Taking Aim on TB Elimination: How Are We Doing?

Jon Warkentin, MD, MPH

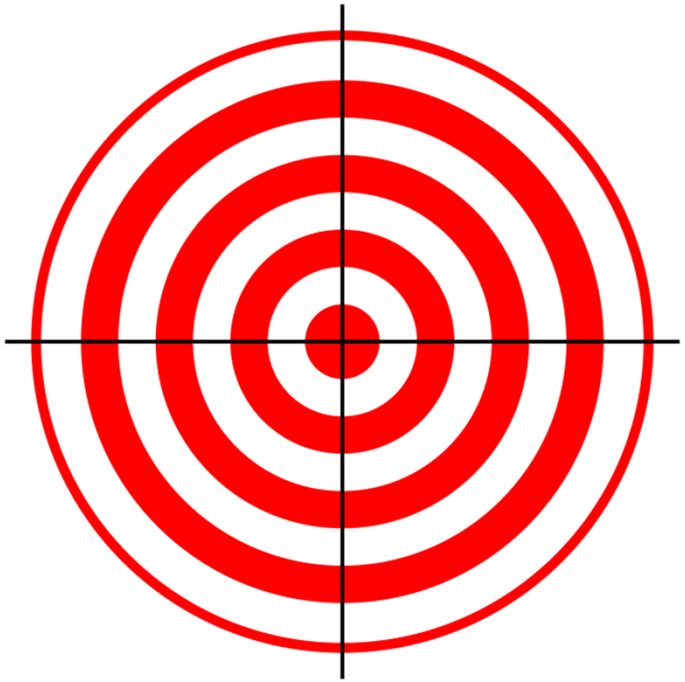
Medical Director, TB Elimination Program

2016 Clinical TB Symposium / March 30, 2016

Objectives

1. Define the goal of TB elimination and describe progress toward achieving that goal in the United States and in Tennessee.

2. Discuss epidemiological and clinical challenges to the achievement of TB elimination.



Context - ACET Strategic Plan (1989)

- 1984 – Dr. James O. Mason, then Director of CDC, challenged public health community to develop a strategy to eliminate TB from the United States
- 1989 – CDC/DHHS Advisory Committee for Elimination of Tuberculosis (ACET) released a strategic plan*
- "The committee urges the nation to establish the goal of tuberculosis elimination (a case rate of less than one per million population"
- "…describing actions necessary to achieve the goal by the year 2010, with an interim target of a case rate of 3.5 per 100,000 population by the year 2000."

TN Department of Health

* CDC. A strategic plan for the elimination of tuberculosis in the United States. *MMWR* 1989; 38(No. S-3).

Context (2) - ACET Strategic Plan (1989)

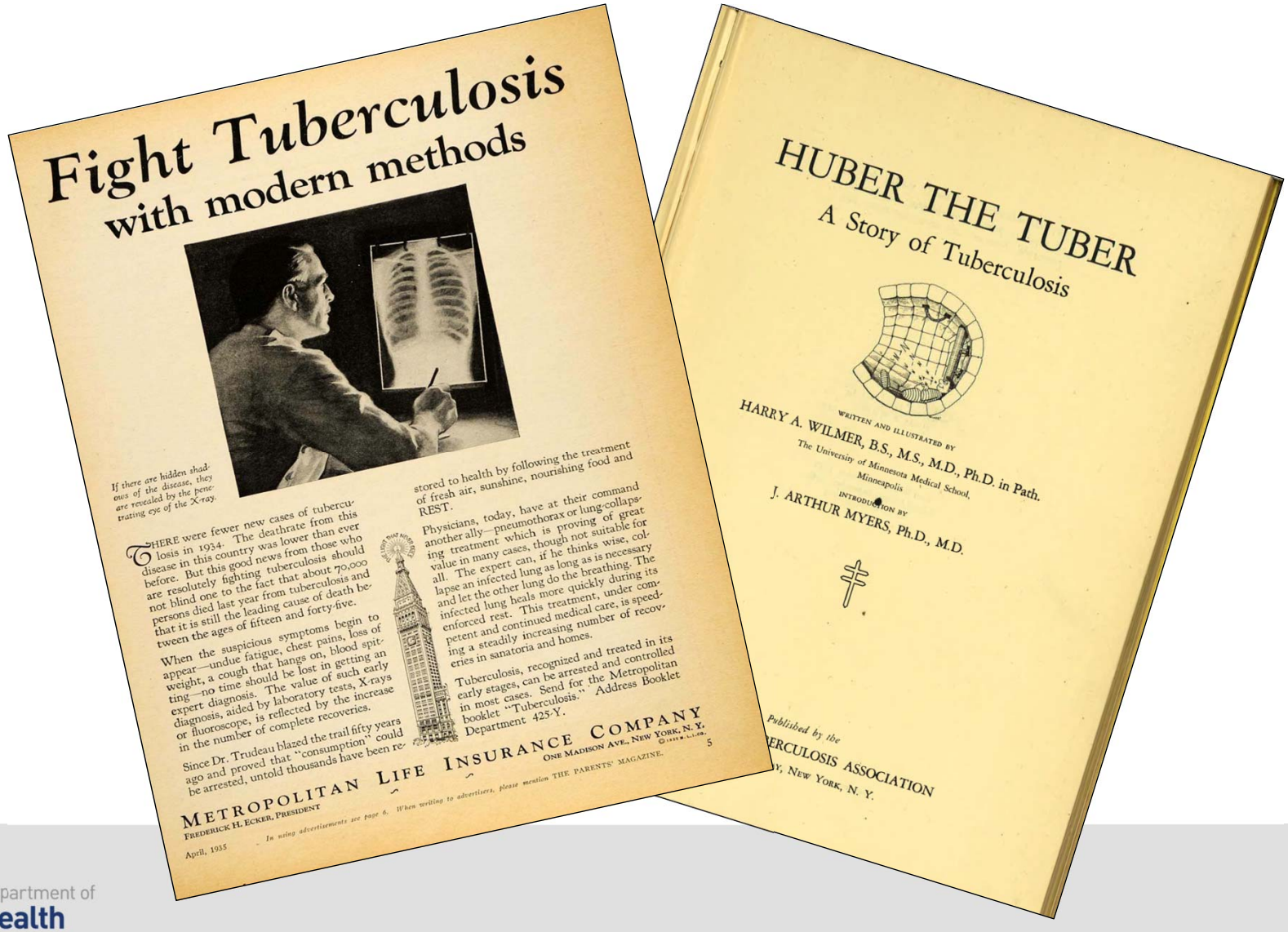
"Three factors make this a realistic goal:

1) tuberculosis is retreating into geographically and demographically defined pockets;
2) biotechnology now has the potential for generating better diagnostic, treatment, and prevention modalities; and
3) computer, telecommunications, and other technologies can enhance technology transfer."*

[emphasis added]

* CDC. A strategic plan for the elimination of tuberculosis in the United States. *MMWR* 1989; 38(No. S-3).

How Are We Doing?



Fight Tuberculosis
with modern methods

If there are hidden shadows of the disease, they are revealed by the penetrating eye of the X-ray.

THERE were fewer new cases of tuberculosis in 1934. The deathrate from this disease in this country was lower than ever before. But this good news from those who are resolutely fighting tuberculosis should not blind one to the fact that about 70,000 persons died last year from tuberculosis and that it is still the leading cause of death between the ages of fifteen and forty-five.

When the suspicious symptoms begin to appear—undue fatigue, chest pains, loss of weight, a cough that hangs on, blood spitting—no time should be lost in getting an expert diagnosis. The value of such early diagnosis, aided by laboratory tests, X-rays or fluoroscope, is reflected by the increase in the number of complete recoveries.

Since Dr. Trudeau blazed the trail fifty years ago and proved that "consumption" could be arrested, untold thousands have been restored to health by following the treatment of fresh air, sunshine, nourishing food and REST.

Physicians, today, have at their command another ally—pneumothorax or lung-collapsing treatment which is proving of great value in many cases, though not suitable for all. The expert can, if he thinks wise, collapse an infected lung as long as is necessary and let the other lung do the breathing. The infected lung heals more quickly during its enforced rest. This treatment, under competent and continued medical care, is speeding a steadily increasing number of recoveries in sanatoria and homes.

Tuberculosis, recognized and treated in its early stages, can be arrested and controlled in most cases. Send for the Metropolitan booklet "Tuberculosis." Address Booklet Department 425-Y.

METROPOLITAN LIFE INSURANCE COMPANY
ONE MADISON AVE., NEW YORK, N. Y.
FREDERICK H. ECKER, PRESIDENT

In using advertisements see page 6. When writing to advertisers, please mention THE PARENTS' MAGAZINE.

April, 1935

5

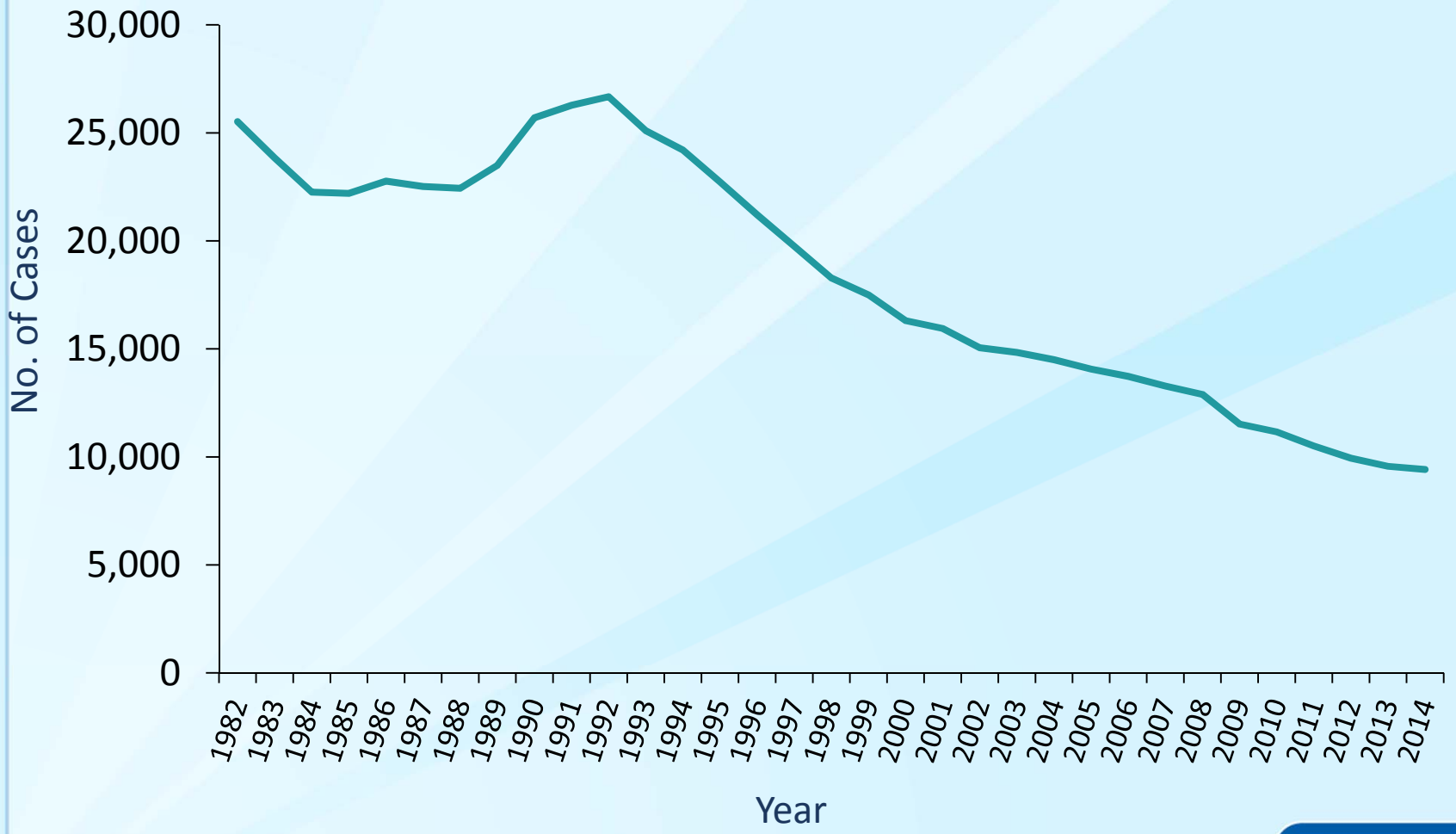
HUBER THE TUBER
A Story of Tuberculosis

WRITTEN AND ILLUSTRATED BY
HARRY A. WILMER, B.S., M.S., M.D., Ph.D. in Path.
The University of Minnesota Medical School,
Minneapolis

INTRODUCTION BY
J. ARTHUR MYERS, Ph.D., M.D.

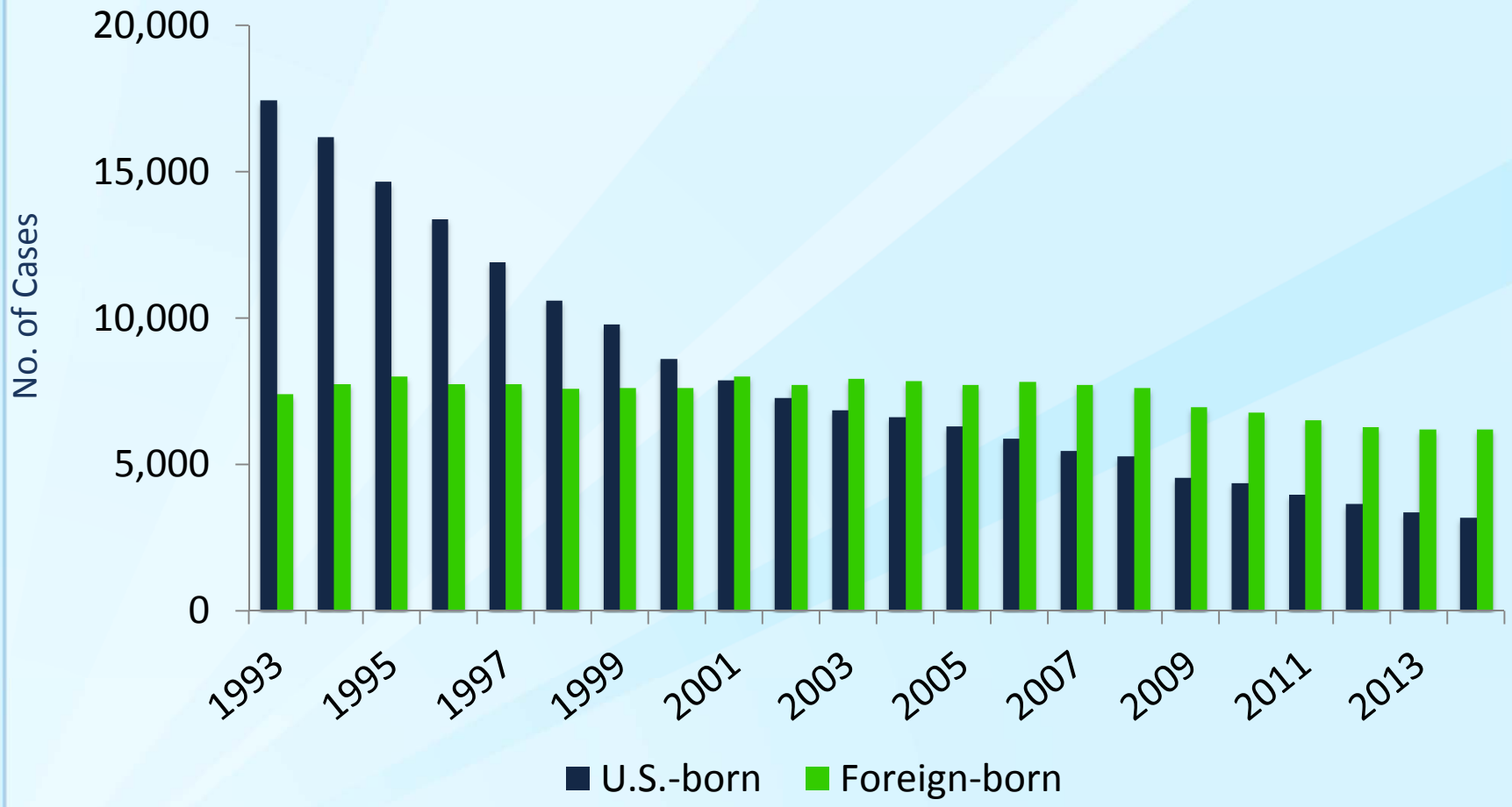
Published by the
ERCULOSIS ASSOCIATION
Y, NEW YORK, N. Y.

Reported TB Cases
United States, 1982–2014*



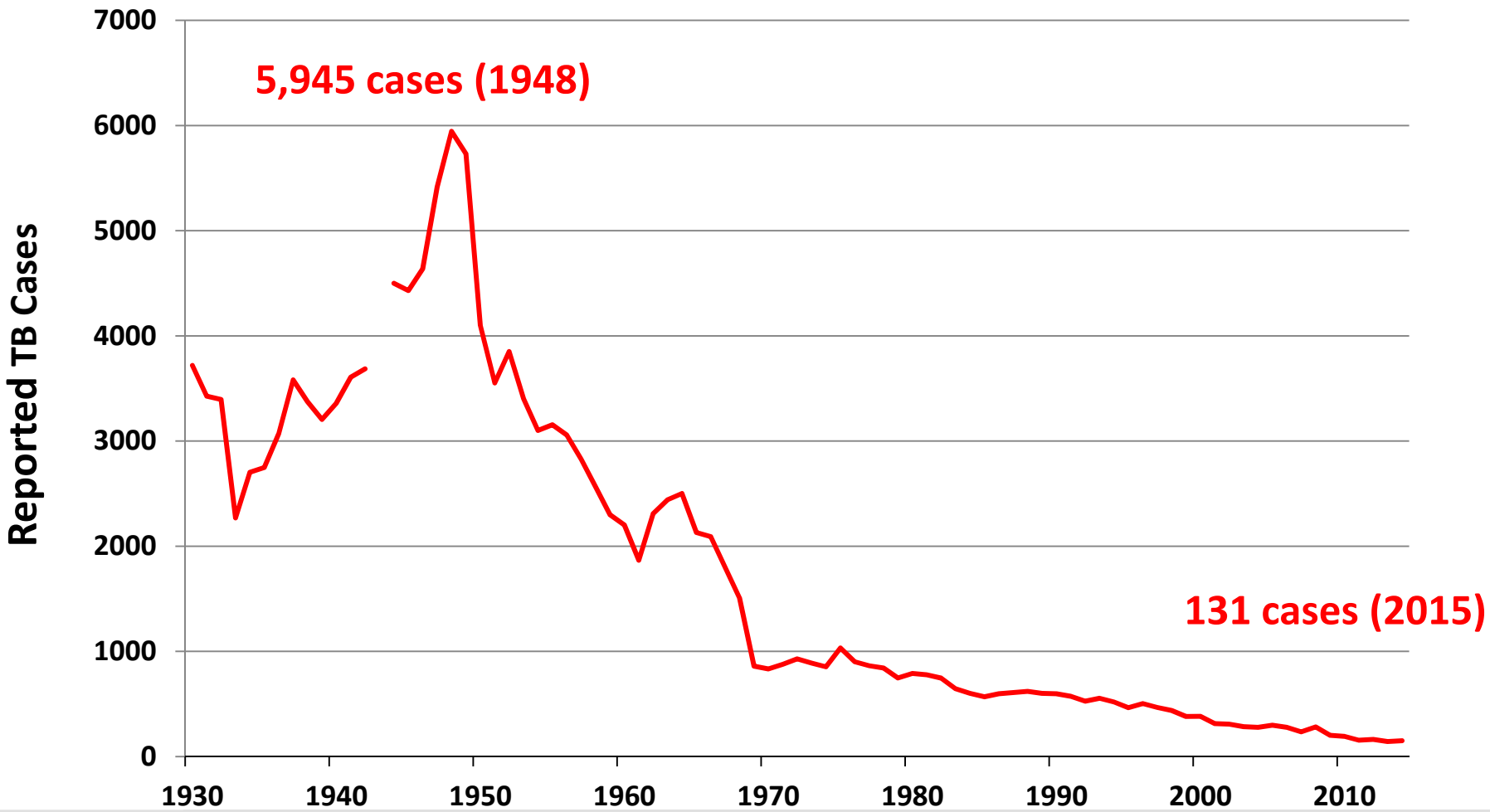
*Updated as of June 5, 2015.

Number of TB Cases in U.S.-born vs. Foreign-born Persons, United States, 1993–2014*



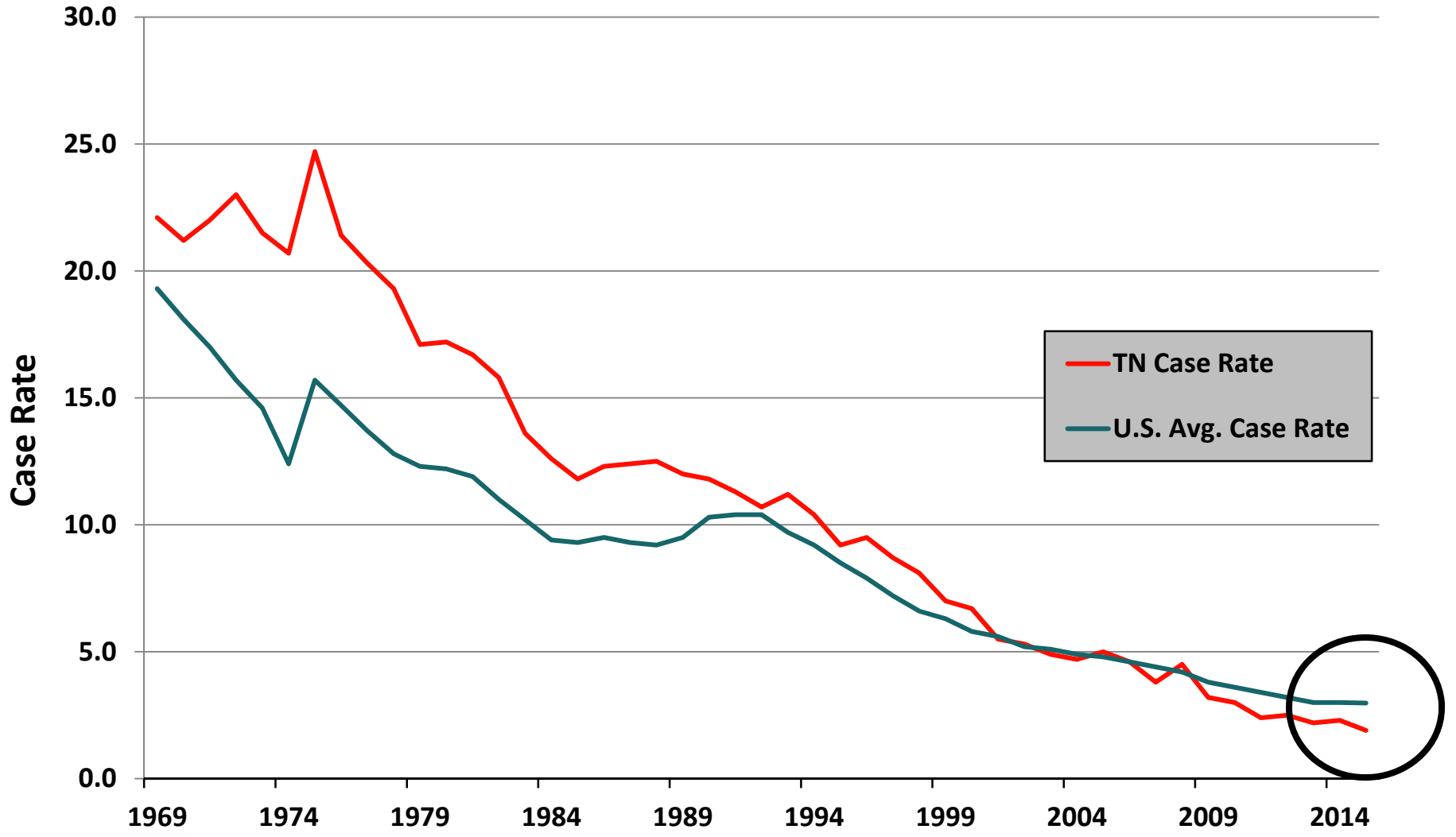
*Updated as of June 5, 2015.

TB Cases by Year - Tennessee, 1930-2015

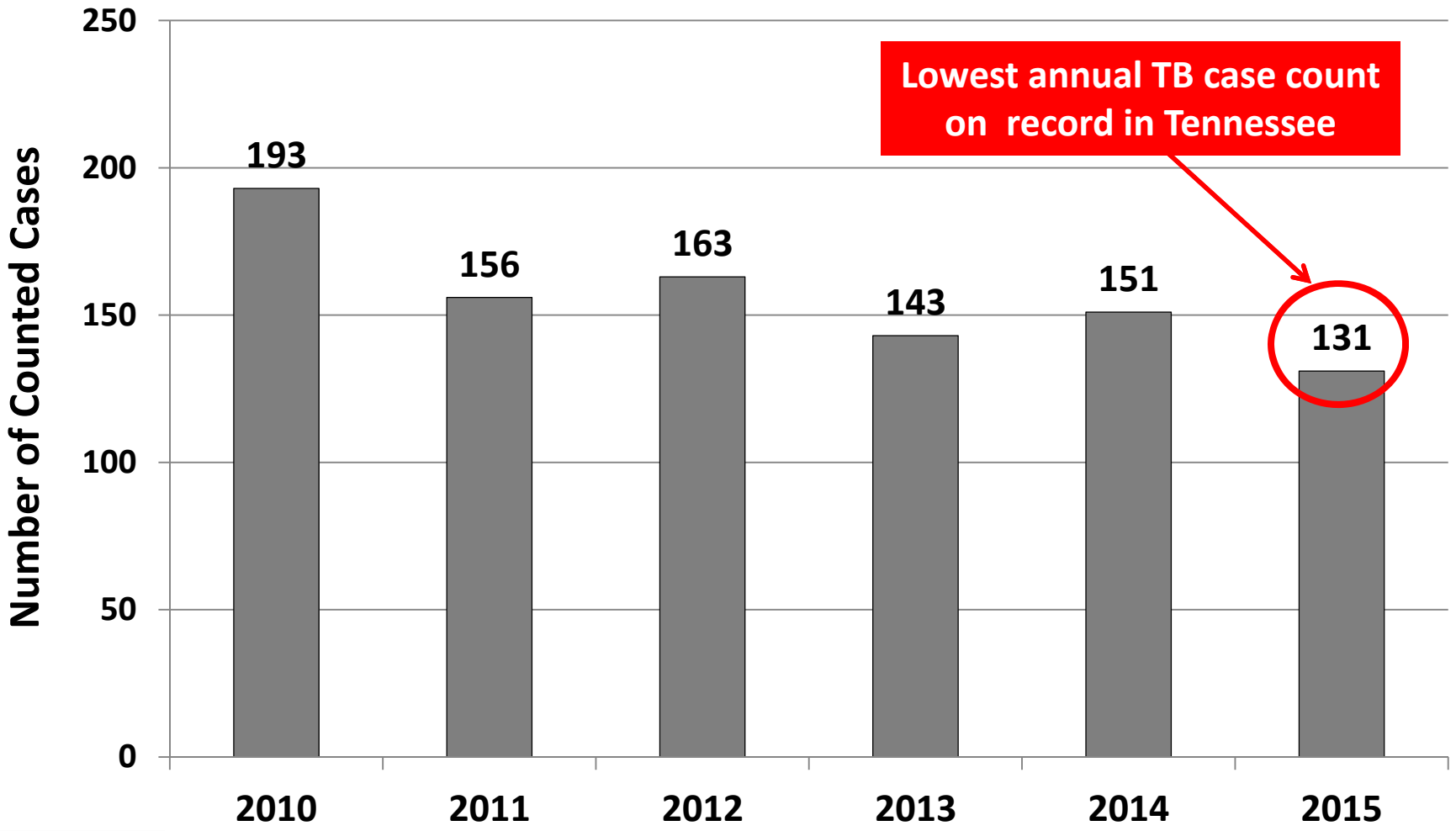


TN Department of Health

Comparison of TB Case Rates - U.S. and TN 1920-2015

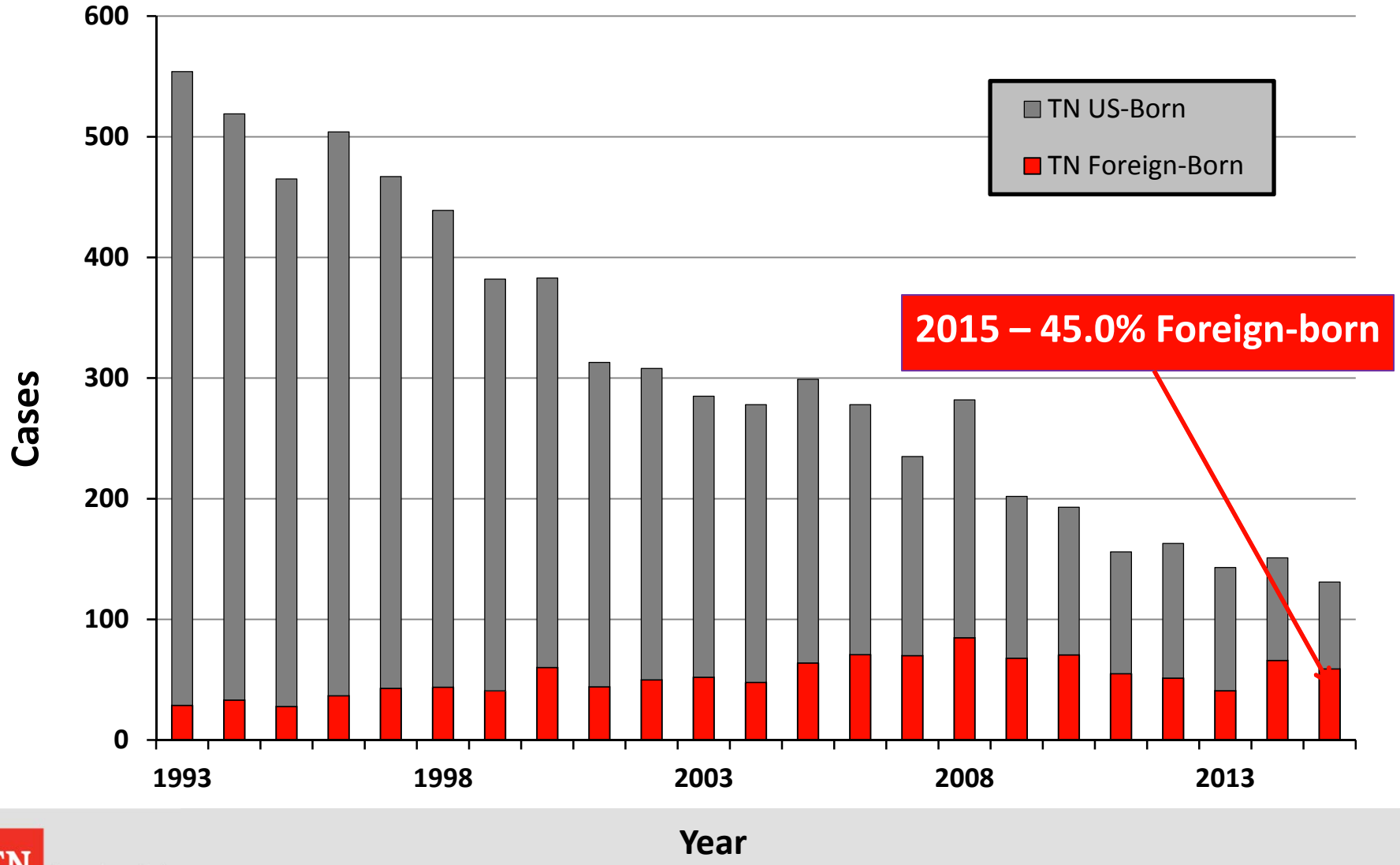


TB Cases - Tennessee, 2011-2015



TN Department of Health

TB Cases by U.S.-born Status Tennessee, 1993-2015



What Has Changed - Overview

- Epidemiology of TB in Tennessee
- Diagnostic and therapeutic technologies
  - Imaging: CT, MRI, PET
  - Bronchoscopy
  - Nucleic acid amplification tests (NAAT)
  - Interferon-gama release assays (QFT, T-Spot.TB)
  - Liquid culture
  - Drug sensitivity testing
  - Molecular detection of drug resistance
  - Genotyping and whole genome sequencing
  - Therapeutic drug monitoring (TDM)
- Public health infrastructure and organization
- Directly observed therapy for TB ("DOT")
- Public and medical awareness of TB

What Has Changed - TB Program

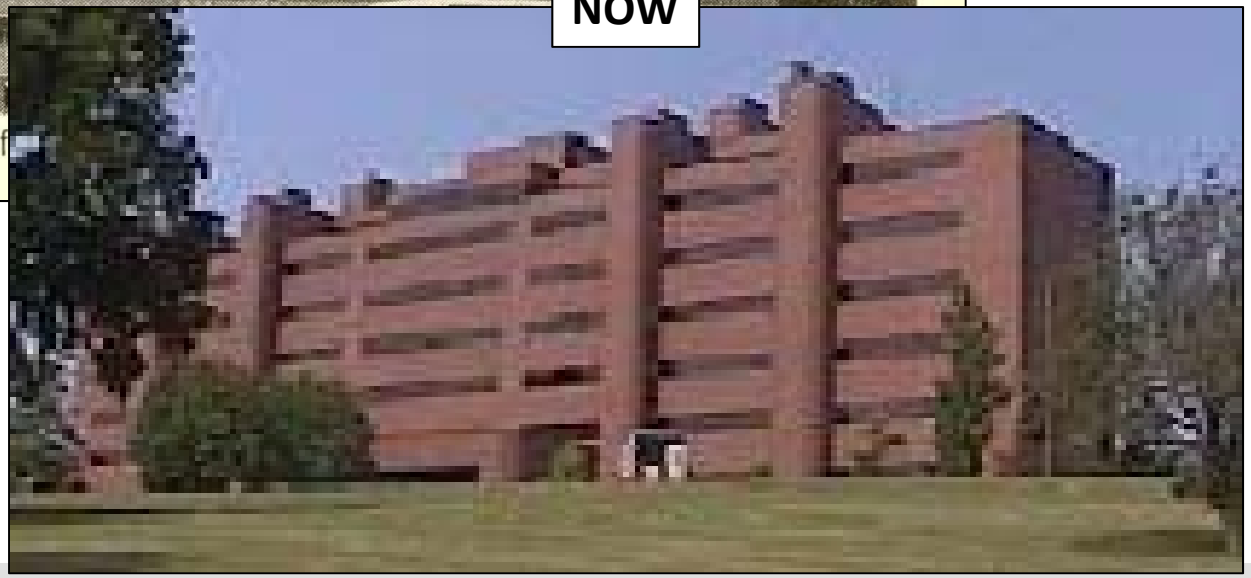
- 2002 – Targeted Testing Initiative (Dr. Connie Haley)
- 2004 – 1st comprehensive "TB Program Guidelines"
- 2004 – Universal genotyping
- 2012 – Use of TDM for selected pts at risk for malabsorption
- 2012 – GeneXpert implemented at TDH Laboratory Services
- 2012 – Collaboration with CDC path. lab and MDDR lab
- 2013 – QFT-GIT with "HIV opt-out" testing implemented
- 2014 – TB cluster analysis
- 2015 – Revised TB Manual with "standards of public health practice"
- 2015 – Implementation of 3HP regimen for tx of TB infection

What Has Changed - PH Technology

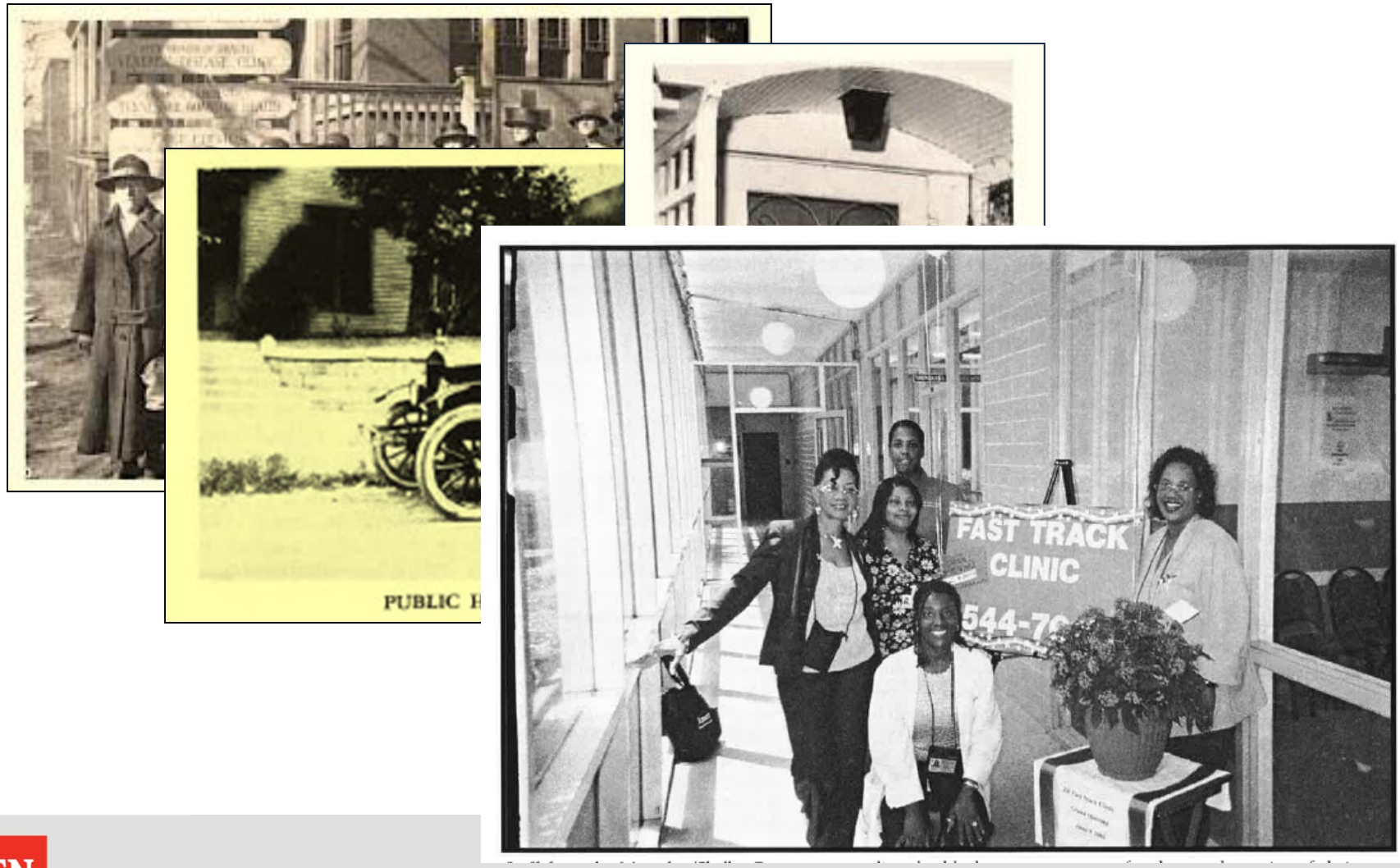
What Has Changed - PH Infrastructure

THEN

NOW



Public Health Nursing - *Still* the Core of PH Practice



What Has *(mostly) NOT* Changed

- 1st-line anti-TB drugs: INH, RIF, PZA, ETH ("HRZE")
- Long treatment course (6 - 24 months)
- PH reliance upon case reporting from physicians, hospitals and laboratories
- TB contact investigation
- Public health commitment to eliminate TB in the TN
- "The Cycle of Neglect" – as TB incidence decreases, PH program resources jeopardized until TB incidence rises again
- Other???

Challenges and Opportunities

- Less toxic, more effective, simpler and shorter anti-TB regimens
- Diagnostic tools to predict which patients at highest risk for progression to active TB disease
- Diagnostic dilemmas: TB? Histo? Sarcoid? Other?
- Raising public and clinician awareness of continued public health threat of TB
  - Community education for high-risk populations
  - Community health centers / screening, testing & treating TBI
  - Clinician education
- Collaborative research (e.g., VTC, CDC, TDH)
- An effective TB vaccine

THE END TB STRATEGY

World Health Organization

Global strategy and targets for tuberculosis prevention, care and control after 2015

VISION	**A world free of tuberculosis** – zero deaths, disease and suffering due to tuberculosis			
GOAL	**End the global tuberculosis epidemic**			
INDICATORS	**MILESTONES**		**TARGETS**	
	2020	**2025**	**SDG 2030**	**END TB 2035**
Reduction in number of TB deaths compared with 2015 (%)	35%	75%	90%	95%
Reduction in TB incidence rate compared with 2015 (%)	20% (<85/100 000)	50% (<55/100 000)	80% (<20/100 000)	90% (<10/100 000)
TB-affected families facing catastrophic costs due to TB (%)	Zero	Zero	Zero	Zero

Acknowledgements

- Jason Cummins, MPH – State TB Program Manager and Senior Epidemiologist
- Ben Katz, MPH – TTBEP Epidemiologist
- Tennessee Department of Health – Division of Communicable and Environmental Diseases and Emergency Preparedness (CEDEP)
- Public health TB clinicians, and regional and local TB program staff
- TDH Laboratory Services
- Centers for Disease Control and Prevention (CDC)

Thank you