

FASTR Workshop - Example Country

January 15-17, 2025 | Capital City, Country

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Workshop Agenda

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Workshop Objectives

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By the end of this workshop, participants will be able to:

1. **[Objective 1]** - e.g., Extract and prepare routine health data for analysis
2. **[Objective 2]** - e.g., Apply data quality assessment methods to identify issues
3. **[Objective 3]** - e.g., Generate coverage estimates using the FASTR methodology
4. **[Objective 4]** - e.g., Interpret and communicate findings to stakeholders

Country Health System Overview

Capital City, Country

Health System Structure

| Level | Description |
|----------|---------------------------|
| National | [Ministry of Health] |
| Regional | [X provinces/regions] |
| District | [X districts] |
| Facility | [X,XXX] health facilities |

Reporting to DHIS2: [X,XXX] ([XX%])

Population

| Group | Estimate |
|---------------------------|---------------|
| Total population | [XX million] |
| Women of reproductive age | [X.X million] |
| Children under 5 | [X.X million] |
| Expected pregnancies/year | [XXX,XXX] |
| Expected live births/year | [XXX,XXX] |

Data Sources

Routine data:

- DHIS2 (reporting rate: [XX%])

Survey data:

- [DHS/MICS YYYY]

Introduction to FASTR

The Global Financing Facility (GFF) supports country-led efforts to improve the timely use of data for decision-making, ultimately leading to stronger primary healthcare (PHC) systems and better reproductive, maternal, newborn, child, and adolescent health and nutrition (RMNCAH-N) outcomes. This set of initiatives and technical support is referred to as **Frequent Assessments and Health System Tools for Resilience (FASTR)**.

FASTR encompasses four technical approaches: (1) RMNCAH-N service use monitoring using routine HMIS data, (2) rapid-cycle health facility phone surveys, (3) high-frequency household phone surveys, and (4) follow-on analyses. **This methodology documentation focuses specifically on the first approach: RMNCAH-N service use monitoring.**

RMNCAH-N Service Use Monitoring

The GFF collaborates with Ministries of Health to conduct rapid-cycle analyses of routine health management information system (HMIS) data. This approach addresses three core objectives:

1. **Assess data quality** at national and sub-national levels to identify and address completeness, accuracy, and consistency issues
2. **Track service utilization changes** by measuring monthly shifts in priority RMNCAH-N health service volumes
3. **Monitor coverage progress** by comparing service delivery trends against country-specific targets and benchmarks

These analyses focus on priority indicators tied to national health reforms and World Bank investments, with findings informing country planning processes and project implementation cycles. During the COVID-19 pandemic, the GFF supported Ministries of Health in over 20 countries to monitor the impact of the pandemic on essential health services using this approach.

 Steps to implement RMNCAH-N service use monitoring.

Figure 1. Steps to implement RMNCAH-N service use monitoring

Why rapid-cycle analytics?

Existing health systems data sources are critical but often come with challenges that limit their use. Health management information system data may not be analyzed promptly or may be perceived as too low-quality to use for decision making. Traditional in-person household and facility-based surveys demand extensive resources and time, with long lags between survey design, data collection, and the availability of findings. This prevents decision-makers from using data to drive meaningful improvements in health outcomes. To fill this gap, the GFF supports countries to develop and use rapid-cycle analytic approaches.

| How does it work?

Rapid-cycle analytic approaches provide timely, rigorous, and high-priority data that respond to each country's specific priorities and data use needs. This continuous cycle of analyze-learn-strengthen-act seeks to improve the systematic use of data for decision-making towards improved RMNCAH-N outcomes.

 FASTR rapid-cycle analytics framework showing the continuous cycle of analyze, learn, strengthen, and act.

Figure 2. FASTR's rapid-cycle analytics approach: Analyze, learn, strengthen, act

Technical Approaches

FASTR's four technical approaches, underpinned by capacity strengthening and data use support, enable countries to use rapid-cycle analytics for strengthening PHC systems and improving RMNCAH-N outcomes through the timely and high-frequency analysis and use of data.

- 1. Analysis of routine health management information system (HMIS) data** assesses data quality, quantifies changes in priority health service volumes, and compares trends in service coverage to country targets for priority RMNCAH-N indicators.
- 2. Rapid-cycle health facility phone surveys** assess the performance of PHC facilities, monitor the implementation of reforms, identify the impact of shocks, and track changes over time. The phone survey is administered to a representative panel sample of PHCs over four quarterly contacts a year.
- 3. High-frequency household phone surveys** provide a snapshot of care seeking behavior, foregone care, financial protection, service coverage, and patient experience of care. Household surveys are currently done in partnership with the World Bank's Living Standards Measurement Study.
- 4. Follow-on analyses** employ root cause analysis and implementation research approaches to provide deeper understanding of issues uncovered by rapid-cycle analytics (e.g., explaining district-level performance variation, contextualizing the impact of health systems reforms, or investigating underlying causes of data quality issues and service delivery disruptions).

Illustrative capacity-building activities include support to automate the extraction, cleaning, and analysis of routine data and support to institutionalize rapid phone survey data collection and analysis approaches. Data use support prioritizes the integration of rapid-cycle analytics into existing data review and feedback mechanisms at national and subnational levels to strengthen the systematic use of data for decision making.

FASTR Approach to Routine Data Analysis

The FASTR approach to routine data analysis takes a three-pronged approach:

- 1. Identify issues in data quality**
- 2. Adjust for issues with data quality** to improve analysis accuracy
- 3. Analyze data to answer pressing country-specific policy questions** including identifying changes in priority service volumes and trends in service coverage as compared to country priorities and targets

This approach enables identification of the highest priority data quality issues and subsequent necessary analytical adjustments so that data can be continually improved while appropriate analyses are conducted. Data quality assessment is conducted by indicator and can be disaggregated at sub-national level given facility-level data is used for the analysis. This is important to generate policy relevant regular reporting on data quality, service volume, and coverage estimates which provides a continual snapshot of RMNCAH-N service use.

| Focus on a Set of Core Indicators

The FASTR approach to routine data analysis focuses on a core set of RMNCAH-N indicators that characterize the reproductive, maternal and child healthcare continuum, priority health areas across LMICs. These indicators capture key service delivery events, which have higher completeness rates and higher volume. In addition, these indicators serve as proxies for other services and interventions delivered at the same service contact. In addition, outpatient consultations (OPDs) are used as a proxy for the general use of health services. Additional, country and program-specific indicators can be added to the analysis to be responsive to country priorities.

| Focus on a Set of Core Data Quality Metrics

The FASTR approach to routine data analysis focuses on a core set of data quality metrics which enables identification of the highest priority data quality issues for which data quality adjustments can be made. In addition to the core data quality measures, the FASTR approach generates an overall data quality score which combines the core metrics into a single summary measure.

Tea Break

15 minutes

We'll resume at 10:45 AM

National Health Priorities

Capital City, Country

Key Health Indicators

| Indicator | Current ([YYYY]) | Target |
|--------------------------|------------------|--------|
| ANC4 coverage | [XX%] | [XX%] |
| Skilled birth attendance | [XX%] | [XX%] |
| Penta3 coverage | [XX%] | [XX%] |
| Measles coverage | [XX%] | [XX%] |

Source: [DHS/MICS YYYY]

Priority Areas for This Analysis

1. [Priority 1] - e.g., Maternal and newborn health
2. [Priority 2] - e.g., Childhood immunization
3. [Priority 3] - e.g., Malaria prevention

Why these priorities?

[Brief explanation of why these were selected]

Why Extract Data?

| Why Extract Data from DHIS2? Why not analyse directly inside DHIS2?

The FASTR Analytics Platform applies data quality adjustments

The FASTR methodology includes specific approaches to:

- Identify and adjust for outliers
- Adjust for incomplete reporting
- Apply consistent data quality metrics

These adjustments require processing that cannot be done within DHIS2's native analytics.

| What Format and Granularity is Required?

Data should be extracted at the **facility-month level** to enable:

- Facility-level data quality assessment
- Subnational disaggregation of results
- Longitudinal trend analysis

Tools for Data Extraction

Content to be developed

This section will cover:

- DHIS2 data export options
- API-based extraction methods
- Data transformation requirements
- Quality checks on extracted data

Lunch Break

60 minutes

We'll resume at 1:00 PM

Data Quality Assessment

Understanding the reliability of routine health data

Why Talk About Data Quality?

The challenge: Health facilities report data every month, but sometimes:

- Numbers seem too high or too low
- Facilities forget to report
- Related numbers don't match up

The impact: Bad data leads to bad decisions

- We might think services are improving when they're not
- We might miss real problems in certain areas
- Resources might go to the wrong places

FASTR's solution: Check data quality systematically, fix what we can, and be transparent about limitations

Three Simple Questions About Data Quality

1. Are facilities reporting regularly?

- Completeness: Did we get reports from facilities this month?

2. Are the numbers reasonable?

- Outliers: Are there any suspiciously high values?

3. Do related numbers make sense together?

- Consistency: Do related services show expected patterns?

These three questions help us understand if we can trust the data for decision-making.

Question 1: Are Facilities Reporting?

Completeness: Did We Get Reports?

What we're checking:

Each month, are facilities sending in their reports?

Example:

- District has 20 health centers
- In March, only 15 sent ANC data
- **Completeness = 75%** (15 out of 20 reported)

Why it matters:

- If many facilities don't report, we're missing part of the picture
- Trends might look like services dropped, when really facilities just didn't report

What's Good Completeness?

It depends on your health system:

- 90%+ is excellent
- 80-90% is good
- Below 80% means we're missing a lot of information

Important: Even 100% completeness doesn't mean we have the full picture - some services might happen outside facilities or some facilities might not be in the reporting system.

What to look for: Is completeness improving over time? Which areas have low completeness?

Completeness: FASTR Output

 Indicator Completeness

Question 2: Are Numbers Reasonable?

Outliers: Spotting Suspicious Numbers

What we're checking:

Are there any values that seem way too high compared to what that facility normally reports?

Real example:

- Health Center A normally reports 20-25 deliveries per month
- In March, they reported 450 deliveries
- **This is likely a data entry error** (maybe they typed an extra digit, or reported cumulative instead of monthly)

Why it matters:

- One extreme value can make it look like there was a huge service increase
- Skews totals and trends for the whole district or province

How We Spot Outliers

We use two checks:

Check 1: Is this value much higher than usual for this facility?

- Look at the facility's typical monthly values
- If one month is extremely different, flag it

Check 2: Does one month account for most of the year's total?

- If March has 80% of the facility's annual deliveries, something's wrong
- Services should be spread more evenly across months

Both checks together help us find data entry errors or reporting problems.

Outlier Example

Health Center B - Malaria Tests:

| Month | Tests Reported | Normal? |
|--------------|----------------|----------------|
| January | 245 | Normal |
| February | 267 | Normal |
| March | 2,890 | Outlier |
| April | 256 | Normal |

What happened? Probably someone entered "2890" instead of "289" (extra zero)

Impact if we don't fix it: March would show a huge "spike" in malaria that didn't really happen.

Outliers: FASTR Output

 Outliers

Question 3: Do Related Numbers Match Up?

Consistency: Do Related Services Make Sense Together?

What we're checking:

Health services are related - certain patterns are expected.

Example 1 - ANC visits:

- More women should get their **1st** ANC visit (ANC1)
- Fewer should complete all **4** visits (ANC4)
- We expect: $ANC1 \geq ANC4$

Example 2 - Vaccinations:

- More babies should get their **1st** Penta dose (Penta1)
- Fewer should complete all **3** doses (Penta3)
- We expect: $Penta1 \geq Penta3$

If these relationships are backwards, something's wrong with the data.

Why Check Consistency at District Level?

Patients move between facilities:

- Woman might get ANC1 at Health Center A
- But deliver at District Hospital B
- If we only look at each facility separately, numbers might not match

Solution: Check consistency at district level

- Add up all ANC1 visits in the district
- Add up all ANC4 visits in the district
- Compare the totals

This accounts for patients visiting different facilities for different services.

Consistency Example

District X - ANC Services:

| Indicator | District Total | Expected Relationship |
|-----------|----------------|-----------------------|
| ANC1 | 5,200 visits | Should be higher |
| ANC4 | 4,100 visits | Should be lower |

This passes the consistency check - more women started ANC (5,200) than completed 4 visits (4,100).

If it was reversed (more ANC4 than ANC1), we'd know there's a data quality problem.

Consistency: FASTR Output

 Internal Consistency

Putting It All Together: Overall Data Quality

Overall Quality Score

For each facility and month, we combine all three checks:

Complete: Did the facility report?

No outliers: Are the numbers reasonable?

Consistent: Do related numbers make sense?

If all three pass -> Quality Score = 1 (good quality)

If any fail -> Quality Score = 0 (quality issue)

This score helps us:

- Decide which data to use for analysis
- Identify facilities that need support
- Track if data quality is improving over time

Overall DQA Score: FASTR Output

 Overall DQA Score

Mean DQA Score: FASTR Output

 Mean DQA Score

Afternoon Break

15 minutes

We'll resume at 3:30 PM

Data Quality Findings

Capital City, Country | January 15-17, 2025

Reporting Completeness

Overall completeness: [XX%]

| Region/Province | Completeness |
|-----------------|--------------|
| [Region 1] | [XX%] |
| [Region 2] | [XX%] |
| [Region 3] | [XX%] |

Outliers Detected

Total outliers flagged: [XXX] facility-months

Most common issues:

- [Issue 1] - e.g., Decimal point errors
- [Issue 2] - e.g., Cumulative vs monthly reporting

Consistency Checks

Pass rate: [XX%] of districts

| Check | Result |
|------------------|-----------|
| ANC1 >= ANC4 | [X%] pass |
| Penta1 >= Penta3 | [X%] pass |
| BCG ~ Penta1 | [X%] pass |

Approach to Data Quality Adjustment

The Data Quality Adjustment module (Module 2 in the FASTR analytics platform) systematically corrects two common problems in routine health facility data:

1. **Outliers** - extreme values caused by reporting errors or data entry mistakes
2. **Missing data** - from incomplete reporting

Rather than simply deleting problematic data, this module replaces questionable values with statistically sound estimates based on each facility's own historical patterns.

Four Adjustment Scenarios

The module produces four parallel versions of the data:

| Scenario | Description |
|-------------------|-----------------------------------|
| None | Original data, no adjustments |
| Outliers only | Only outlier corrections applied |
| Completeness only | Only missing data filled in |
| Both | Both types of corrections applied |

This allows analysts to understand how sensitive their results are to different data quality assumptions.

Adjustment for Outliers

For each value flagged as an outlier, the module calculates what the value "should have been" based on that facility's historical pattern.

Methods used (in order of preference):

1. Average of 3 months before and 3 months after
2. Same month from the previous year (for seasonal indicators)
3. Facility-specific historical average

| Outlier Adjustment: FASTR Output

Percent change in volume due to outlier adjustment.


Heatmap showing percent change in service volumes due to outlier replacement.

Adjustment for Completeness

For months where data is missing or marked as incomplete, the module imputes (fills in) values using the same rolling average approach.

This ensures that temporary reporting gaps don't create artificial drops to zero in the data.

| Completeness Adjustment: FASTR Output

 Percent change in volume due to completeness adjustment.

Heatmap showing percent change in service volumes due to missing data imputation.

See You Tomorrow!

Day 1 Complete

We resume tomorrow at **9:00 AM**

Tomorrow: Data Analysis

Service Utilization Analysis

The Service Utilization module analyzes health service delivery patterns to detect and quantify disruptions in service volumes over time.

Key capabilities:

- Identifies when health services deviate significantly from expected patterns
- Measures magnitude of disruptions at national, provincial, and district levels
- Distinguishes normal fluctuations from genuine disruptions requiring investigation

| Two-Stage Analysis Process

Stage 1: Control Chart Analysis

- Model expected patterns using historical trends and seasonality
- Detect significant deviations from expected volumes
- Flag disrupted periods

Stage 2: Disruption Quantification

- Use panel regression to estimate service volume changes
- Calculate shortfalls and surpluses in absolute numbers

Surplus and Disruption Analyses

The module detects multiple types of service disruptions:

| Disruption Type | Description |
|-----------------------|--|
| Sharp disruptions | Single months with extreme deviations |
| Sustained drops | Gradual declines over several months |
| Sustained dips | Periods consistently below expected levels |
| Sustained rises | Periods consistently above expected levels |
| Missing data patterns | Gaps in reporting that may signal problems |

| Quantifying Impact

Disruption analysis quantifies shortfalls and surpluses by comparing:

- **Predicted volumes** (what would have happened without disruption)
- **Actual volumes** (what was observed)

Results are reported in absolute numbers and percentages at each geographic level.

Service Coverage Estimates

This module estimates health service coverage by answering: **"What percentage of the target population received this health service?"**

Three data sources integrated:

1. Adjusted health service volumes from HMIS
2. Population projections from United Nations
3. Household survey data from MICS/DHS

| Two-Part Process

Part 1: Denominator Calculation

- Calculate target populations using multiple methods (HMIS-based and population-based)
- Compare against survey benchmarks
- Automatically select best denominator for each indicator

Part 2: Coverage Estimation

- Override automatic selections based on programmatic knowledge
- Project survey estimates forward using HMIS trends
- Generate final coverage estimates

Tea Break

15 minutes

We'll resume at 10:45 AM

Coverage Analysis Results

Capital City, Country | January 15-17, 2025

Key Coverage Estimates

| Indicator | FASTR | Survey ([YYYY]) | Difference |
|--------------------------|-------|-----------------|------------|
| ANC1 | [XX%] | [XX%] | |
| ANC4 | [XX%] | [XX%] | |
| Skilled birth attendance | [XX%] | [XX%] | |
| Penta3 | [XX%] | [XX%] | |
| Measles | [XX%] | [XX%] | |

Comparison with [DHS/MICS YYYY]

Key findings:

- [Finding 1 - how do FASTR estimates compare?]
- [Finding 2 - any notable differences?]
- [Finding 3 - what might explain differences?]

Geographic Variations

Highest coverage:

- [Region/District] - [XX%]

Lowest coverage:

- [Region/District] - [XX%]

Equity implications:

[Brief note on geographic disparities]

Next Steps & Action Items

Immediate Actions (Next 2 Weeks)

- [] **[Action 1]** - e.g., Share preliminary findings with MOH
- [] **[Action 2]** - e.g., Request additional data for [specific gap]
- [] **[Action 3]** - e.g., Schedule follow-up meeting

Responsible: [Names/Teams]

Short-term Actions (Next 3 Months)

1. Data quality improvements

- [Specific action]
- [Specific action]

2. Capacity building

- [Training need]
- [Support required]

3. Integration with planning

- [How findings will be used]

Long-term Recommendations

- **Routine updates:** [Frequency of FASTR refresh]
- **System strengthening:** [Key improvements needed]
- **Institutionalization:** [How to make this sustainable]

Questions & Discussion

Contact: fastr@example.org

Resources: <https://fastr.org>

Thank You!

Questions & Discussion

Contact Information

FASTR Team

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