100	0	0



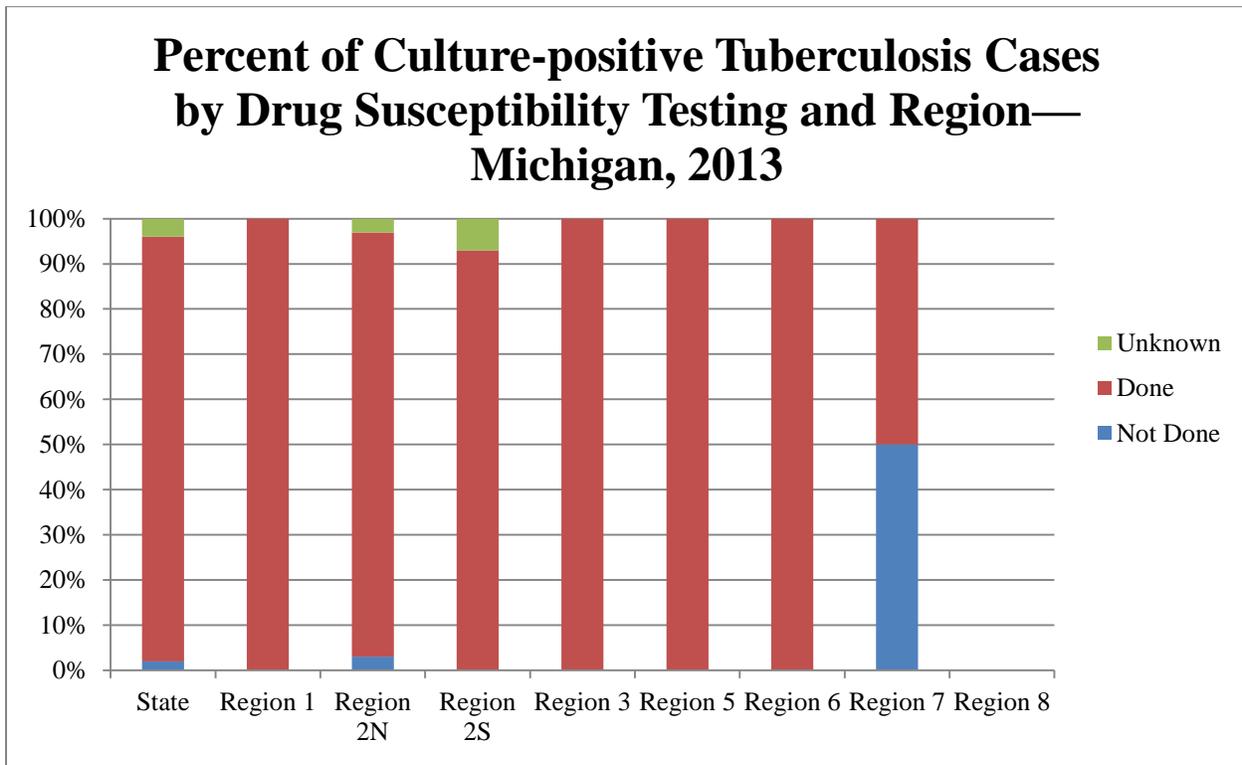
Panel 16b. Number and Percent of Culture-positive Tuberculosis Cases by Drug Susceptibility Testing and Region—Michigan, 2012

	Total	Drug Susceptibility Test Done?					
		No		Yes		Unknown	
		No.	%	No.	%	No.	%
State	103	1	1	102	99	0	0
Region 1	4	0	0	4	100	0	0
Region 2N	23	0	0	23	100	0	0
Region 2S	46	1	2	45	98	0	0
Region 3	5	0	0	5	100	0	0
Region 5	6	0	0	6	100	0	0
Region 6	15	0	0	15	100	0	0
Region 7	4	0	0	4	100	0	0
Region 8	0	0	0	0	0	0	0



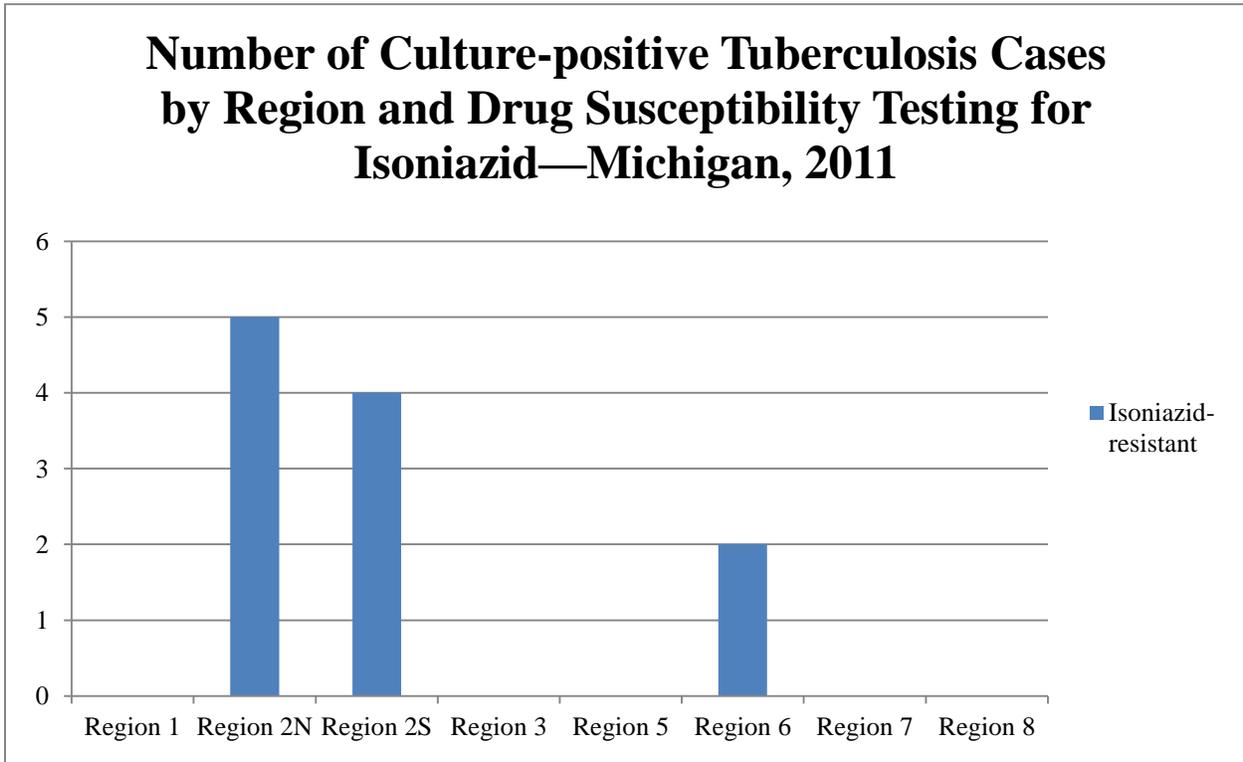
Panel 16c. Number and Percent of Culture-positive Tuberculosis Cases by Drug Susceptibility Testing and Region—Michigan, 2013

	Drug Susceptibility Test Done?						
	Total	No		Yes		Unknown	
	No.	No.	%	No.	%	No.	%
State	96	2	2	90	94	4	4
Region 1	5	0	0	5	100	0	0
Region 2N	29	1	3	27	93	1	3
Region 2S	45	0	0	42	93	3	7
Region 3	2	0	0	2	100	0	0
Region 5	5	0	0	5	100	0	0
Region 6	7	0	0	7	100	0	0
Region 7	2	1	50	1	50	0	0
Region 8	1	0	0	1	0	0	0

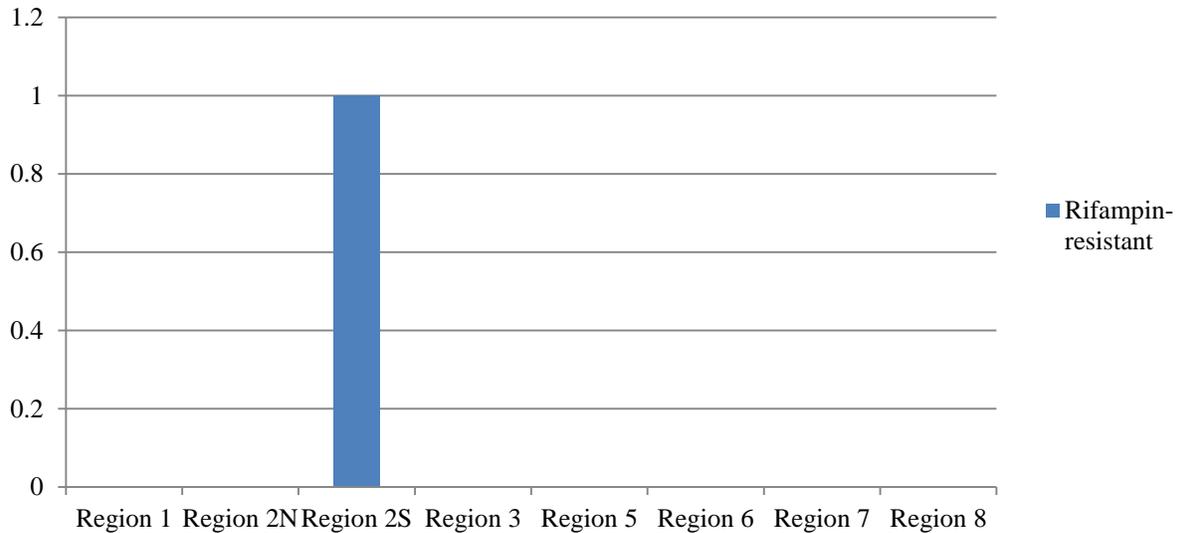


Panel 17a: Number of Culture-positive Tuberculosis Cases by Region and Resistance to Isoniazid, Rifampin, and Multi-Drug Resistance—Michigan, 2011

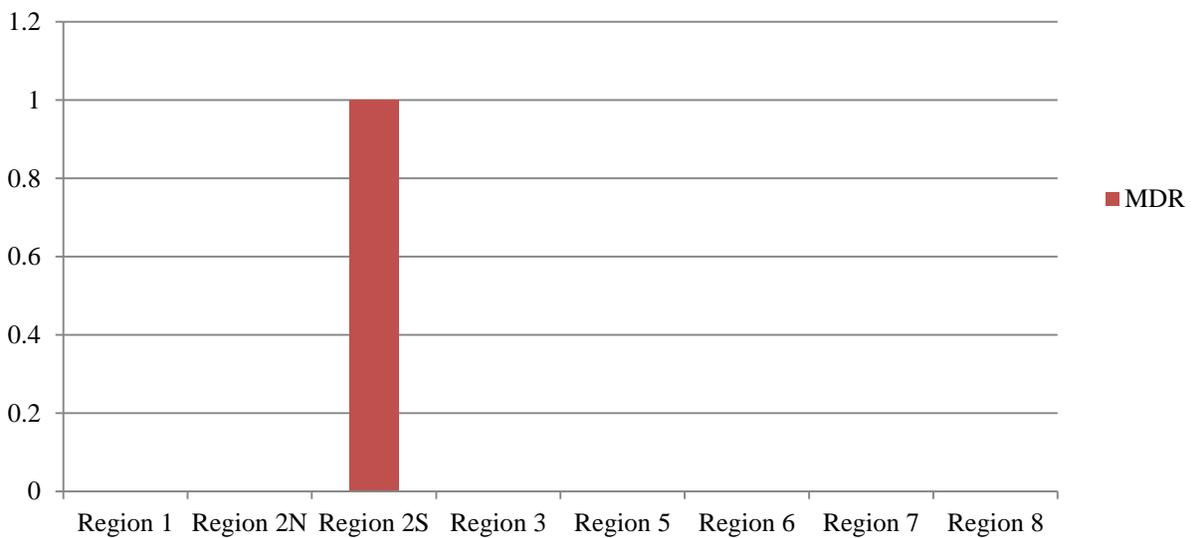
	Isoniazid result			Rifampin result		MDR	
	Total	Resistant	Susceptible	Resistant	Susceptible	Yes	No
	No.	No.	No.	No.	No.	No.	No.
State	125	11	114	1	124	1	124
Region 1	4	0	4	0	4	0	4
Region 2N	37	5	32	0	37	0	37
Region 2S	53	4	49	1	52	1	52
Region 3	6	0	6	0	6	0	6
Region 5	3	0	3	0	3	0	3
Region 6	16	2	14	0	16	0	16
Region 7	4	0	4	0	4	0	4
Region 8	2	0	2	0	2	0	2



Number of Culture-positive Tuberculosis Cases by Region and Drug Susceptibility Testing for Rifampin—Michigan, 2011

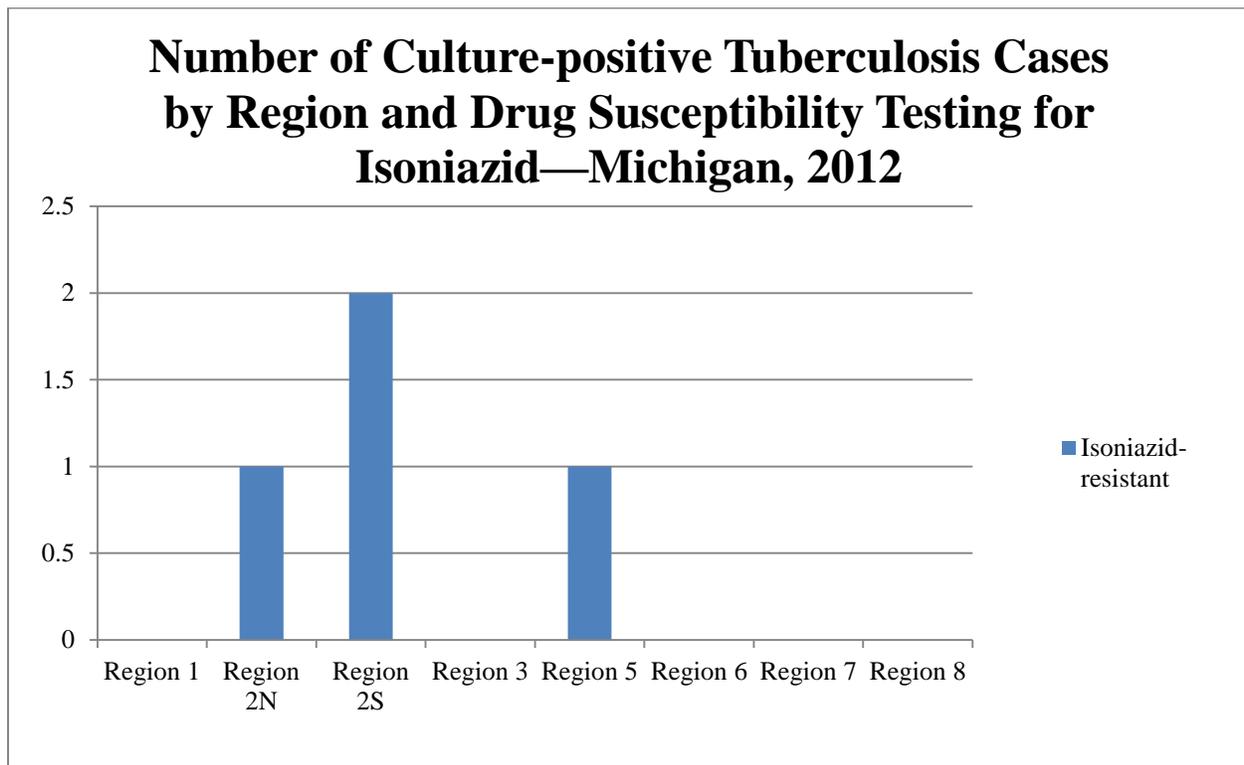


Number of Culture-positive Tuberculosis Cases by Region and Drug Susceptibility Testing for MDR—Michigan, 2011

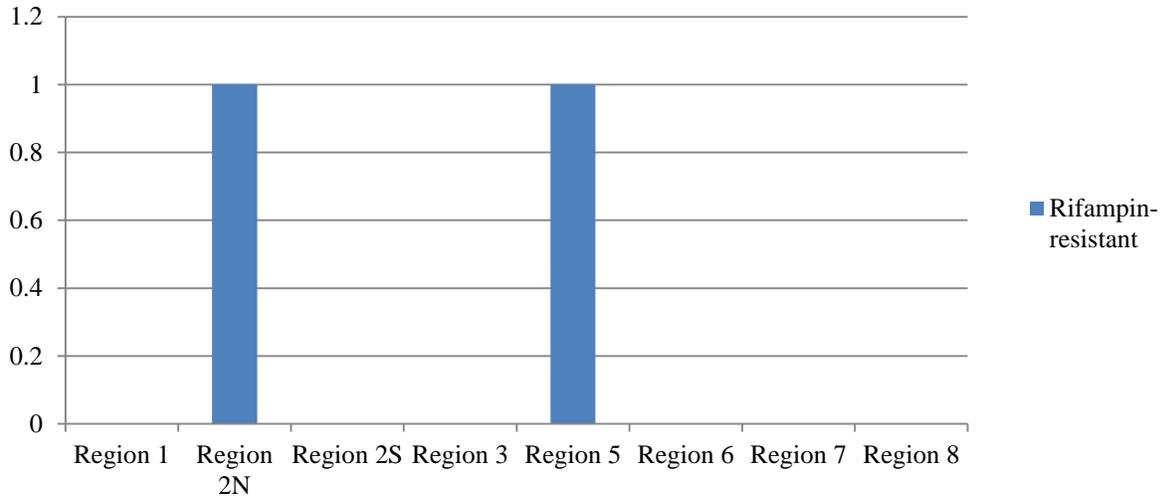


Panel 17b: Number of Culture-positive Tuberculosis Cases by Region and Resistance to Isoniazid, Rifampin, and Multi-Drug Resistance— Michigan, 2012

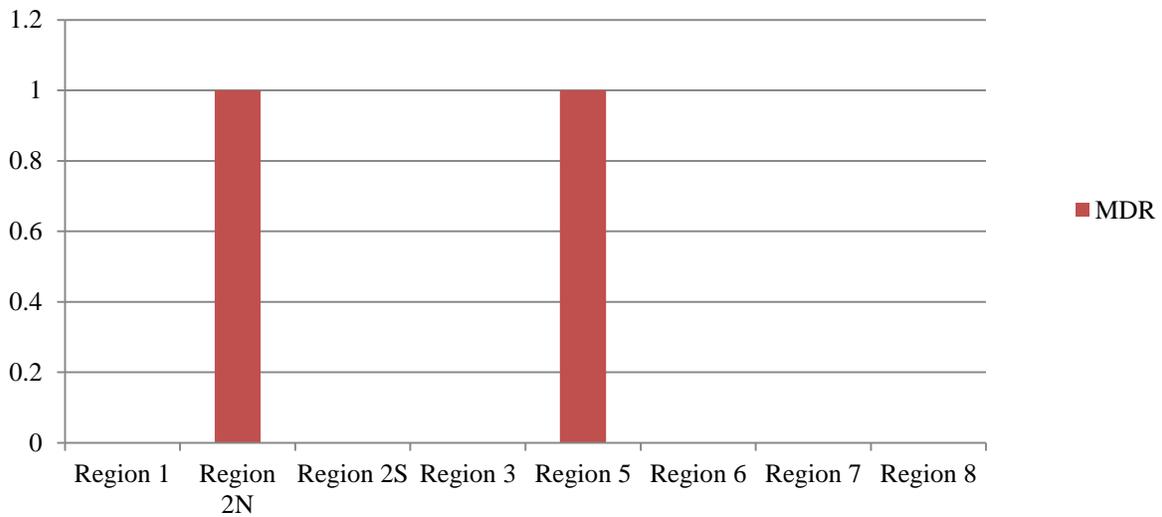
	Isoniazid result			Rifampin result		MDR	
	Total	Resistant	Susceptible	Resistant	Susceptible	Yes	No
	No.	No.	No.	No.	No.	No.	No.
State	102	4	98	2	100	2	100
Region 1	4	0	4	0	4	0	4
Region 2N	23	1	22	1	22	1	22
Region 2S	45	2	43	0	45	0	45
Region 3	5	0	5	0	5	0	5
Region 5	6	1	5	1	5	1	5
Region 6	15	0	15	0	15	0	15
Region 7	4	0	4	0	4	0	4
Region 8	0	0	0	0	0	0	0



Number of Culture-positive Tuberculosis Cases by Region and Drug Susceptibility Testing for Rifampin—Michigan, 2012

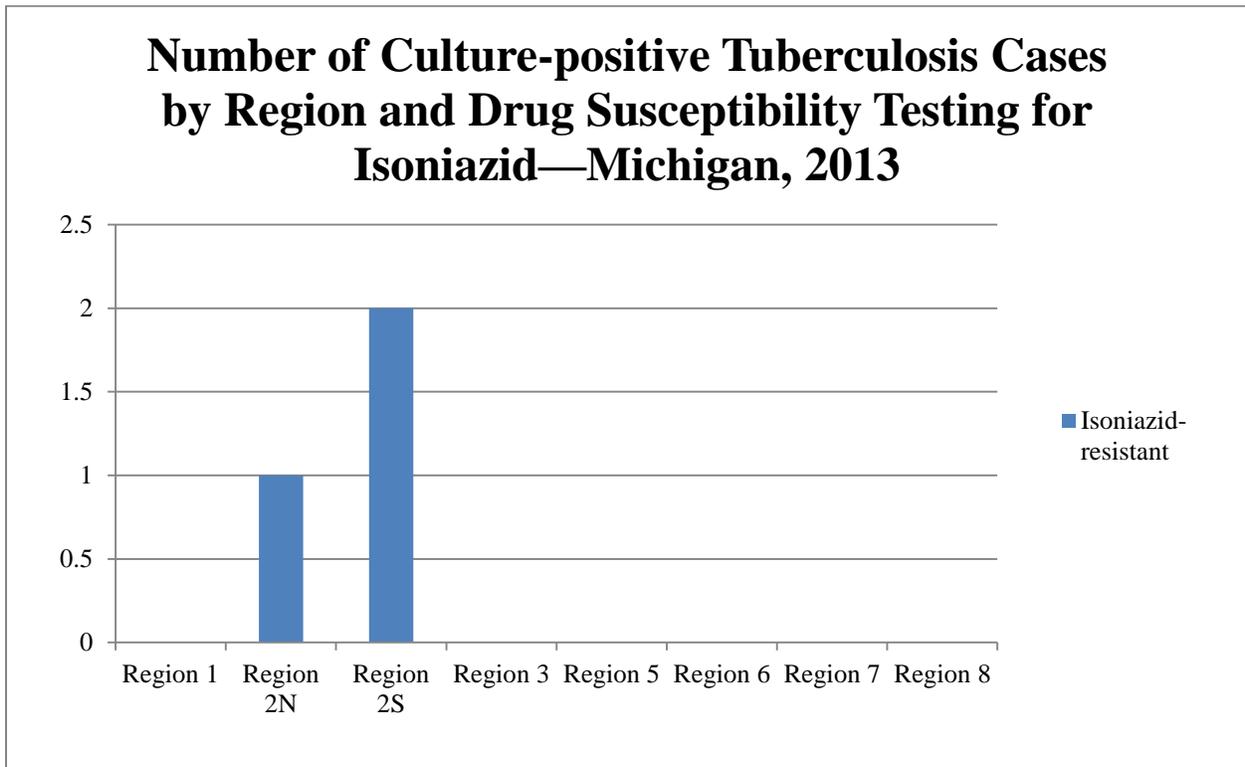


Number of Culture-positive Tuberculosis Cases by Region and Drug Susceptibility Testing for MDR—Michigan, 2012



Panel 17c: Number of Culture-positive Tuberculosis Cases by Region and Resistance to Isoniazid, Rifampin, and Multi-Drug Resistance— Michigan, 2013

	Isoniazid result			Rifampin result		MDR	
	Total	Resistant	Susceptible	Resistant	Susceptible	Yes	No
	No.	No.	No.	No.	No.	No.	No.
State	90	3	87	0	90	0	90
Region 1	5	0	5	0	5	0	5
Region 2N	27	1	26	0	27	0	27
Region 2S	42	2	40	0	42	0	42
Region 3	2	0	2	0	2	0	2
Region 5	5	0	5	0	5	0	5
Region 6	7	0	7	0	7	0	7
Region 7	1	0	1	0	1	0	1
Region 8	1	0	1	0	1	0	1

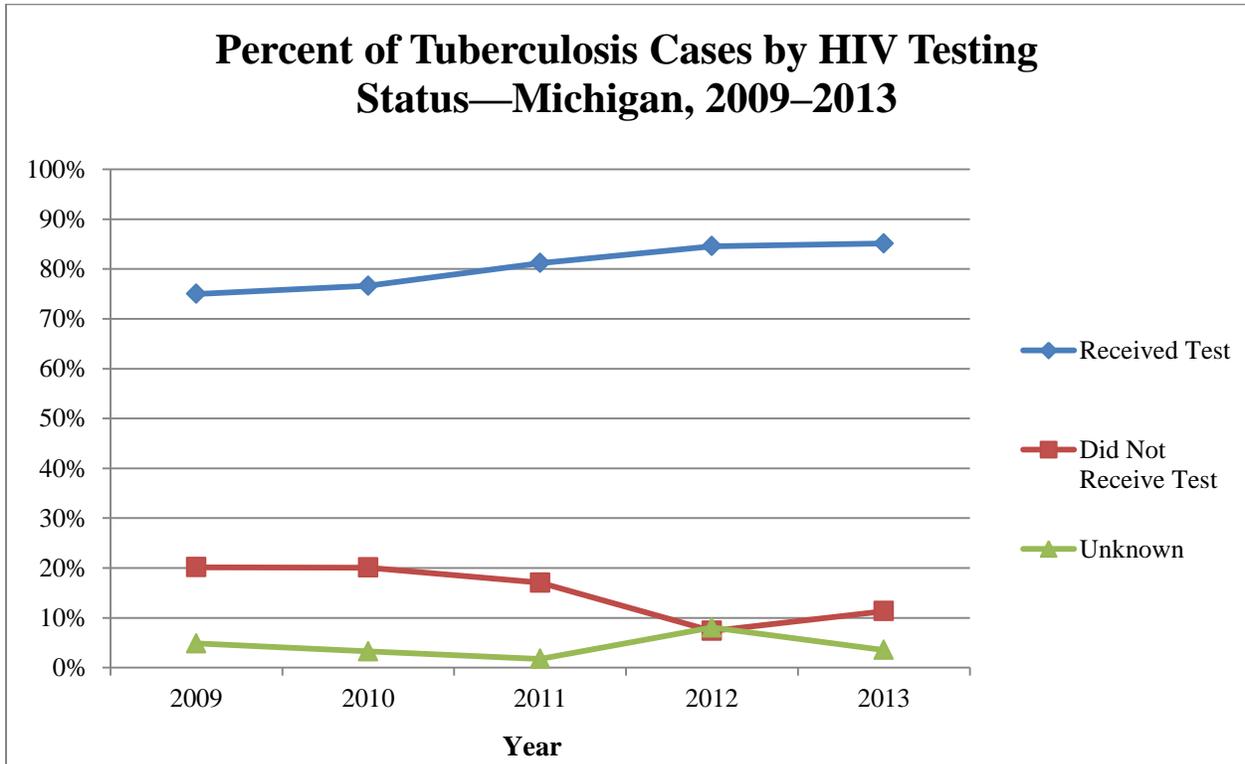


TB RISK FACTORS

Human Immunodeficiency Virus (HIV) is a one of the greatest risk factors for developing TB. People living with HIV are 20 to 37 times more likely to develop TB disease over their lifetime than those who are HIV-negative.¹ It is essential to know the HIV status of TB cases to ensure appropriate treatment. Michigan has shown an increasing trend of TB cases receiving HIV testing as part of case management, and in 2013 more than 85% of TB cases received an HIV test (*Panel 18*). During this report period, an average of 6% of patients each year was co-infected with HIV. In addition to HIV, alcohol and drug abuse are other risk factors for developing TB disease. The proportion of cases with alcohol and drug use peaked in 2011, and then declined to their lowest proportion in 2013 (*Panel 20*), but all regions within Michigan reported cases with alcohol and drug abuse during the past 3 years (*Panel 21a-c*). Other social risk factors for developing TB disease include residence in congregate settings such as homeless shelters, long-term care and correctional facilities. Statewide during this report period, about 8% of TB cases were homeless at some point within the 12 months preceding their diagnosis, and regions 1, 2N, 2S, 5, 6 and 7 have managed TB cases that were homeless. Region 2S consistently reported TB cases that were residents of long-term care facilities and/or in correctional facilities within the past 3 years. There are many financial, social and geographic barriers to health care associated with TB. TB disproportionately affects minority groups, those who are immunosuppressed and/or have reduced access to care. Therefore, it is crucial for TB programs to improve routine testing, education and outreach activities to these vulnerable groups.

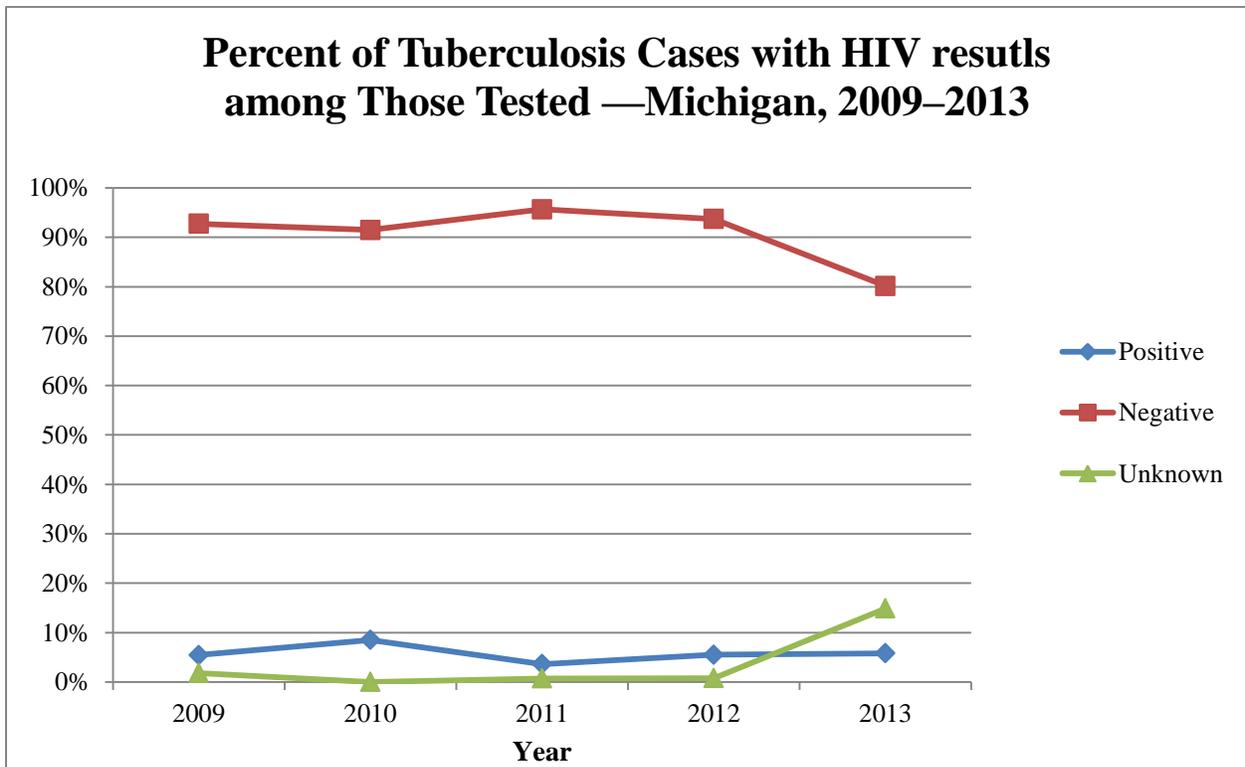
Panel 18. Number and Percent of Tuberculosis Cases by HIV Testing Status—Michigan, 2009–2013

Year	Received Test		Refused Test	Not Offered Test	Total Not Receiving HIV Test		Test Status	
	Test	% of Total			% of Total	Unknown	% of Total	
2009	110	76	9	20	29	20	5	3
2010	141	77	10	27	37	20	6	3
2011	139	82	9	20	29	17	2	1
2012	127	85	5	6	11	7	11	7
2013	120	85	4	12	16	11	5	4



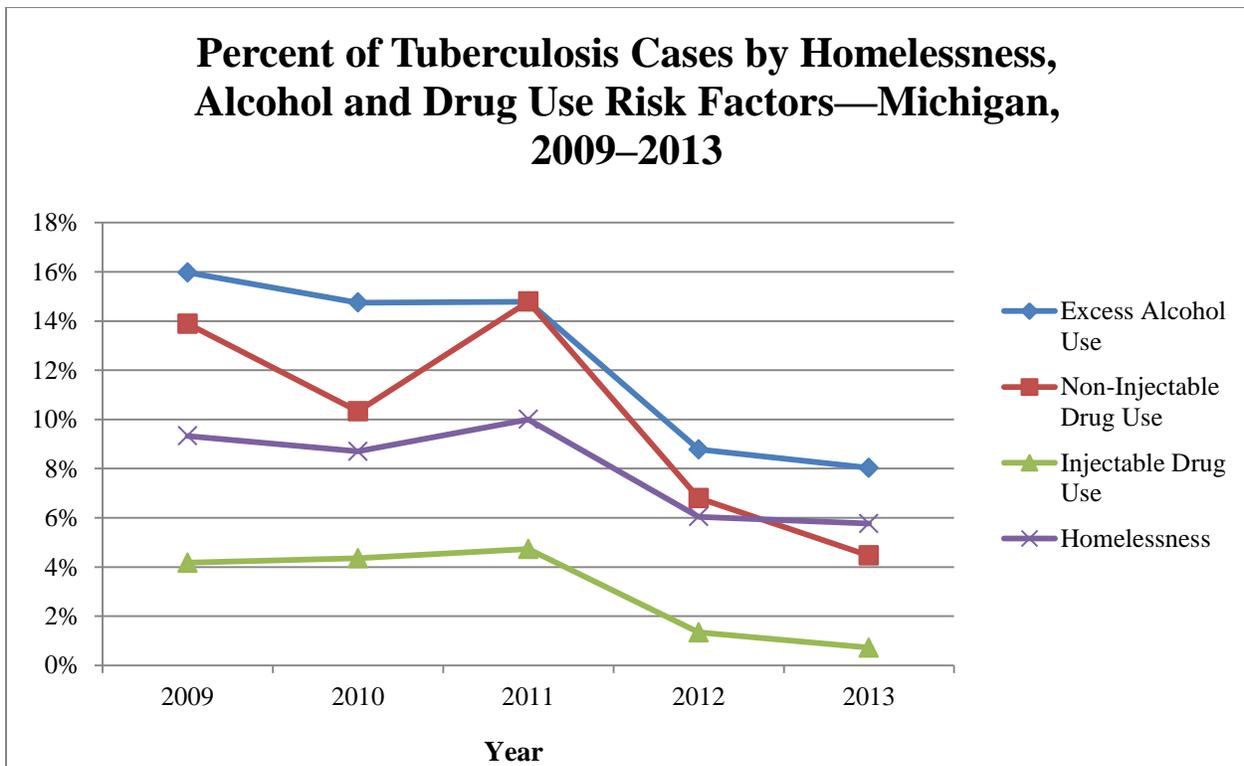
Panel 19. Number and Percent of Tuberculosis Cases with HIV Results among Those Tested—Michigan, 2009–2013

Year	Positive	% of Total	Negative	% of Total	Results Unknown	% of Total
2009	6	5	102	93	2	2
2010	12	9	129	91	0	0
2011	5	4	133	96	1	1
2012	7	6	119	94	1	1
2013	7	6	113	80	21	15



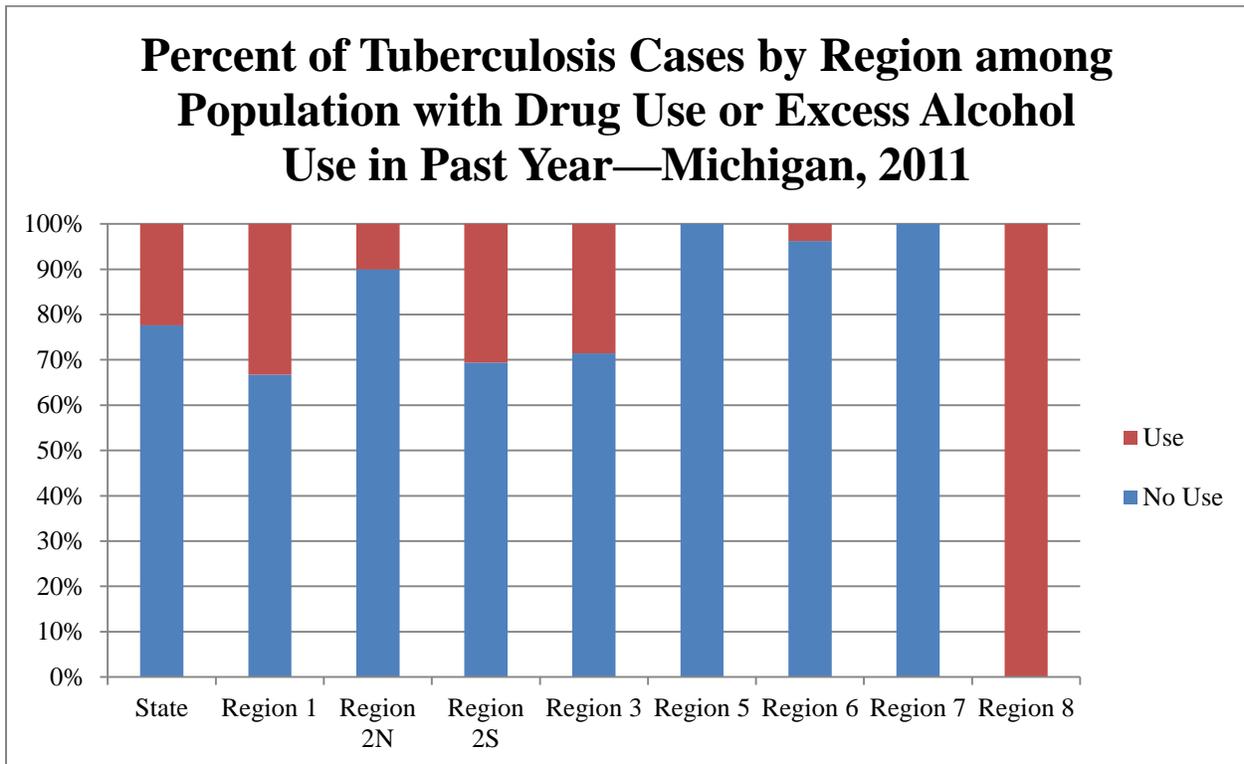
Panel 20. Number and Percent of Tuberculosis Cases by Homelessness, Alcohol & Drug Use Risk Factors—Michigan, 2009–2013

Year	Excess Alcohol Use	% of Total	Non-Injectable Drug Use	% of Total	Injectable Drug Use	% of Total	Homelessness	% of Total
2009	23	16	20	14	6	4	12	8
2010	27	15	19	10	8	4	16	9
2011	25	15	25	15	8	5	17	10
2012	13	9	10	7	2	1	9	6
2013	11	8	6	4	1	1	8	6



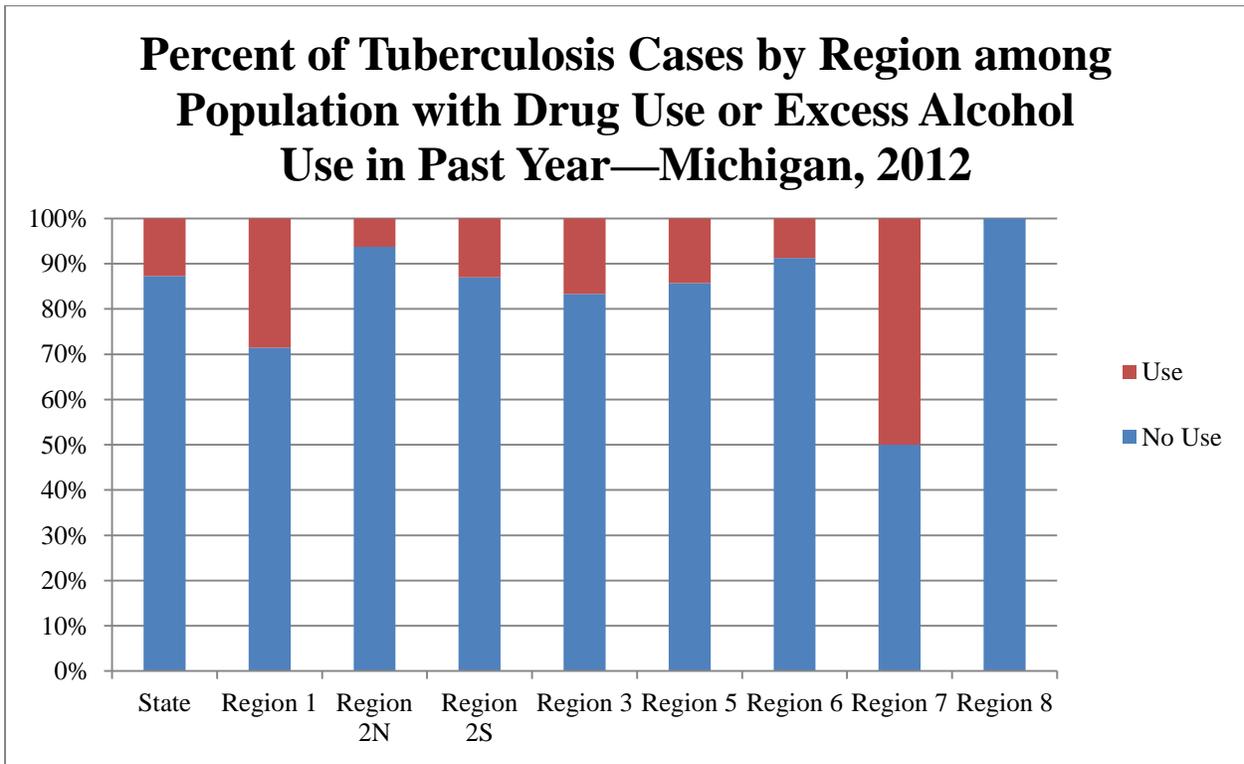
Panel 21a. Number and Percent of Tuberculosis Cases by Region among Population with Drug Use or Excess Alcohol Use in Past Year—Michigan, 2011

	Use of Drugs or Excessive Alcohol Within Past Year					
	Total	No			Yes	
		No.	No.	%	No.	%
State	170	132	78	38	22	
Region 1	12	8	67	4	33	
Region 2N	30	27	90	3	10	
Region 2S	85	59	69	26	31	
Region 3	7	5	71	2	29	
Region 5	3	3	100	0	0	
Region 6	26	25	96	1	4	
Region 7	5	5	100	0	0	
Region 8	2	0	0	2	100	



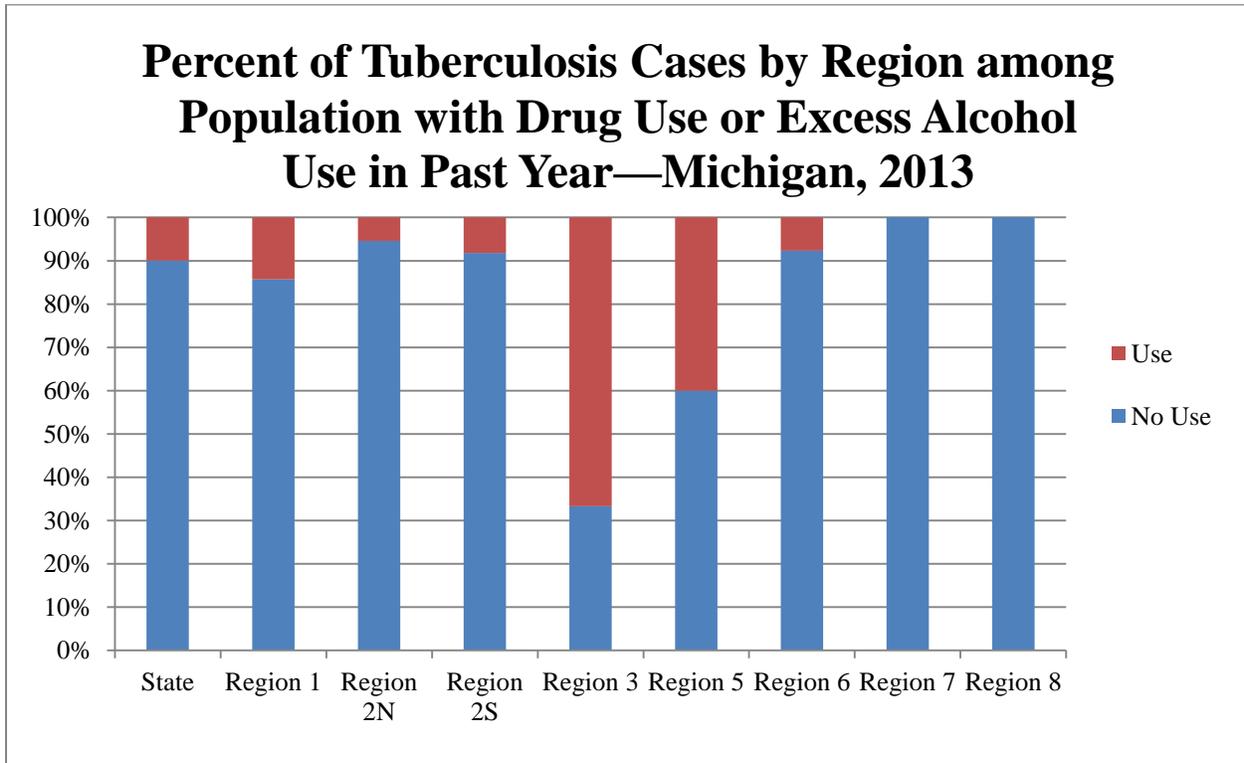
Panel 21b. Number and Percent of Tuberculosis Cases by Region among Population with Drug Use or Excess Alcohol Use in Past Year—Michigan, 2012

	Use of Drugs or Excessive Alcohol Within Past Year				
	Total	No		Yes	
		No.	No.	%	No.
State	149	130	87	19	13
Region 1	7	5	71	2	29
Region 2N	32	30	94	2	6
Region 2S	69	60	87	9	13
Region 3	6	5	83	1	17
Region 5	7	6	86	1	14
Region 6	23	21	91	2	9
Region 7	4	2	50	2	50
Region 8	1	1	100	0	0



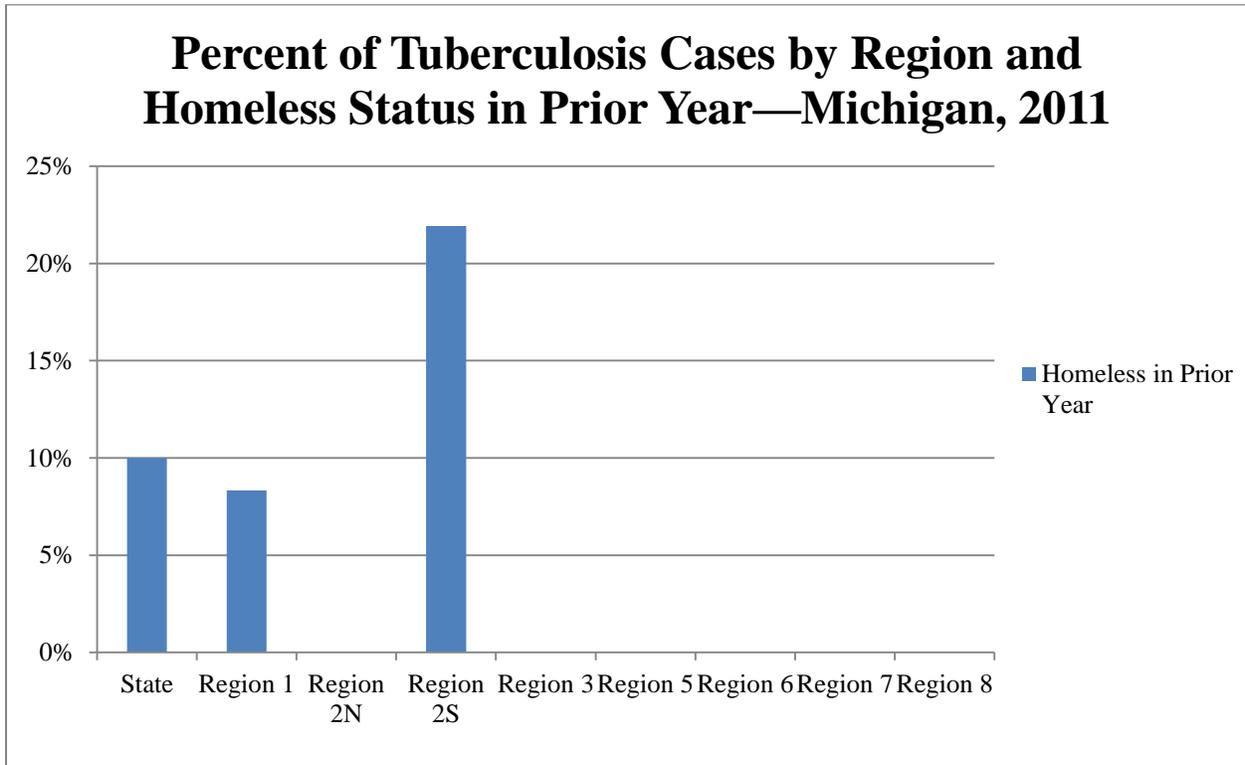
Panel 21c. Number and Percent of Tuberculosis Cases by Region among Population with Drug Use or Excess Alcohol Use in Past Year—Michigan, 2013

	Use of Drugs or Excessive Alcohol Within Past Year					
	Total	No		Yes		
	No.	No.	%	No.	%	
State	141	12	90	14	10	
Region 1	7	6	86	1	14	
Region 2N	37	35	95	2	5	
Region 2S	73	67	92	6	8	
Region 3	3	1	33	2	67	
Region 5	5	3	60	2	40	
Region 6	13	12	92	1	8	
Region 7	2	2	100	0	0	
Region 8	1	1	100	0	0	



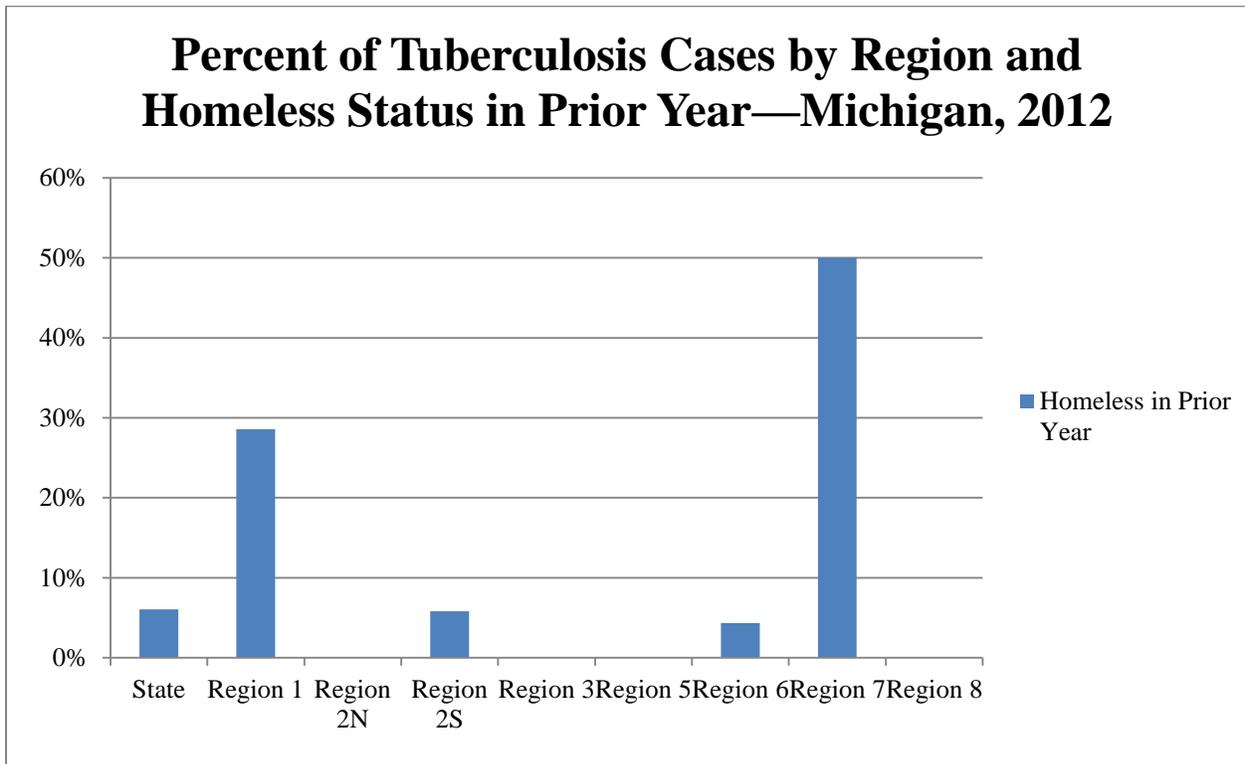
Panel 22a. Number and Percent of Tuberculosis Cases by Region and Homeless Status in Prior Year—Michigan, 2011

	Homeless in Prior Year	% of Total	Unknown Homeless Status	% of Total
State	17	10	2	1
Region 1	1	8	0	0
Region 2N	0	0	1	2
Region 2S	16	22	0	0
Region 3	0	0	0	0
Region 5	0	0	0	0
Region 6	0	0	1	4
Region 7	0	0	0	0
Region 8	0	0	0	0



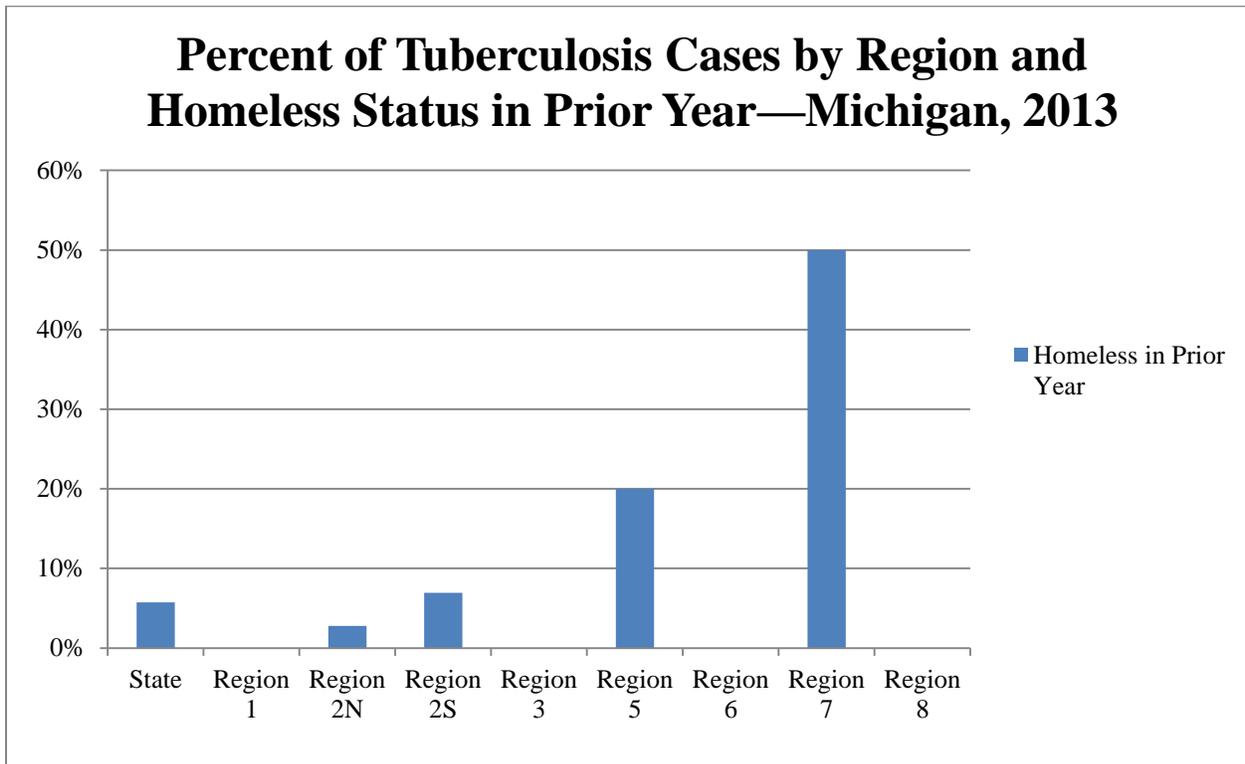
Panel 22b. Number and Percent of Tuberculosis Cases by Region and Homeless Status in Prior Year—Michigan, 2012

	Homeless in Prior Year	% of Total	Unknown Homeless Status	% of Total
State	9	6	2	1
Region 1	2	29	0	0
Region 2N	0	0	0	0
Region 2S	4	6	2	3
Region 3	0	0	0	0
Region 5	0	0	0	0
Region 6	1	4	0	0
Region 7	2	50	0	0
Region 8	0	0	0	0



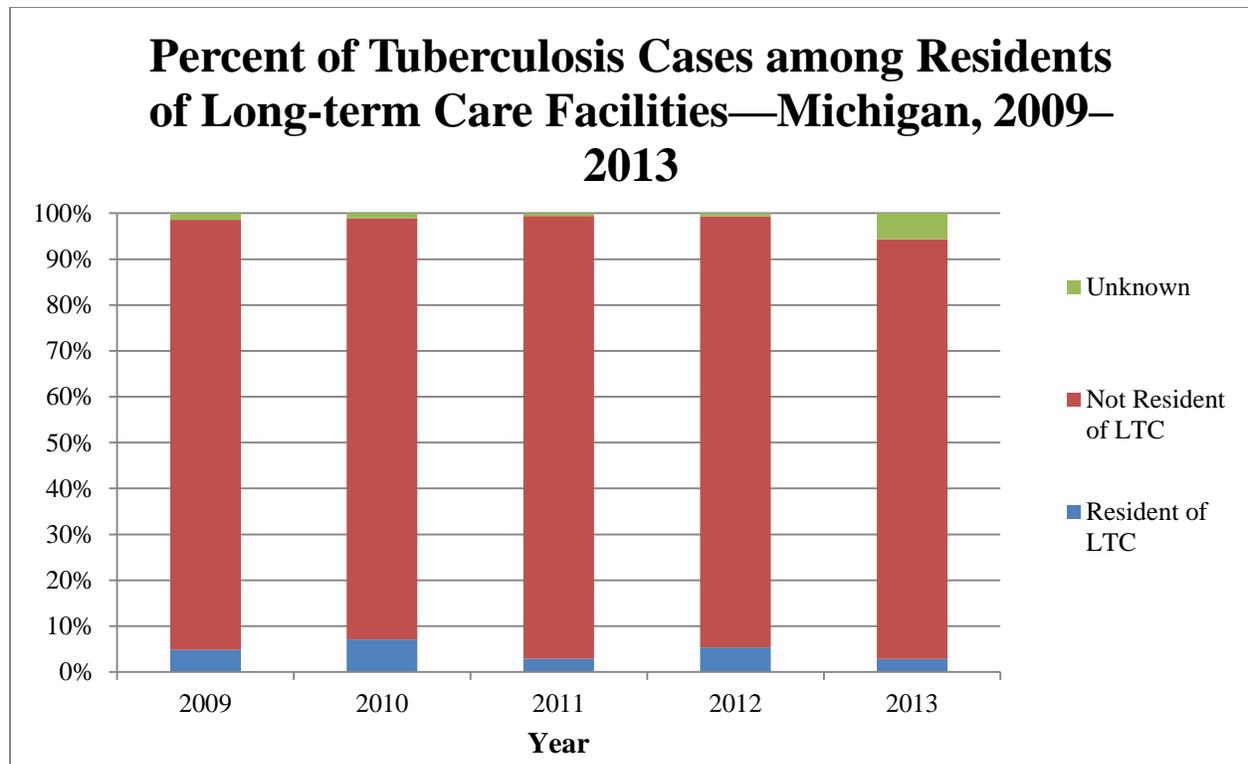
Panel 22c. Number and Percent of Tuberculosis Cases by Region and Homeless Status in Prior Year—Michigan, 2013

	Homeless in Prior	% of Total	Unknown Homeless	% of Total
	Year		Status	
State	8	6	1	1
Region 1	0	0	0	0
Region 2N	1	3	0	0
Region 2S	5	7	0	0
Region 3	0	0	0	0
Region 5	1	20	0	0
Region 6	0	0	1	8
Region 7	1	50	0	0
Region 8	0	0	0	0



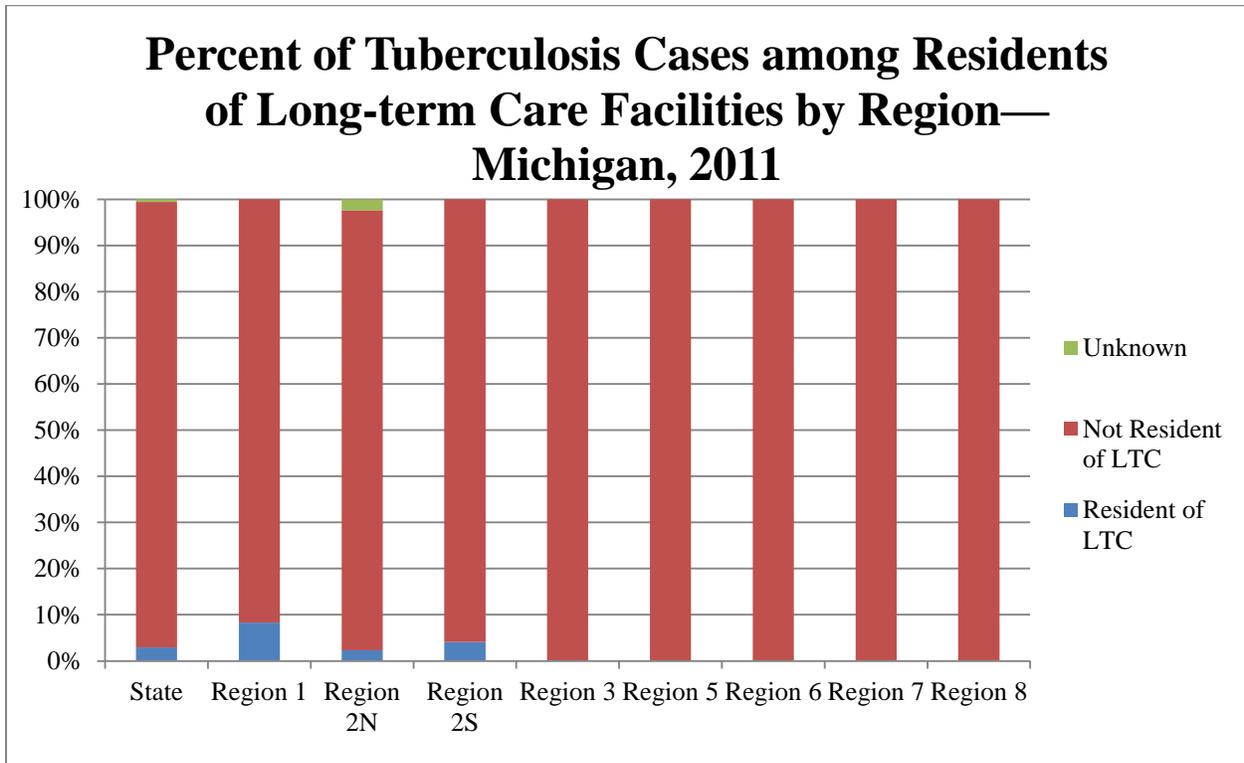
Panel 23a: Number and Percent of Tuberculosis Cases among Residents of Long-term Care Facilities—Michigan, 2009–2013

Year	Total Cases	Resident of Long Term Care	% of total	Not a Resident of Long-term Care/Unknown	% of total	Unknown	% of Total
2009	144	7	5	135	94	2	1
2010	184	13	7	169	92	2	1
2011	170	5	3	164	96	1	1
2012	149	8	5	140	94	1	1
2013	141	4	3	129	91	8	6



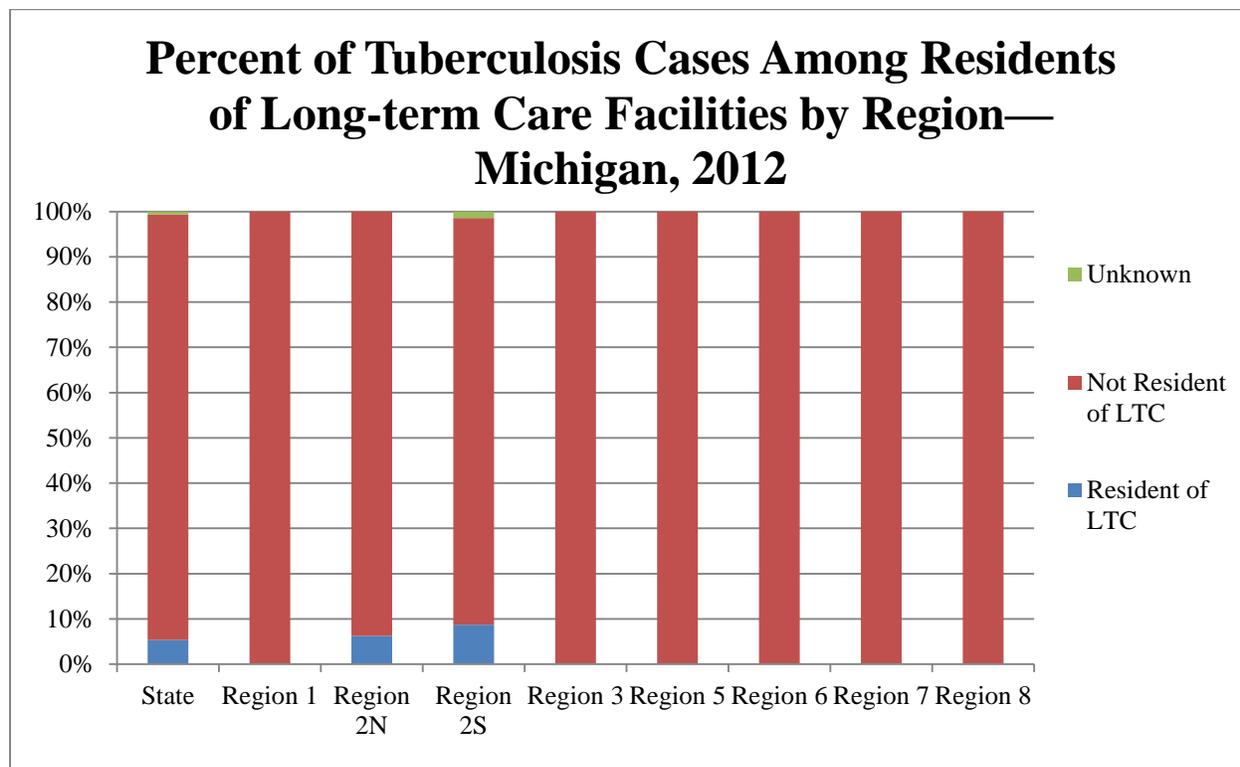
Panel 23b: Number and Percent of Tuberculosis Cases among Residents of Long-term Care Facilities by Region—Michigan, 2011

	Total Cases	Resident of Long Term Care	% of total	Not a Resident of Long-term Care/Unknown	% of total	Unknown	% of Total
State	170	5	3	164	96	1	1
Region 1	12	1	8	11	92	0	0
Region 2N	43	1	2	41	95	1	2
Region 2S	73	3	4	70	96	0	0
Region 3	7	0	0	7	100	0	0
Region 5	3	0	0	3	100	0	0
Region 6	25	0	0	25	100	0	0
Region 7	5	0	0	5	100	0	0
Region 8	2	0	0	2	100	0	0



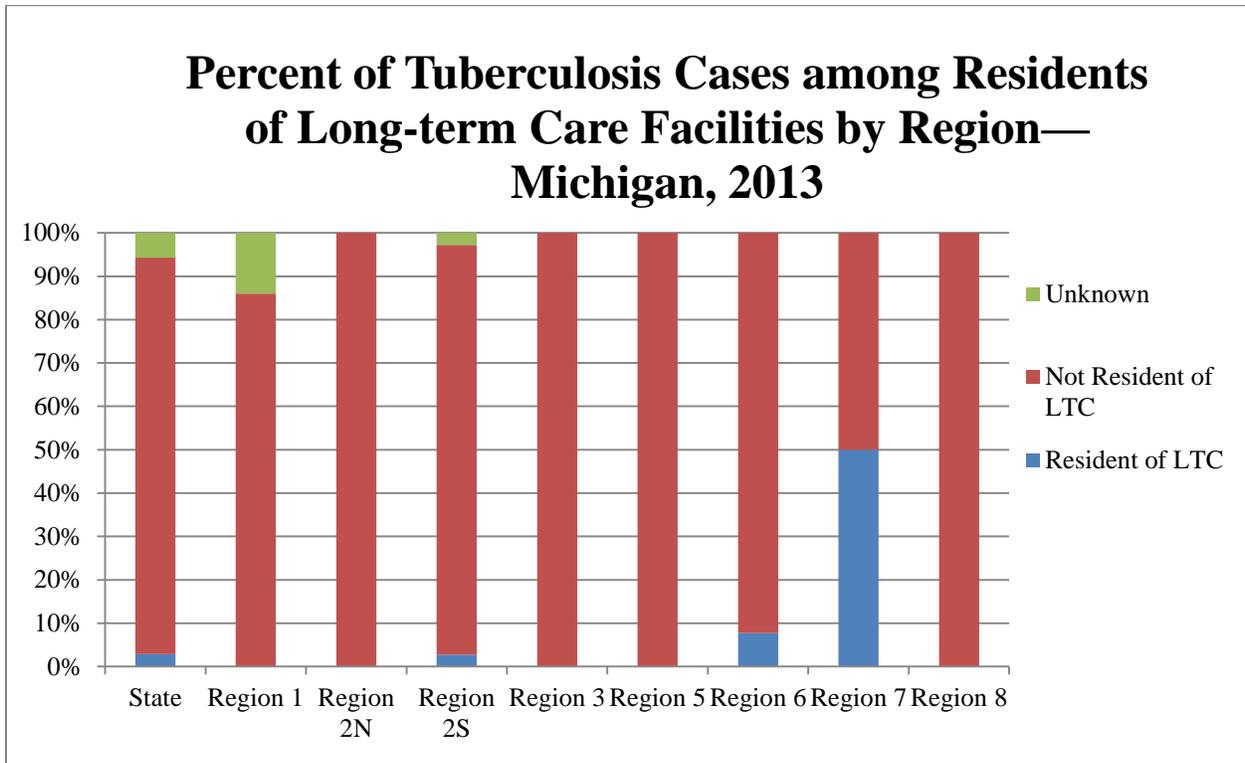
Panel 23c: Number and Percent of Tuberculosis Cases among Residents of Long-term Care Facilities by Region—Michigan, 2012

	Total Cases	Resident of Long Term Care	% of total	Not a Resident of Long-term Care/Unknown	% of total	Unknown	% of Total
State	149	8	5	140	94	1	1
Region 1	7	0	0	2	6	0	0
Region 2N	32	2	6	30	94	0	0
Region 2S	69	6	9	62	90	1	1
Region 3	6	0	0	6	100	0	0
Region 5	7	0	0	7	100	0	0
Region 6	23	0	0	23	100	0	0
Region 7	4	0	0	4	100	0	0
Region 8	1	0	0	1	100	0	0



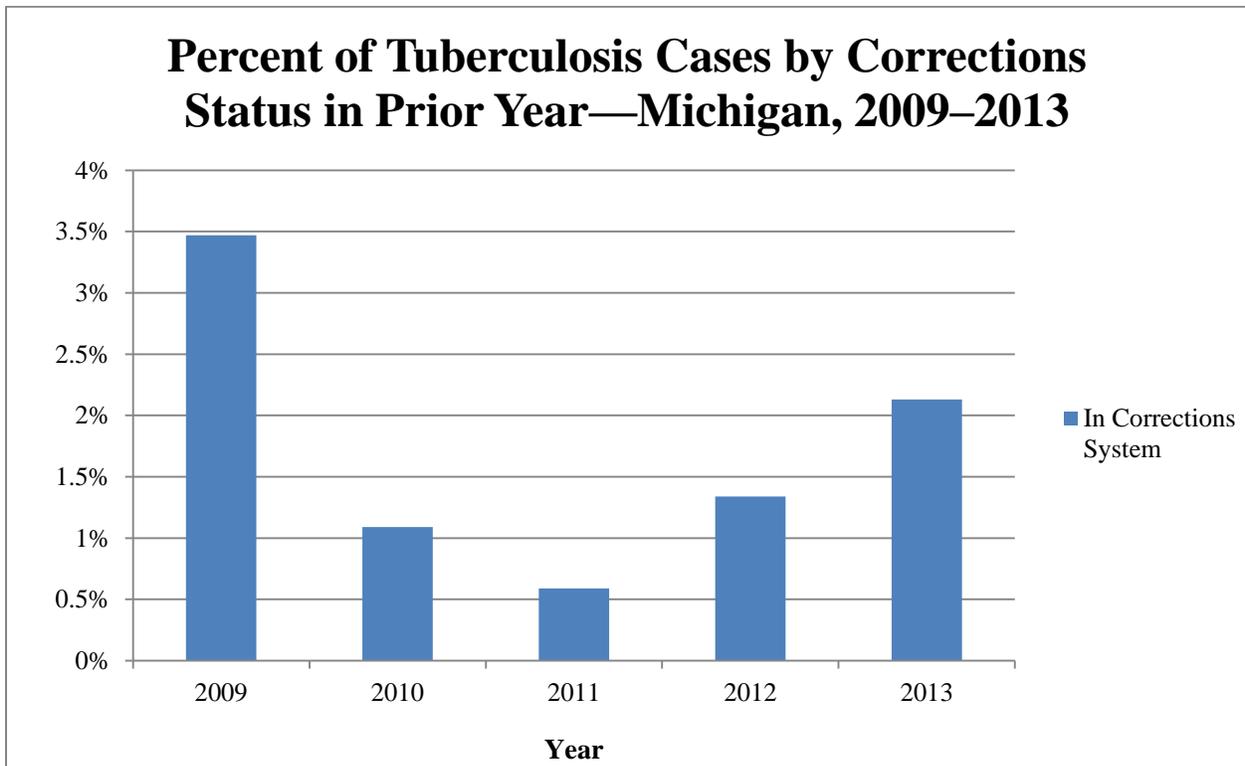
Panel 23d: Number and Percent of Tuberculosis Cases among Residents of Long-term Care Facilities by Region—Michigan, 2013

	Total Cases	Resident of Long Term Care	% of total	Not a Resident of Long-term Care/Unknown	% of total	Unknown	% of Total
State	141	4	3	129	91	8	6
Region 1	7	0	0	7	100	6	16
Region 2N	37	0	0	31	84	0	0
Region 2S	73	2	3	69	95	2	3
Region 3	3	0	0	3	100	0	0
Region 5	5	0	0	5	100	0	0
Region 6	13	1	8	12	92	0	0
Region 7	2	1	50	1	50	0	0
Region 8	1	0	0	1	100	0	0



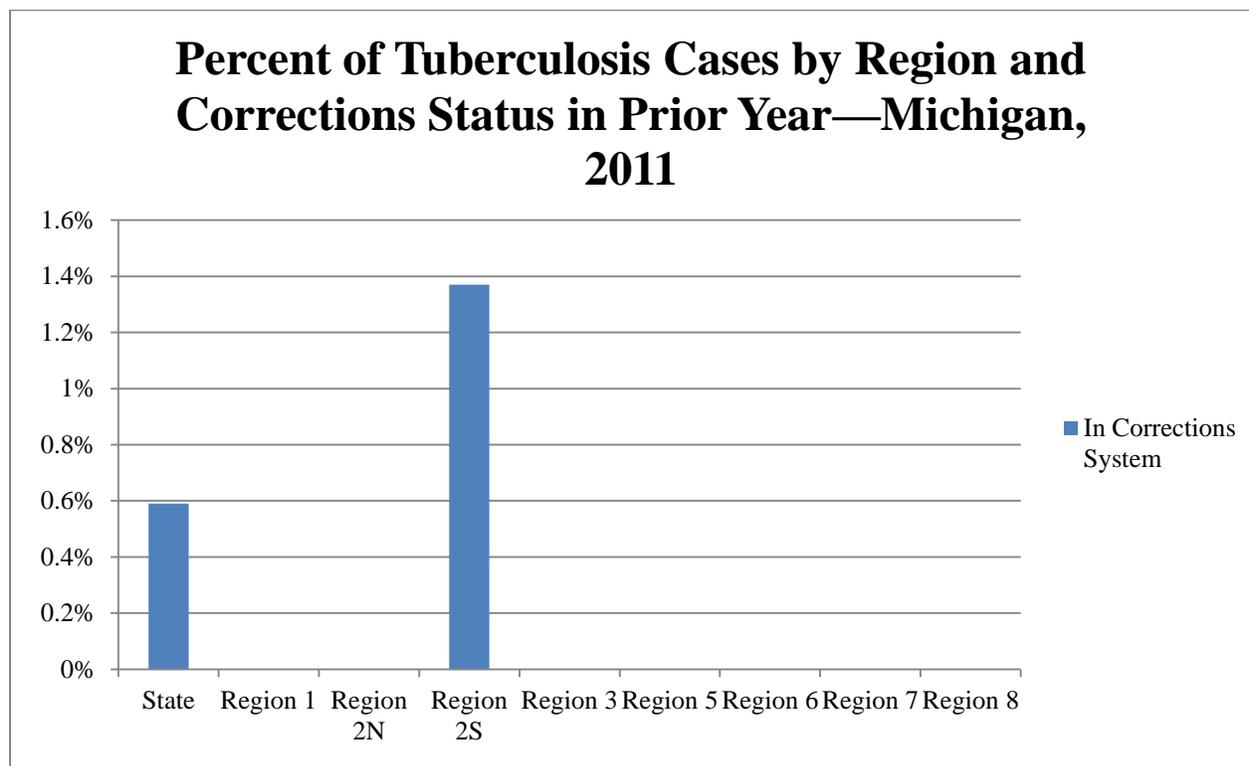
Panel 24a. Number and Percent of Tuberculosis Cases by Corrections Status in Prior Year—Michigan, 2009–2013

Year	In Corrections System	% of Total	Unknown Corrections Status	% of Total
2009	5	3	1	1
2010	2	1	5	3
2011	1	1	2	1
2012	2	1	2	1
2013	3	2	6	4



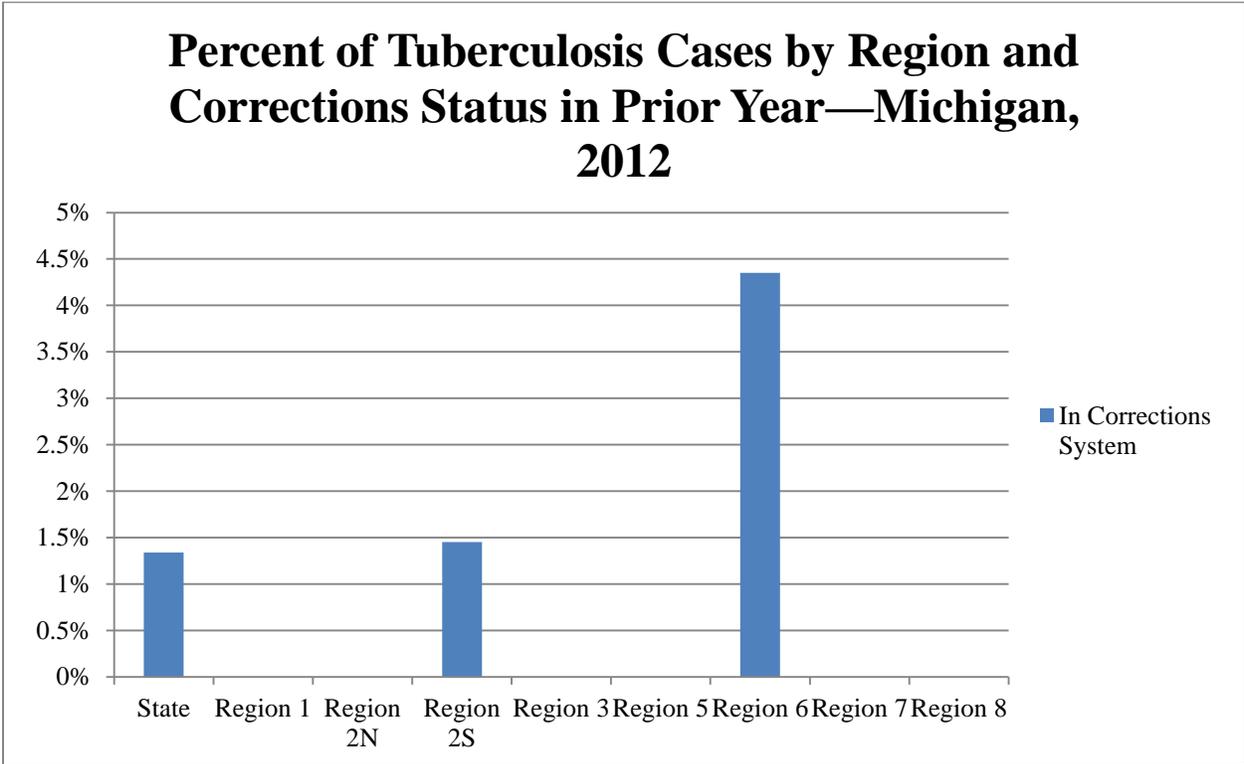
Panel 24b. Number and Percent of Tuberculosis Cases by Region and Corrections Status in Prior Year—Michigan, 2011

	In Corrections System	% of Total	Unknown Corrections Status	% of Total
State	1	1	2	1
Region 1	0	0	0	0
Region 2N	0	0	1	2
Region 2S	1	1	1	1
Region 3	0	0	0	0
Region 5	0	0	0	0
Region 6	0	0	0	0
Region 7	0	0	0	0
Region 8	0	0	0	0



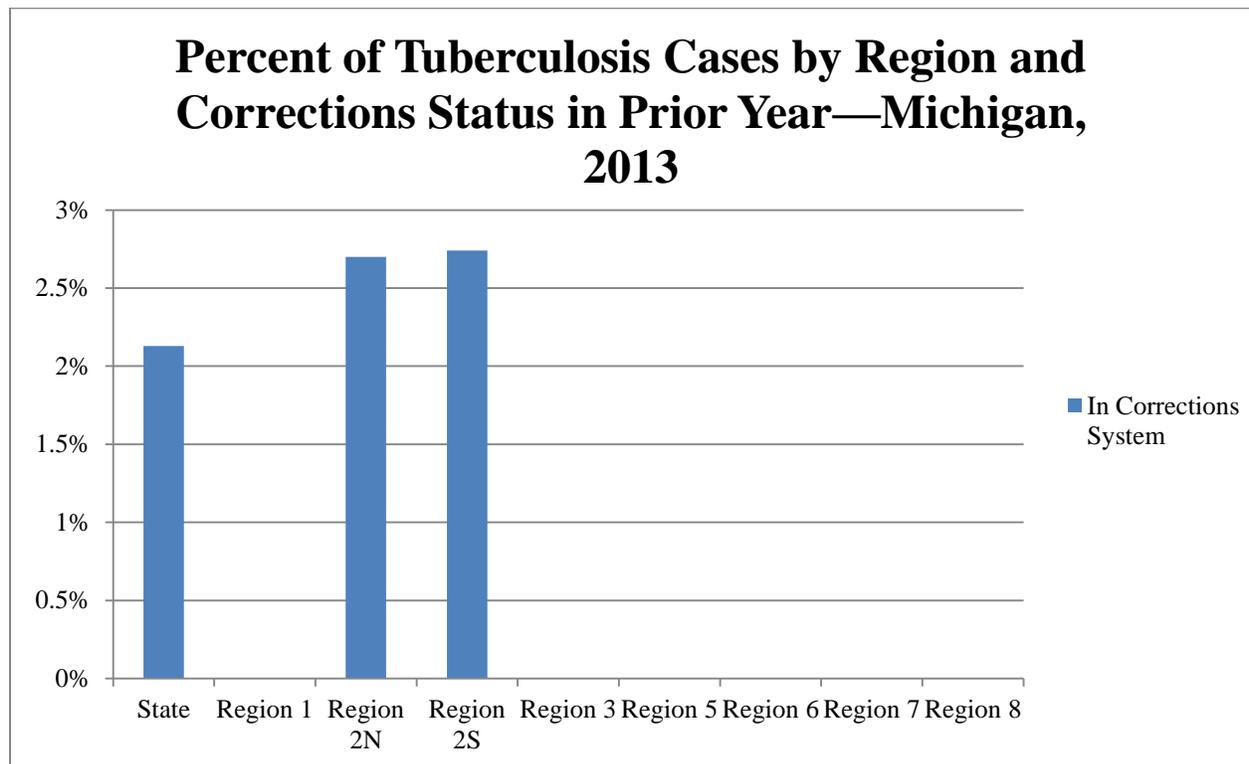
Panel 24c. Number and Percent of Tuberculosis Cases by Region and Corrections Status in Prior Year—Michigan, 2012

	In Corrections System	% of Total	Unknown Corrections Status	% of Total
State	2	1	2	1
Region 1	0	0	1	14
Region 2N	0	0	0	0
Region 2S	1	1	1	1
Region 3	0	0	0	0
Region 5	0	0	0	0
Region 6	1	4	0	0
Region 7	0	0	0	0
Region 8	0	0	0	0



Panel 24d. Number and Percent of Tuberculosis Cases by Region and Corrections Status in Prior Year—Michigan, 2013

	In Corrections System	% of Total	Unknown Corrections Status	% of Total
State	3	2	6	4
Region 1	0	0	1	14
Region 2N	1	3	1	3
Region 2S	2	3	2	3
Region 3	0	0	1	33
Region 5	0	0	0	0
Region 6	0	0	1	8
Region 7	0	0	0	0
Region 8	0	0	0	0



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