Malaria Quarterly Report Time Standardization

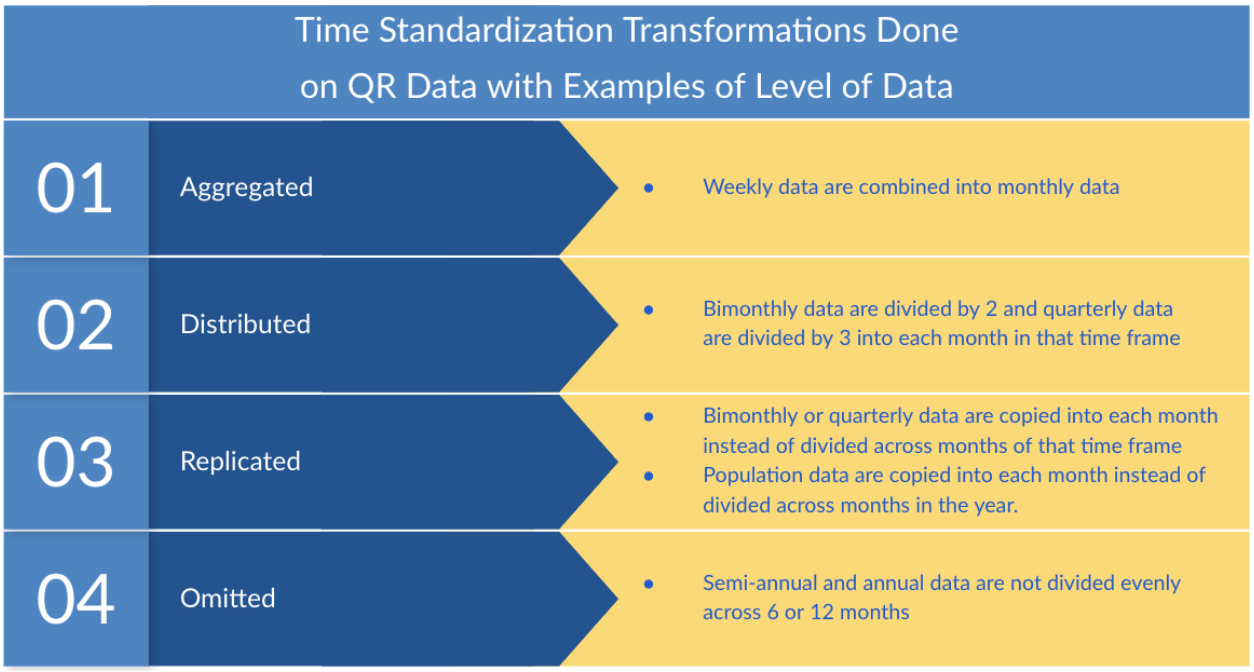
Update July 2022

The Malaria Quarterly Report (QR) is the primary data resource in M-DIVE for understanding malaria incidence, burden, and progress metrics in PMI-supported countries. It includes data provided by countries each quarter, based on what they have available from their existing data collection systems. This document is an overview of how data submitted from different sources and systems are processed within M-DIVE into a consistent, monthly aggregated format.

Time Standardization: In the QR, data are displayed at a monthly cadence. Most data are already submitted to M-DIVE at the monthly level, but sometimes data can be submitted at other intervals such as weekly, bimonthly, quarterly, or yearly. To consistently represent this data in a monthly aggregated format, the M-DIVE QR pipeline will sometimes need to apply standardizations to this non-monthly data. Because any such change will require changing the literal reported value of the data, this depends on some assumptions to make the resulting data as accurate and representative as possible.

Assumptions:

- The logic for whether an indicator undergoes time standardizations is assumed to depend on two factors: the level at which the indicator is reported (weekly, bimonthly, etc.) and the type of indicator (i.e. count indicator).
- For data that are reported at the weekly level, the week number is assumed to be an epidemiological week (i.e. a standardization tool of the time variable for the purpose of epidemiological surveillance, usually a complete week).
- Count indicators that are reported at the bimonthly or quarterly level are assumed to be a total across that time frame without significant seasonal variation and thus are divided equally across all months of that time frame.
- Count indicators reported at the annual level (or every few years) are assumed to be reasonably replicable across all months of that year. Depending on the type of indicator and how it is reported, data might be standardized through one of four operations:



Once the indicators are standardized, the QR data pipeline outputs a table in which each row represents one month at one location. Below is an overview of the standardizations and replications that are done depending on the level of temporal reporting.

Data submitted at the weekly level:

When data are submitted at the weekly level, they are aggregated to the monthly level.

- Count data: With a few exceptions where we would not aggregate because we don't want to double count facilities (e.g. Number of Facilities Expected to Report, Number Facilities Reporting HMIS/LMIS, Number of Facilities Reporting Stock-Outs), columns that depict counts (e.g. Number of RDT Stockouts) get summed together (i.e. value for week 1 + value for week 2, and so on).
- Percentage data: Data submitted in the form of percentages (e.g. Reporting Rate) gets averaged.

For weeks that overlap months or years, values are split and weighted proportionally to the fraction of that week's days that fall in each of the two months (and years, for the case of December and January). For example, if there are 14 suspected cases in week 53, and 4 days of that week fall in December, then we add 8 suspected cases to December and 6 suspected cases to January. If we had 10 stockouts that week, that would get a weight of 4/7 when averaged together with stockouts reported in other weeks of December.

We omit data for any months in which we do not have complete coverage, to avoid implying that one week of reports represents an entire month of data.

Data submitted at the Bimonthly level or Quarterly level:

When data are submitted at the bimonthly or quarterly level and they include count variables that are cumulative over time, the values of the count variables are divided by 2 if bimonthly and 3 if quarterly into each month in that time frame. Below is a sample list of variables that are divided:

- Number of Facilities Reporting a Stock Out of RDT
- Number of Facilities that Reported on RDT
- Number of Facilities Expected to Report Confirmed Cases
- Number of Facilities Reporting Confirmed Cases

For bimonthly or quarterly level data that include indicators that are not cumulative over time (e.g. Number of Community Health Workers, LMIS Facilities Expected to Report, etc.), the values of these indicators are replicated across all months in that time frame. Below is a sample list of variables that are replicated:

- Number of Community Health Workers
- Number Health Facilities
- Number Health Workers
- LMIS Facilities Expected to Report

Data submitted at the Annual level:

In some cases, data are submitted at the annual level because the data are relatively constant over time, are only measured at one point in time every year or every couple of years, and therefore are better represented at the yearly level. In these cases, the values are replicated across all months during that year. For example, population data are typically only measured and reported once every couple of years because population remains relatively constant over the years. Population is better represented as a total number per year rather than a division of that number per month. Therefore, when population data are submitted at the annual level, the values are copied into each month instead of divided across months in the year. Below is a sample list of population variables that are replicated:

- 0-5 Female Population
- 5+ Female Population
- 0-5 Male Population
- 5+ Male Population
- Total Population

When population data are not submitted for a particular year, the population data are extrapolated from the previous year's population data assuming a 3% growth rate.

There are cases where data submitted at the annual level get omitted. For example, if confirmed cases data are submitted at the annual level, they are not split across the months because evenly

splitting would not reflect seasonal effects on malaria cases. Civis first contacts the country team to update and resubmit the data at the monthly level. If the data are not resubmitted, these data are omitted from the QR.

If you have any questions, please submit them to Alaine Knipes (aknipes@cdc.gov) and Misun Choi (mchoi@usaid.gov) on the PMI Surveillance & Informatics team, or to support@civisanalytics.com. If you would like to learn more about additional topics on M-DIVE, please click the links below for further reading.

Important Resources

- Malaria Quarterly Report Data Pipeline Overview: How Quarterly Report Data Are Processed in M-DIVE
- Malaria Quarterly Report Quality Control Processes Overview in M-DIVE
- Malaria Quarterly Report Format Standardization
- Malaria Quarterly Report Indicator Standardization
- Malaria Quarterly Report Geographic Standardization
- Malaria Quarterly Report (M-DIVE access required)
- M-DIVE Help Center (M-DIVE access required)