ZERO TB Initiative

A COMPREHENSIVE APPROACH FOR TB ELIMINATION

TB ELIMINATION IN THE TIME OF COVID-19

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WORKSHOP:
"Innovations for tackling tuberculosis
in the time of COVID-19"
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CENTER FOR GLOBAL HEALTH DELIVERY
HARVARD MEDICAL SCHOOL

HARVARD MEDICAL SCHOOL

BWH BRIGHAM AND WOMEN'S HOSPITAL

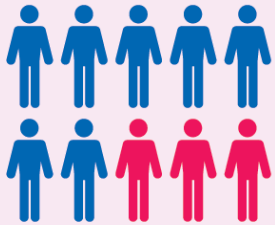
World Health Organization

IN 2018, AN ESTIMATED

10 MILLION PEOPLE FELL ILL WITH TB*

7 MILLION PEOPLE REPORTED TO HAVE ACCESS TO TB CARE, UP FROM 6.4 MILLION IN 2017

3 MILLION WERE UNDIAGNOSED OR NOT REPORTED



*The 95% uncertainty interval for TB incidence is 9.0-11.1 million.

IN 2018

1.5 MILLION* PEOPLE DIED FROM TB

INCLUDING 251 000 PEOPLE WITH HIV

TB is a leading killer of people with HIV and a major cause of deaths related to antimicrobial resistance

*The 95% uncertainty intervals are 1.4-1.6 million for TB deaths and 223 000 - 281 000 for TB/HIV deaths.

IN 2018

ABOUT 0.5 MILLION PEOPLE FELL ILL WITH DRUG-RESISTANT TB*

ONLY **ONE IN THREE PEOPLE** HAD ACCESSED **TREATMENT**

OF THOSE TREATED, ONLY **56% WERE TREATED SUCCESSFULLY**

*The 95% uncertainty interval for the incidence of rifampicin-resistant TB is 420 000 - 560 000. About 80% of these cases had multidrug-resistant TB.

HOW FAR ARE WE FROM ACHIEVING OUR TB ELIMINATION GOALS?

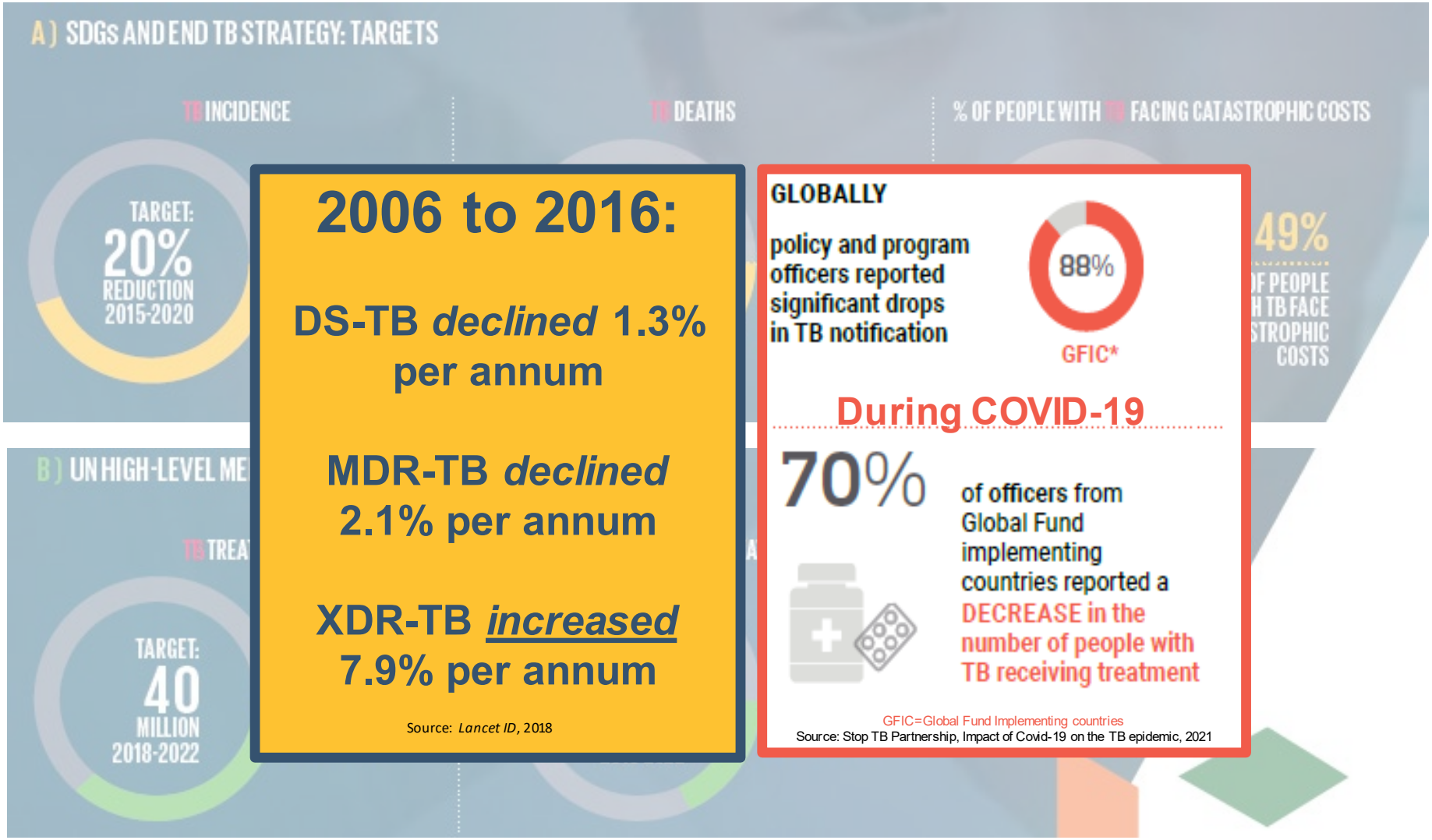
3 million undiagnosed

5,000+ people dead every day

<20% DR-TB patients cured

END TB

Source: WHO 2019



Source: WHO TB Progress Report, 2020

YES.

TB ELIMINATION CAN BE ACHIEVED USING THE **SEARCH-TREAT-PREVENT** EPIDEMIC CONTROL STRATEGY THAT HAS EXISTED SINCE THE EARLY 1960s

WE HAVE YET TO IMPLEMENT THAT STRATEGY GLOBALLY

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1

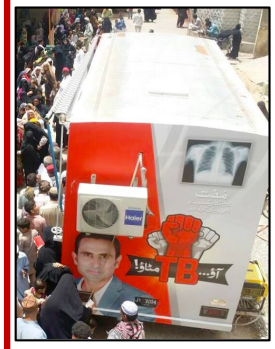
SEARCH for people with TB disease and infection

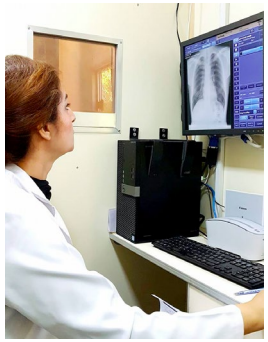
Photo: University of Washington Library

Active case finding using a sensitive diagnostic (x-ray) was a critical tool for finding active cases and stopping transmission of TB

→ Early case detection led to lower mortality

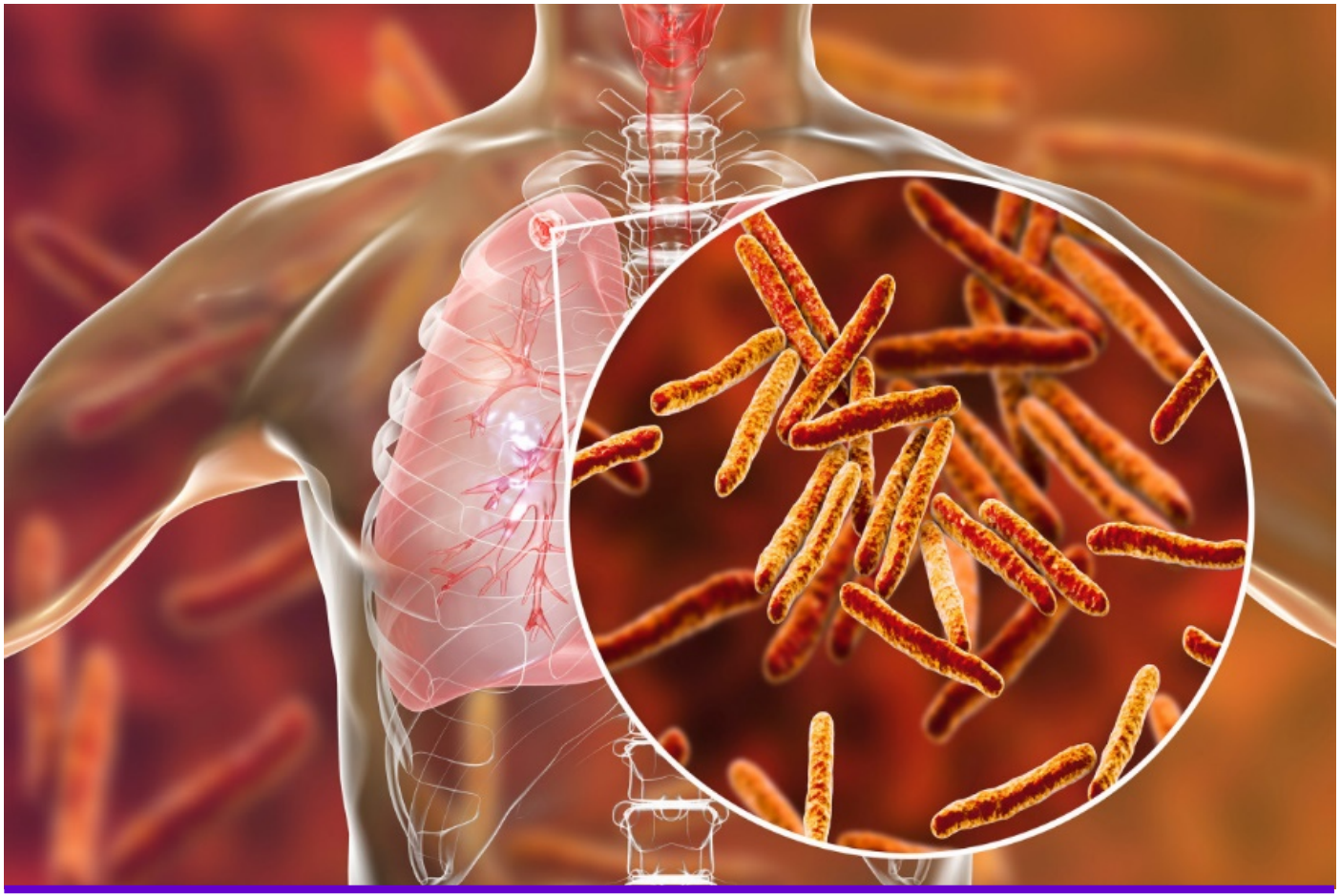
Source: Golub et al. 2005





Tools to confirm TB disease and drug-susceptibility

Tools to confirm TB Infection

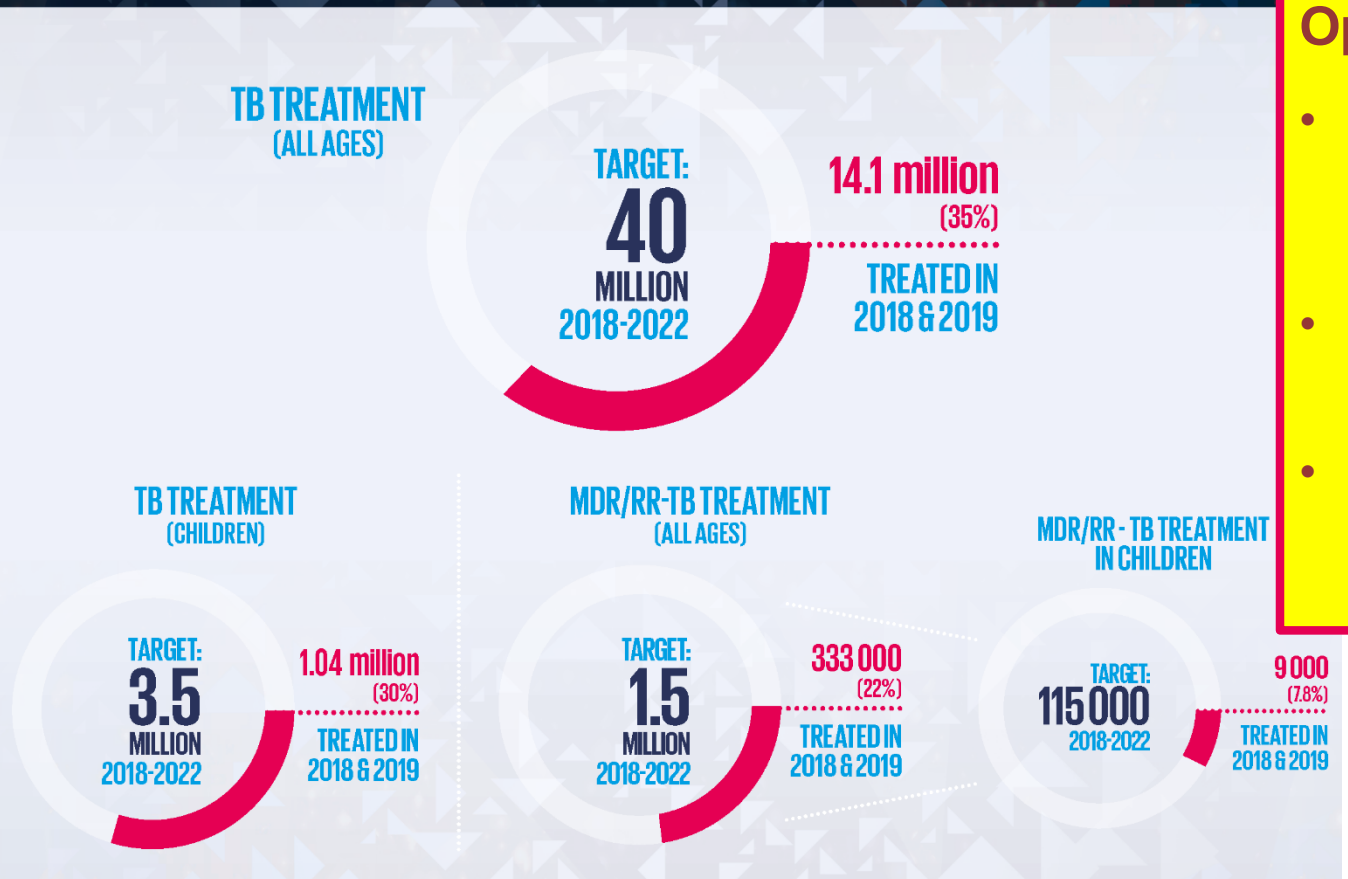


2 TREAT TB disease correctly

USING THE CORRECT MEDICINES WITH LEAST SIDE EFFECTS OVER THE SHORTEST PERIOD OF TIME

GLOBAL PROGRESS IN THE NUMBER OF PEOPLE TREATED FOR TB IN 2018 AND 2019 LAGS BEHIND

WHAT IS NEEDED TO REACH THE UN GLOBAL TARGETS, ESPECIALLY FOR DRUG-RESISTANT TB



Opportunities:

- Short course regimen for DS-TB
- All oral regimens for DR-TB
- Patient supports that include food and cash transfers

END TB

World Health Organization

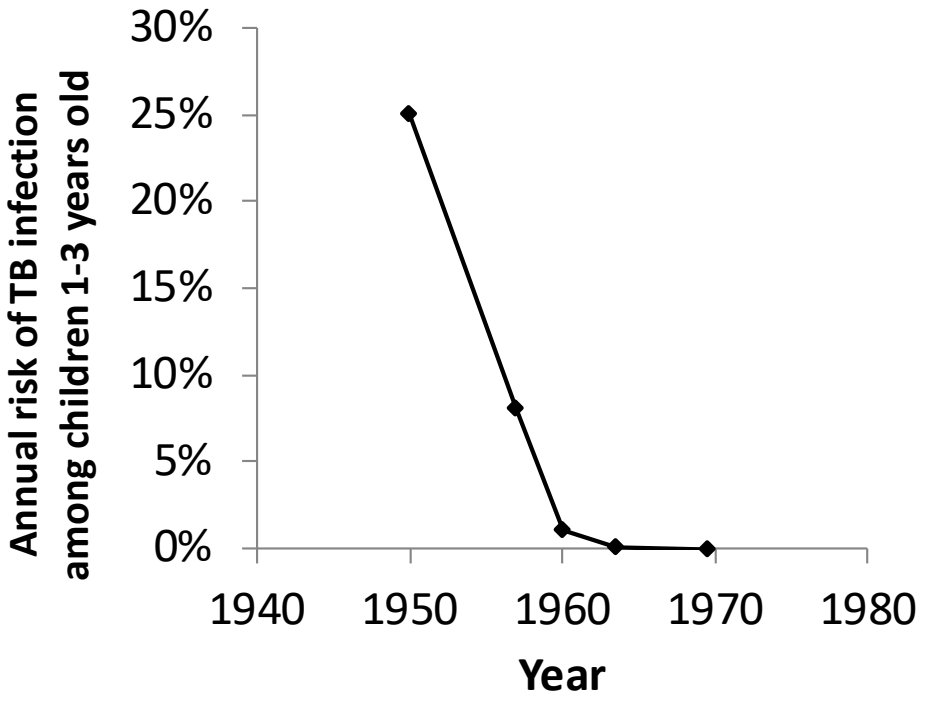
Source: WHO 2020

3

PREVENT TB infection from becoming active disease

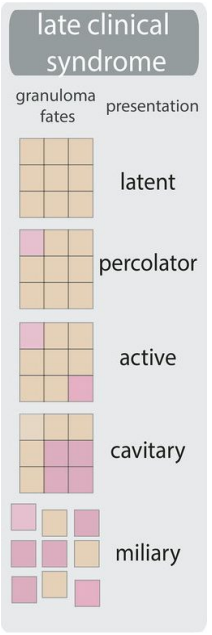
TREATING TB IS AN ESSENTIAL PART OF STOPPING TRANSMISSION AND DISEASE

Preventive therapy and the decline in TB transmission in Alaska



Between 1950 and 1960, the US Public Health Service built health facilities, started **active case finding**, **treatment of all forms of disease**, and **treatment of TB infection**

Kaplan, Fraser, and Comstock. Am Rev Resp Crit Care. 1972

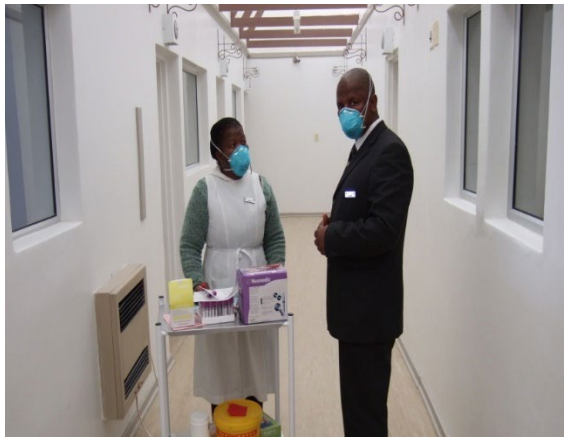


Granuloma formation (informed by Canetti's seminal studies and progression coupled with outcome of M. tuberculosis infection.

Source: Cadena, Flynn & Fortune, *mBio*, 2016

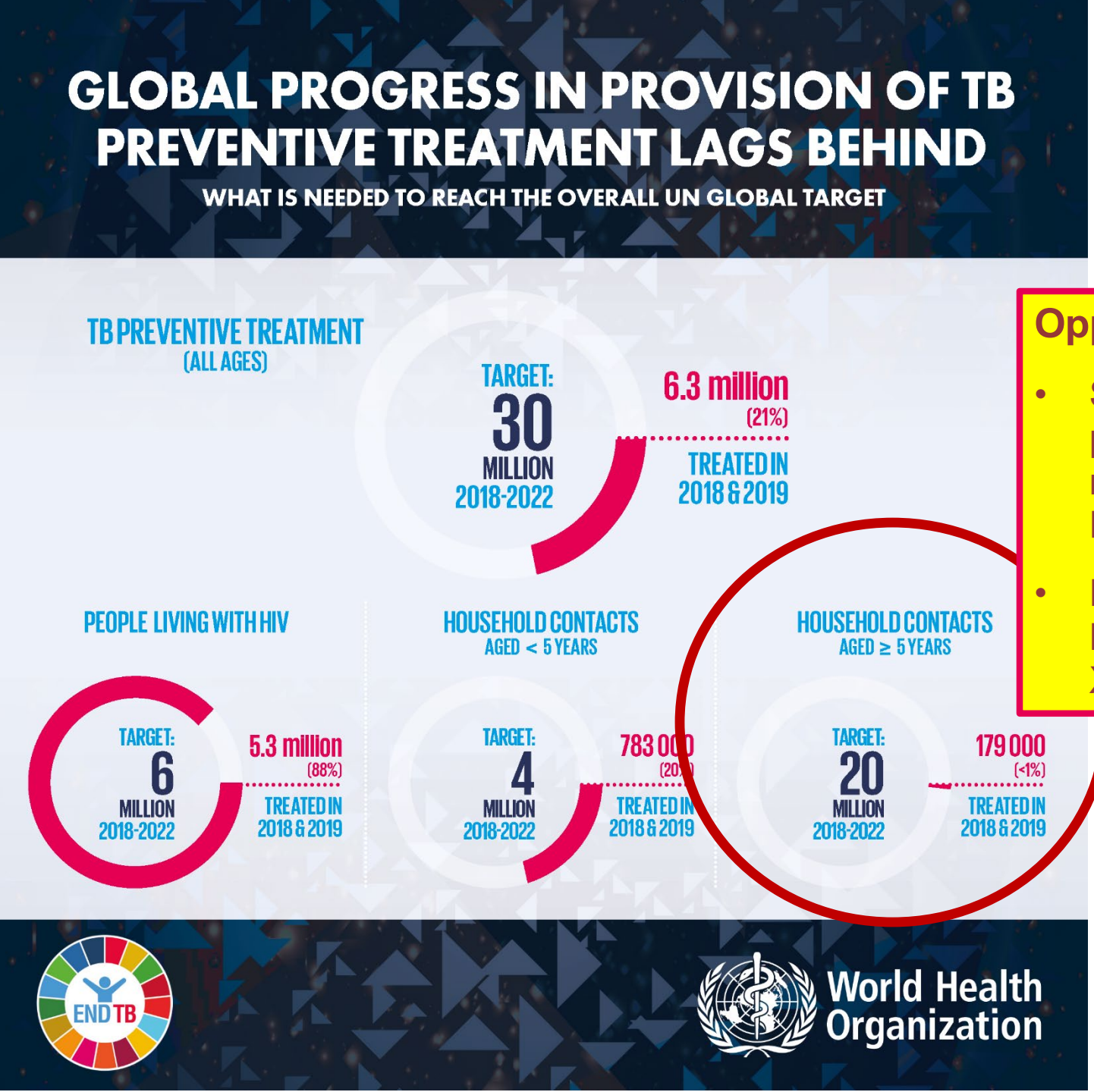
~8 to 10% of contacts will get TB during the first two years after exposure to an individual with active disease

~20-30 million contacts a year should receive treatment



Infection/transmission Control

1. Respirators
2. Ventilation
3. Upper room UV-C germicidal lighting



Opportunities:

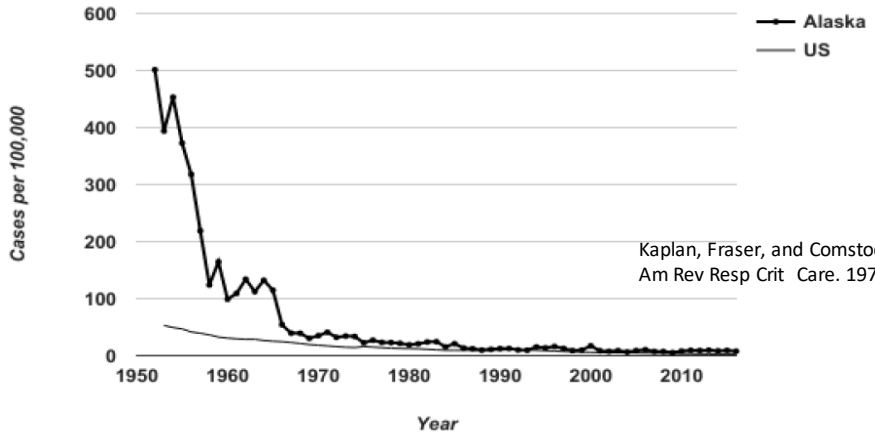
- Short course preventive regimens for DS-TB (1HP; 3HP)
- Regimens for MDR-TB and XDR-TB

Source: WHO 2020

WHAT CAN SEARCH-TREAT-PREVENT ACHIEVE?

FASTER PROGRESS TOWARDS TB ELIMINATION

Figure 1. Alaska and the United States TB Incidence Rates, 1952–2016



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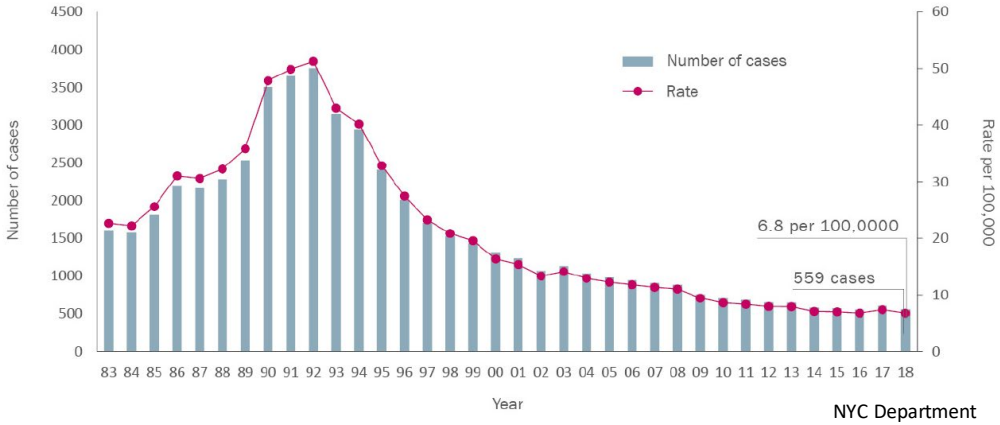


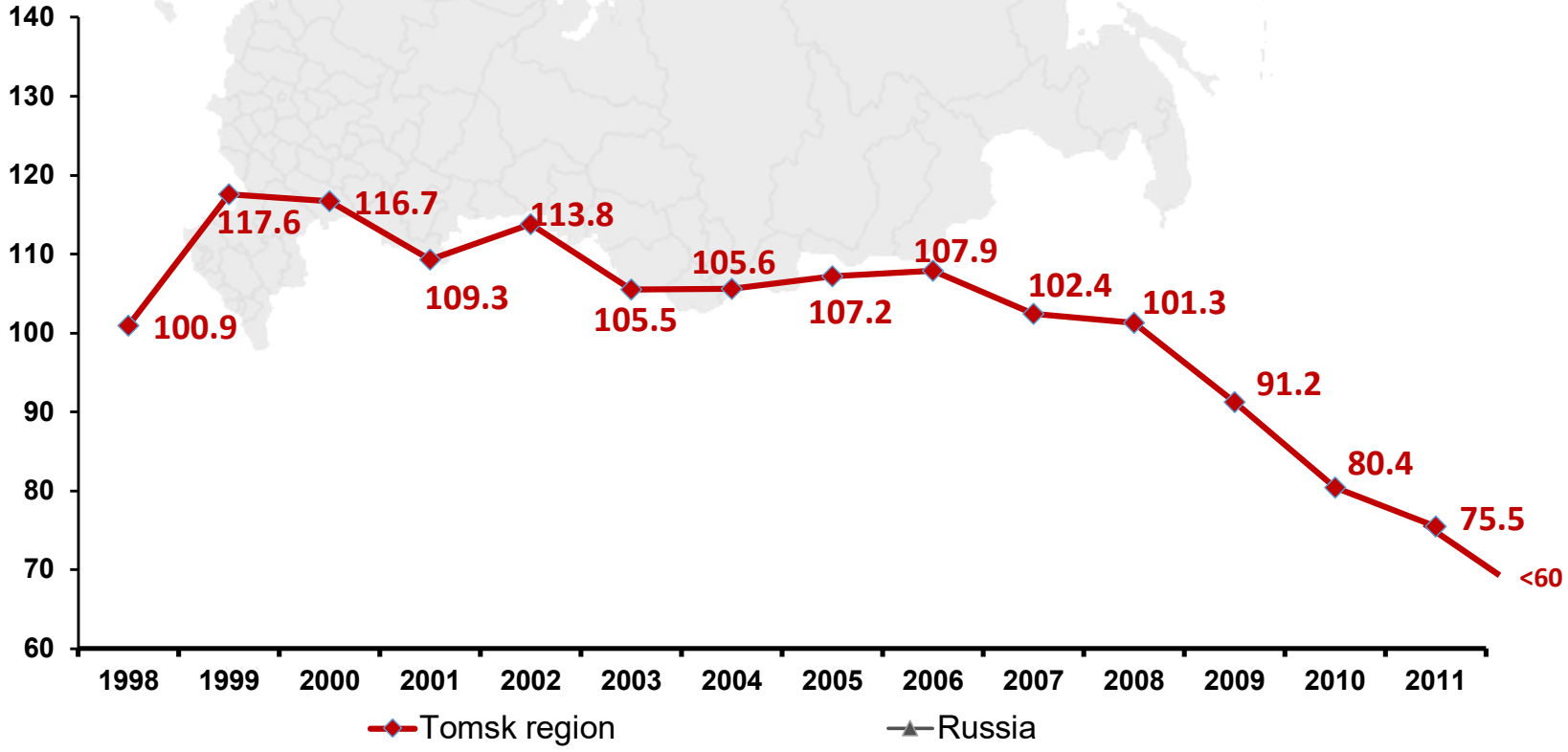
NYC Department of Health

1983-1992:
Overall increase: **134%**
Average annual increase: **11%**

1992-2003:
Overall decrease: **70%**
Average annual decrease: **10%**

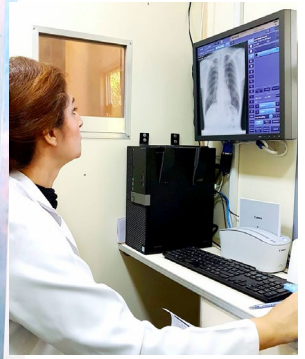
2003-2018:
Overall decrease: **51%**
Average annual decrease: **4%**

In Tomsk, Russia, a comprehensive strategy was used to rapidly reduce TB incidence



Source: Tomsk Oblast TB Services

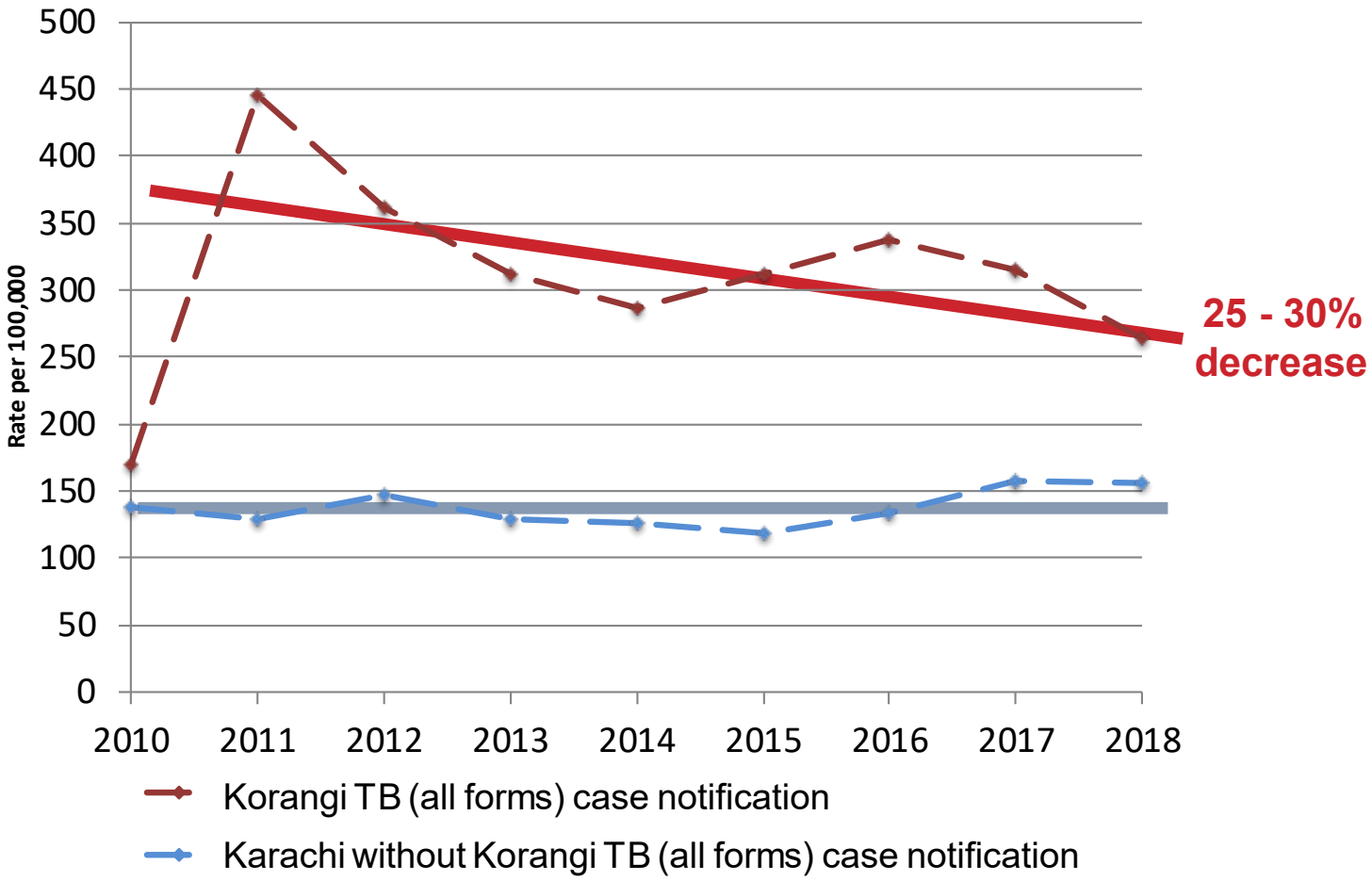
KARACHI, PAKISTAN



Photos: IRD Global

INDUS HOSPITAL

IRD



All these programs are **comprehensive**

All interventions are **simultaneous**

All use **efficaci**

Opportunity:

- The Global Fund supports programs that are *not comprehensive and are not designed to meet the UN goals*
- This results in programs that do not perform to their optimal potential despite continued investment
- Comprehensive S-T-P programs is the standard of care for TB. This should be reflected in what we see globally

A
APPROA

UNITE TO END TB

BUILDING A PLATFORM FOR CARE DELIVERY

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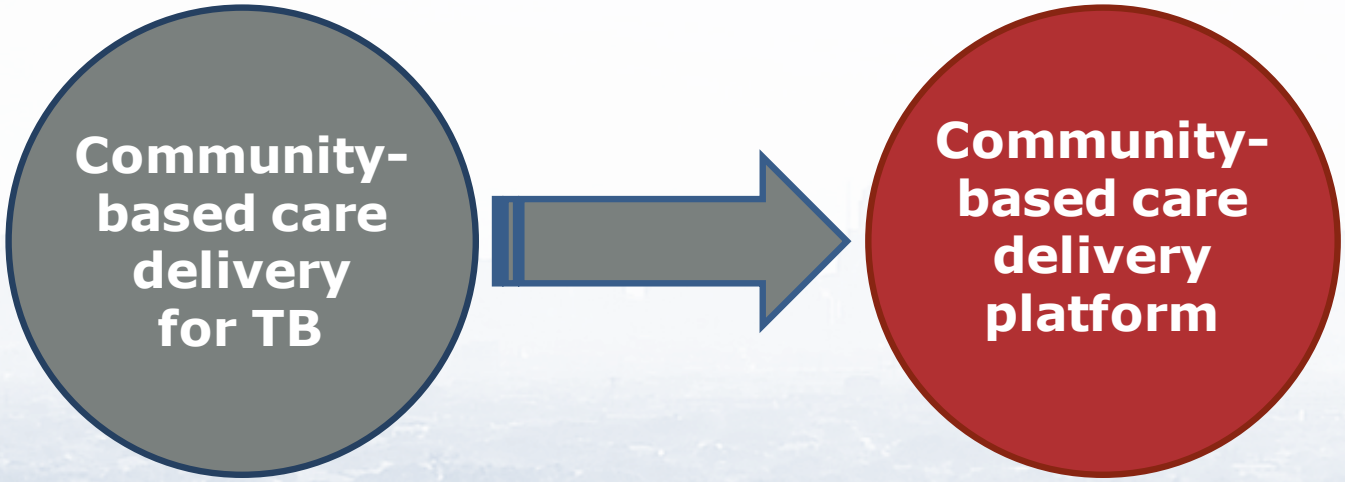

HIV
Hepatitis C
Diabetes
Heart Disease
Mental illness
COVID-19

Pandemic Preparedness: Improving biosecurity through investments in comprehensive epidemic control for tuberculosis

We have an opportunity to shift the global TB control paradigm in a way that will simultaneously strengthen global biosecurity.

	Tuberculosis	Biosecurity
SEARCH	Find people sick with TB or exposed to TB using effective tests (e.g. mobile x-ray; genetic tests).	Community-based screening platform to isolate cases, limit and contain exposure, and stop transmission in communities and place where people live and work.
TREAT	Rapid deployment of the correct medicine and support the sick. This requires testing of strains, access to medicines, and a system for community-based care delivery.	Community-based delivery of treatment in order to prevent hospitals from becoming overburdened. This includes developing systems for home monitoring, creating "virtual hospitals", and systems to support the sick.
PREVENT	Prevent people from being exposed to TB and treating people who have been exposed so that they do not become sick with TB.	Preventing exposure using engineering controls (e.g. UV germicidal lighting) to keep public spaces safe, have a system to provide preventive therapy.

ZERO TB Initiative

@s_keshavjee

Дякую
நன்றி
شكراً جداً
धन्यवाद
Gracias
谢谢
Thank you
Kahm uhn
Siyabonga
شكريه
Спасибо
Asante
Cảm ơn bạn
Ngiyabonga
Merci

Summary of key ideas

1. We are not on track to meet the UN TB elimination goals and rates of TB have increased during the COVID-19 pandemic
2. We have had a TB elimination strategy since the early 1960s: **SEARCH-TREAT-PREVENT**. It has not been implemented globally
3. We need to support communities and programs to implement this comprehensive approach through catalytic investment (e.g. Global Fund and bilateral programs)
4. We need to support research that makes **SEARCH-TREAT-PREVENT** better (e.g. POC tests, vaccines, immunomodulators)
5. We are building more than a TB program. We are building a platform for healthcare delivery in communities where people live and work.