Comparing case detection against other interventions in TB models

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MODELLING GROUP

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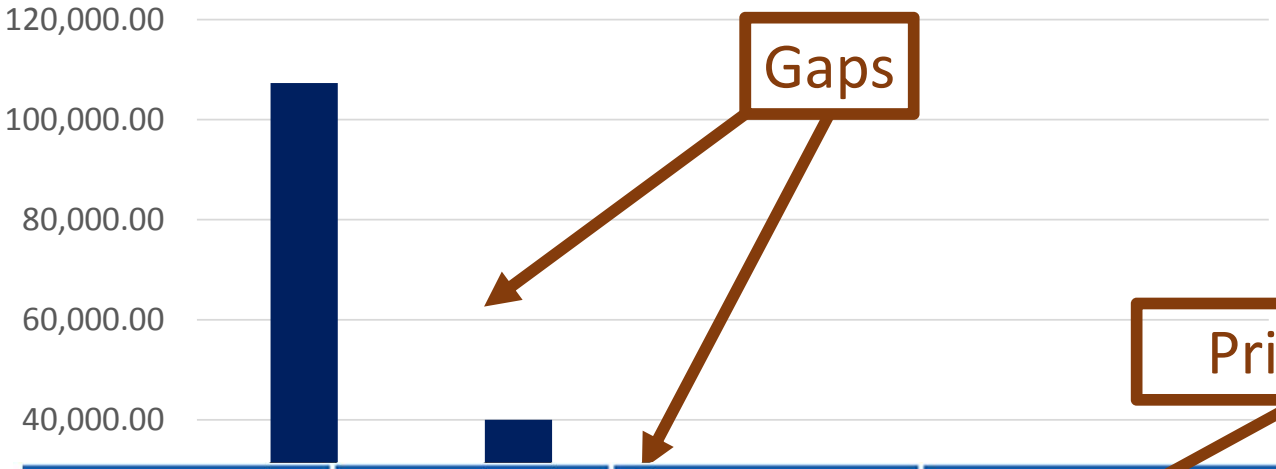
Contents

- Why case finding?
- Outcomes for comparator
- Impact of False Positives
- Implications for modelling

Case finding – why the focus?



Gaps

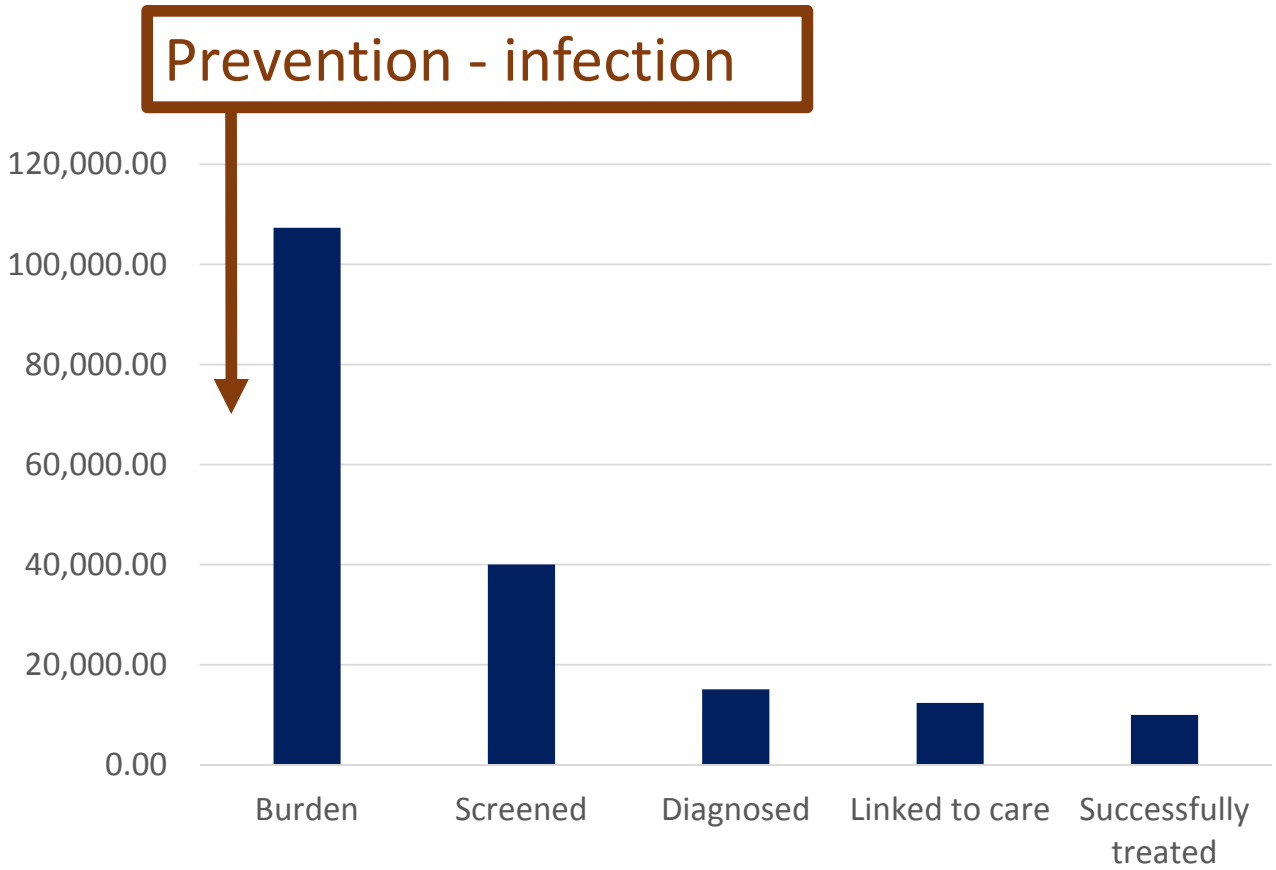
Priority for funders / policy bodies

MODULE	TYPE OF INDICATOR	INDICATOR CODE	INDICATOR DESCRIPTION
Outcome indicators (All modules)	Outcome	TB O-1a	Case notification rate of all forms of TB per 100,000 population – bacteriologically confirmed plus clinically diagnosed, new and relapse cases

Source: GFATM funding model modular framework handbook (Feb 2017)

MEDICINE

Case Finding - the alternatives



- Interventions
  - Infection control
  - Crowding
  - Co-morbidities (Diabetes, HIV?, ….?)
  - Continuous preventive therapy

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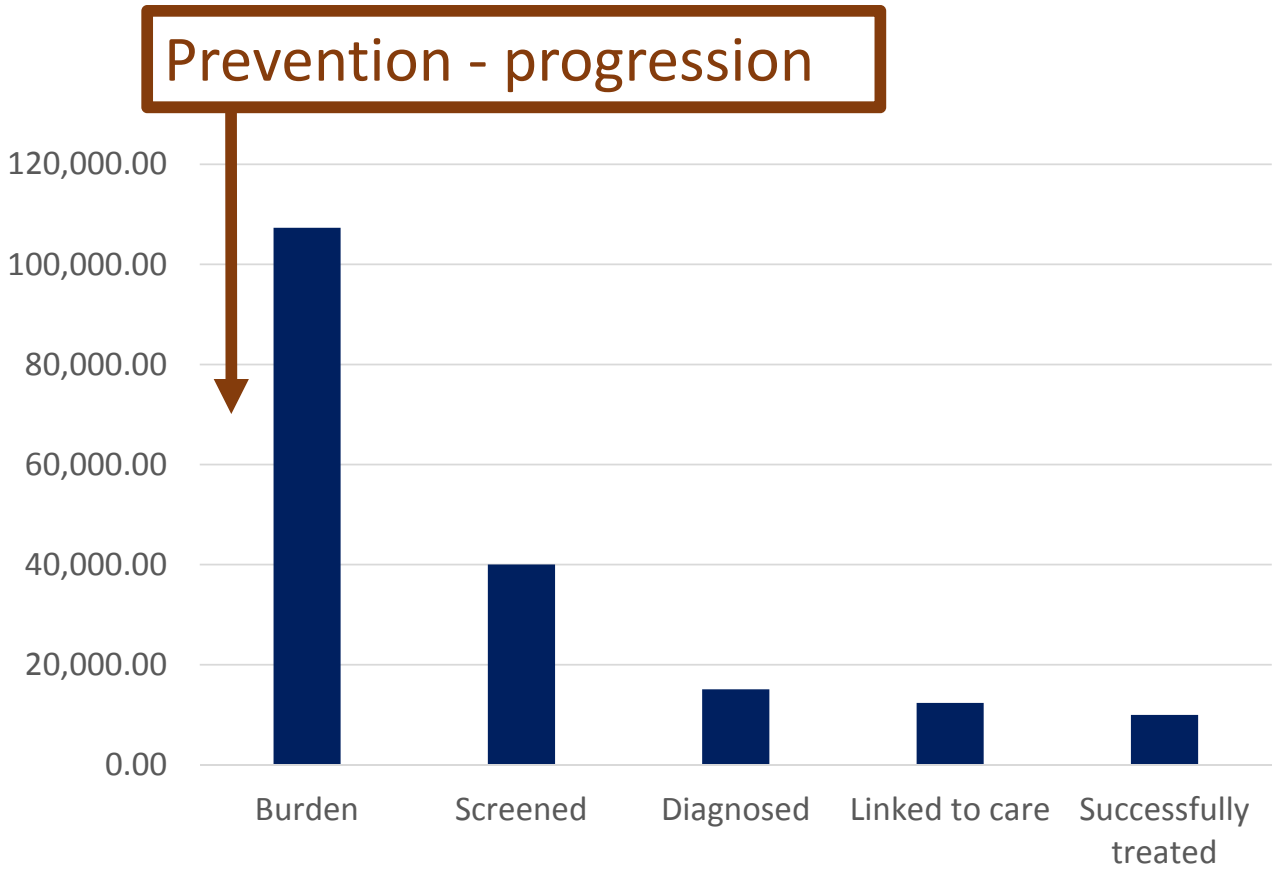
Case Finding - the alternatives



- Interventions
  - Manage co-morbidities (ART, Diabetes treatment)
  - Nutrition
  - Preventive therapy
    - HH contacts, Children, HIV-pos

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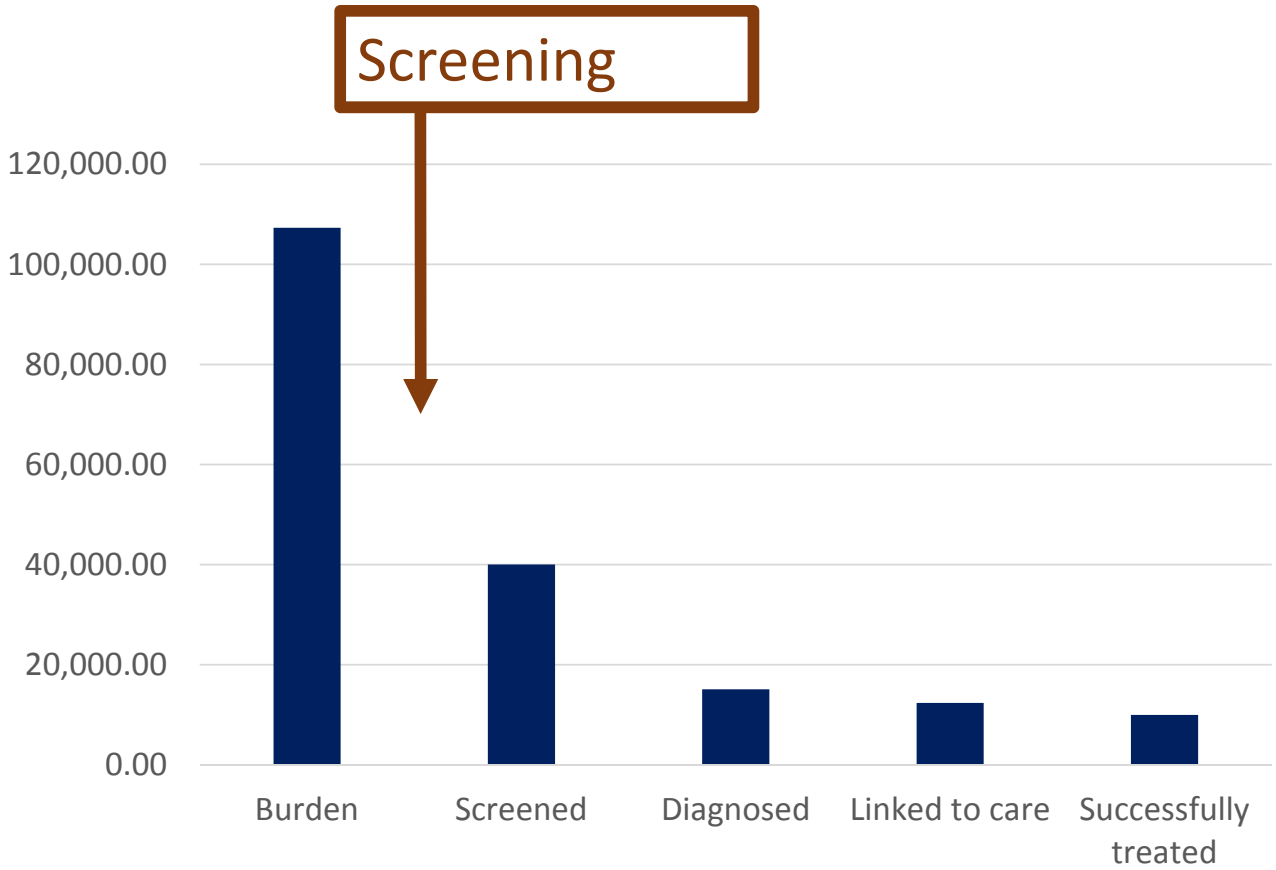
Case Finding



- Interventions
  - Increase population coming forward for passive screening
    - Awareness, …
  - Targeted screening
    - Clinic attendees
    - Risk groups/communities

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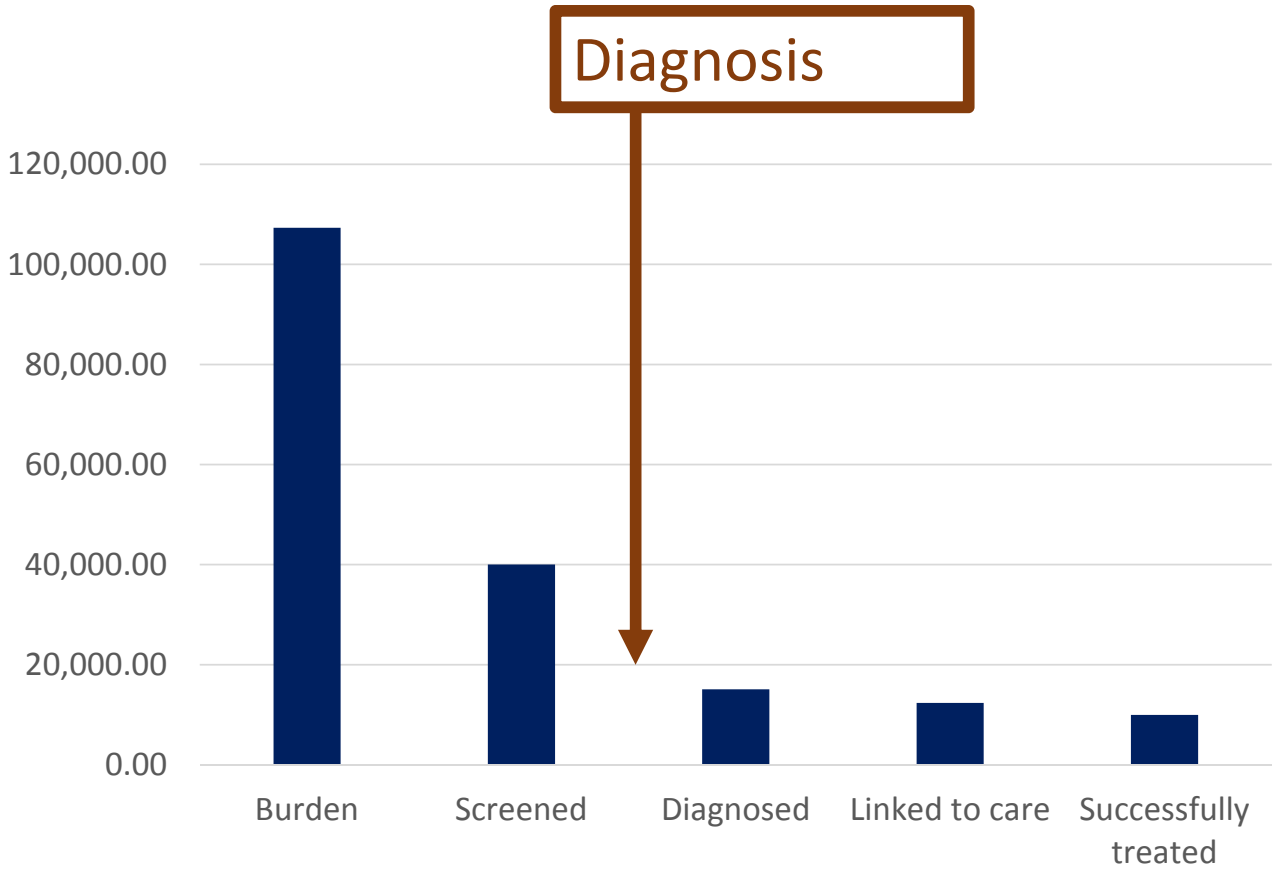
Case Finding



- Interventions
  - Change screening test(s)
  - Change confirmation test(s)
  - At different service levels

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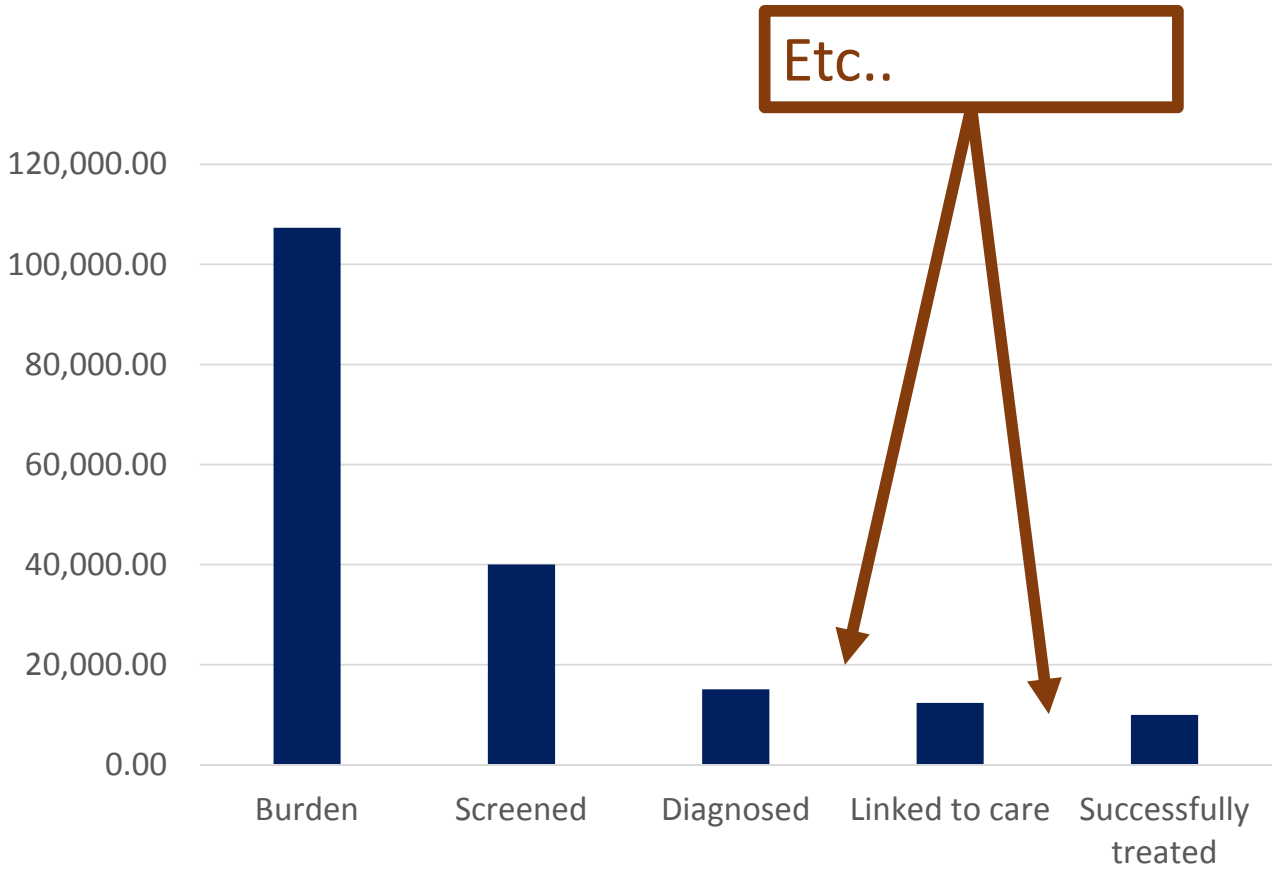
Case Finding - the alternatives



- Interventions
  - Wide range of options available

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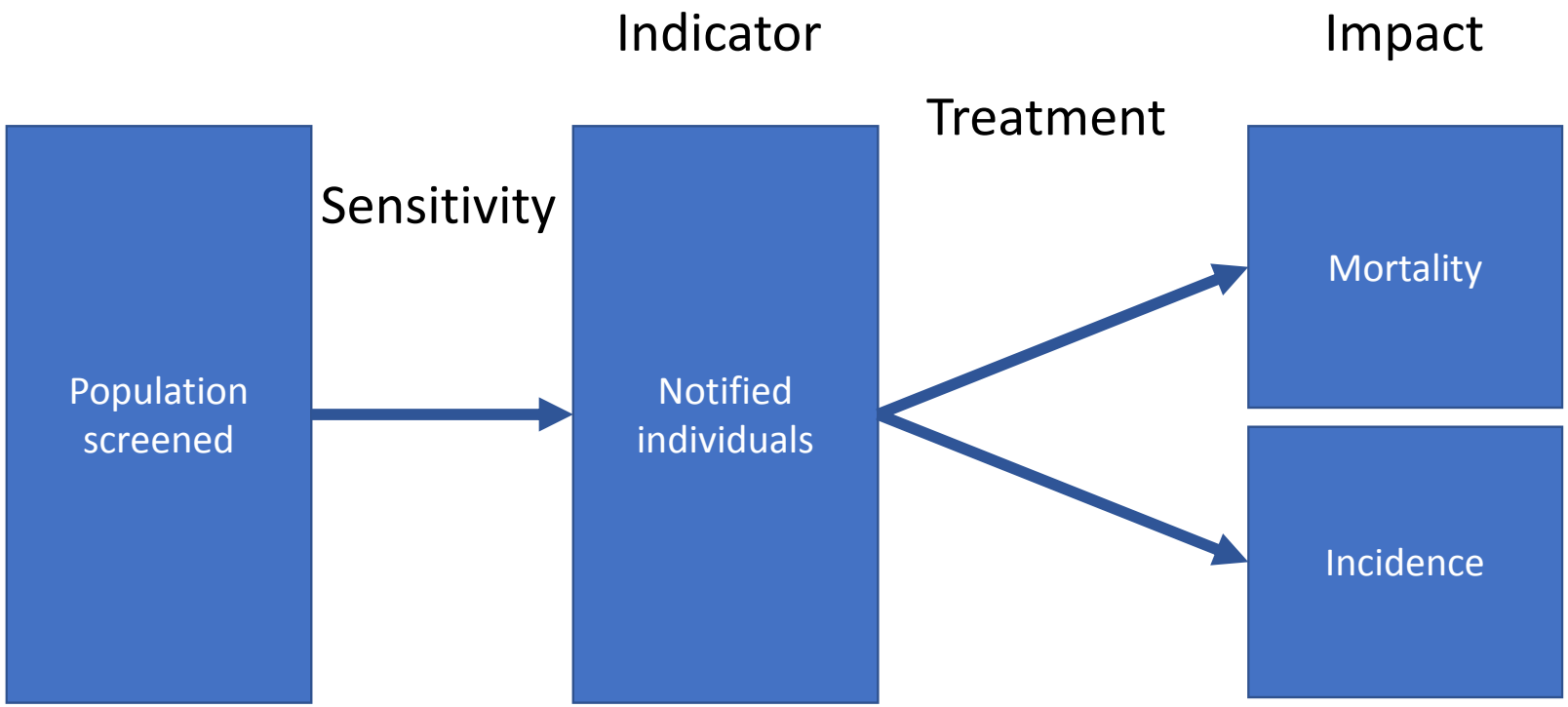
How to compare

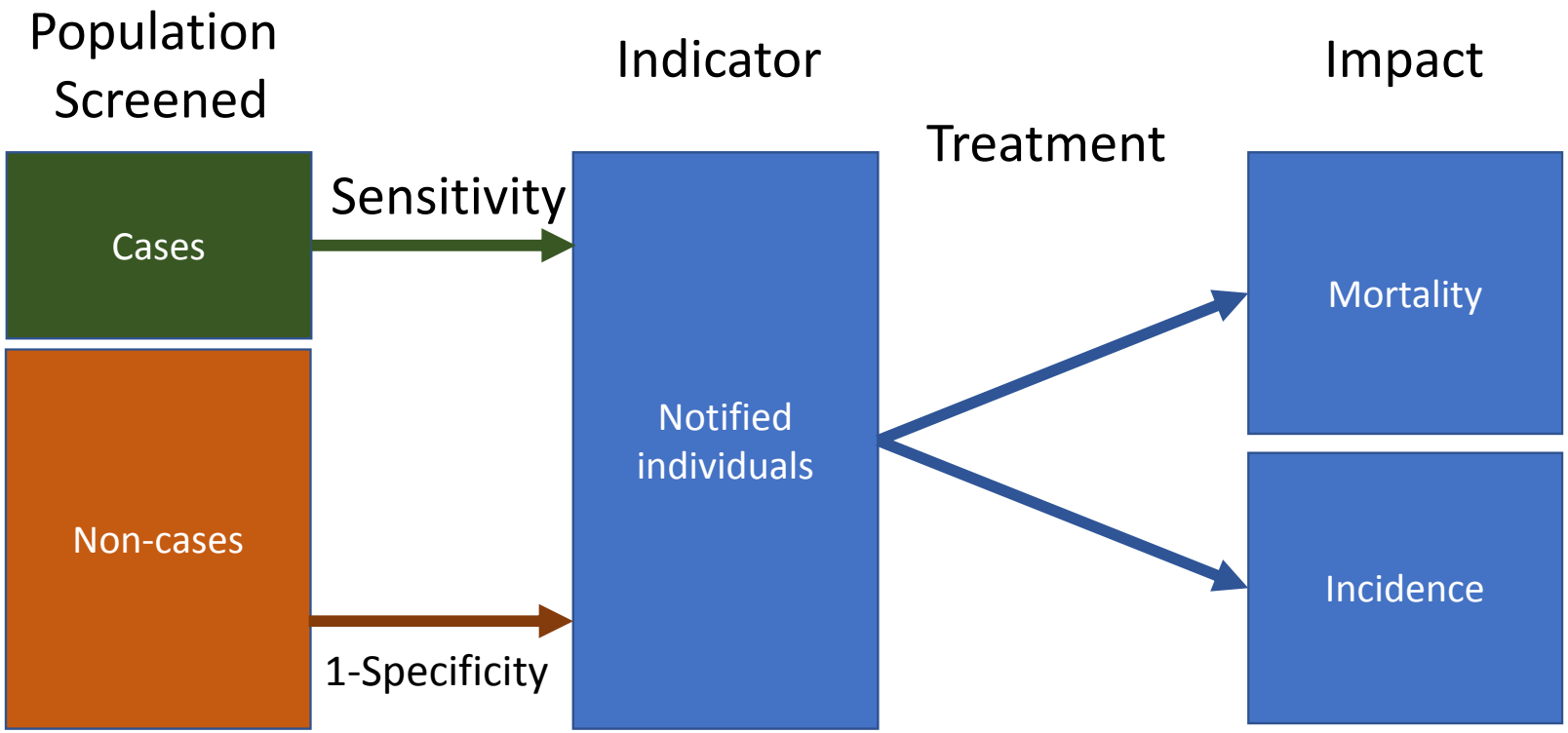
Outcome/Impact	Notes
Notifications	GFATM Outcome indicator
Cases treated	Actual target
Change in incidence	GFATM Impact indicator --> Disease episodes prevented
Change in mortality	GFATM Impact indicator --> Deaths prevented
DALYs averted	Guidance – principle 6
Cost/xyz	

Implicit assumption notified cases >>> Epi-impact

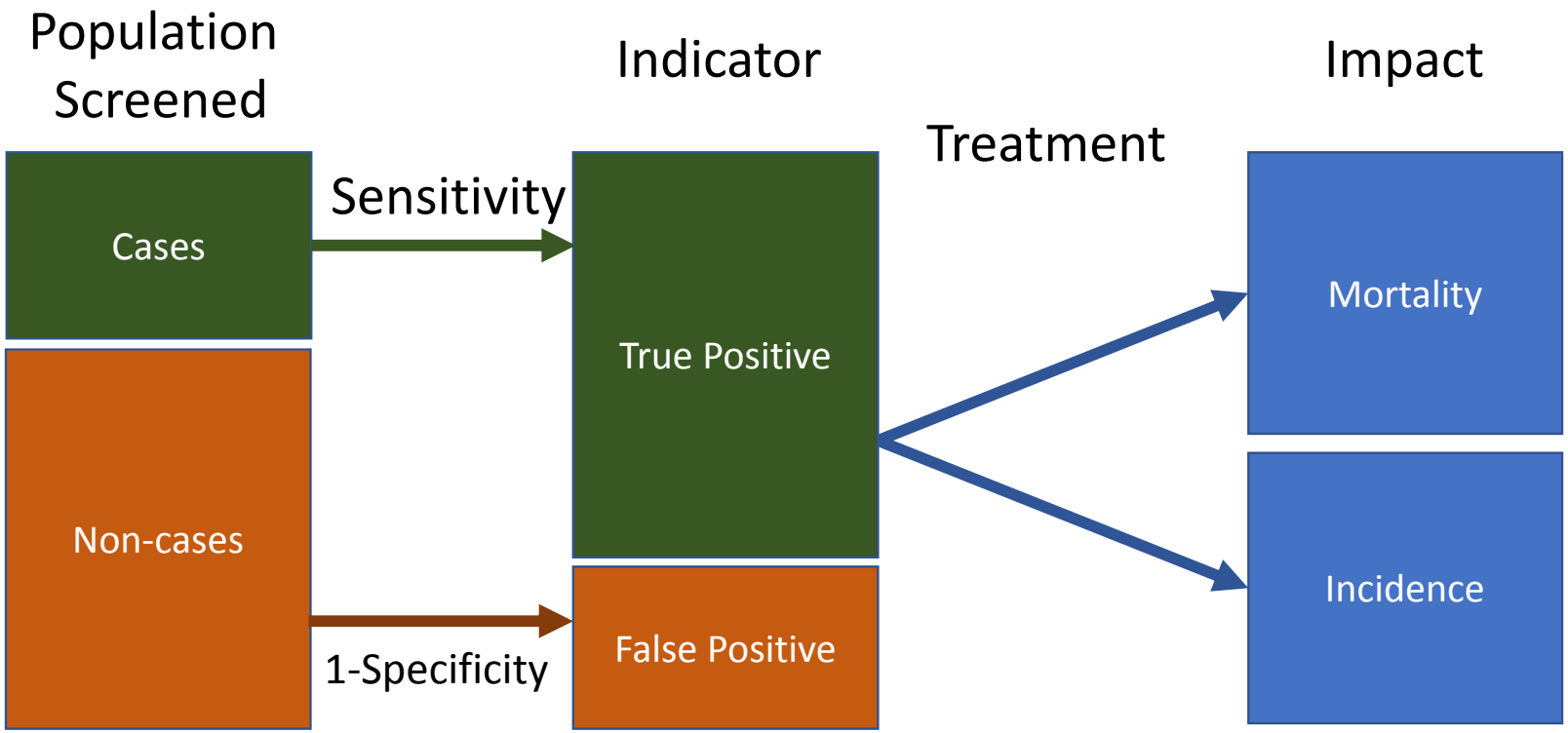
Notifications = cases found?



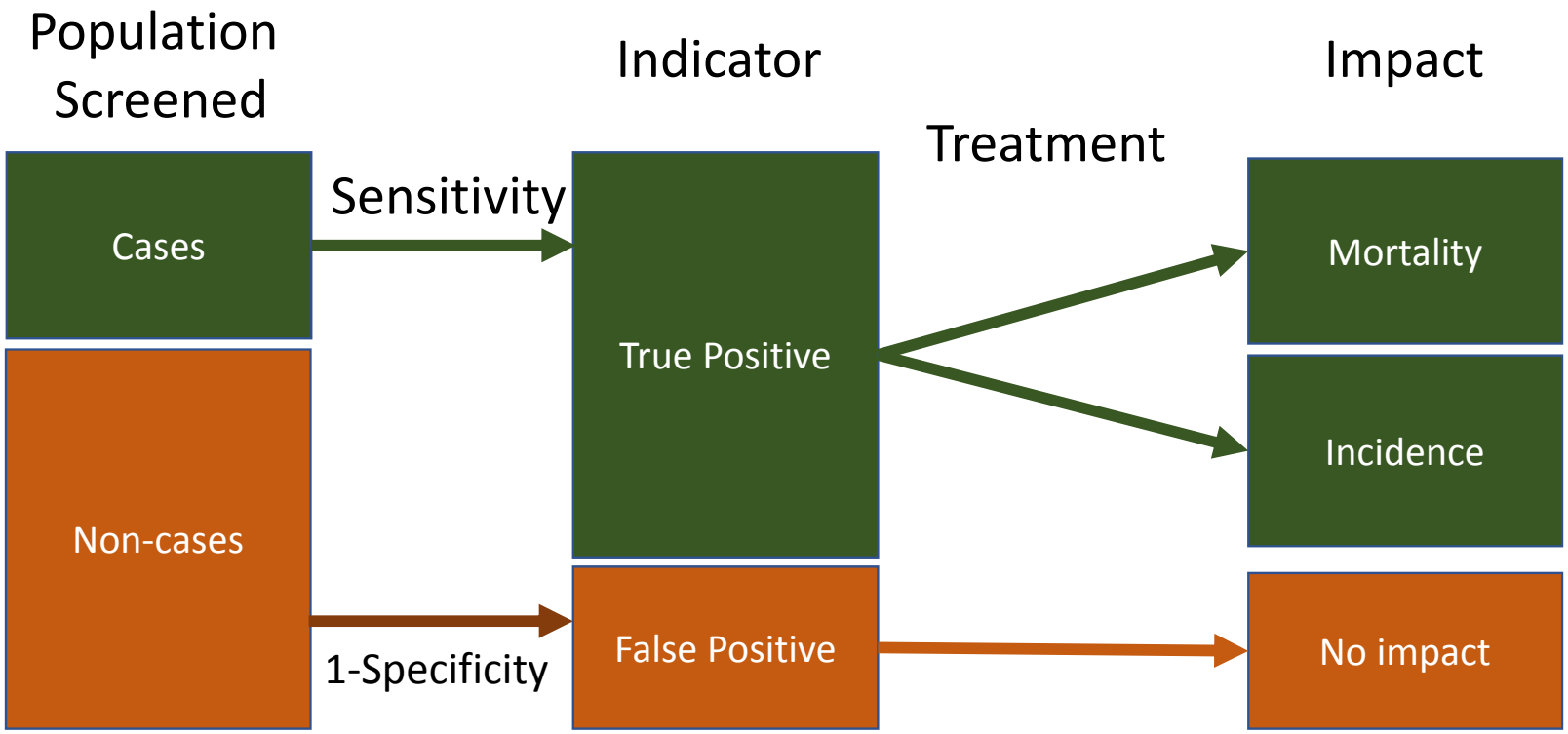
Notifications = cases found?



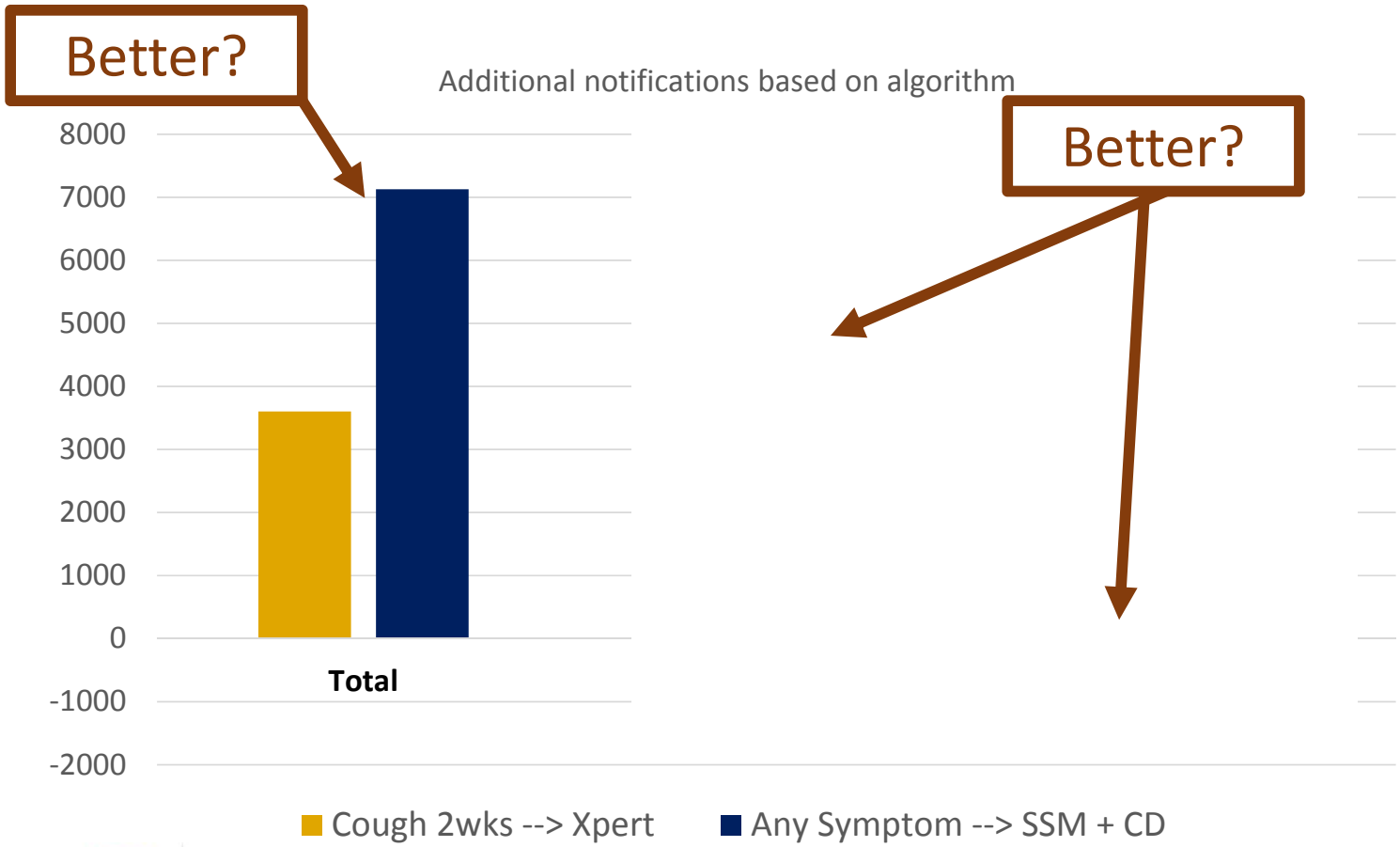
Notifications != cases found



Notifications != cases found



False positive results in modelling case finding



Scenario: expand current screening

- Baseline algorithm
  - 2wk cough, SSM/CD
- Algorithm 1:
  - Replace SSM/CD with Xpert
  - Increase in spec
- Algorithm 2:
  - Replace 2wk cough with any symptom
  - Increase in sens

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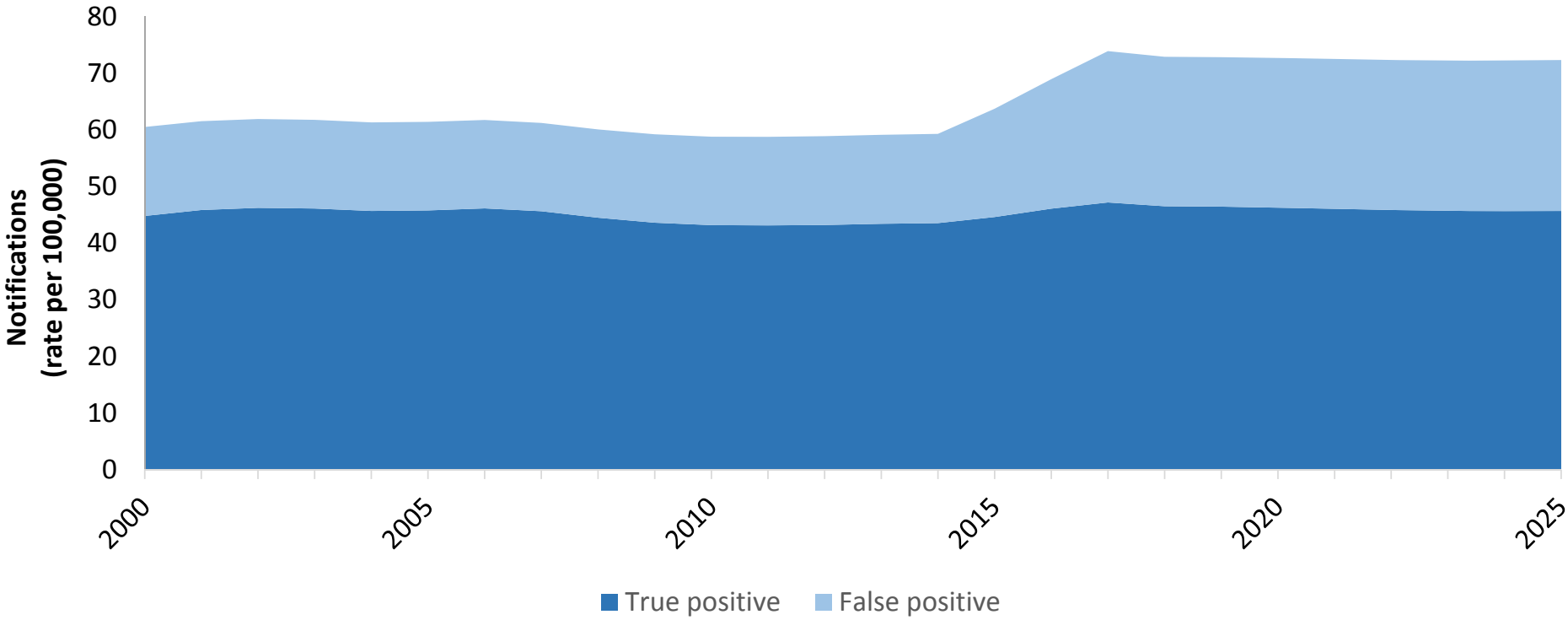
Notifications vs Impact – country example



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Problem escalates with declining prevalence in screening population

Prevalence of disease	% False Positive notifications	
	Any Symptom + SSM/CD Sens: 41% Spec: 94%	Any Symptom/Xray + Xpert Sens: 51% Spec: 99.4%
10,000/100,000 (passive screening)	56%	9%
1,000/100,000 (very high risk group)	93%	52%
500/100,000 (regular high risk groups)	97%	68%
150/100,000 (General population)	99%	87%

Impact of FP on potential comparators

Outcome/Impact	Change in indicator
Notifications	Increased
Cases treated	null
Change in incidence	null
Change in mortality	null
DALYs averted	null
Cost/xyz	Resource needs increased

Relevance for modelling

- False positives in TB are important have substantial and differential implications, depending on comparator used, modality/health system level, diagnostic algorithms considered
- Fraction FP likely higher in non-notified cases (e.g. private sector)
- Models comparing scenarios (case finding or other interventions) should recognise diagnostic structure and process
  - Menzies at al, 2012 PMED, Houben Lalli et al 2016,BMC MED, WHO risk group prioritisation tool
- Relatively speaking, evidence needed to capture process (easily) available
  - Prevalence of disease in screening population, diagnostic algorithm
  - Results of pilot projects – investigate for % FP

Acknowledgements

- Marek Lalli (LSHTM – TIME)

- Funding