Global Fund Data Quality Improvement Framework

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Executive summary

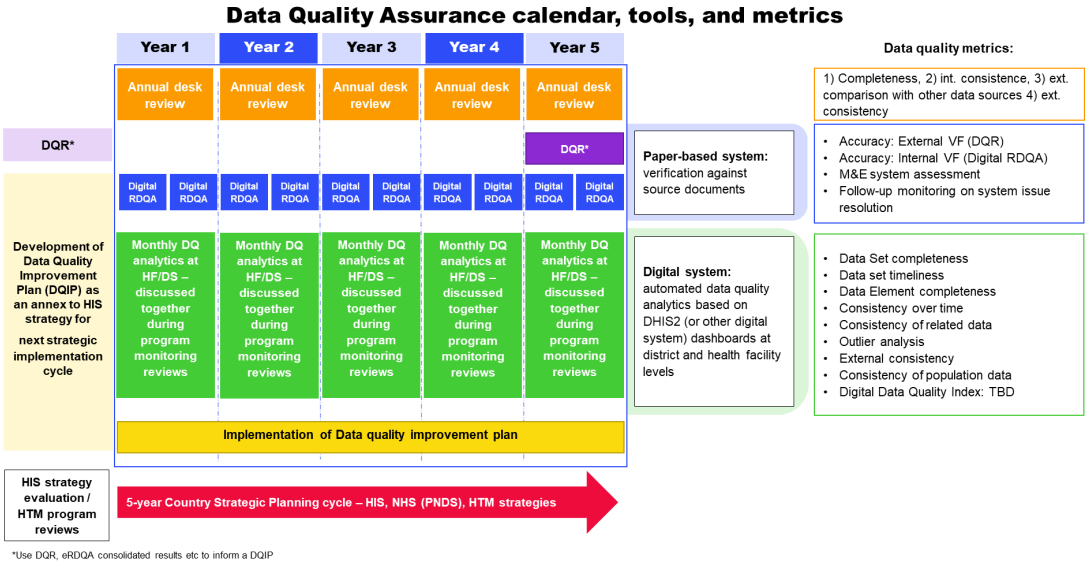
Despite important progress in strengthening national health information systems, data quality remains a major challenge in many countries. The Global Fund needs to invest more strategically in sustainable, country-led efforts to ensure data quality. The evolution of data systems and their digitization offer great opportunities. However, the declining funding landscape and difficult trade-offs that deprioritize data investments pose a serious threat. Figure 1 summarizes key proposed interventions along a national strategic planning cycle for Global Fund High Impact and Core portfolios.

Countries should consider including investments in data quality enablers such as data collection and reporting tools, capacity building, SOPs, digitalization and others.
Based on the country's Health Management Information System (HMIS) maturity, the Global Fund recommends that High Impact and Core portfolios consider implementing the following data quality assurance interventions:

1. Develop a national data quality improvement plan (DQIP), including community data, to address identified root-causes.
2. Adopt as soon as possible the DHIS2 Data Quality Toolkit (if they use DHIS2) with improved data quality functionalities, including analytics.
3. Digitize RDQAs (Routine Data Quality Assessment) already used in routine supervisions – routine data audits allow for closer and quicker action on data quality issue resolution at peripheral level.
4. Strengthen existing country data processes, especially at the subnational level, such as data validation meetings, and adapt their scope to analyze data quality and program performance, interpret results, and take action to improve data and program implementation. Data analysis will improve data quality.

Updated metrics generated in digital systems will allow for more meaningful monitoring of data quality.

Figure 1: Data quality assurance calendar, tools, and metrics within a national strategic planning cycle



1. Context

Despite important progress in strengthening national health information systems, data quality remains a major challenge in many countries. The absence of granular, timely, and quality data at the appropriate level hampers programming and evidence-based decision-making, resulting in inefficient use of resources and lack of health impact. Further progress is contingent on improving data quality.

The Global Fund needs to invest more strategically in sustainable, country-led efforts to ensure data quality. The evolution of health data systems and their digitization offer great opportunities that are not yet fully seized. In addition, the declining funding landscape and difficult trade-offs that deprioritize data investments pose a serious threat. In this document, we outline interventions for countries to consider when requesting funding from the Global Fund. These include investments in data quality enablers (e.g., data collection and reporting tools, capacity building, SOPs, digitization, etc.) and different options for data quality assurance interventions based on the country's HIS maturity. The Global Fund strongly encourages countries to consider opportunities to integrate data quality interventions (e.g., integrated implementation of data quality audits and supervision), as data quality is a systemic, not a disease-specific concern and should be addressed through systemic solutions.

In 2023, the Global Fund, in collaboration with WHO, initiated a partner consultation process to discuss a harmonized approach to data quality improvement.[1] It was agreed that leaner, more frequent, and innovative solutions to measure and improve data quality as close (in space and time) to the point of data production as possible are needed. The Global Fund's framework is fully aligned with the forthcoming WHO *Country Health Statistics Quality Assurance Framework* for routine and non-routine data.

This document focuses on programmatic data quality and is intended for High Impact and Core portfolios. Focused portfolios are welcome to choose options that meet their contextual needs.

2. Systemic Data Quality Investments

Strengthening data quality requires a systemic (integrated) approach. Conducting data quality audits alone is not enough. Data quality audits should facilitate the independent identification of underlying issues, an understanding of the status of data quality, and the triggering of targeted investments to improve the situation. While periodic and independent data audits may be considered necessary, they are not the only source of information that can inform strategic investments. In many settings, the underlying problems are well known, but ownership, strategic planning, and prioritized funding to address them do not always follow.

2.1 Data Quality determinants

The quality of data is compromised from the outset of the data journey. Several factors contribute to the poor quality of data, including a lack of:

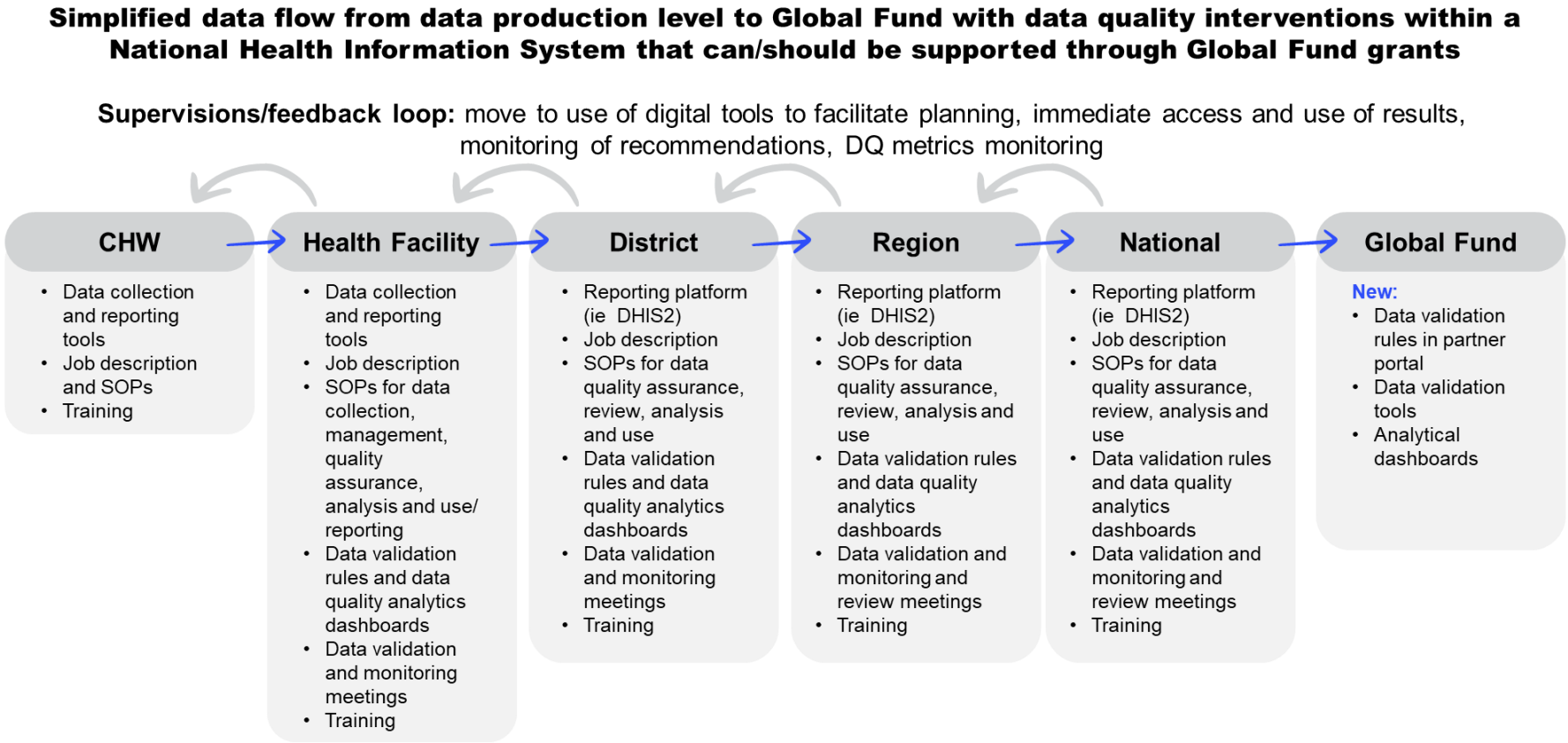
- clear data element/indicator/standards definitions

[1] Participating partners: GFF, CHISU, PMI, PEPFAR, WAHO, UNICEF, CDC, PATH, Malaria Consortium, UiO, HISP WCA, AEDES

- few, simple and standardized collection and reporting tools (paper/digital)
- qualified and trained human resources
- sustainable approach to capacity building (pre-service, in-service, mentoring, etc.)
- clear SOPs on data related processes and responsibilities through the data journey
- job descriptions with clear roles and responsibilities
- systematic data analysis, interpretation and use, at all levels, but especially at subnational levels to guide quality improvement and efficient use of resources
- routine data quality assurance interventions
- periodic data audits to guide system investments for data quality strengthening
- data quality improvement plans to strategically address data quality gaps/root-causes in the national system, that are implemented and monitored
- strong governance
- priority and sufficient resources attributed to data quality interventions

Interventions to improve data quality are needed at all levels of the health pyramid. Figure 2 shows a selection of priority data quality interventions, ranging from country data collection to reporting to the Global Fund. These interventions address many of the factors identified above that contribute to poor data quality. Funding and reprogramming requests to the Global Fund should be informed by country prioritized systemic gaps to address data quality.

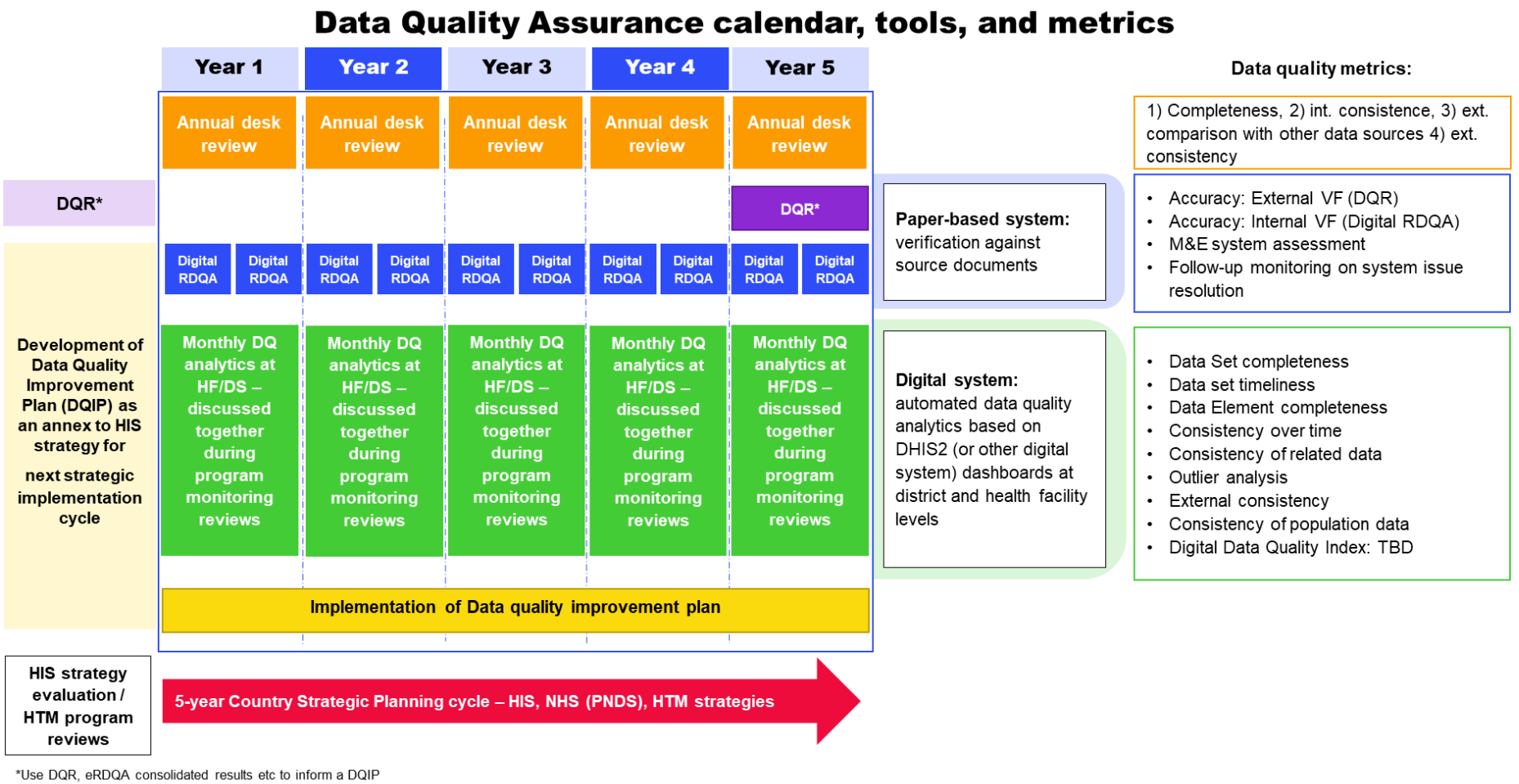
Figure 2: Illustrative data quality interventions from data collection to Global Fund reporting



2.2 Global Fund Data Quality Improvement Framework and available tools

The Global Fund Data Quality Improvement Framework is aligned with the forthcoming WHO *Country Health Statistics Quality Assurance Framework for routine and non-routine data*. It embraces a national strategic planning cycle and builds on existing country practices and widely used tools. The list of tools and approaches should guide countries in directing strategic data quality investments based on their portfolio needs. The proposed mix of independent assessments and routine system strengthening is designed to ensure the reliability of the data produced. Although some of the concrete solutions mentioned have been integrated into DHIS2 (used in 44/54 HI/Core countries), they are intended to be system agnostic and should be integrated into any other digital platform. Figure 3 illustrates Global Fund's strategic support for strengthening sustainable country-led data quality assurance.

Figure 3: Summary of national strategic planning cycle for data quality with recommended tools for use



*Use DQR, eRDQA consolidated results etc to inform a DQIP

The maturity of a country's data system should inform the selection of the subsequent options:

1. Develop a **Data Quality Improvement Plan (DQIP)** or a national data quality strategy . It should describe the priorities and focused approach for addressing identified data quality issues during the assessment. This plan can be either fully integrated into an HIS strategy or can be an appendix. We encourage countries to develop and implement DQIPs even if data accuracy at national level is good, as there will be differences at the subnational level that should be addressed.

   There are a variety of data audit tools that provide measurement of accuracy and a system assessment. The World Health Organization (WHO) has issued an integrated approach to data quality through its data quality assurance (DQA) guidance including a data quality review (DQR) for community health data[2]. Vertical approaches coexist, such as the multi-partner HIV cohort audit (ART; VL)[3] and the malaria or TB surveillance assessments. Countries should explore **opportunities for integration** whenever possible. It is crucial to undertake careful planning to prevent the system from becoming overburdened with duplicate assessments and to allow sufficient time for the implementation of corrective measures before repeating the exercise. It is advisable that integrated data quality audits should not be implemented more frequently than once (every five years) in a national strategic planning cycle, as it is acknowledged that consecutive system strengthening measures require time to be planned for and implemented before any improvement can be expected.

2. Adopt the **DHIS2 data quality toolkit** (or use data quality functionalities in any other digital system in use in country), which provides essential resources for implementing revised data quality functions within DHIS2. Among the toolkit's novelties are additional data quality metrics and data quality analytics for district and health facility levels, which countries can utilize to inform their data validation and review meetings. Further work is being conducted to define a digital data quality index. We strongly recommend that all HI/Core countries using DHIS2 adopt the updated data quality functionalities and prioritize their actual use.

3. On an annual basis, the country may conduct a desk review using the **WHO Data Quality Tool** integrated now in the core instance of DHIS2. This tool provides analytics on completeness, internal consistency, comparison with other data sources, and external consistency. It has been informed by the desk review component of the DQA.

4. On a routine basis, many countries conduct monthly or **quarterly data validation and review meetings** at the district and health facility levels including for community health service data. These meetings should commence with an analysis of the quality of

[2] The community DQR remains to be piloted to inform operational considerations.
[3] Please reach out to your country team to receive a copy of the guidance and tools.

collected data and then proceed to a performance analysis of key indicators representing local priorities. The analysis should be followed by an interpretation of results, which will inform the implementation of actions to improve data quality and program implementation. The ACUIS initiative[4] has developed a range of resources for this purpose that can be adapted to suit the specific country needs. There is an intrinsic relationship between data quality and data use: data analysis and use will improve data quality, which in turn will motivate wider data use.

The Data SI funds (2018-2023) have supported significant endeavors to enhance capacity in data analysis, interpretation, and use, including at subnational levels. This has been achieved through the establishment and operationalization of partnerships between local academic institutions and ministries of health in selected countries. PERSUADE[5] has been implemented in Eastern and Southern African countries, while ACUIS[6] has been implemented in West and Central African countries. We strongly encourage countries to scale-up or introduce this approach through grant funds to improve the quality of already funded country processes.

5. A significant number of countries employ the **RDQA methodology** during routine data-related supervisions. The original excel-based tool has been digitized. It is recommended that **digitalized supervision** be employed, as it offers several advantages. These include the capacity to plan and display upcoming supervisions, the option of targeting implementation by selecting indicators based on predefined performance criteria, the capacity to collect data digitally, which allows for rapid access to results and consolidated analytics for strategic planning and investments, and the capacity to define and follow up on recommendations at different levels. Moreover, it enables the collection of accuracy measurement.[7]

6. Throughout the national strategic cycle, it is important to **monitor the implementation of the DQIP** to address bottlenecks, optimize or reprogram money towards existing gaps.

   A decision tree is included in Annex 1 to assist Countries and CTs in selecting data quality strengthening and assurance activities, including Local Fund Agents (LFA) assurance options. Annex 2 provides guidance on investments in data quality interventions and assurance during Global Fund funding applications, grant-making, and reprogramming opportunities.

3. Updated data quality metrics

To date, the Global Fund has concentrated its monitoring efforts on measuring data quality in terms of reporting completeness and timeliness, with periodic assessments of accuracy. The implementation of revised and innovative tools will provide access to additional data quality

[4] Resources available here: https://acuis.mn.co.
[5] PERSUADE led by Makarere University covered the following countries: Kenya, Tanzania, Zimbabwe, Zambia, DRC, Malawi, Lesotho, Eswatini, Mozambique, Angola, Uganda.
[6] ACUIS led by the AEDES Consortium, covered the following countries: Benin, Burkina Faso, Cameroun, Gambia, Ivory Coast, Mali, Senegal, Sierra Leone.
[7] The Global Fund worked closely with partners to develop a harmonized application that is adaptable to country and donor needs to avoid the proliferation of multiple applications used in a single country.

metrics that will be more insightful and address existing gaps. Some of the metrics have been available for some time in digital systems but are widely underutilized.

While reporting completeness has improved, it may mask reports that have been submitted with incomplete data elements. The use of data element completeness, reporting consistency over time and outlier analysis may help to address the practice of reporting inaccurate or missing data elements to make the reporting deadlines. Furthermore, digital RDQA will facilitate more frequent accuracy measurement. In the near future, these metrics will be complemented by a digital system data quality index combining different metrics to provide an indication (not a perfect measure) of data quality in digital systems. This is of great relevance, as some countries are moving to entirely digitalized health information systems. Partner discussions are underway to define this index.

To have an impact on data quality, it is important that these new metrics are analyzed, discussed, and underlying issues resolved during existing processes at each level of the health pyramid. These processes include data validation and monitoring meetings at the health facility, district, regional, and national levels. Table 1 summarizes the data quality metrics that will be monitored by the secretariat for all HI/Core countries depending on the level of maturity of their HMIS[8]. Their reporting will depend on the uptake of the DHIS2 data quality toolkit, or inclusion of the metrics in any other digital system.

Table 1: Data Quality metrics monitored by the Global Fund Secretariat by data source and frequency. Newly introduced metrics are highlighted in bold

Frequency	Digital Systems (e.g. DHIS2/other)	Paper-based Systems
Annually	• Reporting completeness • **Data element completeness (progressively, depending on country uptake of the DHIS2 data quality toolkit)** • Reporting timeliness • **Digital system data quality index** • **Consolidated routine accuracy (source: digital RDQA, depending on country uptake)**	• Reporting completeness • Reporting timeliness
Periodically (by default, every five years, or once in a grant life cycle for tDQR if accuracy +/-20%)	• Accuracy (source: DQR/tDQR/eRDQA)	• Accuracy (source: DQR/tDQR/eRDQA)

A more detailed table with additional available metrics and their sources is included in Annex 3.

[8] Data on country digital HMIS maturity is collected through the M&E System profiles and the Global Digital Health Monitor. MECA consolidates and updates the data on an annual basis.

4. Complementary Global Fund assurance options (Data System spot-checks)

The targeted DQR (tDQR), implemented by the LFA or other service providers, remains an option in cases where the data quality is consistently poor, prompting the CT to seek an interim solution to measure the external data accuracy.

However, it is of greater importance to direct attention to the implementation of the recommendations stemming from the periodic data audits, which should inform the development of a DQIP or data quality strategy. Furthermore, emphasis should be placed on implementing improvement measures identified through routine assurance activities, such as digital supervisions; the application of data analytics at all levels using digital systems dashboards; and routine data validation and monitoring meetings. New LFA assurance activities were introduced in 2024 to assist in understanding the progress made, help identify bottlenecks, and orient course-correction. These are:

- Implementation review of national data quality improvement plans/national data quality strategies.
- Implementation review of national health information system or digital health strategies.
- Review of data quality analysis performed in digital systems (e.g. run outlier, validation rule, missing values, etc.) and use of results.
- Review of digital RDQA/supervision implementation, use of results, implementation of follow-up actions, etc.

5. Roles and responsibilities

Figure 4 illustrates the roles and responsibilities of all stakeholders involved in the HIS and Data quality strengthening implementation cycle and provides a feedback loop for continuous learning and adaptation. The national strategic planning cycle serves as the starting point, with the development of strategic plans for strengthening HIS and data quality led by national stakeholders. These plans should inform multi-partner implementation roadmaps, which in turn guide donor-specific funding requests.

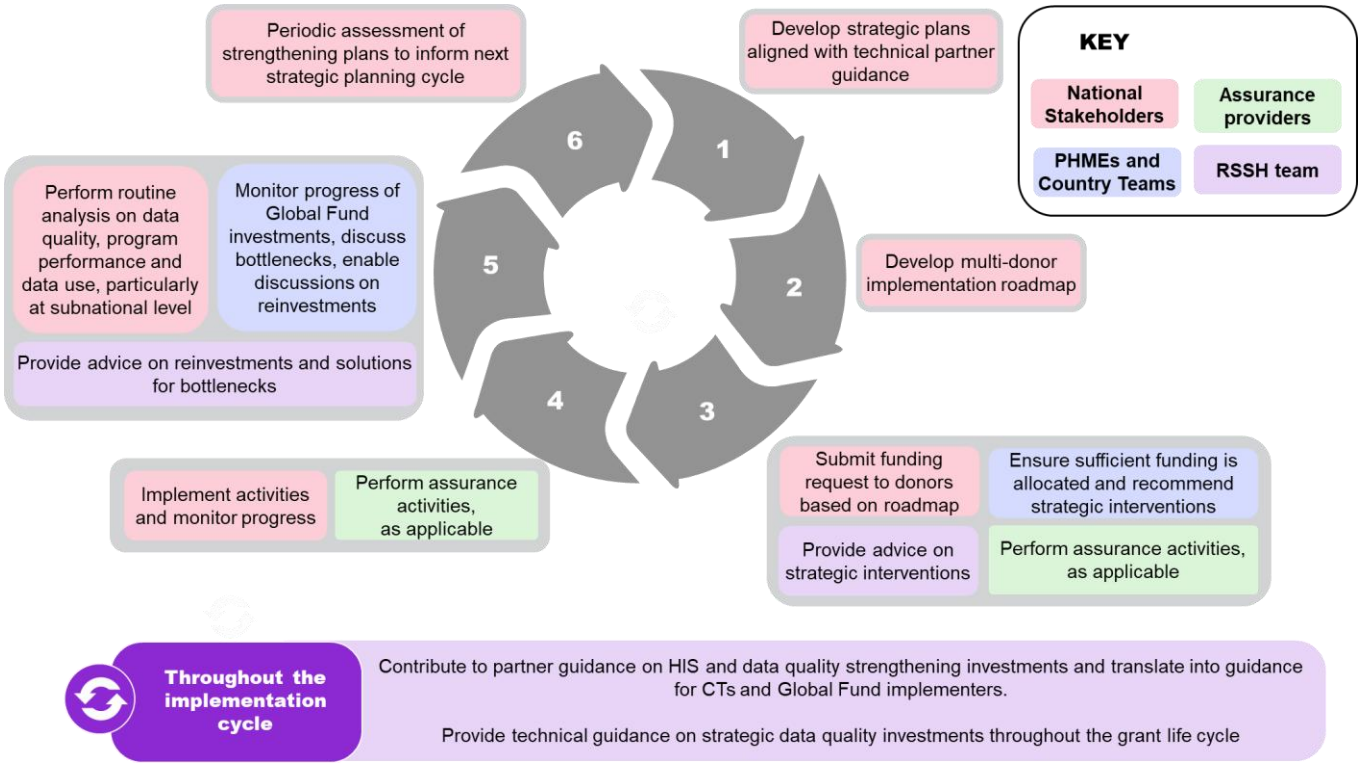
The Monitoring and Evaluation and Country Analysis (MECA) team provides technical advice to CTs on strategic investments in HIS and data quality based on harmonized technical partner guidance and identified country gaps.

CTs support the inclusion of priority interventions identified through country-led processes in grants. They also monitor grant implementation, the reallocation of funds to existing or emerging gaps that are identified by country stakeholders throughout the grant lifecycle. CTs plan for additional risk-based assurance measures, which are implemented by LFAs or other service providers.

National stakeholders implement the roadmap and monitor its implementation at agreed intervals through established technical working groups that discuss progress, bottlenecks, proposed solutions, and necessary changes. The analysis of progress and data quality at all levels, from the health facility to the national level, should inform the improvement of program implementation and data quality. The results of these analyses can be used to engage with CTs on how to fill funding gaps.

At the end of a national strategic cycle, the HIS strategy implementation and data quality plans are evaluated to inform the next strategic period. The Global Fund and other donor funding should be used to support the cycle. The improvement of data quality is contingent upon the fulfillment of the responsibilities of each stakeholder.

Figure 4: Roles and responsibilities for HIS and data quality strengthening



References:

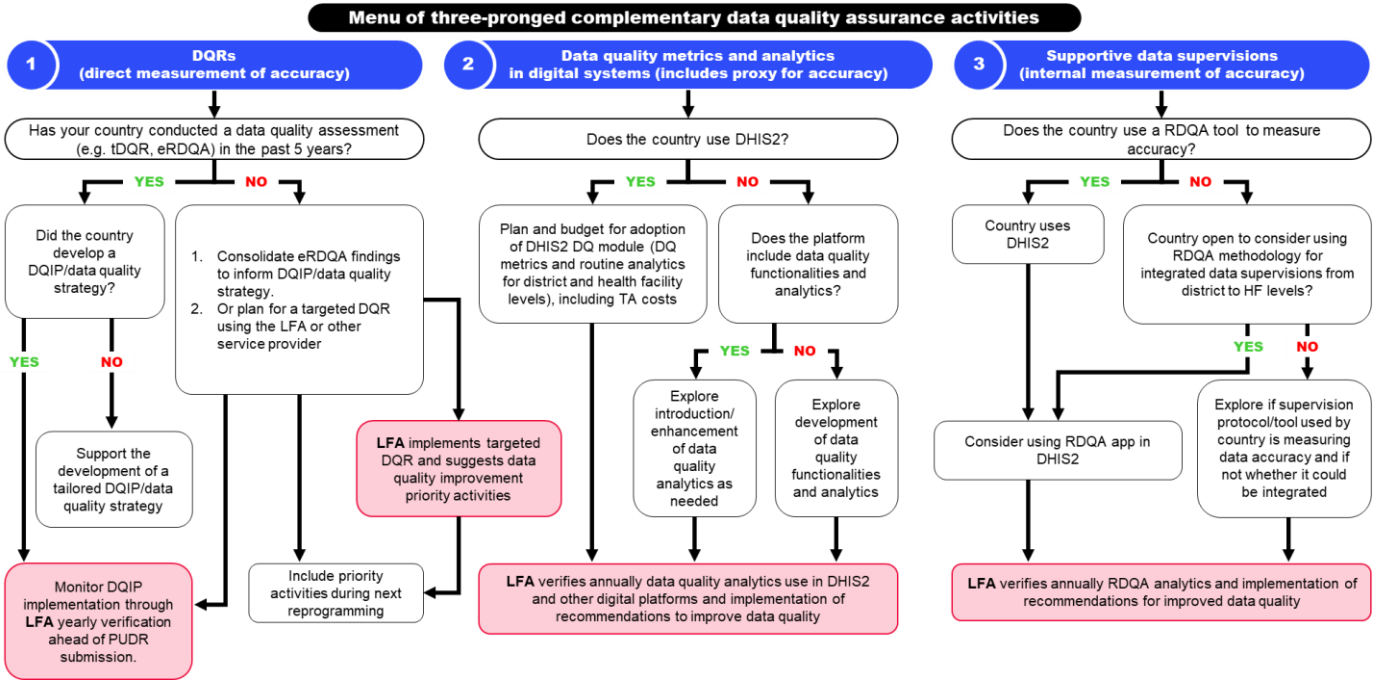
Global Fund resources:

- Resilient and Sustainable Systems for Health Information Note (on M&E and HMIS investments): https://www.theglobalfund.org/en/applying-for-funding/design-and-submit-funding-requests/applicant-guidance-materials/
- Programmatic monitoring: https://www.theglobalfund.org/en/monitoring-evaluation/programmatic-monitoring/

Partner resources:

- DHIS2 data quality toolkit: https://docs.dhis2.org/en/implement/data-quality/overview.html
- WHO Data Quality Assurance: https://www.who.int/data/data-collection-tools/health-service-data/data-quality-assurance-dqa
- WHO Health service data references: https://www.who.int/data/data-collection-tools/health-service-data
- WHO Country Data Quality Framework (forthcoming)
- RDQA (Routine Data Quality Assessment): https://www.measureevaluation.org/resources/tools/data-quality/routine-data-quality-assessment-rdqa-curriculum-materials
- ACUIS (Amélioration des Capacités d' Utilisation de l'Information Sanitaire - Improving capacity to analyse and use health information) platform with resources in French and English: https://acuis.mn.co
- PERSUADE project: https://sph.mak.ac.ug/research-innovations/projects/persuade-ii

Annex 1: Decision tree to guide routine data quality interventions and investments, including LFA assurance options



For optimal data quality assurance, countries should ideally invest in all three prongs outlined above. However, in case of limited funding we recommend choosing at least two activities considered most feasible and impactful within a given context, of which one should be able to directly measure data accuracy (eRDQA or targeted DQR).

LFA activities are included in red boxes and should inform LFA yearly budgeting exercise. It is recommended these activities are performed prior to PUDRs validation process.

Annex 2: Funding Request and reprogramming guidance for data quality essentials investments in High Impact/Core portfolios

To ensure that the Global Fund investments contribute to improve data quality, consider the following three elements in funding requests under the monitoring and evaluation (M&E) module:

1. Data quality basic enablers (HIS investments)
2. Data quality assurance
3. Incentive measures (may not necessarily require additional funding)

When budgeting for the activities to enhance data quality listed below, ensure that there is a harmonized and complementary approach between donors. Technical assistance (TA) costs should be included whenever deemed necessary.
In addition, consider, if not already the case, developing a national data quality improvement plan or data quality strategy.

1) Data quality essentials (if not covered by other funding sources):

Budget for the following, including for private health sector and community data:

1.1. **Periodic revision** (e.g., every 3 years) **of data collection and reporting tools**, including TA as needed:
- **1.1.1.** Adapt list of **variables/indicators** to be collected to a **strict minimum** while meeting the needs of stakeholders (MOH services and partners).
- **1.1.2.** Design **simplified ergonomic data** collection tools that meet the needs of data collection and reporting (register, tabulation sheets, reporting templates, etc.) and are easy to use by end-users.
- **1.1.3.** **Update guidance** (SOPs), defining responsibilities of stakeholders, process for data collection, management, analysis, and use. Keep guidance documents as short as possible. Consider using video clips instead/in support of paper manuals.
- **1.1.4.** **Configure** digital data collection and reporting tools.
- **1.1.5.** **Printing and distribution** of data collection tools and guidance.
- **1.1.6.** For **digital tools**: IT equipment, connectivity, power, software configuration, security, and maintenance, including maintenance of opensource platform costs (e.g., DHIS2 and others as applicable).

1.2. **Staff training and mentoring** adapted to health pyramid level in a) data collection, analysis and use, b) software use (e.g., DHIS2 or any other digital platform used in country), consider in-person/virtual training options.

2) Data quality assurance mechanism:

Budget according to the context and available resources (e.g. available funding may impact frequency of the meetings or supervisions cited below). In case of insufficient funds, it is possible to reprogram during the grant life cycle to fill known or new gaps.

2.1. **Monthly health facility monitoring meetings** to verify, analyze, interpret, use and report data. (See suggested methodology: https://acuis.mn.co/spaces/12580910/content - in French and English).

2.2. **Quarterly district level data validation and monitoring meetings** to verify, analyze, use, and report data. (See suggested methodology https://acuis.mn.co/spaces/12580910/content - in French and English).

2.3. **Six-monthly regional meetings** to verify, analyze, use, and report data. These may be disease specific and/or health sector wide. Explore integration.

2.4. **Annual national meetings** to verify, analyze, use, and report data. These may be disease specific and/or health sector wide.

2.5. **Data quality control activities:**

2.5.1. Supportive digital supervision using RDQA or similar tools; aim for integrated vs disease specific RDQA whenever possible.

2.5.2. For countries using DHIS2: update Data Quality functionalities by adopting the DQ toolkit issued in late 2023 (https://docs.dhis2.org/en/implement/data-quality/overview.html).

2.5.3. For other digital systems: ensure that the data validation rules are in place, enforced and monitored.

3) Data Quality incentives:

Are there means to motivate the improvement of data quality through incentives within your context? E.g. to foster positive competition by making data quality metrics by health facilities, districts, and regional levels (as applicable to the context) publicly accessible and acknowledging "super performers" during subnational/national meetings. E.g. through a prize, a certificate of excellence or training opportunities.
In countries using performance-based funding modalities explore integrating performance of data analysis or data quality metrics as part of the performance assessment and compensation.

Annex 3: Data quality metrics by source and measurement frequency

Data quality metric	Source	Recommended frequency
1) Completeness; **2) Internal consistency;** **3) External comparison with other data sources; and** **4) External consistency of population data (e.g. denominators)**	*Digital:* WHO data quality tool in DHIS2 *Paper-based:* DQA – desk review (module 1)	Annually and every five years as part of DQA to inform the strategic planning cycle.
5) Accuracy (external) **6) Accuracy (internal)**	*Paper-based/digital:* tDQR *Digital:* digital RDQA	tDQR once in a grant life cycle. Every 6 months, depending on national supervision cycle.
1) Data set completeness **2) Data set timeliness** ***3) Data element completeness (new)*** **4) Consistency over time** **5) Consistency of related data** **6) Outlier analysis** **7) Digital data quality index** **8) External consistency** **9) Consistency of population data**	*Digital:* DHIS2 and other digital systems	1)-7) monthly (tbc for accuracy proxy), DHIS2 data quality dashboards 8) annually, through WHO DHIS2 desk review 9) periodically as population data sources get updated