

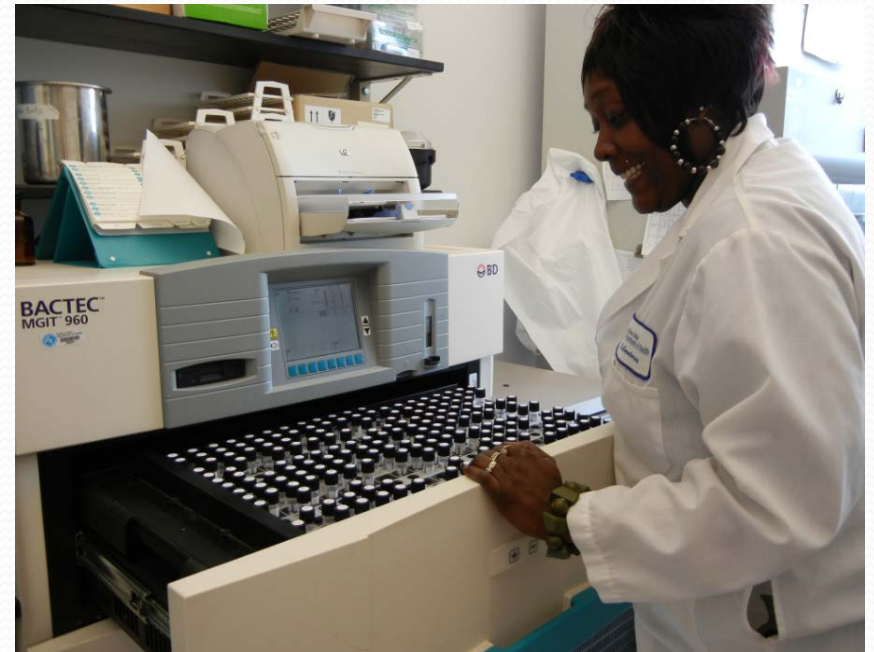
# Reducing Redundant Specimens: Indiana's Sputum Collection Algorithm

Jessica Gentry  
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8<sup>th</sup> National Conference on Laboratory Aspects of TB

# Objectives

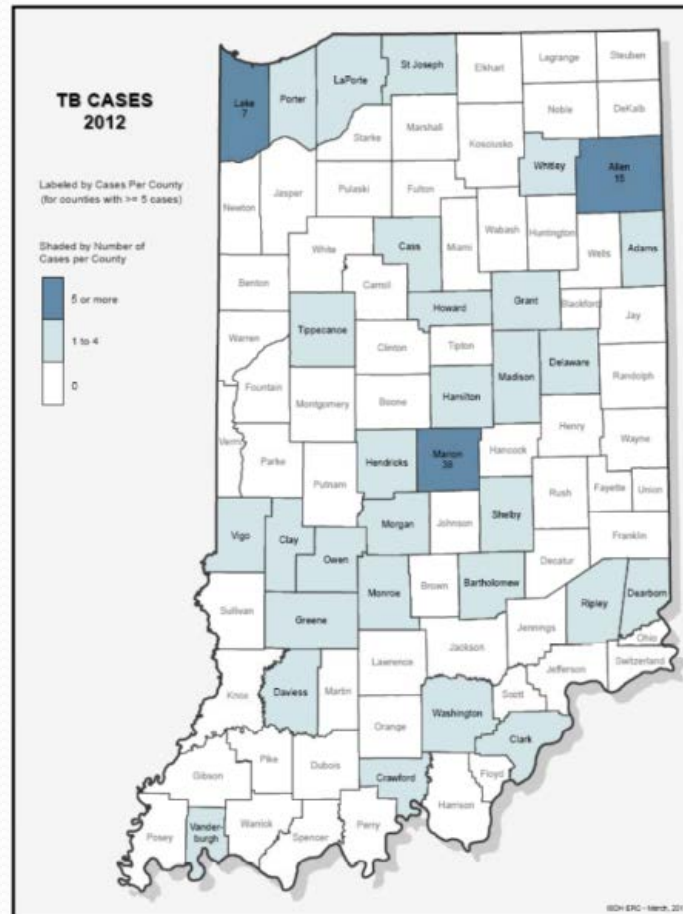
- Background
- Specimen Collection Algorithm
  - Why do we need it?
  - What is it?
- LimsNet



# Background

- Approx. 100 cases of TB annually
  - Largest Burmese population outside of Burma
- State PHL tests approximately 2000 specimens/year
  - Majority of samples submitted by local health departments (LHDs)
  - AFB and culture performed for every specimen
    - AFB rated with CAP scale
      - >50/field, >10/field, 1-10/field, <1/field, <1/smear (very few)

# 2012 Indiana TB Cases by County



*From 2012 TB Control Annual Report*

# Background, (con't.)

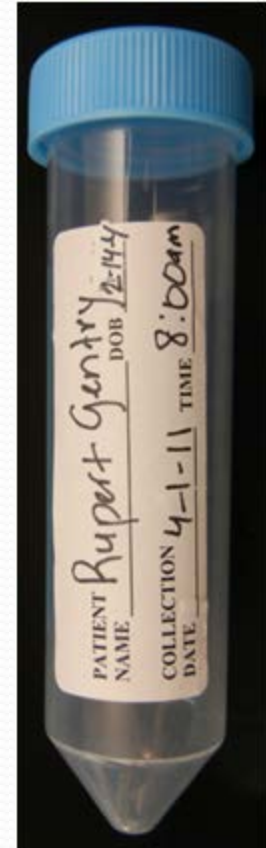
- Indiana is a “home rule” state
- TB Control regulated by the Indiana Communicable Disease Rule (CDR)
  - Investigation must be performed immediately by local health officer
  - Infectiousness determined by set of 3 sputa
    - 3 smear negative sputa=release from isolation
- As a direct result of the CDR, one of the primary functions of ISDH Lab is for monitoring of therapy

# Lab Challenges--2009

- Staff Shortages
- Funding Decreases
- Costs increasing due to addition of PCR and pyrosequencing
- How do we continue to provide quality services while maximizing our resources???

# Observations

- Many LHDs sending an excessive number of specimens per TB patient
  - Allen CHD—coll. 48 samples in 10 week period
  - Clark CHD—coll. 3x weekly for 8 weeks (>50/field)
  - Kosciusko CHD—coll. 27 samples in 8 week period
  - Many smear/culture negatives collected
- Many LHDs sending an excessive number of specimens/NTM patients
  - 51% of culture positive specimens were NTMs



# Proposed Solution

## Reduce numbers of unnecessary specimens

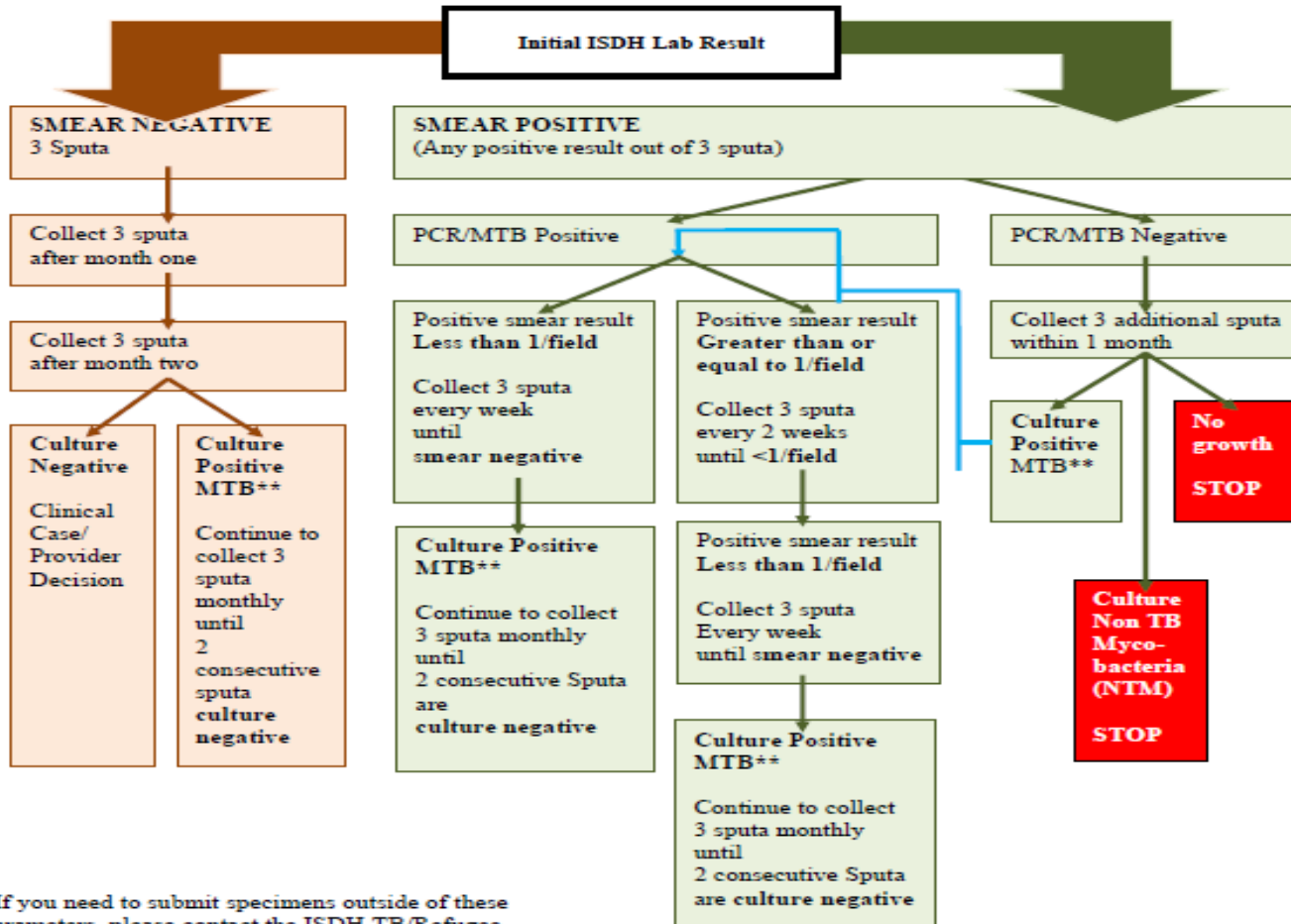
### Specimen Collection Algorithm

- Is designed to assist the clinician by:
  - Collecting the most appropriate number of sputums
  - Collecting the most appropriately timed sputums
  - Interpretation of results
- Helps to conserve resources by eliminating unnecessary sputum collections





**TUBERCULOSIS SPUTUM COLLECTION ALGORITHM\***

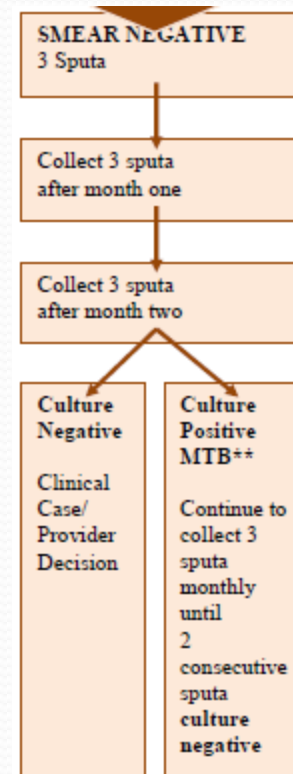


\*If you need to submit specimens outside of these parameters, please contact the ISDH TB/Refugee Division at 317.233.7434 or your TB Regional Nurse Consultant (contact information in Section 1 – Introduction).

\*\*TB sputum collection algorithm does not apply to Non Tuberculous Mycobacteria (NTM)

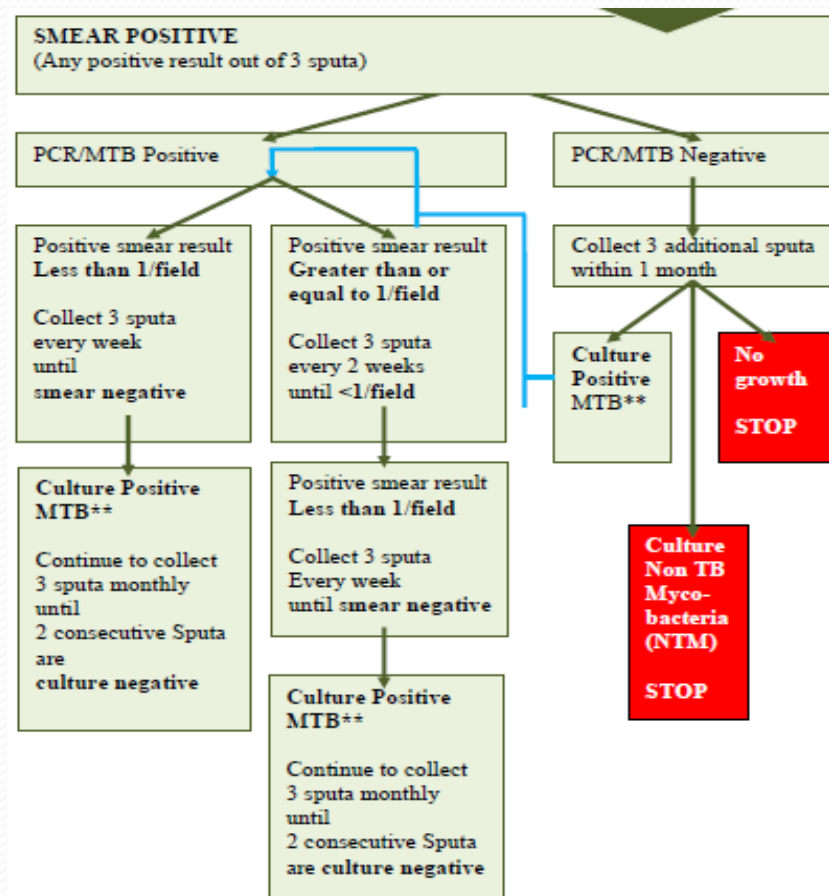
# Section 1—Smear Negative

- Smear negative 3x
  - Collect 3x sputa after one month
  - Collect 3x sputa after two months
    - If both are culture negative—stop collecting
    - If culture positive, continue monthly collections
- Must end with two consecutive months of culture negativity



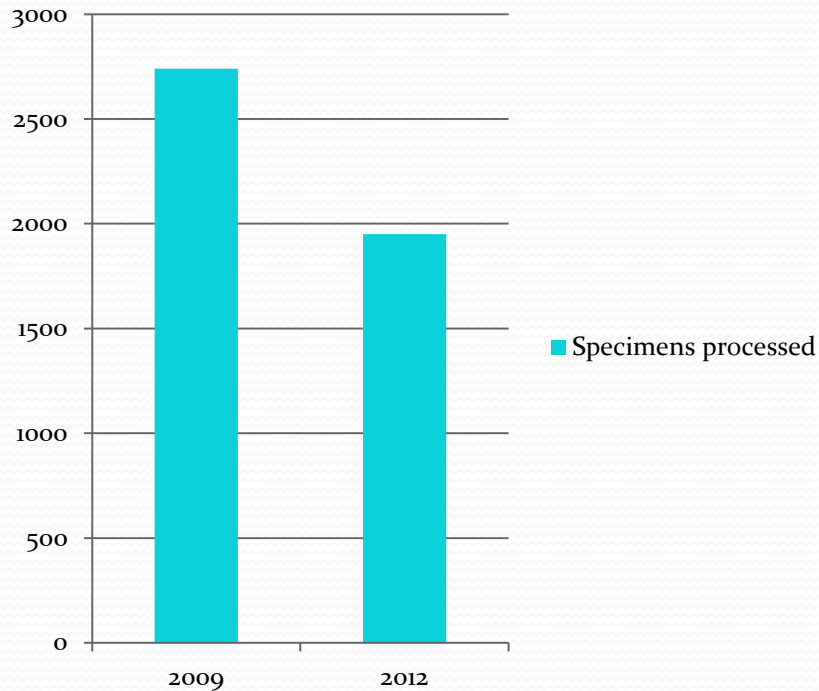
# Section 2—Smear Positives

- <1/field
  - 3x sputa weekly until smear negative
- >1/field
  - 3x sputa every 2 weeks until smear negative
- Must end with two consecutive months of culture negativity
- NTM (MTBC neg) cultured—STOP collecting

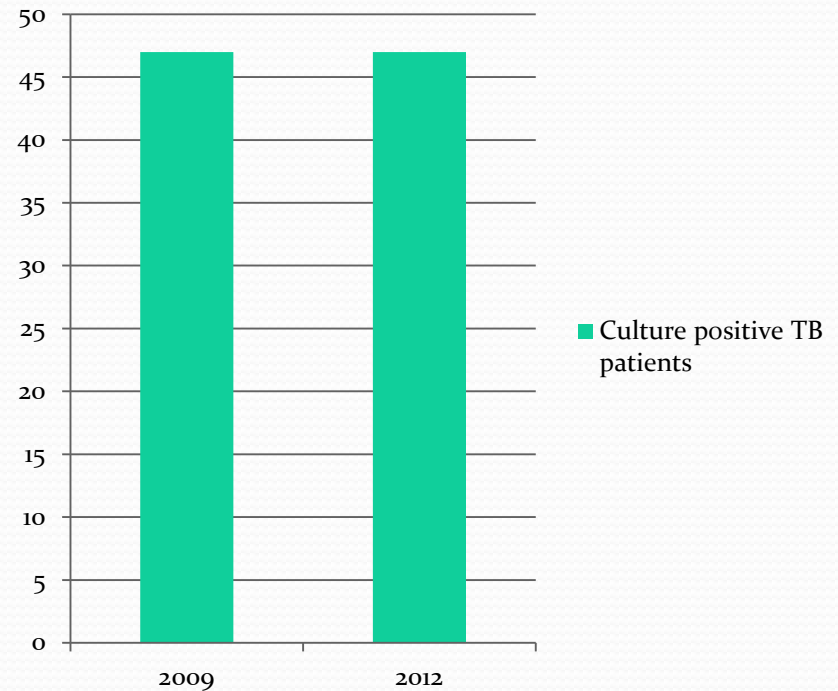


# Comparison of Sample Volumes

## Specimens processed



## Culture positive TB patients



# Continuing Challenges

- Re-education of PHNs
  - LHD staffing turnover
  - Rural counties with few TB cases
- Monitoring for submission patterns
  - Business Intelligence (BI) report
  - Generated quarterly, pulls data from LIMS
    - Can work one on one with repeat offenders
  - Includes smear and culture results
- Newsletter articles



# Electronic Submissions/Reporting

- LimsNet/STARLIMS
  - Submitters enter patient demographics and UPS tracking info into LimsNet
  - Samples are then received into STARLIMS at the lab
  - Results, QC, etc. entered into STARLIMS by lab staff
  - Lab reports released from STARLIMS into LimsNet
  - Preliminary reports released for smear, PCR, pyro, HPLC, DST, preliminary ID
- HL7 messaging
  - STARLIMS results coded via HL7 and sent to D-REX, where they pass into TB-SWIMSS

# LimsNet Patient Information Screen

209 unsubmitted tests.      Jessica Gentry      Site: ABC (ISDH) Test Clinic  
Log new test: Tuberculosis    [Submit Tests](#)   [Packages](#)   [Test Results](#)   [Personalized Settings](#)  
[Log Off](#)

**Mycobacteriology Test Request Form**  
INDIANA STATE DEPARTMENT OF HEALTH LABORATORIES

Patient Information	
Patient's Clinic ID Number:	<input type="text"/> <input type="button" value="Lookup Info"/>
Patient's First Name: ■	<input type="text"/> Middle Init: <input type="text"/>
Patient's Last Name: ■	<input type="text"/>
Street Address:	<input type="text"/>
City:	<input type="text"/> State: <input type="text"/> ZIP: <input type="text"/>
County:	<input type="text"/> Sex: ■
Date of Birth: ■	<input type="text"/> <input type="radio"/> Male <input type="radio"/> Female <input type="radio"/> Unknown

Physician Information	
Physician's First Name:	<input type="text"/> Last Name: <input type="text"/>
Street Address:	<input type="text"/>
City:	<input type="text"/> State: <input type="text"/> ZIP: <input type="text"/>

Specimen Information	
Collection Date: ■	<input type="text"/> <input type="button" value="Calendar"/>
Collection Time: ■	Hr: <input type="text"/> Hr <input type="text"/> Mi: <input type="text"/> Min <input type="text"/> AM/PM: <input type="text"/> AM/PM <input type="text"/>
	Sample Type: ■ <input type="radio"/> Specimen <input type="radio"/> Isolate

Provider Code:	<input type="text"/> 990 - ABC (ISDH) Test Clinic	Staff ID:	<input type="text"/> jg (initials)
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# LimsNet Test Results Screen

207 unsubmitted tests. Jessica Gentry Site: ABC (ISDH) Test Clinic  
 Log new test: [--- Select One ---](#) [Submit Tests](#) [Packages](#) [Test Results](#) [Personalized Settings](#)  
[Log Off](#)

## Search Test Results

Open Reports in a new window  
 Open Reports in this window

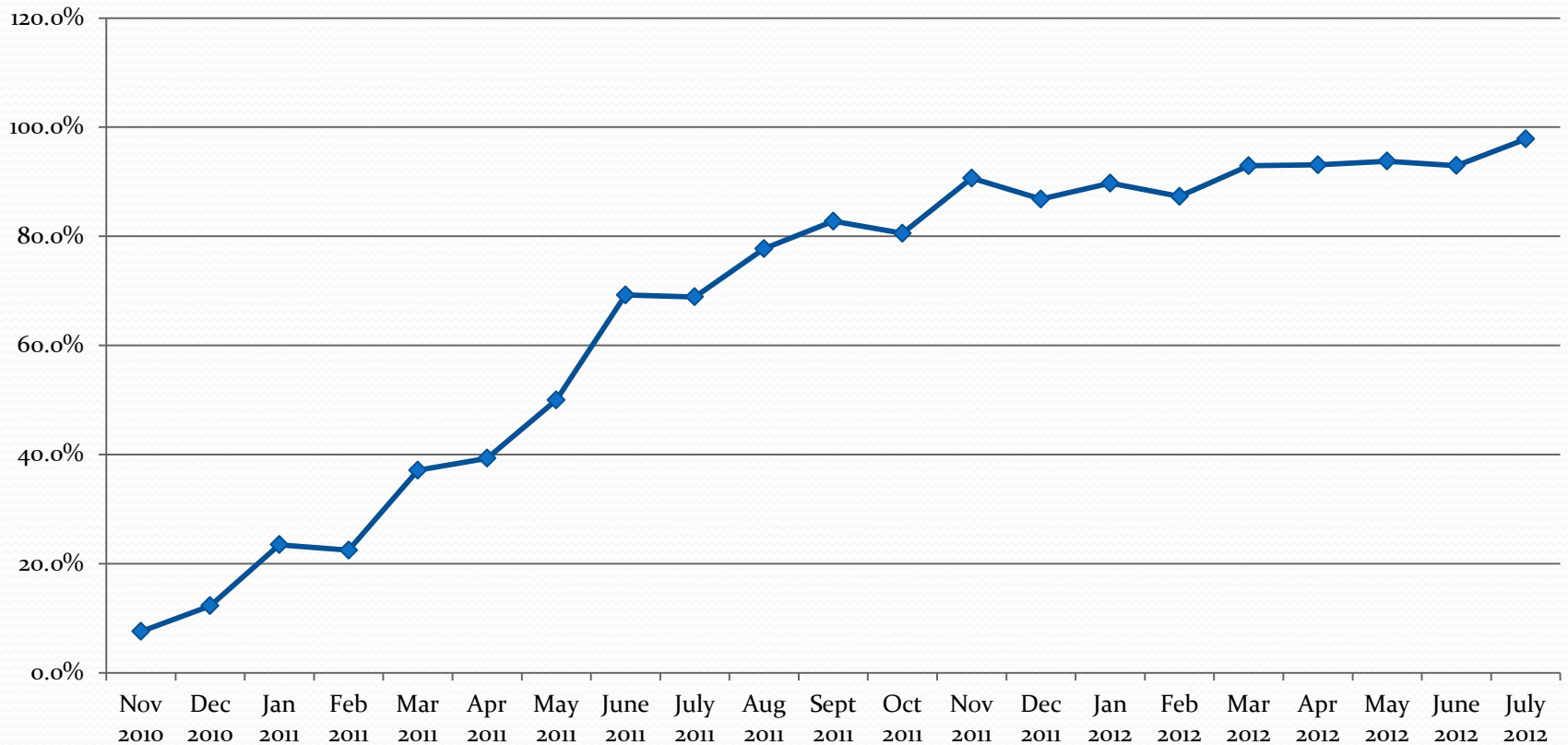
Select	Report	Status	Date Created	Collection Date	Patient ID	First Name	Last Name	Test Type	Staff ID	Provider Name
		In Transit	4/1/2011 10:04 AM	3/28/2011	1	EditMode	Jones34	Tuberculosis	yg	ABC TESTING SITE
		In Transit	4/1/2011 9:51 AM	3/27/2011	1	EditMode	Jones34	Tuberculosis	yg	ABC TESTING SITE
		Unshipped	3/27/2011 11:26 AM	3/24/2011		harry	vardon	Blood Lead	rb	ABC TESTING SITE
		In Transit	3/11/2011 2:48 PM	3/2/2011	123	Davee	McNally	Tuberculosis	yg	ABC TESTING SITE
		Unshipped	3/2/2011 10:27 AM	3/1/2011	123123	Nick	Wood	Blood Lead	sk	ABC TESTING SITE
<input type="checkbox"/>	<input type="button" value="View"/>	Released	1/31/2011 10:48 AM	1/31/2011	123456	TEST SCREENING 1	SYPHILIS	Syphilis	yg	ABC TESTING SITE
		In Transit	2/4/2011 10:35 AM	1/31/2011	HI11111	Maryjane	Prenantlady	Blood Lead	mh	ABC TESTING SITE
<input type="checkbox"/>	<input type="button" value="View"/>	Released	1/31/2011 10:54 AM	1/30/2011	123456	TEST SCREENING 7	SYPHILIS	Syphilis	yg	ABC TESTING SITE
<input type="checkbox"/>	<input type="button" value="View"/>	Released	1/31/2011 10:52 AM	1/30/2011	123456	TEST SCREENING 4	SYPHILIS	Syphilis	yg	ABC TESTING SITE
<input type="checkbox"/>	<input type="button" value="View"/>	Released	1/31/2011 10:52 AM	1/30/2011	123456	TEST SCREENING 2	SYPHILIS	Syphilis	yg	ABC TESTING SITE

1 2 3 4 5 6 7 8 9 10 ...

Records Per Page: 10

# LimsNet usage

Percentage LimsNet



# TB Laboratory Staff

Senior Microbiologist 2  
Ed Harris

Microbiologist 2  
Laura Taube

Laboratory Technician 2  
Avia Boss



# Acknowledgements

- *Authors of Sputum Collection Algorithm*
  - Dr. Lixia Liu
  - Tina Feaster
  - Shanica Alexander
  - Sarah Burkholder

# Questions?

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Indiana State  
Department of Health