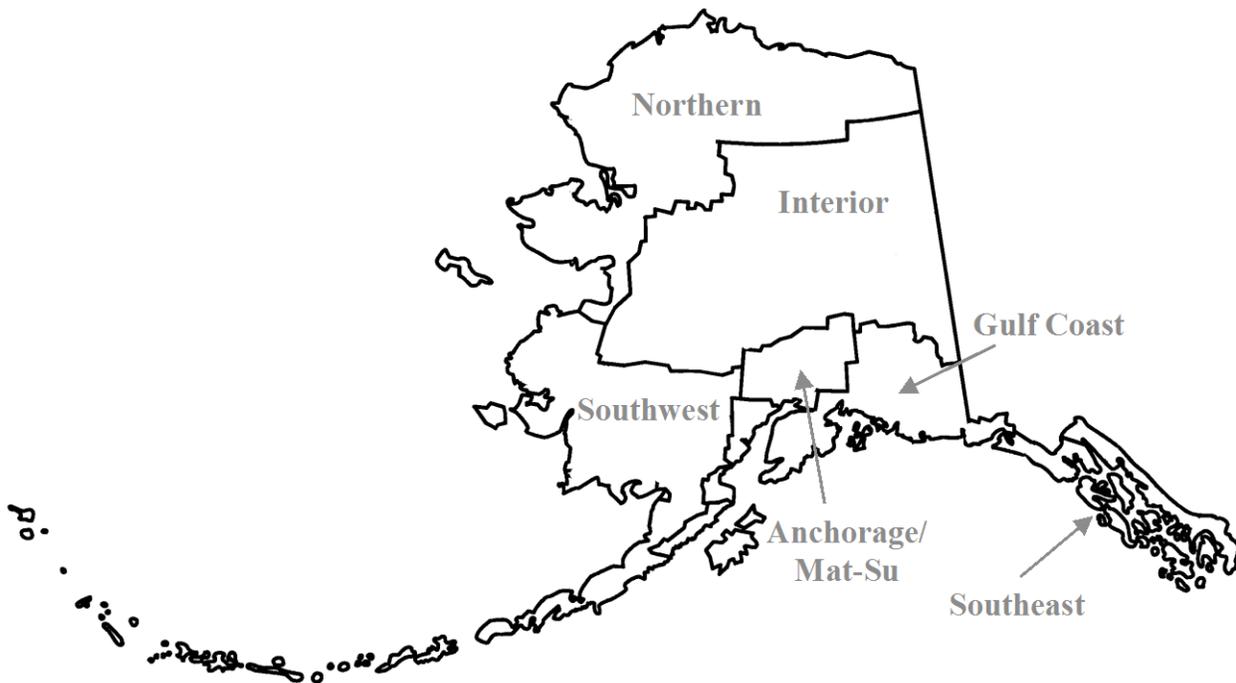


Tuberculosis in Alaska

2014 Annual Report

CDC TB Elimination Cooperative Agreement
U52/CCU007863-22



STATE OF ALASKA
Department of Health and Social Services
Division of Public Health
Section of Epidemiology

TABLE OF CONTENTS

I.	Incidence of Tuberculosis in Alaska.....	4
II.	Demographics of TB in Alaska	5
	<i>Age.....</i>	<i>5</i>
	<i>Pediatric TB.....</i>	<i>5</i>
	<i>Race.....</i>	<i>6</i>
	<i>Gender.....</i>	<i>8</i>
	<i>Homelessness</i>	<i>8</i>
	<i>Regional trends</i>	<i>9</i>
	<i>Village and community outbreaks.....</i>	<i>10</i>
	<i>Foreign-born persons with TB.....</i>	<i>11</i>
	<i>Non-pulmonary tuberculosis.....</i>	<i>12</i>
	<i>Mortality related to tuberculosis</i>	<i>13</i>
III.	National TB Program Objectives	13
	<i>Objective 1: Completion of Treatment.....</i>	<i>13</i>
	<i>Objective 2: TB Case Rates</i>	<i>14</i>
	<i>Objective 3: Contact Investigation</i>	<i>16</i>
	<i>Objective 4: Laboratory Reporting: Turn-around Time & Drug Susceptibility Results.....</i>	<i>18</i>
	<i>Objective 5: Treatment Initiation.....</i>	<i>19</i>
	<i>Objective 6: Sputum Culture Conversion</i>	<i>19</i>
	<i>Objective 7: Data Reporting.....</i>	<i>21</i>
	<i>Objective 8: Recommended Initial Therapy</i>	<i>22</i>
	<i>Objective 9: Universal Genotyping</i>	<i>22</i>
	<i>Objective 10: Known HIV Status</i>	<i>23</i>
	<i>Objective 11: Evaluation of Immigrants and Refugees</i>	<i>24</i>
	<i>Objective 12: Sputum-Culture Reported.....</i>	<i>25</i>
	<i>Objective 13: Program Evaluation.....</i>	<i>25</i>
	<i>Objective 14: Human Resource Development Plan.....</i>	<i>26</i>
	<i>Objective 15: Training Focal Point.....</i>	<i>26</i>
IV.	TB Public Health Laboratory	27

*Progress towards meeting CDC recommendations as described in Tenover, et al. and Styrk
et al. and the Healthy People 2010 goal.....28*

Laboratory Goals.....30

V. Appendices.....32

Appendix A: Summary information about tuberculosis in Alaska: 2005-201433

Appendix B: Surveillance Completeness Summary Report34

Appendix C: Alaska Historical TB Control Objectives35

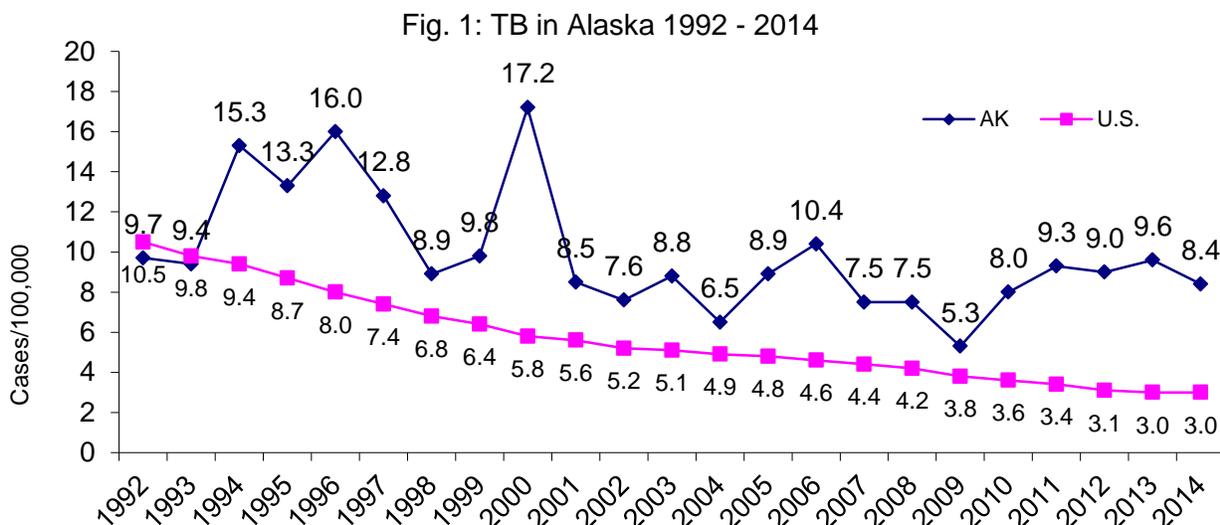
Appendix D: TB Program Training and Human Resource Strategy Plan.....37

Appendix E: TB Evaluation Plan - Enhanced Contact Investigation Project (ECIP).....50

TUBERCULOSIS IN ALASKA 2014 Annual Report

I. Incidence of Tuberculosis in Alaska

In 2014, 62 cases of tuberculosis (TB) were reported to the Alaska Tuberculosis Program for an incidence of 8.4 cases per 100,000 population. This was a 13% decrease in the number of cases and a 12.5% decrease in the incidence of tuberculosis when compared to 2013. The United States tuberculosis incidence was 3.0 cases per 100,000 in 2014, a 2.2% decline from 2013 (Figure 1).



Alaska had five isoniazid resistant cases of TB in 2014, and one Multi-Drug Resistant (MDR) case. Since 2001, Alaska has had a total of nine MDR TB cases, one each in 2003, 2006, 2010, 2012, 2014, and four in 2011. Two of the MDR cases in 2011 were from the same household with one of these cases foreign-born. The other two cases of MDR TB in 2011 were isolated cases in foreign-born individuals. The one case of MDR TB in 2012 was from an individual whose only other risk factor for TB was spending less than 10 months volunteering at various sites in a former Russian republic country just prior to illness, and the case from 2014 was in a foreign born individual from Southeast Asia.

Alaska was one of 29 states and the District of Columbia that had a lower incidence of tuberculosis in 2014 compared to 2013.

Alaska was one of ten reporting areas with a tuberculosis rate that exceeded the national average. The states and district with the highest TB rates are listed in Table 1.

Table 1: States and district with the highest incidence of tuberculosis in 2014

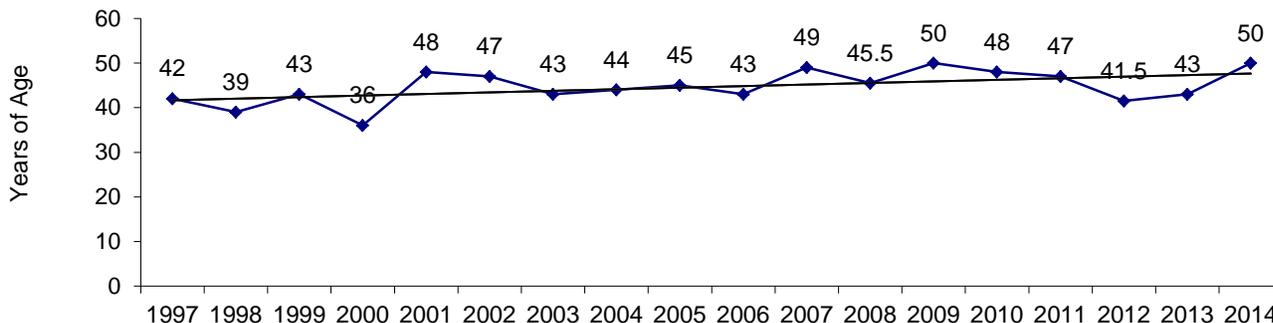
State or District	Number Cases	Incidence of TB	Population
Alaska	62	8.4	736,732
Hawaii	136	9.6	1,419,561
District of Columbia	33	5.0	658,893
California	2,145	5.7	38,802,500
Texas	1,269	4.7	26,956,958

II. Demographics of TB in Alaska

Age

In 2014, the mean age of persons with TB was 49 years; the median age was 50 years. Since 1997, the median age has increased (Figure 2).

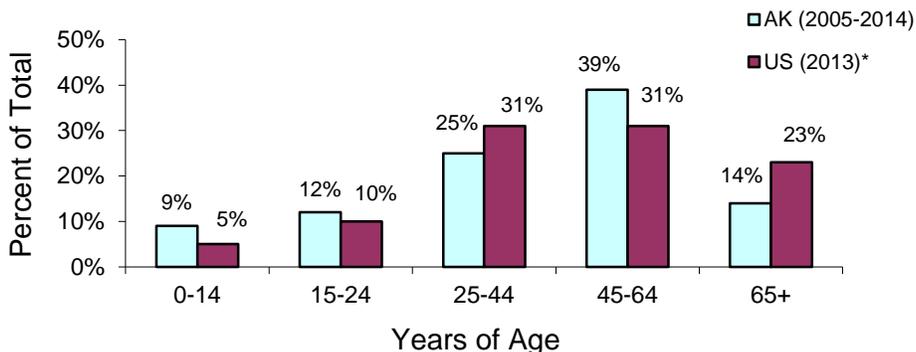
Fig. 2: Median age of persons with TB in Alaska



Pediatric TB

Previously, the proportion of TB cases under 15 years of age was greater in Alaska compared to the U.S. overall. This trend is less apparent when looking at age data from 2005 to 2014. The median age of persons with TB in Alaska is similar to that of the United States overall (Figure 3).

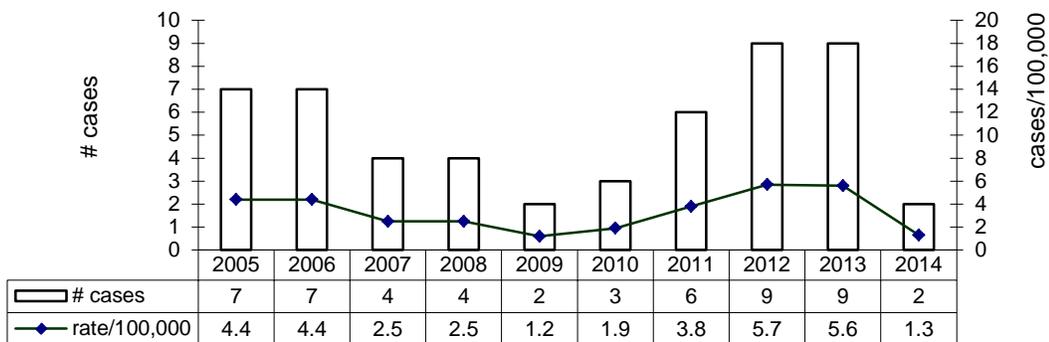
Figure 3: Age of persons with TB: Alaska and U.S.



*CDC. Reported Tuberculosis in the United States, 2013. Atlanta, GA: U.S. Department of Health and Human Services, CDC, October 2014.

For the purposes of this report, a child is anyone less than 15 years of age. In 2014 two children were diagnosed and treated for tuberculosis, a rate of 1.3 cases per 100,000 children (Figure 4). The rate of pediatric TB in Alaska has ranged from a high of 5.7 cases per 100,000 to a low of 1.2 cases per 100,000 children over the past 10 years. The mean rate over the past 10 years, 2005 – 2014, was 3.3 cases/100,000 children.

Figure 4: Pediatric TB in Alaska, 2005 - 2014



Race

Between 2005 and 2014, a total of 589 cases of TB were reported to the Alaska TB Program. Alaska Native and Asian/Pacific Islanders continue to bear a disproportionate burden of TB in Alaska (Figure 5)(Table 2). Seventy percent (411) of TB cases were Alaska Native, although this group represents only ~15% of the general population. Nineteen percent (114 cases) were Asian or Pacific Islanders compared with ~6% of the general population. Only 9% (53 cases) of TB cases were white and 2% (11 cases) were African American.

Figure 5: Racial Demographics TB in Alaska from 2005-2014 compared to Alaska 2013 Populations Estimates ¹

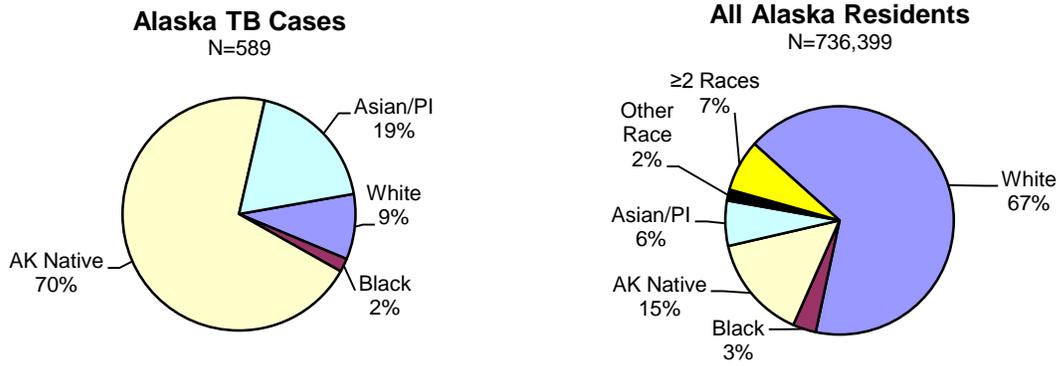


Table 2: Cases and rates of tuberculosis by race over 10 years (N=589)¹

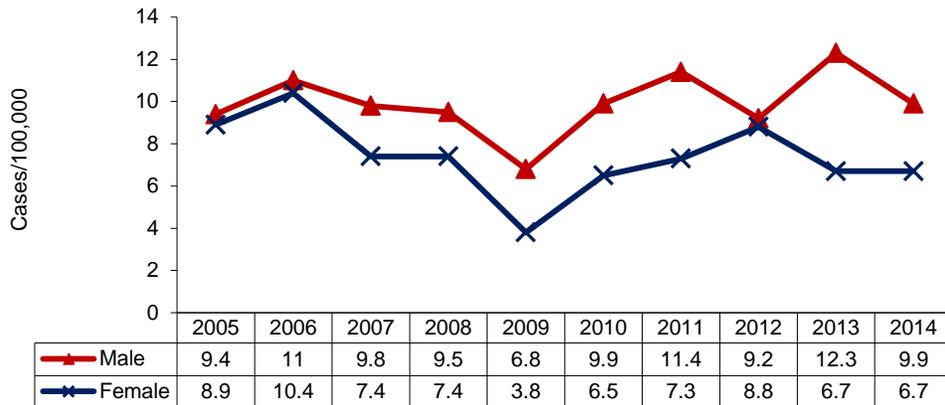
Race	2005		2006		2007		2008		2009		2010		2011		2012		2013		2014	
	Cases / Rate																			
White	8	1.7	6	1.2	9	1.8	5	1.0	2	0.4	5	1.2	7	1.5	4	0.8	4	0.8	2	0.4
Black	1	3.4	2	6.7	1	3.3	2	6.6	1	3.2	2	6.5	1	4.3	1	3.0	0	0	0	0
Native	30	25	50	42	32	26	33	27	25	20	41	33	47	38	52	43	54	44	47	38
Asian/Pacific Islander	20	54	12	32	8	21	10	26	9	23	9	23	12	32	8	15	13	23	13	23
Total	59	8.9	70	10	50	7.4	50	7.3	37	5.3	57	8.0	67	9.3	66	9.0	71	9.6	62	8.4

¹ <http://www.labor.state.ak.us/research/pop/popest.htm>

Gender

In 2014, 66% of TB case-patients were male, yielding an incidence of 9.9 cases per 100,000, while the incidence for females was 6.7 cases per 100,000 (Figure 6). Over the past 10 years, 61% of 589 cases were male and 39% were female.

Fig. 6: Incidence of TB for Males and Females



Homelessness

In 2014, 14 of 62 (23%) TB case-patients were reported to be homeless.

- Eight cases were from Anchorage, an incidence of 200 cases per 100,000 homeless persons, while three homeless persons were from the Northern region, two from the Southwest region, and one from the Interior region. (Table 3).

Table 3: Number and location of homeless persons with TB over 10 years

Location	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Anchorage/MatSu Region	1	28	9	8	3	7	12	2	5	8
Northern Region	1	3	1	1	1	4	1	2	1	3
Southwest Region				2		1		2	1	2
Southeast Region				1			2			
Gulf Coast Region		1								
Interior Region		1	1							1
Statewide Total	3	33	13	12	4	12	15	6	7	14
%TB cases homeless	5%	47%	26%	24%	11%	21%	22%	10%	10%	23%

* Alaska homeless population data for homelessness is only available for the Municipality of Anchorage.

There had been a decline in new tuberculosis cases among homeless persons in Anchorage from 2006 to 2009, and the years 2010 and 2011 showed a resurgence, with outbreak clusters noted in 2010 and 2011. TB screening for homeless individuals is an ongoing challenge. A high proportion of homeless people have long-standing latent TB infection. Therefore TB skin testing is not useful for measuring ongoing TB transmission in shelters and other

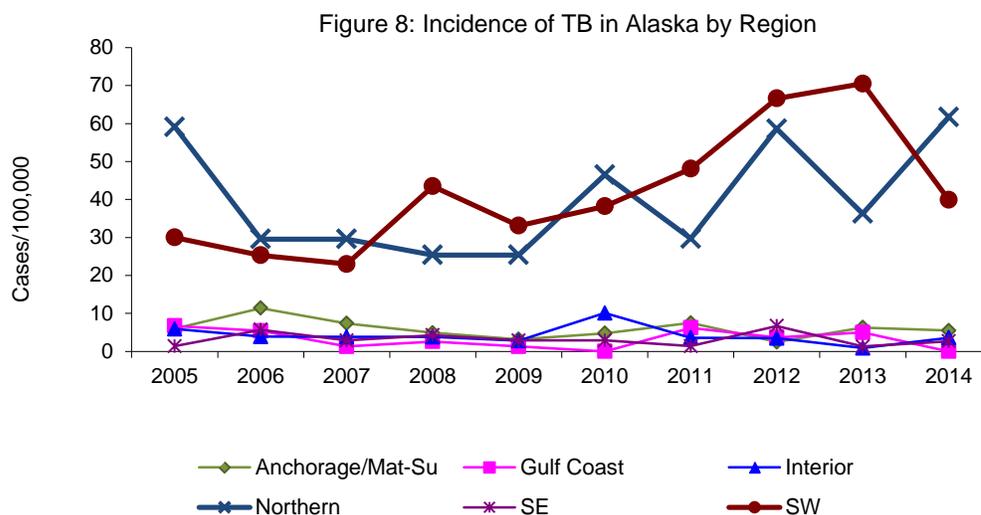
organizations that serve this population. Symptom screening coupled with sputum tests have become the tools of choice in this population. The Municipality of Anchorage Department of Health and Human Services performs targeted TB screening among the homeless population on a quarterly basis.

Regional trends

The incidence of tuberculosis is not evenly distributed throughout the state. The highest rates are found in the Northern and Southwest regions of the state (Table 4), which also have relatively higher proportions of Alaska Native residents. The six regions of the state are demonstrated in the map on the title page of this document.

Table 4: Number and incidence of TB cases by region and state

Region	2009 (cases/100,000)	2010 (cases/100,000)	2011 (cases/100,000)	2012 (cases/100,000)	2013 (cases/100,000)	2014 (cases/100,000)
Anchorage/Mat-Su	12 (3.2)	18 (4.8)	29 (7.5)	10 (2.5)	25 (6.3)	22 (5.5)
Gulf Coast	1 (1.3)	0 (0.0)	5 (6.2)	3 (3.7)	4 (5.0)	0 (0.0)
Interior	4 (3.7)	11 (10.1)	4 (3.6)	4 (3.5)	1 (0.9)	4 (3.6)
Northern	5 (21.1)	11 (46.5)	8 (29.7)	16 (58.6)	10 (36.3)	17 (61.7)
Southeast	2 (2.9)	2 (2.9)	1 (1.4)	5 (6.7)	1 (1.3)	2 (2.7)
Southwest	13 (33.1)	15 (38.2)	20 (48.1)	28 (66.6)	30 (70.5)	17 (39.9)
STATE TOTAL	37 (5.3)	57 (8.0)	67 (9.3)	66 (9.0)	71 (9.6)	62 (8.4)



The Northern Region includes the North Slope, Maniilaq and Norton Sound areas. The Norton Sound area usually reports the greatest number of TB cases for this region. In 2014, the incidence of TB in the Northern Region was 61.7 cases per 100,000 population, an increase from a rate of 36.3 the previous year (Figure 8). A challenge to TB control in this

area occurred with a shift in infrastructure in 2011; services previously provided directly by the Norton Sound Health Corporation transferred to the State, with new and unanticipated challenges which are successfully being overcome.

The Southwest Region includes the Yukon-Kuskokwim (Y-K) Delta, Bristol Bay, and the Eastern Aleutian and Aleutian-Pribilof Islands. While this region has had the highest rate of TB in Alaska for the previous three years, in 2014 the rate decreased to 39.9 cases per 100,000. Small, rural village-based outbreaks continue, and continue to pose an ongoing challenge to TB control in Alaska.

Village and community outbreaks

RURAL VILLAGE OUTBREAKS:

Village A

The single largest YK Delta village outbreak for many years occurred in 2013 (Figure 9). A total of 17 cases of active TB were detected in this village of less than 1,000 people in 2013. One case had compatible symptoms and was PCR positive, but smear and culture negative. The remaining 16 case-patients had positive cultures (four gastric, 12 sputa), and all shared GENType G13072. Ages ranged from under 5 to over 70 years of age, and 13 of the case-patients were male. Two additional TB cases with matching G13072 GENType were identified in 2014 from this and a neighboring village, with no evidence of further activity.

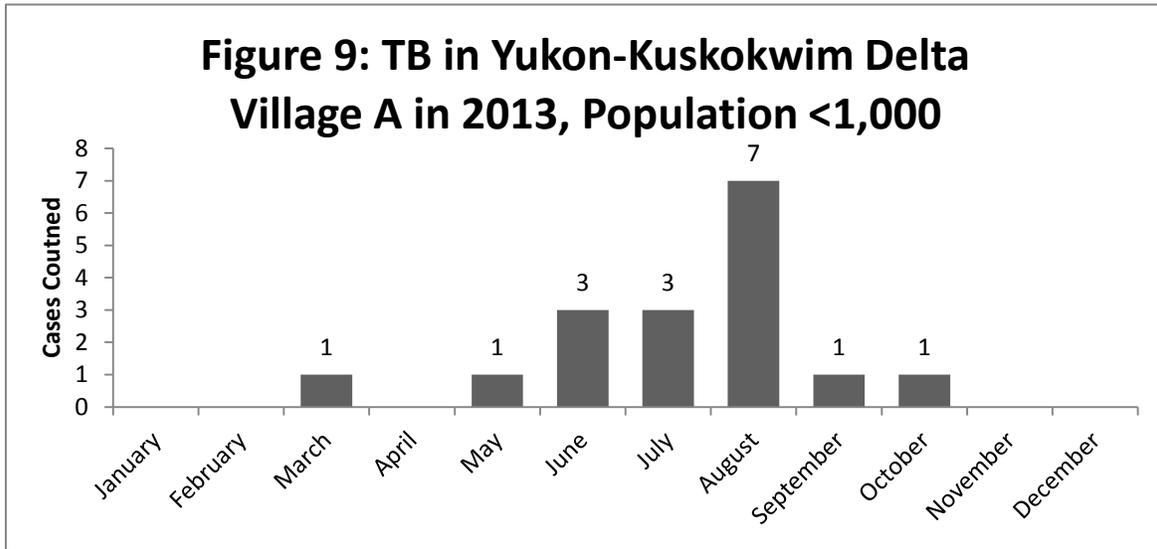
Village B

Village B is located in the YK Delta Region and until 2009 had no TB activity since 1991 when a single case was reported. The last outbreak occurred in 1987, when 11 cases of TB were reported. After 19 years without any TB, a single case was reported in 2009, followed by four cases in 2010. More than 2.5% of this community had active TB. Of four isolates available for testing, all were genotype cluster AK_0017 (PCR00015) Two more cases with this genotype were discovered in this village in 2011. In 2012, four further cases with this GENType (G10422) were identified in Alaska, two from this village, one from Anchorage and one from a village in the Northern Region with travel reported to the Southwest, although no direct contact to known active TB cases. In 2013, four new active TB cases with G10422 were reported, one from Village B. In 2014, one further case with matching GENType was discovered in village B, with another in a neighboring village.

Village C

In 2013, six TB cases were reported from a village of under 700, Village C, in the Northern Region, all with GENTYPE G11428. One case involved a patient who was successfully treated in 2009. While two cases were reported in 2010, 2011 and 2012 in Village D, six cases were reported in the town which serves as the hub for the village in 2012 with matching GENTYPE. The only other matching GENTYPE for Alaska is from a case-patient from another Northern village with no documented contact. Six further cases were detected

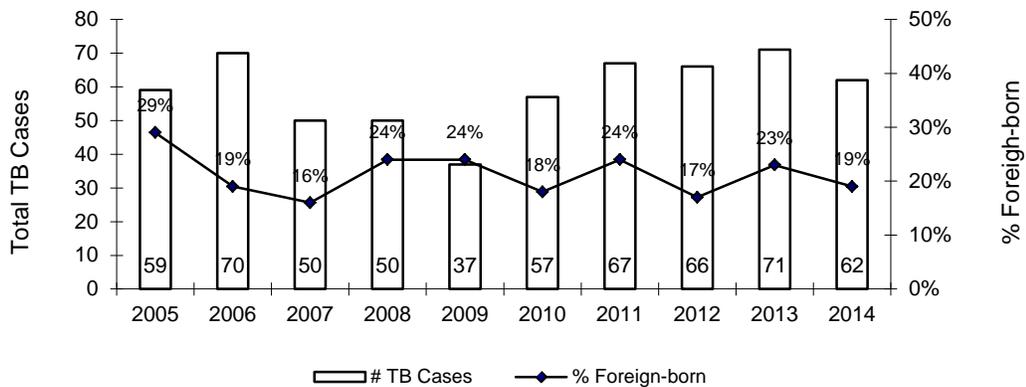
in 2014 with matching GENType in village C, with four matching cases detected in the hub town. Ongoing focused screening continues in this village.



Foreign-born persons with TB

In 2014, 12 (19%) of 62 TB cases were in foreign-born individuals, compared to 16 (23%) in 2013, 11 (17%) in 2012 and 16 (24%) in 2011 (Figure 10). Six individuals were from the Philippines, three individuals were from Laos, two from Korea, and one from Tonga. In comparison, nationally 65% of all TB case-patients were foreign-born in 2013.²

Figure 10: Number of TB cases and the percent foreign-born



Between 2005 and 2014, 124 foreign-born persons were diagnosed with tuberculosis in Alaska, representing 21% of total TB cases. They originated from 26 different countries.

² CDC. Trends in Tuberculosis - United States, 2012. Atlanta, GA: U.S. Department of Health and Human Services, CDC, March 22, 2013. The full report is available at <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6311a2.htm>

The Philippines was the country of origin for 67 (54%) of cases, followed by Laos (10%), the Republic of Korea (8%), Mexico (5%), and Thailand (4%). Table 5 lists countries of origin with greater than one TB case in the past ten years.

Table 5: Country of Origin for Foreign-born TB Cases, >1 Case: 2005-2014

Country of Origin	TB Cases (%)
Philippines	67 (54%)
Laos	12 (10%)
Korea, Republic of	10 (8%)
Mexico	6 (5%)
Thailand	5 (4%)
Vietnam	2 (2%)
China	2 (2%)
Nepal	2 (2%)

Non-pulmonary tuberculosis

From 2005 through 2014, 55 cases or 9% of 589 cases of TB involved at least one extra-pulmonary site (Table 6). The cervical lymphatics (17 cases) and pleura (8) were the two most common non-pulmonary sites.

Table 6: Body site of non-pulmonary TB: 2005-2014

Site	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Lymphatic: cervical	2	3	2	2	1	2	1	2		2	17
Genitourinary	2				1	1			1		5
Pleural		2	1	1			1		2	1	8
Lymphatic: intrathoracic	1				1			1			3
Bone/Joint			1			1	1		1	2	6
Pericardium	1					1					2
Miliary											0
Meningeal					1		1				2
Other				1		1	1	1	1		5
Lymphatic: other								2		1	3
Ear & mastoid cells					1						1
Eye and Ear				1							1
Peritoneal							1				1
Thyroid/parathyroid											0
Subcutaneous tissue		1									1
Skin/skin appendages											0
Total for year	6	6	4	5	5	6	6	6	5	6	55

Mortality related to tuberculosis

There were four TB related deaths in 2014, one who died from TB before diagnosis, three who died during therapy.

III. National TB Program Objectives

Data from 2014 were used wherever possible to address the TB Program objectives. However many 2014 TB cases remain open and contact investigations were still in progress at the time of this writing. Where 2014 data were not available, 2013 data were used to measure progress.

Objective 1: Completion of Treatment

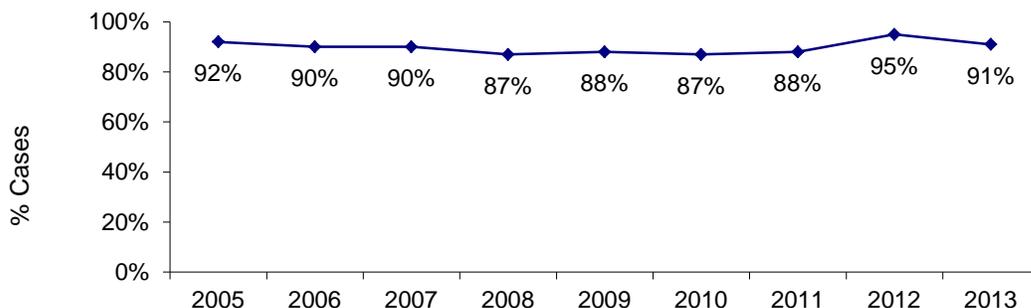
Performance Targets

- By December 31, 2012, at least 91% of persons with newly diagnosed TB, for whom therapy for one year or less is indicated, will complete therapy within 12 months.
 - By December 31, 2015, at least 93% will complete therapy within 12 months.

Status

During 2013, of the 71 active TB patients, two died during treatment. Of the remaining 69 patients, 63 (91%) completed therapy within one year, one refused treatment, and 5 completed therapy in greater than one year.

Figure 11: Proportion of TB Cases who completed treatment within 12 months*



* Analysis excludes cases who died before or during treatment or for whom >12 months treatment is recommended, and unknown status.

Major Findings

We are meeting this objective, although there are still unknown/incomplete TB cases.

Barriers

It is not unusual for the treatment period to be extended because patients develop adverse reactions to medications, requiring an alternative regimen. On other occasions, patients are non-compliant or lost to follow-up, often due to alcohol abuse. State public health law has not been particularly effective in helping us to assure treatment of non-compliant patients.

Objective 2: TB Case Rates

Performance Targets

- By December 31, 2012, the incidence of TB will be reduced:
 - U.S.-born persons who are not Alaska Native to less than 1.5 cases/100,000
 - Alaska Native persons to less than 25 cases/100,000
 - Foreign-born persons to less than 25 cases/100,000
 - U.S.-born non-Hispanic blacks to less than 10 cases/100,000
 - Children younger than 5 years of age to less than 5 cases/100,000.
- By December 31, 2015, the incidence of TB will be reduced:
 - U.S.-born persons who are not Alaska Native to less than 0.7 cases/100,000
 - Alaska Native persons to less than 20 cases/100,000
 - Foreign-born persons to less than 20 cases/100,000
 - U.S.-born non-Hispanic blacks to less than 5.0 cases/100,000
 - Children younger than 5 years of age to less than 3.6 cases/100,000.

Status

Table 7: Incidence of TB among high risk groups compared to the U.S. born non-Native population

Target Groups	Goal (2015)	2012		2013		2014	
	Incidence per 100,000	Number of Cases	Incidence per 100,000	Number of Cases	Incidence per 100,000	Number of Cases	Incidence per 100,000
U.S. born ⁵ (not Alaska Native/Am Indian)	0.7	2	0.4	2	0.4	2	0.4
Alaska Native/Am Indian	20.0	52	43	54	44	48	44
Foreign-born ³	20.0	12	24	16	32	12	23
Asian/Pacific Islander	---	8	15	13	24	13	24
African American	5.0	1	4.3	0	0	0	0
Children <5 y.o.	3.6	2	4	6	11	0	0
ALL Alaska TB Cases	---	66	9.0	71	9.6	62	8.4

*Based on estimates of foreign-born persons living in Alaska

**Based on estimates of U.S.-born persons who are not Alaska Native or American Indian

Major Findings

The incidence of TB was higher than the 2015 objective for Alaska Native/ American Indian persons and foreign-born populations. The objective was met for African American persons, children under 5 years, and non-Alaska Native U.S. born persons.

Barriers

Clusters and outbreaks in Alaska Native communities are expected periodically, and will continue to make ongoing TB control very challenging. With overall small numbers of active cases, even small clusters or outbreaks will have dramatic effects on overall rates in Alaska.

³ U.S. Census Bureau. Fact Sheet for Alaska

http://www.factfinder.census.gov/servlet/ACSSAFFacts?_event=Search&_name=&_state=04000US02&_county=&_cityTown=&_zip=&_sse=on&_lang=en&pctxt=fph&_submenuId=factsheet_1

Objective 3: Contact Investigation

Performance Targets

- By December 31, 2011
 - 100% of proportion of TB patients with positive AFB sputum-smear results will have contacts elicited
 - 70% of contacts to sputum AFB smear-positive TB cases will be evaluated
 - 50% of contacts to sputum AFB smear-positive TB cases with newly diagnosed latent TB infection (LTBI) will start treatment
 - 50% of contacts to sputum AFB smear-positive TB cases who have started treatment for the newly diagnosed LTBI will complete treatment
- By December 31, 2013
 - 100% of proportion of TB patients with positive AFB sputum-smear results will have contacts elicited
 - 75% of contacts to sputum AFB smear-positive TB cases will be evaluated
 - 65% of contacts to sputum AFB smear-positive TB cases with newly diagnosed latent TB infection (LTBI) will start treatment
 - 62% of contacts to sputum AFB smear-positive TB cases who have started treatment for the newly diagnosed LTBI will complete treatment
- By December 31, 2015,
 - 100% of proportion of TB patients with positive AFB sputum-smear results will have contacts elicited.
 - 80% of contacts to sputum AFB smear-positive TB cases will be evaluated
 - 80% of contacts to sputum AFB smear-positive TB cases with newly diagnosed latent TB infection (LTBI) will start treatment
 - 75% of contacts to sputum AFB smear-positive TB cases who have started treatment for the newly diagnosed LTBI will complete treatment

Status

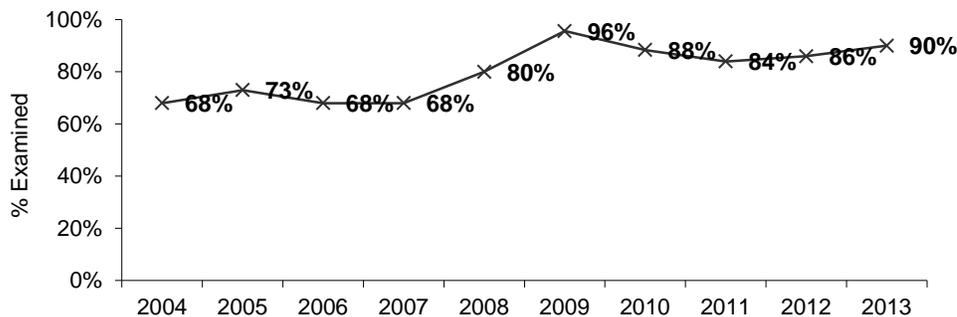
Table 8: Performance Targets for Contact Investigations

Targets	2011	2012	2013	2014*
Cases with named contacts (%)	100%	100%	96%	*
# contacts per case	11.23	10.89	8.83	*
Contacts evaluated (%)	84.3%	85.7	90	78
% contacts with LTBI	42%	38%	44%	22%
% contacts with TB disease	6.69%	8%	11%	*
Contacts with LTBI who started Rx** (%)	81%	74%	80%	69%
Contacts with LTBI who completed Rx (%)	67%	72%	82%	44%

*Preliminary Data – not available

**Contacts with newly identified LTBI who were not previously treated for LTBI

Figure 12: Percent of contacts to AFB smear positive cases who were examined



*Preliminary data for 2013

Major Findings

This objective was partially met:

Analysis is based on 2013 data, as not all 2014 contact investigations are complete.

- For 2013, 96% of cases had contacts elicited (Table 8). Ninety percent of contacts were evaluated in 2013, and 44 percent were found to be infected with LTBI. Eighty percent of newly infected contacts started therapy, and 82 percent completed therapy, an improvement from prior years. We believe that this result is due to nurse-to-nurse training regarding case management and contact evaluation. In addition, the TB Program

developed updated contact evaluation forms that many public health nurses are using to record results of their investigations. Data from 2014 are still preliminary.

See Appendix E for ongoing programmatic efforts to improve contact investigations.

Barriers

The challenges to identifying and locating contacts in remote Alaska, accessible only by small aircraft, have already been discussed in previous grant proposals. These challenges have not changed. We anticipate increased completion rates with increased use of the 12 week isoniazid/rifapentine regimen.

Objective 4: Laboratory Reporting: Turn-around Time & Drug Susceptibility Results

Performance Targets

- By December 31, 2012:
 - 80% of culture-positive or nucleic acid amplification test-positive *M. tuberculosis* complex results will be reported by the laboratory within 21 days from the date the initial specimen is received.
 - 100% of initial *M. tuberculosis* isolates will undergo susceptibility testing
- By December 31, 2015:
 - 85% of culture-positive or nucleic acid amplification test-positive *M. tuberculosis* complex results will be reported by the laboratory within 21 days from the date the initial specimen is received.
 - 100% of initial *M. tuberculosis* isolates will undergo susceptibility testing

Status

Table 9: Laboratory turn-around times for TB culture and susceptibility reports

Laboratory Objectives	2010	2011	2012	2013	2014
% positive AFB cultures reported within 21 days	78%	93%	92%	85%	85%
% <i>M. tuberculosis</i> isolates sent for susceptibility testing	100%	98%	100%	100%	100%

Major Findings

The objective for reporting within 21 days was met in 2012, 2013, and 2014. All isolates at the Alaska State Public Health Laboratory and outside reference laboratories underwent susceptibility testing in 2012, 2013, and 2014.

Barriers

Sputum specimens from remote Alaska can take from 7 days or longer to arrive at the State Laboratory. During winter months, specimens may undergo one or more freeze-thaw cycles during transit. This can increase bacterial overgrowth as well as the viability of the *M. tuberculosis* organism, delaying isolation in culture. These situations are out of the Laboratory’s control, but may contribute to delays in turn-around times for culture.

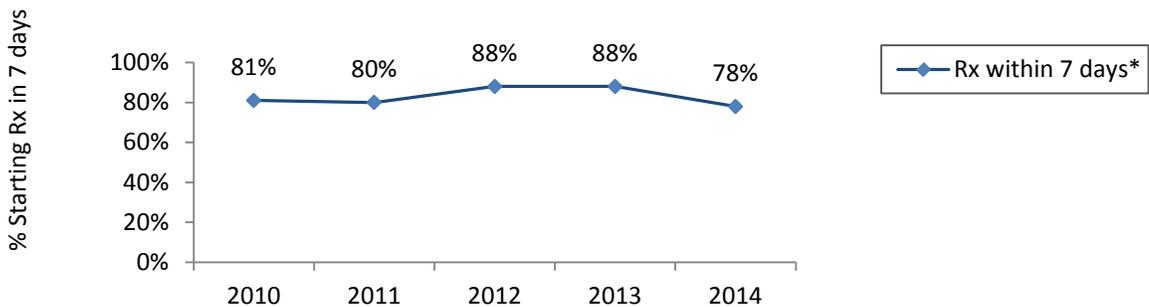
Objective 5: Treatment Initiation

Performance Targets

- By December 31, 2012, 70% of TB patients with positive AFB smears will begin treatment within 7 days of specimen collection.
 - By December 31, 2015, 90% of TB patients with positive AFB smears will begin treatment within 7 days of specimen collection.

Status

Figure 13: TB treatment initiated for AFB+ cases ≤7 days of report to the Alaska TB Program*



*Dead at diagnosis and unknown status excluded

Major Findings

When our program fully transitions and implements the new TB program module to replace TIMS, data accuracy and completeness will improve.

We have met the 2012 objective each year since 2010, and the goal for 2015 of 90% of TB patients with positive AFB smears beginning treatment within 7 days of specimen collection will be difficult to achieve in Alaska, due to barriers mentioned below.

Barriers

Specimens from rural Alaska may take up to 7 days (sometimes longer) to arrive at the State Laboratory. Occasionally the collection date is not written on the specimen container or requisition slip. Many specimens are collected in remote villages with non-licensed community health aides (CHAs) serving as health care providers. There is a high turn-over rate for CHAs and education about collection and labeling of sputum specimens has not been successful.

Objective 6: Sputum Culture Conversion

Performance Targets

- By December 31, 2012, 55% of TB patients who have culture-positive sputa will have culture negative sputa within 60 days of initiating treatment.

- By December 31, 2015, 61.5% of TB patients who have culture-positive sputa will have culture negative sputa within 60 days of initiating treatment.

Status

Table 10: Days of treatment to sputum culture conversion for culture-positive TB cases

Days of treatment until sputum culture conversion (days)	2010 (45 cult. + cases)	2011 (55 cult + cases)	2012 (49 cult + cases)	2013 (52 cult. + cases)	2014* (29 cult. + cases)
0 – 60	23 (51%)	31 (63%)	24 (49%)	30 (58%)	15 (52%)
61 – 120	10 (22%)	15 (31%)	15 (31%)	15 (29%)	9 (31%)
121 - 180	4 (9%)	3 (6%)	2 (4%)	3 (6%)	0 (0%)
181 - 240	0 (0%)	0 (0%)	1 (2%)	1 (2%)	0 (0%)
241 - 300	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
301 - 365	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
No documented conversion (died or other)	7 (16%)	6 (11%)	7 (14%)	3 (6%)	5 (17%)

*Preliminary data

Major Findings

In 2012, of 49 culture-positive TB cases, seven patients either died or had unknown status. Of the total 49 cases, 24 (49%) had documented sputum conversion within 60 days of treatment initiation. Another 15 (31%) converted within 120 days, two cases had conversion between 121-180 days after beginning treatment, and one case converted between 181-240 days.

Extensive disease requiring an extended treatment regimen, delays in obtaining sputum because of remote location or failure to request a sputum, and poorly compliant patients continue to play roles in delays of culture conversion.

In 2013, 30 (58%) of 52 culture positive cases converted within 60 days, while 19 (37%) converted in greater than 60 days. Data for 2014 are still preliminary, with 15 (52%) of 29 culture positive cases converting within 60 days.

Barriers

Community health aides (CHAs), the primary care providers in many remote villages, are sometimes unaware of the need to document sputum conversion. High turnover of community aides makes ongoing education a daunting task. In some communities, the role of CHAs in the care of TB patients is not clear. As a result, sputum may not be collected on a monthly basis, and prolonged conversion data may be misleading. Improved communication, collaboration and clearly identifying roles and responsibilities may lead to improved outcomes.

We are still in the process of switching from TIMS to a new data system, a TB PAM that is a component of our disease surveillance system AK STARS. We are still working with the vendor to develop and implement this system, and analysis of TB data is still a challenge. Much of the analysis for this report was done by individual chart review – a time consuming process.

Additionally, State public health law has not been effective in helping us assure treatment of non-compliant patients.

Objective 7: Data Reporting

Performance Targets

- By December 31, 2012, 99% of core RVCT⁴ data items will be reported to CDC. This proportion will be maintained through 2015
- By December 31, 2012, 80% of ARPE⁵ core data will be reported to CDC.
 - By December 31, 2015, 100% of ARPE core data will be reported to CDC.
- By December 31, 2012, for individuals who can be located, 60% of core EDN⁶ data items will be reported to CDC
 - By December 31, 2015, for individuals who can be located, 90% of core EDN data will be reported to CDC.

Status

RVCT

RVCT data transmission for 2010 to the CDC TB Elimination program using our new TB program area module was started in February 2011. One field remains incomplete from 2012, and two fields remain incomplete for 2013, with greater than 99% of core RVCT data items reported. Data for 2014 are still preliminary. See Appendix B for more detail.

ARPE Reports

Our 2012 and 2013 ARPE reports have been submitted to CDC.

Major Findings

The RVCT data and ARPE reports are in good standing as of 2014 . Although the new TB PAM is able to electronically transmit all RVCT fields to CDC, we continue to work with the new module, and with the export and query functions to be able to analyze the data for programmatic reports. Unfortunately, much of the program evaluation is still done using hand review of paper charts. Currently, we are unable to extract the EDN data to analyze it for this report, although we are working on plans to improve our EDN system.

Barriers

See above comments.

⁴ Report of Verified Tuberculosis Case manual at <http://www.cdc.gov/tb/programs/rvct/ParticipantManual.pdf>

⁵ Aggregate Reports for Tuberculosis Program Evaluation manual:
http://www.cdc.gov/TB/publications/PDF/ARPEs_manualsm1.pdf

⁶ Electronic Data Notification, a secure Internet based system for immigrants and refugees with B1 and B2 tuberculosis classification, developed and implemented by the Division of Global Migration and Quarantine (DGMQ).

Objective 8: Recommended Initial Therapy

Performance Targets

- By 2012, at least 93.4% of patients with TB will start treatment using a 4-drug regimen.
 - By 2015, at least 95% of patients with TB will start treatment using a 4-drug regimen.

Status

Table 11:

Number of drugs used at initiation of treatment	2010	2011	2012	2013	2014
0	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
1	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
2	0 (0%)	0 (0%)	0 (0%)	1 (1%)	0 (0%)
3	5 (9%)	6 (9%)	4 (6%)	1 (1%)	5 (8%)
4	49 (86%)	59 (88%)	58 (89%)	66 (93%)	55 (89%)
>4	3 (5%)	2 (3%)	3 (5%)	3 (4%)	1 (2%)
Total	57 (100%)	67 (100%)	66(100%)	71(100%)	62 (100%)

*

Major Findings

The intent of this objective was met. In 2012, 94% of 66 cases started at least 4 drugs initially, and 97% of cases in 2013 did so. One patient counted in 2013 was a clinical case from a previous year who was started on two drugs, and one case in 2013 was a child contact to a known pan-susceptible case who did not get ethambutol started. In 2014, one case was dead at diagnosis, one was pregnant at diagnosis and did not receive pyrazinamide, and others were known to be pan-susceptible at start of medications and did not require ethambutol.

Barriers

Public health nurses and providers in Alaska have accepted the 4-drug regimen as the standard of care. In cases where the TB patient is epidemiologically linked to another case with known susceptibilities, the patient may be started on a 3-drug regimen. There are occasions where a four drug regimen may not be appropriate or necessary.

Objective 9: Universal Genotyping

Performance Targets

- By December 31, 2012, at least 94% of all first *M. tuberculosis* isolates of TB patients will be submitted for genotyping results.
 - By December 31, 2015, at least 98% will be submitted for genotyping results.

Status

All *M. tuberculosis* isolates processed at the Alaska State Public Health Laboratories were submitted for genotyping in 2013 and 2014. The Alaska TB Program makes every attempt to collect isolates from specimens that were sent to out-of-state laboratories and send them for genotyping as well.

Major Findings

Overall, the system for *M. tuberculosis* genotyping is working well and provides valuable epidemiological data to the Alaska TB Program.

Barriers

Out-of-state reference laboratories do not routinely send Alaska resident TB isolates to the State Public Health Laboratory. The Alaska TB program must make special arrangements for isolates from outside reference laboratories to be sent to our state laboratory, where they will be forwarded for genotyping.

Objective 10: Known HIV Status

Performance Targets

- By December 31, 2012, at least 80% of patients with tuberculosis who are 15 through 54 years of age will undergo HIV testing.
 - By December 31, 2015, at least 95% of patients with tuberculosis who are 15 through 54 years of age will undergo HIV testing.

Status

Table 12: HIV status for TB cases 15-54 years of age

Year	TB Cases offered HIV testing					HIV testing not offered	Unknown or blank	Total
	HIV -	HIV +	Refused testing	Result unknown	% Offered testing			
2010	32	1	0	0	100%	0	0	33
2011	38	1	0	0	98%	1	0	40
2012	42	0	1	0	100%	0	0	43
2013	39	0	0	0	98%	1	0	40
2014	29	0	1	0	100%	0	0	30

Major Findings

This objective was met. There has been overall acceptance of HIV testing by both providers and TB patients.

Barriers

There are few barriers to HIV testing, even in the most remote parts of the state. This is a vast improvement when compared to 10 years ago.

Objective 11: Evaluation of Immigrants and Refugees

Performance Targets

- By December 31, 2012, 75% of immigrants and refugees will initiate medical evaluation within 30 days of arrival to the U.S.
 - By December 31, 2015, 85% of immigrants and refugees will initiate medical evaluation within 30 days of arrival
- By December 31, 2012, 65% of those who initiate medical evaluation will complete evaluation within 90 days of arrival to the U.S.
 - By December 31, 2015, 75% of those who initiate medical evaluation will complete evaluation within 90 days of arrival to the U.S.
- By December 31, 2012, 50% of those who are diagnosed with LTBI, for who treatment is indicated, will start treatment
 - By December 31, 2015, 65% of those who are diagnosed with LTBI, for who treatment is indicated, will start treatment
- By December 31, 2012, 40% of those who are initiate LTBI treatment will complete an accepted course or treatment
 - By December 31, 2015, 50% of those who are initiate LTBI treatment will complete an accepted course or treatment

Status

During 2012, 149 immigrants and refugees were reported to Alaska. Data available at this time is reflected in the table below.

Table 13: Parameters for TB Evaluation of Immigrants and Refugees

	2012	2013	2014*
Total number of immigrants/refugees reported to the AK TB Program through EDN	151 (100%)	147 (100%)	166 (100%)
TB evaluation initiated \leq 30 days of arrival in U.S.	48 (32%)	46 (31%)	36 (22%)
TB evaluation initiated and completed \leq 90 days of arrival in U.S.	37 (77%)	35 (76%)	30 (83%)
LTBI treatment initiated	28 (57%)	8 (44%)	*
LTBI treatment completed*	1 (4%)	0 (0%)_	*

*incomplete data

Major Findings

This objective is partially met. In 2012, 32% of immigrants and refugees had required TB evaluation initiated within 30 days, and this dropped to 31% in 2013. This is primarily due to staffing difficulties and work backlogs currently being experienced at the Municipality of Anchorage, where the majority of immigrants and refugees in Alaska seek their evaluations. However, in 2012 77% of immigrants and refugees who initiated their evaluation completed the evaluation within 90 days of arrival, with 76% doing so in 2013. In 2012, 57% of those offered LTBI treatment initiated therapy, with 44% doing so in 2013.

In 2014, we received funding related to preparedness which will assist the Municipality of Anchorage with their electronic disease notification system.

EDN adds yet one more data system to the TB Program, one that is slow and cumbersome from the state’s perspective. We continue to learn how to extract some of the data to allow analysis for this objective. The next steps are:

1. Continue to educate public health nurses throughout the state on the use and reporting of the data forms
2. Develop a reminder system to enhance the return of report forms.
3. Enter the data back into EDN in a timely manner.

Barriers

The EDN system has made the process of immigrant/refugee follow-up more cumbersome for us. The paperwork has increased, and this has led to confusion at the public health center level. We have had to develop an educational program to train the local public health nurses on the process and use of the new forms. The data, once entered, are cumbersome to extract and analyze, although we are hopeful that this will improve as the system is upgraded and we gain more experience.

Objective 12: Sputum-Culture Reported

Performance Targets

By December 31, 2012, 95.7% of patient with pleural or respiratory site TB aged 12 years or over will have a sputum-culture result reported. This rate will be maintained through December 31, 2015.

Status

Table 14: Sputum culture reports for pulmonary & pleural TB cases

	2011	2012	2013	2014
Sputum culture report available	59 (100%)	58 (98%)	61 (100%)	54 (98%)
No sputum culture report available	0 (0%)	1 (2%)	0 (0%)	1 (2%)
Total pulmonary/pleural cases	59	59	61	55

Major Findings

This objective is being met.

Barriers

Pediatric cases and those who initiate treatment in other countries may not submit sputum specimens.

Objective 13: Program Evaluation

Cohort Review:

The Alaska TB program performed one cohort review with the Municipality of Anchorage Department of Health and Human Services (MOA DHHS) in February 2011. MOA DHHS has approximately 40 to 45% of all TB cases in the state annually. In addition, they provide services for cases from other regions of the state who are in Anchorage for consultative

services. Currently, the Alaska TB Program performs case reviews of all MOA DHHS active TB cases on a twice-monthly basis.

Please see Appendix D for an update of our program evaluation project.

Objective 14: Human Resource Development Plan

Please see Appendix D for an update on our human resource development plan.

Objective 15: Training Focal Point

Karen Martinek serves at the Alaska TB Program Training focal point.

New Objectives

School Screening:

Although not currently recommended by the Centers for Disease Control and Prevention, broad school based screening for tuberculosis continues in Alaska. In Alaska, each public school district and non-public school offering pre-elementary education through the 12th grade is required to administer a PPD to all students newly enrolled in the district in kindergarten or higher, and to all students in grades kindergarten and seventh grade. Additionally, annual testing for all grade levels is required for designated districts considered to have historically high rates of tuberculosis.

The Alaska TB program has analyzed school TB data from the past ten years, to assess the impact and feasibility of continuing this program. In 2014, the TB program has updated its guidance for schools, please visit the TB program website for more details. A TB risk assessment can now be used in low-incidence school districts, to avoid unnecessary TB testing for low risk students.

B. TB Public Health Laboratory

The Alaska State Public Health Laboratory (ASPHL) TB department is located in Anchorage, Alaska and is the only full-service TB laboratory in the state. ASPHL processes patient samples, identifies mycobacteria and performs first-line drug susceptibility testing of *Mycobacterium tuberculosis* complex isolates. Currently, three microbiologists share the duties of performing all testing in the TB Laboratory and report to upper management as needed.

Organizational Chart of the ASPHL TB Laboratory



1. Methods used by the ASPHL for TB sample processing and analysis

TB specimen processing occurs Monday through Friday. All specimens received by 8:00 am are processed the same day as received. All samples are logged into *Horizon*, ASPHL's Laboratory Information Management System (LIMS). The system assigns a laboratory accession number, appropriate tests to each sample, and generates labels for each container. This is followed by demographic information entry for each specimen (i.e., patient name, date of birth, unique identifier, collection date and time, submitter, etc.).

Samples are processed using a NALC-NaOH digestion-decontamination procedure. All specimens are inoculated onto a Middlebrook 7H10 or Selective 7H11 plate. All specimens (with the exception of blood and stool) are inoculated into BACTEC MGIT 960 liquid medium. Acid Fast Bacilli (AFB) concentrated smears are prepared, read and reported the same day the sample is processed. Positive smear results are called to the submitter and the Section of Epidemiology – TB Control the same day they are observed.

Negative cultures generate a preliminary report at three weeks and a final report at six weeks which are mailed to each submitter. Positive cultures are reported to the submitter and TB Control via telephone/fax as soon as a positive identification is made and final reports are

mailed. *Mycobacterium tuberculosis* complex is identified using the HOLOGIC Gen-Probe® AccuProbe® or the Agilent MIDI HPLC mycolic acid analysis identification test. Susceptibilities are performed on all initial positive *M. tuberculosis* specimens. First-line drug susceptibilities are performed using the BACTEC™ MGIT™ 960 liquid culture system. All drug-resistant isolates are retested in-house and sent to National Jewish Health for confirmation. Results are immediately reported to the submitter and to TB Control. Repeat identification and susceptibilities are performed only if the patient is culture positive three months after initial identification.

ASPHL Workload	2010	2011	2012	2013	2014
a. Total number of clinical specimens processed and cultured	4,394	5,151	5,725	5,405	5,604
b. Number of individual patients for whom a clinical specimen was processed and a TB culture inoculated	2,010	2,166	2,397	2,259	1,960
• Number of individual patients for whom at least one culture was positive for <i>M. tuberculosis</i> complex	46	57	49	59	48
c. Number of individual patients for whom a reference isolate was received by ASPHL to rule out or confirm the identification of <i>M. tuberculosis</i> complex	0	0	0	0	0
• Number of individual patients that had at least one reference isolate identified	0	0	0	0	0
d. Number of individual patients for whom <i>M. tuberculosis</i> drug susceptibility tests were performed for first-line drugs	46	60	50	58	48
e. Number of individual patients from ASPHL for whom a clinical specimen was tested directly with a NAAT or other rapid detection test	2	4	111	145	190
f. Number of individual patients for whom ASPHL referred an isolate of <i>M. tuberculosis</i> complex for genotyping	50	57	51	59	49

2. Progress towards meeting CDC recommendations as described in Tenover, et al. and Styrt et al. and the Healthy People 2020 goal.

Meeting sample transit time goals is a continued challenge for the ASPHL and remains out of ASPHL’s ability to change. As of 2014, approximately 59% of all TB samples are collected in the Anchorage/Mat-Su area and are delivered by courier services within 1 – 3 days. At least 41% of all TB specimens originate outside the Anchorage/Mat-Su area. Alaska is unique geographically, and the vast distance, absence of roads, extreme weather conditions

and sporadic transportation schedules play a significant role in sample transit time for these specimens.

2010	2011	2012	2013	2014	Description of turnaround times (TAT) for initial diagnostic specimens
					1. Promote rapid delivery of specimens. (TAT goal: Specimens should be received in the laboratory within 24 hours of specimen collection.)
33%	36%	41%	33%	44%	% of specimens received within 1 calendar day
48%	49%	53%	47%	60%	% of specimens received within 2 calendar days
63%	61%	65%	60%	71%	% of specimens received within 3 calendar days
					2. Use fluorescent acid-fast staining and promptly transmit results by phone, FAX or electronically. (TAT goal: Report acid-fast microscopy results within 24 hours of specimen receipt.)
94%	93%	98%	97%	96%	% of AFB results reported within 1 calendar day
94%	96%	99%	98%	98%	% of AFB results reported within 2 calendar days
97%	97%	100%	100%	99%	% of AFB results reported within 3 calendar days
					3. Identify growth as acid-fast and use rapid methods to identify isolates as <i>M. tuberculosis</i> complex as soon as possible and report result promptly. (TAT goal: 14-21 calendar days from receipt.) Report the percent of <i>M. tuberculosis</i> complex isolates identified from initial diagnostic specimens (e.g. sputum, CSF, etc.) identified within 21 calendar days.
78%	93%	92%	85%	85%	% of <i>M. tuberculosis</i> isolates identified within 21 calendar days
					4. Determine the susceptibilities (DST) of initial <i>M. tuberculosis</i> complex isolates to first-line drugs in a rapid culture system and report results promptly. (TAT goal: 21-28 calendar days from receipt of specimen.) Report the percent of SIRE susceptibility results reported for <i>M. tuberculosis</i> isolates from initial diagnostic specimens within 28 days.
65%	80%	69%	49%	54%	% of 1 st line DST results reported within 28 calendar days
0	0	18	6	23	5. Report the number of individual patients for whom laboratory confirmation of tuberculosis was provided within 48 hours of clinical specimen (i.e., sputum, CSF, etc.) receipt (i.e., use of NAAT or direct HPLC)

3. Laboratory Goals

Component I: CDC and HP2020 Recommended Laboratory Activities and Turnaround Times

Program Need

ASPHL needs to continue improving turnaround times for first-line drug susceptibility results (21-28 days). Multiple susceptibilities were delayed because of low Growth Units (GU) in the Growth Control tube of the MGIT SIRE AST.

ASPHL needs to meet the 48 hour TAT in the diagnosis of *Mycobacterium tuberculosis* complex. The TB laboratory implemented an in-house Real-time PCR test for the identification of *M. tuberculosis* complex in February 2012.

Objectives

1. ASPHL will improve the TAT for first-line drug susceptibility results.
2. ASPHL will perform the in-house NAAT for laboratory confirmation of *M. tuberculosis* complex to meet the 48 hour TAT.

Method

1. ASPHL will perform an in-house study comparing different dilutions of the Growth Control suspension to resolve the problem of low Growth Units (GU) in the Growth Control tube of the SIRE AST.
2. ASPHL will perform the in-house NAAT for the identification of *M. tuberculosis* complex on AFB smear positive patients 3 days a week: Monday, Wednesday and Friday.

Evaluation

1. ASPHL will monitor the Growth Units (GU) in the Growth Control tube of SIRE AST as they are removed from the BACTEC MGIT 960 instrument.
 - In 2014, there were 2 (4%) susceptibility failures due to low Growth Units. In 2013, there were 7 (12%) separate failures.
 - An in-house study was performed comparing the failure rates of a Growth Control tube prepared to a 1:50 dilution with the recommended 1:100 Growth Control for MGIT 960 SIRE. There were no Growth Control tube failures for either dilution during the study period. It was noted that the increased dilution to 1:50, only slightly improved the TAT (an average of 13 fewer hours). As a result, ASPHL has decided to continue to follow the recommended 1:100 Growth Control standard for BACTEC™ MGIT™ 960 SIRE susceptibility testing.
 - Additional consultation with Becton Dickinson revealed that en-route shipping conditions may contribute to Growth Control tube failures. ASPHL has since shipped all BACTEC™ MGIT™ 960 SIRE Kits overnight (Ground Shipping was used previously). There have not been any subsequent Growth Control tube failures following this change.

2. ASPHL will evaluate TAT by exporting TB PCR test data from the laboratory's LIMS (*Horizon*).
 - o ASPHL has been routinely performing TB PCR for the identification of MTC on initial AFB smear positive respiratory specimens. Seventeen (77%) of the twenty-two AFB smear positive samples identified as MTC were reported within the 48 hour TAT. TB PCR was performed on AFB smear negative specimens when requested by TB Control.

Component II: Development of a System to Provide Timely and Reliable Laboratory Testing in Support of TB Treatment and Control Efforts

Program Need

The ASPHL is the only full-service TB laboratory in the state and requires satisfactory samples to provide timely and reliable testing. It is important that the ASPHL continues to improve communication with submitters and health care providers regarding questionable samples received as well as any other aspects of TB testing.

Objectives

1. ASPHL will continue to provide feedback to specific submitters regarding unsatisfactory samples received for testing in a personalized annual report.
2. ASPHL will inform and educate public and private submitters about appropriate collection methods for AFB smear positive patients and/or newly diagnosed TB patients. This will reduce time and resources spent on replicate patient specimens.

Methods

1. Send a report with site specific data exported from ASPHL's Laboratory Information Management System (LIMS) to specific submitters. It will include the following information:
 - o Submitter
 - o Number of samples received for AFB testing
 - o Number of unsatisfactory samples with an explanation as to why they were rejected
 - o Helpful information on proper collection and transportation of samples (if needed)
 - o ASPHL TB contact information
2. A newsletter will be sent to submitters and healthcare providers with information specifying the number of samples that should be collected and submitted on AFB positive patients and/or newly diagnosed TB patients with additional guidance from the State of Alaska Tuberculosis Control Program.

Evaluation

1. Compare data every six months to determine a decrease in the receipt of unsatisfactory specimens.
 - In 2014, we received a total of 4,764 AFB specimens from 56 submitters from all over the state. There were 160 (3.4%) unsatisfactory samples received. This is a decrease of 0.5% from the previous year. ASPHL's goal is to have an unsatisfactory rate of 2.0% or less.
2. Follow-up with submitters and health care providers to answer any questions concerning the appropriate testing of AFB smear positive patients and/or newly diagnosed TB patients and make recommendations as needed.
 - ASPHL was unable to perform this task as desired due to staffing shortages and time constraints. This goal has been added to the 2015 CDC TB Elimination Cooperative Agreement.

Appendices

Appendix A: Summary information about tuberculosis in Alaska: 2005 – 2014

Appendix B: Surveillance Completeness Summary Report

Appendix C: Alaska Historical TB Control Objectives

Appendix D: TB Program Training and Human Resource Strategy Plan

Appendix E: TB Evaluation Plan Progress Report

Appendix A: Summary information about tuberculosis in Alaska: 2005-2014

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014 [†]
No. of TB cases	59	70	50	50	37	57	67	66	71	62
Alaska population	663,253	670,053	676,056	681,977	692,314	710,231	722,190	732,298	736,399	736,337
Alaska case rate (per 100,000)	8.9	10.4	7.3	7.3	5.3	8.0	9.3	9.0	9.6	8.4
USA case rate (per 100,000)	4.8	4.6	4.4	4.2	3.8	3.6	3.4	3.2	3.0	3.0
Alaska population 0-14 years	160,376	161,255	162,000	163,620	166,100	170,398	158,322	158,865	159,860	159,846
No. 0-14 yrs old (% total) (cases/100,000)	7 (12%) (4.4)	7 (10%) (4.3)	4 (8%) (2.5)	4 (8%) (2.4)	2 (5%) (1.2)	3 (5%) (1.8)	6 (9%) (3.8)	9 (14%) (5.7)	9 (13%) (5.6)	2 (3%) (1.3)
No. foreign born (% total)	17 (29%)	13 (19%)	8 (16%)	12 (24%)	9 (24%)	10 (18%)	16 (24%)	12 (18%)	16 (23%)	12 (19%)
No. homeless in Anchorage (cases/100,000)	1 (25)	28 (700)	9 (225)	6 (150)	3 (75)	6 (150)	12 (300)	2 (50)	5 (125)	8 (200)
No. with isoniazid-resistant TB	2	2	0	1	0	1	7	2	4	5
No. with multiple drug resistant TB (MDR-TB)*	0	1	0	0	0	1	4	1	0	1
No. offered HIV testing (% of total)	46 (78%)	52 (74%)	39 (78%)	38 (76%)	30 (81%)	47 (82%) [†]	58 (87%)	55 (83%)	62 (87%)	55 (89%)
No. TB cases infected with HIV	0	1	1	1	1	1	1	0	0	0
No. drug use (IV & non-IV) (% total)	2 (3%)	2 (3%)	6 (12%)	5 (10%)	1 (3%)	6 (11%)	8 (12%)	13 (20%)	6 (8%)	4 (6%)
No. excessive alcohol use (% total)	10 (17%)	31 (44%)	21 (42%)	18 (36%)	2 (5%)	13 (32%) [†]	29 (43%)	28 (42%)	18 (25%)	21 (34%)

* MDR-TB indicates resistance to both isoniazid and rifampin.

[†] Preliminary data

Appendix B: Surveillance Completeness Summary Report

RVCT Field	2010	2011	2012	2013	2014
Age	100.00	100.00	100.00	100.00	100.00
Sex	100.00	100.00	100.00	100.00	100.00
Ethnicity	100.00	100.00	100.00	100.00	98.39
Race	100.00	100.00	100.00	100.00	100.00
Country of Origin	100.00	100.00	100.00	100.00	98.39
Date Entered US	100.00	100.00	90.91	93.33	91.67
Patient Alive or Dead	100.00	100.00	100.00	100.00	100.00
Previous Case of TB	100.00	100.00	100.00	100.00	79.03
Previous Year TB	100.00	100.00	100.00	100.00	100.00
Major Site of Disease	100.00	100.00	100.00	100.00	100.00
Sputum Smear	100.00	100.00	100.00	100.00	100.00
Sputum Culture	100.00	100.00	100.00	100.00	100.00
Microscopic Exam	100.00	100.00	100.00	100.00	82.26
Culture of Tissue	100.00	100.00	100.00	100.00	83.87
Chest X-Ray	100.00	100.00	100.00	100.00	88.71
Skin Test	98.25	100.00	100.00	100.00	93.55
Hiv Status	100.00	100.00	100.00	100.00	91.94
Hiv Status Age 25-44	100.00	100.00	100.00	100.00	92.86
Homeless	100.00	100.00	100.00	100.00	96.77
Correction Facility at Dx	100.00	100.00	100.00	100.00	100.00
Longterm Care Facility at Dx	100.00	100.00	100.00	100.00	100.00
Start Therapy Date	100.00	100.00	100.00	100.00	100.00
Injecting Drug Use	100.00	97.01	100.00	100.00	90.32
Non-Injecting Drug Use	100.00	94.03	100.00	100.00	88.71
Alcohol	100.00	100.00	100.00	100.00	93.55
Occupation	98.25	100.00	100.00	100.00	79.03
Init Drug Susceptibility	100.00	100.00	100.00	100.00	100.00
Sputum Conversion	100.00	100.00	100.00	100.00	60.87
Stop Therapy Date	100.00	100.00	100.00	100.00	63.93
Reason Therapy Stopped	100.00	100.00	100.00	100.00	63.93
Health Care Provider	100.00	100.00	100.00	100.00	63.93
DOT	100.00	100.00	100.00	100.00	63.93
RIF	100.00	100.00	100.00	100.00	100.00
INH	100.00	100.00	100.00	100.00	100.00
Mean field completeness	99.89	99.73	99.73	99.80	90.17

Appendix C: Alaska Historical TB Control Objectives

(A) Treatment and Case Management of Persons with Active TB

1. At least 90% of persons with newly diagnosed TB, for whom therapy for one year or less is indicated, will complete therapy within 12 months by December 31, 2005.
 - 1.1. At least 95% of persons with newly diagnosed TB, for whom therapy for one year or less is indicated, will complete therapy within 12 months by December 31, 2009.
2. At least 95% of persons with newly diagnosed TB will receive an ATS/ISDA/CDC recommended regimen of treatment using directly observed therapy (DOT) by December 31, 2005.
 - 2.1. This objective will remain the same for December 31, 2009.
3. All A, B1, or B2 immigrants and refugees will be entered into a secure and confidential electronic database by December 31, 2005.
 - 3.1. At least 90% of all locatable A, B1, or B2 immigrants and refugees will be evaluated within 60 days of arrival in the state by December 31, 2009.
4. For at least 95% of all newly reported culture-positive TB cases, drug susceptibility results will be reported by December 31, 2005.
 - 4.1. This objective will remain the same for December 31, 2009.
5. For at least 80% of all newly reported TB cases age 25-44 years, HIV status will be reported in 2005.
 - 5.1. For at least 85% of all newly reported TB cases age 25-44 years, HIV will be reported in 2009.
6. By December 31, 2005, the incidence of TB among Alaska Natives will be reduced to no more than 35 cases per 100,000 population.
 - 6.1 By December 31, 2009, the incidence of TB among Alaska Natives will be reduced to no more than 30 cases per 100,000 population.

Note: Alaska has not had 50 or greater cases annually in U.S.-born African Americans.

(B) Contact Investigation

7. By December 31, 2005, at least 70% of contacts to sputum AFB smear positive TB cases will have completed evaluation of infection and disease within 5 months of diagnosis.
 - 7.1. By December 31, 2009, at least 85% of contacts to sputum AFB smear positive TB cases will have completed evaluation for infection and disease within 5 months of diagnosis.

8. At least 70% of infected contacts to sputum AFB smear positive TB cases will complete therapy by December 31, 2004.

8.1. At least 85% of infected contacts to sputum AFB smear positive TB cases will complete therapy by December 31, 2009.

(C) TB Surveillance/Reporting

9. All isolates will be sent to the regional genotyping laboratory for genotyping by December 31, 2004.

9.1. This objective will remain the same for December 31, 2009.

10. By December 31, 2004, 90% of all cases of TB will be detected through usual disease reporting and surveillance systems (e.g. telephone, Rapid Telephone Reporting system, or facsimile reports or through electronic laboratory reporting).

10.1. By December 31, 2009, 95% of all cases of TB will be detected through usual disease reporting and surveillance systems.

11. 100% of newly diagnosed cases of TB will be reported to CDC using the CDC-developed electronic reporting system and at least 95% of specified variables will be reported to the CDC annually.

11.1 This objective will remain the same for December 31, 2009.

12. By December 31, 2004, 100% of all suspected and confirmed cases of TB will be maintained in a secure, confidential TB registry that contains the elements needed for the national TB case report, Report of Verified Case of Tuberculosis (RVCT).

12.1 This objective will remain the same for December 31, 2009.

13. By December 31, 2004, 100% of TB/HIV co-infections will be detected through ongoing collaboration between the Alaska TB Program and the Alaska HIV/AIDS Program.

13.1 This objective will remain the same for December 31, 2009.

(D) Human Resource Development

14. The Alaska TB Program will develop a plan for TB Training and Education within 3 months after the cooperative agreement award, or some other defined date pending development of federal resources.

(E) Program Evaluation Activities

15. The Alaska TB Program will develop a program evaluation plan which will be completed in 2005 or some other defined date pending development of federal tools.

Appendix D: TB Program Training and Human Resource Strategy Plan Progress Report

Objectives and Activities

I) Goal I:

Establish and improve existing in-service TB training and human resource development

Objective 1:

Maintain designated TB training focal point/coordinator, ongoing.

Activities/Strategies:

- A. Identify TB program staff person to serve in this capacity.

Evaluation: *Completed/Ongoing*. Karen Martinek identified as focal point in 2005 and continued in this role throughout this funding cycle.

- B. Work plan will include focal point activities as an essential element.

Evaluation: *Completed/Ongoing*. Work assignment continues. Ms Martinek continues to be the focal point for TB training and human resource development in Alaska. She also continues to distribute TB news, resources and references by email, provides Nurse-to-Nurse Training in health centers across the state, and provides TB training for public health nurse (PHNs) and others via online webinars.

- C. Designated TB training coordinator will maintain membership in TBETN.

Evaluation: *Completed/Ongoing*. Active membership remains in place since 2004.

- D. Designated TB training coordinator will attend TB/ETN Biennial Conferences.

- E. Evaluation: *Completed/Ongoing*. Conferences are attended when scheduled. Last conference was held September 2014.

Objective II:

Maintain fully trained TB Program staff, ongoing.

Activities/Strategies:

- A. All new TB Program staff will participate in TB training courses at the Curry International TB Center, National Jewish Hospital, or equivalent TB training centers.

Evaluation: *Completed/Ongoing*. All long term TB program staff have completed TB training courses at the Curry International TB Center (CITC). Dr Michael Cooper has been in his role as Infectious Disease Epidemiologist/TB Controller since July 2011. He participated in a mini-fellowship at the CITC and attended the Denver TB Course in October 2011. He participates in the annual National TB Conferences and has been an invited speaker at several International Union Against TB and Lung Disease (IUATLD) meetings.

Peggy Cobey, RN, ANP, MPH, Nurse Epidemiologist, was hired in May 2012. Although Peggy had experience with Indian Health Service and the Community health Aide Program, she needed TB training. Unfortunately, the CITC Case Management and Contact Investigation (CMCI) training scheduled for September 2012 was cancelled. Ms. Cobey attended the CITC Clinical Intensive and TB Nurse Workshop in Seattle in June 2013. A new Nurse Epidemiologist, Leslie Felts, RN, MSN, was hired October 2013. She attended the November 2013 CITC CMCI Course in Oakland, CA. Additionally, she completed CDC TB Self-Study modules within a few months of hire.

- B. Current staff will maintain TB expertise by periodic participation in TB continuing education including face-to-face training, self-study modules and webinars.

Evaluation: *Completed/Ongoing*. All staff participate in periodic TB training webinars and online educational activities whenever possible. This includes webinars offered by CITC as well as other Regional Training and Medical Consultation Centers. Additionally, weekly information from emailed TB list serves which include references and resources are also reviewed by staff.

Objective III:

By 6/30/10, the new Alaska TB Manual will be in use statewide.

Activities/Strategies:

- A. *Revised Strategy* - TB Manual will be complete and posted online by 6/30/11. Periodic revisions will be done and posted as needed.

Evaluation: *Completed/Ongoing*. The target date for this was reset to 6/30/11. The TB Manual was posted online in November 2011. It has been very well received by partners and end users. Several major revisions such as incorporating information about the new short-course isoniazid-rifapentine regimen for LTBI treatment, and the availability of nucleic acid amplification testing at the State Laboratory were included.

A comprehensive revision was completed in November 2012 and posted. User feedback regarding the Manual has been extremely favorable.

B. *Revised Strategy* – Plans for a webinar have been deferred indefinitely.

Evaluation: *Ongoing*. Discussion continues with the Section of Nursing (SON) since the November 2011 posting of the Manual to identify training needs for PHN end users. To date, questions have been handled individually and no urgent training needs have been identified. As revisions to the Manual are completed and practice issues for PHNs are identified, the need for a training or update webinar will be revisited.

A subcommittee of the PHN/Epi TB Workgroup was formed in 2013 and has been meeting to review the PHN TB charting update. The intent of this group is to standardize PHN TB charting; update the TB encounter form and TB chapter of the charting manual; and insure that TB forms “support the practice”. Subcommittee members are reviewing the Alaska TB Manual and comparing SON and SOE TB forms. Recommendations or concerns noted by the group will be reviewed for inclusion in the next revisions to the Manual. The next updates and revisions to the Alaska TB Manual have been postponed and will be completed by the end of 2015 to incorporate the implementation of changes to school TB screening in addition to other updates.

PHNs, in collaboration with the Alaska TB Program, have also used the Alaska TB Manual as a resource to develop a TB Logic Model and TB Sweep Policies and Procedures for PHNs statewide.

Goal II:

Establish evaluation strategies to improve existing systems and to identify ongoing training and human resource needs.

Objective I;

By 12/31/09, the TB Program will use conference evaluation data from the September 2009 conference, *Tuberculosis: Thinking Globally, Acting Locally* to identify TB educational needs among participants.

Activities/Strategies:

- A. Conference participants will be asked to identify TB educational needs and topics of interest.

Evaluation: *Completed*. The conference was attended by 113 participants including PHN case managers, physicians, infection practitioners, and others. The conference was collaboratively planned and sponsored by the Alaska DHSS, the Municipality of Anchorage DHHS, Alaska Regional Hospital and the Alaska Chapter of the Association of Infection Control Practitioners (APIC). Participant evaluations were very positive. A question was included in the evaluation asking participants to list, "What TB continuing education topics would help you in your practice?" This information was compiled to identify perceived training needs among conference attendees.

- B.** Revised Strategy - Analyze results regarding educational needs identified by conference participants by 6/30/10.

Evaluation: *Completed*. Results have been analyzed. The training topics identified as "most helpful" by participants include: TB and LTBI treatment; case studies; laboratory/diagnostics, radiology, CT and medication updates, case management issues, and TST screening recommendations and issues.

Objective II:

By 12/30/10, an updated assessment of the educational needs of Alaskan providers will be completed.

Activities/Strategies:

- A. *Alaska TB program staff will collaborate with the Curry International TB Center (CITC) RTMCC to design and implement an updated needs assessment. Announcements and reminders were emailed to more than 200 individuals statewide.*

Evaluation: *Completed*. Needs assessment completed by CITC August 2010.

- B.** *Revised Strategy - Analyze results of needs assessment by 6/30/11.*

Evaluation: *Completed*. Summary of Alaska Needs Assessment received 4/7/11. A key informant interview was scheduled in April 2011 to review results with CITC staff and provide additional information about educational needs.

- C. Collaborate with PHN Training Academy Coordinator, PHN Regional Managers and Nurse Managers to further clarify current PHN TB training needs by 3/31/11.*

Revised Strategy – Continue periodic and ongoing meetings with Section of Nursing (SON) Training Coordinator to identify and meet educational needs of PHNs.

Evaluation: Completed/Ongoing. Several meetings were held with the Southwest Regional Manager and other staff in 2011 to discuss TB training/orientation and continuing education needs and related issues for new and established PHNs. Managers and staff continue to identify the need for TB training for new PHNs and periodic updates for existing staff as priorities. The PHN/EPI TB Workgroup was re-convened in September 2010 to address TB issues and solutions and has met at least three times yearly since 2011. The group has provided important feedback on the TB Manual and TB forms and remains a forum for the ongoing identification of TB education and training needs. Meetings have explored policy as well procedural TB issues including the TB drug ordering process, TB Sweep data sets and documentation, as well as collaboration on a formalized DOT training module which is currently in development.

- D. Collaborate with stakeholders – TB program staff, PHN staff and management, etc. – to identify priority needs by 5/31/11.*

Evaluation: Completed/Ongoing. Two to three educational priorities identified.

PHNs in South east Alaska identified the need for training on the updated guidelines and process for completing **TB screening for immigrants and refugees** per the 2007/2008 CDC revisions to the reporting format and guidelines. PHNs in Anchorage and Fairbanks have also identified this as a priority. In response to this request, a new module for *Nurse-to-Nurse (N2N)* Training was developed and incorporated into the July 2010 trainings held in Ketchikan and Juneau. The module was also presented to PHNs and other staff at the Municipality of Anchorage. This new session was very well received by all training participants and was incorporated into future *N2N* trainings since it is relevant to both high and low incidence regions. Revisions to this content will be made to incorporate the recent 2014 changes to the guidance and Electronic Data Network (EDN) Reporting Form. An overview of TB laboratory technologies has been incorporated into Nurse-to-Nurse Training.

The CDC requirement for implementation of **cohort review** by the end of 2010 necessitated the development of a cohort review process that will work throughout Alaska. Although a pilot test of Alaska's cohort review model was scheduled in Anchorage for November 2010, it was postponed until February 2011 due to staffing issues. The Municipality has Alaska's only dedicated TB nurse case managers, a part time medical officer and management staff who would be supportive of the process. Unfortunately, one of the two nurse case managers was on extended leave, leaving the remaining nurse case manager to oversee all essential TB prevention and control activities including the care

and treatment of all TB and LTBI patients, DOT and contact investigation, immigrant screening, etc. In March 2011, Karen Martinek participated in Utah's cohort review. Since their materials and process were used for the February 2011 review in Anchorage, it was very helpful to experience the "mature" Utah process with the benefit of data and a PowerPoint summary of each case presented. Development of the cohort review process and training for participating staff was a priority during the last quarter of 2011. Although another cohort review was projected during 2011, staff transitions and vacancies in the State TB Program did not allow this to occur.

Maggie Grinnell, a Public Health Associate Program (PHAP) worker, joined the program in July 2012 and compiled materials and forms used in many other jurisdictions for cohort review. After careful examination of her work, a decision was made to resume cohort review before the end of 2012. That decision, however, was reevaluated after Karen Martinek participated in the 2012 TB PEN/ETN Meeting and attended the breakout session and poster presented by the Washington TB Program, a long-standing champion of cohort review. Washington has reconsidered its cohort review process as a result of dwindling interest and participation in favor of more "real time" case reviews that also focus on indicator data. Alaska has continued to standardize monthly case review data elements, reporting, and feedback. TB Program staff and PHNs find monthly case conferences to extremely useful for "real time" discussion of case management and treatment issues that impact patient outcomes. The Alaska TB Program revisited retrospective cohort review again in 2013 but concluded that monthly case management meetings and teleconferences are more effective in improving patient management as well as outcomes due to Alaska's unique needs and resources. It is anticipated that the TB Program will reconsider cohort review at least annually. A statewide TB Workgroup was to be convened in the Fall of 2014 to consider this issue. Unfortunately, Alaska's limited TB staff and resources were required to quickly develop and implement an Ebola response for Alaska. It is anticipated that the TB Workgroup will be initiated in 2015.

The addition of the **Hospital Acquired Infection (HAI) Program** into the Infectious Disease/TB Program unit has also provided enhanced collaboration with infection practitioners (IPs) across the state. Due to turnover and hospitalization patients with TB in acute care facilities, the group has requested training in TB infection control, discharge planning, and collaboration with public health. Training was provided by webinar in April 2011, and was repeated at the annual APIC conferences in Anchorage in November 2011 and 2013 APIC Conference at the request of IPs.

Contact Investigation remains an educational priority as Alaska continues its program evaluation activities in the area. Work with the PHN/Epi TB Workgroup, SON management and direct interaction with PHNs on the phone and in the field helps to identify ongoing training needs and deficiencies. It became apparent during a large outbreak in a Yukon Kuskokwim (YK) village that even experienced PHN case managers were not always performing contact investigation activities according to CDC guidance and protocol detailed in the Alaska TB Manual. As a result, contact investigation forms are reviewed by TB Program staff and direct technical assistance/consultation is provided

to PHNs after initial contact investigation forms are submitted. It is anticipated that timely contact investigation, evaluation of contacts, and LTBI treatment of newly infected contacts will improve.

Providing continuing nursing education (CNE) units for training is often very important to nurses. In collaboration with public health preparedness activities, Kim Spink, EPI Team nurse and HAI Coordinator, became a CNE provider thru the Montana Nurses Association. Our ability to provide CNEs for attending TB training activities has been a bonus and important incentive for participants who attend TB and other training offered by the SOE.

In an effort to collaborate more fully within the Division of Public Health and with important external partners, the SOE Provider Unit is being reconfigured in 2014. Colleen McNulty, PHN Training Coordinator for SON, will assume the primary nurse planner role, and Kim Spink and Peggy Cobey will remain nurse planners for SOE. Additional nurse planners will be added including the School Nurse Consultant from Women's, Children, and Family Health, a nurse trainer from Quality Health, and a nurse trainer/coordinator from Alaska Respond (public health preparedness contractor).

Objective III:

By December 31, 2012, training sessions for at least two educational priorities will be developed and pilot tested with TB Program staff and at least one PHN region.

Activities/Strategies:

- A. Explore/review appropriate materials from CDC and other TB resources for priorities identified by 9/30/11.*
- II) Evaluation: Completed/Ongoing. Educational materials are reviewed on an ongoing basis. Nurse case management for PHNs continues to be a priority. Monthly case management teleconferences are routinely held with PHNs and invited providers in the Yukon-Kuskokwim, Norton Sound (Nome), Maniilaq (Kotzebue) and Fairbanks regions. Periodic teleconferences are also scheduled as needed with PHNs in other regions of the state. Monthly face-to-face meetings are also held to review Anchorage case and suspects with Municipality of Anchorage PHNs, Dr Chandler and outreach workers.
- B. Revised Strategy - Collaborate with TB program staff, PHN Training Academy Coordinator and Regional Nurse Managers on selection and development of PHN training sessions by 12/30/12.*

III) Evaluation: Completed/Ongoing. Meetings held. The need for PHN training modules has become less of a priority for SON as it has focused more heavily on online training, including TB training, for new PHNs. Dialogue with SON continues and strategies for providing basic TB to new PHNs through the “PHN Academy” webinar series will continue to be explored. It is likely that TB training will be incorporated into the Spring or Fall 2013 series. A new module on “Epidemiology 101” was developed as an adjunct to Nurse-to-Nurse Training. It was first presented in Barrow in August and was used again in Nome in September 2012. It was well-received.

IV) PHN Academy modules on Infectious Disease Investigation and TB were revised and presented by webinar in January, July and December 2014.

C. Training sessions developed for two focus areas by 6/30/12.

V) Evaluation: Completed/Ongoing. A module on Immigrant and Refugees Screening was developed and presented to PHNs in several areas of the state during Nurse-to-Nurse Training. It was also offered to PHNs statewide in webinar format in July 2011.

VI) During this funding cycle, Nurse-to-Nurse Training content has been revised to incorporate advanced case management knowledge and skills. The training is usually offered in high incidence areas of Alaska 1-2 times a year to ensure that new PHNs have timely training and seasoned staff have a “refresher” course in addition to updates. A Nurse-to-Nurse Lite module was developed early in 2014 primarily as a refresher course for previously trained PHNs. The four-hour module covers diagnosis and treatment of TB and LTBI, nurse case management and contact investigation. It was piloted in Bethel in April 2014 and was so well-received that it is the preferred training for most PHNs statewide. It has since been presented in these public health centers during 2014: Juneau – May; Nome – August; Anchorage – October and MatSu – November. The traditional one-day Nurse-to-Nurse training was also presented in Anchorage in January 2014.

VII) A TB infection control module was also developed and presented in April and November 2011. It was offered again during the September 2013 APIC Conference in Anchorage.

D. Training sessions piloted tested on TB Program staff and one PHN region by 12/31/12.
Evaluation: *Completed.* Training(s) held. See above.

Goal III:

Establish and improve patient education and communications capacity within the program.

Objective 1:

Revised Goal. By 12/30/13, the TB Program will collaborate with PHNs to update at least two types of educational materials specific for Alaska Native peoples. This

activity will build upon outreach and training provided to PHNs and providers in high incidence areas.

Activities/Strategies:

- A. Identify prospective members of a PHN / Epi TB Workgroup representing at least three large regions including the Yukon-Kuskokwim Delta, North Slope, Norton Sound (Nome), Bristol Bay, Maniilaq (Kotzebue) and the Anchorage area.*

Evaluation: Completed. The PHN / EPI TB Workgroup was reconvened in September 2010. At least three meetings are held each year.

- B. Identify simple print material targeting Alaska Native populations that can be used to reinforce essential elements of PHN case management such as treatment of LTBI, treatment of active TB, etc.*

- C. Revised Strategy 1 – Explore options for print and/or radio public service announcements (PSAs) to deliver public health messages that raise community awareness and reinforce important elements of community-based TB prevention and control such as symptoms of TB, TB transmission, and the importance of TB and LTBI treatment, etc. in high incidence regions of Alaska.*

Revised Strategy 2 – The PHN/Epi TB Workgroup identified the development of a training module for community-based DOT Aides (who are usually Alaska Native) as an important priority during this reporting period. An Ad Hoc Committee of PHNs and TB program staff has been convened to identify content, review available materials, and proceed with the development of a training module tailored to Alaska's needs. The Nurse Manager of the Bethel Public Health Center will take a lead role in the development of DOT training as a doctoral project. It is anticipated that current DOT Aides will provide input before and during the development of the module through key informant interviews or surveys.

Evaluation Revised Strategy 1: Ongoing. Due to staff changes and vacancies, little progress was made in this area. A National Public Radio (NPR) story on TB in Alaska was aired statewide and nationally in April 2012. It included a background interview with a former TB patient and family member who is also a Community Health Aide/Practitioner (CHA/P). The story included a joint interview with Dr Michael Cooper and Karen Martinek.

Evaluation Revised Strategy 2: Ongoing. The Committee informally interviewed current DOT Aides for feedback on issues and content to include in the DOT Training Manual. Due to a change in graduate programs during 2014, the Nurse Manager of the Bethel

Health Center declined the lead on this project which has since shifted back to Epi/TB program staff. Karen Martinek and Peggy Cobey have developed a draft which will be reviewed by both the Bethel Nurse Manager and her PHN staff by the end of March 2015. Field testing is planned to start in April 2015. A final version of the DOT Manual should be available during the last quarter of 2015.

D. Explore options for developing a TB educational video telling the stories of Alaska Natives treated for tuberculosis.

Evaluation: *Ongoing*. Currently, the “What is TB? (not TV)” DVD produced by the British Columbia Centre for Disease Control, Canada, is being used for community education in many villages across Alaska. It incorporates story-telling about tuberculosis, so important in Alaska native cultures, to provide TB education to a lay audience. To date, this is the most culturally-appropriate TB education film available and has been very well-received by PHNs and communities. Due to competing priorities and dwindling resources, development of culturally appropriate print or video materials has not occurred. We will continue to assess the need to develop an Alaska-specific educational video with stakeholders.

E. Reassess patient education and communications capacity of the TB Program in FY2014.

Evaluation: *Ongoing*. Reevaluation of needs will continue annually.

Goal IV:

3. Coordinate training related to TB control with training for other disease control interventions such as HIV/AIDS, STD and Hepatitis.

4.

Objective 1:

By June 30, 2011, collaborate with the AIDS/STD and Hepatitis Programs to explore training needs.

Activities/Strategies:

- A. Work with AIDS/STD and Hepatitis program managers and staff to identify TB training needs and educational strategies continues. Informal meetings are held at least twice a year with AIDS/STD staff to discuss TB training needs. The Alaska Hepatitis Program Coordinator, Ginger Provo, is one of five Nurse Epidemiologists working in the Infectious Disease Team. As such, her routine duties include oversight of TB case management by PHNs. Ms. Provo is also a member of the statewide HIV Prevention Planning Group, which meets quarterly. This relationship provides an ongoing mechanism to identify TB training needs in AIDS/STD staff, their community partners and the population served.*

Evaluation: *Ongoing/Completed*. Informal meetings continue with TB, hepatitis, and AIDS/STD staff.

- B. Explore options for using experienced disease investigation HIV/STD staff to train PHN case managers on interviewing skills to improve contact investigations as needed.*

Evaluation: Meetings held.

- C. Revised strategy – Nurse Managers from the SON have not identified the need to provide additional training to PHNs on interviewing skills at this time. Contact investigation data suggest that the improved contact investigation goals detailed in Alaska’s Program Evaluation plan are being sustained. Revisit the need for providing training on advanced interviewing skills annually.*

E. Evaluation: Completed/Ongoing. Training(s) developed and held. At this time, Nurse-to-Nurse Training is meeting the educational needs of PHNs per the PHN Trainer and the PHN/Epi TB Workgroup.

- D. Revised strategy - Develop and provide TB training to AIDS/STD or partner agencies staff as needed.*

F. Evaluation: Ongoing. AIDS/STD staff continues to decline formal TB training. Coinfection is rare and informal training is meeting current needs. Will track training(s) developed and held as needed.

5.

Goal V:

Target other health care providers or organizations serving high-risk populations.

Objective 1:

By 12/31/13, provide training about the diagnosis and treatment of TB to providers in at least three of the 12 regional Native Corporation areas where TB incidence is highest.

Activities/Strategies:

- A. Explore educational needs with lead regional medical staff.*

Evaluation: *Ongoing*. Dr. Michael Cooper continues to develop important relationships with providers across the state through face-to-face encounters, telephone consultations,

presentations, interviews, and participation in monthly grand rounds in several Anchorage hospitals. These activities also help to provide important insight about the educational needs of the medical and provider community. He and staff have presented to various groups in Anchorage, including grand rounds at local hospitals, an outgoing Physician Assistant class, and Community Health Aides/Practitioners (CHAP) during 2014.

VIII) TB presentations during this reporting period were varied and presented by Drs. Michael Cooper, Peggy Cobey, and Karen Martinek. Several “first time” audiences were among the sessions that included:

- PHN Academy – TB Module - Karen Martinek:
 - – January, July and December 2014
- Nurse-to-Nurse Training - Karen Martinek:
 - Anchorage – January 2014
 - Bethel – April 2014
 - Juneau – May 2014
 - Nome – August
 - Anchorage – October 2014
 - MatSu – November 2014
- April 2014 – TB Updates and Overview for Statewide PHN Conference – Karen Martinek.
- April 2014 – TB and School TB Screening Updates for Statewide School Nurse Conference – Karen Martinek.
- April 2014 – TB Overview for YK Tribal Gathering – Michael Cooper.
- August 2104 – Grand Rounds/TB presentation to Norton Sound Board (Nome) – Michael Cooper
- September 2014 – Grand Rounds – ANMC – Michael Cooper

B. Identify priority areas for training.

Evaluation: *Ongoing*. Although many of the existing Case Managers and Discharge Planners at ANMC attended the October 2008 Nurse-to-Nurse training in Anchorage, most of the nurses now responsible for these functions are new and untrained. As a result, there have been problems with some recently discharged TB suspects and cases, including some infectious patients who were unable to travel to their home villages. Working with ANMC staff to revisit discharge policies and timelines and train staff on their implementation remains a priority. The April 2011 webinar and November 2011 face-to-face training on TB infection control, discharge planning and collaboration with public health should address some of the most critical needs of ANMC staff. Meetings were

scheduled in 2013 to discuss case management and discharge planning issues with MOA and State staff.

Alaska TB Program's Application for CITC Nurse-to-Nurse Training was accepted for 2015. The planning committee began meeting in late 2014 and is moving forward with finalizing the agenda, speakers and marketing materials for the June 2, 2015 training which will be held at the BP Energy Center in Anchorage. The facility has a capacity of 70 participants and we expect registration to fill quickly. The target audience will be PHN TBN case managers, but we will also invite Infection Preventionists, Case Managers and Discharge Planners to attend as space permits.

C. Develop and present educational sessions.

IX) Evaluation: Presentations done as described in A and B above.

D. Analyze participant evaluations to plan subsequent training.

Evaluation: Kim Spink analyzes and retains all evaluations from Nurse-to-Nurse Training for CNE purposes.

E. Explore training needs of Department of Corrections staff during FY2013.

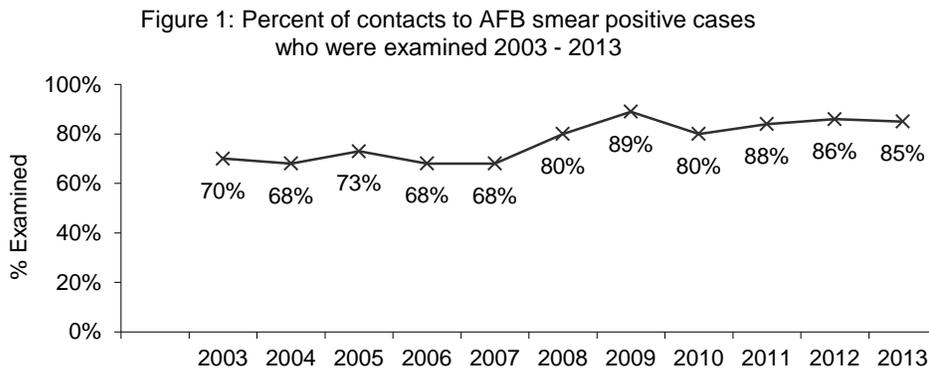
Evaluation: *Ongoing*. Staff education and TB training continue to be discussed at least yearly with lead nursing and medical staff in the correctional system. To date, corrections staff have not requested or scheduled training.

Summary

Significant capacity-building and infrastructure have been developed during this five-year funding period, particularly with regard to Goals I, II and III. The HRD Focal point has been consistent; all TB Program staff are fully trained and the online TB Manual is available and has already been through one revision with another planned in 2015. The TB Program continues to interact regularly with SON to identify PHN training needs and presents a PHN Academy TB Training module 3-4 times a year. Nurse-to-Nurse training is also offered 4-6 times a year in Public Health Centers to train new PHNs and provided updated information and a "refresher" for experienced PHNs. Nurse-to-Nurse Lite was developed in 2014 and has been extremely well-received. CITC Nurse-to-Nurse Training will be held in Anchorage in June 2015. Target audience will include PHN Case Managers, Discharge Planners and Infection Preventionists. Additionally, Dr Cooper usually provides 3-4 Grand Rounds presentations annually and staff provided TB updates or education to other audiences upon request. A much-needed DOT Manual and training materials were initiated during this funding period and will be finalized in 2015.

Appendix E: TB Evaluation Plan - Enhanced Contact Investigation Project (ECIP)

The overall goal of the ECIP is to improve performance in Objective C of the Alaska TB Program Grant which states that “At least 70% of contacts to sputum AFB-smear positive TB cases will be evaluated for infection and disease”. This objective has been met or exceeded since 2008. (Figure 1). The Alaska TB Program has made and maintained significant success in the evaluation of contacts to AFB-smear positive TB cases since the inception of the ECIP. The discontinuation of CDC’s TIMS, the delay in transitioning to a functional commercial TB module (TB-PAM), and the absence and turnover of data entry staff do, however, continue to negatively impact Alaska’s ability to easily generate data and monitor quarterly progress with this objective.



It is expected that Alaska’s ability to evaluate programmatic activities will be enhanced by ongoing participation in the TB Program Evaluation Network (PEN) which was established in 2009.

Objectives and Status:

Objectives for Phase 1 of the ECIP include the following:

1. *Identify barriers to the identification and evaluation of contacts to AFB smear positive cases of TB by 6/30/06.*

This objective has been met. Public health nurse (PHN) focus group/work group identified real and perceived barriers to identification and evaluation of contacts to AFB smear positive cases.

Work to identify and monitor both new and existing barriers continues.

2. *Explore options and strategies for increasing the number of contacts to AFB smear positive TB cases who are evaluated for infection and disease by 6/30/06.*

This objective has been met. PHN work group reviewed available information and materials from other jurisdictions in addition to brainstorming uniquely Alaskan strategies for increasing the number of contacts to smear positive cases that are evaluated.

Data, both statewide and regional, are being provided at least annually to state and grantee PHNs to assist them to monitor regional trends in the identification, evaluation and treatment of persons who were contacts to AFB-smear positive cases of tuberculosis. This will improve the likelihood that PHNs will identify ineffective approaches and explore new strategies to improve the both the timeliness and percentage of contacts to AFB smear positive cases who are evaluated. See *Appendix D: TB Program Training and Human Resources Strategy Plan Progress Report* for additional information on strategies for identifying and meeting training needs related to contact investigation.

3. *Develop new contact investigation standards and forms by 9/30/06.*

This objective has been met. The PHN work group identified strengths and weaknesses of the current contact investigation guidelines and data collection form. The group thoroughly reviewed the new Centers for Disease Control and Prevention. Guidelines for the Investigation of Contacts of Persons with Infectious Tuberculosis: Recommendations from the National Tuberculosis Controllers Association and CDC, and Guidelines for Using the QuantiFERON–TB Gold Test for Detecting Mycobacterium tuberculosis infection, United States. MMWR 2005;54 (No. RR-15):[1-47]. Additionally, contact investigation protocol and forms from many other jurisdictions were collected and integrated into the new contact investigation (CI) form. The 2005 CDC Guidelines were also endorsed by the group.

The new Alaska TB Manual and Forms section were posted online in November 2011. An extensive revision was completed and posted online in December 2012. The Manual has been well-received by users statewide.

4. *Implement new contact investigation standards and data collection forms by 10/31/06.*

This objective has been met. The new Alaska TB Manual and Forms section were posted online in November 2011 and revised in November 2012. The Forms Section is incorporated in the manual but is also available as a stand-alone document for ease of use.

New standards and forms are included in the new Alaska TB Manual. Guidelines for using the forms have been incorporated into all *Nurse-to-Nurse* trainings that have been held for PHNs in Bethel, MatSu, Nome, Fairbanks, Ketchikan, Juneau, Kotzebue, and Anchorage. Most regions and PHNs have been using the draft form since 2008.

5. *Increase the percentage of contacts to AFB smear positive TB cases who are evaluated for infection and disease according to new standards to 75% by 12/31/06.*

This objective was attained for the first time during 2008, when 80% of contacts to AFB smear positive cases were examined. (Table 1.) A revised goal is to maintain an evaluation rate of 75% among contacts to AFB smear positive TB cases in subsequent years. This has occurred from 2008 – 2013 with at least 80% of contacts to AFB smear positive TB cases evaluated. The SON has identified several TB goals and objectives as part of its current Management Plan, including tracking of the number of contacts to AFB smear positive that are identified and evaluated. Baseline and regional data were first presented to Regional SON Managers in September 2006. Biannual data have

subsequently been generated and reviewed by TB Program staff, including special runs separating the Municipality of Anchorage from the MatSu Borough (combined as Anchorage/MatSu Region.)

Table 1: Summary contact investigation data for AFB smear positive TB cases, 2004 – 2014*

Year	Contacts examined		Contacts infected		Contacts with LTBI started on LTBI TX		Contacts with LTBI completed LTBI TX	
	Number	%	Number	%	Number	%	Number	%
2004	223	69	80	36	35	44	24	69
2005	188	74	69	37	36	52	22	61
2006	200	68	69	35	15	22	10	67
2007	276	69	95	34	29	31	16	55
2008	106	80	42	40	12	29	8	67
2009	127	95	47	37	12	26	11	92
2010	203	88	98	48	38	39	25	66
2011	295	88	114	39	43	38	29	67
2012	252	86	114	45	44	39	32	73
2013	200	90	80	40	39	49	31	79
2014**	131	78	60	46	17	28	5	29

* Data from 2009 – 2013 have been updated from previous reports

**2014 data are preliminary

Regional data have been provided to SON Regional Nurse Managers and region-specific strategies to improve contact evaluation follow-up have been explored. Repeat contact investigation training has been provided to PHNs in Bethel, MatSu, Fairbanks and Nome.

Year end 2013 data demonstrate that the improvement made in the per cent of contacts to AFB smear positive cases who are examined yearly has been maintained at 80% or higher since 2008. Data from 2014 are preliminary.

The revised 2010 ECIP Objectives also focus on **LTBI start and completion rates for infected contacts to AFB smear positive TB cases**. In 2009, 26 (67%) of infected contacts to AFB smear positive TB cases had been previously treated for LTBI or active TB disease and thus were not candidates for LTBI treatment. Thus only 13 (33%) of infected contacts were in fact newly infected. This trend has continued through 2013 with only 33 (47%) of all infected contacts being newly infected as summarized in Table 2.

It remains unclear if poor LTBI treatment completion rates might be due to actual failures to complete treatment, long regimens, discontinuation of universal DOPT in the Norton Sound region, medically advised suspension of treatment due to adverse reactions, incomplete reporting, incomplete data entry, or other factors. The Alaska TB program will need to more thoroughly understand the issues contributing to poor LTBI treatment

completion rates in newly infected contacts to AFB-smear positive in order to improve outcomes with this important TB prevention and control strategy.

It is anticipated, however, that the use of the new 12-week Isoniazid-Rifapentine (3HP) regimen, primarily in the YK region and Municipality of Anchorage, will improve overall treatment completion rates. Once 2012-2013 LTBI treatment data are finalized, additional analysis will be done to determine if LTBI treatment using the 3HP regimen was, in fact, more likely to be completed when compared to other regimens. It is anticipated that this new LTBI treatment option will substantially increase the number of newly infected contacts who both start and complete LTBI treatment.

Table 2: Summary contact investigation data for **newly** infected contacts to AFB smear positive cases, 2009 - 2013*

Year	Contacts examined		All Infected contacts		Newly infected contacts		Newly infected contacts with LTBI started on LTBI TX		Newly infected contacts with LTBI completed LTBI TX	
	Number	%	Number	%	Number	%	Number	%	Number	%
2009	127	95	47	37	13	28	11	85	10	91
2010	203	88	98	48	30	31	17	57	10	59
2011	295	88	114	39	42	37	33	79	22	67
2012	252	86	114	45	43	38	32	74	23	72
2013	200	90	80	40	35	44	28	80	23	82
2014**	131	78	60	46	13	22	9	69	4	44

* 2009-2013 data have been revised since the last report

**2014 data are preliminary

New Objective:

6. *Develop and pilot test a cohort review process for Alaska that will enhance TB case management, outcomes and accountability, including contact investigation, by December 31, 2010.*

The focal point collected and reviewed forms and guidelines from CDC, the RTMCCs, and other jurisdictions, particularly low incidence states, to assist in the development of a an Alaska cohort review process.

The CDC requirement for implementation of **cohort review** by the end of 2010 necessitated the development of a cohort review process that will work throughout Alaska. Although a pilot test of Alaska’s cohort review model was scheduled in Anchorage for November 2010, it was postponed until February 2011 due to staffing issues. The Municipality has Alaska’s only dedicated TB nurse case managers, a part time medical officer and management staff who would be supportive of the process. Unfortunately, one of the two nurse case managers was on extended leave, leaving the remaining nurse case manager to oversee all essential TB prevention and control activities including the care and treatment of all TB and LTBI patients, DOT and contact investigation, immigrant

screening, etc. In March 2011, Karen Martinek participated in Utah's cohort review. Since their materials and process were used for the February 2011 review in Anchorage, it was very helpful to experience the "mature" Utah process with the benefit of data and a PowerPoint summary of each case presented. Development of the cohort review process and training for participating staff was a priority during the last quarter of 2011. Although another cohort review was projected during 2011, staff transitions and vacancies in the State TB Program did not allow this to occur.

Maggie Grinnell, a Public Health Associate Program (PHAP) worker, joined the program in July 2012 and compiled materials and forms used in many other jurisdictions for cohort review. After careful examination of her work, a decision was made to resume cohort review before the end of 2012. That decision, however, was reevaluated after Karen Martinek participated in the 2012 TB PEN/ETN Meeting and attended the breakout session and poster presented by the Washington TB Program, a long-standing champion of cohort review. Washington has reconsidered its cohort review process as a result of dwindling interest and participation in favor of more "real time" case reviews that also focus on indicator data. Alaska has continued to standardize monthly case review data elements, reporting, and feedback. TB Program staff and PHNs find monthly case conferences to extremely useful for "real time" discussion of case management and treatment issues that impact patient outcomes. The Alaska TB Program revisited retrospective cohort review again in 2013 but concluded that monthly case management meetings and teleconferences are more effective in improving patient management as well as outcomes due to Alaska's unique needs and resources. It is anticipated that the TB Program will reconsider cohort review at least annually.

Critical to the implementation of cohort review or enhanced case conferences that involve providers as well as PHNs, will be opportunities for Dr. Cooper to interact with local and statewide providers through telephone consultations and travel to important hub communities to both meet the provider community and present updated information on the epidemiology, diagnosis and treatment of TB and LTBI in Alaska.

New Objective:

7. *Continue to assist remote villages and regions, and the PHNs who serve these regions by facilitating TB Sweeps, an important TB prevention and control strategy in Alaska. Ongoing.*

TB Sweeps

TB Sweeps have been used for many years in Alaska as an important TB prevention and control strategy in high-risk populations and communities. Sweeps are usually done in response to newly diagnosed TB cases, unexplained clusters of TST conversions among school children who are tested annually, or outbreaks in villages or communities with a history of previous TB outbreaks and high prevalence of persons with LTBI / old treated TB - "old positives". These collaborative public health interventions employ a community-specific approach based on epidemiologic data and the community / cultural environment to expand or evaluate contact investigation activities or implement an outbreak response. TB Sweeps are routinely done in targeted communities in the Northern and Southwest Regions as well as in

Anchorage shelters and soup kitchens. Annually, 3-5 village sweeps and two (2) Anchorage sweeps targeting the homeless population are done. TB Sweeps have been successful in maintaining ongoing surveillance, completing or expanding contact investigations, identifying persons with TB and LTBI, and responding to ongoing transmission as suggested by programmatic or GIMS data.

Teams of 3 – 5 nurses, including itinerant or regional PHNs, and at least one Nurse Epidemiologist from the Alaska TB Program travel to small, remote villages to screen as many residents as possible within a 4-5 day period. This usually includes TSTs for all school and Head Start students and other community members, unless contraindicated, and symptom screening and collection of two (2) sputa for the large numbers of residents with prior positive TSTs. Collaborative planning is done with PHNs, tribal entities and corporations, schools and community health aides. Screening is advertised and “raffle prizes” (gift certificates to local stores, fuel suppliers, etc.) for completed screening facilitate participation. Local helpers, transportation and interpreters are hired as needed. Community meetings and education are always offered to meet community needs and raise TB awareness. Sweeps also provide an important opportunity for itinerant PHN case managers and expert TB Program nurses to interact with each other as well as with persons diagnosed with TB and LTBI in their family and community settings. Working directly with PHN case managers in the field also builds rapport and enhances collaboration with TB Program staff, thereby contributing to better patient outcomes. Face-to-face supervision and training for local DOT Aides is also done. This model has been so successful in Alaska, that PHNs will often do “mini sweeps” in villages where TB is a concern.

Table 3 contains summary information on village TB Sweeps coordinated and done by TB Program staff in collaboration with PHNs during this reporting period. This table does not include data on the Sweeps done in the Anchorage shelters and soup kitchens by the Municipality of Anchorage or those done exclusively by PHNs. The SON was interested in developing capacity for PHNs to plan and execute Sweeps during this reporting period thereby reducing the number of Sweeps coordinated by TB Program staff. All Sweeps done during this reporting period occurred in villages and communities with high TB incidence and history of recent TB outbreaks. Although screening more than 1000 individuals in remote Alaskan villages is very costly in terms of staff time and travel to find three new cases of active TB disease, TB Sweeps remain an essential surveillance and case finding activity in Alaska. Even if new cases of active TB are not identified, these village wide screenings provide evidence that there are NOT undetected TB cases or ongoing transmission in these high risk communities.

Table 3: Summary of Village TB Sweeps, 1/14 – 12/14

Village	Date	# Screened*	#TST Convertors	#TST Reactors	# TB cases identified
Norton Sound (NS) Village A	4/14	343	5	0	1
Yukon Kuskokwim (YK) - Village A	2/14	145	0	1	0
YK Village A	10/14	146	1	1	0
NS Village A	10/14	375	1	0	2
Total	4	1009	7	2	3

*TB screening includes TSTs placed and read, or symptom screening and/or sputa collection for individuals with known (+) TSTs.