Swiss TPH

Tuberculosis

Where Are We and What Do We Need to Do

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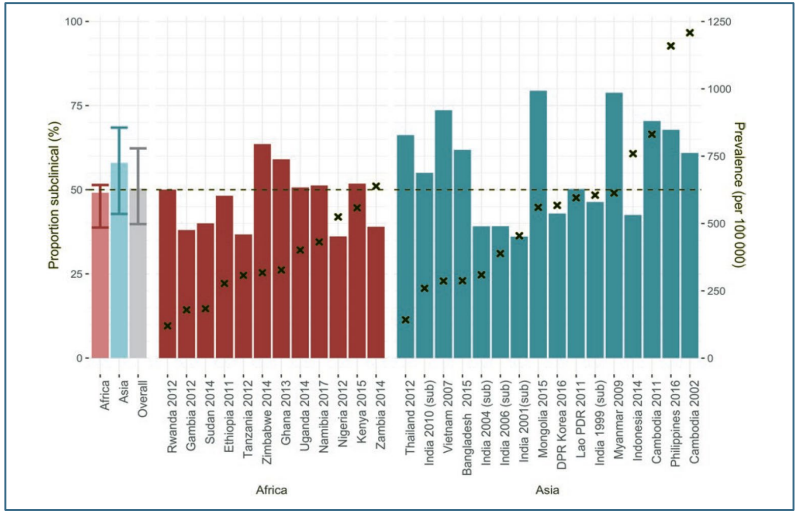
Monday, 28 June 20 - Global Health in the 21st Century

Agenda -10 min

Epidemiology
Basic Science
Diagnostics
Drugs
Vaccines
TB Control
TB and COVID-19

TB research: new evidence, progress and innovation

Around **50 %** of the prevalent infectious TB burden is **subclinical**
(= no symptoms!)

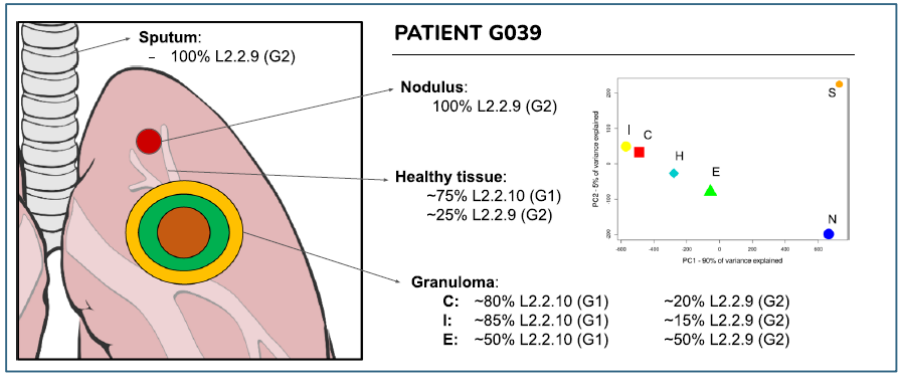


→ Implications for **global TB control!**

- **Epidemiology**
- Basic Science
- Diagnostics
- Drugs
- Vaccines

TB research: new evidence, progress and innovation

Human lung resections: a high frequency of **polyclonal infections**
(40% of surgery cases = multiple strains)



→ Implications for interpretation of sputum samples testing (i.e. **DST**) and **vaccine development**

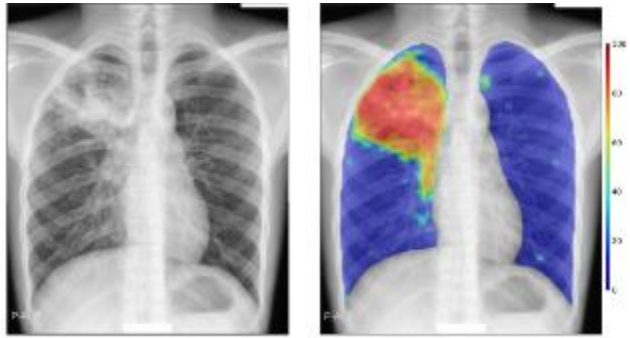
- Epidemiology
- **Basic Science**
- Diagnostics
- Drugs
- Vaccines

TB research: new evidence, progress and innovation

Renaissance of the **X-ray**

Ultra-portable X-ray solutions

&



AI-powered reading of CXR

TB TRIAGE+

- Epidemiology
- Basic Science
- **Diagnostics**
- Drugs
- Vaccines

→ community-based **TB triage testing / screening**

Murphy K et al. Sci Rep 2020; Qin ZZ et al. arXiv:2006.05509v2; https://tbtriage.com/

TB research: new evidence, progress and innovation

DS-TB

2021

- **After 40 years of trying**

- Efficacy of a **4-month rifapentine**-based regimen containing **moxifloxacin** was non-inferior to the standard 6-month regimen.

MDR-TB

2021

- **From 20 to 9 to 6 months?**

- *TB*-PRACTECAL: 6-months of **bedaquiline**, **pretomani**d, **linezolid** and **moxifloxacin** vs.standard of care. DSMB review → early stop: new regimen superior to current care.

XDR-TB

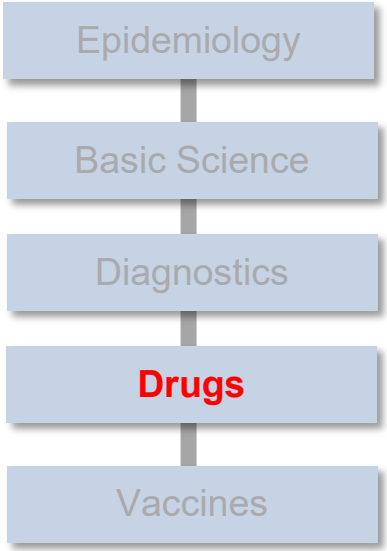
Non-responsive MDR-TB

2020

- **TB Alliance success story**

- *NiX-TB* : 6-months of **bedaquiline**, **pretomani**d, **linezolid** Clinical resolution: 89-92% Favourable outcomes: 90%.

- Linezolid: peripheral neuropathy↑↑ myelosuppression↑



Swiss TPH

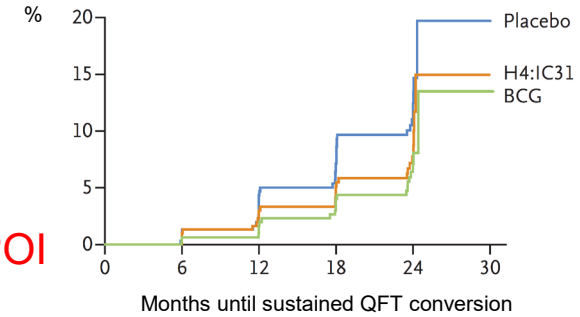
Dorman SE NEJM 2021; Conradie F et al NEJM 2020
https://msf.org.uk/article/drug-resistant-tb-clinical-trial-ends-enrolment-early-after-positive-initial-data;

TB research: new evidence, progress and innovation

Surprising & exciting **efficacy signals**

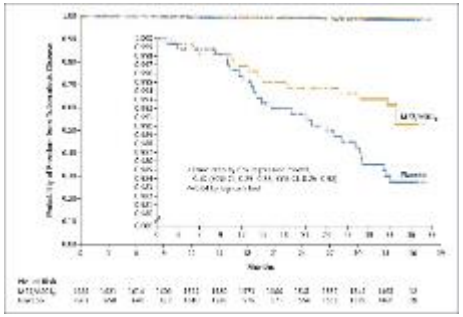
BCG vaccine reduced the rate of sustained QFT conversion, with an efficacy of 45.4%

POI



M72/AS01E and prevention of disease:
Efficacy 49.7% (90%CI, 12.1-71.2)
Acceptable safety profile

POD

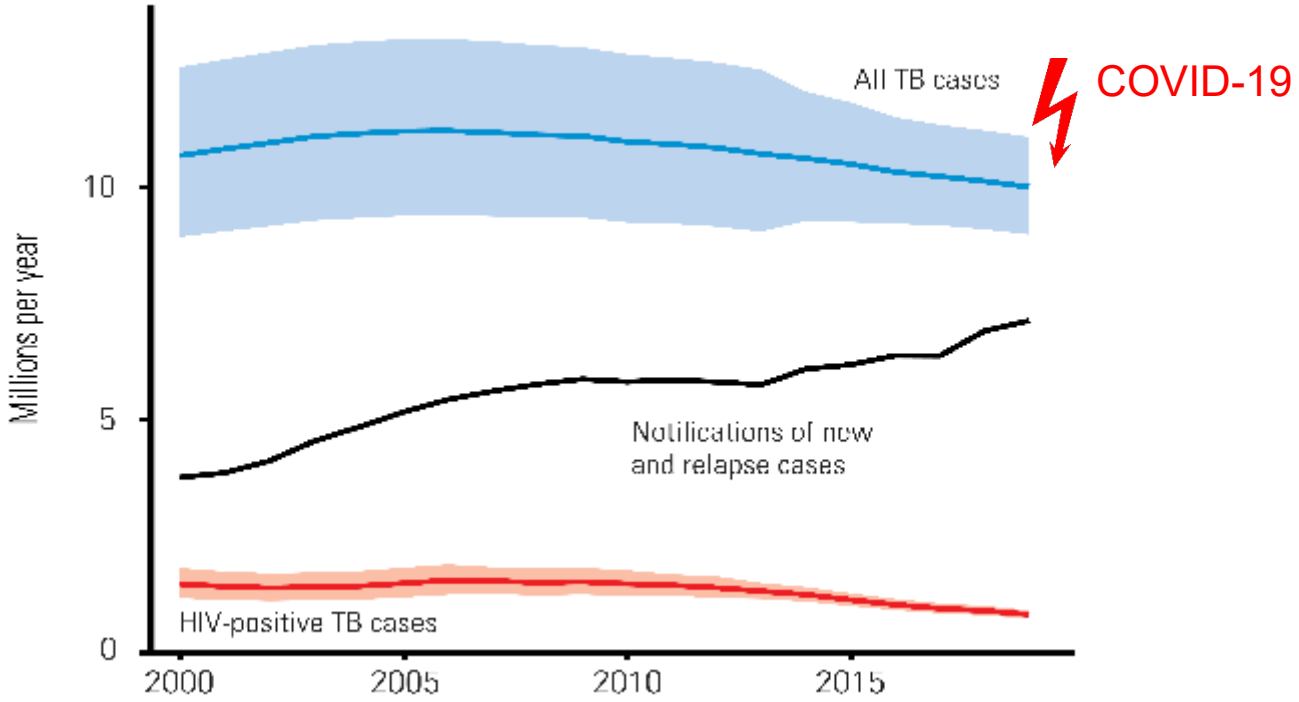


- Epidemiology
- Basic Science
- Diagnostics
- Drugs
- **Vaccines**

Nemes E et al NEJM 2018
Van Der Meeren O et al NEJM 2018; Tait DR et al NEJM 2019

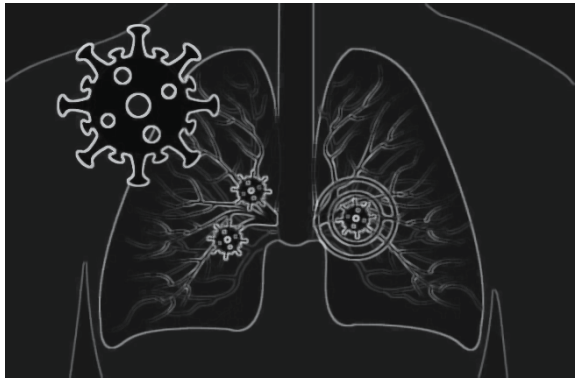
We need to get better!

Global trends in the estimated number of incident TB cases



TB is a global health crisis, similar to COVID-19

- Currently **# 2** infectious disease killer
- ~ 4000 deaths per day
- Transmission: droplet nuclei
- Complex pathophysiology
- Co-evolution with humans for 70’000+ years
- Slow, insidious development



- Currently **# 1** infectious disease killer
- 6263 per day (June 20,2021)
- Transmission: droplets, aerosols
- Complex pathophysiology
- Newly emerged pathogen
- Spreads dramatically fast

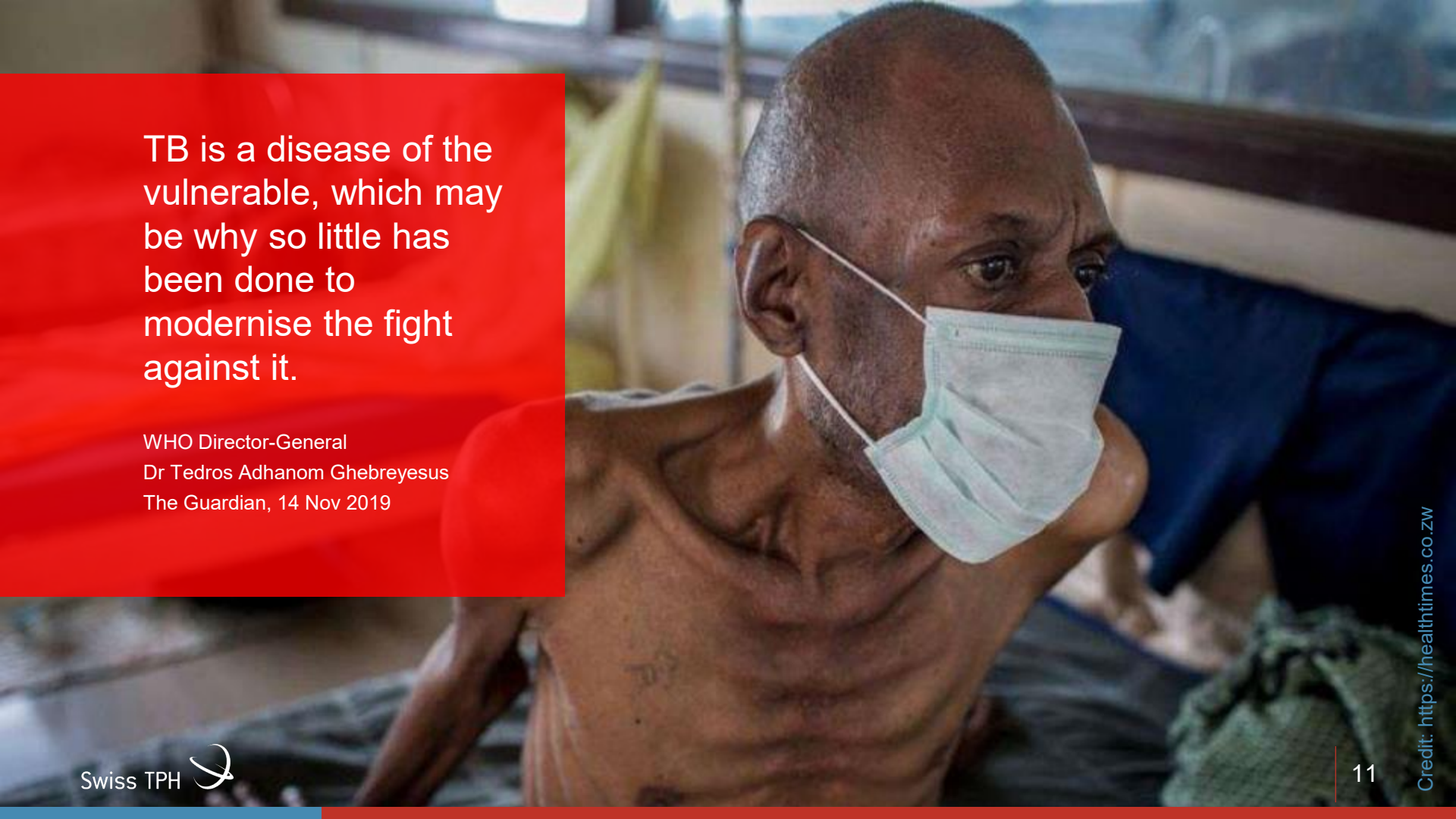
Why does the world respond so differently to these pandemics?

Let's be honest here!

TB is a disease of poverty.

TB threatens those who are vulnerable and don't have the power, resources or financial means to protect themselves from this deadly disease …

… and those who have this power **simply don't care.**



TB is a disease of the vulnerable, which may be why so little has been done to modernise the fight against it.

WHO Director-General
Dr Tedros Adhanom Ghebreyesus
The Guardian, 14 Nov 2019

Credit: https://healthtimes.co.zw