

# Data Triangulation & Integration

THIS 2016 and Programme Data

# Triangulation & Integration

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Broadly defined as the synthesis and integration of data from multiple sources through collection, examination, comparison and interpretation.

Or:

*An analytical approach known as “triangulation” integrates multiple data sources to improve the understanding of a public health problem and to guide programmatic decision-making to address such problems.*

**Source:** HIV triangulation resource guide: synthesis of results from multiple data sources for evaluation and decision-making. WHO 2009

# Example

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# Level of complexity of data source

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# THIS/THMIS Prevalence by sex ( Tanzania)

THMIS 2011-12			THIS 2016-17		
Tanzania Overall Prevalence Ages 15-49					
Total	Male	Female	Total	Male	Female
5.1% (CI: 4.6-5.6)	3.8%	6.2%	4.7% (CI: 4.3-5.0)	3.1%	6.2%
<b>HIV Testing Algorithm</b>	1. ELISA (Vironostika® HIV Ag/Ab [Biomérieux]) 2. ELISA (Enzygnost® HIV Integral II assay [Siemens]) 3. If 1 and 2 are discordant, repeat 1 and 2. 4. If results remain discordant, use confirmatory test (HIV 2.2 western blot [DiaSorin])		1. SD Bioline HIV 1/2 2. UniGold (Trinity Biotech) 3. If results are discordant, use confirmatory test (BioRad Geenius HIV-1/HIV-2 Supplemental Assay)		

# THIS/THMIS Prevalence by sex and residence

Mainland Prevalence Ages 15-49					
THMIS 2011-12			THIS 2016-17		
Total	Male	Female	Total	Male	Female
<b>5.3%</b>	3.8%	6.2%	<b>4.8%</b>	3.1%	6.2%
<b>Urban</b>	7.2%		<b>Urban</b>	5.5%	
<b>Rural</b>	4.3%		<b>Rural</b>	4.2%	
Zanzibar Prevalence Ages 15-49					
Total	Male	Female	Total	Male	Female
<b>1.0% (CI: 0.4-2.3%)</b>	0.9%	1.1%	<b>0.4% (CI: 0.1-0.8)</b>	*	0.8%

## Decrease in prevalence of HIV among persons ages 15-49 years, by region and sex from THMIS to THIS, Tanzania

	Females	Males	Total
Region	%	%	%
Njombe	0.7	-8.1	<b>-3.2</b>
Dar es Salaam	-1.9	-3.3	<b>-2.6</b>
Lindi	-3.6	-1.1	<b>-2.6</b>
Rukwa	-1.7	-2.5	-2.1
Mtwara	-2.9	-0.2	-2.0
Shinyanga	-0.9	-2.6	-1.9
Kilimanjaro	-1.8	-1.1	-1.6
Ruvuma	-2.5	0.4	-1.5
Arusha	-2.1	-0.3	-1.3
Mara	-1.2	-1	-1.2
Pwani	-1.5	0.5	-0.6
Katavi	2.7	-3.8	-0.5
Kigoma	-1.1	0.7	-0.4
Tabora	-0.3	-0.3	-0.3

## Increase in prevalence of HIV among persons ages 15-49 years, by region and sex from THMIS to THIS, Tanzania

	Females	Males	Total
Region	%	%	%
Morogoro	0.6	-0.6	0.1
Mbeya	2.2	-1.8	0.2
Singida	0.8	-0.2	0.2
Manyara	-0.3	0.9	0.3
Geita	1.2	0	0.5
Dodoma	3.7	-1.2	1.3
Kagera	2.1	2.0	2.0
Iringa	4.6	-0.3	<b>2.1</b>
Mwanza	4.2	0.6	<b>2.3</b>
Tanga	3.7	2.8	<b>3.0</b>
Songwe	NA	NA	NA



# Triangulation of Data along HIV Clinical Cascade

Population	Data Source	PLHIV	Incidence % (95%CI)	Prevalence % (95%CI)	Known Status %	Linkage %	Community ART %	Viral Suppression %
Children 0-14 yrs	THIS Programme			0.4(0.2-0.6)				18.4(4.6-32.3)
	Spectrum 2017	110,000					46.8%	29.5
Adults 15-49 yrs	THIS Programme		0.27(0.17-0.37)	4.7(4.3-5.0)	52.2	90.9	47.5	52.0(48.6-55.4)
	Spectrum 2017	1,298,046	0.21(0.16-0.25)	4.7(4.0-5.4)	70.0(62.0-80.0)	77.0	60.9	51.8%
Targets	UNAIDS 90-90-90 by 2020		-1.8		90		81	

# Change in total PLHIV aged 15-49 year by region (1)

Regions with largest increment

SOURCE	COP16/17 SPECTRUM		THIS 2016		DIFFERENCE	
Region	PLHIV	HIV Prevalence	PLHIV	HIV Prevalence	PLHIV	Prevalence
Mwanza	55,435	3.9%	108,316	6.5%	52,881	3.3%
Songwe*	NA	NA	31,600	5.6%	31,600	5.8%
Tanga	23,149	2.3%	54,609	5.4%	31,460	2.8%
Kagera	53,664	4.5%	84,797	6.8%	31,133	2.0%
Dodoma	27,407	2.7%	54,333	4.2%	26,926	2.3%
Iringa	42,212	8.5%	60,191	11.2%	17,979	2.8%

*\*Songwe is a new region carved out from Mbeya region hence no COP16/17 estimate*

# Change in total PLHIV aged 15-49 year by region (2)

Regions with largest decrement

SOURCE	COP16/17 SPECTRUM		THIS 2016		DIFFERENCE	
Region	PLHIV	HIV Prevalence	PLHIV	HIV Prevalence	PLHIV	Prevalence
Dar es Salaam	192,811	6.5%	133,971	4.7%	(58,840)	-1.8%
Mbeya*	121,016	8.4%	89,968	9.3%	(31,048)	0.9%
Mtwara	24,979	3.8%	13,377	2.0%	(11,602)	-1.8%
Lindi	12,157	2.7%	1,370	0.3%	(10,787)	-2.4%
Arusha	28,235	3.0%	18,734	1.9%	(9,501)	-1.1%
Kilimanjaro	30,042	3.6%	23,205	2.6%	(6,837)	-1.0%
Njombe	50,665	13.9%	44,999	11.4%	(5,666)	-2.5%

*\*Songwe is a new region carved out from Mbeya region hence no COP16/17 estimate*

# Change in ART coverage by region (1)

Largest increment in performance

Region	15-49 years ART Coverage (%)		
	COP16/17	THIS 2016	Absolute difference
Lindi	86.1	764.2	678.1
Songwe*	0	69.0	69.0
Mtwara	62.9	117.4	54.5
Arusha	49.	74.35	25.0
Dar es Salaam	56.8	81.7	24.9

*\*Songwe is a new SNU1 carved out from Mbeya region hence no COP16/17 estimate*

# Change in ART coverage by region (2)

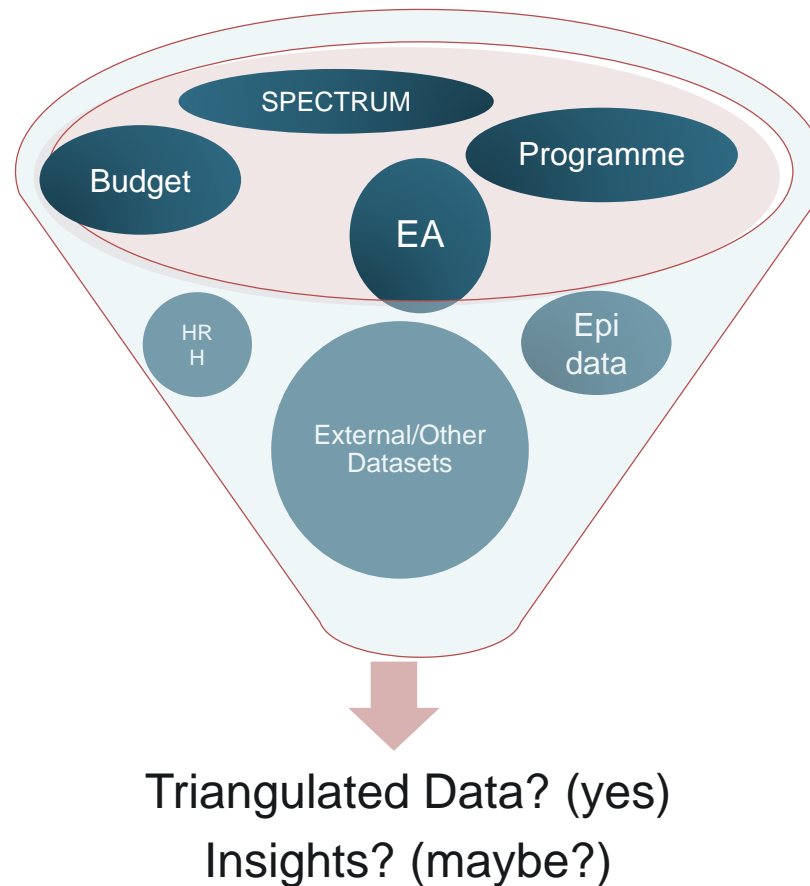
Largest decrement in performance

Region	15-49 years ART Coverage (%)		
	COP16/17	THIS 2016	Absolute difference
Tanga	87.4	37.4	-50.3
Mwanza	74.6	38.2	-36.4
Iringa	89.0	62.4	-26.6
Dodoma	50.6	25.4	-25.1
Kagera	68.1	43.1	-25.0
Manyara	46.3	26.1	-20.2

# Triangulation and data insight

*The logic of triangulation is based on the premise that no single method ever adequately solves the problem of rival explanations. Because each method reveals different aspects of empirical reality, multiple methods of data collection and analysis provide more grist for the research mill.*

- Patton (1999)



**Asante**





# THMIS 2011-2012 and THIS 2016-2017 comparison

Variable	THMIS 2011-2012	THIS 2016-17
<b>Sampling Frame</b>	2002 Population and Housing Census	2012 Population and Housing Census
<b>Sample Size</b>	583 Enumeration Areas (EAs) 10,496 households selected 20,811 eligible adults (15-49)	521 EAs 16,198 households selected 38,734 eligible adults (15+) 10,642 eligible children (0-14)
<b>Sample Allocation</b>	The number of EAs in each region was determined in such a way that they would provide an adequate sample in each region ( <i>nonproportional allocation, approximately equal sample size in each region</i> ).	The final allocation of the sample is the combined product of the sample size requirement for national incidence and viral load suppression requirements for individual strata (regions) ( <i>proportional allocation, greater variation in sample size among regions</i> ).
<b>Regions</b>	30	31
<b>Age Eligibility in Years (Interview)</b>	15-49	10-14 (adolescent) 15+ (adult)
<b>HIV Testing Algorithm</b>	<ol style="list-style-type: none"> <li>1. ELISA (Vironostika® HIV Ag/Ab [Biomérieux])</li> <li>2. ELISA (Enzygnost® HIV Integral II assay [Siemens])</li> <li>3. If 1 and 2 are discordant, repeat 1 and 2.</li> <li>4. If results remain discordant, use confirmatory test (HIV 2.2 western blot [DiaSorin])</li> </ol>	<ol style="list-style-type: none"> <li>1. SD Bioline HIV 1/2</li> <li>2. UniGold (Trinity Biotech)</li> <li>3. If results are discordant, use confirmatory test (BioRad Geenius HIV-1/HIV-2 Supplemental Assay)</li> </ol>

# THIS, PROGRAM and SPECTRUM Data Comparison

Table 1: Triangulation of THIS, PEPFAR Program, and SPECTRUM Data Along the HIV Clinical Cascade								
Population	Data Source	Indicator						
		PLHIV	Prevalence (95% CI)	Incidence (95% CI)	Known Status	Linkage	On ART	VS
Children Aged 0-14	THIS 2017		0.4% (0.2-0.6%)					18.4% (4.6-32.3%)†
	PEPFAR Program FY17Q2*						46.6%	29.5%
	SPECTRUM 2017	110,000						
Adults Aged 15-49	THIS 2017		4.7% (4.3-5.0%)	0.27% (0.17-0.37%)	52.2%**	90.9%	47.5%**	52.0% (48.6-55.4%)*†
	PEPFAR Program FY17Q2				68.3%	77.0%	60.9%	51.8%
	SPECTRUM 2017	1,298,046	4.7% (4.0-5.4%)	0.21% (0.16-0.25%)	70.0% (62.0-80.0%)		62.0%	
Targets	UNAIDS 90-90-90 by 2020				90.0%		81.0%	73.0%

## Footnotes

\*Mid-point of THIS 2017 data collection period

\*\*Self-reported known HIV status and on ART will likely lead to an underestimate of the 1st and 2nd 90s. Other country PHIA experience showed ~5% increase in known status estimate upon correcting for ART metabolite biomarker laboratory results.

\*\*\*Adults aged 15-64

†Data derived from laboratory test

Contextual note: PEPFAR Data Quality Assessments show concurrence between facility level source documents and routine program data for on ART