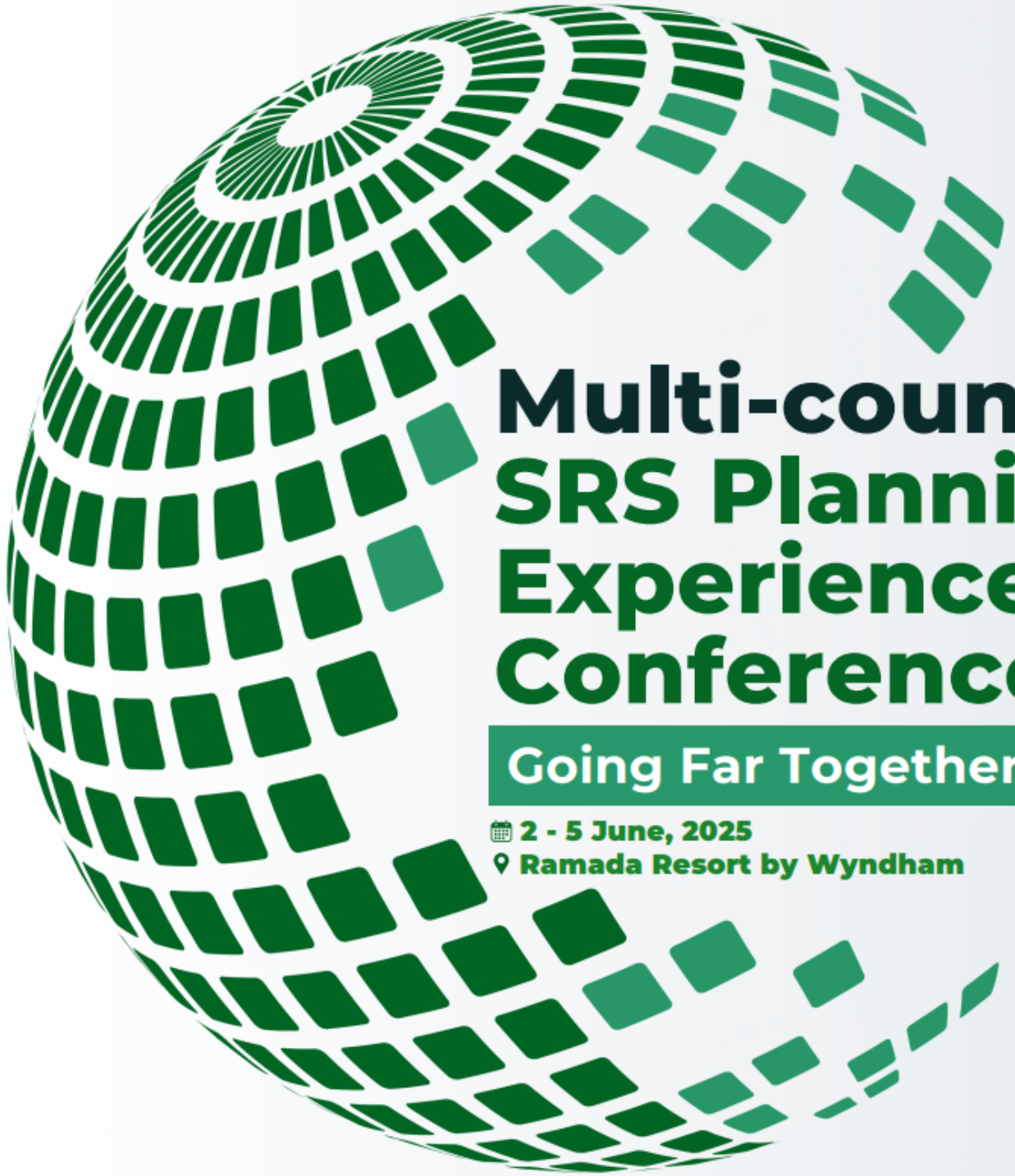


Multi-country SRS Planning and Experience-Sharing Conference

Going Far Together

2 - 5 June, 2025

Ramada Resort by Wyndham

Thank you to our hosts, organizers, and facilitators!

Vital Strategies

Swiss TPH
Swiss Tropical and Public Health Institute

ISO 9001: 2015 certified
IFAKARA HEALTH INSTITUTE
research | training | services

VIVA
Vital Insights for Vital Action

JOHNS HOPKINS
BLOOMBERG SCHOOL
of PUBLIC HEALTH

AfricaCDC
Centres for Disease Control and Prevention

CDC
U.S. CENTERS FOR DISEASE CONTROL AND PREVENTION

MITRE

UNSW
SYDNEY

11 countries represented!

Bangladesh

Kenya

Pakistan

Tanzania

Ghana

Mali

Senegal

Zambia

India

Mozambique

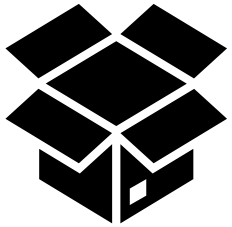
Sierra Leone

Conference Agenda

Goal

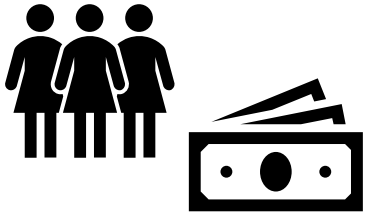
Support the **development of robust, integrated, and fit-for-context SRS designs based on situational assessment results as well as resource mobilization plans** based on best practices and lessons learned from cross-country experiences.

Create a vision for each country's SRS



Unpack what was learned during the situational assessments

Design an SRS with representation and integration



Identify resources needed to develop and implement an SRS

Objectives

- Provide **dedicated time and support** to review situational assessment findings and draft SRS designs.
- Create a **peer learning community for countries to share lessons learned** from their planning and implementation experiences and understand how to effectively design and build integrated SRS platforms that respond to multiple stakeholder needs.
- **Develop strategies for mobilizing resources** to support longer-term SRS implementation activities.
- **Articulate activities needing to be accomplished post-conference** to shape the SRS design, develop a costed action plan, and determine what additional information is needed to support robust planning and implementation activities.

Day 1

Day 1, June 2 – Developing a Vision and Investment Case for an SRS	
10:30-11am	• Break + Group Picture
11-11:30am	• Opening remarks from ACDC • Overview of Regional Framework and Progress
11:30-1pm	• Topic 1: SRS Vision- Articulating a vision for SRS and building an Investment Case
1-2pm	• Lunch
2-2:30pm	• Presentation on India's SRS- with focus on design and system priorities
2:30-3:00pm	• Presentation on Bangladesh's SVRS- with focus on vision for SVRS and its modular approach
3:00-3:30pm	• Presentation from Mozambique's SIS-COVE- with focus on vision for the system as part of an integrated platform
3:30-4:00pm	• Break
4:00-4:30pm	• Presentation on Sierra Leone's Heal-SL – with focus on design and sustainability considerations
4:30-5:00pm	• Presentation from Zambia's SRS- with focus on developing IT system requirements to fulfill system integration
5-5:30pm	• Panel session for discussion and Q&A with all presenters
5:30pm	• Closing and preparation for Day 2

Day 2

Day 2, June 3 – Articulating SRS Design and Core Requirements	
8:30am	• Optional Session: In depth discussion of VIVA digital solutions for data managers and IT teams
9-10:30am	• Topic 2: Reviewing situational assessment results and implications for SRS design
10:30-11am	• Break
11-11:30pm	• Introduction to VIVA website and SRS Technical Package
11:30-1pm	• Topic 3: Designing an SRS
1-2pm	• Lunch
2-3:30pm	• Topic 4: Collaborative Requirements Development for SRS and Systems Integration
3:30-4pm	• Break
4-5pm	• How can SRS help fill DHS gaps?
5pm	• Closing
5-6pm	• Optional Session: Software and IT system considerations and discussion
Evening	• Social and networking event at local restaurant including dinner

Day 3

Day 3, June 4 – How to develop an SRS Design and Outings	
9-10:30am	• Topic 5: Developing a plan for defining SRS design- what comes next? Revisit situational assessment, design and implementation plan; decide what activities are needed to complete SRS design
10:30-11	• Break
11-12pm	• Situational assessment presentations and report out on learning- 3 countries
12-1pm	• Situational assessment presentations and report out on learnings- 3 countries
1-2pm	• Lunch
2-6 pm	Optional Outings • Ifakara Health Institute field site visit in Bagamoyo • Gift shopping for traditional crafts in Dar es Salaam
6-7pm	Optional Session: Developing a costed SRS plan

Day 4

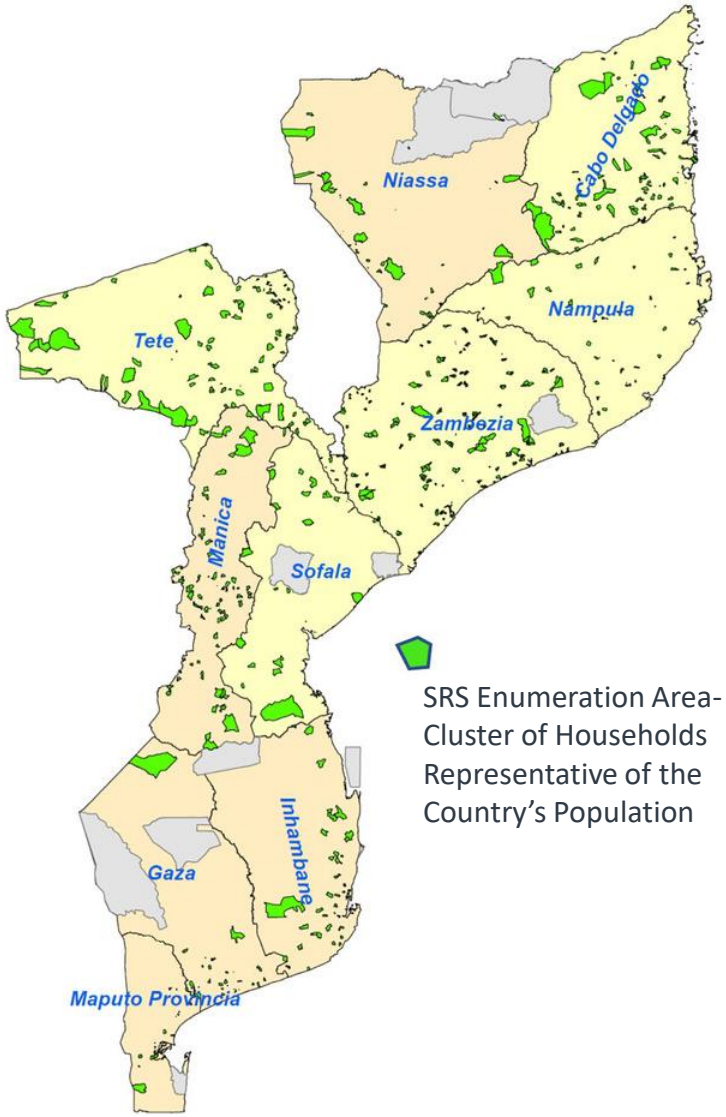
Day 4, June 5- Resource Mobilization and Closing	
9-10:30am	• Topic 6: Introduce resource mobilization best practices
10:30-11am	• Break
11-12pm	• Panel discussion and Q&A with countries on building sustainable programs
12-12:30pm	• Closing Remarks • IHI Closing

Break Out Room Assignments

Country	Room
Ghana	Front of main hall
Kenya	Grand Garden 2
Mali	Back of main hall
Pakistan	Front of main hall
Senegal	Back of main hall
Tanzania	Grand Garden 1

GF Opening Reflections

SRS Basics

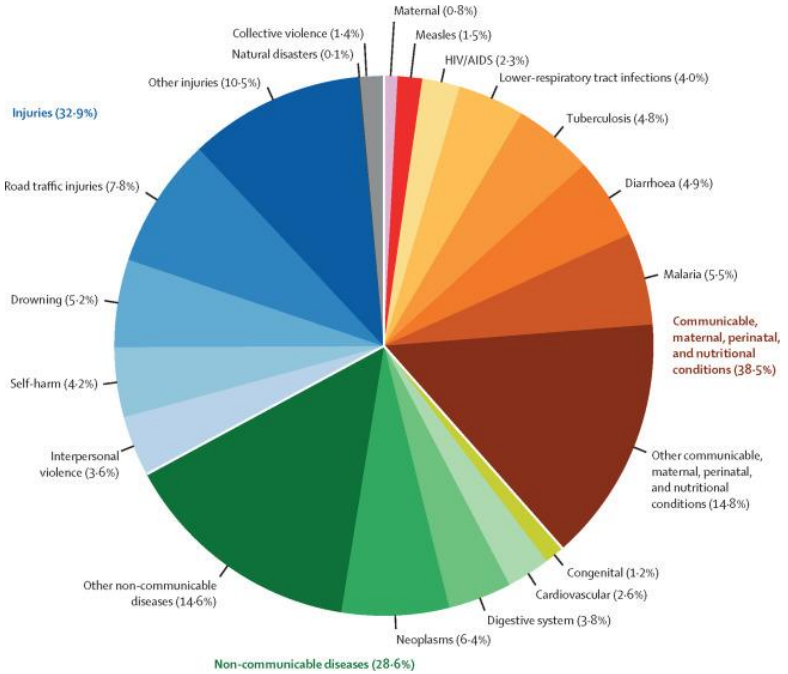


SRS Enumeration Area- Cluster of Households Representative of the Country's Population

Monitor **living population** in enumeration areas to generate denominator data

All **births and deaths notified and registered** in enumeration areas

Generate information on the **causes of death**



Unbiased estimates that reflect the entire population

Macicame I et al. Countrywide Mortality Surveillance for Action in Mozambique: Results from a National Sample-Based Vital Statistics System for Mortality and Cause of Death. Am J Trop Med Hyg. 2023 Apr 10;108(5_Suppl):5-16. doi: 10.4269/ajtmh.22-0367.

Liu L et al. National, regional, and global causes of mortality in 5-19-year-olds from 2000 to 2019: a modelling analysis. Lancet Glob Health. 2022 Mar;10(3):e337-e347. doi: 10.1016/S2214-109X(21)00566-0.

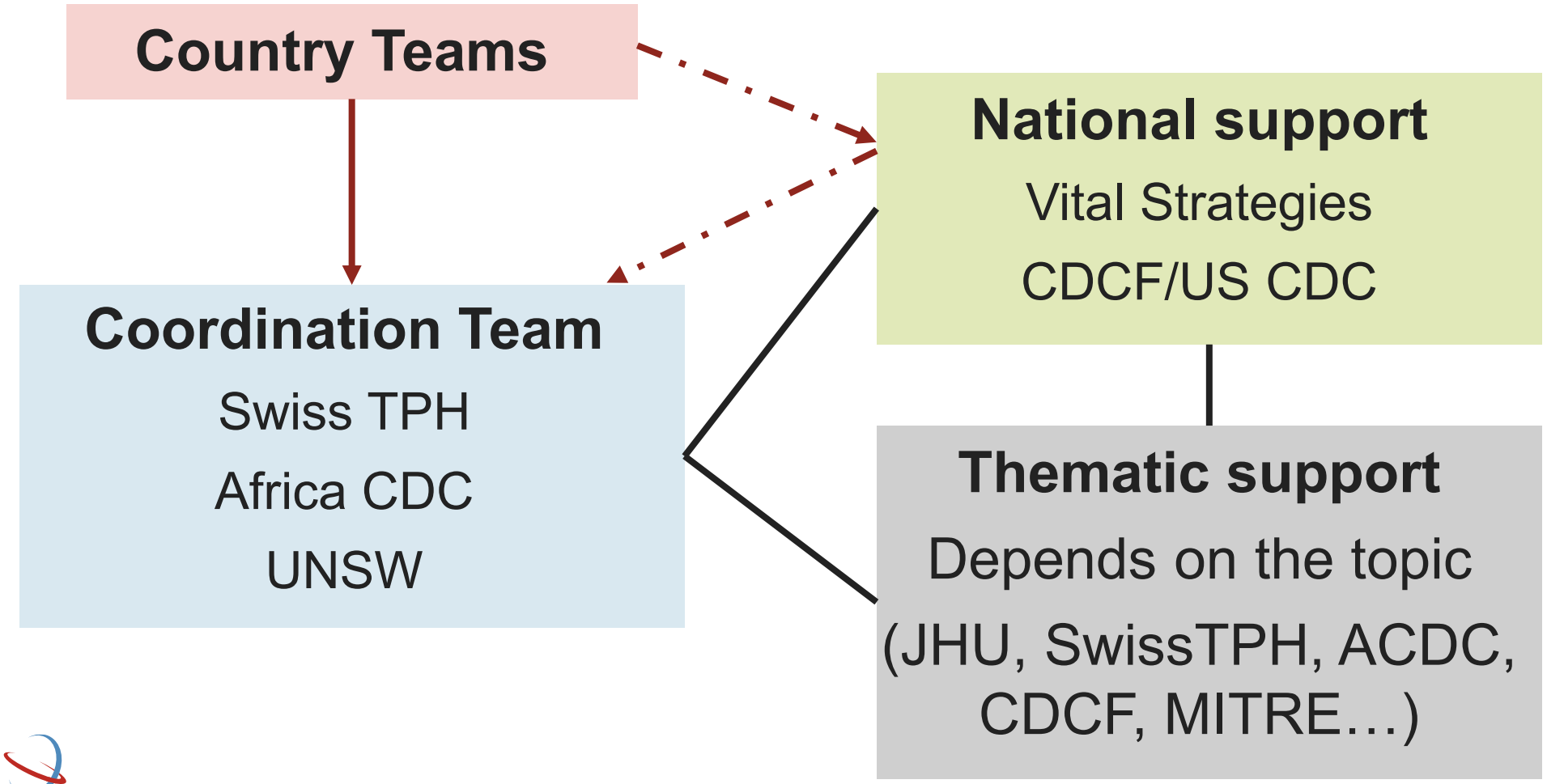
To go from existing sources of data to an SRS:

1. Does an **SRS align with our national priorities** for strengthening civil registration and vital statistics (CRVS)?
2. What **policy decisions will be informed by the data** generated from an SRS?
3. Can an SRS be designed to **produce representative data** for the entire country, including rural, urban, and hard-to-reach populations?
4. What **institutions would need to be involved**, and do they have the necessary capacity?
5. What is the **estimated cost** of establishing and maintaining the SRS?
6. Are there **funding sources available** for start-up or capacity-building costs?
7. Can the SRS be **integrated with or complement existing CRVS, health information systems, or demographic surveillance systems**?

SRS TA Roles

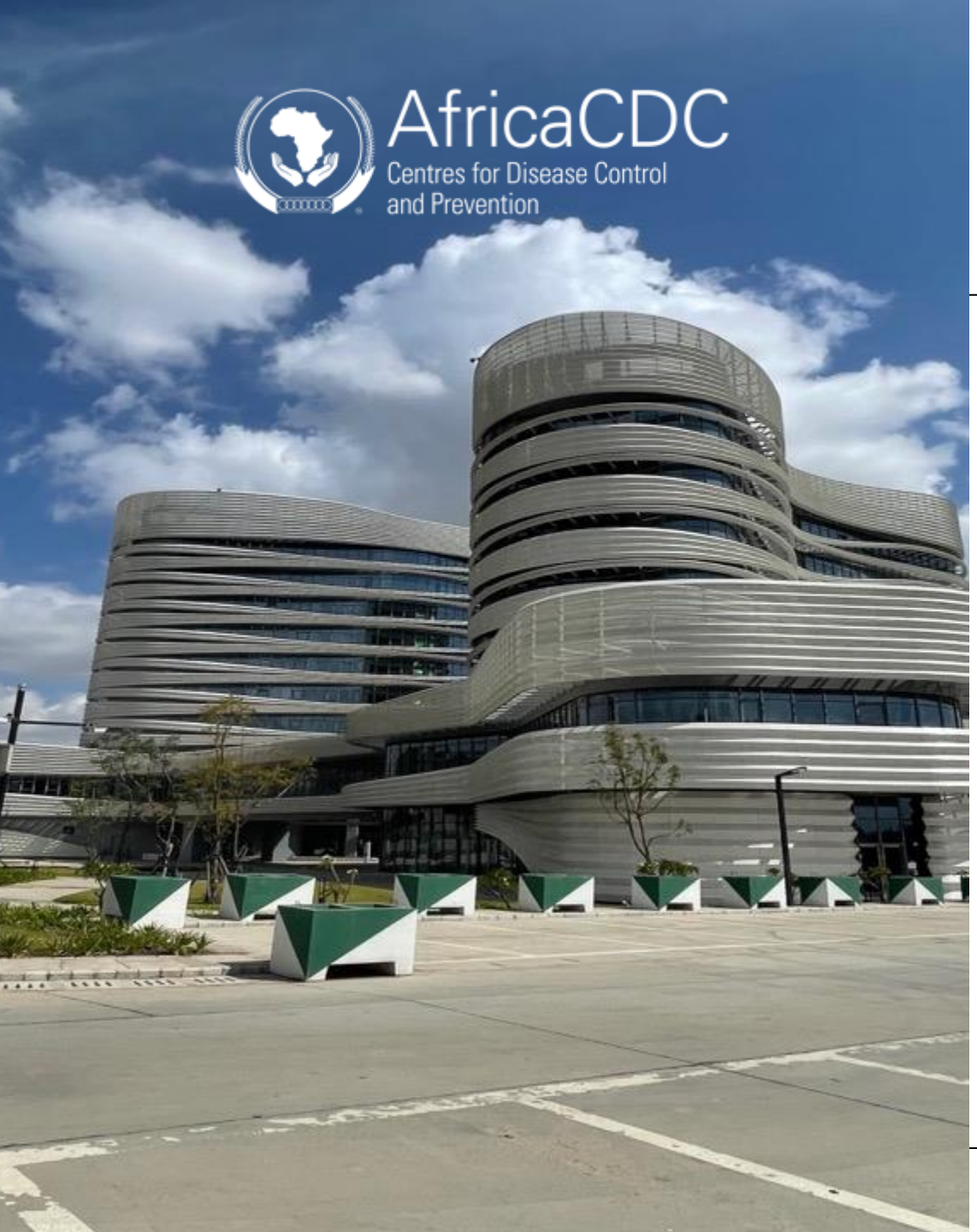
Techincal Assistance Mechanism

Who is who



Group Picture and Break

Africa CDC



Continental Efforts for Strengthening Mortality Surveillance

Atuheire Emily

Mortality Surveillance Program Lead

SRS Conference, Dar es Salaam, June 2-5, 2025

AfricaCDC
Centres for Disease Control and Prevention

Importance of Mortality Statistics

- Mortality statistics are important for:
  - measuring the health and wellbeing of a population;
  - evaluating the effectiveness of health programs and interventions;
  - guiding decisions on resource allocation
- The demand for timely reliable mortality data has been amplified by:
  - the frequent epidemics and humanitarian situations
  - the need to monitor and address existing disease burden
- Timely mortality data from the health security perspective,
  - Allows for monitoring of PH threats
  - Early detection & response to current and emerging health threats/epidemics
  - Measuring impact of PH events

AfricaCDC
Centres for Disease Control and Prevention

Gaps in data availability from CRVS systems in Africa

- Historically, Civil Registration and Vital Statistics (CRVS) systems are preferred for production of routine mortality statistics
- The Global Agenda for Sustainable Development & the African Agenda 2063 recognize the importance of CRVS systems,
- Regional, efforts to strengthen CRVS system development have yielded considerable improvements especially in birth registration, however, death registration remains low
- Gaps in availability of routine data on the number of deaths by age, sex, location, and cause, generated from a universal source remain persistent

Key challenges affecting mortality data in Africa

01

Weak policy /legal environment Leadership and governance

- Lack of clarity on institutional roles & responsibilities
- Absence of harmonized strategic and operational plans, across the multiple stakeholders
- Weak or outdated legal frameworks,
- Limited data architecture frameworks

02

Multiple Fragmented systems

- Fragmented & siloed systems
- Lack of harmonized tools,
- Varying standards & guidelines for data collection & processing
- Lack of community reporting systems
- Lack of an integrated database

03

Limited technical expertise & Technological barriers

- Limited expertise on cause of death certification & coding
- Lack of digitized systems for timely data collection & analysis
- Inadequate data quality
- Limited utility of the data

Introducing the Continental Framework for Strengthening Mortality Surveillance

Rationale:
The continental framework provides guidance to support the AU Member States towards improving availability of timely and reliable mortality data for better public health (PH) decisions.

The Concept of Mortality Surveillance

- Emphasizes the systematic, routine, timely detection, reporting, analysis and dissemination of information for PH actions
- Integrates models of primary and secondary data sources to:
  1. **COLLECTION:** Establish reliable death recording & reporting procedures
  2. **PROCESSING:** Develop efficient data compilation & management processes into a national database
  3. **USE:** Strengthen national capacity for routine analysis & dissemination of information for PH use

Goal of the Continental Framework

Goal: Establish a unified mechanism for death reporting that fully aligns with CRVS operations in AU Member States

1. Timely information for Public Health Decisions:

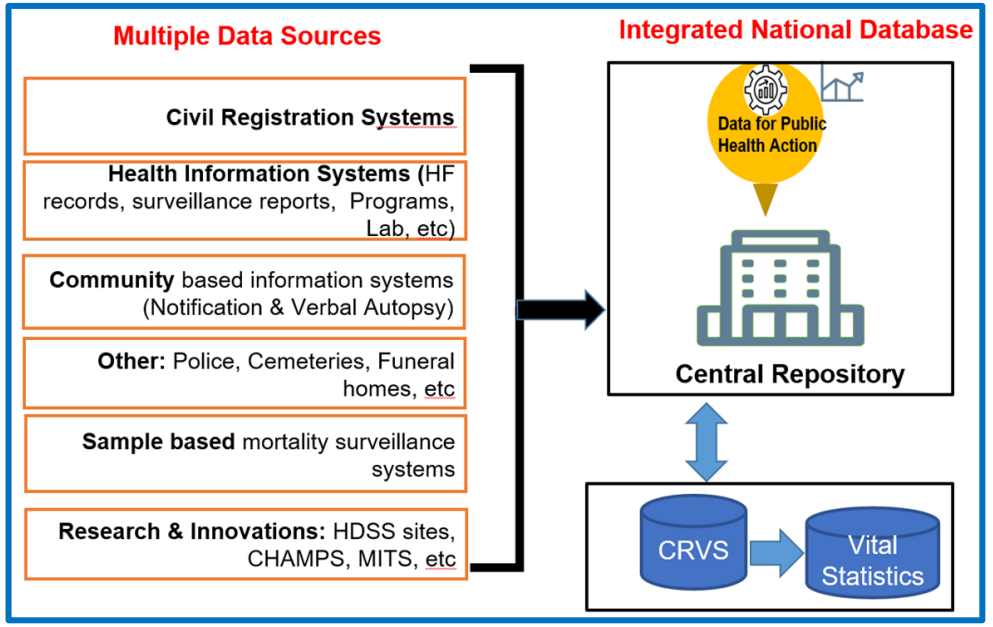
- Requires an active surveillance approach for routine detection, recording, compilation, analysis and dissemination of information

2. Integrate data from multiple sources:

- Integration of data from multiple sources into a single repository; which calls for linkage of systems, to facilitate aggregation and maximise data use

3. Standardisation & harmonisation

- Standardise existing processes and practices for collection, analysis and dissemination of information



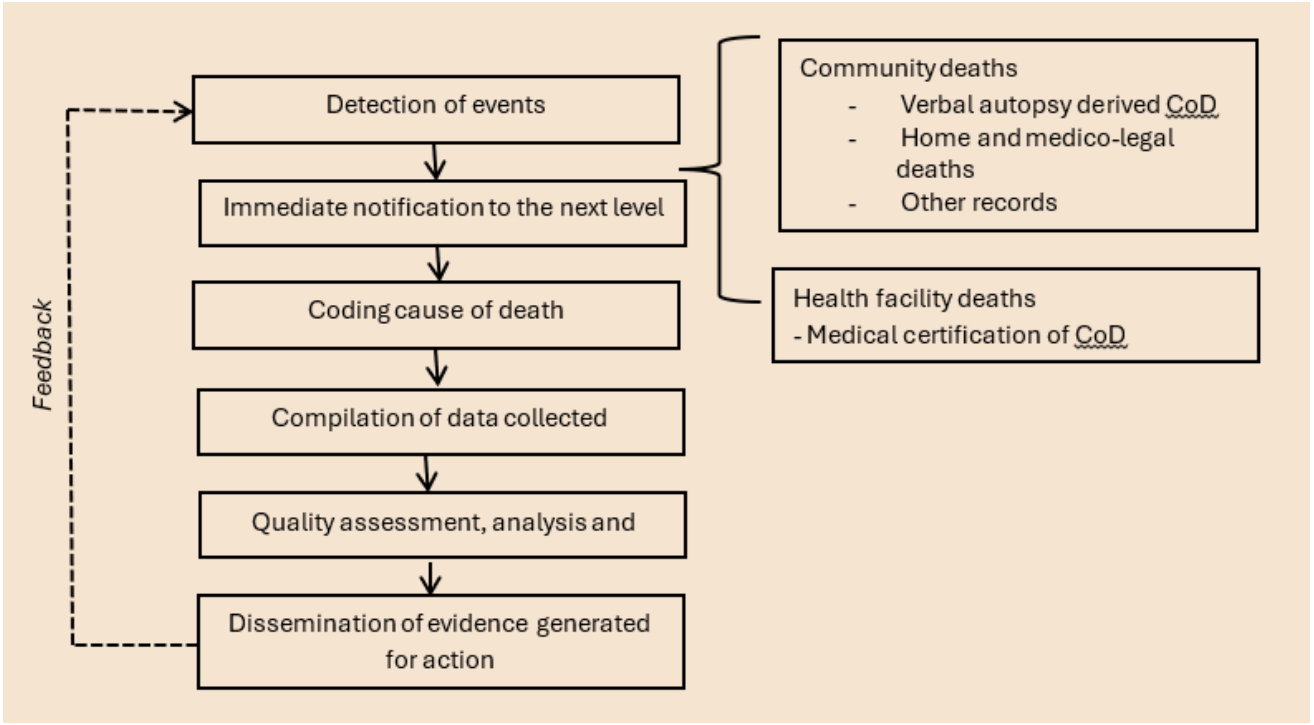
Essential activities & supporting functions for mortality surveillance

The **core functions** of a mortality surveillance system include:

- continuous recording of death events as they occur
- timely and systematic data compilation and transfer to relevant authorities for
- analysis, interpretation and dissemination on a routine basis

Support functions include:

- System design
- Implementation
- Capacity building
- Governance
- Resource mobilization
- Technical support



Steps for design and implementation of mortality surveillance - SRS

1. Planning and coordination

- Coordination committee
- Technical working groups
- Schedule of activities

2. Mortality Data systems assessment

- List of local data sources
- Systems design & performance report
- Analysis & Recommendations for improvement

3. Program design and strategy

- Death reporting protocols
- Standard operating procedures
- Field manuals & training materials
- Mortality surveillance database

4. Strategic Plan for Implementation

- Institutional networks and roles
- Technical and human resources
- Phased implementation
- Surveillance Data collection, compilation, analysis & dissemination for health policy & action

5. Monitoring & Evaluation

- Framework of data quality indicators
- Periodic data quality reports
- Mechanisms to correct data errors
- Recommendations to improve the system

Key strategic considerations in setting up mortality surveillance system - SRS

PLANNING
- Systems mapping
- Stakeholder analysis
- Goals and targets

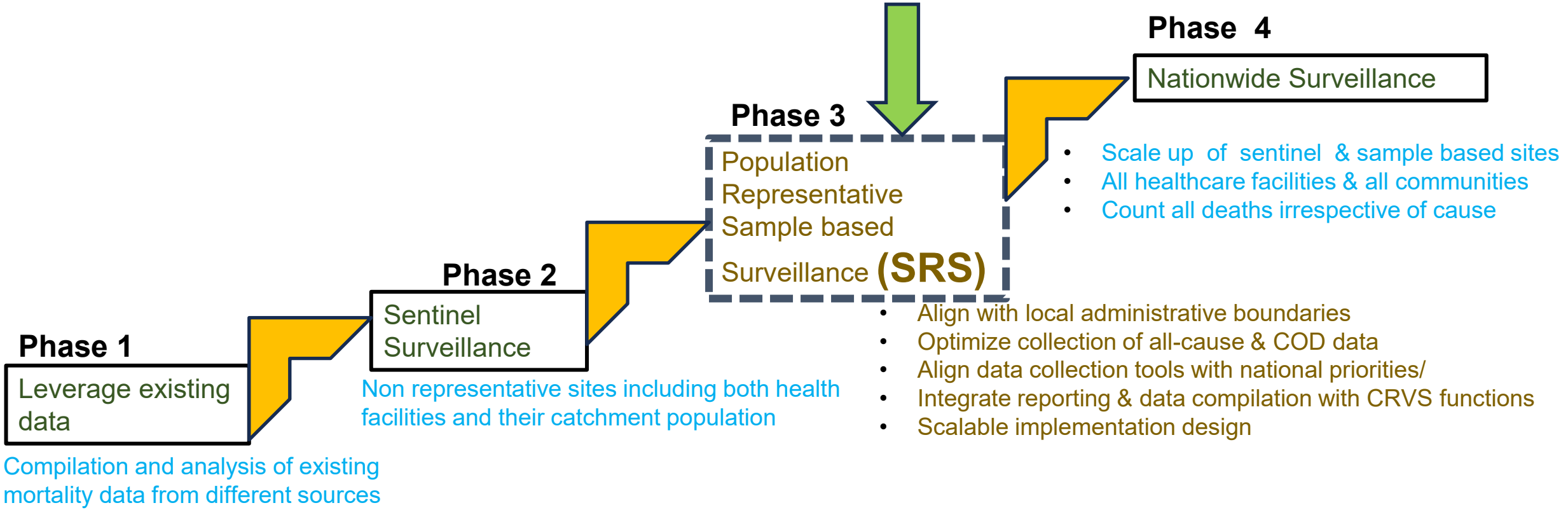
RESOURCES
- Finances
- Equipment
- Personnel

PROCESSES
- Data collection tools
- Procedures
- Institutional capacity

DATA OUTCOMES
- Coverage
- Representativeness
- Quality

IMPACT
- Data utility
- Evidence based policy
- Maintenance

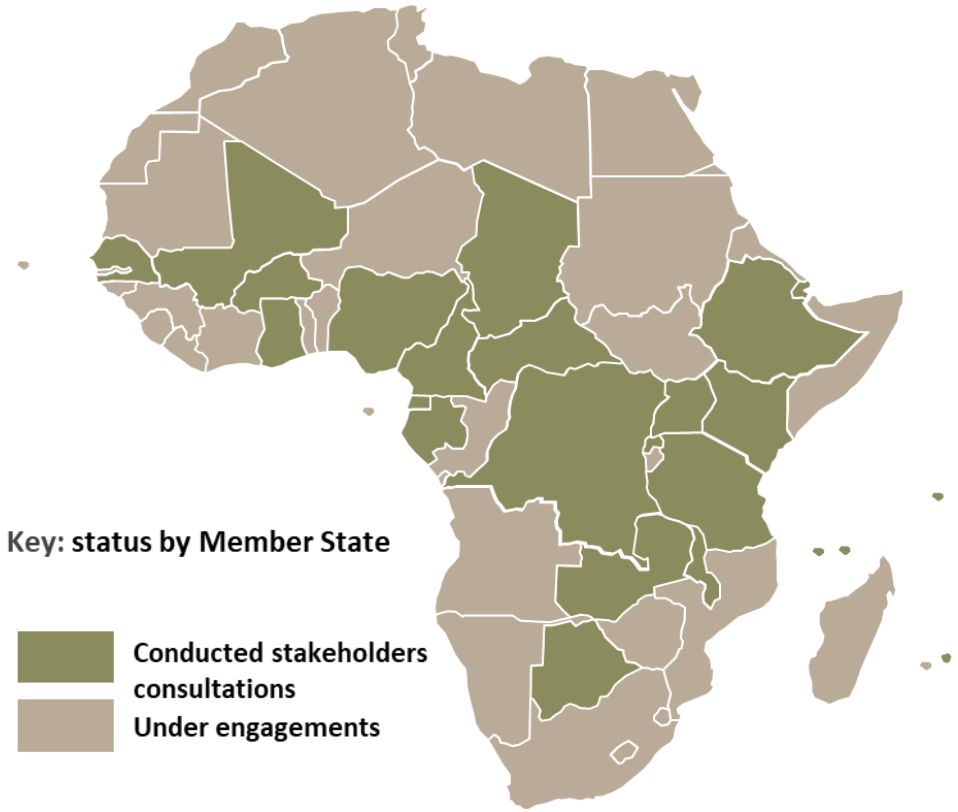
Phased implementation for mortality surveillance: Focus on SRS



*For all phases, the catchment population under surveillance must be clearly defined to enable derivation of appropriate mortality indicators.

AfricaCDC
Centres for Disease Control and Prevention

Progress in rolling out the CF



Planning and Coordination = 20 Countries

- Established national TWGs
- Conducted SWOT analysis of existing systems
- Identified Priorities
- Developed harmonized national strategic action plans
- Published national strategies = Zambia, Uganda, Burkina Faso, Cameroon,

Ongoing Capacity building

Mentorship program on surveillance data analysis = 07 Countries (1st cohort)

Guideline development = 04 countries (Uganda, Cameroon, Rwanda, Botswana

Online training course on mortality surveillance = 200 participants

SRS in Context

The Continental Framework:

- Recognizes SRS as a steppingstone to nationwide mortality surveillance
- SRS should be aligned with CRVS systems strengthening as the main and sustainable data source
- Advocates for use of international standards for generating cause of death information
- SRS design & plans should align with the CF recommendations & ongoing CRVS strengthening efforts

How can SRS compliment national priorities?

1. Integrate SRS with the broader system strengthening efforts (CRVS, Health sector and mortality surveillance, etc)

- Ensure SRS design & implementation complements Health sector & CRVS strengthening efforts
- Share infrastructure, data standards, and governance frameworks
- Support data sharing and use for PH functions

2. Position SRS to support national health planning & policy development

- Linkage with national statistical offices, health ministries, and civil registration bodies is key

3. **Start small and scale strategically**

Topic 1: Articulating a vision for SRS and building an investment case

Swiss TPH

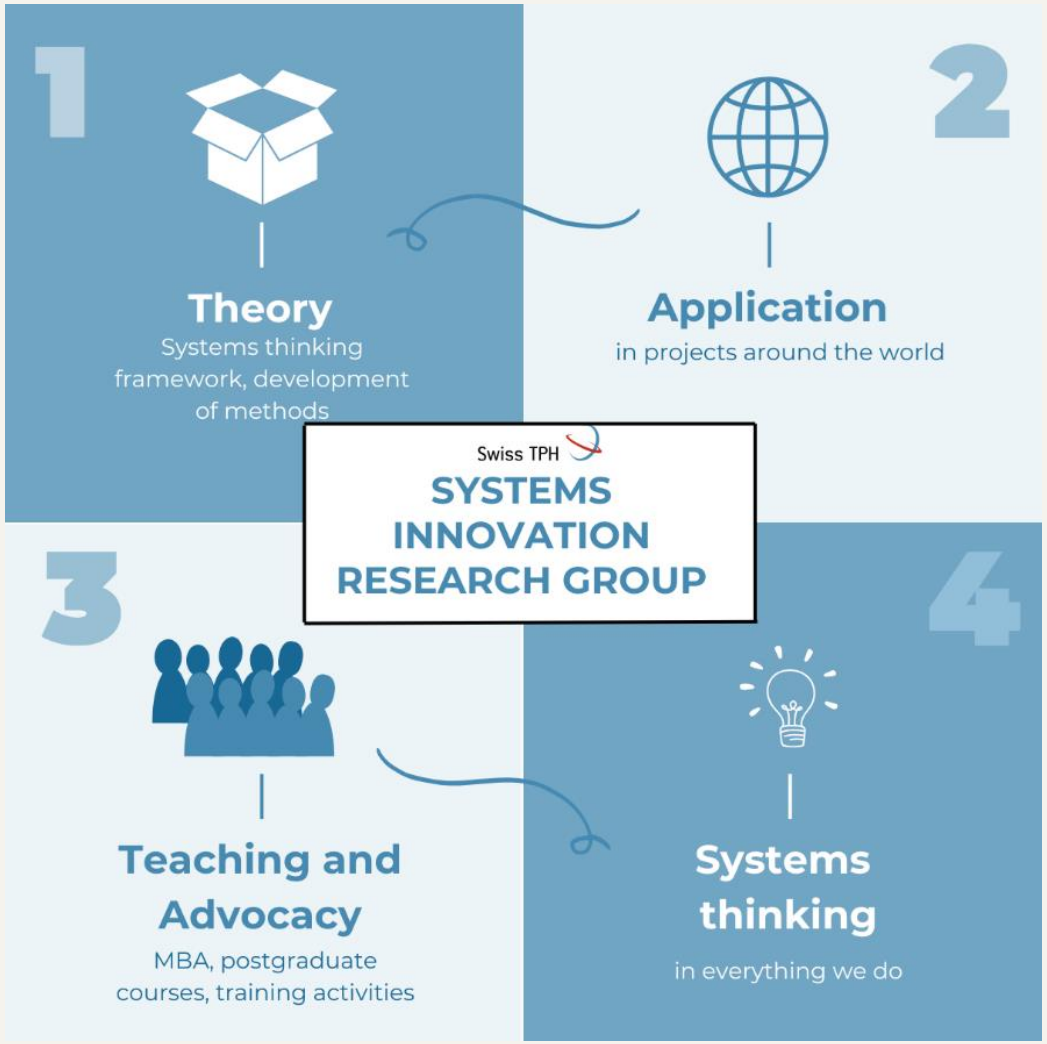
Vital Strategies

Articulating a vision for SRS and building an Investment Case

A systems and strategy perspective

2 June 2025

Systems Innovation Research Group



Vision for an integrated SRS

Outline

- Key Takeaways
- What is a vision?
- Failure 1 – Winchester House, USA
- Failure 2 - National Programme for IT in the NHS, UK
- Creating a vision for an integrated SRS

Importance of a Clear Vision for an Integrated SRS

Key takeaways – Success Factors

1. If you have a **clearly articulated vision**
2. If your vision is **shared and supported** by the different stakeholders
3. If your vision is **dynamic and context specific**
4. If your vision is **realistic and grounded on robust situational assessment**

You will **succeed in setting up your sample registration system integrated with the CRVS system**

Vision for an integrated SRS

What is a 'Vision'?	Why do we need a Vision?

• A vision describes a desirable future state — it sets the long-term direction.
• It is aspirational, inspirational, and strategic.
  • In health systems, a vision:
  • Guides decisions over time
  • Aligns stakeholders
• Anchors investments
 	
"A vision articulates a view of the future that motivates action and guides strategy."
	• SRS is a multi-stakeholder, system-wide intervention.
	• A shared vision:
	  ✓ Aligns diverse actors (ministries, agencies, funders)
	  ✓ Clarifies priorities in resource-limited settings
	  ✓ Anchors long-term planning (institutionalization, sustainability)
	  ✓ Enhances political and financial buy-in
	
	"Vision serves as a compass when navigating uncertainty in complex systems."
	- Meadows D. Thinking in Systems (2008)

Vision for an integrated SRS

What is a vision?

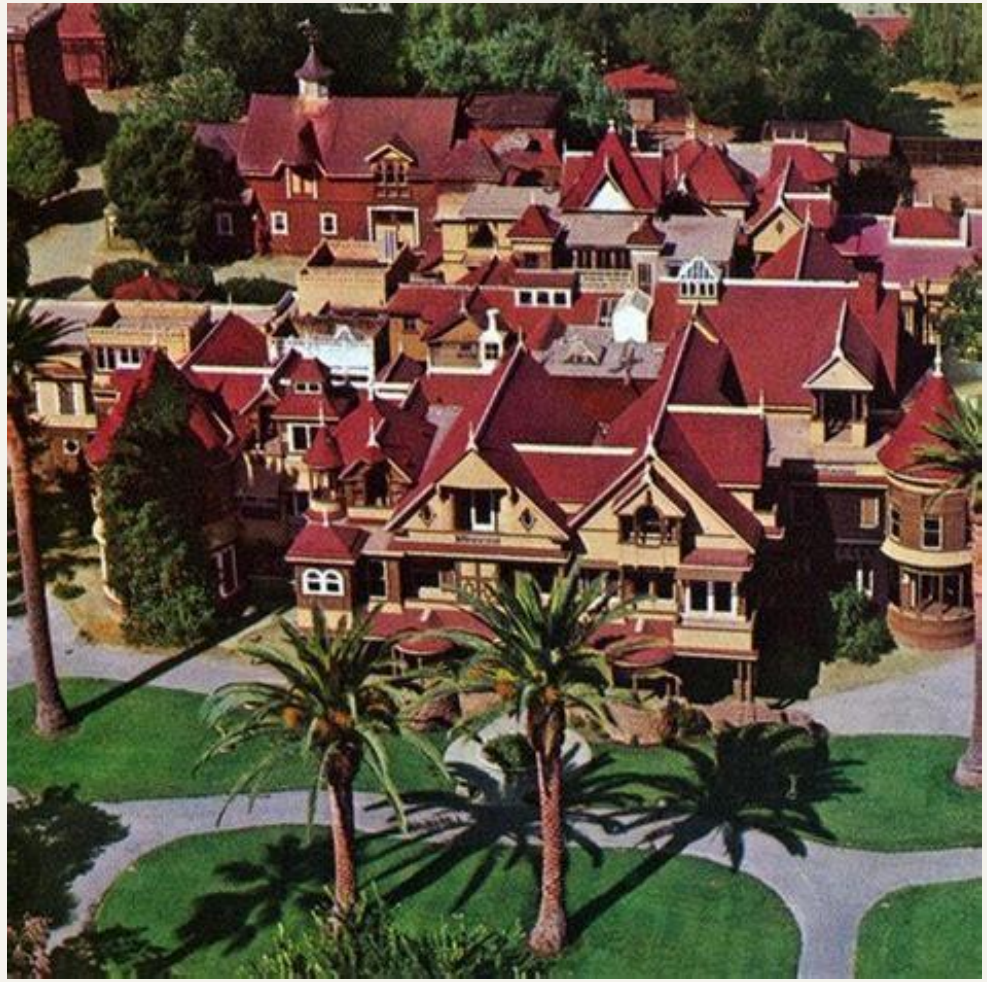
Concept	Definition	Example
Vision	Future desired state	“By 2030, SRS enables data-driven policies through accurate mortality data.”
Mission	Purpose of the initiative	“To establish a functioning national SRS to collect timely and representative mortality data.”
Goals	Specific, measurable outcomes	“Integrate SRS with CRVS in 5 priority regions by 2027.”

What happens where there is no clear vision …

Failure 1 – Winchester House

Let's build the house as we go…

- 160 rooms (more than 900 doors)
- 2 basements
- 47 stairways (some leading to ceilings or nowhere)
- 13 bathrooms
- 10,000+ panes of glass
- 17 chimneys (some not connected to fireplaces)



What happens when there is no clear vision …

Failure 2 - National Programme for IT in the NHS, UK

"To deliver a fully integrated electronic care record system for every patient in England that would reduce reliance on paper files, enable rapid access to accurate medical records, and support better, safer, and more efficient care."

What happens when there is no clear vision …

What they wanted to achieve	What actually happened
• National electronic medical record system • Improve data sharing across GPs, hospitals… • Standardize IT systems across the UK • Enhance patient safety • Increase Efficiency and Reduce Costs	• Fragmented and siloed implementation • Limited interoperability with multiple local variations • Clinicians did not support the system and claimed to be not user friendly • Initial budget 6.4 billion GBP – Final cost 11.4 billion GBP

Why it happened

Failure 2 - National Programme for IT in the NHS, UK

- Lack of a Unified and Realistic Vision, leading to ↓
- Top-Down, Supplier-Led Design Without User Input, leading to ↓
- Fragmented Implementation and Poor Interoperability and Little Cost Control,, leading to ↓
- No Clear Plan for Change Management and Long-Term Governance

Vision for an integrated SRS

Creating a vision for an integrated SRS

- ✓ Clear time line (e.g. 2030)
- ✓ Core outcome (e.g. policy-informed mortality data)
- ✓ Strategic contribution (e.g. data for UHC, equity)
- ✓ System attributes (e.g. inclusive, agile, sustainable)

Must be: concise, future-oriented, systems-aware

Reminder of Success Factors … Summing Up

Key takeaways – Success Factors

1. If you have a **clearly articulated vision**
2. If your vision is **shared and supported** by the different stakeholders
3. If your vision is **dynamic and context specific**
4. If your vision is **realistic and grounded on robust situational assessment**

You will **succeed in setting up your sample registration system integrated with the CRVS system**

Creating a vision for an integrated SRS

Time now to create or improve your vision in groups

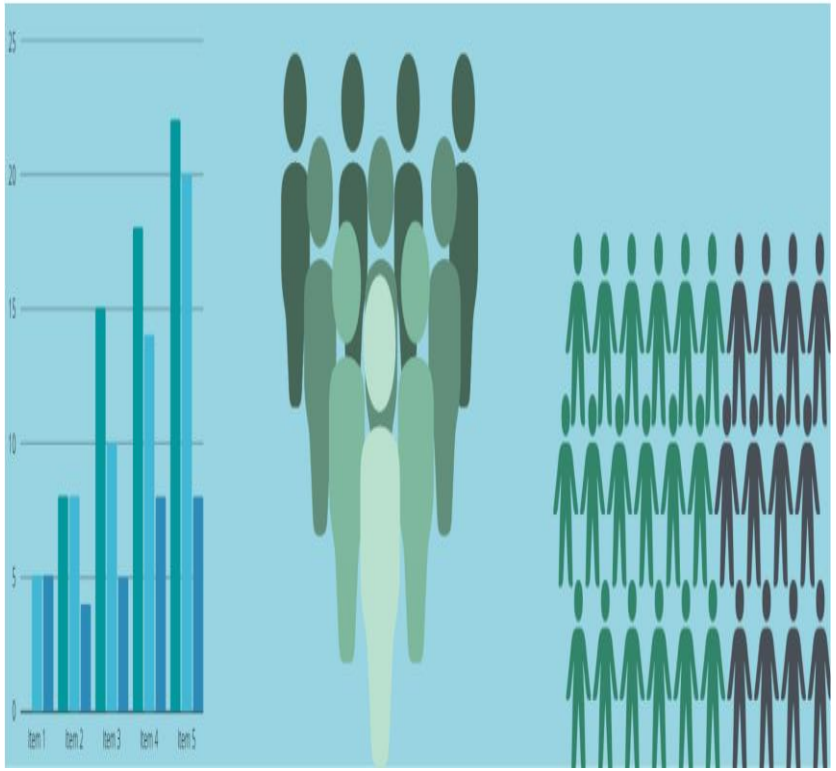
- You have 40 min to create or refine your vision
- Work with your country team and facilitator
- Follow this handout to ensure your concept includes all key points
- Use flip charts to sketch, note or visualize key elements of your vision

Thanks!

Lunch

IHI – Current Progress in Tanzania

India’s SRS



Sample Registration System - India

Dr. Anand Krishnan

Professor,

Centre for Community Medicine,

All India Institute of Medical Sciences, New Delhi

Contents

- Sample registration System in India
- Integrating verbal Autopsy into SRS systems
- Emerging issues & way forward

Key Features of Indian SRS

- Among the first to be started globally
  - a pilot project in 1964-65 and made it fully operational in 1969-70
- Fully funded by the government
  - Administered by Indian Statistics Service Officers
- Among the largest SRS system in the world
  - Covers about 8 million population (0.6% of the population)
- Introduced verbal autopsy in 1999
  - Best source of cause-of-death in India

Need for SRS in India – Focus on Population growth and fertility

Addressing Incomplete Civil Registration:

- The CRS, while legally mandated, was not consistently implemented across all states, resulting in incomplete and unreliable data.

Need for Reliable Data for Planning:

- Accurate demographic data for effective planning in various sectors, including health, education, and economic development. The SRS was designed to provide this data, especially for population projections and evaluating health programs.

Focus on Sub-National Data:

- The SRS was designed to provide data at the state level for urban areas and the natural division level for rural areas, enabling more targeted planning and interventions.

Continuous Data Collection:

- The SRS operates as a continuous survey, collecting data regularly to provide up-to-date information on population trends and vital statistics.

Sample design

Uni-stage stratified simple random sampling without replacement-

- Stratification by various characteristics followed by simple random sampling of population clusters (villages, village segments or census enumeration blocks)

Rural- Villages or village segments are the sample units

- Villages with less than 2000- stratum I
- Villages with 2000 or more- stratum II
- Population less than 200- excluded

Sampling Frame- Based on decennial census
[Max pop of village is 2000, Pop of CEB- 800 TO 1000

Urban- Census enumeration blocks are the sample units

- Stratum I-less than 1 lakh,
- Stratum II- 1 lakh to less than 5,
- Stratum III- 5lakh or more,
- Stratum IV- 4 metro cities

Sample size

- Arrived by using binomial model

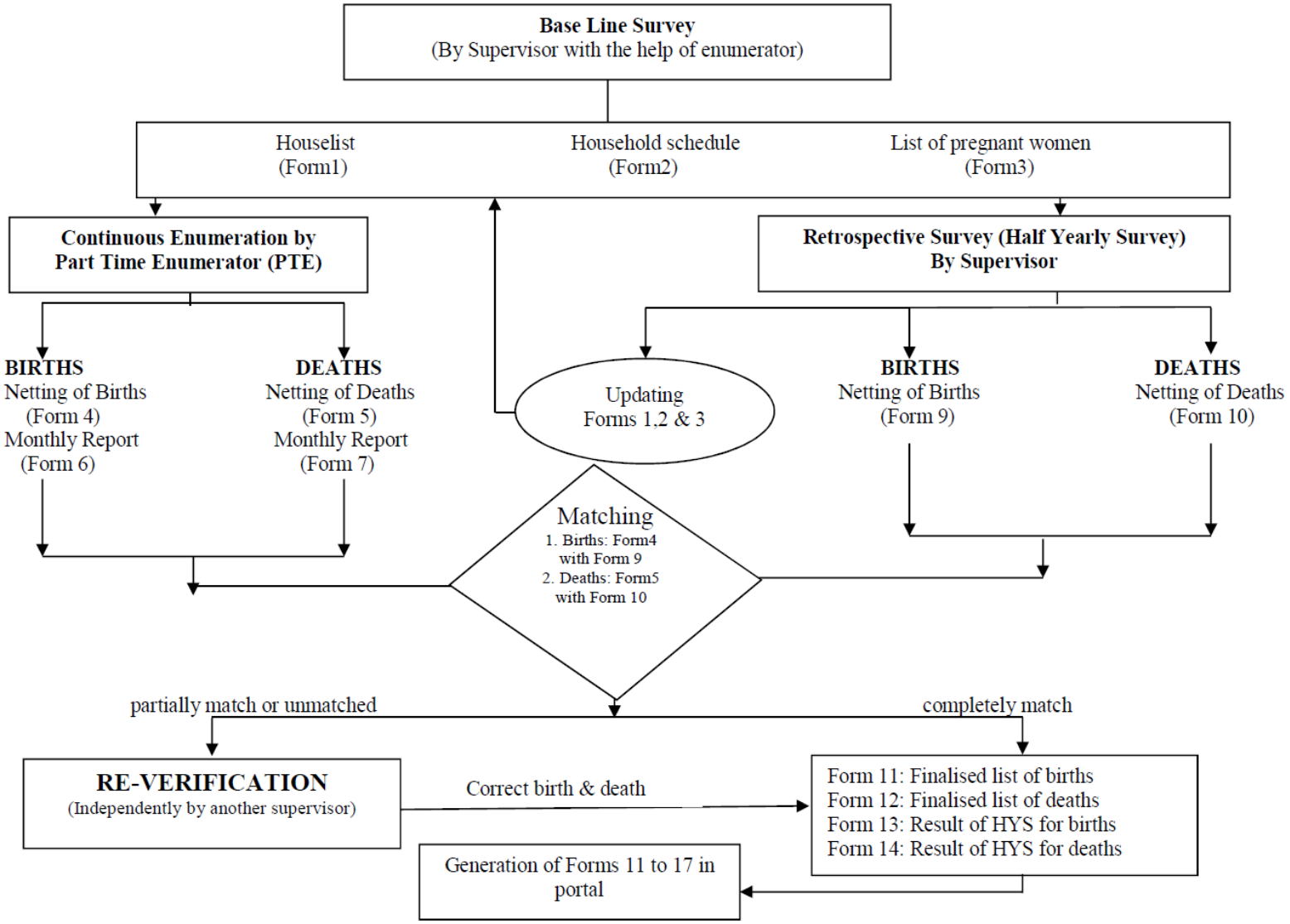
Principles adopted for Determination of SRS Sample Size

Year	Key Indicator (Parameter)	Provisional parameter value	Lowest pop unit	
			Rural	Urban
1969-70	Crude Birth Rate(CBR)	0.04=40 Births /1000 Pop.	Big States: Substate Natural Divisions. Minor States: All State	All State
1977-78	Crude Birth Rate(CBR)	0.03=30 Births /1000 Pop.		
2004	Infant Mortality Rate	SRS Estimate		

SRS Sample Units and population

- Increase in sample size over the years can be attributed to
  - making-up the initial short fall in sample size,
  - emerging demand for smaller area statistics,
  - to provide firm estimates of vital rates for union territories attaining statehood, and newly formed states, and
  - gradual reduction in event rates calling for increase in sample size to sustain the same level of precision for parameter estimates.
  - 2020 – 8841;4958,3883
    - 8310,6081,2229

Addition / Replacement Period	Year	Sample Units			Sample Population		
		Rural	Urban	Total	Rural	Urban	Total
1969 - 70	1970	2,367	1,256	3,623	2,633,349	1,029,687	3,663,036
	1971	2,432	1,290	3,722			
1977 - 78	1978	2,450	1,344	3,794			
	1979	2,460	1,344	3,804			
1982 - 85	1982	4,147	1,875	6,022			
	1989	4,149	1,873	6,022	4,624,293	1,319,323	5,943,616
1993 - 95	1993	4,149	2,151	6,300	4,706,000	1,088,000	5,794,000
	1994	4,420	2,193	6,613	4,668,000	1,265,000	5,933,000
	1995	4,420	2,198	6,618	4,516,000	1,286,000	5,802,000
	1996	4,436	2,235	6,671	4,598,000	1,319,000	5,917,000
	2003	4,410	2,235	6,645	5,064,000	1,387,000	6,452,000
2004	2004	4,433	3,164	7,597	4,936,000	1,798,000	6,734,000
	2013	4,433	3,164	7,597	5,453,000	1,986,000	7,439,000
2014	2014	4,961	3,892	8,853	5,552,000	1,954,000	7,506,000
	2015[3]	4,916	3,859	8,775	5,609,000	2,003,000	7,612,000


Base Line Survey
(By Supervisor with the help of enumerator)
Houselist
(Form1)
Household schedule
(Form2)
List of pregnant women
(Form3)
Continuous Enumeration by
Part Time Enumerator (PTE)
Retrospective Survey (Half Yearly Survey)
By Supervisor
BIRTHS
Netting of Births
(Form 4)
Monthly Report
(Form 6)
DEATHS
Netting of Deaths
(Form 5)
Monthly Report
(Form 7)
Updating
Forms 1,2 & 3
BIRTHS
Netting of Births
(Form 9)
DEATHS
Netting of Deaths
(Form 10)
Matching
1. Births: Form4
with Form 9
2. Deaths: Form5
with Form 10
partially match or unmatched
completely match
RE-VERIFICATION
(Independently by another supervisor)
Correct birth & death
Form 11: Finalised list of births
Form 12: Finalised list of deaths
Form 13: Result of HYS for births
Form 14: Result of HYS for deaths
Generation of Forms 11 to 17 in
portal

Estimation procedure using population weights

- Unbiased estimation
- Applied both in rural and urban areas
- Ensures reliable estimates of vital events at state and national level
- Method-
  - At first the population and number of events at the stratum level is estimated from the observed population and events in sample villages
  - Then add up estimated population of all strata to arrive at the estimated population for respective natural division.
  - The estimated population at the state level is obtained by summing up estimated population at natural division level.

Estimated Population in j^{th} Stratum of k^{th} natural division:

$$\hat{p}_{jk} = \frac{N_{jk}}{n_{jk}} \sum_{i=1}^{n_{jk}} p_{i_{jk}} = \frac{\textit{Total Number of Villages/Segments in } j^{th} \textit{ stratum of } k^{th} \textit{ Natural Division}}{\textit{Number of Sample Villages/Segments in } j^{th} \textit{ stratum of } k^{th} \textit{ Natural Division}} \times \sum_{i=1}^{n_{jk}} p_{i_{jk}}$$

Where i_{jk} = *Counter for Sample Villages in* j^{th} *Stratum of* k^{th} *Natural Division*,

$\sum_{i=1}^{n_{jk}} p_{i_{jk}}$ = *Sum of Population in Sample Villages/Segments in* j^{th} *Stratum of* k^{th} *Division*

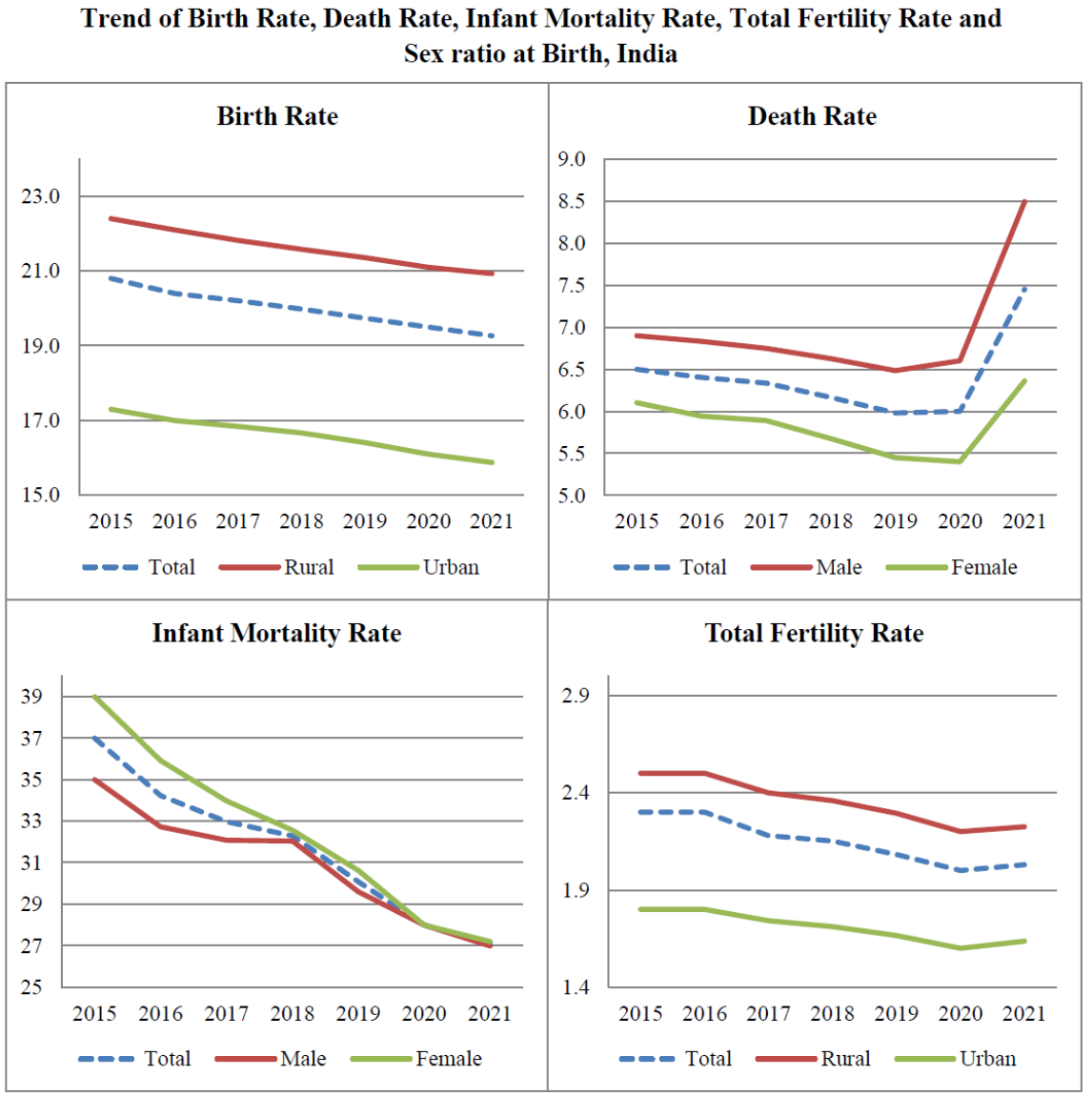
And $\frac{N_{jk}}{n_{jk}}$ = *Stratum Multiplier For* j^{th} *Stratum of* k^{th} *Division*.

SRS Statistical Annual Report

Information	Available Statistics
Population distribution	Population by 5 year age sex groups 0-4, to 70+ until 1994, and to 85+ since 1995
Fertility	Population by Marital Status
	Age Sp. & Marital Fertility Rates
	Age Sp. Fertility Rates by Education
	Birth order and interval wise distribution of births
Mortality	Age Specific Death Rates by 0, 1-4, and 5 year age groups from 5-9 until 70+ 0r 85+
	Mort. Indicators: Crude Death Rate, Child mortality, IMR etc.
	% Distribution of deaths by age
Access to Med. Care	Medical Attention at Birth
	Medical Attention at Death

Key SRS Publications

- SRS Bulletins
- SRS Statistical Report
- Bulletin on Maternal Mortality in India
- Compendium of Fertility and Mortality Indicators 1971-2013
- SRS Based Life Tables
- Cause of Death Statistics



FIGURES AT A GLANCE, INDIA - 2021

Item		Total	Rural	Urban
I.	**Percentage distribution of population by broad age groups**			
	0-14	24.8	26.5	21.5
	15-59	66.2	64.8	69.0
	60+	9.0	8.8	9.4
II.	**Fertility Indicators**			
	Crude Birth Rate	19.3	20.9	15.9
	General Fertility Rate	67.2	74.0	53.9
	Age-specific Fertility Rate			
	15-19	11.3	13.2	6.7
	20-24	115.3	129.9	83.3
	25-29	144.4	156.9	120.5
	30-34	82.6	87.4	74.1
	35-39	35.3	38.6	29.5
	40-44	11.9	13.4	9.3
	45-49	4.9	5.5	3.9
	Total Fertility Rate	2.0	2.2	1.6
	Gross Reproduction Rate	1.0	1.1	0.8
	General Marital Fertility Rate	108.6	118.5	88.6
	Total Marital Fertility Rate	5.2	5.3	4.7
	Mean age at effective marriage for females	22.5	22.1	23.5
III.	**Total Fertility Rate by level of education of the mother**			
	Illiterate	3.2	3.3	2.6
	Literate	2.0	2.2	1.6
	Without any formal education	2.4	2.5	2.0
	Below primary	2.5	2.6	1.9
	Primary	2.4	2.5	1.8
	Middle	2.1	2.3	1.7
	Class X	1.9	2.1	1.6
	Class XII	1.7	1.9	1.5
	Graduate and above	1.7	1.8	1.6
IV.	**Percentage distribution of live births by birth order**			
	1	60.6	59.3	64.1
	2	25.5	25.2	26.2
	3	9.0	9.7	7.0
	4+	4.9	5.8	2.7

FIGURES AT A GLANCE, INDIA - 2021

Item		Total	Rural	Urban
V.	**Percentage distribution of Current live births by birth interval (in months)**			
	10-12	1.6	1.8	1.2
	12-18	6.9	7.0	6.4
	18-24	11.7	12.6	8.8
	24-30	13.6	14.0	12.4
	30-36	13.7	13.6	14.2
	36+	52.4	51.0	57.0
VI.	**Mortality Indicators**			
	Crude Death Rate	7.5	7.9	6.6
	Percentage of infant deaths to total deaths	7.0	8.1	4.3
	Percentage of deaths of less than one week to total infant deaths	52.7	52.4	54.1
	Under-five Mortality Rate	31	35	21
	Infant Mortality Rate	27	30	18
	Neo-natal Mortality Rate	19	22	13
	Early Neo-natal Mortality Rate	14	16	10
	Late Neo-natal Mortality Rate	5	6	3
	Post Neo-natal Mortality Rate	8	8	5
	Peri-natal Mortality Rate	18	20	13
	Still Birth Rate	4	4	3
VII.	**Percentage distribution of births by type of medical attention at delivery**			
	Government Hospital	66.2	68.4	59.1
	Private Hospital	24.9	21.3	36.4
	Qualified Professional	5.0	5.8	2.4
	Untrained Functionary and Others	3.9	4.5	2.1
VIII.	**Percentage distribution of deaths by type of medical attention before death**			
	Government Hospital	25.1	23.6	29.0
	Private Hospital	14.2	12.2	19.6
	Qualified Professional	13.3	12.9	14.2
	Untrained Functionary and Others	47.4	51.4	37.1

Comparison of NFHS (Indian DHS) and SRS

	National Family Health Survey (NFHS)	Sample Registration System(SRS)
Scope	Large-scale, nationally representative household survey conducted periodically	Continuous system for recording births and deaths in a sample of villages and urban blocks across India.
Data	Collects extensive data on various aspects of health and family welfare, including fertility, contraception, maternal health, child health, and nutrition, as well as socio-economic factors and access to healthcare	Primarily focuses on birth and death registration to estimate birth and death rates, as well as other demographic indicators.
Methodology	Uses a multi-stage sampling design to ensure national representativeness 610,000 HHs across India	Uses a simple random sampling approach to select areas for data collection
Frequency	Conducted periodically, providing a snapshot of health and demographic trends over time. (roughly every 5-7 years).	Continuous system, providing ongoing data on births and deaths.
Strengths	Provides in-depth data on a wide range of health and demographic indicators. Useful for monitoring progress on health and family welfare goals.	Provides more precise estimates of birth and death rates. Useful for monitoring population trends and making demographic projections.
Limitations	Less focused on precise demographic estimates compared to SRS. Can be expensive and time-consuming to conduct. Uses recall for last five years for births/deaths	Less comprehensive in terms of health and family welfare indicators compared to NFHS. May not capture all deaths, especially in remote areas or among certain populations.

An Overview of Evaluation Studies on Sample Registration System in India

- Both direct and indirect estimates showed that the incidence of under registration of births and deaths were within the tolerable range of up to 10%.
- Female births/deaths, still-births, neonatal deaths counting is challenging.

Dates	Study Design	Findings	Ref.
1970-1975	Indirect estimate (Brass 1975)	6% under reporting of adult deaths	RGI, 1982
1971-1976	Indirect est. (Brass 1975; Preston & Coale 1980)	10% under reporting of deaths. Insignificant interstate variations. Excluded Bihar & West bengal for poor data quality.	Bhat et al. 1984
1978	Indirect est. (P/F ratios, UN 1983, Ch-II)	6% under reporting of births. State underestimates in 1978 ranged from <1% (Guj) to >17% (KA)	RGI 1984, Swamy et al. 1992
1980-1981	Intensive inquiry of 10% subsample	3% under estimation of birth and death rates. State underestimates around 1% (Guj, Har, MP) to 11% (KA)	Grover 1988; Swamy et al. 1992.
1985-1986	Intensive inquiry of 10% subsample	State underestimates, <1% (AP, BI, Guj, KE, MP,, MH, OR, TN) to >3% (AS, WB)	Swamy et al. 1992.
…	…	…	…
1978-1992	Comparison of SRS with NFHS fertility est.	At least 10% under registration of births.	Narasimhan et al. 1997

Strengths and limitations of SRS in India

Strengths-

- Done every year
- Elimination of errors of duplication
- Self evaluating technique
- Dual reporting system
- Sampling frame changes every 10 years once.
- Sustainable funding

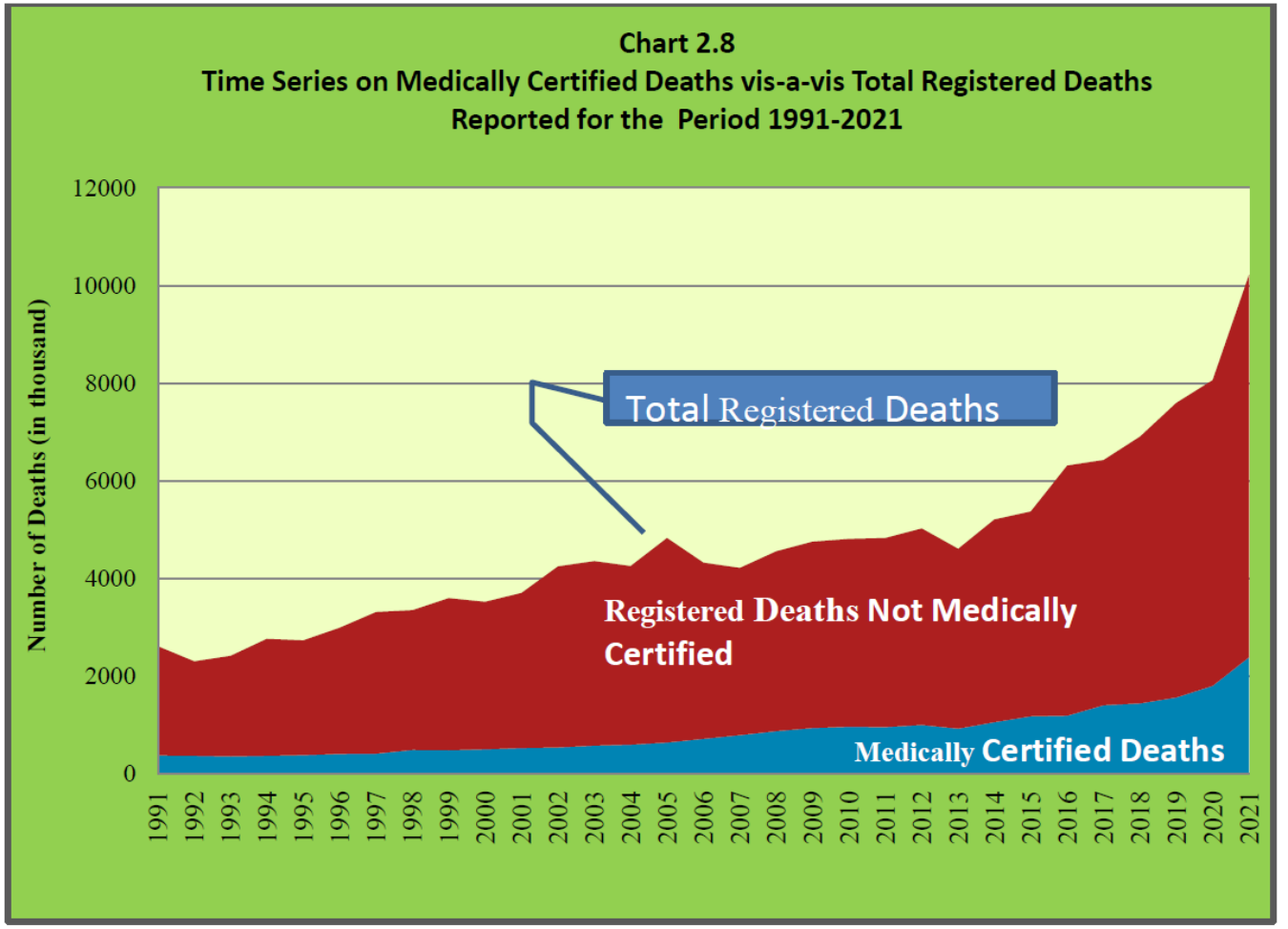
Limitations-

- Sample size only for state level indicators
- Limited set of variables

Strengthening SRS

- Enhancing Data Accuracy and Completeness:
  - **Training and Supervision-**Regular supervision and feedback mechanisms are crucial to ensure adherence to protocols.
  - **Data Processing and Analysis:** strengthening data quality control measures and ensuring the proper handling of unmatched and partially matched events
  - **Data Dissemination:** Timely dissemination of SRS data to policymakers, researchers, and the public is vital for informed decision-making and effective policy implementation.
- Leveraging Technology:
  - **Digital Platforms:** Exploring the use of digital platforms, such as mobile applications and online databases, can streamline data collection and reporting, reduce errors, and improve efficiency.
  - **Data Visualization and Analysis Tools:** Utilizing data visualization and analysis tools can facilitate the identification of patterns, trends, and disparities in demographic data, informing policy decisions.
- **Integration with Other Systems:** Integrating SRS with other data sources, such as civil registration systems and health information systems, can enhance the completeness and accuracy of data.

Integrating Verbal Autopsy Based Cause of death Reporting within SRS



Need for a Verbal Autopsy based system

Limited Medical Certification:

- In India, the proportion of deaths reported with a medical certification was relatively low (less than 25%). This was especially true in rural areas due to the shortage of medical personnel and facilities.

Need for Reliable Data:

- The lack of accurate cause of death data hindered efforts to understand mortality patterns and plan effective public health interventions.

Introduction of Verbal Autopsy:

- To address this, verbal autopsy (VA) was introduced as a component of the SRS. VA involves interviewing family members or caregivers of the deceased to gather information about the symptoms, medical history, and circumstances surrounding the death.

Development of VA forms in SRS

- Forms were developed based on the existing experience of WHO, Chinese Surveillance System and other international and national studies.
- Key consideration – length of the form to reduce load on the supervisors
- Type of forms- https://karnataka.census.gov.in/SRS/20.Verbal%20Autopsy%20Form10A-10D.pdf
  - Neonatal form
  - Childhood form
  - Adult form
  - Maternal death form
- Validation Study done
- Physician coded
  - agreement between two coders

Common heads-
1. Identity details of deceased and respondents
2. Details of injury/accident (if any)
3. Details of sickness at the time of death
4. Narrative part

Gajalakshmi V, Peto R, Kanaka S, Balasubramanian S. Verbal autopsy of 48 000 adult deaths attributable to medical causes in Chennai (formerly Madras), India. BMC Public Health. 2002 May 16;2:7. doi: 10.1186/1471-2458-2-7. PMID: 12014994; PMCID: PMC113750.

Verbal Autopsy in India

Until December 1998, cause of death data for rural areas used to be collected under Survey of Cause of Death Rural Scheme, from a sample of villages by lay diagnosis and reporting system

Dec. 1998

In 2001, GOI initiated Verbal Autopsy of about 45,000 deaths identified under SRS every year

2001

Jan. 1999

From January 1999, a cause of death component was merged with SRS

MINErVA

VA forms from 2015 onwards

cghr

VA forms 2001-2014

Starting Vision of MINErVA

Strengthen SRS-VA System to make it of Global Standards

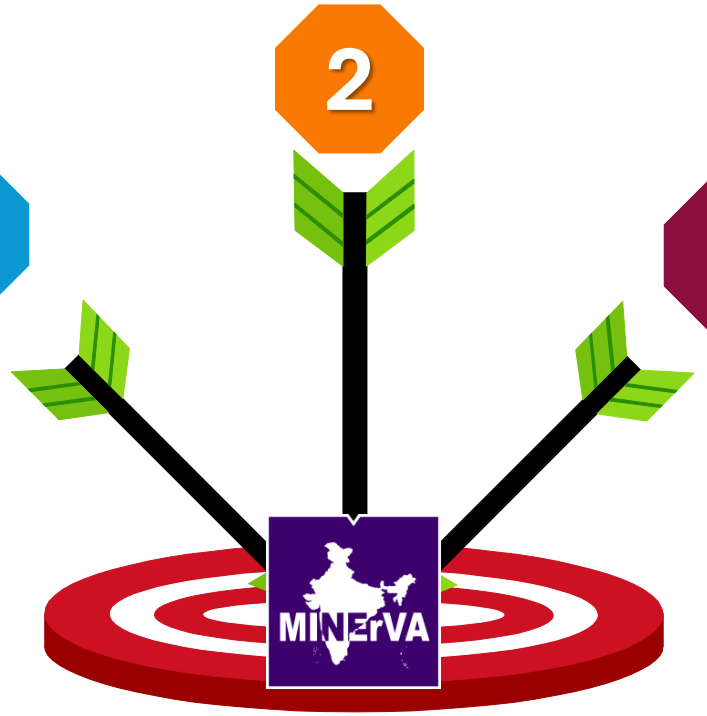
- Good Quality of Verbal Autopsy
- Good Quality of Coding

ENSURE GOOD QUALITY OF DATA

GENERATE TIMELY ESTIMATES

1

- Reduce time between death & VA
- Reduce Time between VA & uploading
- Reducing time in Coding
- Reduce time in release of reports



USE OF DATA FOR ACTION

3

- Improve Availability of Data
- Produce better reports/data products

MINErVA: What do we do?

- Technical support to Office of the Registrar General of India (RGI) for SRS-VA
- Training of 800 Supervisors conducting Verbal Autopsy under SRS
- Quality control of Verbal Autopsy under SRS
- Maintaining network of trained multi-lingual physician VA coders
- Cause of Death assignment of ~ 45000 deaths/yr through online platform
- Preparation of final tables for each year

MINErVA

TAG

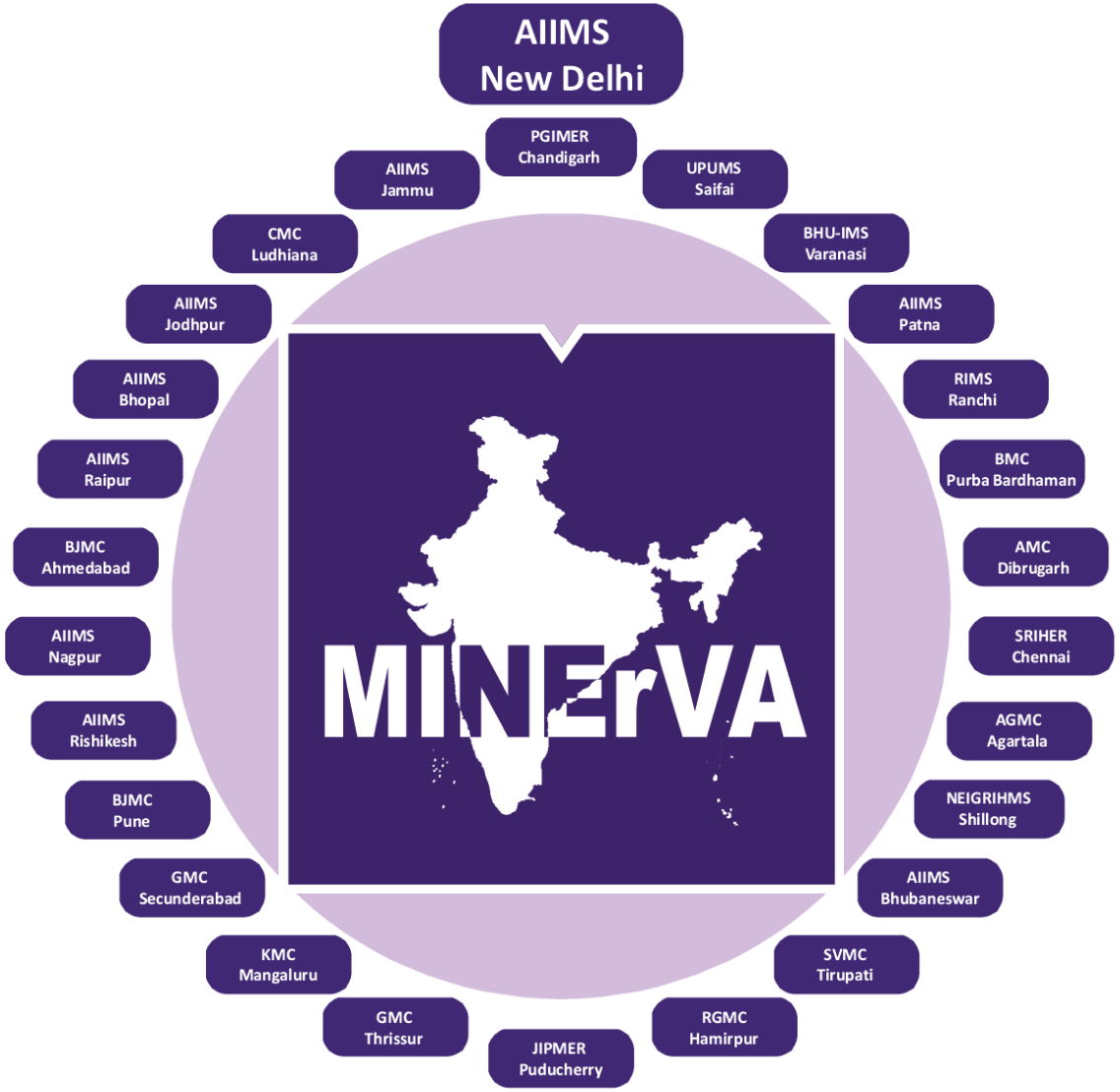
ATSU

IT Platform

Network Institutions

Physician Coders

Network Institutions



Technical Advisory Group (TAG)

TAG is the apex advisory body which also provides external oversight

Terms of Reference

1. Chaired by Secretary Health Research
2. Provide expert advice and strategic guidance for all technical aspects related to the estimation of cause-specific mortality using verbal autopsies under the SRS.
3. Review and assess the progress of the MINErVA Network
4. Recommend measures to address challenges and improve the quality of CoD estimates.
5. Advise on future directions,

Composition : Expertise in Epidemiology, Demography, Social Sciences, Clinical Medicine

MINErVA Network: Milestones in Evolution

2017

New Beginnings- MoU signed between AIIMS & ORGI

1st Network & TAG meeting

2018

2nd Network & TAG meeting

Website launch- www.causeofdeathindia.com www.minervacoding.aiims.edu

2019

Coding of VA forms for 2015-2017

3rd Network & TAG meeting

2020

Development of app for mobile based data

2021

Coding of 2018 VA forms

4th Network & TAG meeting

17 Network Partner Institutes

2022

5th Network & TAG meeting

Coding of 2019 VA forms

2023

Coding of 2020 VA forms

6th Network & TAG meeting

2024

7th Network & TAG meeting

Coding of 2021 and 2022 VA forms

27 Network Partner Institutes & 1300 registered VA coders

Key modifications introduced in SRS-VA system

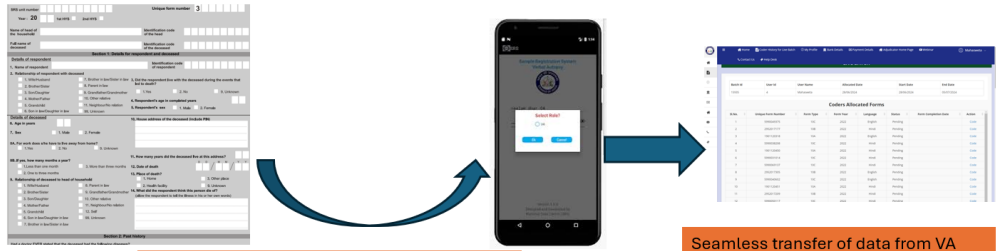
- Improve Verbal Autopsy Quality
  - Annual training of Supervisors for data collection through VA with 90% coverage
  - VA Tool- Key symptoms included in Adult form

27. Key symptoms (check all that apply,and then use symptom list for narrative)

1. Fever	5.Chest pain	9a.) Diarrhoea or Vomiting
2. Weight Loss	6. Cough	9b.) Difficulty/pain with swallowing solids, liquids
3. Oedema/Swelling	7.Difficulty, fast breathing or Breathlessness	10 .Urinary problem
4a.) Skin yellowishness (Jaundice)	8a.) Pain/mass in abdomen	11.Paralysis/stroke
4b.) Skin rash	8b.) Abdominal distension	12.Unconscious/fits

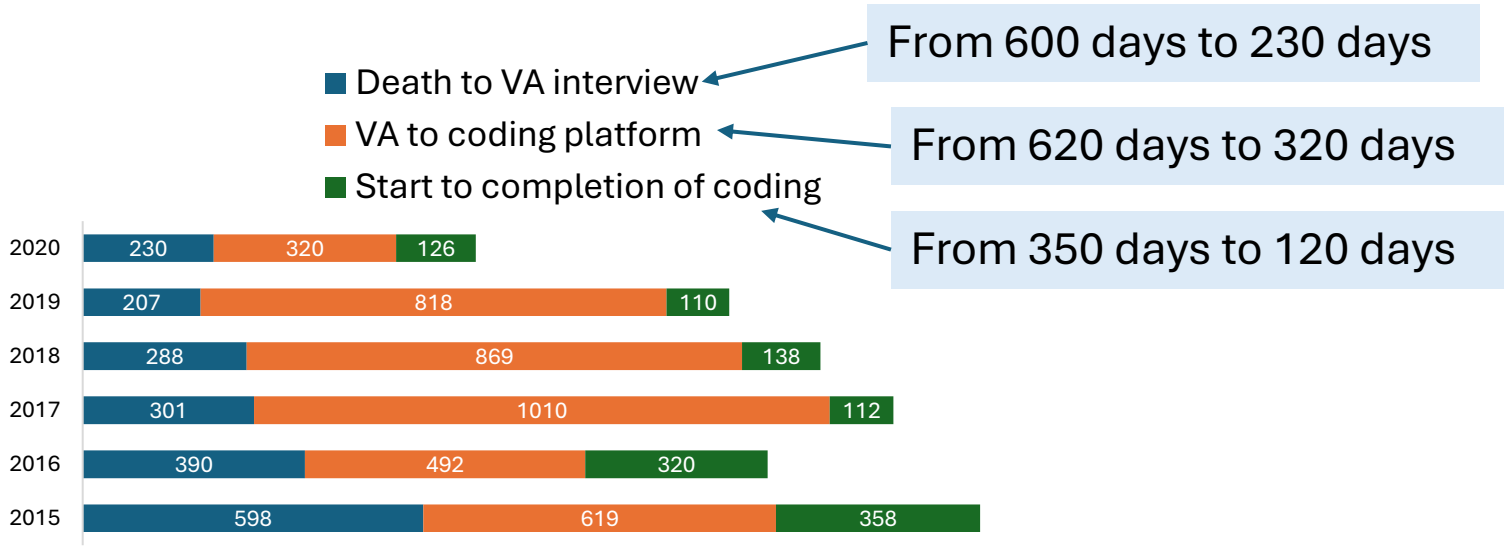
Key modifications introduced in SRS-VA system

- Improve Verbal Autopsy Quality
  - Annual training of Supervisors for data collection through VA with 90% coverage
  - VA Tool- Key symptoms included in Adult form
- Improve timeliness
  - Moved from paper format data collection to mobile application-based data collection
  - Large panel of Coders



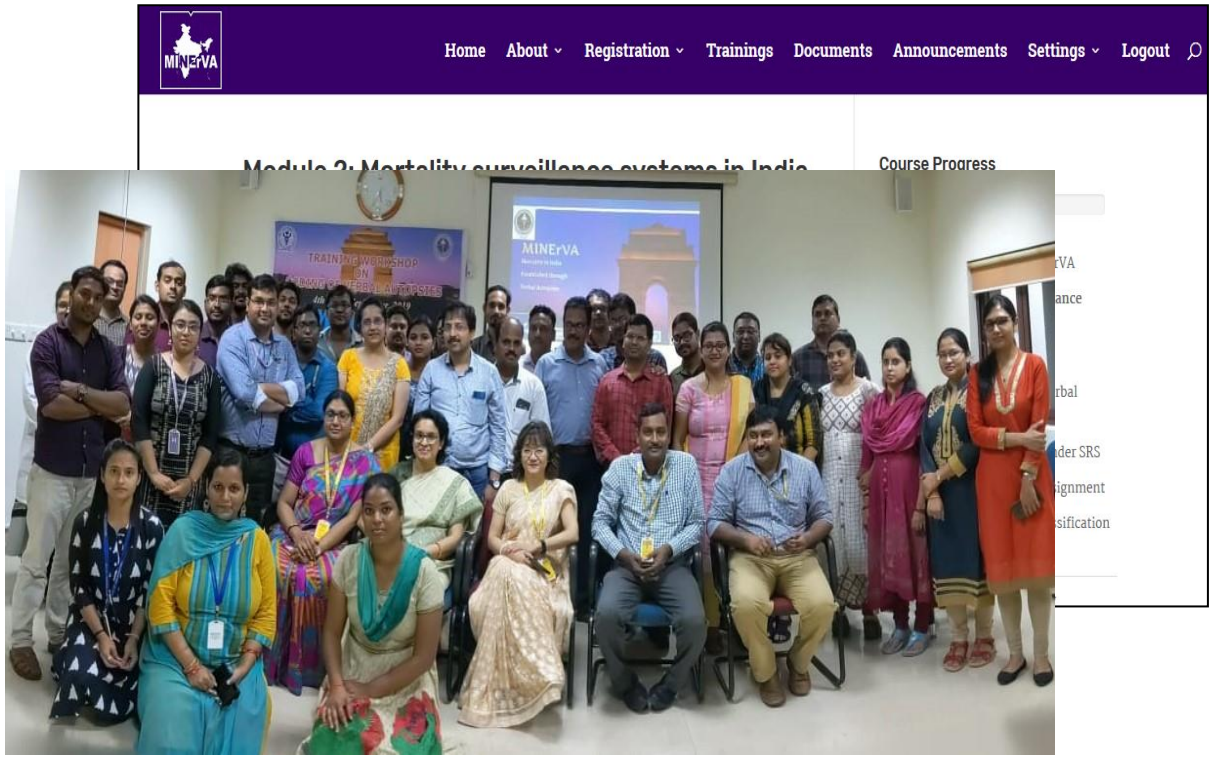
Rreducing the time for transfer of data from the point of data collection to ORGI.

Seamless transfer of data from VA app to ORGI and coding platform



Key modifications introduced in SRS-VA system

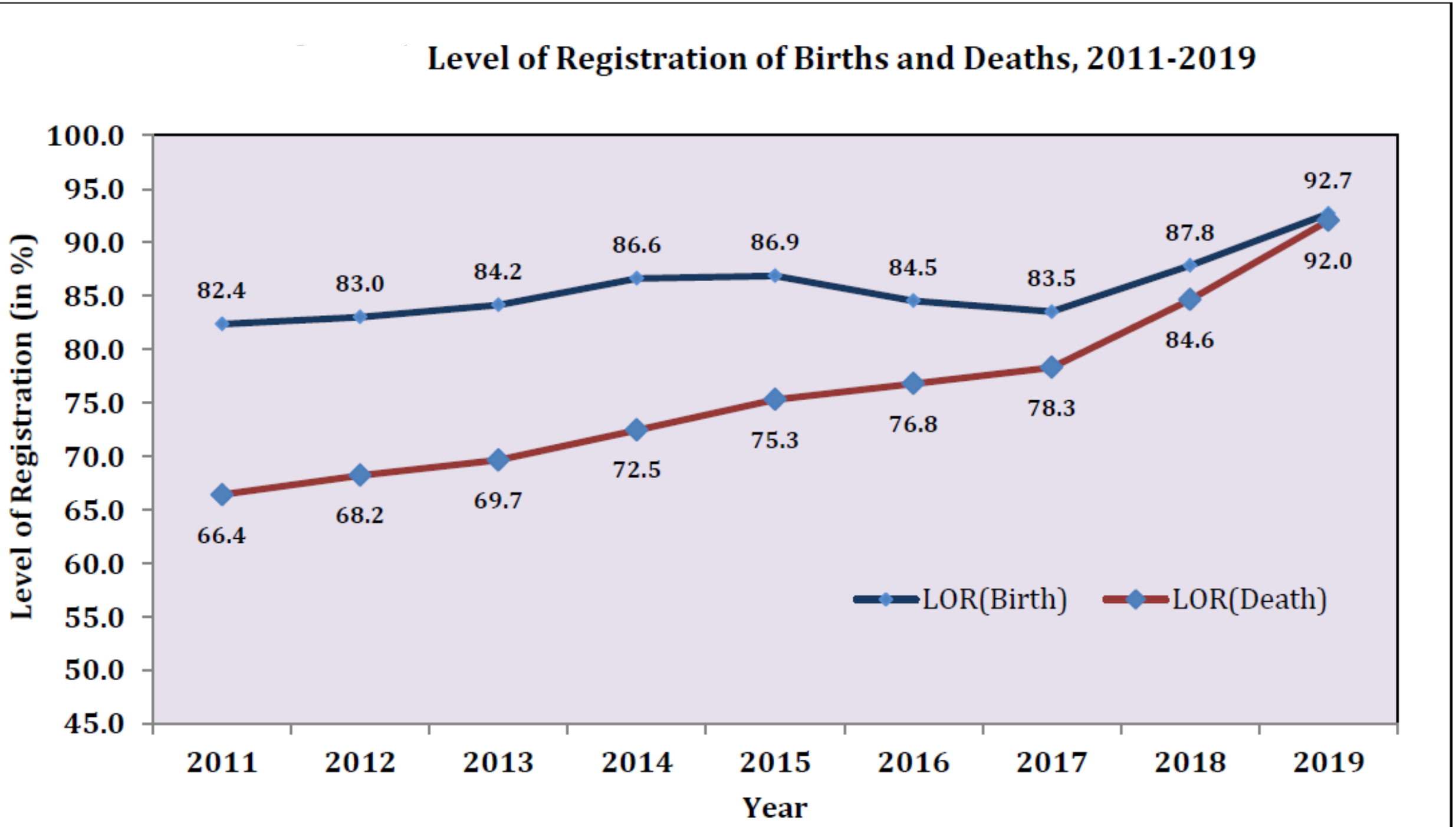
- Improve Verbal Autopsy Quality
  - Annual training of Supervisors for data collection through VA with 90% coverage
  - VA Tool- Key symptoms included in Adult form
- Improve timeliness
  - Moved from paper format data collection to mobile application-based data collection
- Improved coding
  - Online Physician coder training modules on ICD codes and coding of VA
  - Feedback process & retraining
  - Multi-language panel development
- Network expansion activities



Summary of SRS-VA system

- Collaboration with AIIMS Working well
  - Timeliness, quality issues addressed
  - Use of data needs more work
- Current arrangement extended till 2030 and likely thereafter.
- Open to adopt digital solutions
- Data use is still a challenge

Emerging Issues & Way forward


Level of Registration of Births and Deaths, 2011-2019
Level of Registration (in %)
100.0
95.0
90.0
85.0
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
82.4
83.0
84.2
86.6
86.9
84.5
83.5
87.8
92.7
66.4
68.2
69.7
72.5
75.3
76.8
78.3
84.6
92.0
LOR(Birth)
LOR(Death)
2011
2012
2013
2014
2015
2016
2017
2018
2019
Year

Future of SRS – Maybe time to move for universal approach

- Decreasing relevance
  - mortality and fertility rates decline – sample size needs to increase
  - As decentralization occurs in decision making, need lower-level data
- Increasing Birth and Death registration
  - Focus to shift for their integration into decision making
  - Largely for legal and administrative purposes
- Poor linkage with users of data
  - Ministry of Health is not involved
- Continued poor coverage with MCCD means that cause of death will have to be by verbal autopsy

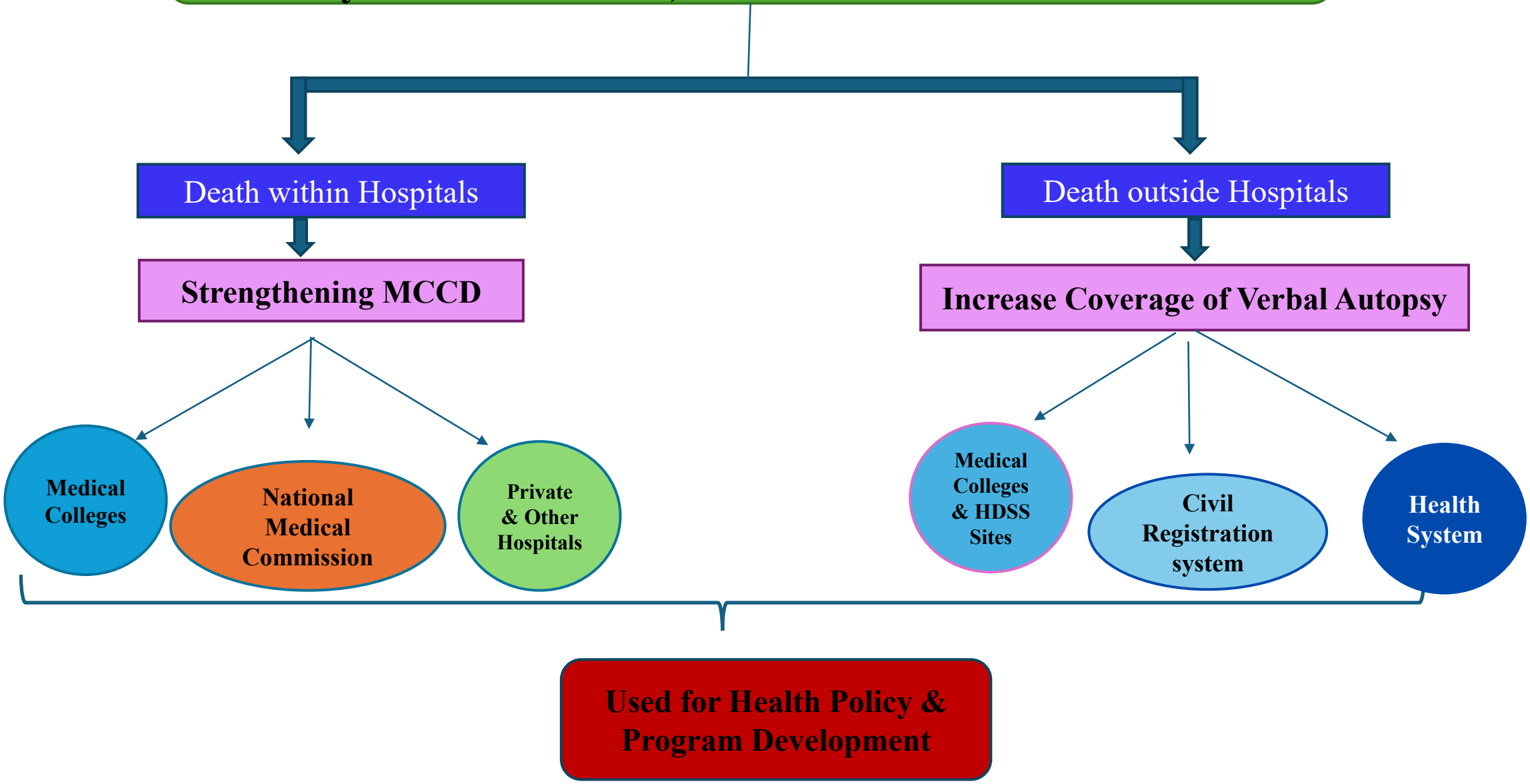
Way forward: Strategies to reach the goals to strengthen mortality surveillance in India

- **Short –term**
- Strengthen SRS-VA system
- Supplement SRS-VA with additional VA based system like medical college field practice areas or demographic surveillance sites

- **Long–term**
- Establish VA based system to cover non-institutional deaths especially through health system
- Employ digital VA solutions
- Integrate all data at district level

Goal for India

Every death is counted, and cause of death ascertained



Issues in increasing adoption of digital solutions for Verbal Autopsy

- Digital Solutions are the likely long-term solution
- Lack of evidence of superior performance of current CCVA methods over PCVA
  - Evaluated the performance of PCVA and three CCVA methods i.e., InterVA 5, InSilico, and Tariff 2.0 using the WHO 2016 VA tool on 2,120 reference standard cases developed from five tertiary care hospitals of Delhi.
  - For CSMF Accuracy, the PCVA method achieved the highest score of 0.79, followed by 0.67 for Tariff_2.0, 0.66 for Inter-VA and 0.62 for InSilicoVA.
- Use of Narratives in CCVA & Indian Languages for Machine learning
- Way forward
  - Develop local solution, need for large VA database
  - Use of Hybrid method in the routine system – CCVA assisted physician coding
- Can we develop a comprehensive digital solution available free in public domain for all potential users?
  - Agnostic to VA tool or coding methods
  - Our work with UNSW to pilot test it in four sites

Benara SK et al. Evaluation of methods for assigning causes of death from verbal autopsies in India. Front Big Data. 2023 Aug 24;6:1197471.

DIGITVA – A free digital solution for all Verbal Autopsy related work

- Content-
  - About Us and Our Goals
  - General Introduction to Verbal Autopsy
  - Introduction to Cause of Death Analysis
  - Description of Tools Used for Cause of Death Data Collection and Ascertainment
  - Links for
    - Training Platform for Coders & Interviewers
    - Data Collection Platform (ODK Central)
    - VA Coding (to Ascertain the Cause of Death)
    - SmartVA Results

Key lessons from Indian Experience

1. Plan long-term - sample size and arrange resources
2. Set up National Technical advisory group/academic institutional collaboration
3. Include CoD ascertainment as an integral part of SRS
4. Adopt digital solutions to the extent possible – look for global solutions
5. Strong linkage to data users – else the whole process is without purpose.
6. Continue Moving towards universal registration and certification.

References

- https://unstats.un.org/unsd/demographic/meetings/wshops/1993_China_CRVS/docs/1993_Doc.26_India.pdf
- https://www.researchgate.net/publication/228471937_An_Overview_of_the_Sample_Registration_System_in_India

- Officially named the *Registration of Births and Deaths Rules, 1999*.- Enforced from **1st January 2000**, replacing earlier rules
- Specifies **28 weeks** as the minimum gestation period to define a live/still birth.
- **Reporting Births and Deaths-**Information must be submitted to the **Registrar** using:
  - **Form 1** (birth)
  - **Form 2** (death)
  - **Form 3** (stillbirth)
- **Cause of Death Certificate-** Issued in **Form 4 or 4A**,
- **Delayed Registration**
  - **Within 30 days**: Late fee ₹2.

    30 days to 1 year: Requires written permission + ₹5.

    After 1 year: Requires Magistrate's order + ₹10
- **Correction/Cancellation of Entries**

  Clerical errors can be corrected by the Registrar.

  Substantive errors require a declaration from **two credible persons**.

  Fraudulent entries are reported for further action

THE REGISTRATION OF BIRTHS AND DEATHS (AMENDMENT) ACT, 2023

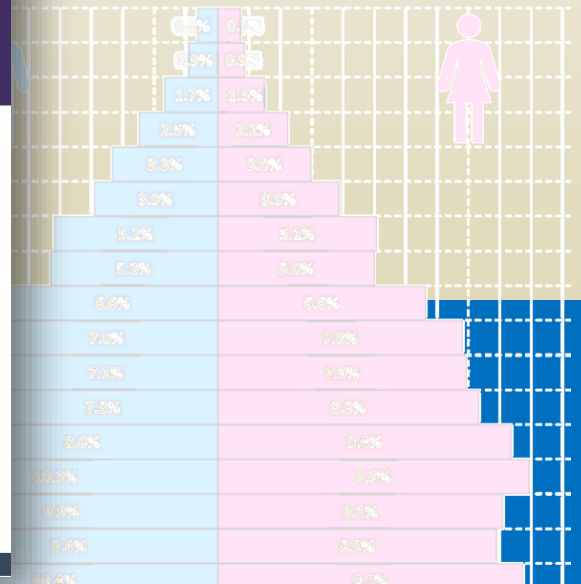
Digitization and Centralized Databases

Aspect	Amendment Act, 2023	Rules, 1999
Central Database	Mandates a national-level digital database maintained by the Registrar General of India	No mention of centralized digital database
State Database	States must maintain unified digital records using a designated portal	Records maintained locally and in physical forms
Data Sharing	Allows sharing with agencies managing Aadhaar, passport, voter lists, etc.	No data-sharing provisions

Bangladesh’s SVRS

Presentation on

BANGLADESH'S SVRS- WITH A FOCUS ON VISION FOR SVRS AND ITS MODULAR APPROACH



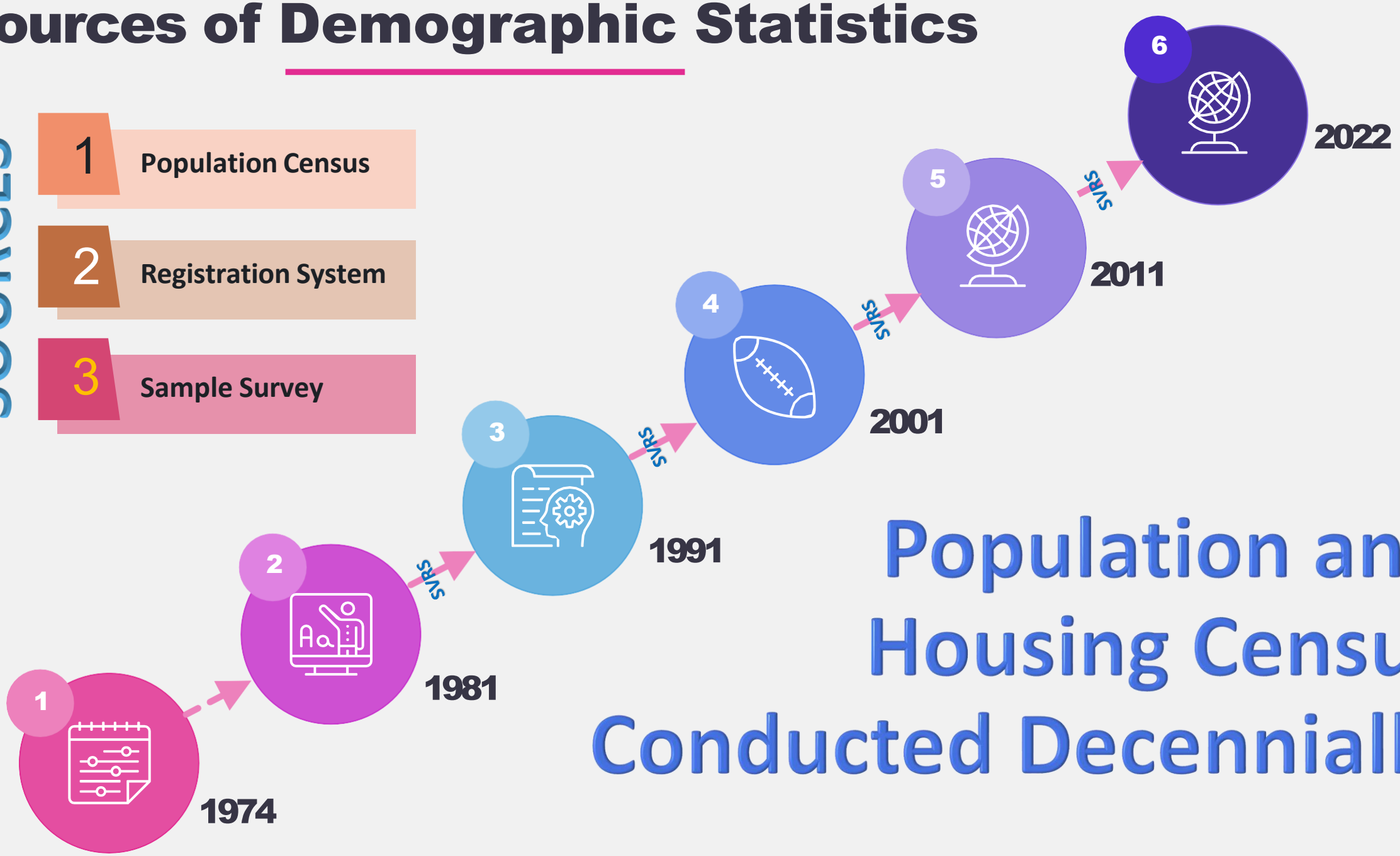
Md. Alamgir Hossen, *MPH*
Deputy Director and Focal Point
Sample Vital Registration System (SVRS)
Bangladesh Bureau Of Statistics
Email: alamgir.hossen@bbs.gov.bd

Background

Sources of Demographic Statistics

SOURCES

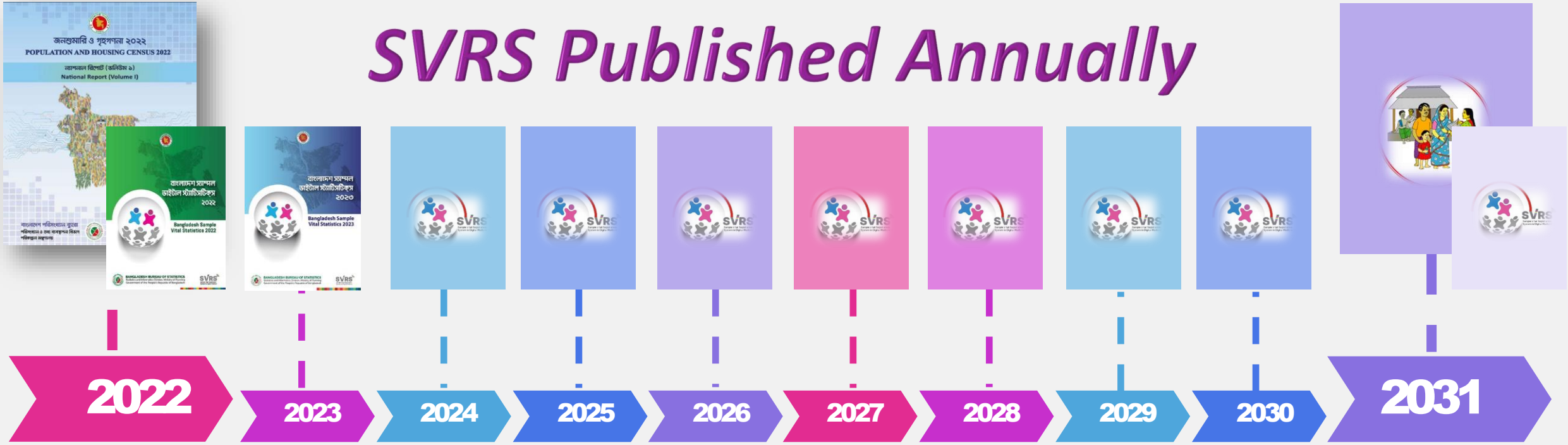
1. Population Census
2. Registration System
3. Sample Survey



Population and Housing Census Conducted Decennially

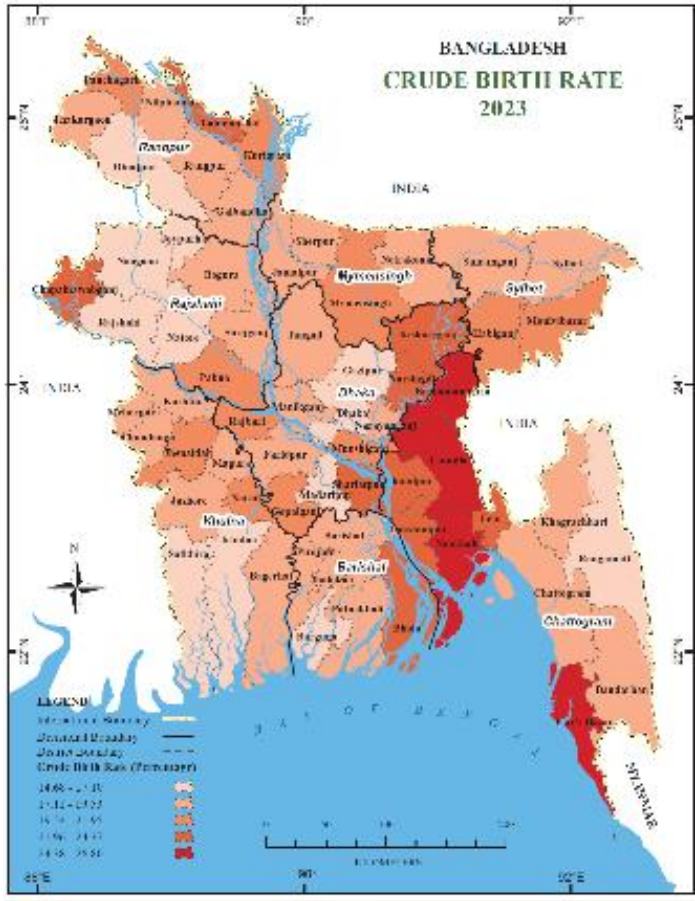
Demographic Data Sources in Bangladesh

Sample Vital Registration System (SVRS) Initiated in 1980

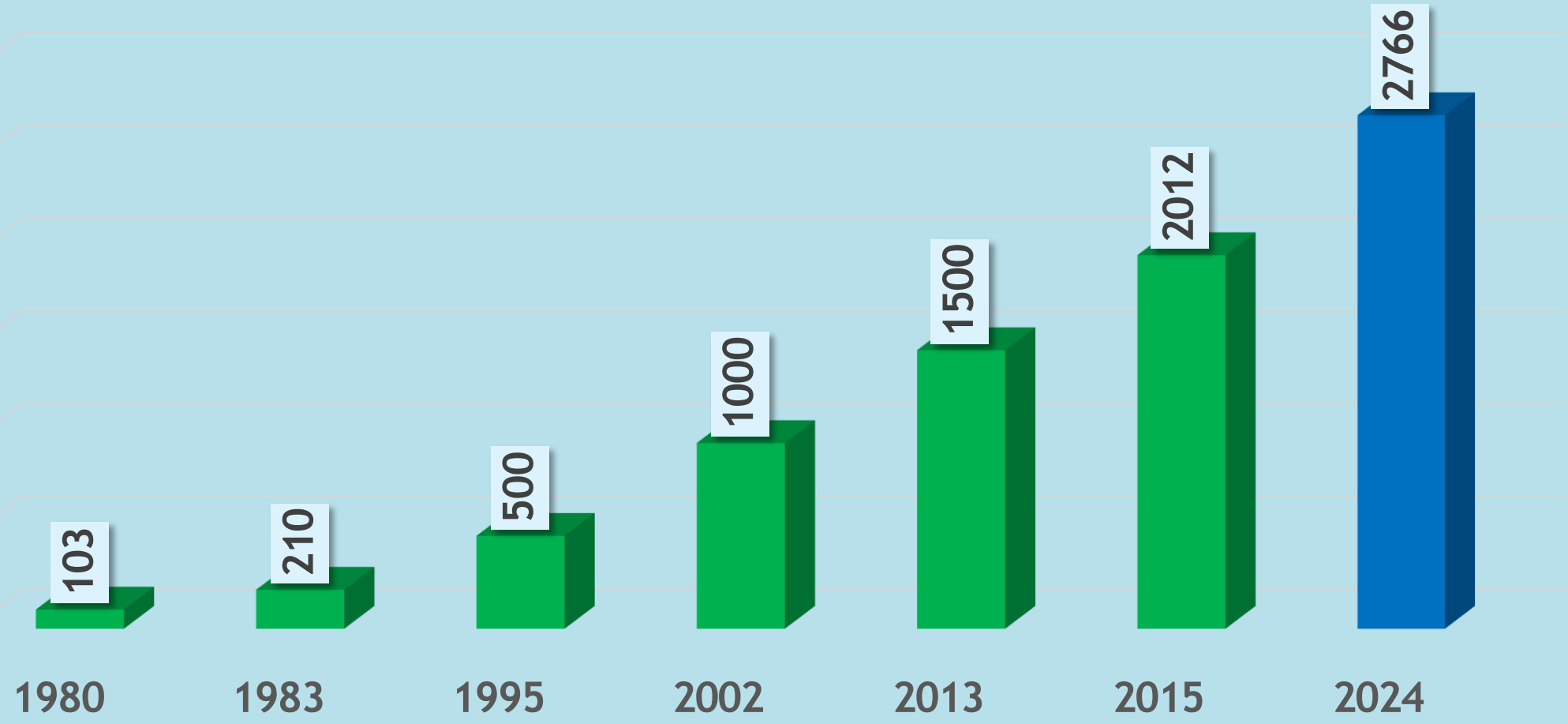


HISTORY

- SVRS Follows the Integrated Multipurpose Sample (IMPS) based on the last Population and Housing Census Sampling Frame.
- The surveillance started with 103 Primary Sampling Units (PSU), each comprising 250 households, in 1980.
- The PSU has been gradually increased based on each Population Census.
- The number of sample PSUs is raised to 2,766 in 2024 based on the Population and Housing Census 2022 Sampling Frame, aiming for district-level estimates.
- During 1980-2021 data collection was followed the dual recording system developed by Chandra Sekar-Deming with traditional paper and pencil-based data collection
- Since 2022 single recording system (System-II has been replaced with a validation Survey) was introduced replacing the dual recording system.
- Computer Assisted Personal Interviewing (CAPI) has been introduced since 2021.



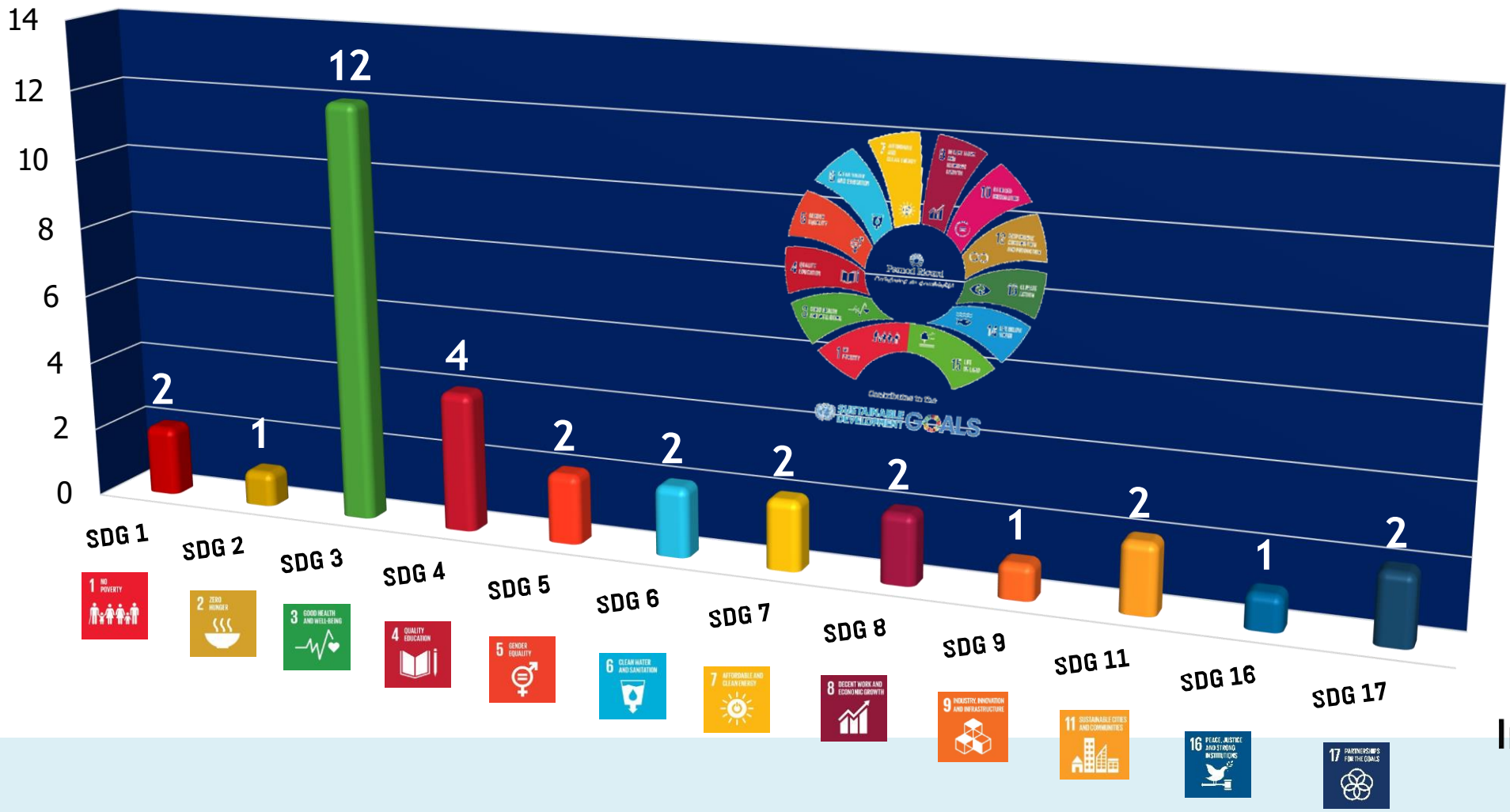
Historical Increase of Sampling PSUs in SVRS



Distribution of PSUs and Base Households 2024

Division	PSU	Household
Barishal	210	23,844
Chattogram	525	59,358
Dhaka	662	76,477
Khulna	363	40,663
Mymensingh	186	20,847
Rajshahi	334	37,074
Rangpur	314	35,886
Sylhet	172	18,924
Total	2,766	313,073

SDG Indicators Data Source from SVRS



34

Indicators

5 Tier Coordinated Monitoring System

Division Level
Divisional Coordinator
8 Persons

District Level
Supervising Officer
64 Persons

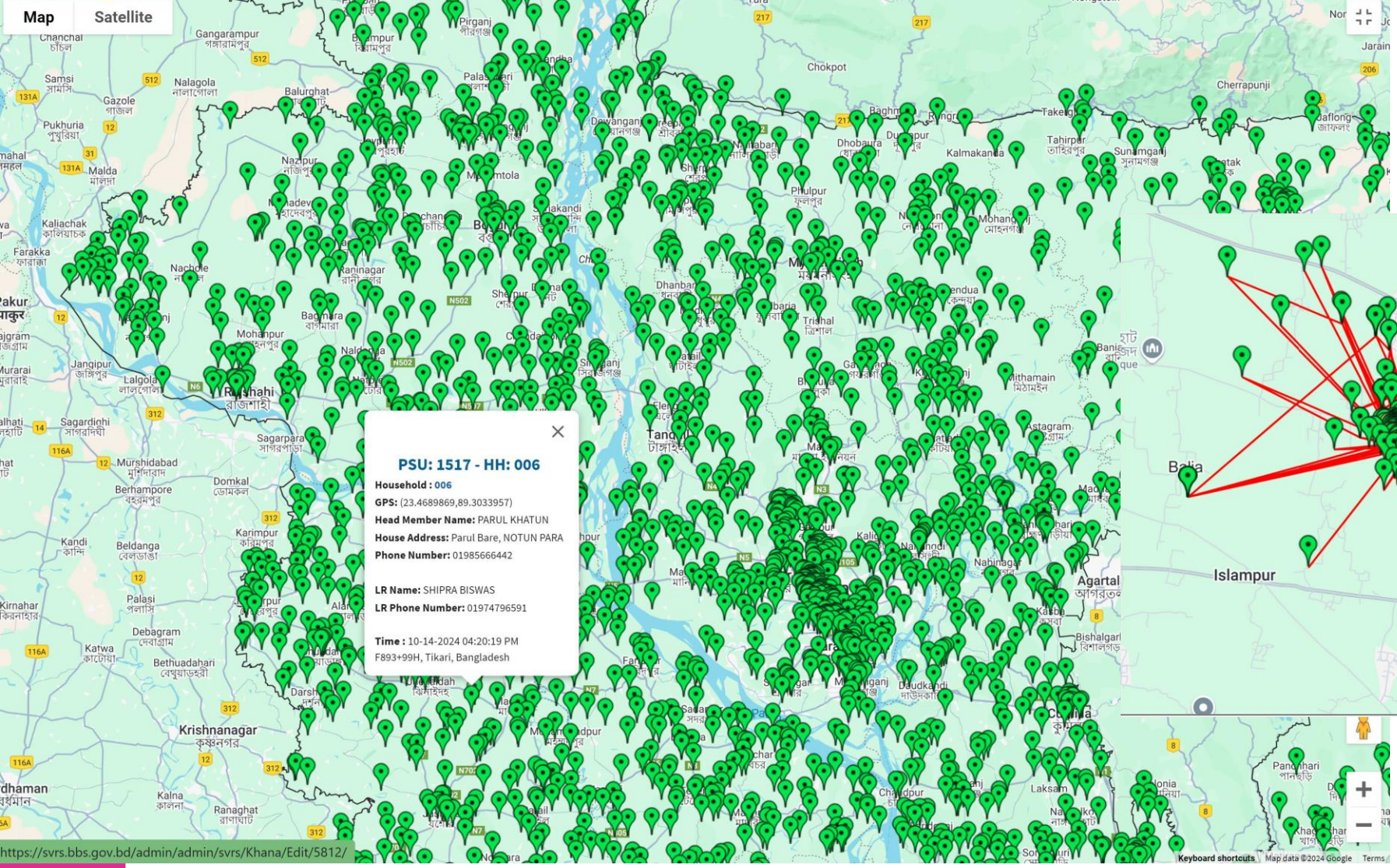
Sub-District Level
Supervisors
610 Persons

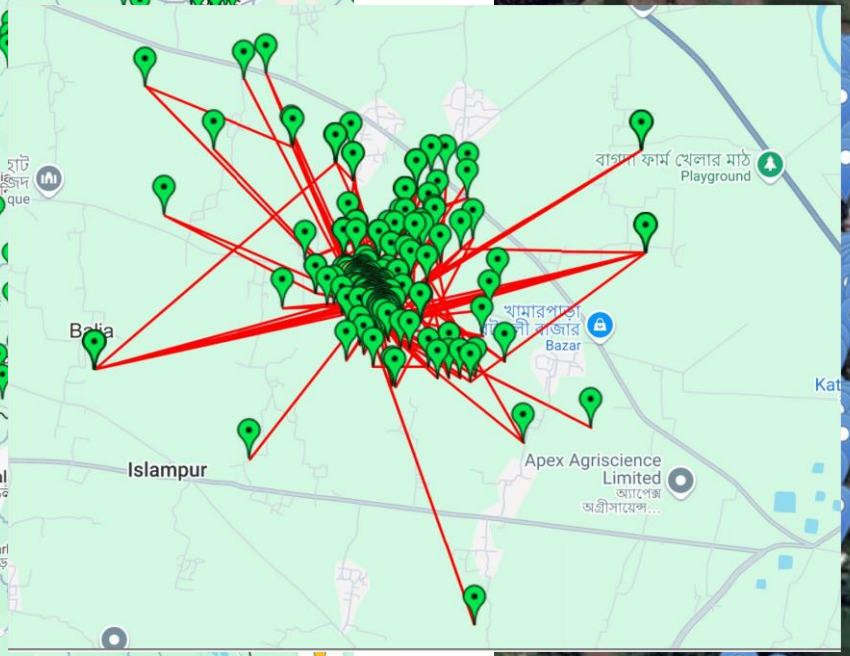
PSU Level
Local Female Registrar
2766 Persons

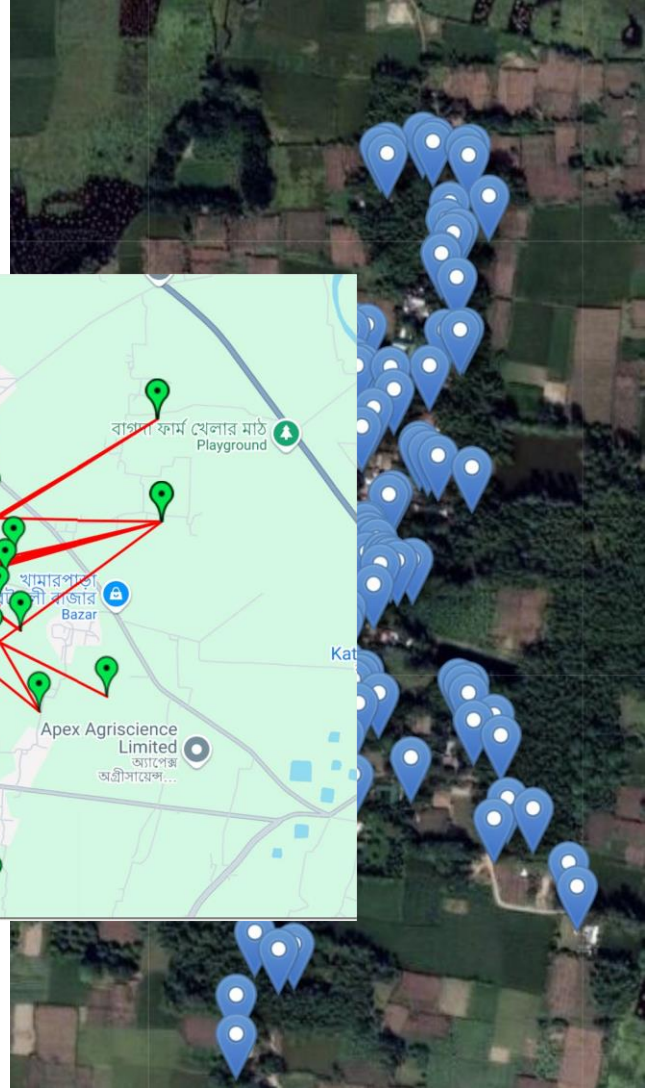
BBS Headquarters
Divisional Coordinator
20 Persons

Use of ICT for Quality Control

- Use of Geo-fencing for Data Collection
- Audio Recording of Interviews
- Photographs of Households
- Selfie of the LRs
- GPS Tracking with Time Stamp







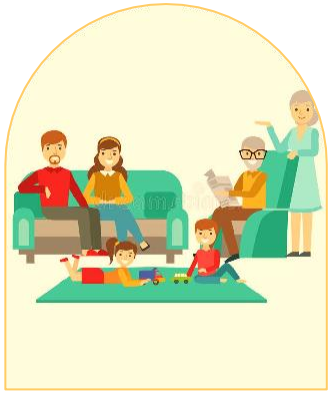
Household Locations in a PSU

Monitoring with Household GPS Records

Modules in SVRS

Household Module

Items Covered	Data Collection Frequency	Respondent Group
• Area identification of each PSU household • Head of Household and contacts, GPS • Housing Condition • Water, Sanitation and Hygiene • Electricity, Fuel, and Communications • Household Assets • Annual Income and Expenditures • Taxonomy of household members • Vital events summary	Annual	All Household Heads



Individual Module

Items Covered	Data Collection Frequency	Respondent Group
• Name, DoB, Age, Sex, Relationship, Parent information, Religion, Ethnicity, Birth Registration, NID, Marital Status and history • Education, Literacy, Employment and Occupation • Access to ICT and Banking-MFS • Language, Language, Nationality and Origin	Annual	All Household Members

Birth Module

Items Covered	Data Collection Frequency	Respondent Group
• Name of newborn • DoB, Sex, Birth Registration status • Place of birth, birth assistants • Delivery mode (normal/c-section) • Antenatal Care visits • Type of birth (single/twin/multiple) • Survival status of the newborn • Live/Still birth • Parents' demographics • Birth order	Monthly	All reproductive women

Death Module

Items Covered	Data Collection Frequency	Respondent Group
• Deceased name, DoD, age, sex, other demographics • Place of birth • Maternal Death identifiers • Period history • Causes of Death • Death Registration status	Monthly	Family members of all deceased

Marriage Module

Items Covered	Data Collection Frequency	Respondent Group
• Married members' demographics • Spouse demographics • Education, employment, etc. • Marriage registration status • Cause of early marriage	Monthly	All newly married

Divorce/Separation Module

Items Covered	Data Collection Frequency	Respondent Group
• Divorced/separated members' demographics • Type of • Spouse demographics • Education, employment, etc. • Divorce registration status • Cause of divorce/seperation • Migration status	Monthly	All divorcee

Inmigration Module

Items Covered	Data Collection Frequency	Respondent Group
• Demographics of in-migrant (name, sex, age, etc.) • Origin of in-migrant • Spectrum of origin • District/Country of origin • Cause of in-migration • Identifier of internal displacement and retunee	Monthly	All in-migrants

Out-migration Module

Items Covered	Data Collection Frequency	Respondent Group
• Demographics of out-migrant (name, sex, age, etc.) • Origin of out-migrants • Spectrum of destination • District/Country of destination • Cause of out-migration	Monthly	All out-migrants

Disability Module

Items Covered	Data Collection Frequency	Respondent Group
• Disability status of all members • Demographics of disabled persons • Signs/identifiers of disability • Type of disability • Duration and intensity of disability • Initial Cause of disability • Coverage of social safety net program	Annual	All members

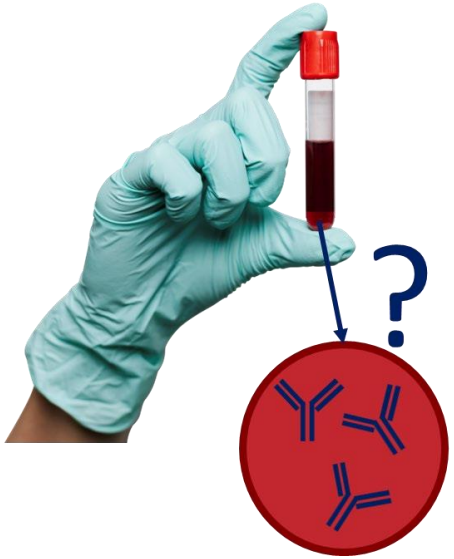
Contraception/ Family Planning Module

Items Covered	Data Collection Frequency	Respondent Group
• Demographics of both spouses • Ever use of contraceptives • Current use of contraceptive • Side effects of contraceptive use • Source of contraceptives • Causes of not using contraceptives • Future plan of using contraceptives • ECP Use status • Unmet need of family planning	Annual	All reproductive-age females

Pregnancy Module

Items Covered	Data Collection Frequency	Respondent Group
• Demographics of reproductive females • Period history and current period status • Pregnancy status • Last pregnancy history (abortion/termination/etc.) • Sex of aborted fetus • Current pregnancy information • Expected Date of Delivery • Method/way of pregnancy confirmation • Birth history and contact numbers	Monthly	All reproductive-age females

New Modules under Piloting



Sero surveillance

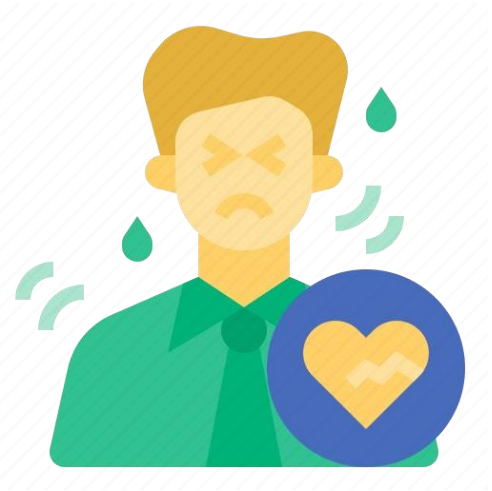
Verbal Autopsy

Future Plan of New Modules

Food Security

Early Child Development

Morbidity Status



SVRS
Sample Vital Registration System in Digital Platform

Thank You

Mozambique’s SIS-COVE

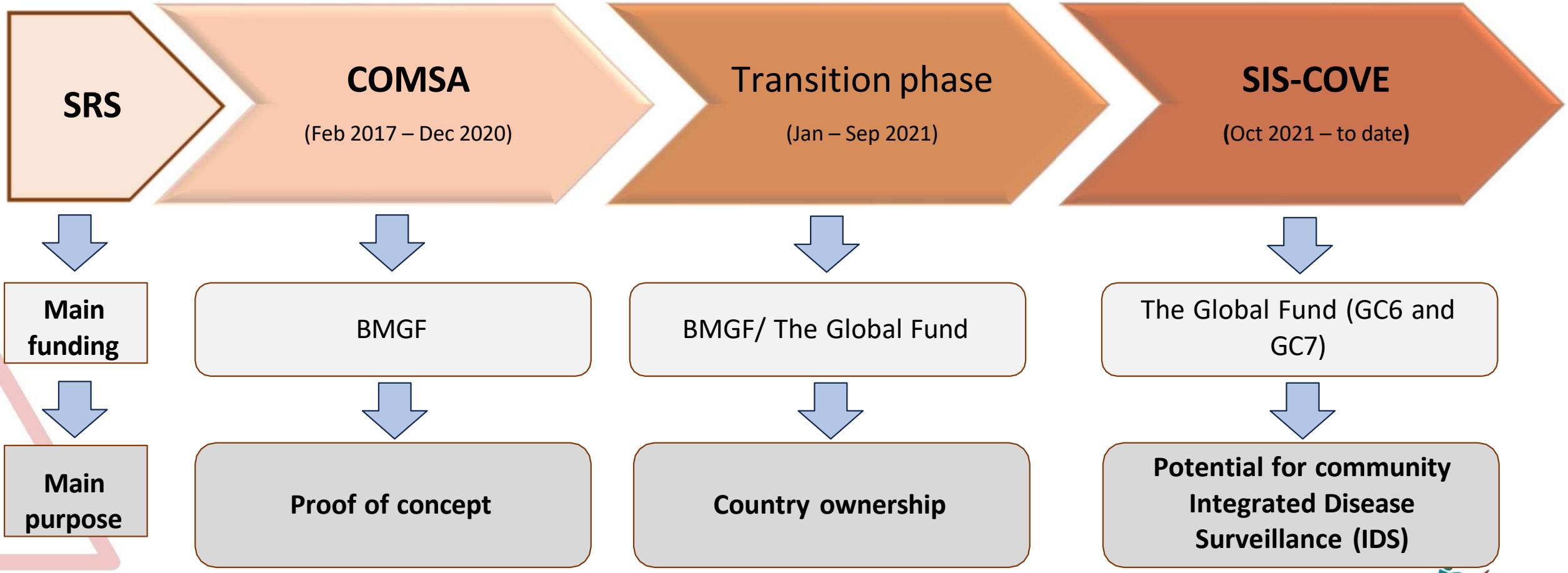
Mozambique's SIS-COVE- with focus on vision for the system as part of an integrated platform

Ivalda Macicame, MD PhD

On behalf of COMSA/SIS-COVE Mozambique team

June 2025

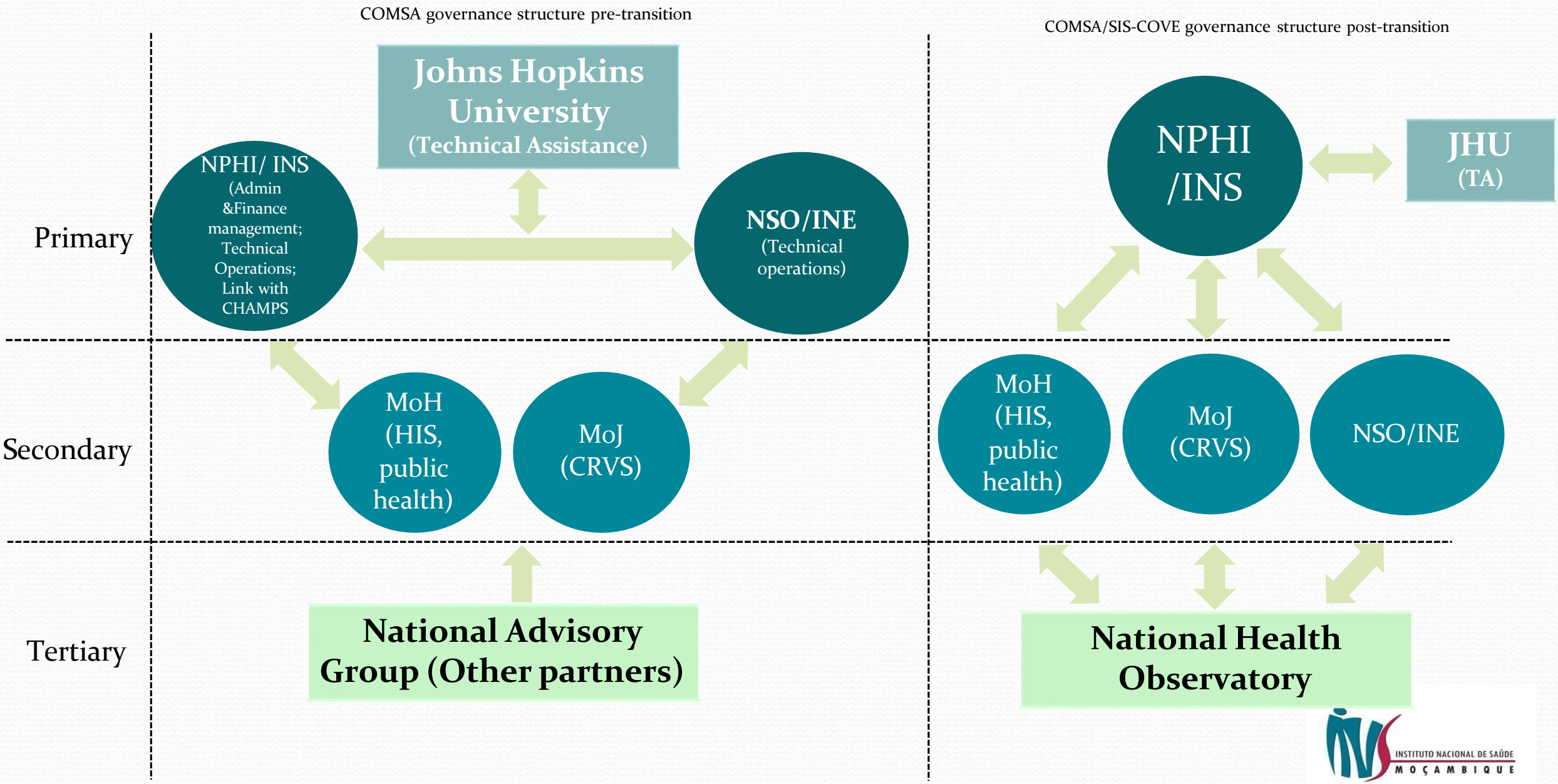
Mozambique recognized SRS as a strategy for immediate and long-term availability of representative CRVS and causes of death data



Guiding principles for transitioning from COMSA to SIS-COVE

- COMSA was Institutionalized as a surveillance system owned and implemented b government
- Respond to the need of MoH, MoJ, NPHI (INS), National Statistics Office (INE) an stakeholders
- Clear division of labor with each institution accountable for its assigned duties, including fundraising and data ownership

INS ensures SIS-COVE data sharing with stakeholders and the National Health Observatory

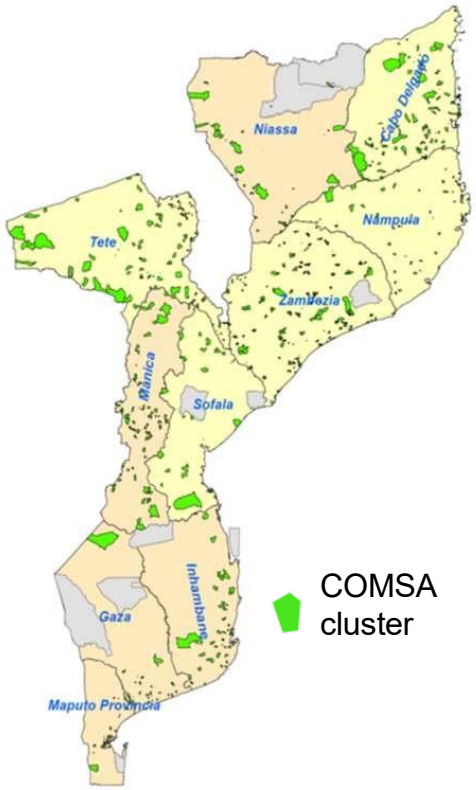


Governance role by level, COMSA-Mozambique

SIS-COVE Sample is Larger than Existing Surveys

Comparison of COMSA Sample to Existing Survey (PHIA 2015)

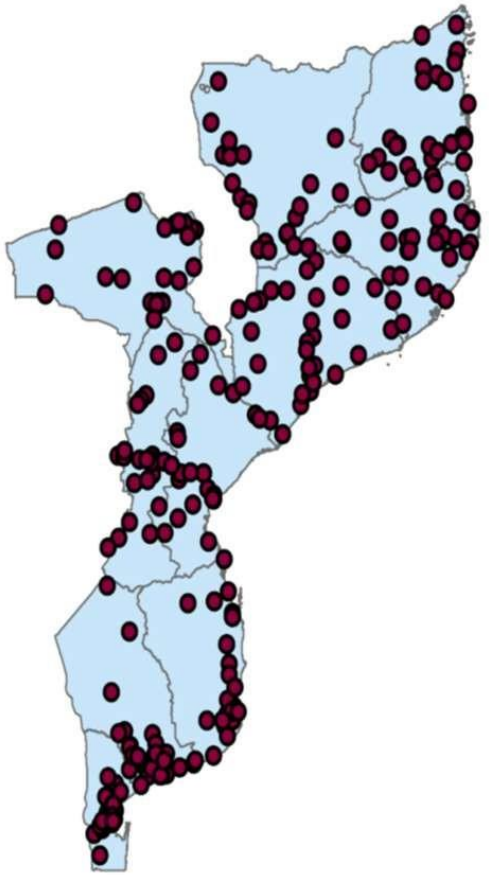
COMSA/ SIS-COVE



1. Random selection of clusters
2. Representative at national and provincial levels
3. **700 clusters**
4. **Large cluster (~300, households)**
5. **Surveillance on total population each cluster**
6. **180,000 households**
7. **Possibility to select a subsample for specific data collection (e.g. MNCH)**
8. **Continuous**

IMASIDA (PHIA) - 2015

1. Random selection of clusters
2. Representative at national and subnational levels
3. **307 clusters**
4. **Small cluster (~120 households)**
5. **Selection of 24 households per cluster**
6. **7,169 households**
7. **No possible for subsample**
8. **One time survey**



INSTITUTO NACIONAL DE SAÚDE MOÇAMBIQUE

SIS-COVE data collection and analysis tools

Community surveillance

Household listing form

List of events in the community:

- Pregnancies
- Pregnancy outcomes
- Deaths, including 3 questions to capture maternal deaths for any woman aged 12-54

Verbal and Social Autopsy (VASA)

Verbal Autopsy Questionnaires (WHO 2016):

- Neonatal (less than 28 days, includes stillbirth)
- Children (28 days-11 years)
- Adults (12 years and over)`

Social Autopsy Questionnaires

- Household, housing and community characteristics
- Care seeking behavior/ Pathway to survival

Automated methods for determination of causes of death

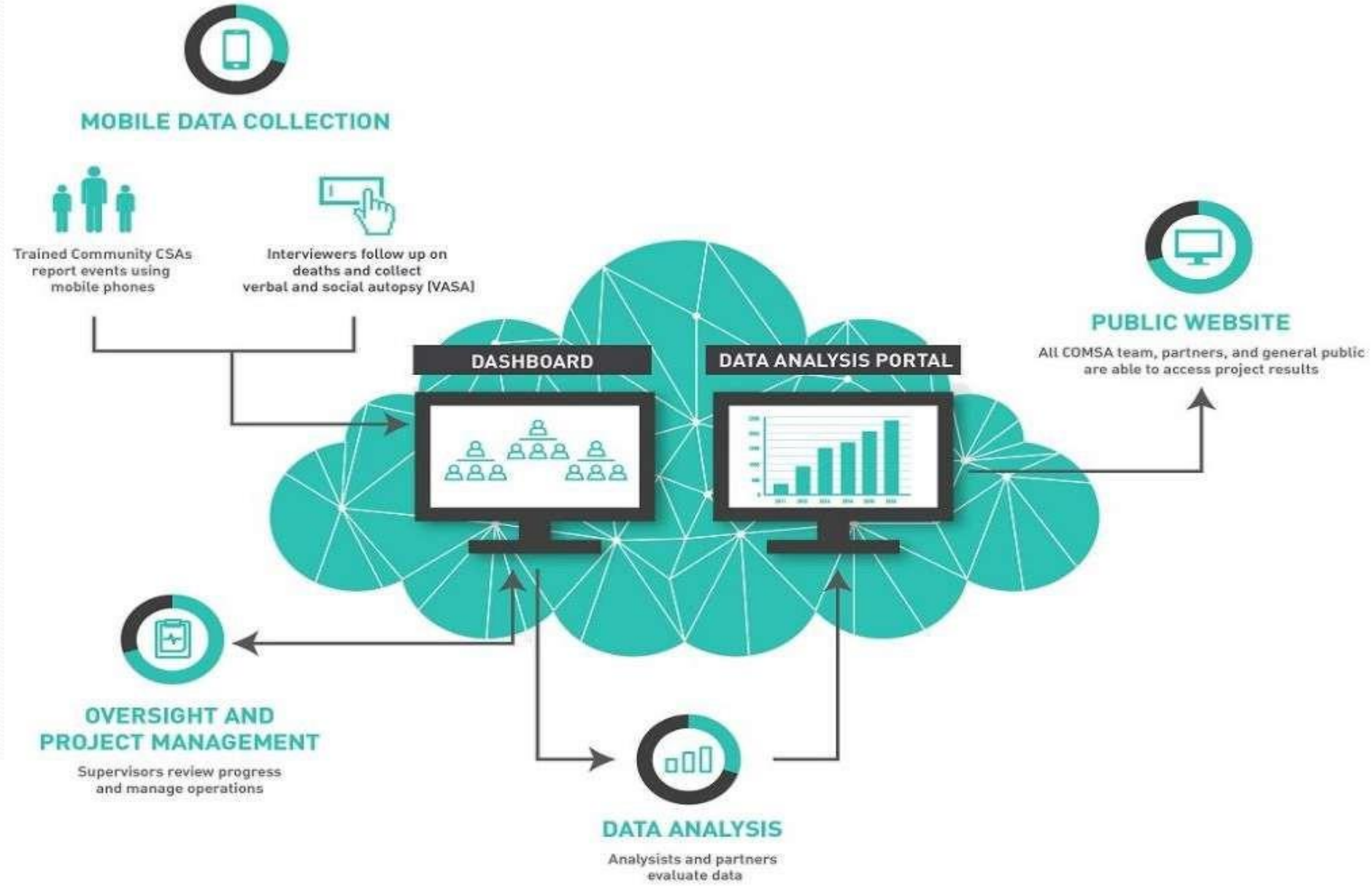
Inter-VA 5

InsilicoVA

EAVA

VA Calibration with CHAMPS data

SIS-COVE Real Time Data Reporting and Analysis



NSTITUTO NACIONAL DE SAÚDE
OÇAMBIQUE

SIS-COVE data dissemination and data use

Levels of Data Dissemination and Use in Mozambique

National level

Ministers council

Official dissemination event

Provincial level

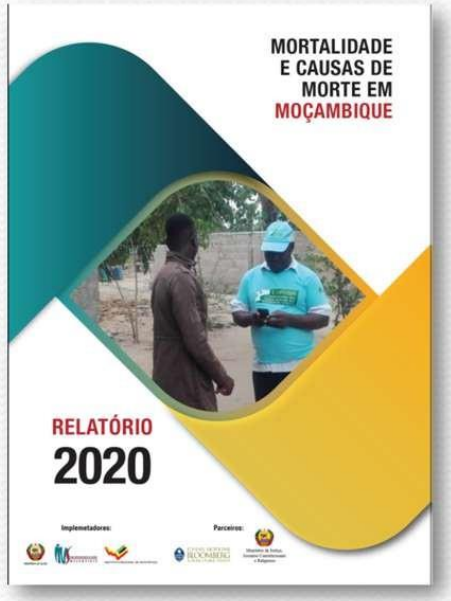
Multisectoral roundtables

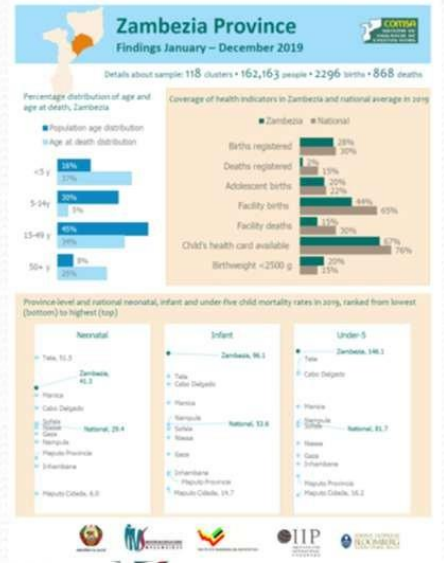
Programmatic meetings

Community level

CSAs at provincial meetings

Distribution of flyers during field work activities





Mortality data being used to increase general literacy and for poli

SIS-COVE and DHS as the main sources of data to inform the development of the 2025-2029 Health Sector Strategic Plan

REPÚBLICA DE MOÇAMBIQUE

MINISTÉRIO DA SAÚDE

Direcção de Planificação e Cooperação

Plano Estratégico do Sector da Saúde

PESS 2014-2019

(Extensão 2020-2024)

«O NOSSO MAIOR VALOR É A VIDA»

Maputo, Agosto 2022

Meetings

Radio

Newspapers

Live interviews

INSTITUTO NACIONAL DE SAÚDE
MOÇAMBIQUE

Mortality data being disseminated using a multisectoral approach through the National Health Observatory (NHO)

Mortality data and SIS-COVE initiatives being massively dissem

Sistema Comunitário de Observação em Saúde

PAÍSES AFRICANOS BUSCAM EXPERIÊNCIAS DE MOÇAMBIQUE

Vinte peritos em saúde pública da Nigéria e da Zâmbia encontram-se de visita, desde terça-feira última, ao Instituto Nacional de Saúde do nosso país para a troca de experiências em matéria de implementação do Sistema Comunitário de Observação em Saúde e de Eventos Vitais (SIS-COVE), em curso desde 2017.

Em países com recursos limitados, incluindo Moçambique, é difícil estimar as causas de morte

Segundo o Director-geral do INS, Eduardo Samo Gudo, Moçambique foi escolhido para acolher a visita, em virtude dos grandes progressos que tem registado na implementação de sistemas de vigilância que permitem monitorar as causas e taxas de morte por doenças, sendo, por conseguinte, visto pela comumidade internacional como um exemplo a seguir pelos países cuja implementação se encontra na sua fase inicial.

Não obstante os sucessos que têm sido alcançados, Samo Gudo reconhece que em países como Moçambique, com fortes limitações em termos de recursos, é bastante desafiante estimar as causas de morte por esta ocorrer, na maioria dos casos, fora das unidades sanitárias.

"Nenhum país pode planificar e definir estratégias para a redução de mortes causadas por várias doenças, se não tiver dados. Os dados são a bússola que diz quais são as principais razões de morte em várias faixas

bia e Nigéria buscam experiência
mbique em sistemas de vigilânc
alidade

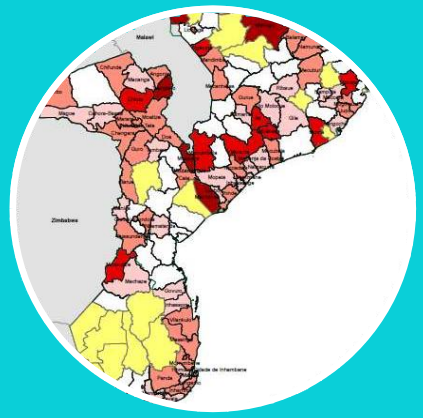
2024-06-18 4 min read

INSTITUTO NACIONAL DE SAÚDE
MOÇAMBIQUE

SIS-COVE main vision as an integrated platform

Civil Registration and Vital Statistics (CRVS)

Health Information System (HIS)

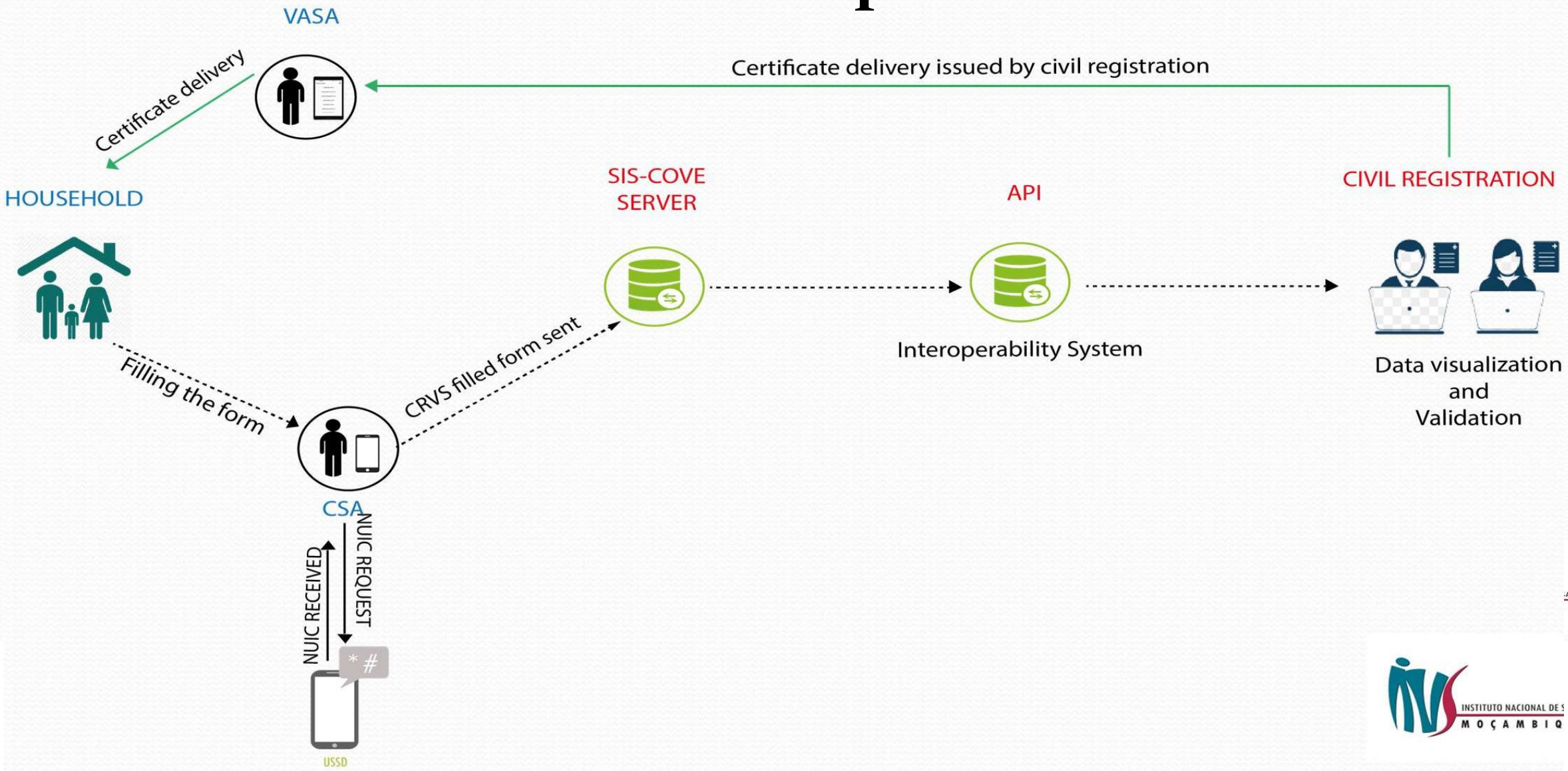


Disease (Sero)Surveillance

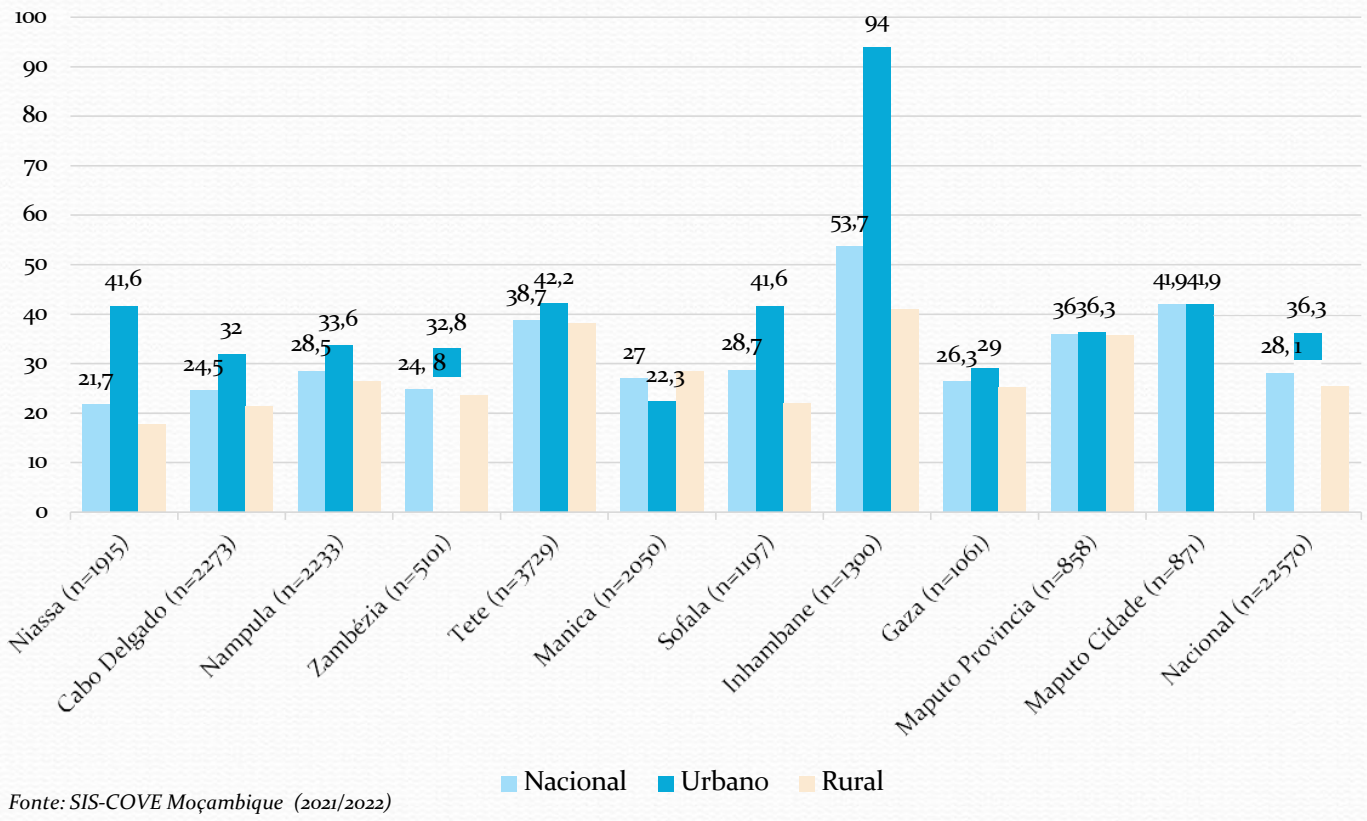
INSTITUTO NACIONAL DE SAÚDE
MOÇAMBIQUE

CRVS pilot in Inhambane province using SIS-COVE platform

CRVS pilot data flow within SIS-COVE clusters in Inhambane province

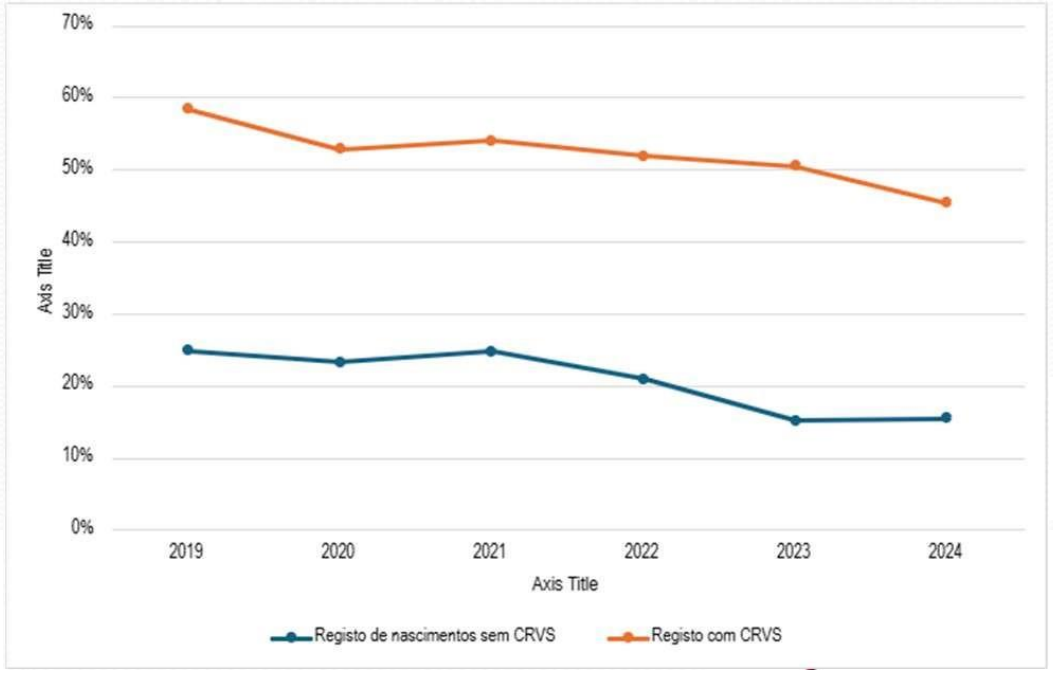


The CRVS pilot in the SIS-COVE clusters increased civil registration coverage in Inhambane.



Fonte: SIS-COVE Moçambique (2021/2022)

Thanks to the implementation of CRVS pilot by SIS-COVE, Inhambane is the province with the highest number of births registered in the civil registry (54%).



Without the CRVS pilot project, only 15% of children in Inhambane would be registered in the civil registry.

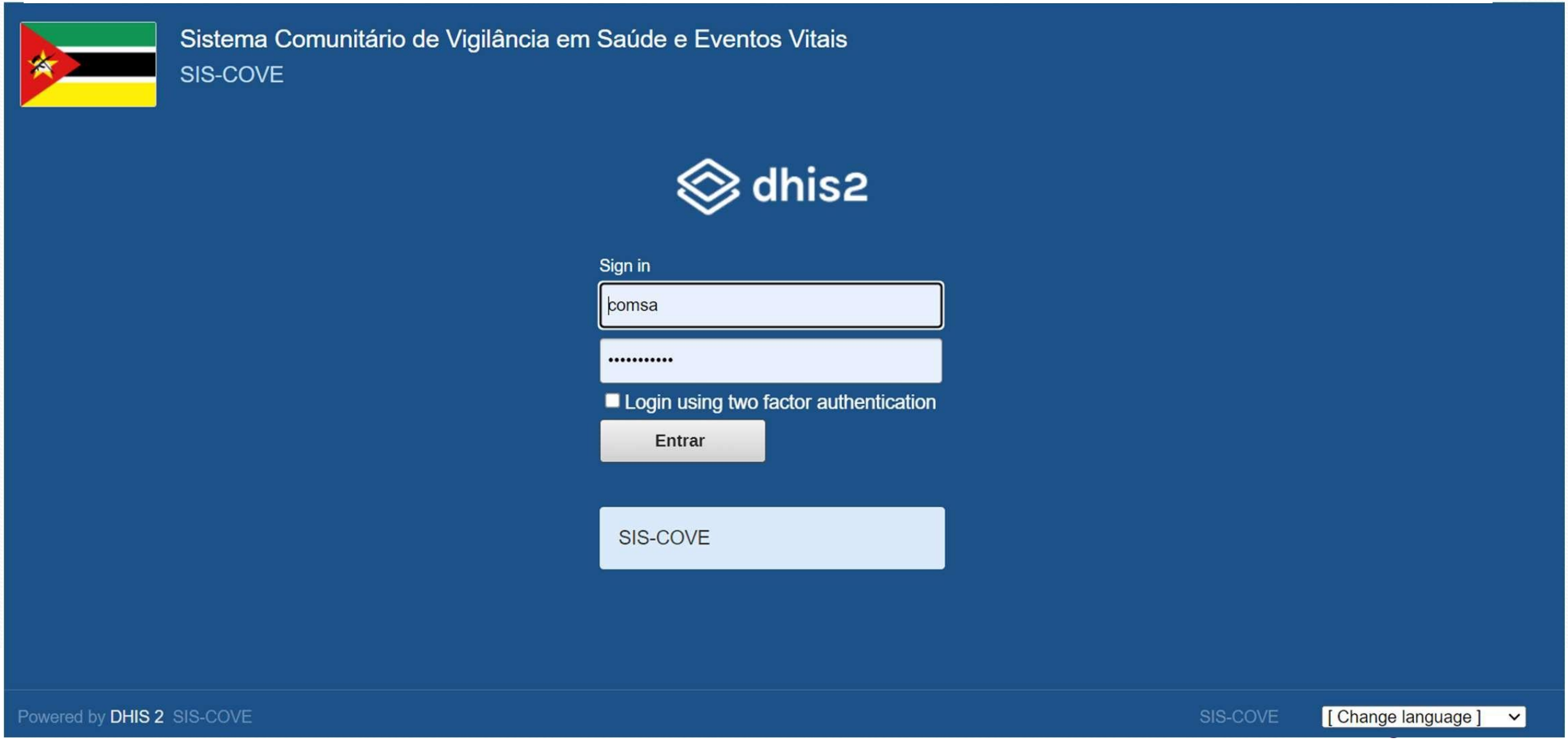
Interoperability between SIS-COVE and e-CRVS in Mozambique

- SIS-COVE officially started feeding CRVS, supporting civil registration in one province
- Next step: fundraising to increase the coverage including all remaining provinces

INSTITUTO NACIONAL DE SAÚDE
MOÇAMBIQUE

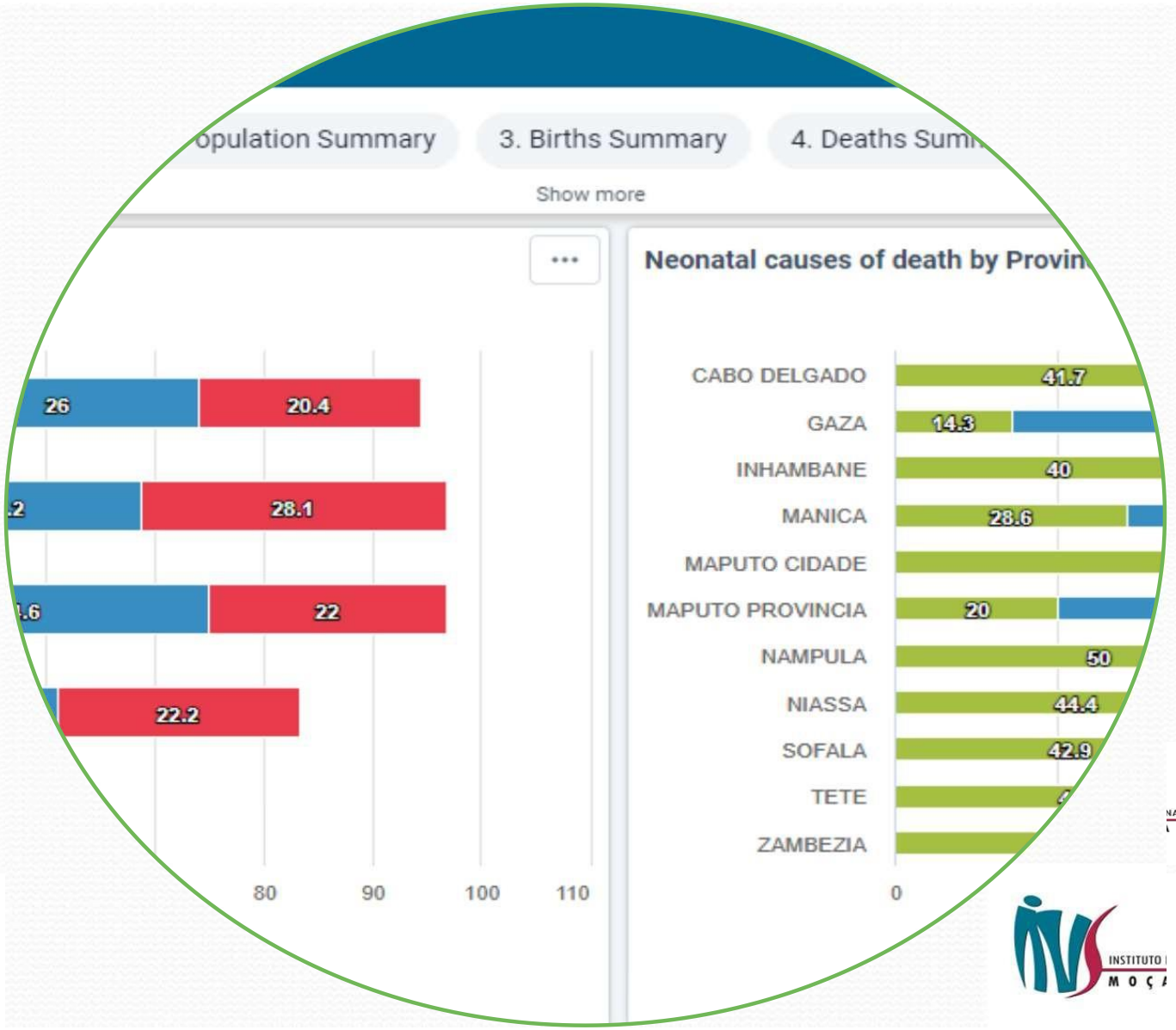
Interoperability between SIS-COVE and HIS

SIS-COVE dHIS-2 module developed to feed the Mozambican mair



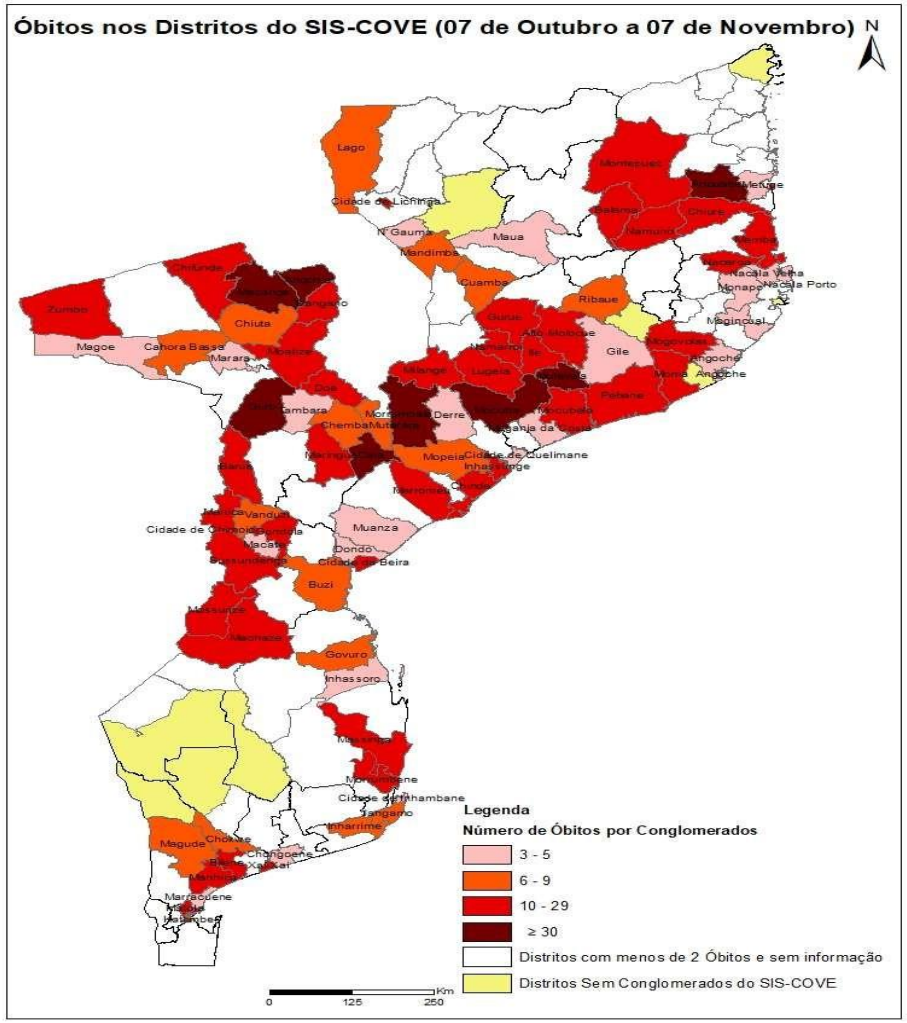
SIS-COVE dHIS-2 module developed to feed the Mozambican mair

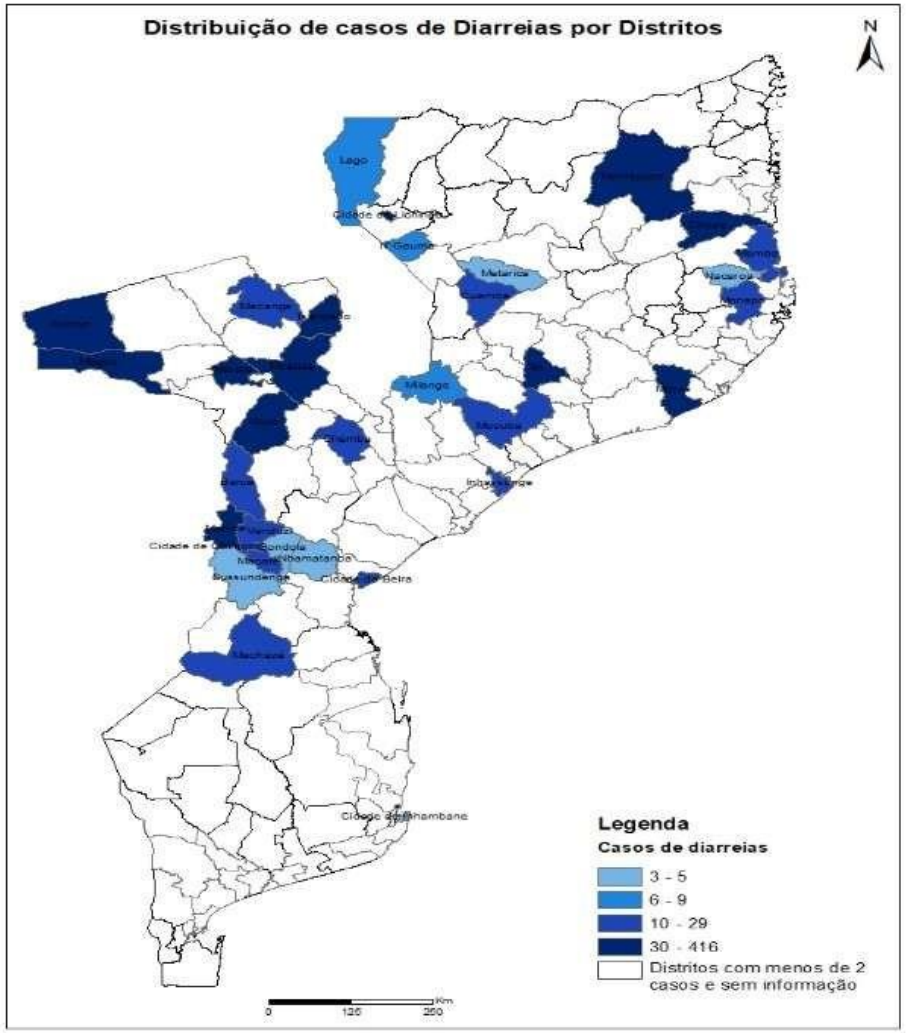
- SIS-COVE DHIS-2 module allows access to mortality data at district and **provincial** level



Leveraging SIS-COVE to strengthen disease (sero)surveillance

Leveraging SIS-COVE to improve community-based disease surveillance and



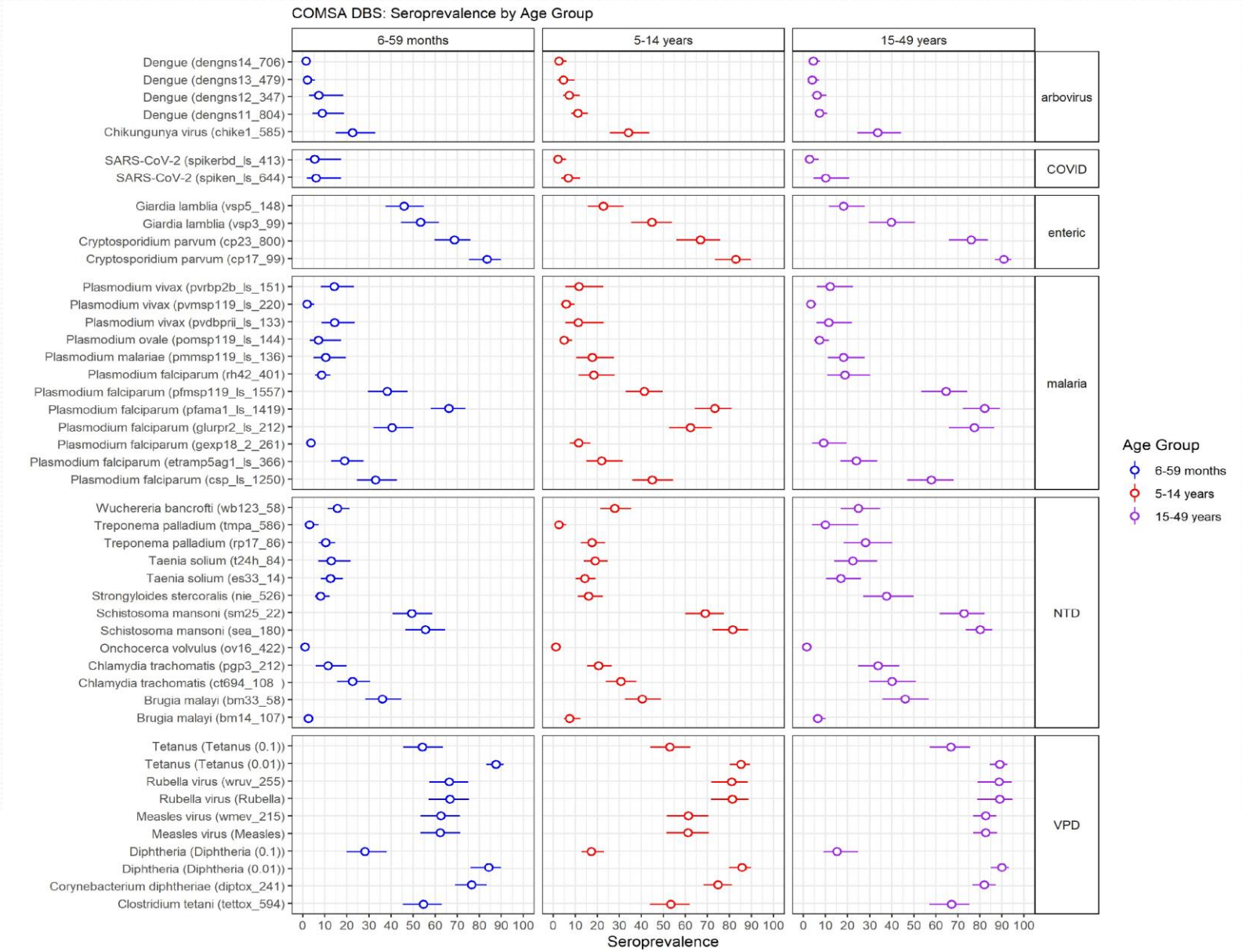


<u>Cholera outbreaks since 2023</u>:

- Excess mortality in remote communities due to cholera
- "Early" warning system through mortality surveillance to detect public health treats

Leveraging SIS-COVE to implement a multiplex (DBS) pilot for VPDs, NTDs and diseases

	Pathogen	Disease
Malaria	***P. falciparum***	Malaria
	P. vivax	Malaria
	P. ovale	Malaria
	P. malariae	Malaria
VPD	**Measles virus**	Measles
	Rubella virus	Rubella
	Diphtheria toxin	Diphtheria
	Tetanus toxin	Tetanus
NTD	***Strongyloides stercoralis***	Strongyloidiasis
	Onchocerca volvulus	Onchocerciasis
	Taenia solium	Cystesarcosis
	Chlamydia trachomatis	Trachoma/Chlamydia
	Treponema pallidum	Yaws/Syphilis
	Wuchereria bancrofti	Lymphatic filariasis
	Schistosomiasis	Schistosomiasis
Arbovirus	**Dengue virus**	Dengue
	Chikungunya virus	Chikungunya
Enteric	**Cryptosporidium**	Cryptosporidiosis
	Giardia lamblia	Giardia
Emerging	**SARS-CoV-2**	Covid-19



IANPHI Africa Regic Network: 2024 Recogni Success

INSTITUTO NACIONAL DE ESTATÍSTICA

INSTITUTO NACIONAL DE SAÚDE MOÇAMBIQUE

JOHNS HOPKINS BLOOMBERG SCHOOL of PUBLIC HEALTH

MINISTÉRIO DA SAÚDE

MINISTÉRIO DA JUSTIÇA, ASSUNTOS CONSTITUCIO

cism centro de investigação em saúde de manhiça

CHAMPS Child Health and Mortality Prevention Surveillance

Gates Foundation

THE GLOBAL FUND

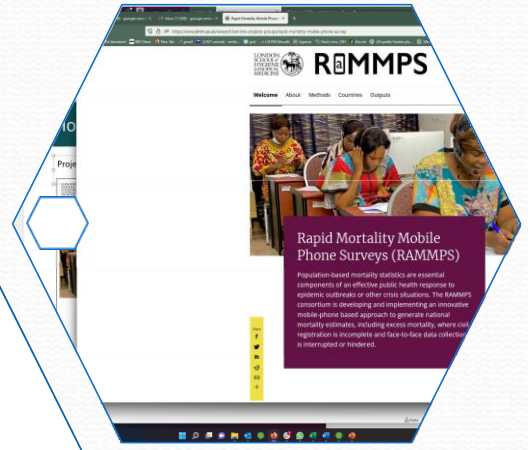
CDC Centers for Disease Control and Prevention

Vital Strategies

Obrigado(a)!
Khanimambo!

Mozambique SRS: A Platform for Additional Studies

Rapid Mortality Mobile Phone Survey (RaMMPS)

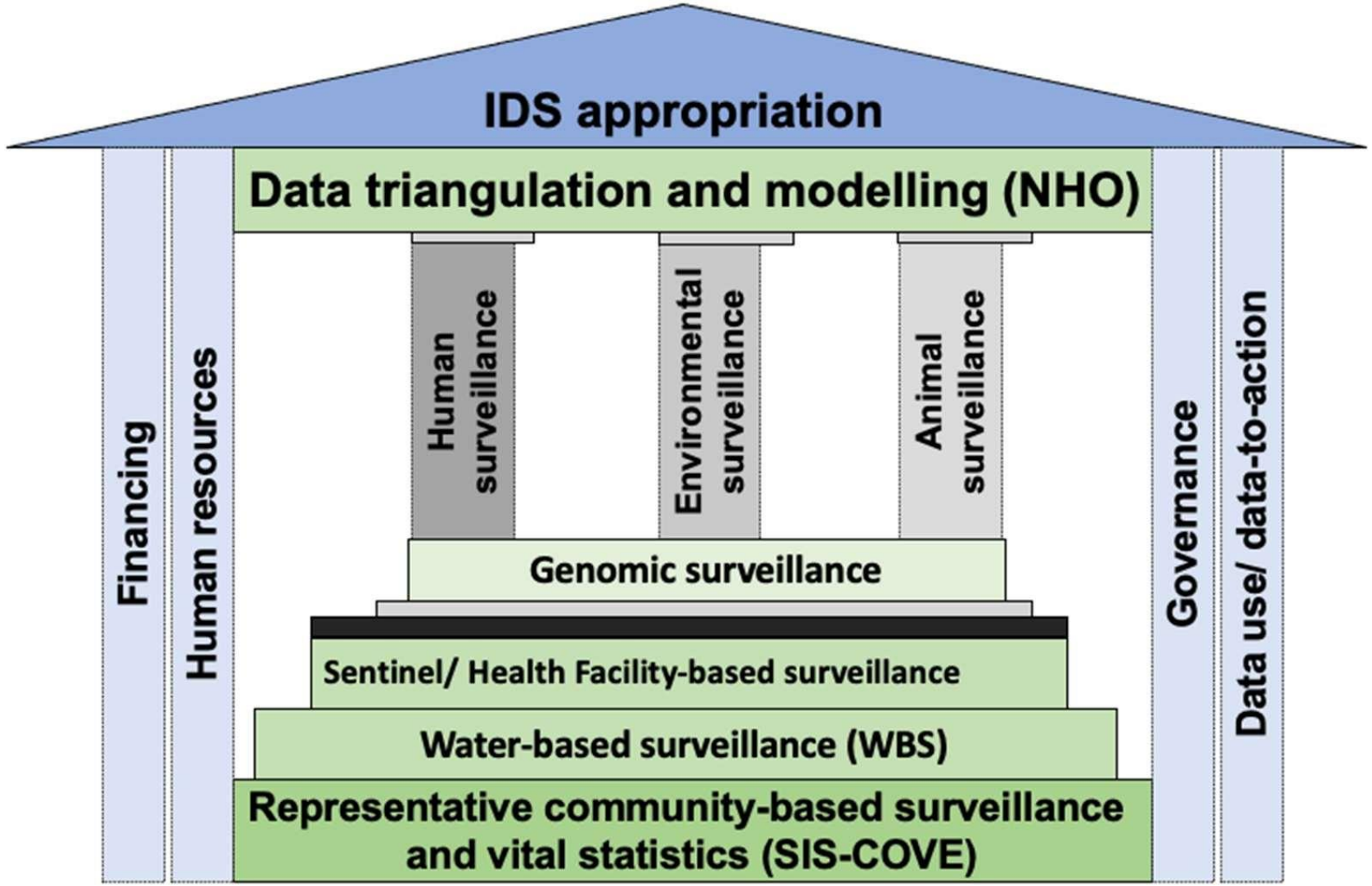


Impact of COVID on Reproductive maternal, newborn child health and Nutrition (RMNCH-N)

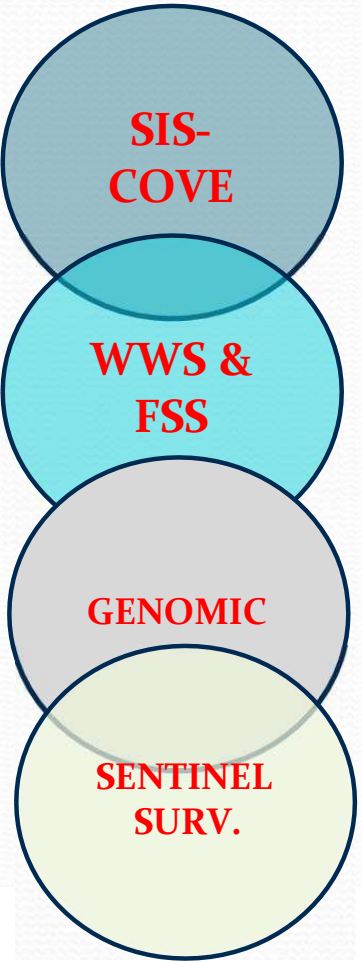
Dried Blood spot (DBS) in Zambezia

INSTITUTO NACIONAL DE SAÚDE MOÇAMBIQUE

SIS-COVE as a platform for Integrated Disease Surveillance (IDS) in Mozambique



IDS-MOZ Applied Conceptual Framework



Level 1: Data collection (process harmonization)

Level 2: Data integration/ Data triangulation

Level 3: Data analysis and dissemination

Surveillance

Health Facility

Laboratory

Human/ animal/ environment/ other

Community

Electronic systems

Health data

Non-Health data

Data center/ data warehouse

Data management
Data visualization

Products

Data triangulation and Modelling

National Health Observatory

Periodic reports

Routine surveillance and programmatic reports

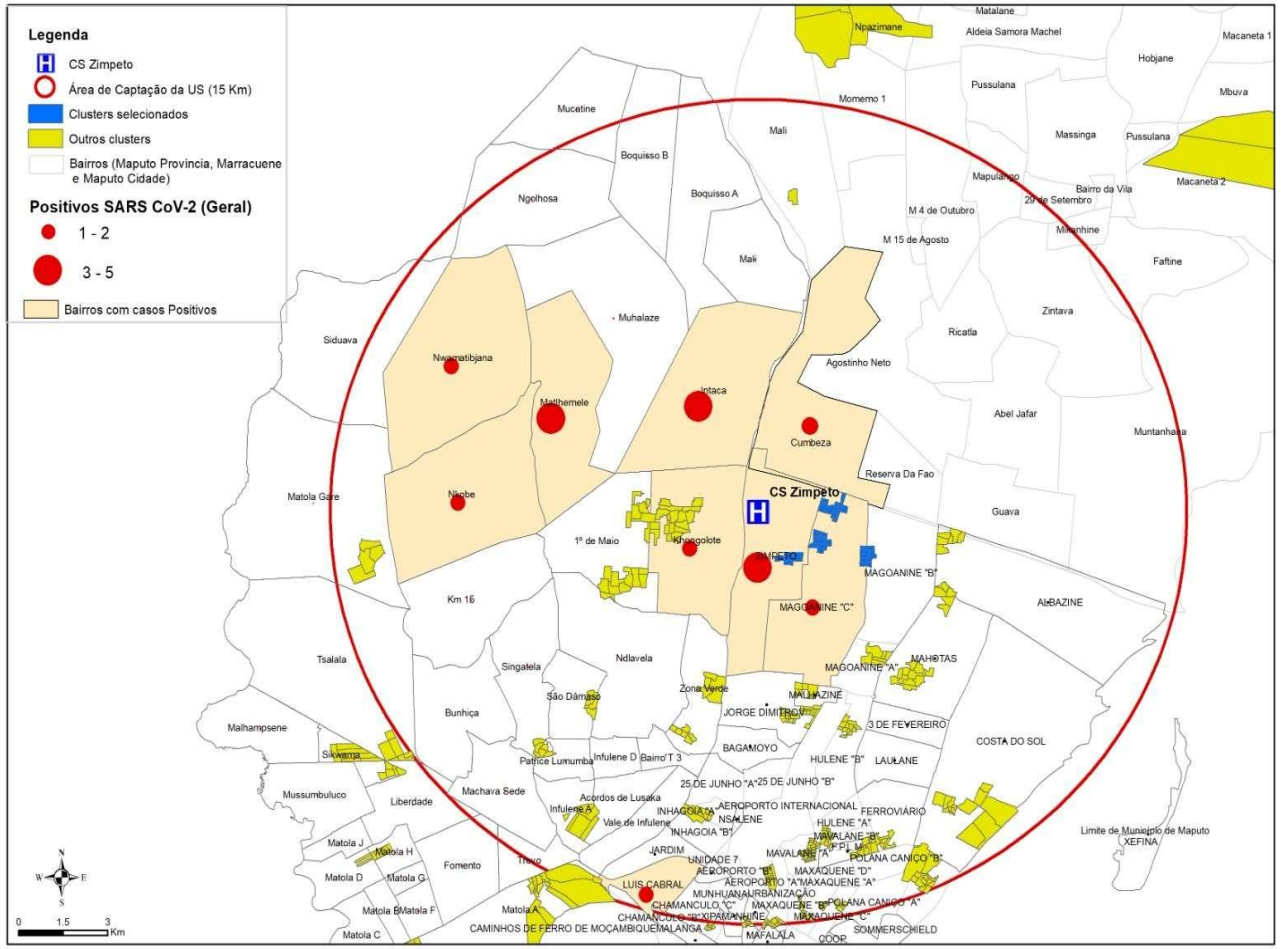
M&E/ outbreak investigations/ PH Emergency response

INSTITUTO NACIONAL DE SAÚDE MOÇAMBIQUE

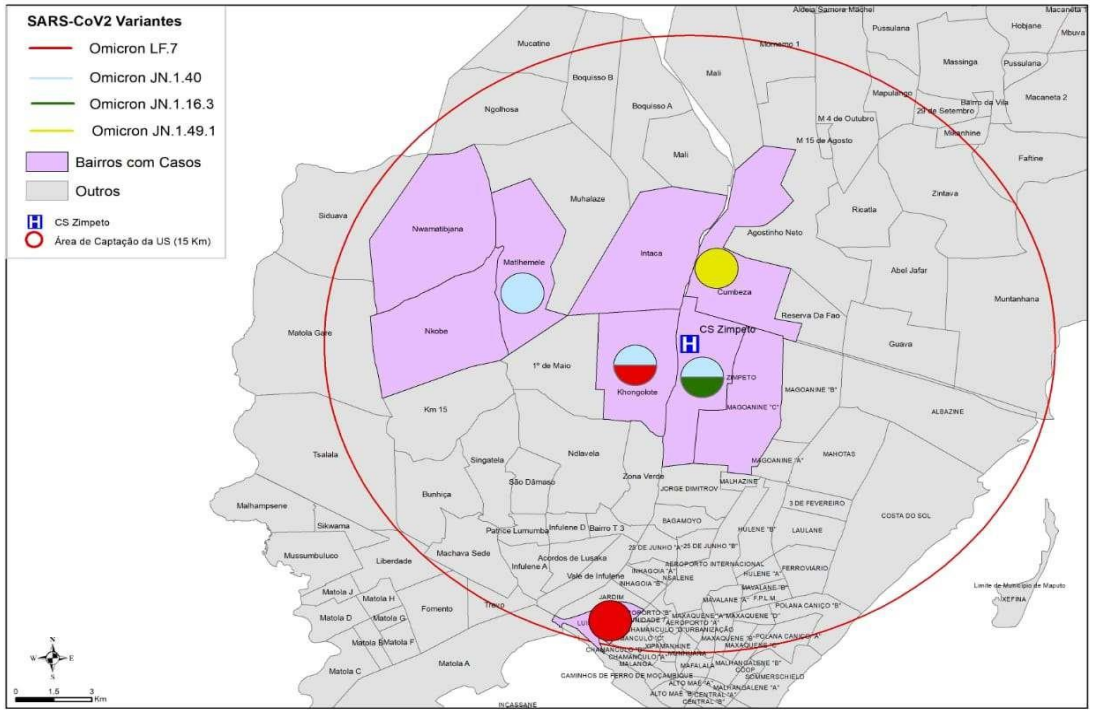
- Pilot project: Polio virus, *V. Cholerae,* Typhoid, Influenza, SARS-CoV-2

SARS-CoV-2- Combined HF and Community

Geographic distribution and genomic monitoring

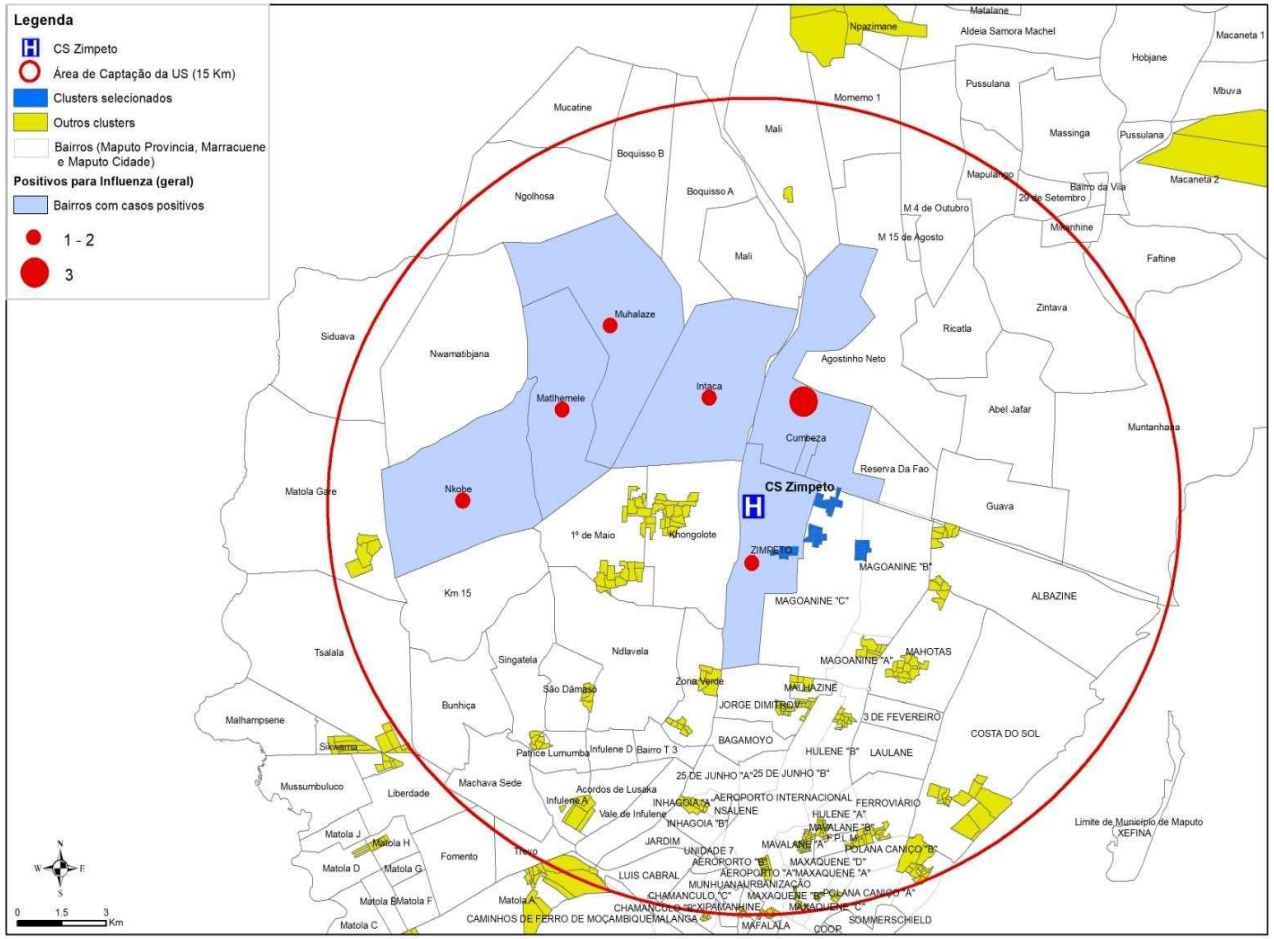


19/19 samples sequenced (2 samples with low coverage);
Results (n=17): Omicron 24A (JN 1.40) (3); 24H (LF.7) (4); 24A (JN 1.49.1) (1); 24A (JN 1.16.3) (1); 24A (JN.1.) (6); 24B (JN.1.11.1) (1); BA.3 (1)

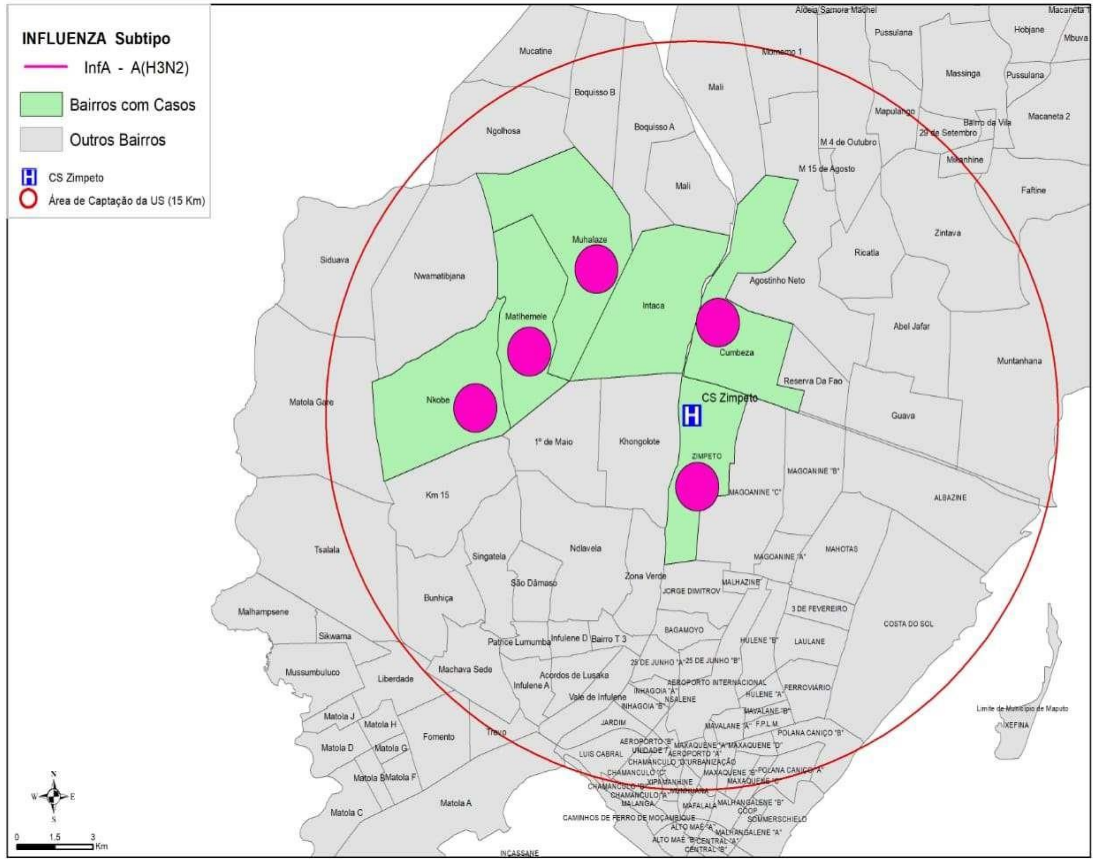


Influenza- Combined HF and Community

Geographic distribution and genomic monitoring

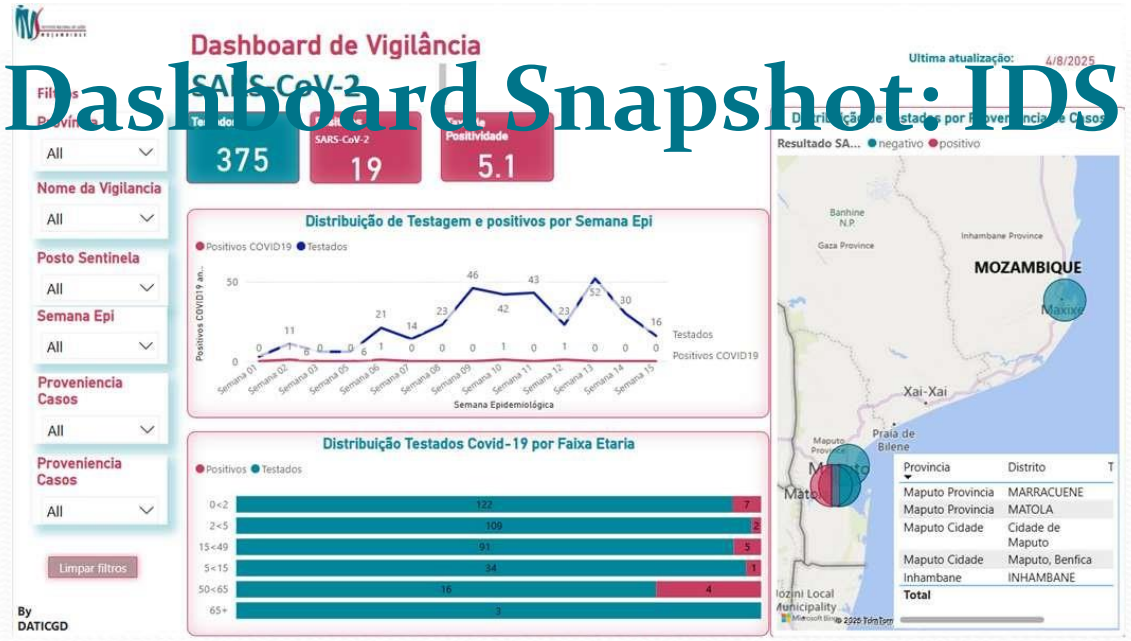


8/9 samples sequenced: all positive for Influenza A (H3N2)- subclade J2

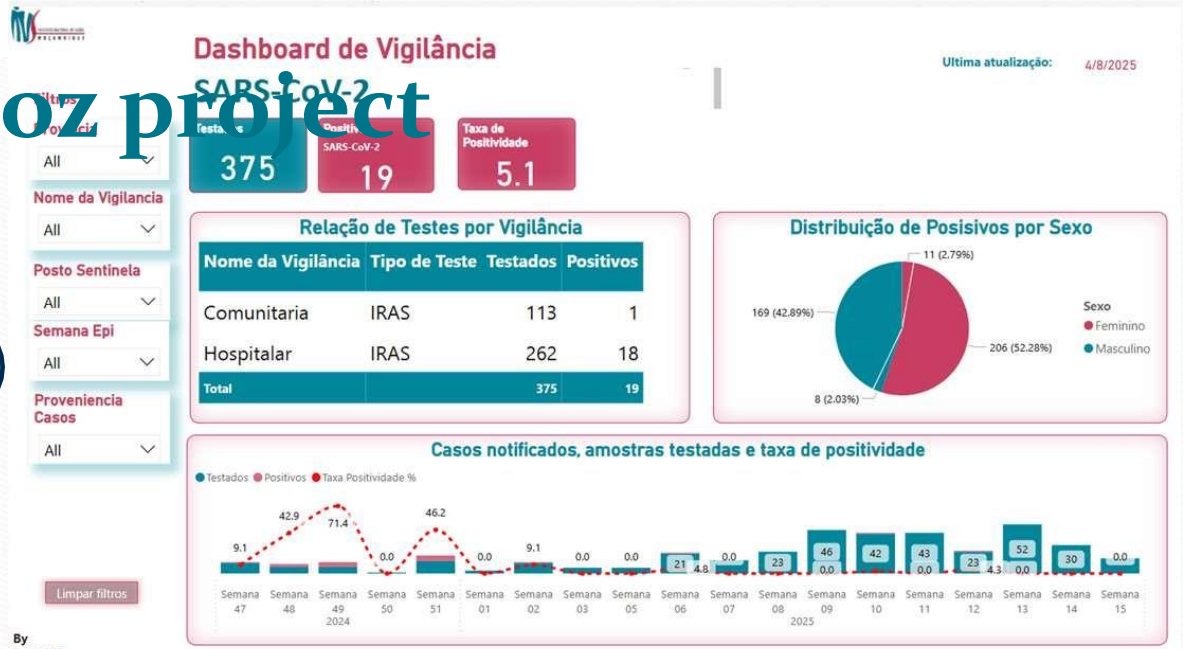


Dashboard Snapshot: IDS Moz project

1

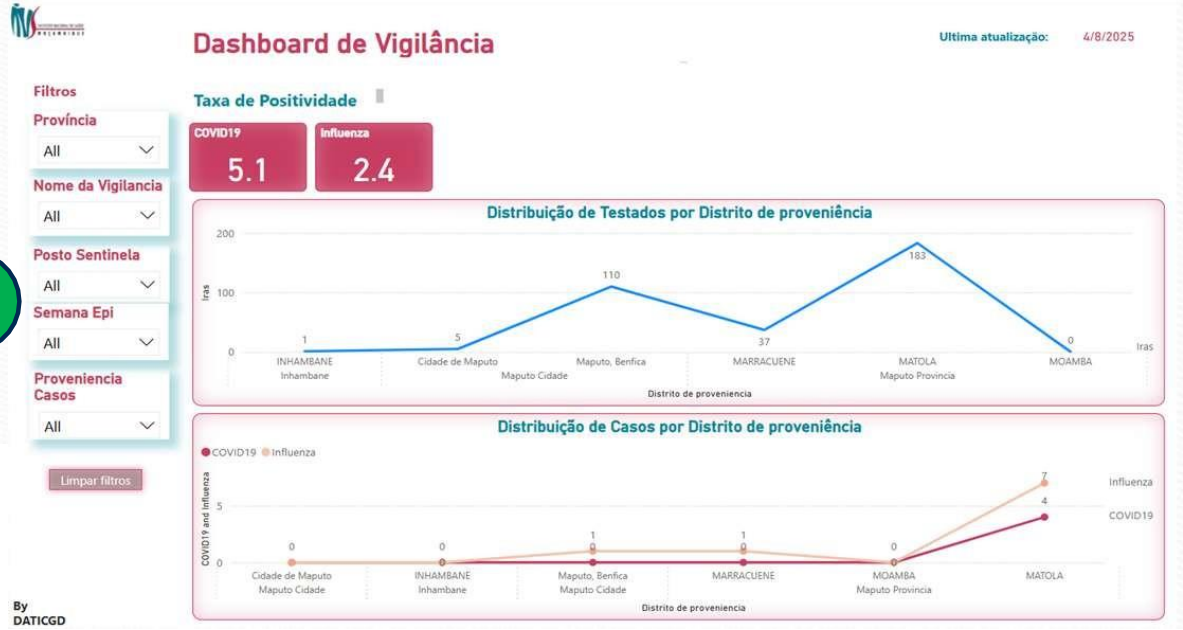


2



3

4



SIS-COVE challenges, opportunities and lessons learned

Lessons learned/ challenges/ opportunities while implementing COMSA/ SIS-COVE

- Surveillance/ health system strengthening is not a priority
- Vertical funding

- Involvement of all stakeholders
- Exchange of experience with other countries

Financial resources

Collaboration

Human resources

Sustainability

- Investment on health care/ community workers
- Capacity building

- Leveraging existing HIS/ initiatives
- Government prioritization

COMSA/ SIS-COVE main national stakeholders

National Public Health Institute(INS) *	• National institute for heath statistics and health research • Main SIS-COVE implementation institution • Interaction with other institutions
National Statistics Bureau (INE)	• Cartography • Sampling procedures
Ministry of Health (MISAU)	• Community health workers reporting vital events • Supporting the implementation of serosuveillance • Interoperability with dHIS-2
Ministry of Justice (MJCR)	• Linking community births and deaths to CRVS to increase CRVS coverage • Interoperability with e-CRVS

* With Technical assistance from Johns Hopkins University since 2017

SIS-COVE Main components

Vital Statistics	Causes and determinants of deaths	Disease (sero)surveillance	Data management and Information systems	Data use/ data to action
✓ Community surveillance (births and deaths) ✓ Link to CRVS to improve community births and deaths registration	✓ Verbal and Social Autopsy (VASA) ✓ Link with CHAMPS ✓ Data triangulation with other sources of mortality data data (National Health Observatory)	✓ Community disease serosurvey (DBS/multiplex) ✓ Link with Health facility data ✓ Link with MoH activities (including outbreak investigation)	✓ Data storage and data management and data analysis ✓ Interoperability with dHIS-2/ SIS-MA ✓ Feed INS and NHO websites ✓ Interoperability with e-CRVS	✓ Annual reports ✓ Monitoring of SGD indicators ✓ Data sharing with stakeholders ✓ Data dissemination though reports, policy briefs, etc) ✓ Data dissemination through institutional websites and media

Break

Sierra Leone’s HealSL

Counting the dead to help the living: Healthy Sierra Leone (HEAL-SL)

Rashid Ansumana, Ronald Carshon-Marsh, Foday Sahr, Eric Koona, Mohamed Vandi Amara Jambai, Francis Smart, Sartie Kenneh, Anteneh Assalif, Alimatu Vandi, Catherine Meh, Hellen Gelband, Patrick Brown, Prabhat Jha on behalf of the Healthy Sierra Leone Team

https://healsl.org/

Ministry of Health, National Public Health Association

Njala University, University of Toronto

HEAL-SL is supported by the Bill and Melinda Gates Foundation, Queen Elizabeth Scholarships and Mastercard Foundation and University of Toronto, Canada

NATIONAL PUBLIC HEALTH AGENCY SIERRA LEONE

MINISTRY OF HEALTH GOVERNMENT OF SIERRA LEONE

NJALA UNIVERSITY Sierra Leone

UNIVERSITY OF TORONTO DALLA LANA SCHOOL OF PUBLIC HEALTH

cghr CENTRE FOR GLOBAL HEALTH RESEARCH

Conclusions

- The Healthy Sierra Leone (HEAL-SL) provides reliable ongoing **nationally representative cause of death data** for Sierra Leone, covering ~5% of population and deaths in all areas of the country
- Major lessons on how to organize high quality mortality surveillance at low cost, and need for quality control and innovations
- About **one in five of all deaths in Sierra Leone were due to malaria**, which was the leading cause of death for all age groups except neonates
- SARS-CoV-2 infected widely, but caused few deaths
- Ability to study inequalities in mortality and a range of other outcomes

SEE: www.healsl.org or www.npha.gov.sl

HEAL-SL by the numbers

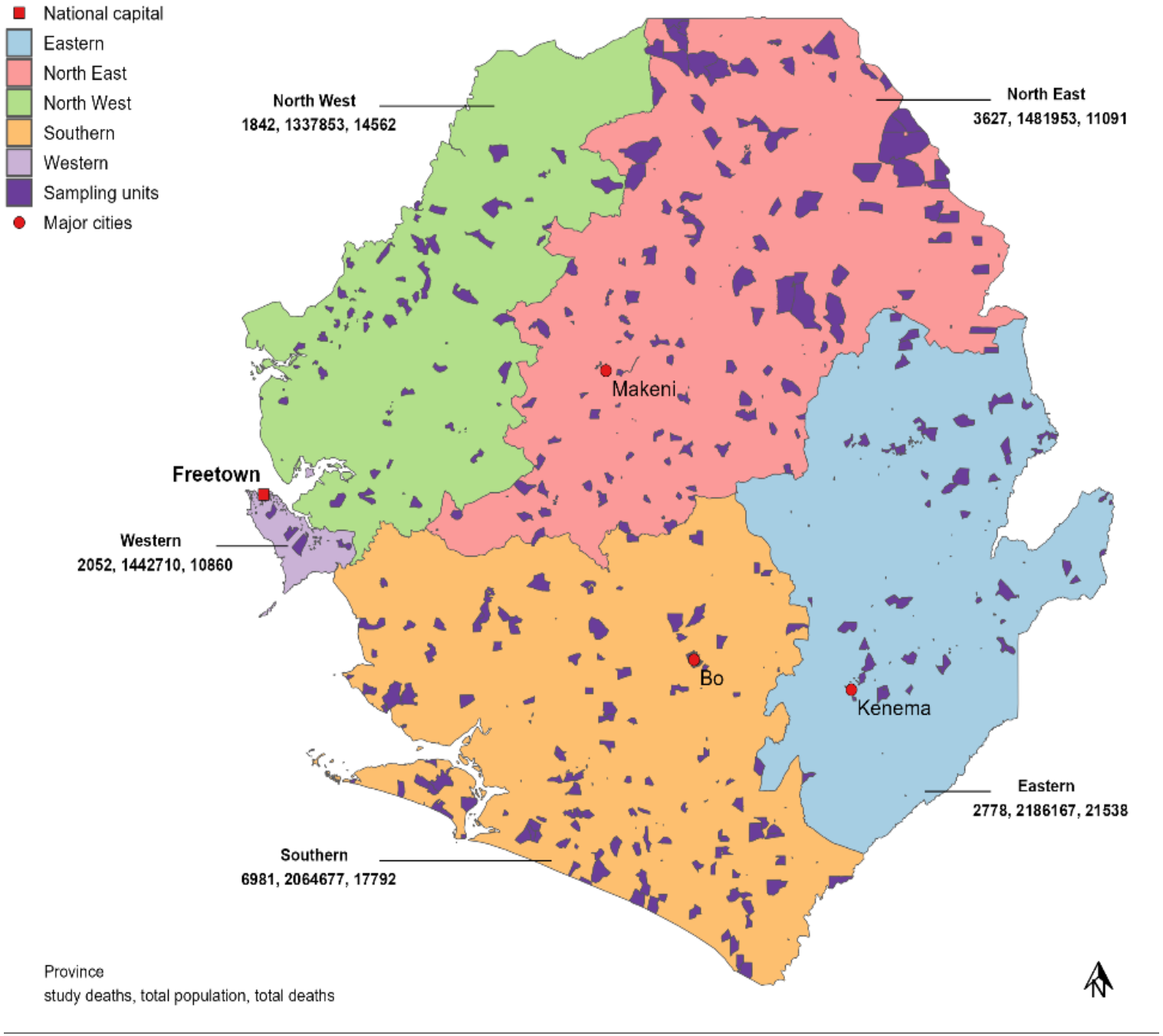
Child, maternal, and adult mortality in Sierra Leone: nationally representative mortality survey 2018–20

Ronald Carshon-Marsh, Ashley Aimone, Rashid Ansumana*, Ibrahim Bob Swaray, Anteneh Assalif, Alimatu Musa, Catherine Meh, Francis Smart, Sze Hang Fu, Leslie Newcombe, Rajeev Kamadod, Nandita Saikia, Hellen Gelband, Amara Jambai*, Prabhat Jha*

- Population: **~350 000** (~5% of Sierra Leone's total, and growing with population growth, sampling to ensure lowest education/social groups included)
- Deaths surveyed to date (2018-2025): **~29 000**
  - Female: **~13 000**
  - Rural: **~18 000**
- Field Staff: **45**
- Physician coders: **12**

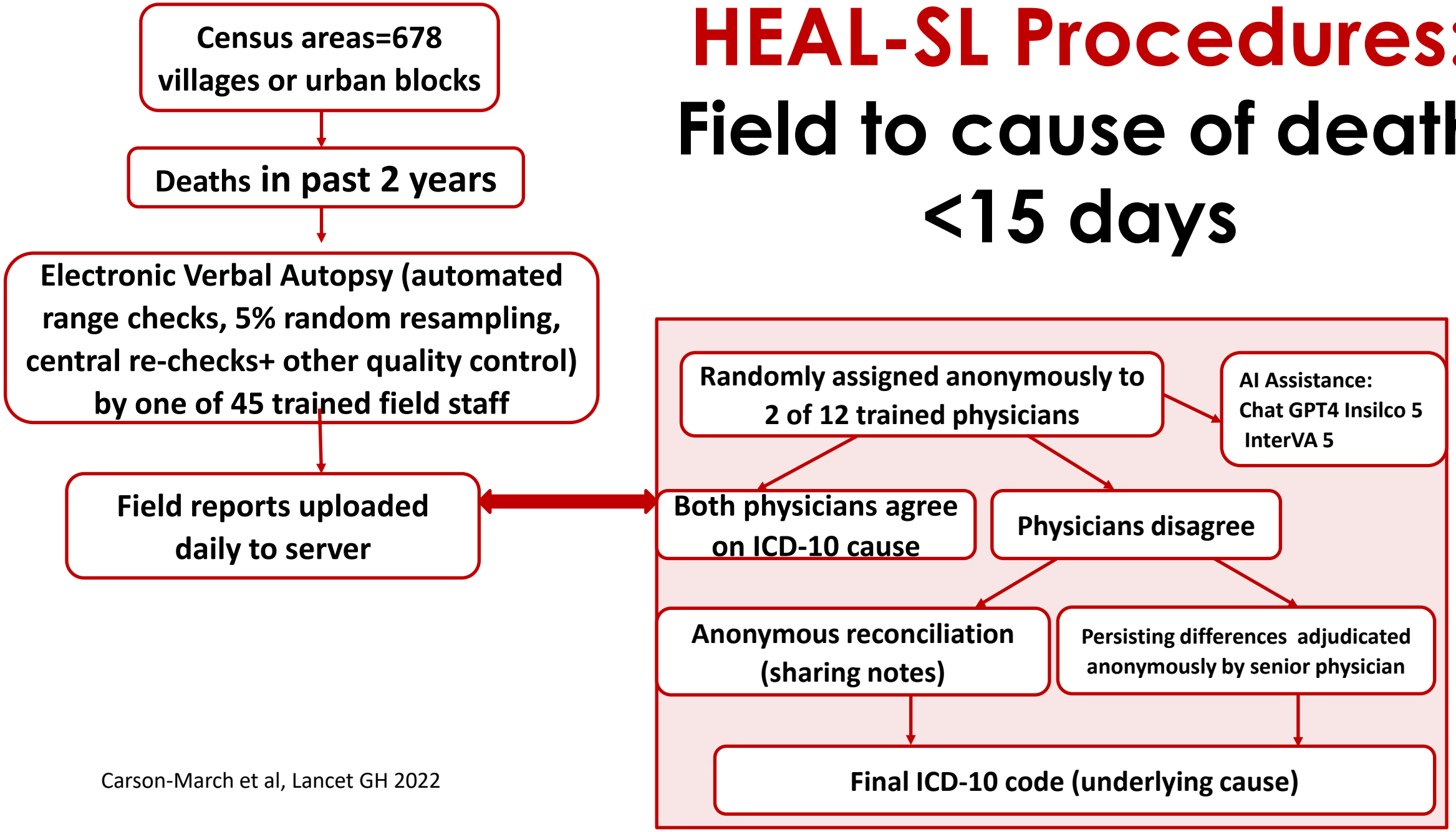
Carson-March et al, Lancet GH 2022

Sierra Leone enumeration areas and numbers of study deaths by region



Carson-March et al, Lancet GH 2022

HEAL-SL Procedures:
Field to cause of death <15 days

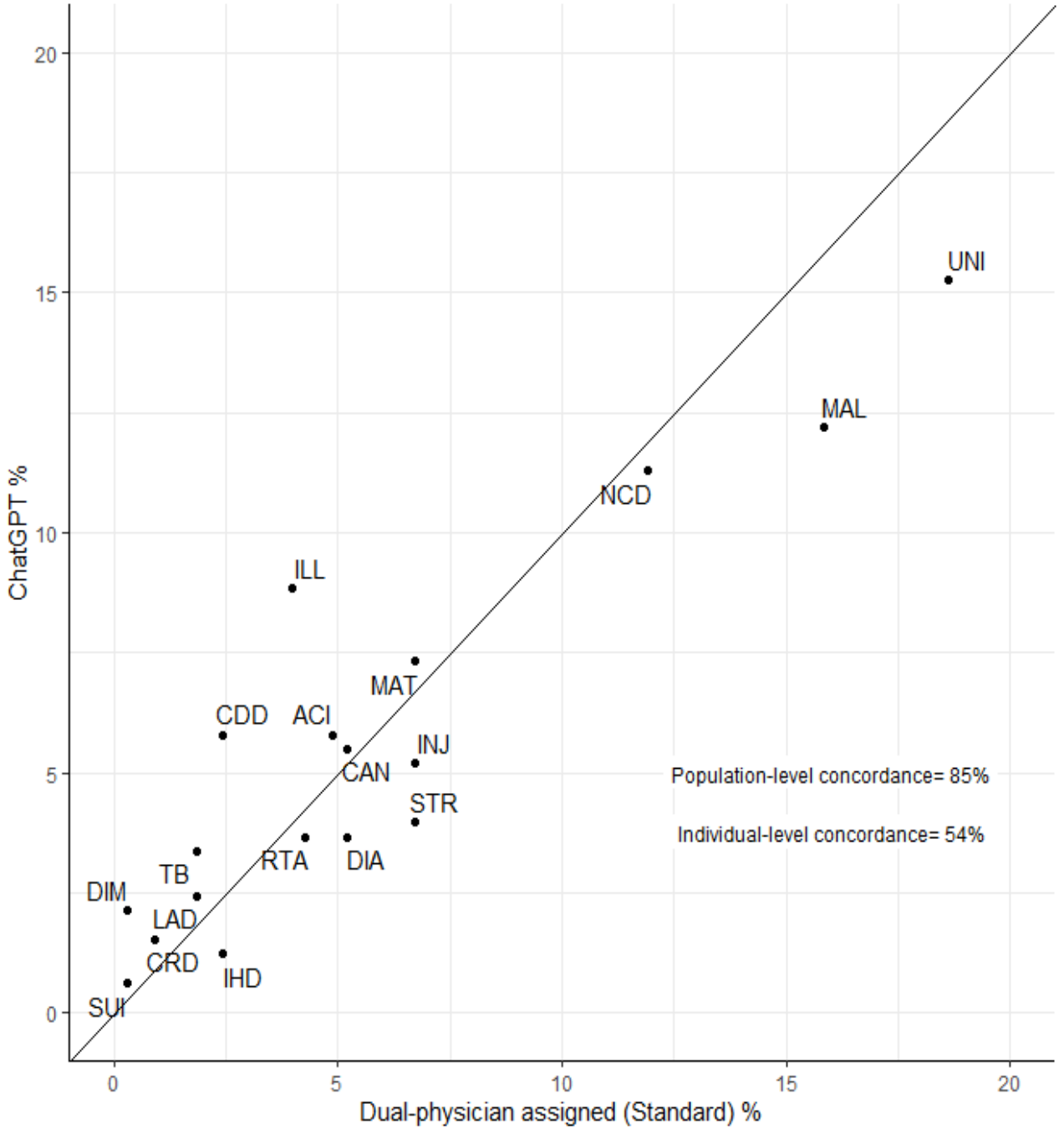


Carson-March et al, Lancet GH 2022

Quality assurance is key to results remaining credible

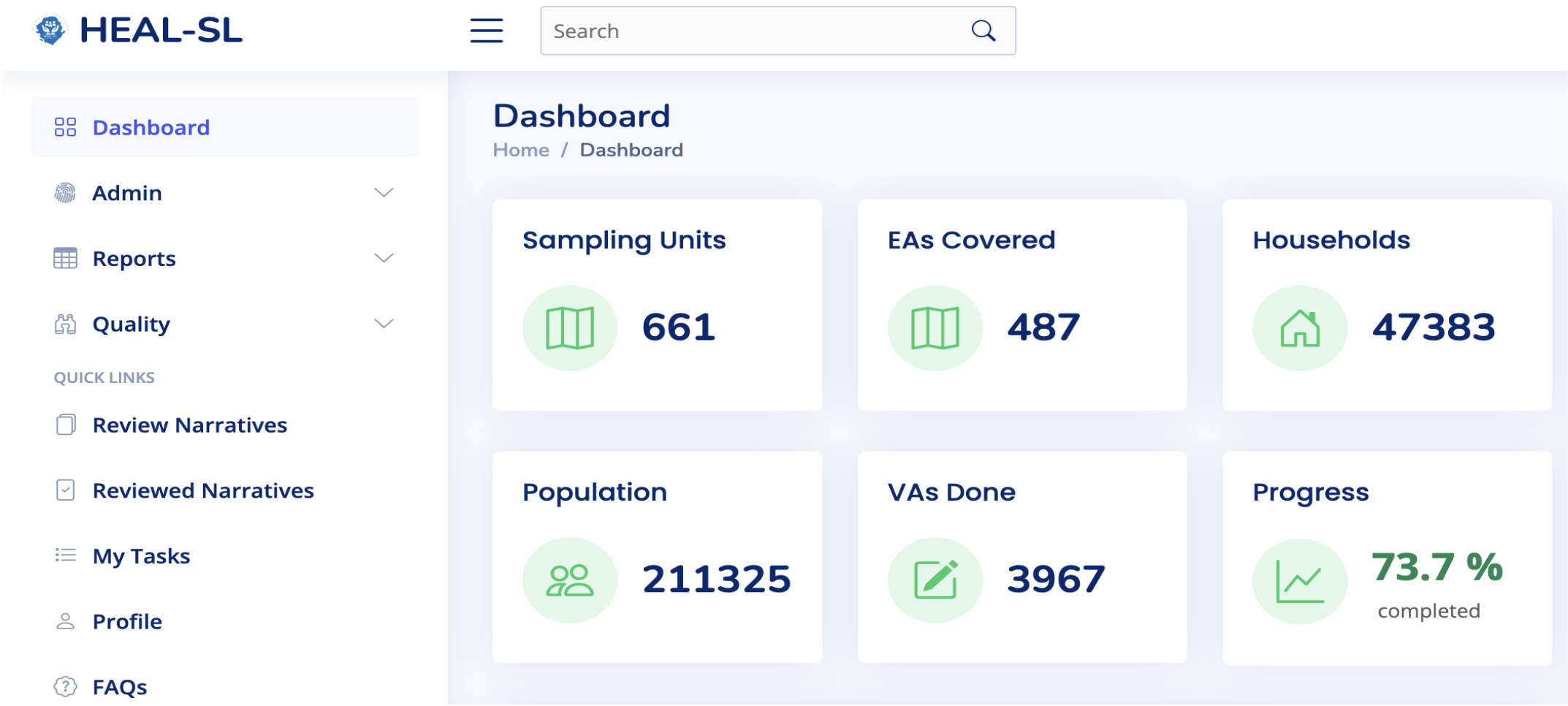
- GPS tracking (and updating maps from recent Census)
- Interview recordings: central audio review (every surveyor per week, random)
- Area re-sampling
- Monitor work loads and pace of work using dashboard
- Random field spot checks (regional coordinator & central team)
- Narrative reviews and weekly experience sharing
- Chat GPT plus algorithms to assist dual physician coding

Proportions of adult deaths on e-VAs coded by ChatGPT versus dual physician coding in Sierra Leone



Behnidan, under review

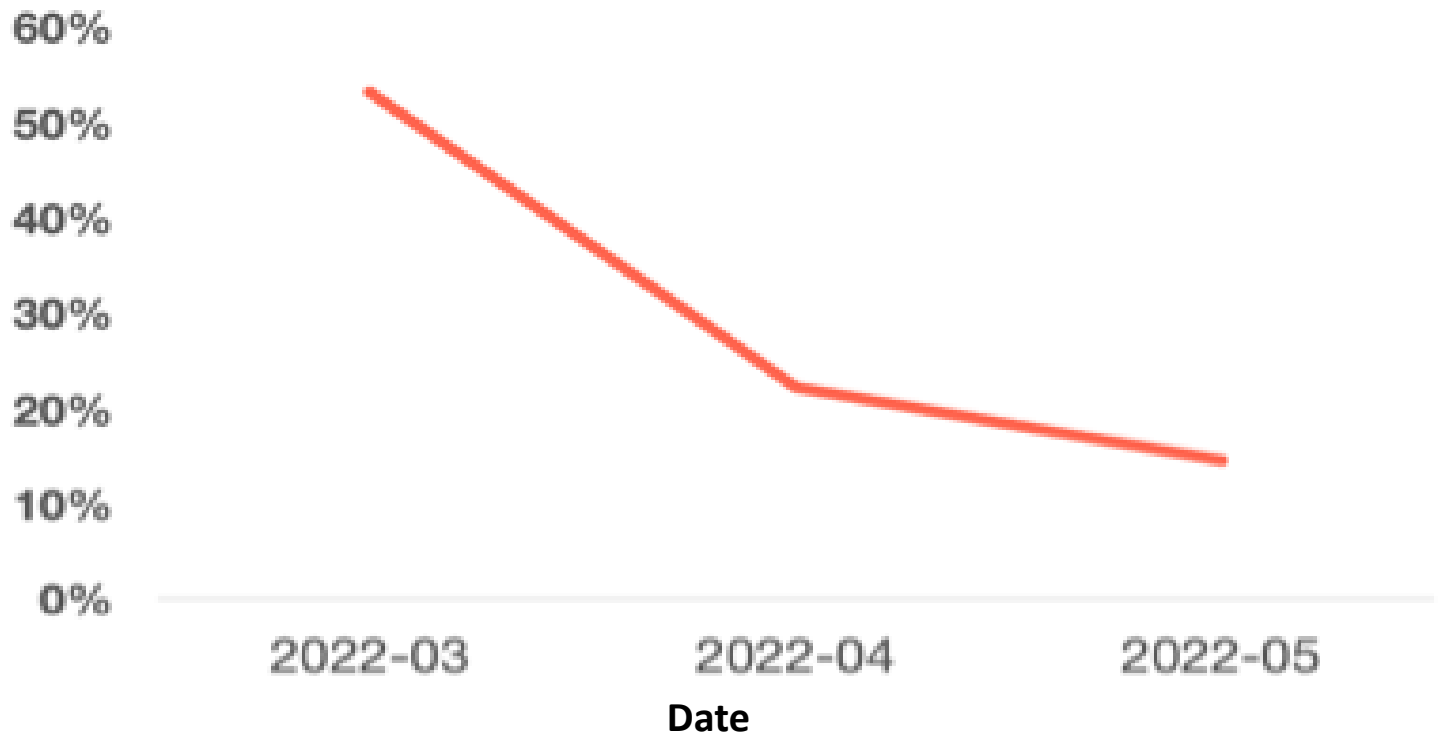
Real-time dashboards to track the field work and ensure quality



Have interventions implemented since early 2022 improved quality?

- Change in work culture among surveyors- “shortcuts no longer acceptable and will be caught” “strong teams need all”

- **Reduction in % of e-VAs that were rated as “low quality”**



Impact of HEAL-SL: Three examples

- Malaria deaths in children and adults
- Widespread infection but low excess deaths from SARS-CoV-2
- Educational differences in mortality

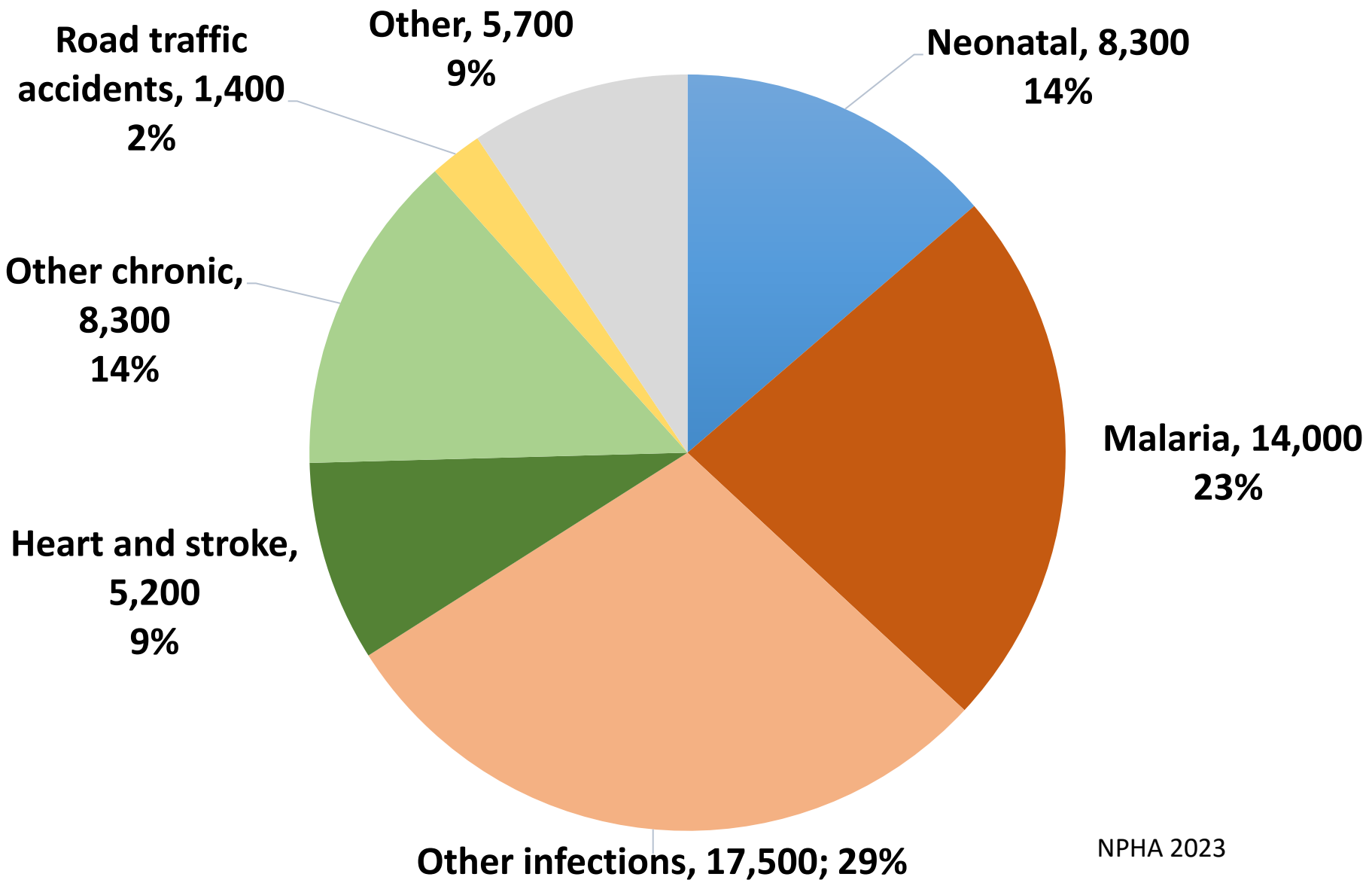
Carson-March et al, Lancet GH 2022
Osman et al, PLOS GH 2024
Wu et al, Lancet GH under review

Deaths by age in Sierra Leone, 2023

Age group	Total national deaths
Child ~ 30,600	
Stillbirths	4,612
Neonates	8,253
1-59 months	18,651
5-14 years	3,705
Adults ~ 45,000	
15-29 years	5,917
30-69 years	23,735
70+ years	15,582
All deaths (excluding stillbirths)	75,843

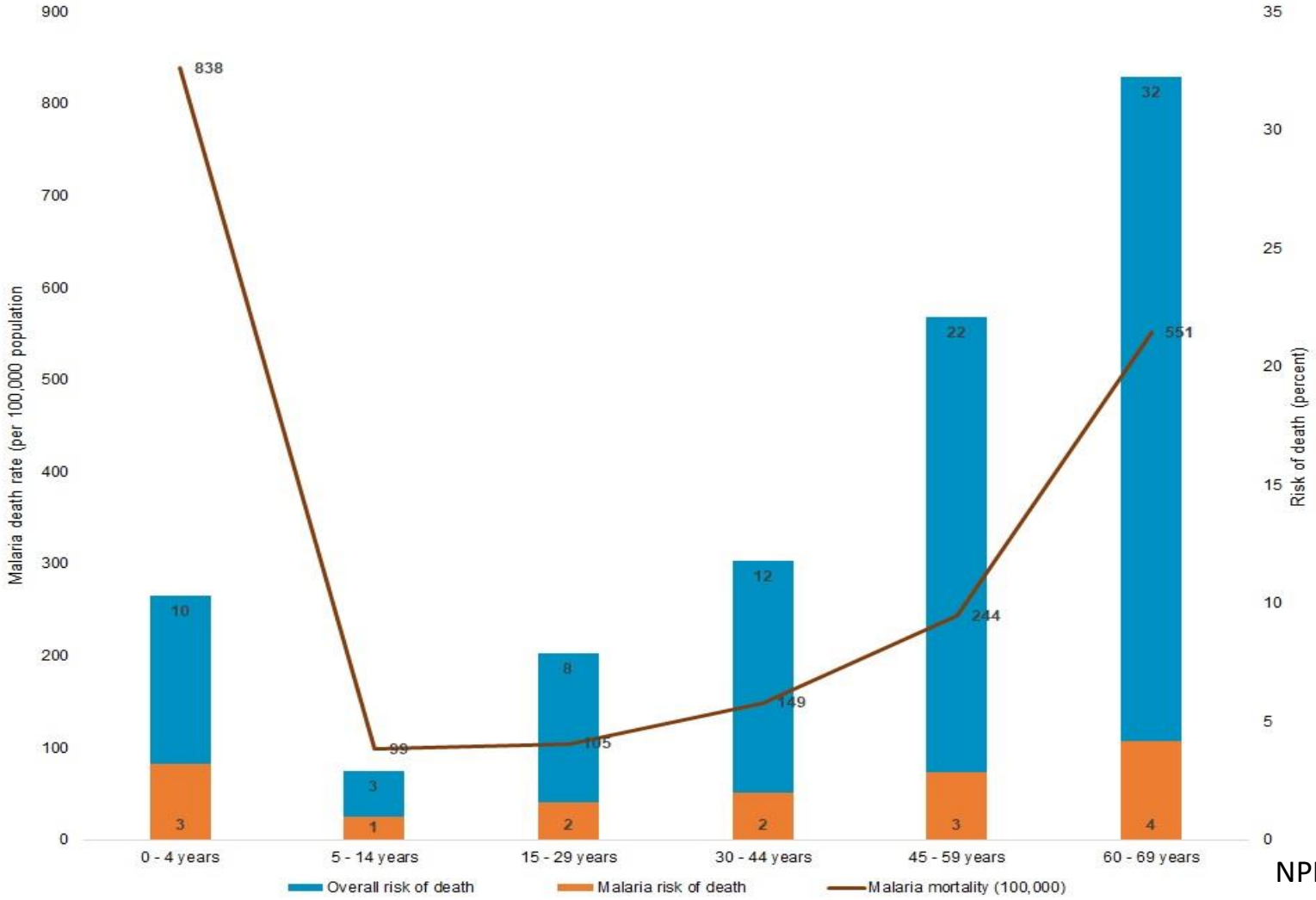
NPHA 2023

Leading causes of death <70 years



NPHA 2023

Annual malaria mortality rate by age group in Sierra Leone – malaria was a leading cause of death in all age groups except neonates



NPHA 2025 unpublished

Malaria studies and interventions

- Malaria parasitemia in SL is 22% in <age 5 (SLMIS 2021)
- Bo hospital study of febrile adults to determine malaria as a cause-completed showing high proportion of febrile deaths were malaria
- Common sense: widespread RDT confirmed P falciparum cases in HEAL-SL staff (but CURED with diagnosis and prompt treatment)

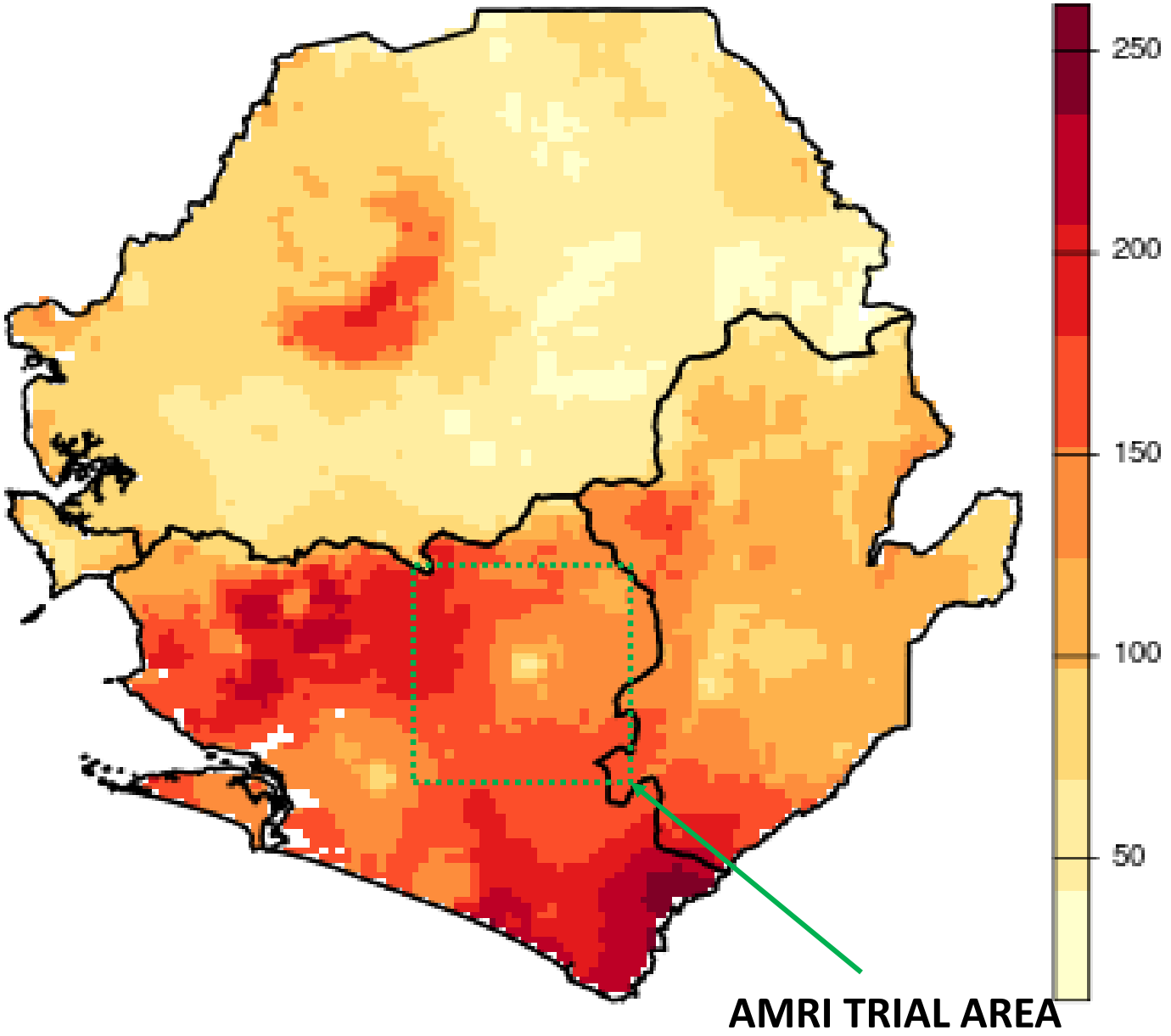
Malaria in verbal autopsies

Validation of malaria-attributed deaths using verbal autopsy studies: a systematic review

Malaria Journal **23**, Article number: 217 (2024)

Ronald Carshon-Marsh ✉, Susan Bondy, Theodore Witek & Prabhat Jha

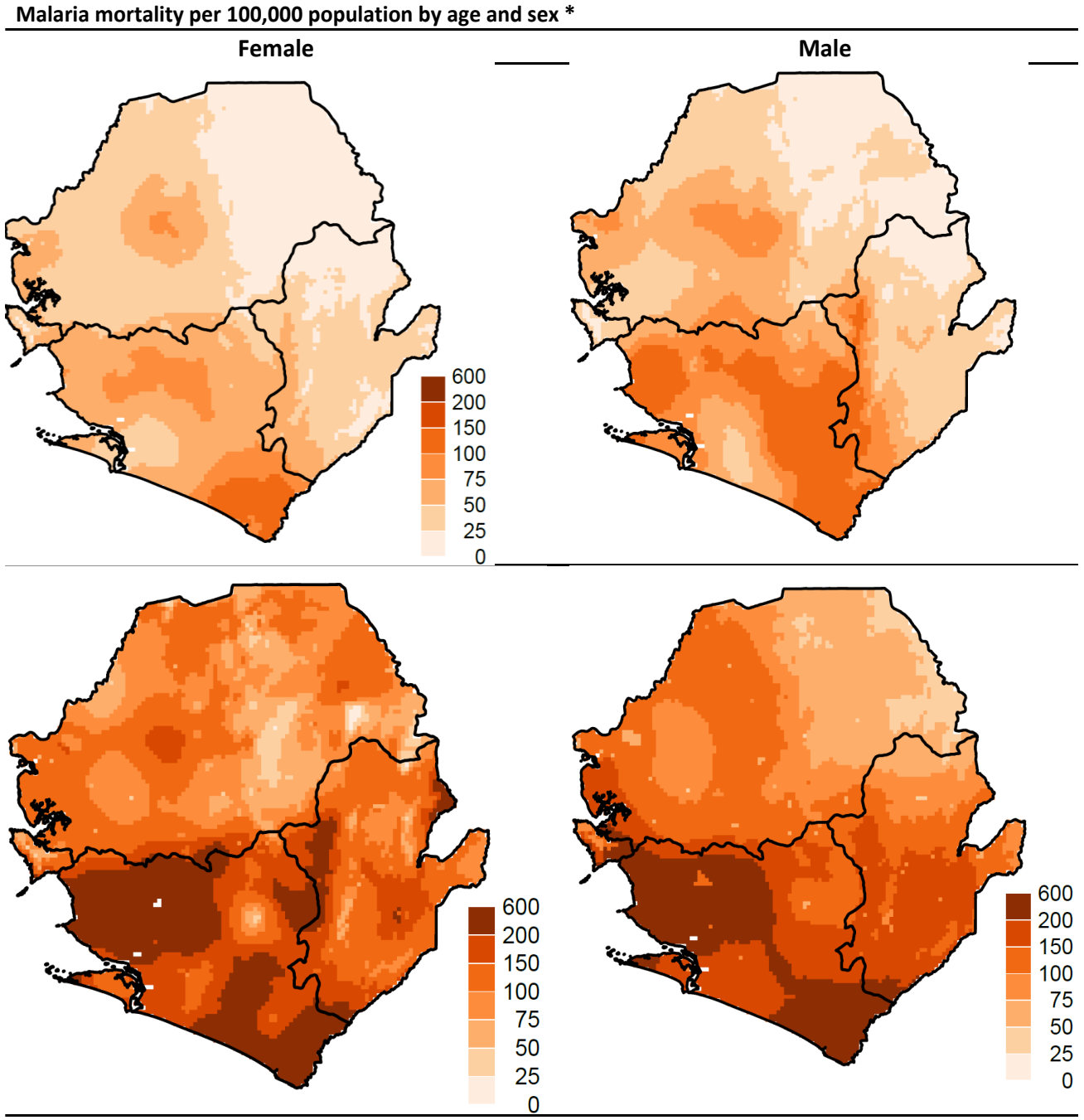
- Meta-analyses; 71 studies reviewed, 21 included
- Malaria versus biologic/pathologic data: Sensitivity 18 to 33%, specificity: 87 to 97%
- Doubling sensitivity =~ modest drop in specificity. Thus, VA studies with high specificity in malaria endemic areas yield largely plausible results.



Spatial distribution of malaria death risks in Sierra Leone, 2018-23, all ages

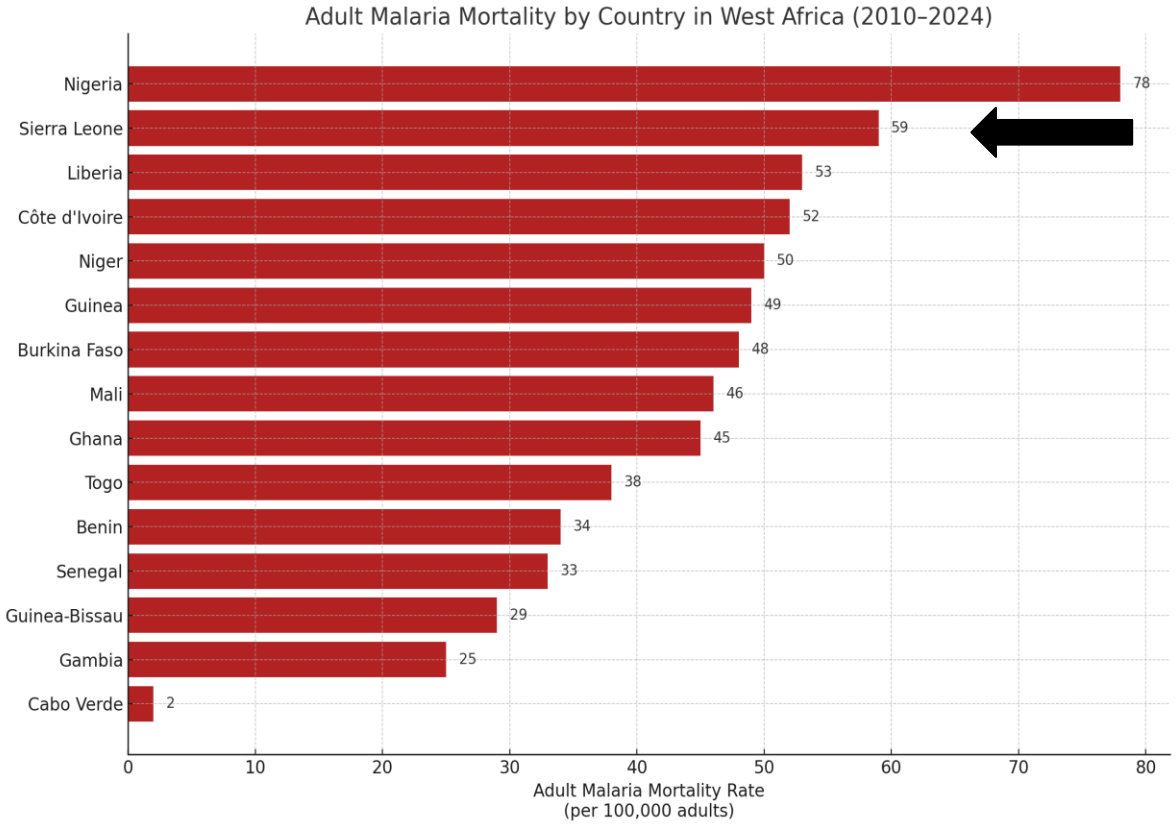
Ansumana under prep, 2025

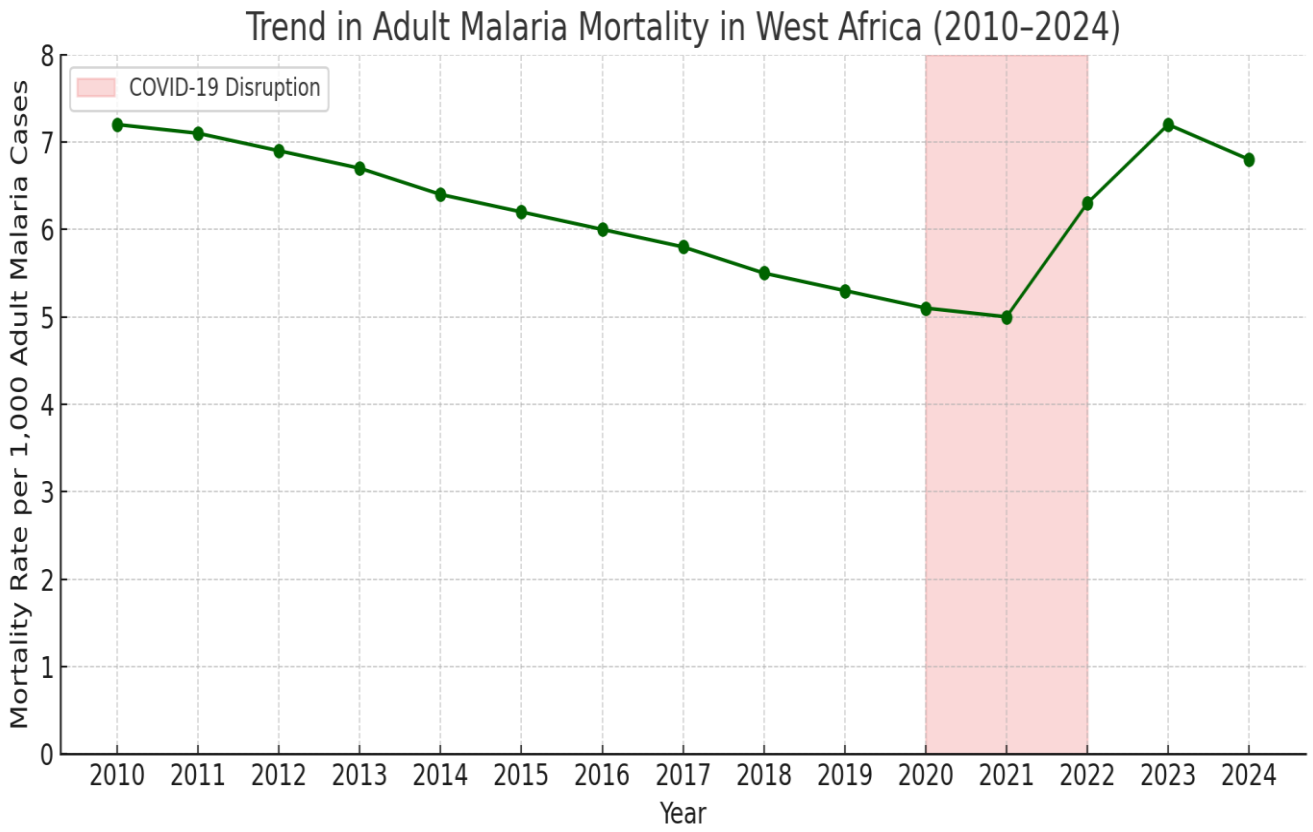
Spatial distribution of malaria death risks, 2018-23, by age and sex



Ansumana under prep, 2025

Meta-analyses of Trends in Adult Malaria Mortality in West Africa (2010-2024)

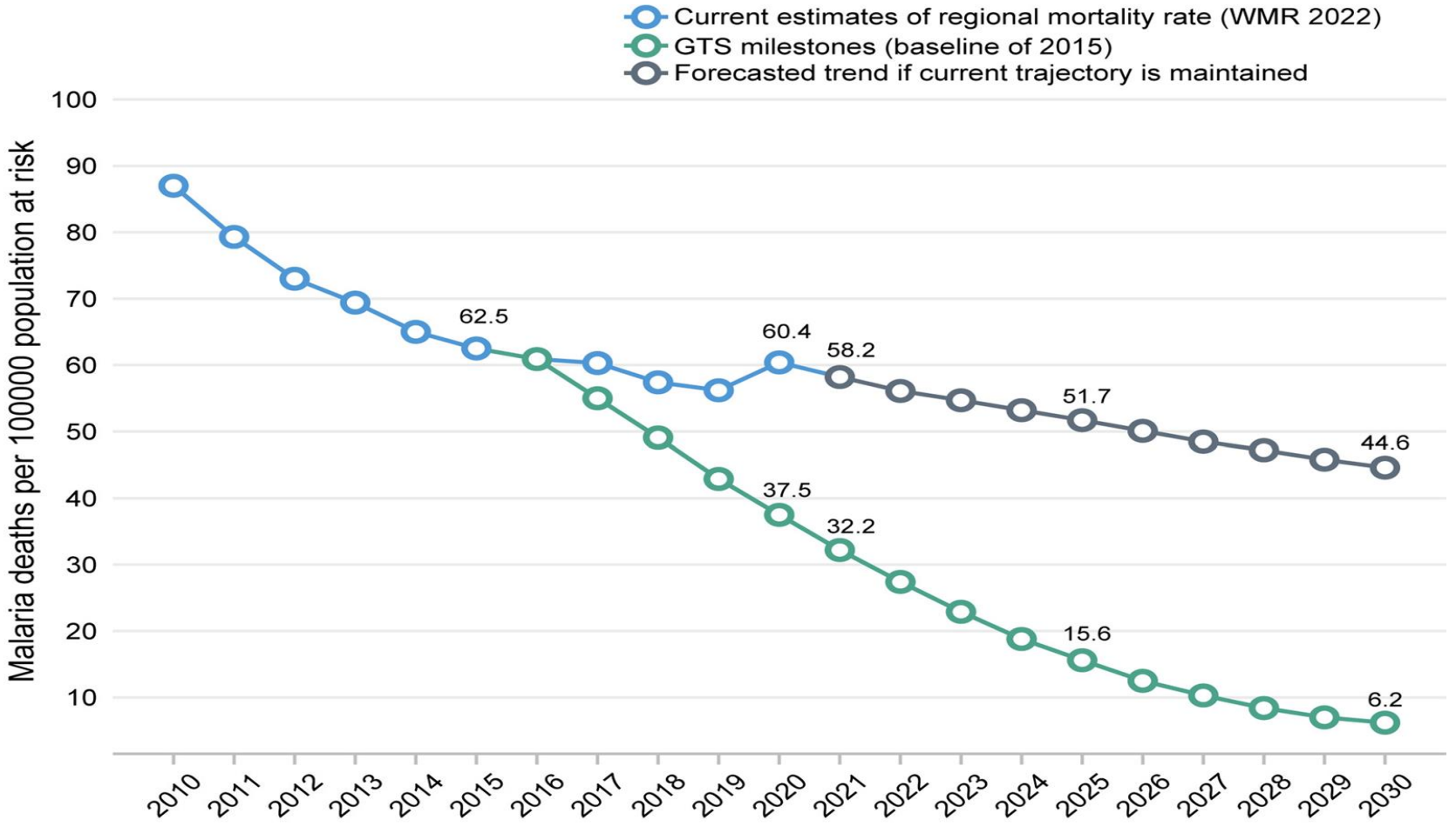




Ansumana et al, 2025 (in prep)

Global trends in malaria mortality rate in WHO Africa region (deaths/100,000 population at risk), 2010-2021

(PRIOR TO PMI Cuts)



GTS: Global Technical Strategy for Malaria 2016-2030; WHO: World Health Organization; WMR: World Malaria Report.

Gelband et al, Malaria Journal 2023

Adult Malaria Reduction Intervention Trial

- Assess **R21** (target: infecting sporozoite, so disease reducing) and **Pfs230** (target: gametocyte in mosquito gut, so transmission blocking) vaccine in Bo district, Sierra Leone
- 6000 adults in three arms: 3 or 2 doses or placebo
- Primary outcome: immunogenicity and safety
- Partnership with U of Oxford, NIH, LSTHM, Serum Institute of India

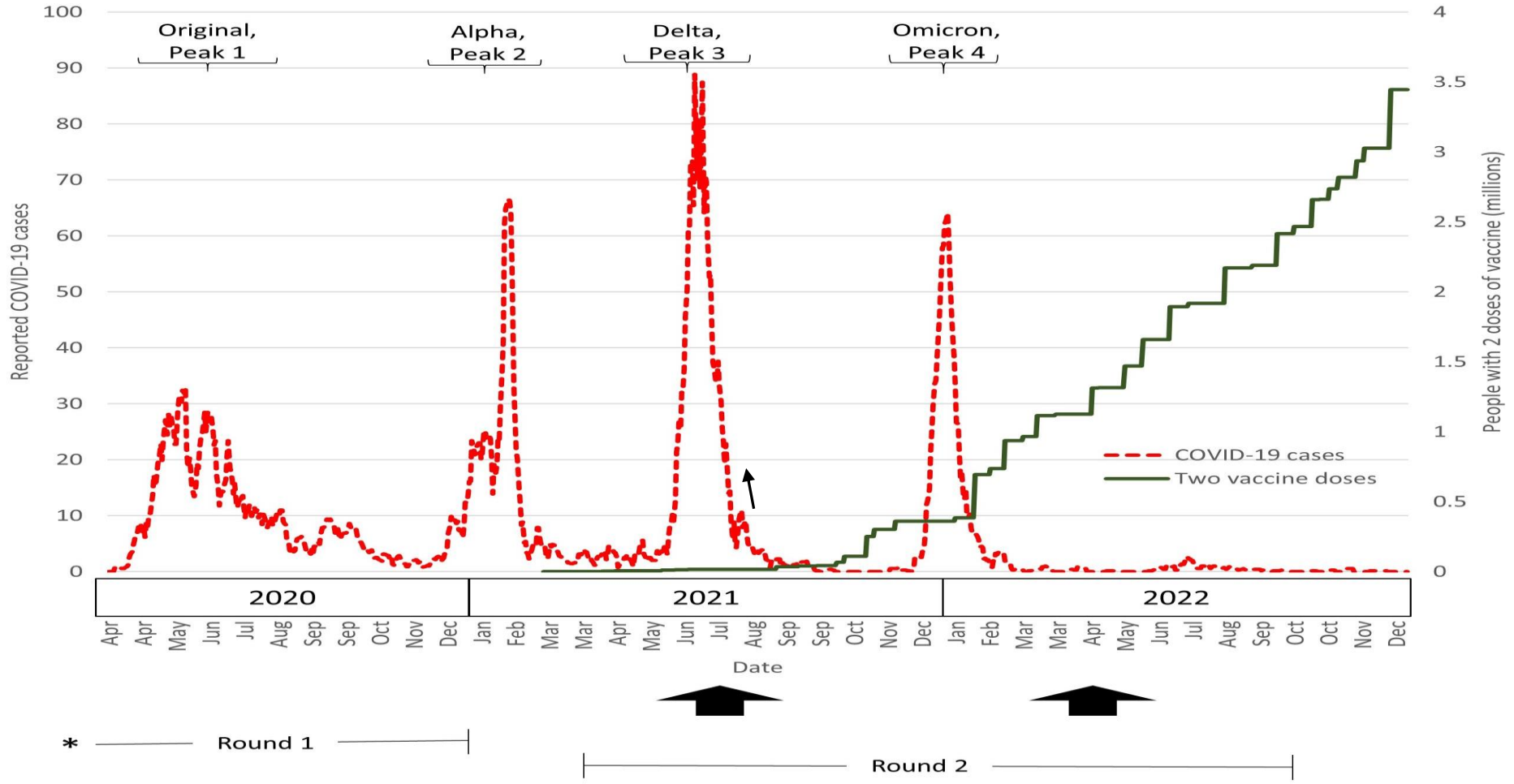
Ansumana, under prep, 2025

High SARS-CoV-2 seroincidence but low excess COVID mortality in Sierra Leone in 2020–2022

Ahmed Osman, Ashley Aimone, Rashid Ansumana, Isaac Bogoch, Hellen Gelband, Karen Colwill, Anne-Claude Gingra
Marc-André Langlois, Ronald Carshon-Marsh, Ibrahim Bob Swaray, Amara Jambai, Mohamed Vandi, Alimatu Vandi, [...],
Prabhat Jha [view all]

Published: September 10, 2024 • https://doi.org/10.1371/journal.pgph.0003411

Reported COVID infections well before expansion of SARS-CoV-vaccine doses in Sierra Leone



80% of ~7500 reported cases are in Western Area Urban (Freetown) and Rural, and incoming passengers; Vaccinated- by April 2022- **1.3 M/total pop 8M**

Osman et al, PLOS GH 2024

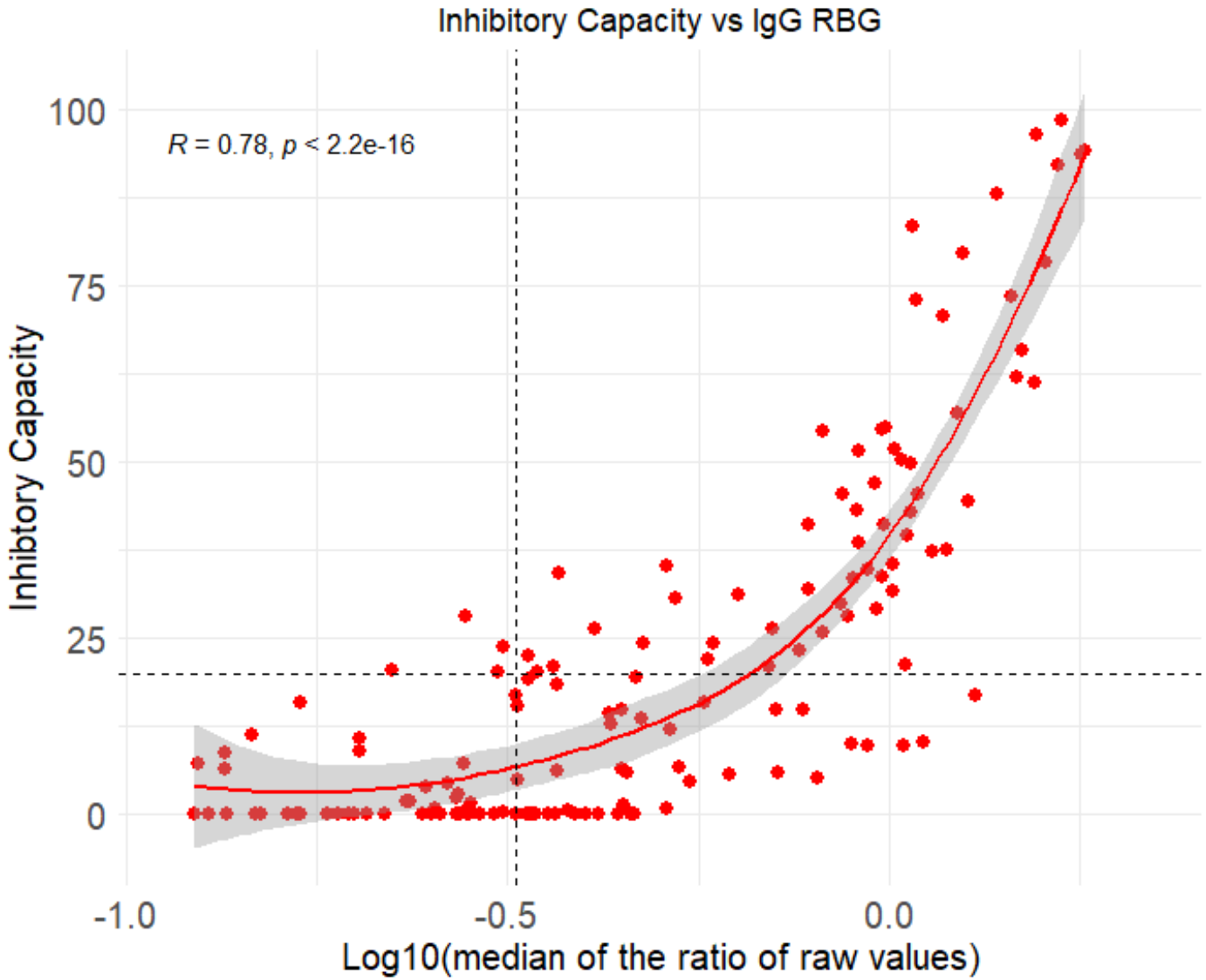
SARS-CoV-2 Serosurveys in urban Bo, Sierra Leone

Assay	Delta wave: July 2021 N = 227*	Omicron wave: April 2022 N=114
Antigens on sensitive/specific ELISA		
RBD AND Spike positive	69% (157)	84% (96)
RBD OR Spike positive	91% (207)	98% (112)
Nucleocapsid positive	67% (153)	74% (84)
Neutralizing antibodies (subset)	43% (97)	
Seroconversion from July 2021 to April 2022		
No change		64% (73)
Became positive		21% (24)
Became negative		15% (17)

*excludes 3 missing sex or age

Osman et al, PLOS GH 2024

RBD "titers" versus Neutralization "titers"



Osman et al, PLOS GH 2024

Excess mortality in Sierra Leone: death rates (per 100,000) from HEAL-SL and death registration

	Peaks	Non-peaks	Excess risks, based on regression (95% CI)
HEAL-SL (median deaths/week)			
≥70 years	96	63	1.70 (1.23,2.35)
30-69 years	15	14	1.22 (0.93,1.61)
NCRA (median deaths/month)			
≥70 years	400	272	1.22 (1.16,1.28)
30-69 years	715	587	1.10 (1.05,1.14)

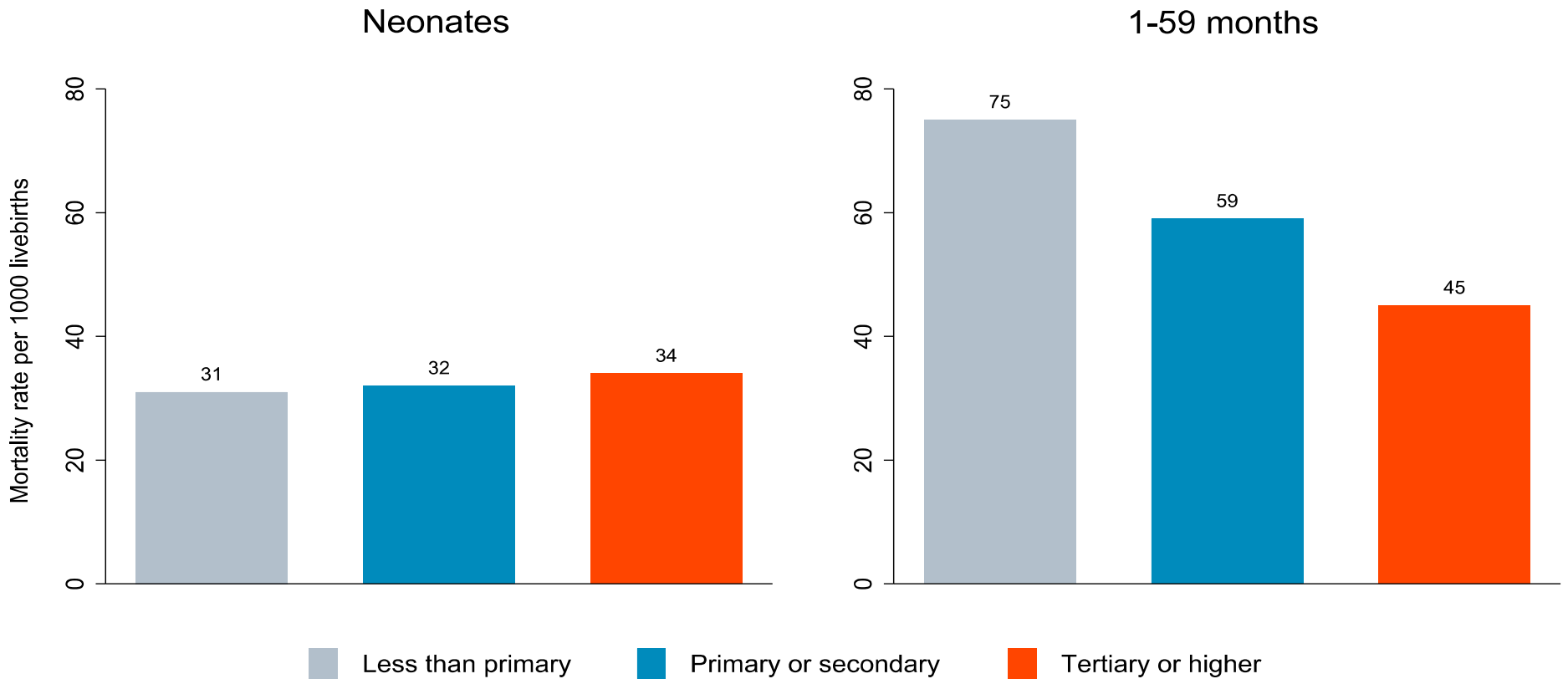
Osman et al, PLOS GH 2024

Estimated excess deaths from COVID ≥ 30 years

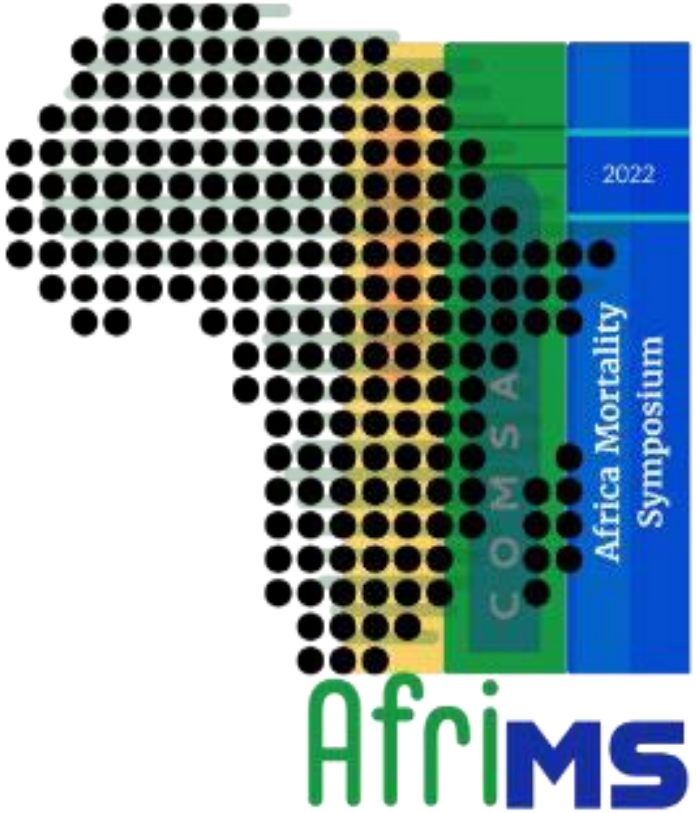
Country/data source	Reference period	Excess deaths (M) and % of UN total deaths (30+) annually	
INDIA: National survey, facility deaths, registration	June 2020-July 2021	**3-4M**	**35-45%**
CHINA: National survey	Feb 2022-Jan 2023	**1.3M**	**13%**
CANADA: Registration	March 2020-Dec 2022	**50K**	**6%**
SIERRA LEONE: Mortality study	June 2020-Dec 2022	**7K**	**6%**

Jha et al, J of Health Inequalities 2024

Mortality rates by education of head of household in Sierra Leone 2021-24



Wu et al, Lancet GH under review



Africa Mortality Symposium

Counting the Dead
Making the Dead Count in Africa

November 29-30, 2022

Radisson Blu, Freetown, Sierra Leone,

- **Major presentations from over 10 countries, >25 global participants, plus 50 national**
- **Sessions focused on National studies in Africa; Current status of mortality data in Africa; COVID, Malaria & Infectious Diseases**
- **First of its kind, need for a 2026 follow up (focused on expanding nationwide studies)**

Conclusions

- The Healthy Sierra Leone (HEAL-SL) provides reliable ongoing **nationally representative cause of death data** for Sierra Leone, covering ~5% of population and deaths in all areas of the country
- Major lessons on how to organize high quality mortality surveillance at low cost, and need for quality control and innovations
- About **one in five of all deaths in Sierra Leone were due to malaria**, which was the leading cause of death for all age groups except neonates
- SARS-CoV-2 infected widely, but caused few deaths
- Ability to study inequalities in mortality and a range of other outcomes

SEE: www.healsl.org or www.npha.gov.sl


COMSA
CDC

THANK YOU


with chief pa Aliekalie Turay
in Mayefeh village.
BUBUYA.

EXTRA SLIDES

WHO changed its maternal mortality estimates based on HEAL-SL

MMR estimates per 100,000 live births

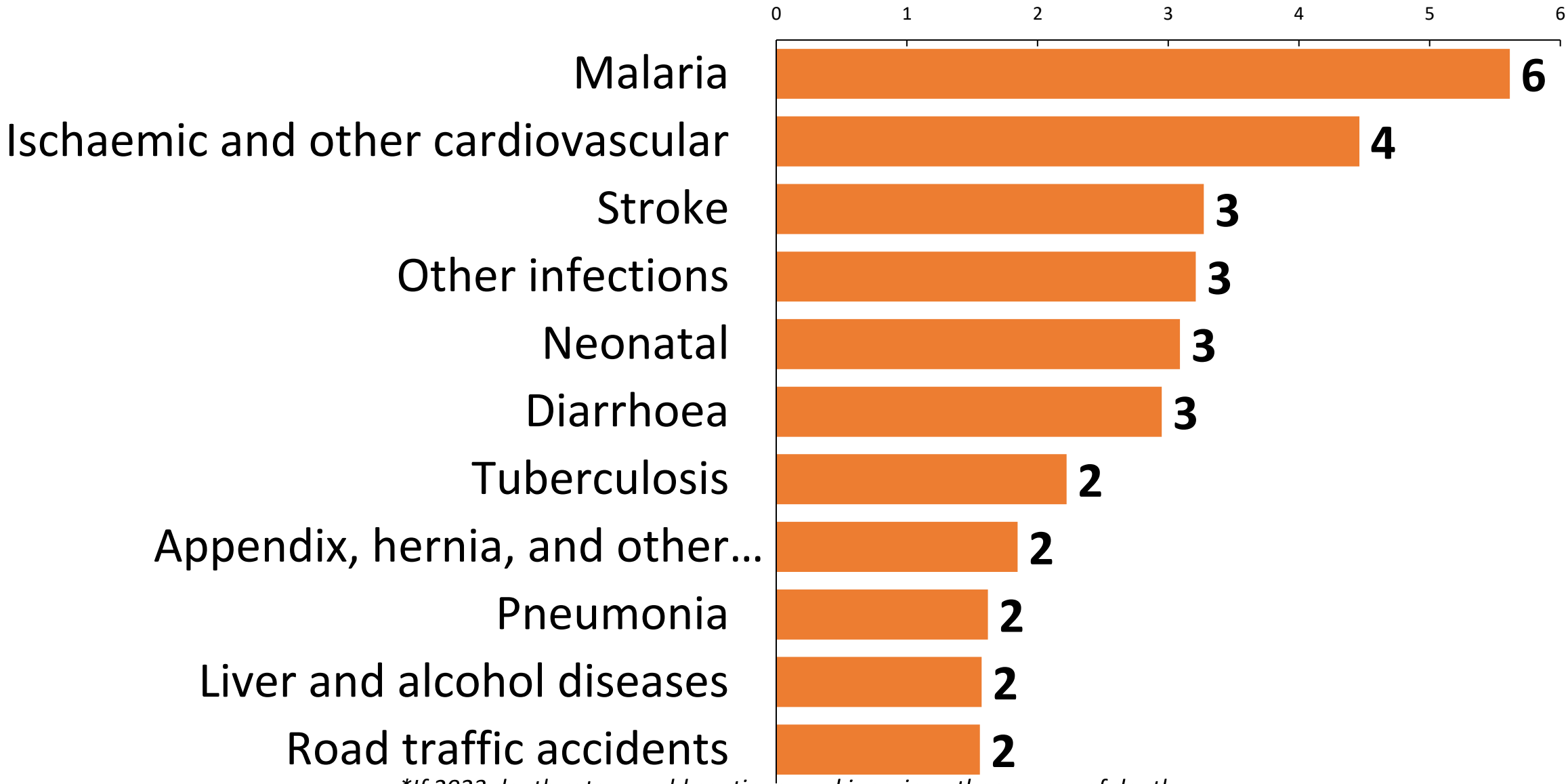
- WHO for SL in 2019 – **1165**
- DHS 2019 – **717**
- HEAL-SL 2018-2020 – **510**
- 2020 MMR estimate for SL by WHO revised downwards to **443** (*WHO 2023*)
- Round 2 HEAL-SL shows lower totals to about **318 (BUT more analyses needed- in partnership with MOH/WHO)**

Maternal deaths in Sierra Leone: Thus, in <4 years, ~500 FEWER women dying per year in childbirth

Study maternal deaths in HEAL-SL (round 1 and 2)	305
In 2020	
Maternal mortality ratio (95% CI)	**510** (483-538) *
Absolute total maternal deaths (95% CI)	**1317** (1247-1389) +
In 2023 – Preliminary MMR ~**318, Absolute total 850**	

Leading causes of maternal death	Percent
Hemorrhage	26%
Infection and sepsis	12%
Hypertensive disorders	6%

Risk of death <70 years among 100 Sierra Leoneans*



*If 2023 death rates would continue, and ignoring other causes of death

Leading causes of death for neonates and stillbirths in Sierra Leone, 2018-2023

807 neonatal deaths in HEAL-SL	National annual deaths (%)	Risk of death %
Birth asphyxia/birth trauma	2,431 (30)	0.9%
Severe systemic infection	2,170 (26)	0.8%
Prematurity and low birthweight	1,570 (19)	0.6%
Non-communicable causes	244 (3)	0.1%
Pneumonia	215 (3)	0.1%
Total neonatal deaths	**8,253 (100)**	**3.1%**
370 stillbirths in HEAL+SL		
Stillbirths	4,612 (32)	

Neonatal mortality rates

- Sierra Leone: 31/1,000 live births
- Global: 18/1,000 live births
- WHO African region: 27/1,000 live births

Leading causes of death for children 1-59 months in Sierra Leone, 2018-2023

4,329 deaths at 1-59 months in HEAL-SL	National annual deaths (%)	Period risk %
Malaria	8,881 (47)	3.3%
Other infectious and parasitic	4,225 (23)	1.6%
Diarrhoea	1,344 (7)	0.5%
Pneumonia	954 (5)	0.4%
Injuries	570 (3)	0.2%
Meningitis/encephalitis	329 (2)	0.1%
Non-communicable causes	285 (2)	0.2%
Measles	175 (1)	0.1%
Total 1-59 months	**18,651 (100)**	**7.0%**

Under-5 death rates

- Sierra Leone: 70/1,000 live births
- Global: 38/1,000 live births
- WHO African region: 72/1,000 live births

Leading causes of death among children 5-14 years in Sierra Leone, 2018-2023

1,487 deaths at 5-14 years in HEAL-SL	National annual deaths (%)	Period risk %
Malaria	1,453 (39)	0.7%
Infections and parasitic causes	719 (19)	0.3%
Injuries	377 (10)	0.2%
Diarrhoea	280 (8)	0.1%
Sickle-cell disorders	146 (4)	0.1%
Non-communicable causes	124 (3)	0.1%
Pneumonia	80 (2)	<0.1%
Meningitis/encephalitis	68 (2)	<0.1%
Total 5-14 years	**3,705 (100)**	**1.7%**

Annual mortality rates for children and adolescents aged 5-14 years

- Sierra Leone: 17/1,000
- Global: 6/1,000
- WHO African region: 15/1,000

Leading causes of death among adults 15-29 years in Sierra Leone, 2018-2023

2,142 deaths at 15-29 years in HEAL-SL	National annual deaths (%)	Period risk %
Injuries	1,030 (17)	0.6%
Malaria	1,000 (17)	0.6%
Road traffic accidents	384 (7)	0.2%
Other infections	348 (6)	0.2%
Diarrhoea	313 (5)	0.2%
Pneumonia	210 (4)	0.1%
HIV/AIDS and STIs	207 (4)	0.1%
All vascular causes	175 (3)	0.1%
Total 15-29 years	**5,917 (100)**	**3.6%**

Annual mortality rates for teens and young adults aged 15-29 years

- Sierra Leone: 242/100,000
- Global: 130/100,000
- WHO African region: 319/100,000

Leading causes of death among adults 30-69 years in Sierra Leone, 2018-2023

6,633 deaths at 30-69 years in HEAL-SL	National annual deaths (%)	Period risk %
Ischemic heart	2,821 (12)	4.4%
Malaria	2,661 (11)	4.1%
Stroke	2,099 (9)	3.2%
Other infections	1,553 (7)	2.4%
Diarrhoea	1,355 (6)	2.1%
Tuberculosis	1,324 (6)	2.0%
Pneumonia	983 (4)	1.5%
Liver and alcohol	940 (4)	1.4%
Road traffic accidents	834 (4)	1.3%
Total 30-69 years	**23,735 (100)**	**36.6%**

Annual mortality rates for adults through middle age, aged 30-69 years

- Sierra Leone: 915/100,000
- Global: 593/100,000
- WHO African region: 1,053/100,000

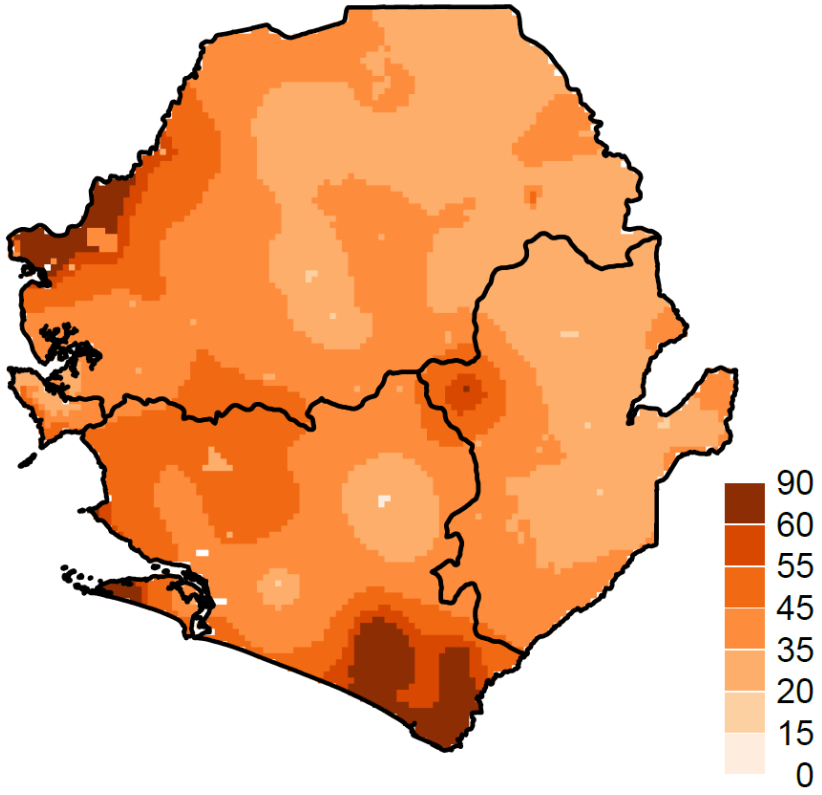
Leading causes of death among adults 70+ years in Sierra Leone, 2018-2023

1,512 deaths at 30-69 years in HEAL-SL	National annual deaths (%)	Period risk %
Ischemic heart	2,735 (18)	17.8%
Stroke	2,105 (14)	13.7%
Malaria	2,080 (13)	13.5%
Other infections	2,053 (13)	13.3%
Diarrhoea	908 (6)	5.9%
Tuberculosis	688 (4)	4.5%
Pneumonia	632 (4)	4.1%
Total 30-69 years	**15,582 (100)**	**101.2**

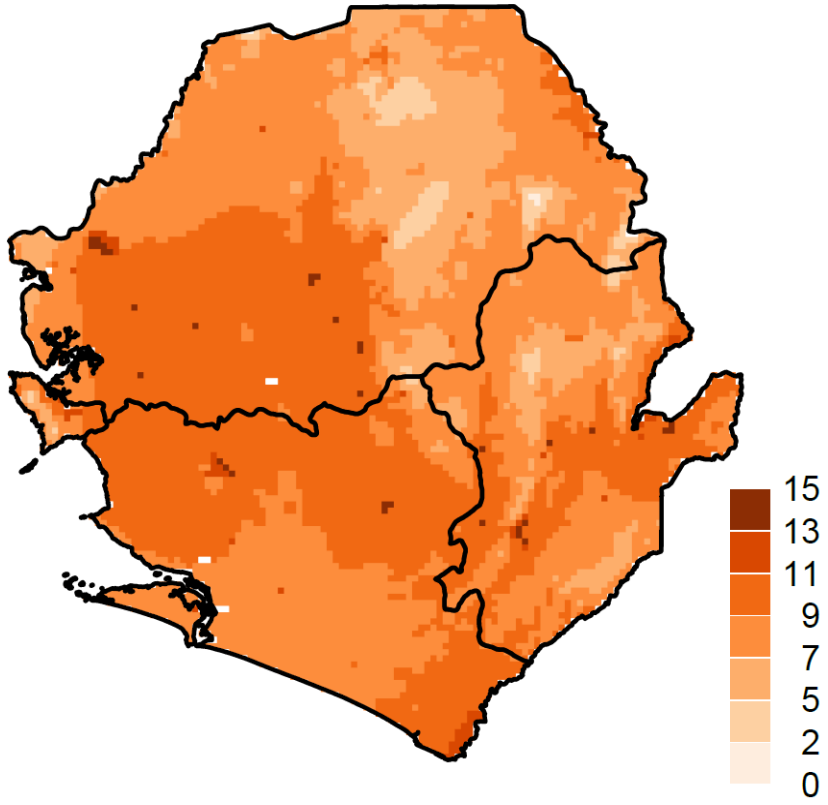
Annual mortality rates for older adults aged 70+ years

- Sierra Leone: 10,119/100,000
- Global: 5,876/100,000
- WHO African region: 9,200/100,000

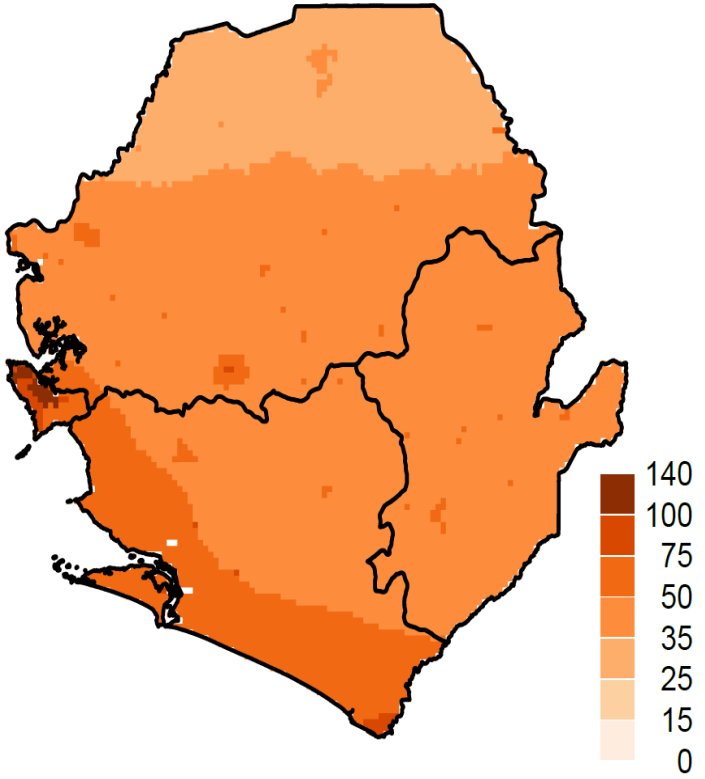
Spatial distribution of selected other causes in Sierra Leone, 2018-23, all ages



Diarrhoea <15 years



Road traffic all ages



Stroke >30 years

Zambia’s SRS

Developing SRS VA-IT System Requirements- Zambia Sample Based Registration System with Vital Statistics

Dr Stephen Longa Chanda

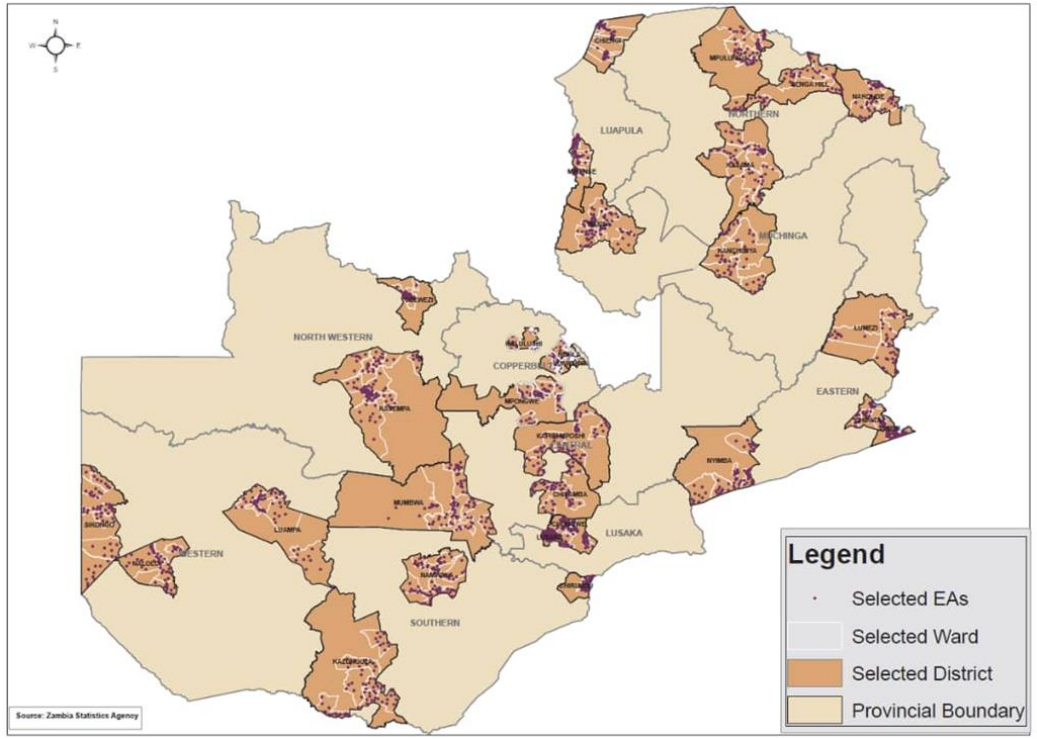
Mortality Surveillance Coordinator

Zambia National Public Health Institute

Overview

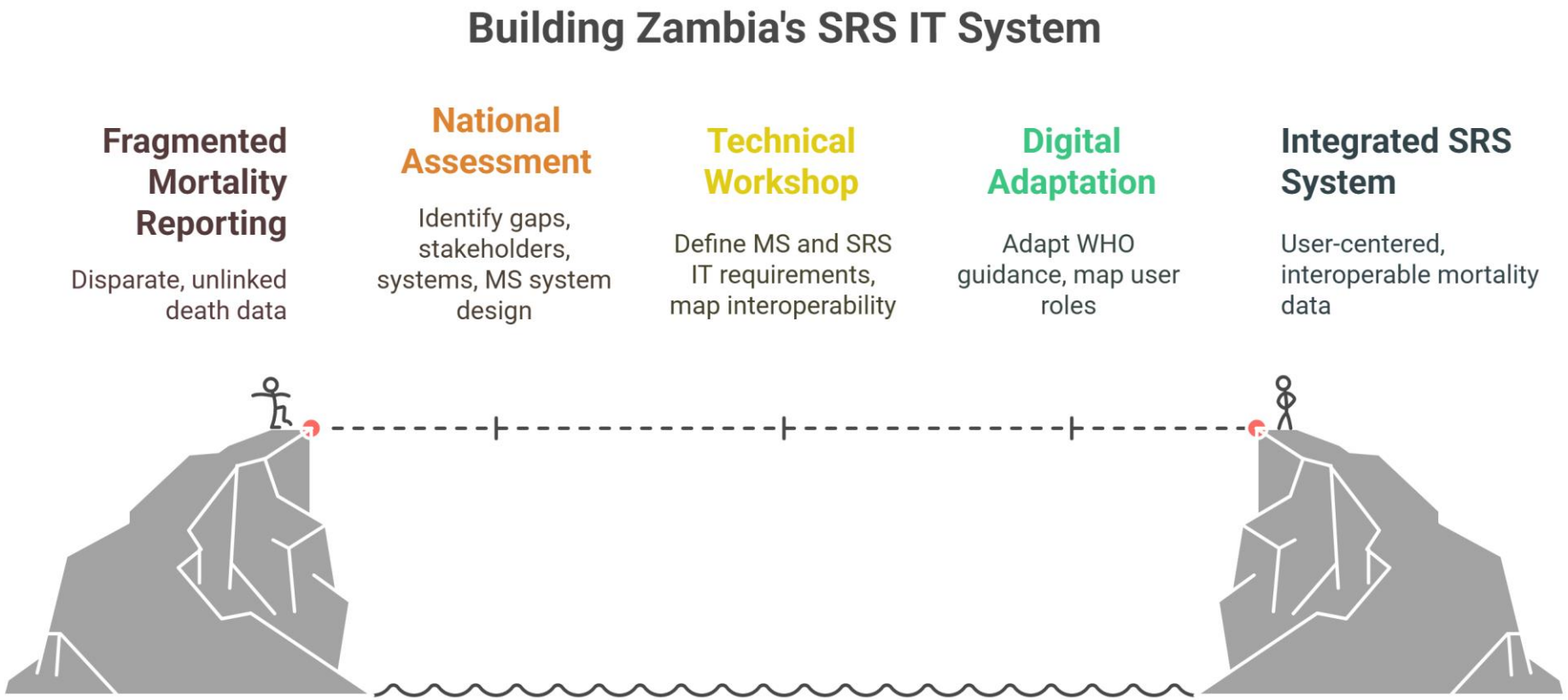
1. Design Considerations, Zambia SRS-VS
2. Steps towards VA-IT design
3. Linking SRS-IT system design to system development
4. Status of SRS-IT system development

Design Considerations Zambia SRS-VS



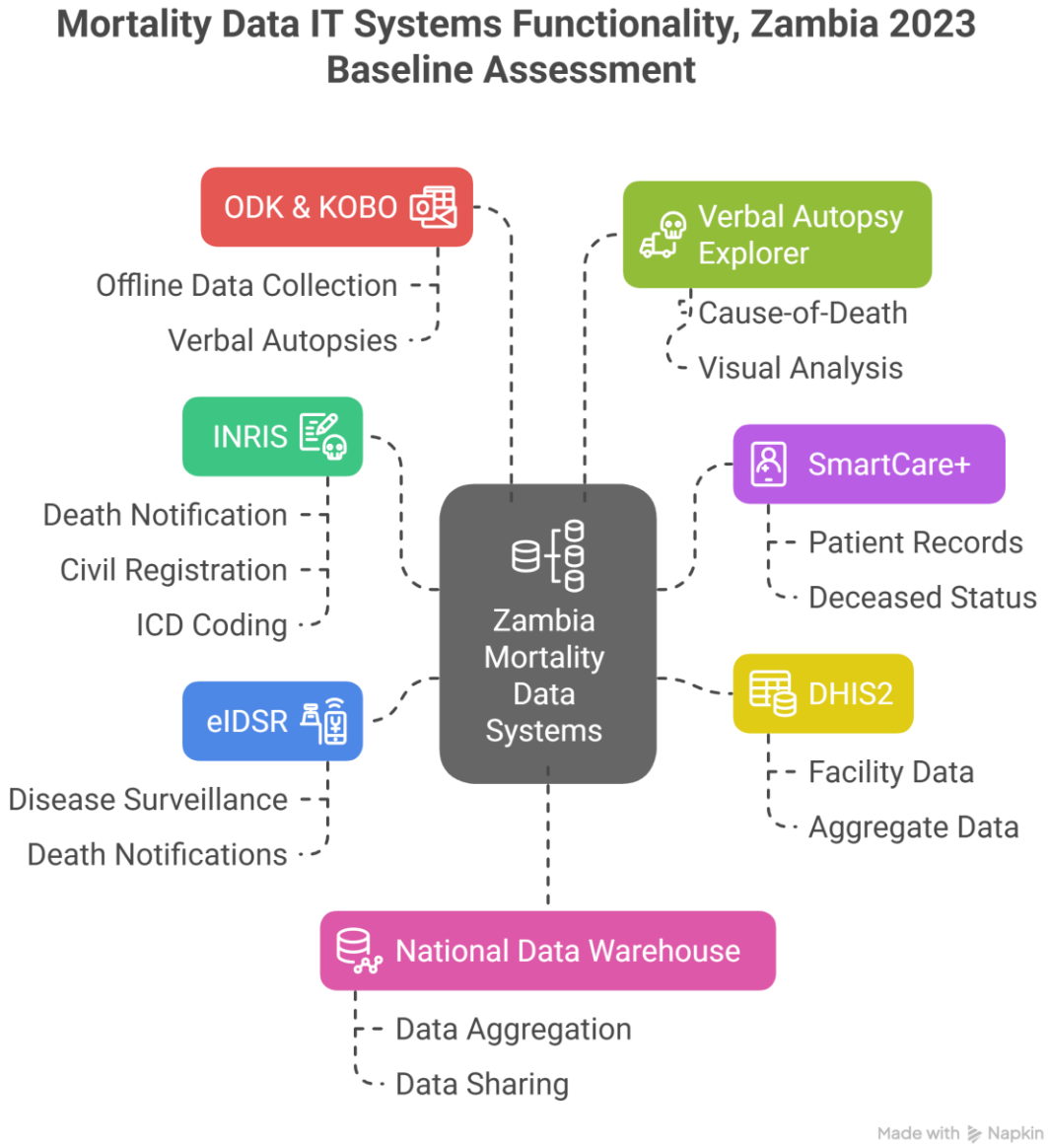
- 2022 Census sampling frame
- Representative at National and Provincial levels
- Rural and Urban stratification at National level
- Approximately 6% of national population under surveillance
- Active case finding
- Linkages to CRVS and other public health systems

Zambia’s Steps towards VA-IT system development and integration



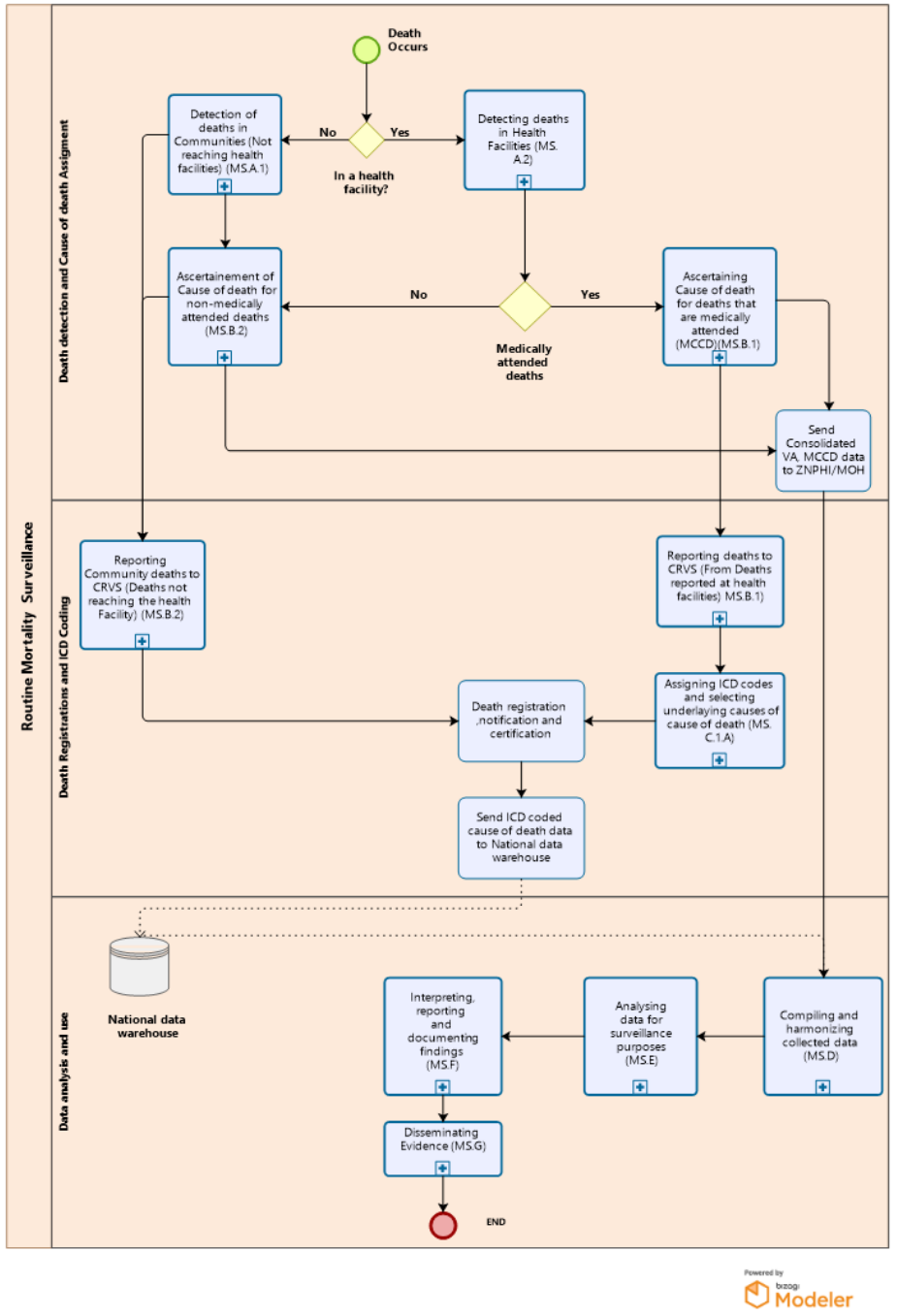
Baseline Assessment findings, ICT Systems in Mortality Surveillance

- Deep structural inefficiencies and fragmentation in Zambia MS echo-system
  - < 21% of estimated deaths captured in the DHIS2
  - 18% in the CRVS system.
- MS data spread across disconnected systems, INRIS, SmartCare+, DHIS2, ODK, Kobo
- Heavy reliance on manual processes, paper-based forms, and family-initiated reporting
- Community deaths underreporting



Defining MS and SRS IT requirements

- Conceptualise a digitally Integrated MS ecosystem
  - "Collect once, use many"
  - Develop a list of minimum data elements for mortality analysis
  - SRS IT system integrated from start not an after thought
- Refine approach to SRS IT system build
  - How do you link system designers to system developers?

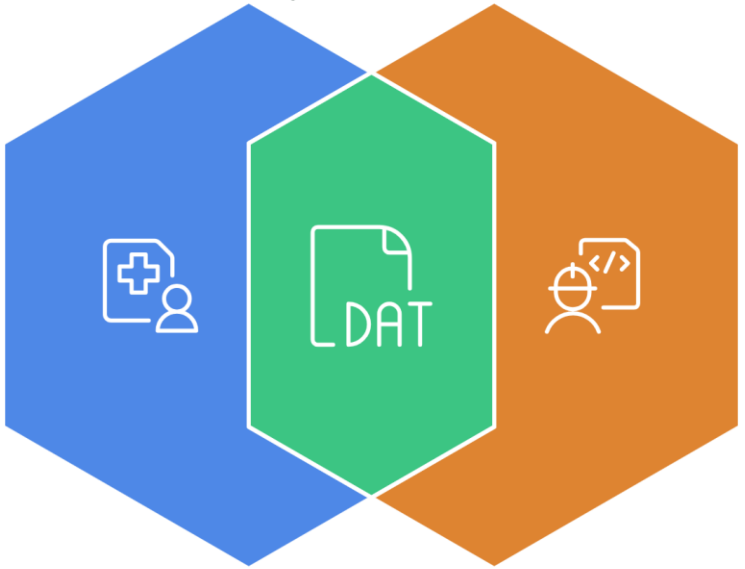


Linking SRS Design to System Development

Bridging the Gap in Digital Health Development

Digital Adaptation Kits

Standardized, actionable requirements



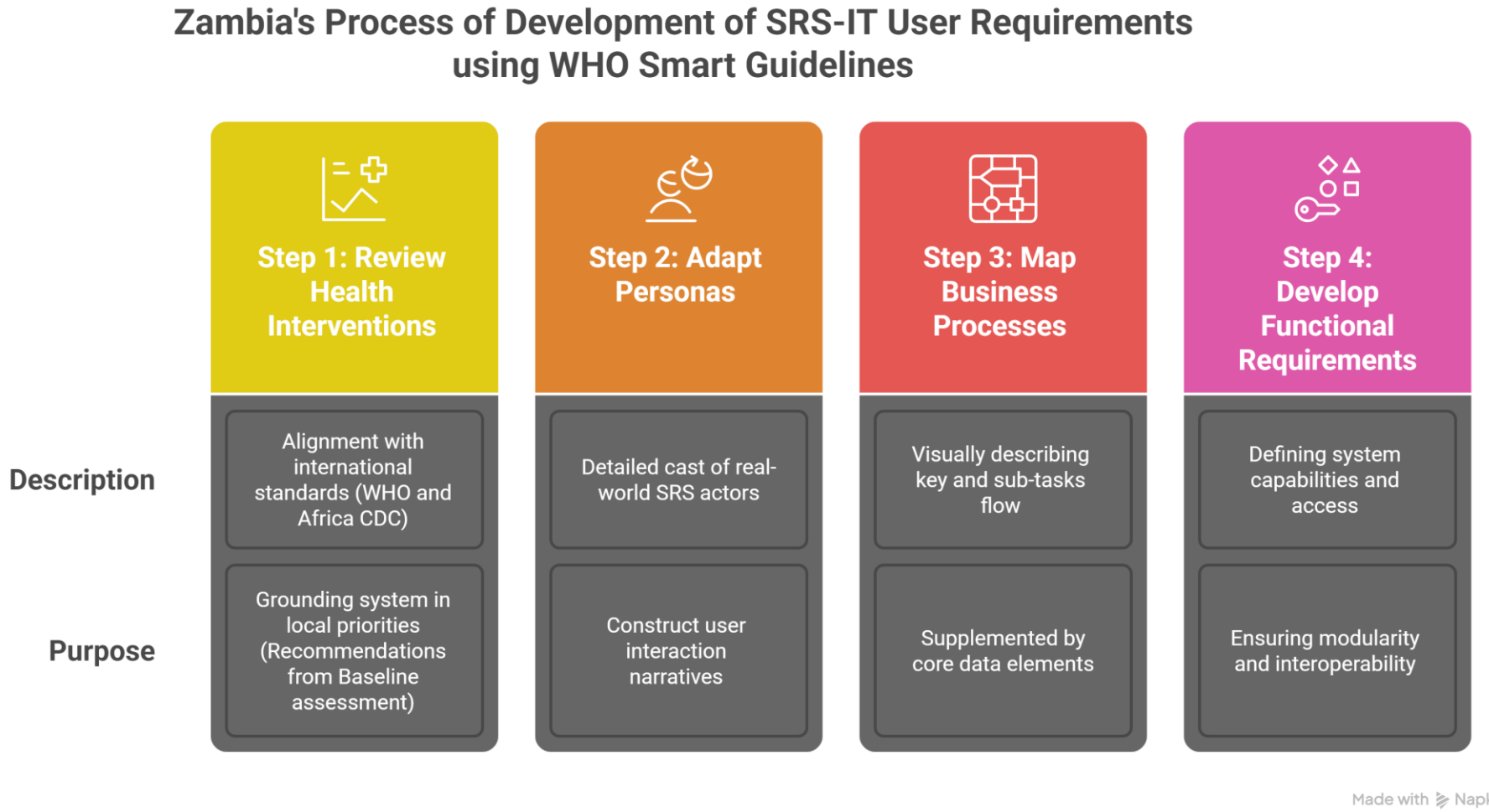
System Designers

Public health experts and SRS Planning committees

System Developers

Software engineers and implementers

Adaptation of DAKs to generate SRS IT User requirements



SRS VA-IT System Development Considerations

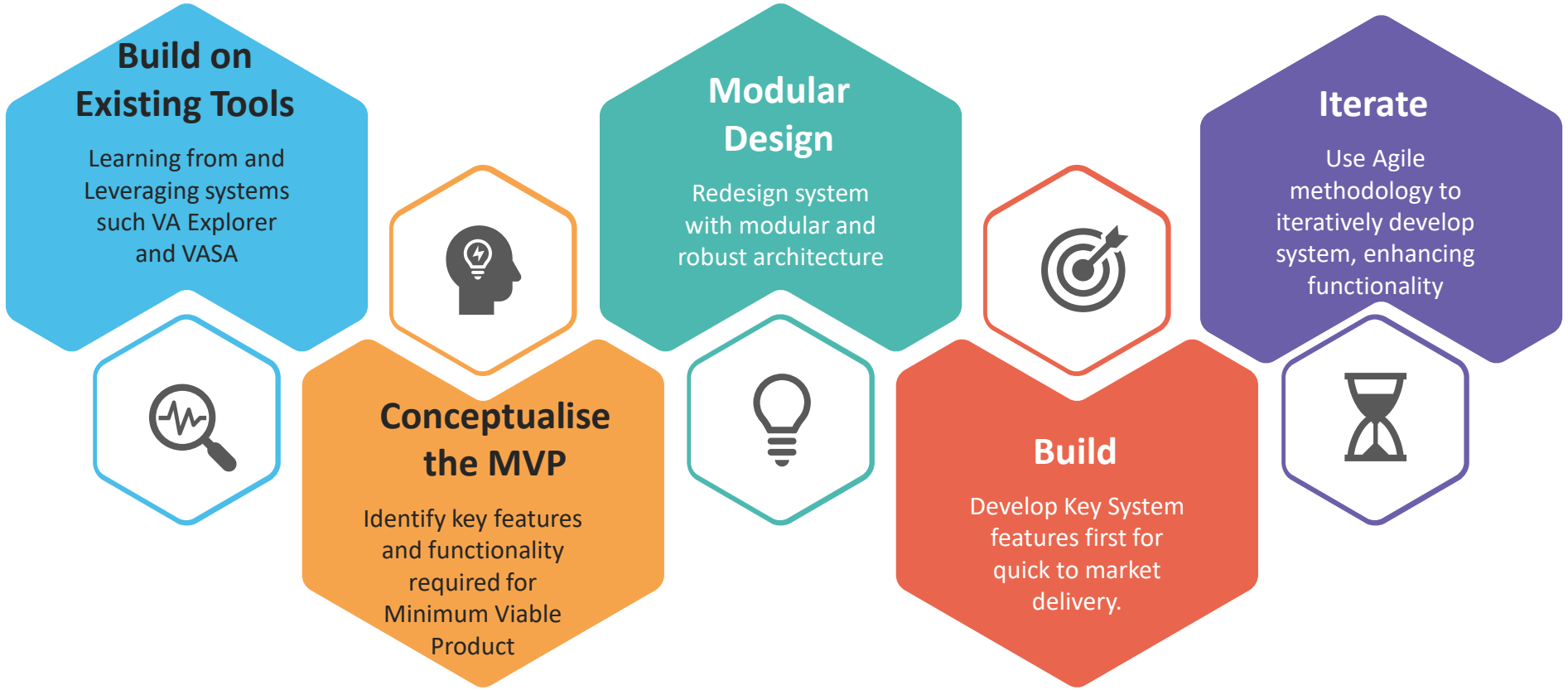
Starting point for system development

- Adopt an already existing package,
- Adapt an already existing package in line with unique requirements or
- Build from scratch?

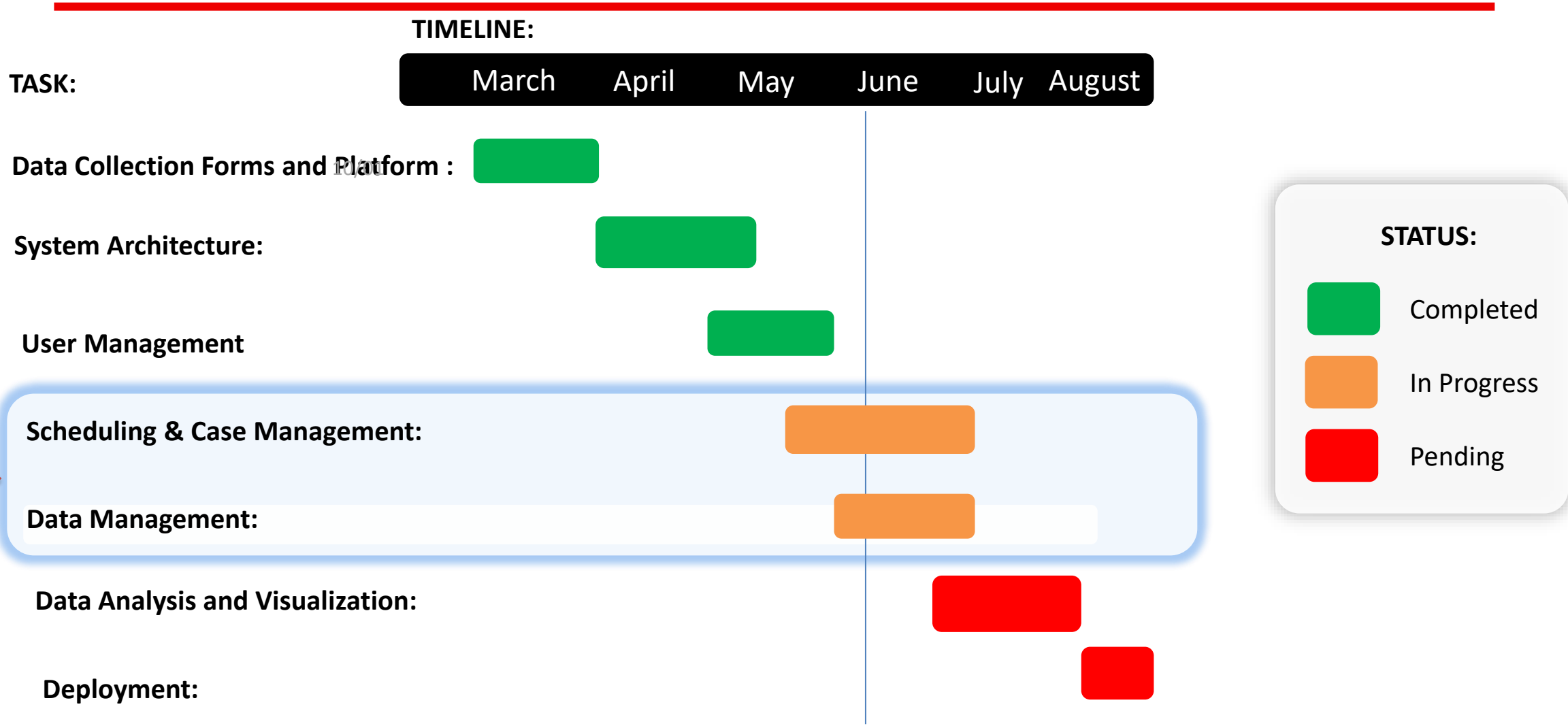
Approach towards system development

- Financial and human resource capacity
- Development and implementation timelines

SRS VA-IT System Development Approach



SRS VA IT System Development Status



Summaries and Control Panel

Last Data Update	Last VA Interview	Coded VAs	Uncoded VAs
2025-05-31	2025-05-29	165	0

Note: this dashboard visualizes only Coded VAs and all charts will sum to the value in the Coded VAs cell above.

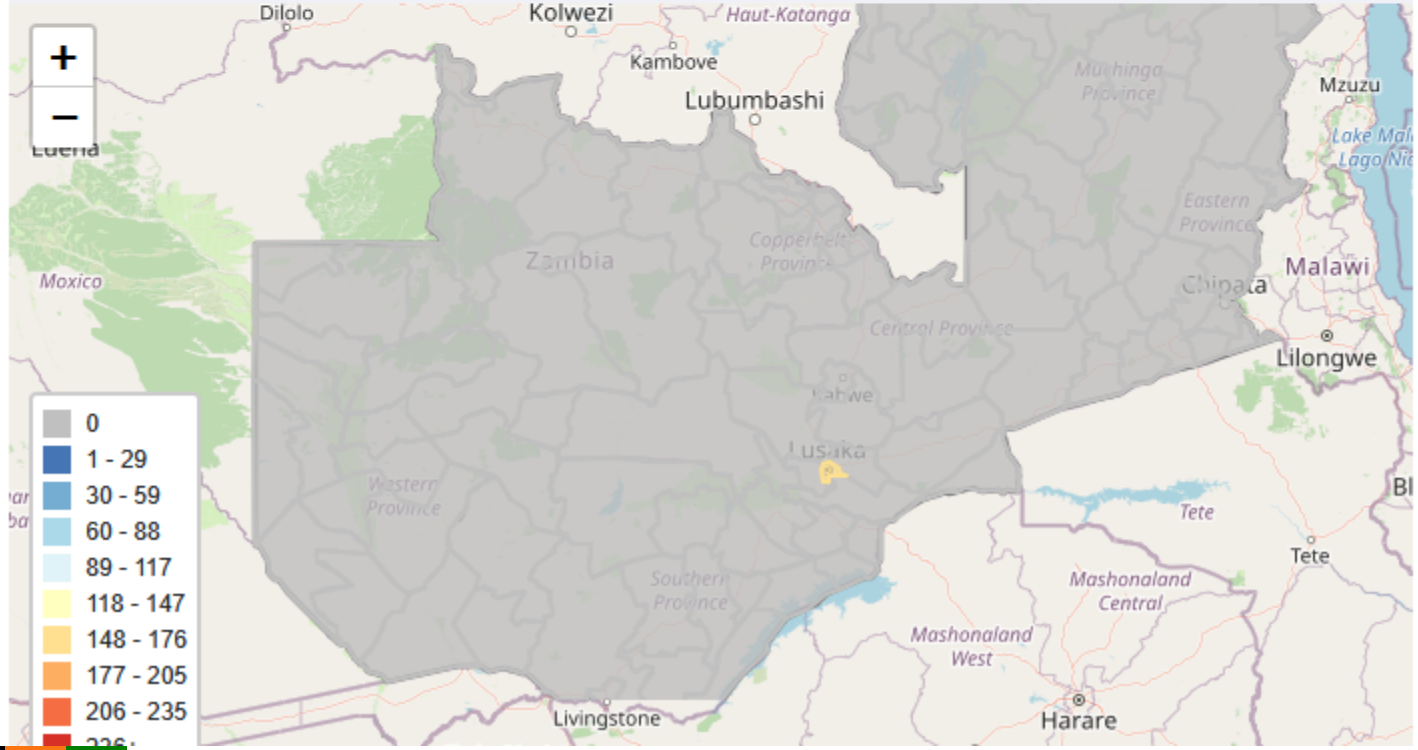
Cause of Death: All Causes | Age: All | Sex: All

Death Date: Any Time

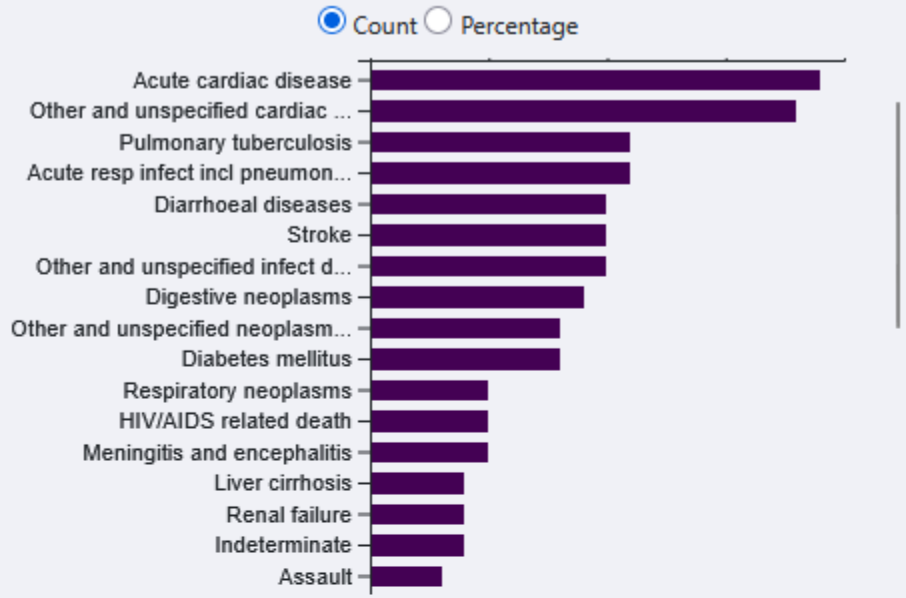
Reset

Geographic Distribution

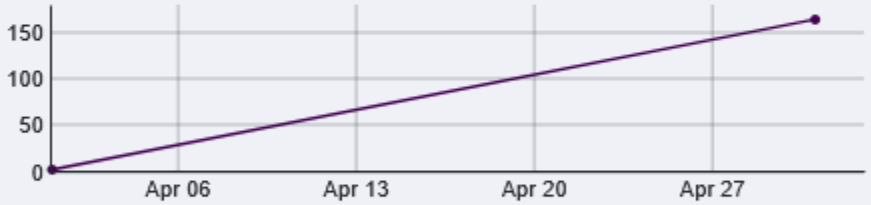
Map View: District | All Districts



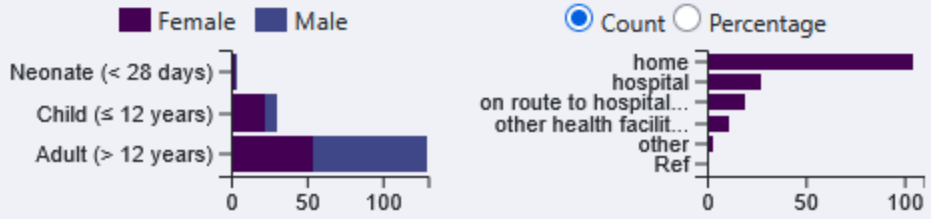
Cause of Death Analysis



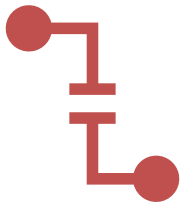
Trend



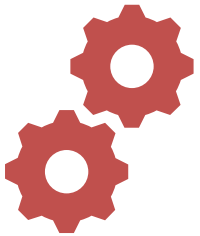
All Cause Demographics



Final Thoughts



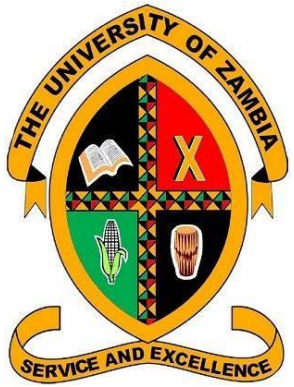
VA IT systems are critical to address MS data fragmentation, Silos and inefficient data collection



SRS VA-IT system integration core feature and not after thought

SMART guidelines useful in developing user requirements

Acknowledgements



Gates Foundation


Thank you for your attention
SafariBookings.com
Photo © nini

Panel Discussion and Q&A with Presenters

Closing