

**The Union**

International Union Against  
Tuberculosis and Lung Disease  
*Health solutions for the poor*

# The “Fourth 90”

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**The Union, Paris, France**

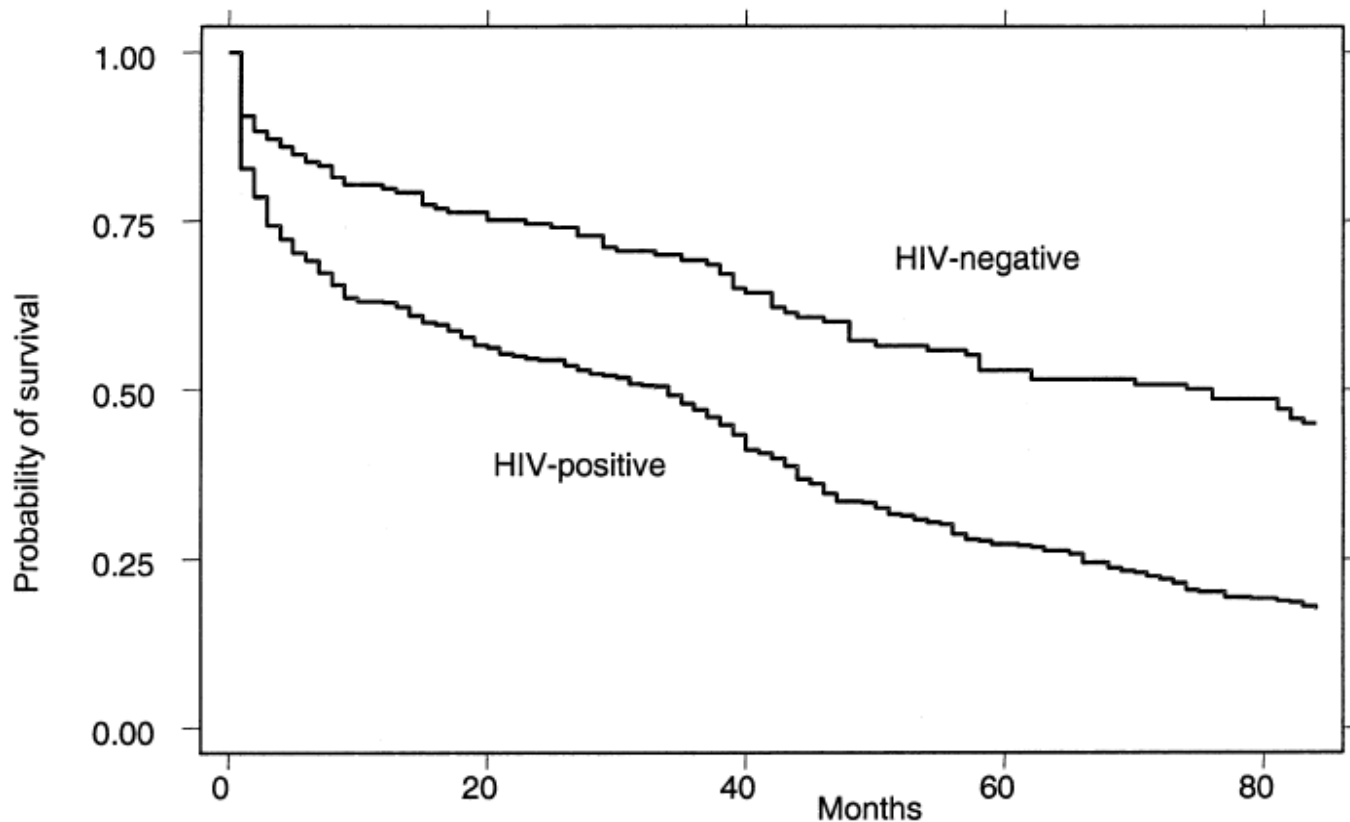
**LSHTM, London UK**

## Long-term outcome in patients registered with tuberculosis in Zomba, Malawi: mortality at 7 years according to initial HIV status and type of TB

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- 827 consecutively registered TB patients (Jul-Dec 1995)
- 793 had concordant HIV results at registration
- 612 (77%) HIV-positive
- 181 (23%) HIV-negative
- Treated with standard TB regimens – no HIV interventions
- Followed up to end of treatment and for another 72 months



**Figure 1** Survival probability by HIV serostatus. HIV = human immunodeficiency virus.

HIV-positive TB patients – mortality rate 28.7 /100 pyo

HIV-negative TB patients – mortality rate 12.5 / 100 pyo

[But no control group of HIV-negative non-TB persons]

# Death in HIV-negative persons after completing TB treatment

## Study data:

- 124 HIV-negative TB patients completed treatment
- Six years later, 62 (50%) known to be alive, and 57 (47%) reported by relatives to have died. 5 LTFU.

## Possible reasons for death:

- Older cohort (39 years)? may have become HIV-positive? initial diagnoses of smear-negative PTB and EPTB incorrect? precarious life in rural Africa?

# Post-TB Morbidity

- Pulmonary complications [A. Gupte]
- Extrapulmonary complications [J. Johnstone]
- Other complications:
  - Associated comorbidities (HIV, DM, silicosis)
  - Associated social determinants (smoking, alcohol)
  - Adverse effects of treatment (deafness)
  - Associated mental health issues and stigma

# UNAIDS 90-90-90 targets [2014]

By 2020:

- 90% of all PLHIV will know their HIV status
- 90% of all diagnosed PLHIV will receive ART
- 90% of PLHIV on ART will have viral suppression

Achieving targets will enable world to end AIDS epidemic by 2030  
[defined as 90% reduction in HIV incidence and AIDS mortality]



OPINION

Open Access

# Beyond viral suppression of HIV – the new quality of life frontier



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We propose adding a **fourth 90'** to the testing and treatment target: ensure that 90 % of people with viral load suppression have good health-related quality of life. The new target would expand the continuum-of-services paradigm beyond the existing endpoint of viral suppression. Good health-related quality of life for PLHIV entails attention to two domains: comorbidities and self-perceived quality of life.



## UNAIDS survey aligns with so-called fourth 90 for HIV/AIDS

The survey echoes a trend in the community to take notice of mental wellness when thinking of public health interventions to fight HIV/AIDS. Paul Webster reports.

[www.thelancet.com](http://www.thelancet.com) Vol 393 June 1, 2019



# Ending TB by 2030

SDG and WHO indicators	2015	2030
80% reduction in <b>TB incidence</b> rate per 100,000 compared with 2015	142	28
90% reduction in absolute numbers of all <b>TB deaths</b> compared with 2015	1,800,000	180,000

No TB families facing catastrophic costs at any time

# Stop TB Partnership 90-(90)-90 targets

**Table 2. 90-(90)-90 People-centered global targets for tuberculosis.**

- Reach and treat at least 90% of all people with TB<sup>a</sup>
- As a part of this approach, reach and treat at least (90%) of the key populations<sup>b</sup>
- Achieve at least 90% treatment success for all people diagnosed with TB<sup>c</sup>

TB, tuberculosis. <sup>a</sup>Includes people with both drug-susceptible and drug-resistant TB as well as people who require preventive therapy (for example, people living with HIV and those in contact with patients with TB). <sup>b</sup>Includes vulnerable, underserved, and at-risk populations which vary depending on country context. <sup>c</sup>Includes achieving 90% treatment success among people diagnosed with both drug-susceptible and drug-resistant TB as well as people who require TB preventive therapy. Adapted from reference 9.

## Should we consider a ‘fourth 90’ for tuberculosis?

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“Ensuring that 90% of all people successfully completing treatment for TB can have a good health-related quality of life”

# What does this mean in practice?

- Pragmatic assessment of persistent symptoms, associated co-morbidities, social determinants, other complications and lung function in patients who complete treatment
- Resource-poor environments
- Decentralised peripheral health centres

# End of treatment check list

On month 5 or 6 of DS-TB treatment or the last month of DR-TB treatment, the patient needs to submit sputum (smear or culture to determine cure) and be rapidly assessed by a check list – this will most often be done by a nurse or paramedical officer with many other non-TB tasks to fulfil

# Key components of the check list

## 1. Assess for symptoms and co-morbidities:

- Persistent symptoms – cough, dyspnoea
- HIV coinfection – refer back to HIV care / ART
- Diabetes mellitus (DM) – refer back to DM clinic
- Mental illness – simple assessment?
- Cardiovascular disease – WHO CVD risk score?

# Key components of the check list

## **2. Assess for determinants and medication effects:**

- Smoking – assess status and advise to quit
- Alcohol - assess status and advise to reduce
- Substance abuse – consider drug dependency help
- Poverty, homelessness – context specific
- Long-lasting medication effects - deafness

# Key components of the check list

## 3. Assess for lung structure /function and assist:

- Chest x-ray?
- Pulmonary spirometry?
- Carbon monoxide diffusion capacity (DLCO)?
- **Six-minute walking test (6MWT)** – would need to be standardised with reliable threshold for defining pulmonary impairment



# Considerations for 6MWT

- Continuous track or point-to-point?
- Track should be flat
- Walk **as far as possible** in 6 minutes (stop watch)
- Think about confounders – e.g., neuropathy
- Reliably measure this distance – pedometer?
- Do it once or twice?
- Do we need sphygmomanometer; pulse oximeter for oxygen saturation; access to oxygen?

# If 6MWT shows pulmonary impairment, then what?

- Refer to pulmonary specialist?
- Refer for pulmonary rehabilitation package?
  - Initially physiotherapy directed
  - Aerobic and resistance exercises learnt
  - Exercises practised at home
  - Monitored for effect through 6MWT

*[Jones et al, Int J Chronic Obstruct Pulmon Dis 2017; 12: 3533-39]*

# How to monitor the “Fourth 90”

“Has the 6MWT been done in 90% of TB patients on treatment completion and can we get a normal test in 90% of these patients within six months of treatment completion”?

# Scylla and Charybdis



The way forward for the TB Fourth 90:

- Simple and quick enough to get it done in most resource-poor NTPs

BUT

- Comprehensive enough to make it acceptable to the scientific community and beneficial to patients

# Dual Fourth 90

- Can we go beyond viral suppression for HIV and beyond treatment success for TB?
- Dual Fourth 90 offers a public health paradigm shift that addresses on-going health and well-being of PLHIV and patients with TB
- The metrics and targets need to be defined

**THANK YOU**