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Updates on Key Performance Indicator on Investment Efficiency (KPI4) of the Global Fund

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Oct 2nd 2019, Istanbul

Global Fund 2017-2022 Strategic Key Performance Indicator (KPI) Framework

Strategic Targets	**Strategic Targets**			
	1 Performance against impact targets		2 Performance against service delivery targets	
Strategic Objectives	**Maximize Impact Against HIV, TB and malaria**	**Build resilient & sustainable systems for health**	**Promote and protect human rights & gender equality**	**Mobilize increased resources**
Strategic vision	Invest funds to maximize portfolio impact	Improve the performance of strategically important components of national systems for health	Reduce human rights barriers to service access; & Reduce gender and age disparities in health	Increase available resources for HIV, TB & Malaria; & Ensure availability of affordable quality-assured health technologies
Strategic KPIs	3 Alignment of investment & need 4 Investment efficiency 5 Service coverage for key populations	6 Strengthen systems for health a) Procurement b) Supply chains c) Financial management d) HMIS coverage e) Results disaggregation f) NSP alignment 7 Fund utilization	8 Gender & age equality 9 Human rights	10 Resource mobilization 11 Domestic investments 12 Availability of affordable health technologies

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KPI4 on Investment Efficiency

Strategic Objective	Maximize impact against HIV, TB, and Malaria
Strategic Vision	Increase the efficiency of program design to maximize impact of fund investments
Indicators	• Cost per life saved • Cost per infection/case averted
Target	**90%** of countries measured show a decrease or maintain existing levels of cost per life saved or infection averted*
Countries	**High Impact countries for all 3 diseases**
Assessment timeline	Each country is assessed **every 3 years**

*Those countries eligible for maintaining levels of efficiency would be restricted to those already highly efficient; defined as within two standard deviations of the projected optimal efficiency

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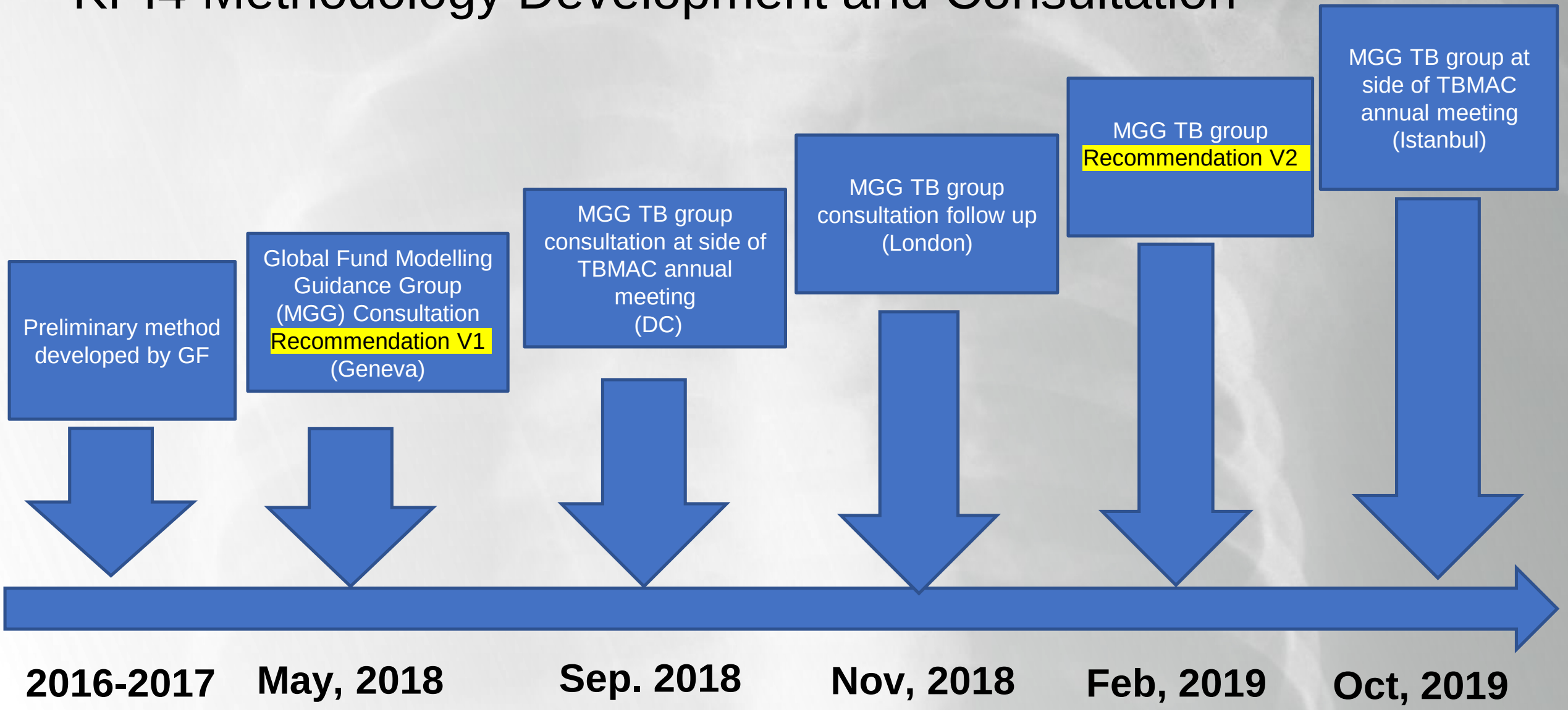
KPI4 Methodology Development and Consultation



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MGG Recommendations on KPI4 Methodology

Methods proposed:

1. Simple empirical method
2. Math modelling method based on marginal benefits
3. Math modelling method per original specification
4. Math modelling method per original specification, modified to exclude NPI

Current GF allocation cycle 2017-2019

GF allocation cycle 2020-2020 and beyond

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MGG Recommendation V1

Simple Empirical Method

To estimate the **change in cost per life saved** by patients receiving TB treatment.
Not cost per case averted.

$$KPI14 = \frac{Cost\ per\ life\ saved_{N-1} - Cost\ per\ life\ saved_{N}}{Cost\ per\ life\ saved_{N-1}}$$

- Method #1 should be the primary, and at this stage only
- Convenes a small group to:
  1. Examine the pros and cons of other sub-indicators at the input and output level.
  2. Work on methods to extend empirically measured outcomes into the future.

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Assessing Lives Saved Due to Treatment

Case Fatality Ratios, non-MDR		
	Non-notified cases	**Notified Cases**
HIV-		
Mode	0.43	0.03
HIV+ not receiving ART		
Mode	0.78	0.09
Receiving ART for less than one year		
Mode	0.62	0.06
Receiving ART for more than one year		
Mode	0.49	0.04

Data	2015-2017	2018-2020
Case notification	WHO reports by country	GF performance framework target
Cost	GF funding landscape information on the expenditure of national programs (domestic, GF and non-GF sources)	GF funding landscape for the national budget (domestic, GF and non-GF sources)

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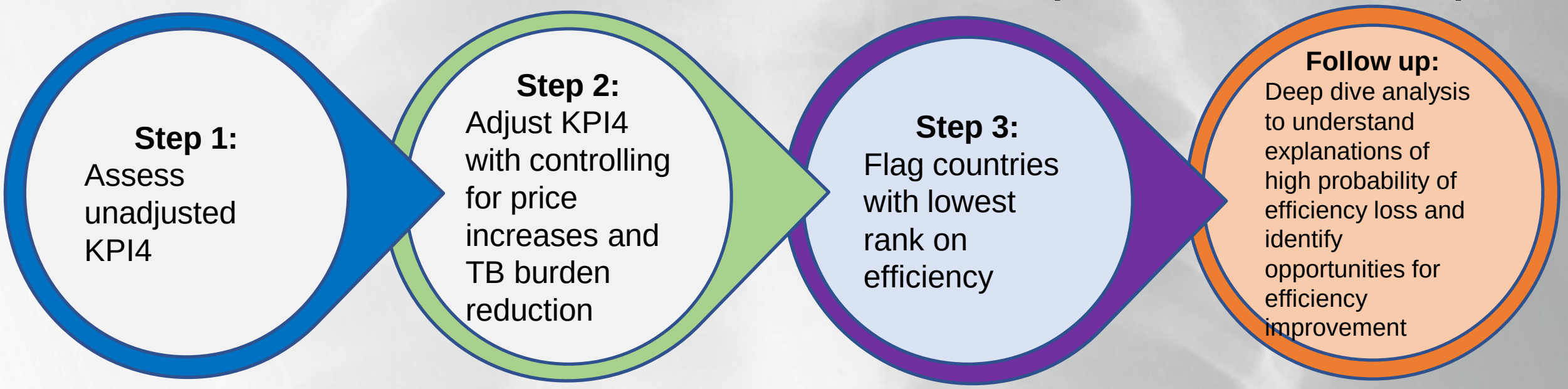
MGG Recommendations V2

Method for KPI4 Assessment: 3 Steps and follow up



Comparing cost per life saved of 2015-2017 with that of 2018-2020

Regression analysis to control the effect of GDP and TB burden change on KPI4

Flag countries with high probabilities of efficiency loss given the threshold chosen

- Spending pattern over time
- Adopted short-course regimen and advanced diagnostic technologies?
- Any major capital investment?
- TB hospitalization by MDR status
- Other explanations of high unit cost?

Empirical Method for KPI4 Assessment: Step 1

Step 1:
Assess unadjusted KPI4

KPI4 unadjusted

$$= \frac{Cost\ per\ life\ saved_{2015-2017} - Cost\ per\ life\ saved_{2018-2020}}{Cost\ per\ life\ saved_{2015-2017}}$$

Comparing cost per life saved of 2015-2017 with that of 2018-2020

Data/Period	2015-2017	2018-2020
Total cost	**Total spending** of the national program summited to the Global Fund as part of the funding request	Total expected funding landscape between 2018-2020 of the national program summited to the Global Fund as part of the funding request
Numbers of life saved	Lives saved due to treatment: estimated by comparing deaths with or without TB treatment, by applying case fatality ratios (CFR) to notified TB cases based on WHO figures	Lives saved due to treatment: projected by comparing deaths with or without TB treatment, by applying case fatality ratios (CFR) to notified TB cases with notification targets defined in the signed performance framework reflecting national targets.

Empirical Method for KPI4 Assessment: Step 2

Step 2:
Adjust KPI4 with controlling for price increases and TB burden reduction

$KPI4_{all}$ =Function (change of GDP, change of TB incidence, etc.)

KPI4 adjustment for country i:

$\boldsymbol{KPI4adjusment_i}$ = Function (change of GDP_i, change of $TB\ incidence_i$)

Regression analysis to control the effect of GDP and TB incidence change on KPI4

$KPI_{unadjusted}$ - $KPI_{adjustment}$ ="Residual"

Unexplained change of unit cost per life saved after controlling for GDP and TB incident trend

Empirical Method for KPI4 Assessment: Step 3

Illustration

Step 3:
Flag countries with lowest rank on efficiency

Country	KPI4 unadjusted	Residual
Country 1	-35%	-2.3%
Country 2	-50%	-4.5%
Country 3	20%	-1.8%
Country 4	10%	6.5%
Country 5	-25%	-3.1%
Country 6	-80%	-8.6%
Country 7	14%	5.6%
Country 8	26%	2.1%
Country 9	-30%	-4.1%
Country 10	-44%	-5.4%
Country 11	17%	3.0%
Country 12	5%	1.3%

Ranking countries by increasing order of residual

Country	KPI4 unadjusted	Residual
Country 6	-80%	-8.6%
Country 10	-44%	-5.4%
Country 2	-50%	-4.5%
Country 9	-30%	-4.1%
Country 5	-25%	-3.1%
Country 1	-35%	-2.3%
Country 3	20%	-1.8%
Country 12	5%	1.3%
Country 8	26%	2.1%
Country 11	17%	3.0%
Country 7	14%	5.6%

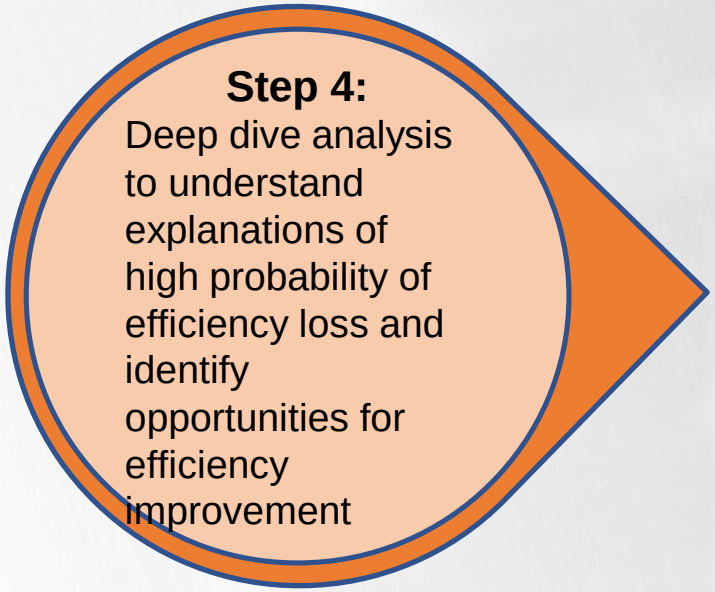
Flag countries with high probabilities of efficiency loss given the threshold chosen

- A negative residual implies the likely increase of unit cost per life saved between 2018-2020 and 2015-2017 after controlling for the potential cost increase due to change of input prices and TB incidence levels.
- Higher negative residual values flag high probabilities of efficiency loss.

- Applying upper quantile/25% threshold will flag 3 countries with high probability of efficiency loss

Empirical Method for KPI4 Assessment: Potential Follow Up

Deep dive analysis is recommended for the national programs flagged in step 3 to further understand reasons for likely efficiency loss, identify potential sources for inefficiency and measures to improve efficiency moving forward as relevant.



- Assessing the **spending pattern** of national programs. For example, whether the TB program is expanding, and if so, where does the new investment go and whether or not a high unit cost of a given period is driven by capital investment for instance, or new program activities such as active case finding which may have an effect, etc.
- Checking whether or not a country follows **WHO technical guidelines for TB response**, such as adopting short-course regimen and advanced diagnostic technologies (e.g. Xpert), and whether those practices explain cost increase
- Looking into whether or not country is shifting from hospitalization to ambulatory care including checking the **average length of hospitalization** by MDR status
- Checking whether or not the increased cost can be justified with **other reasonable explanations**

Step 1: Unadjusted KPI4 for Country A (data)

		Results/Expenditure				Targets/Budget			
		2015	2016	2017	Total	2018	2019	2020	Total
TB Treatment	DS-TB	100,780	102,097	102,725	**305,602**	101,745	102,528	99,544	**300,775**
	MDR-TB	2,131	2,450	2,694	**7,275**	3,420	4,050	4,680	**18,225**
Funding	Domestic	$22,547,625	$27,028,736	$30,371,518	**$130,150,434**	$33,626,343	$36,682,688	$40,004,250	**$163, 755,629**
	Other External	$2,271,661	$1,940,421	$2,646,840		$2,443,092	$1,966,353	$1,751,809	
	GF	$15,706,844	$12,334,106	$15,302,683		$17,006,869	$15,514,868	$14,759,357	

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Step 1: Unadjusted KPI4 for Country A (Cont'd)

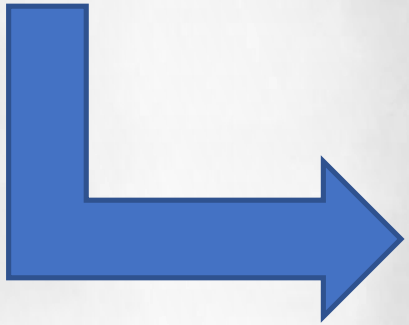
Period	TB Treatment results (2015-2017) and targets (2018-2020)		Deaths Averted	Expenditure (2015-2017) and budget (2018-2020) (2018 USD)	Cost Per Death Averted (USD)
	DS-TB	MDR-TB			
2015-2017	305,602	7,275	126,320	$132,152,040	$1,070
2018-2020	303,817	12,150	126,787	$163, 755,629	$1,292

$$KPI4 = \frac{\$1{,}070 - \$1{,}292}{\$1{,}070} * 100\% = -20.7\%$$

Step 2: Adjusting KPI4 for Country A

Period	Adjustment Factor	
	GDP per capita	TB cases per 100k
2015-2017	6,445	132
2018-2020	7,984	120
Change	23.9%	-9.5%

Residual of KPI4 = -4.00%



This implies that relative change the cost per life saved 2018-2020 of National TB program of Country A is likely to be 4.00% higher than that of 2015-2017 after adjusting for GDP growth and TB incidence reduction.

Step 3: Flag Countries with High Probabilities of Efficiency Loss

Country	KPI4 unadjusted	Residual
Country 1	-89%	-20.2%
Country 2	-70%	-19.1%
Country 3	-54%	-16.3%
Country 4	-63%	-14.3%
Country 5	-44%	-13.1%
Country 6	-39%	-10.4%
Country 7	-42%	-9.3%
Country 8	-36%	-8.8%
Country 9	-38%	-7.6%
Country 10	-42%	-6.9%
Country 11	-40%	-5.0%
Country 12	-23%	-4.9%
Country 13	-26%	-4.3%
Country 14	-22%	-3.2%
Country 15	-19%	-3.1%
Country 16	-15%	-2.6%
Country 17	-23%	-2.4%
Country 18	-32%	-2.1%
Country 19	-10%	-1.8%
Country 20	-9	-1.6%
Country 21	-14%	1.3%
Country 22	-15%	.9%
Country 23		.2%
Country 24		.1%
Country 25		.3%
…		.0%
		.0%
		.0%
		.0%
		.0%
		.0%
…		0.0%
Country 61	-2%	2.3%
Country 62	-5%	2.5%
Country 63	-6%	3.1%
Country 64	4%	3.3%
Country 65	8%	4.5%
Country 66	20%	5.6%
Country 68	30%	9.6%
Country 69	33%	10.4%

residual values illustrative

Upper 25% (i.e. 17) countries flagged with high probabilities of efficiency loss, including Country x

- A negative residual implies the likely increase of unit cost per life saved between 2018-2020 and 2015-2017 after controlling for the potential cost increase due to change of input prices and TB incidence levels.
- Higher negative residual values flag high probabilities of efficiency loss.

			Percentile based on ranking of standardized residuals				
Country	KPI4	Res	10%	15%	20%	25%	30%
Country 1	-224.6%	-36.00	x	x	x	x	x
Country 2	-78.1%	-14.32	x	x	x	x	x
Country 3	-118.9%	-14.09	x	x	x	x	x
Country 4	-43.7%	-8.44	x	x	x	x	x
Country 5	-29.4%	-6.42	x	x	x	x	x
Country 6	-81.1%	-6.07	x	x	x	x	x
Country 7	-31.6%	-6.00		x	x	x	x
Country 8	-25.6%	-5.03		x	x	x	x
Country 9	-25.6%	-4.13		x	x	x	x
Country 10	-20.7%	-4.01		x	x	x	x
Country 11	-30.8%	-3.43			x	x	x
Country 12	-12.8%	-3.28			x	x	x
Country 13	-10.2%	-2.93			x	x	x
Country 14	-7.8%	-2.63				x	x
Country 15	-9.2%	-2.54				x	x
Country 16	-7.5%	-1.85				x	x
Country 17	-3.8%	-1.81				x	x
Country 18	-3.1%	-1.79					x
Country 19	-2.4%	-1.43					x
Country 20	-9.4%	-1.40					x
Country 21	-5.8%	-1.35					
Country 22	-2.7%	-1.32					
Country 23	-0.4%	-0.95					
Country 24	6.0%	-0.69					
Country 25	-13.3%	-0.62					
Country 26	-6.4%	-0.56					
Country 27	-3.5%	-0.49					
Country 28	9.9%	-0.21					
Country 29	-18.5%	-0.06					
Country 30	-20.2%	0.06					
Country 31	6.0%	0.16					
Country 32	13.4%	0.40					
Country 33	6.7%	0.45					
Country 34	6.6%	0.57					
Country 35	22.8%	1.11					
Country 36	16.1%	1.18					
Country 37	21.9%	1.25					
Country 38	18.9%	1.27					
Country 39	5.9%	1.42					
Country 40	23.7%	1.60					
Country 41	27.2%	1.90					
Country 42	16.2%	1.97					
Country 43	20.1%	2.14					
Country 44	25.2%	2.22					
Country 45	26.7%	2.36					
Country 46	27.1%	2.38					
Country 47	13.9%	2.38					
Country 48	14.2%	2.49					
Country 49	20.2%	2.91					
Country 50	30.9%	3.04					
Country 51	30.9%	3.13					
Country 52	23.2%	3.33					
Country 53	29.8%	3.58					
Country 54	25.6%	3.86					
Country 55	27.7%	3.92					
Country 56	24.4%	4.02					
Country 57	25.9%	4.20					
Country 58	30.7%	4.35					
Country 59	45.9%	4.91					
Country 60	45.6%	5.20					
Country 61	45.4%	5.27					
Country 62	44.6%	5.37					
Country 63	32.6%	5.39					
Country 64	51.5%	5.48					
Country 65	45.6%	5.98					
Country 66	42.6%	6.87					
Country 67	64.3%	7.30					
Country 68	68.4%	9.67					
Country 69	61.8%	10.34					
	# Flagged		6	10	13	17	20

			Percentile based on ranking of standardized residuals				
Country	KPI4	Res	10%	15%	20%	25%	30%
Country 1	-224.6%	-36.00	x	x	x	x	x
Country 2	-78.1%	-14.32	x	x	x	x	x
Country 3	-118.9%	-14.09	x	x	x	x	x
Country 4	-43.7%	-8.44	x	x	x	x	x
Country 5	-29.4%	-6.42	x	x	x	x	x
Country 6	-81.1%	-6.07	x	x	x	x	x
Country 7	-31.6%	-6.00	x	x	x	x	x
Country 8	-25.6%	-5.03		x	x	x	x
Country 9	-25.6%	-4.13		x	x	x	x
Country 10	-20.7%	-4.01		x	x	x	x
Country 11	-30.8%	-3.43			x	x	x
Country 12	-12.8%	-3.28			x	x	x
Country 13	-10.2%	-2.93			x	x	x
Country 14	-7.8%	-2.63			x	x	x
Country 15	-9.2%	-2.54				x	x
Country 16	-7.5%	-1.85				x	x
Country 17	-3.8%	-1.81				x	x
Country 18	-3.1%	-1.79					x
Country 19	-2.4%	-1.43					x
Country 20	-9.4%	-1.40					x
Country 21	-5.8%	-1.35					x
Country 22	-2.7%	-1.32					
Country 23	-0.4%	-0.95					
Country 24	6.0%	-0.69					
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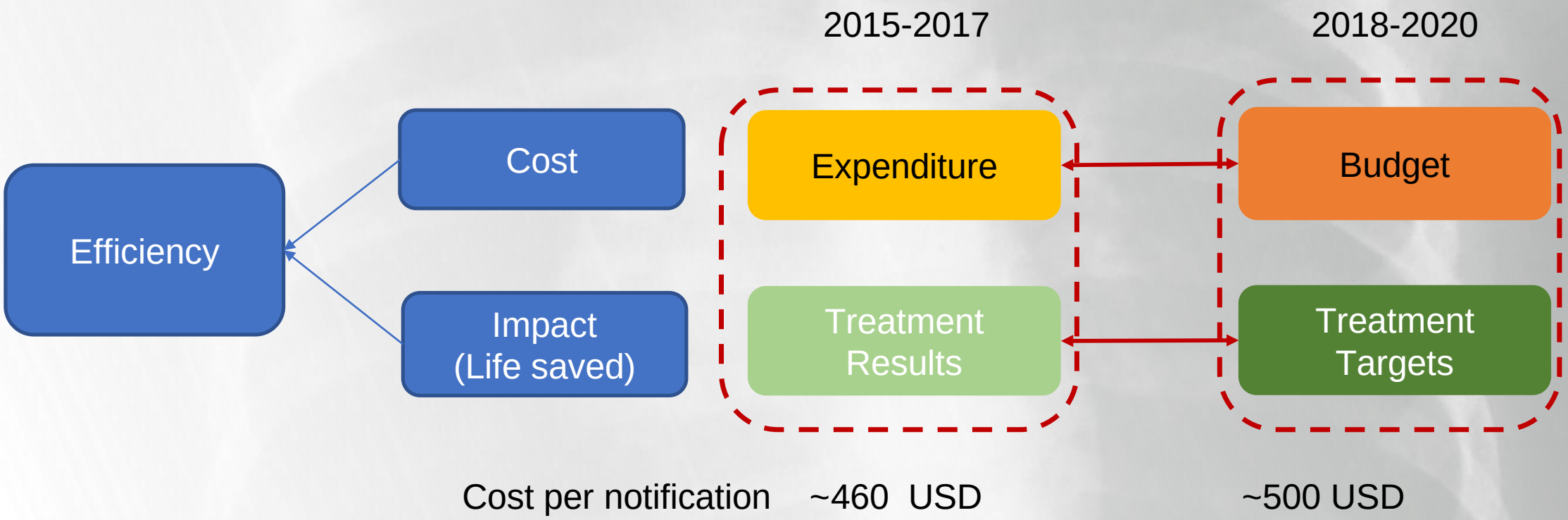
Country 31	6.0%	0.16					
Country 32	13.4%	0.40					
Country 33	6.7%	0.45					
Country 34	6.6%	0.57					
Country 35	22.8%	1.11					
	# Flagged		7	10	14	17	21
	# High Impact Flagged		2	4	5	7	8

Empirical Method for KPI4 Assessment: Deep Dive

Deep dive analysis: understand reasons for likely efficiency loss, identify potential sources for inefficiency and measures to improve efficiency moving forward as relevant.



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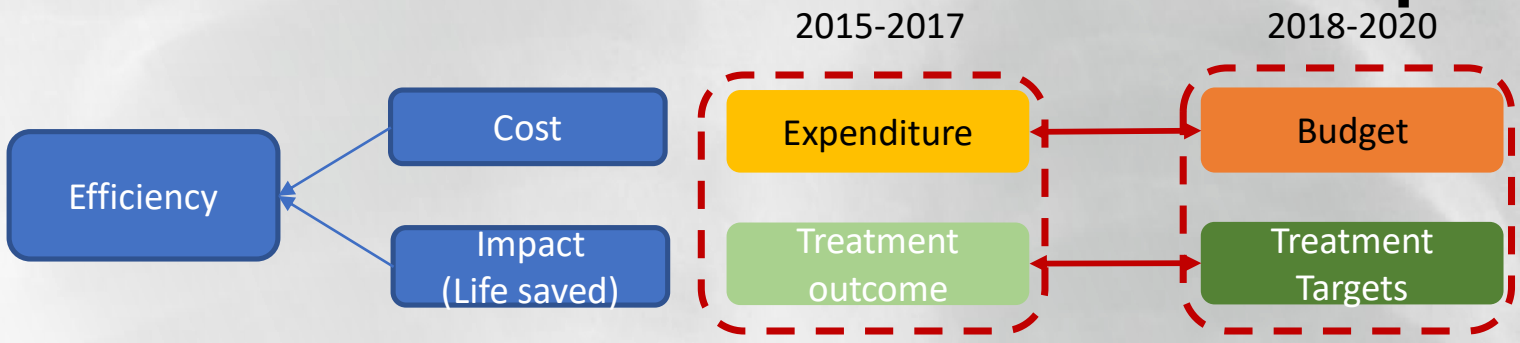
Potential Dimensions of Deep Dive



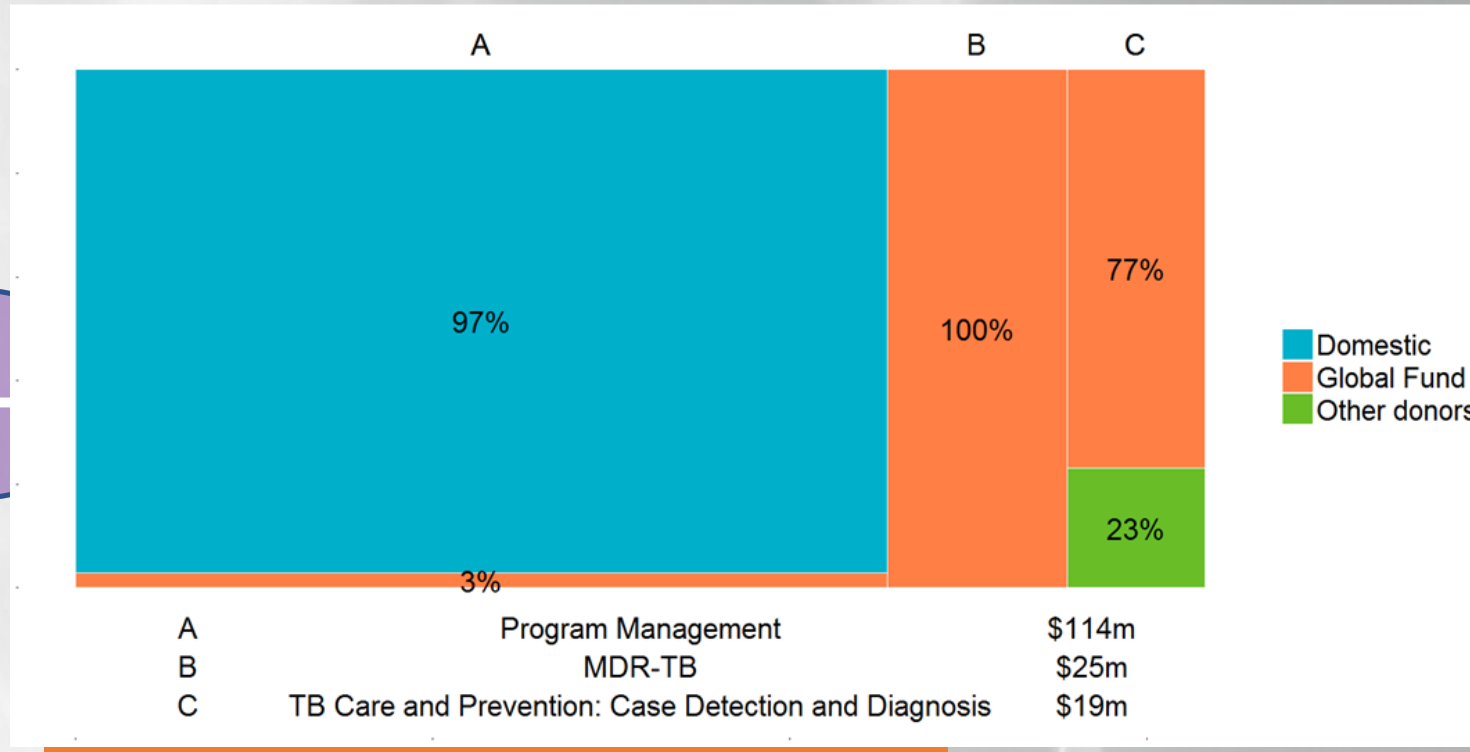
Country A- Financing by source and intervention - TB

Spending pattern change?

- Any major capital investment in 2018-2020?
- Any increase in preventive therapy?
- Intensify program management?

Other potential explanation?

- Underestimation of 2015-2017 expenditure?
- Overestimation of 2018-2020 budget?
- Underestimation of 2018-2020 targets?
- Other reasons?



Feasibility and Next Steps

Spending pattern change?
- Any major capital investment in 2017-2019?
- Any increase in preventive therapy?
- Intensify program management?

Cost of service delivery increase?
- Any prediction of input price increase?
  - Further adoption of short term regimen?
- Increase in patient support?
- Adoption of more expensive diagnostic technology?

+

Other potential explanation?
- Underestimation of 2015-2017 expenditure?
- Overestimation of 2018-2020 budget?
- Underestimation of 2018-2020 targets?
- Other reasons?

Different Care Delivery Protocol?
- More focus on intensive case finding?
- Reaching out to remote people in remote areas?

Key Questions

- What data do we need?
- What data do we have?
- How to proceed?
  - Who to engage
  - Timeline

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Reflections on the Current Method

- It serves more as a flagging tool rather than providing conclusive assessment of whether a national program is expected to be more efficient
- The threshold which determines the number of countries to flag is subjective
- It does not fully capture the impact of prevention programs
- The result may be driven by outliers

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Questions for Discussion

- How to robustly assess efficiency?
  - Where to draw the line for adding more “exogenous” adjustment factors that may explain unit cost variations across countries?
- How to do conduct properly deep dive analysis?
- What shall KPI4 methodology for TB look like for the GF allocation cycle 2020-2022?
- What shall GF do now to improve the KPI4 methodology?

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Thank you!

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Back up slides

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Data Sources

Time Periods	Epi	Financial
2015-2017	• TB treatment (WHO) (DS vs MDR-TB) • TB incidence (WHO)	• Funding Landscape (GF) on past investment • GDP per capita (IMF)
2018-2020	• National TB treatment (DS vs MDR-TB) targets indicated in Performance Framework of the signed grants (GF) • TB incidence projection	• Funding Landscape (GF) of expected resources available from all sources • GDP per capita forecast (IMF)