Liberia

National and County Coverage on Reproductive, Maternal, Newborn & Child Health Data from Health Facility and Surveys information, Covering the period 2017- 2021

Liberia

Synthesis Report Based on an endline analyses Countdown to 2030 / GFF / UNICEF / WHO workshop

Held @ Emara Ole Sereni Hotel in Kenya, Nairobi from June 13-17, 2022

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Introduction

The Countdown to 2030 and GFF are working together to support and strengthen Liberia's health sector and review progress and performance made during the period. The focus is on analysis of data on RMNCAH and Nutrition related indicators, especially coverage and service utilization at national and counties levels.

The Countdown has established country collaboration teams in 15 countries (13 in sub-Saharan Africa) since 2019. The country teams are led by academic and public health institutions with participation from the Ministry of Health and Countdown global or regional partners. During the past 2 years, the country teams have worked on various analytical projects, such as endline reviews, coverage and equity assessments, quality of care and organization of services, impact of COVID-19 on the continuation of essential services, adolescent sexual and reproductive health and MNCH. Prior to 2020, APHRC, the lead Countdown partner in sub-Saharan Africa, and Countdown organized regional analysis workshops focusing on equity analyses in surveys and health facility data analysis, other aspects leading to multiple joint regional and country-specific publications.

The main data sources for such indicators are routine health facility data, household, facility surveys and health system data. Countries have made considerable progress in gathering, analyzing and presenting routine health facility data, which is increasingly becoming a predominant source of key health statistics, especially on coverage of interventions and service utilization at the local level. The pause in surveys during the COVID-19 pandemic has reinforced the reliance on health facility data.

Obtaining reliable coverage statistics from routine health facility data is difficult and there is considerable issue in the numerators (the reported events) and the denominators (target populations) for most indicators. Therefore, careful "endline analysis" is required in which analysts assess, edit and clean all data, develop a set of denominators and conduct comparative analysis of results obtained from different data sources. Such procedures have become standard for household surveys and can also be applied to other sources such as routine facility data. The primary purpose of the workshop was for each country team to work on an endline analysis and come up with the best possible estimates at national and county levels for key indicators. In addition, the workshop includes several analysis training sessions and a poster session in which Liberia share ongoing work.

Background

This brief report describes the data, methods, and results of an analysis of the health facility (and other) data for selected indicators of reproductive, maternal, newborn and child health, supported by survey analyses and health system data where available. It focuses on national and subnational regions administrative units in countries. The aim of this analyses is to inform national and global reviews of progress and performance of the national plan and strategy for RMNCH. From the health facility data (maintained in DHIS2 software) a clean data set is created for the endline review. This is done through a systematic approach, with major attention for facility data quality assessment and adjustment, denominator selection, joint assessment of surveys and facility results and consideration of possible other biases. This report has the following sections:

1. Description of the data set: description on the of number of facilities & key indicators

2. Data quality assessment and adjustment: presents the data quality score card and adjustments made to develop a clean data set for the endline analysis

3. Denominators or target populations: assesses the population projections and DHIS2 denominators, and applies a facility data derived denominator method; presents the annual coverage trend by year for the main indicators of the endline analysis

4. Private sector bias: aims to assess the potential size of a private sector reporting bias

5. County Level Analyses: a comparison of counties coverage (using indexes) between the LDHS 2019 and the DHIS2 statistics and an assessment of the extent to which inequalities between counties have changes from 2017 to 2021

6. Potential further analyses: analysis of county progress and performance using health system inputs and coverage; analysis of the facility data on maternal mortality, stillbirths; analysis of the outpatient and inpatient data

Description of the data set

Liberia has Fifteen Counties and 93 Health Districts. In the aforementioned country, there are Eight-Hundred and fifty-six (856) Functional health facilities submitting services delivery report through the DHIS2 and Nine Hundred & Sixty-Four on the Master Facility Listen. Monthly district data, extracted from DHIS2 were analyzed for the period January 2017 to December 2021 looking at Sixteen (16) indicators in total. After data quality assessment and adjustment, the monthly district data were aggregated for annual county data for this analysis. Survey data were used for assessment of the denominators of the facility data derived coverage statistics and for external comparison of the coverage statistics. The main surveys conducted from 2019 were LDHS 2019/2020, LMIS 2016 (malaria). The last Liberian population &Housing Census, was conducted in 2008, the Liberian Labor Force Survey was conducted in 2010, STEPs Survey 2022 and HHFA was also conducted in 20, Service Available & Readiness Assessment 2018.

Table 1: Summary Data for Health facility

Administrative organization	
Number of provinces / regions / counties	15
Number of districts	93
Health facilities	
Number of health facilities on MFL	964 in MFL
Number of health facilities of reporting Facilities in DHIS2	856
Data on core health professionals	**Yes**
Data on hospital beds	**Yes**
Number of districts	93
Facility Data Analysis & Analysis Period	
First month and year with health facility data	January 1, 2017
Last month and year with health facility data	December 31, 2021
Health facilities	

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Indicator	Year
Total population for every year	Yes
Live births for every year	No
Population under 1 year for every year	Yes
Name of Survey	
LDHS	2019/2020
LDHS	2013
LDHS	2007
Indicators with facility data for the analysis	**Has data**
Antenatal care first visit	Yes
Antenatal care 4th visit	Yes
IPT 2nd dose (malaria)	Yes
Institutional delivery or skilled birth attendant	Yes
Caesarean Section	Yes
Postnatal care	Yes
Family planning new and revisits	Yes
BCG vaccination	Yes
Pentavalent / DPT first dose	Yes
Pentavalent / DPT third dose	Yes
Measles vaccination	Yes
Stillbirths (fresh / macerated)	Yes
Maternal deaths in health facilities	Yes
OPD visits children under 5 years	Yes
IPD admissions children under 5 years	Yes
Under 5 deaths in health facilities	Yes
Antenatal care first visit	Yes

Data quality assessment and adjustment

Reporting rate plateau at 96% and with a national threshold is 95%; reporting rate of 96% is considerably appreciable. Used default K-factor (k=0.25)

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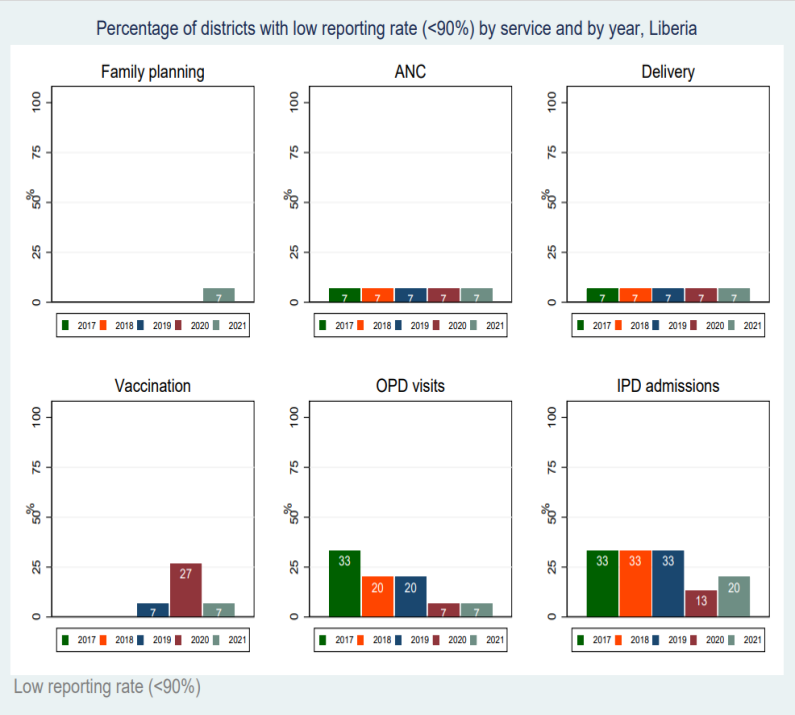
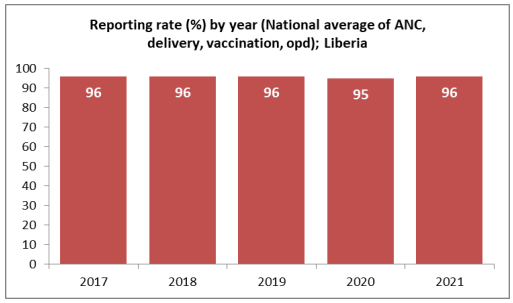
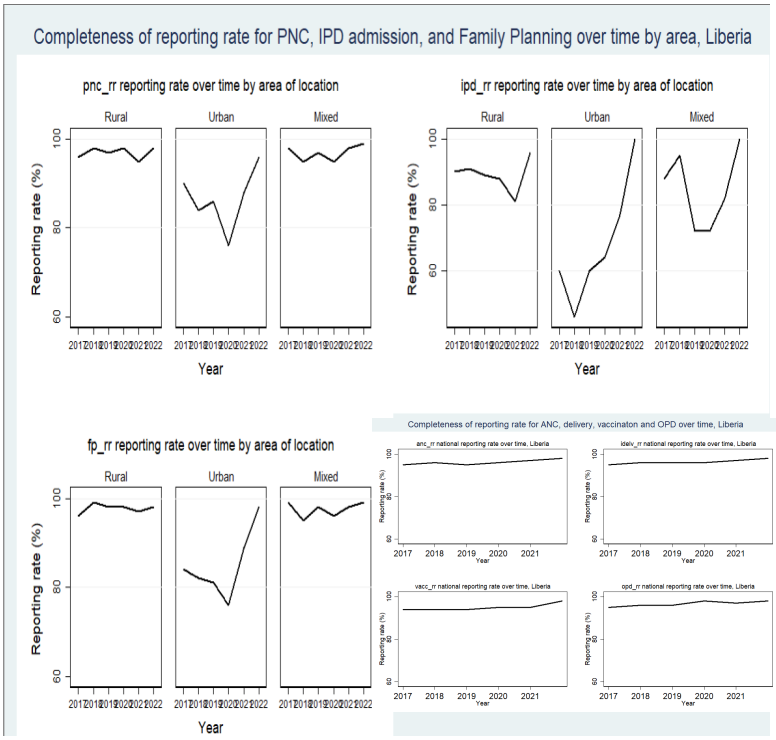
Generally, about 93%% of districts reported reporting rates below 95% for reproductive and maternal health indicators; an increasing proportion of counties reported lower reporting rates (<90%) or Immunization, OPD and IPD services.

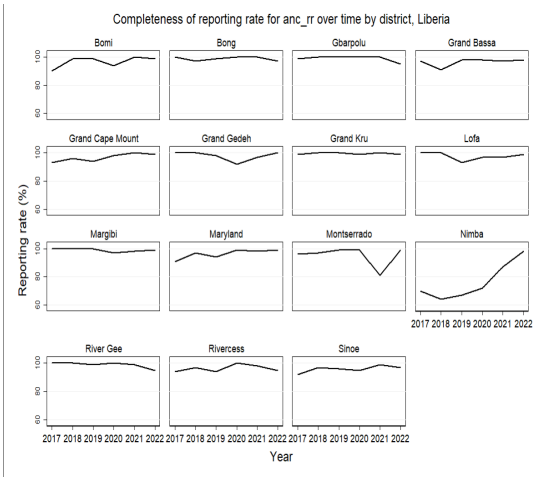
Low reporting rate is prevalent among private facilities (mainly in Urban setting such as Montserrado) where capacity for reporting as well as tracking and accountability of changes in services is often challenged

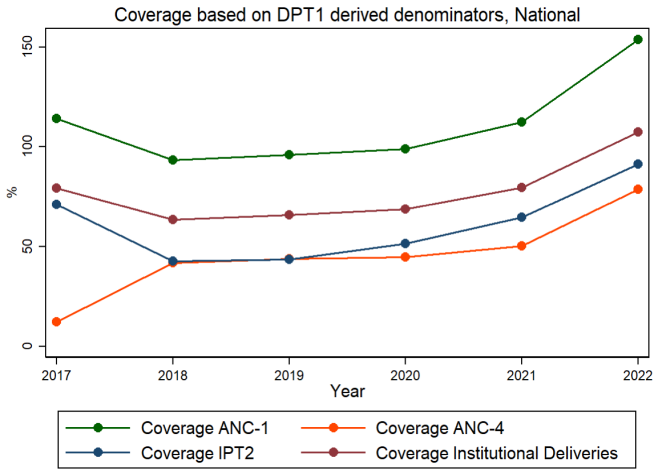
and penta3 was high (Figure 3). Outliers in the monthly values were corrected by imputing a value based on the median value of the calendar year.

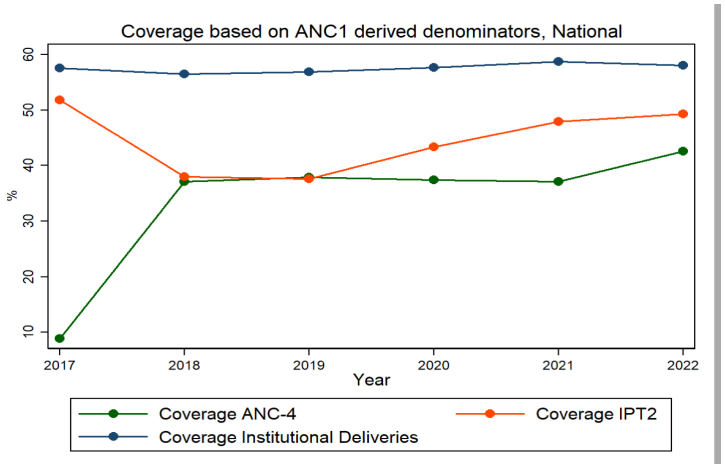












DPT coverage would have been a bit lower, if not within reasonable range of figures below 100% had the Census projection been applied in this case.

This is due to the findings that Un Population for Children and Under 1 pop is relatively lower in comparison.

Reporting Rate on Time by Public and Private Facilities

No.	Period	Public Facilities	Private Facilities
1.	2017	94.7 %	67.7 %
2.	2018	92.9 %	69.5 %
3.	2019	90.1 %	51.7 %
4.	2020	87.6 %	63.4 %
5.	2021	90.7 %	77.9 %

The above table shows that public facility has a very reportion rate on time compare to private facility. There is reason as to why public facilities submit report on time. Public facilities are managed by County Health Team while private facilities are managed and owned by private individual or entities. Reports are normally collected by the County Health Team on the monthly basis for entry into the national system DHIS2. Some private facilities have bureaucracy when it comes to report.

Reporting Rate by Services and Year

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Year	2017	2018	2019	2020	2021
All	96%	96%	96%	95%	96%
ANC All	96%	96%	95%	97%	97%
Delivery All	96%	96%	96%	97%	96%
PNC All					94%
Vaccination All	100%	100%	99%	91%	95%
OPD All	91%	92%	94%	96%	95%
IPD All	84%	89%	90%	94%	94%
Family Planning All	100%	100%	100%	100%	97%
ANC1	96%	96%	95%	97%	97%
4 ANC Visits	96%	96%	95%	97%	97%
Delivery	96%	96%	96%	97%	96%
Penta 1	100%	100%	99%	91%	95%
Penta 2	100%	100%	99%	91%	95%
IPT2	96%	96%	95%	97%	97%
C-Section	96%	96%	96%	97%	96%
BCG	100%	100%	99%	91%	95%
Measles1	100%	100%	99%	91%	95%
PNC 48 Hours					94%
SBA	96%	96%	96%	97%	96%
OPD Under 5	91%	92%	94%	96%	95%
IPD Under 5	84%	89%	90%	94%	94%
FP New	100%	100%	100%	100%	97%
FP Revisit	100%	100%	100%	100%	97%
Still Birth All	96%	96%	96%	97%	96%
Still Birth Fresh	96%	96%	96%	97%	96%

Still Birth Macerated	96%	96%	96%	97%	96%
Under 5 Death	91%	92%	94%	96%	95%
Maternal Death	96%	96%	96%	97%	96%

Minimum Threshold: 95%

PNC: low reporting rate due to change in definition and timing of enrollment

Relative dip in reporting rate in 2020 could be explained by the NCOVID effect.

DQ 2b - Percentage of districts with no extreme outliers in the year

year	2017	2018	2019	2020	2021
All	90%	98%	96%	96%	90%
ANC All	87%	93%	100%	100%	100%
Delivery All	87%	93%	93%	87%	80%
PNC All	73%	73%	93%	93%	93%
Vaccination All	93%	93%	100%	100%	100%
OPD All	93%	100%	100%	100%	93%
IPD All	93%	100%	100%	100%	100%
Family Planning All	87%	100%	87%	87%	73%
ANC1	87%	100%	87%	87%	73%
4 ANC Visits	93%	100%	100%	100%	100%
Delivery	93%	100%	100%	100%	93%
Penta 1	73%	100%	100%	100%	93%
Penta 2	93%	100%	93%	93%	100%
IPT2	100%	100%	100%	100%	0%
C-Section	93%	100%	100%	100%	100%
BCG	80%	87%	100%	100%	100%

Measles1	87%	87%	87%	87%	73%
PNC 48 Hours	67%	87%	93%	93%	67%
SBA	80%	80%	87%	87%	100%
OPD Under 5	93%	93%	87%	73%	87%
IPD Under 5	87%	87%	80%	87%	80%
FP New	87%	87%	80%	60%	87%
FP Revisit	73%	60%	53%	87%	87%
Still Birth All	60%	47%	47%	53%	73%

Minimum Threshold: 100%

PNC: lower value for 2021 due to lack of reasonable trend data resulting from late enrollment of indicator

Relatively poor quality for mortality data could be due to limited system capacity for classifying morbidity and mortality conditions

Data Quality Score by Service

year	2017	2018	2019	2020	2021
All	96%	96%	96%	95%	96%
ANC All	96%	96%	95%	97%	97%
Delivery All	96%	96%	96%	97%	96%
PNC All					94%
Vaccination All	100%	100%	99%	91%	95%
OPD All	91%	92%	94%	96%	95%
IPD All	84%	89%	90%	94%	94%
Family Planning All	100%	100%	100%	100%	97%
ANC1	96%	96%	95%	97%	97%
4 ANC Visits	96%	96%	95%	97%	97%
Delivery	96%	96%	96%	97%	96%

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Penta 1	100%	100%	99%	91%	95%
Penta 2	100%	100%	99%	91%	95%
IPT2	96%	96%	95%	97%	97%
C-Section	96%	96%	96%	97%	96%
BCG	100%	100%	99%	91%	95%
Measles1	100%	100%	99%	91%	95%
PNC 48 Hours					94%
SBA	96%	96%	96%	97%	96%
OPD Under 5	91%	92%	94%	96%	95%
IPD Under 5	84%	89%	90%	94%	94%
FP New	100%	100%	100%	100%	97%
FP Revisit	100%	100%	100%	100%	97%
Still Birth All	96%	96%	96%	97%	96%
All	96%	96%	96%	97%	96%
ANC All	96%	96%	96%	97%	96%
Delivery All	91%	92%	94%	96%	95%
PNC All	96%	96%	96%	97%	96%

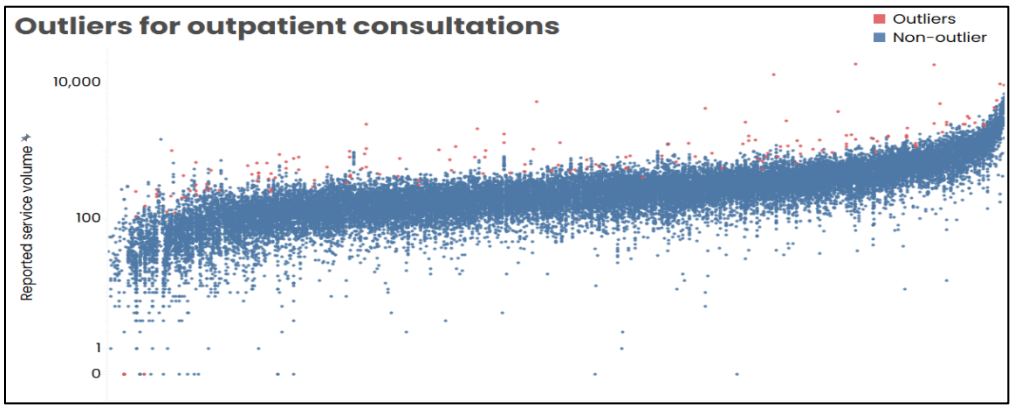
Minimum Threshold: 95%

PNC: low reporting rate due to change in definition and timing of enrollment

Relative dip in reporting rate in 2020 could be explained by the NCOVID effect

Relatively poor quality for mortality data could be due to limited system capacity for classifying morbidity and mortality conditions

Outliers for Outpatients Consultations

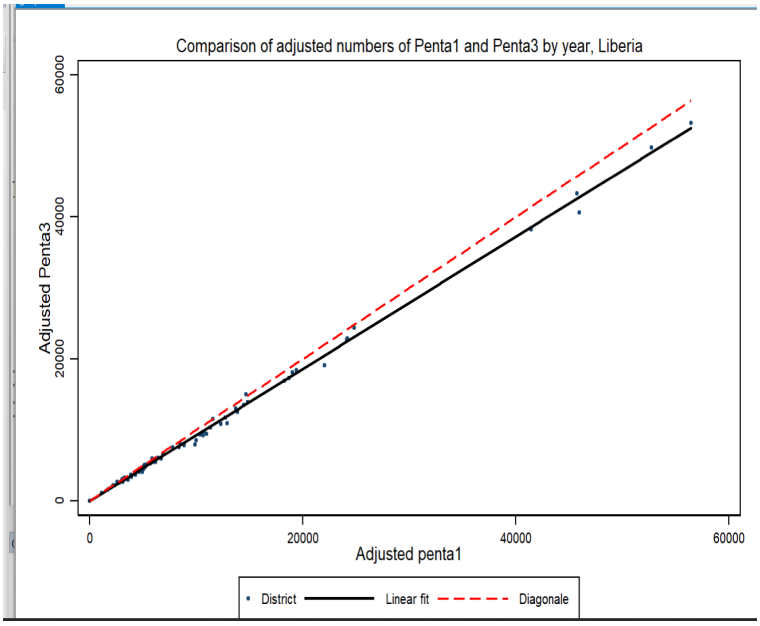


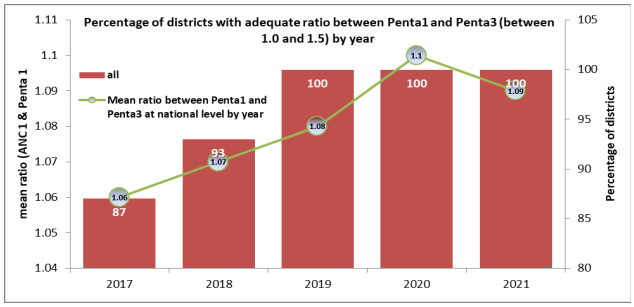
Few outliers noted; most of which are related to post-natal care service data and under five deaths reporting.

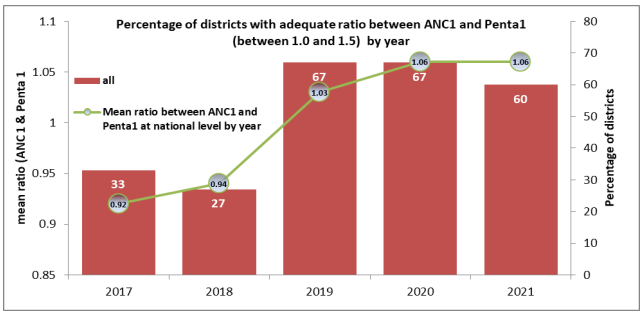
Lower Post-natal care service volume is due to changes in indicator definition from PNC within 24 hours to PNC within 48 hours (i.e. PNC1)

quality of mortality reporting is. influenced by the availability or lack thereof standardized reporting tool or ledger and the lack of implementation of the ICD system of classification of mortality and morbidity

Internal Consistency







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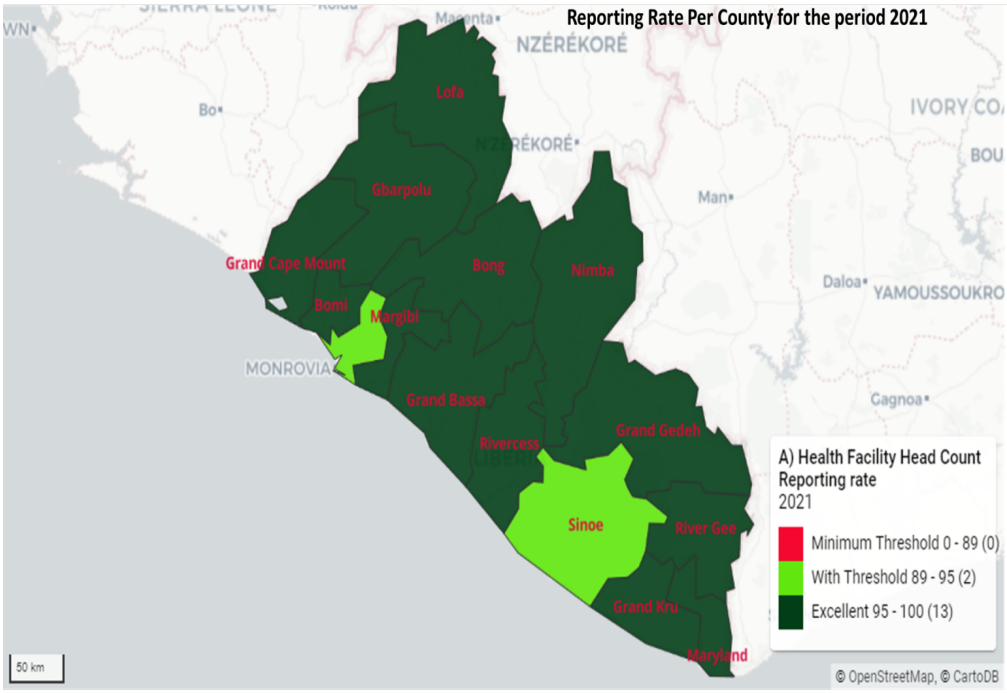
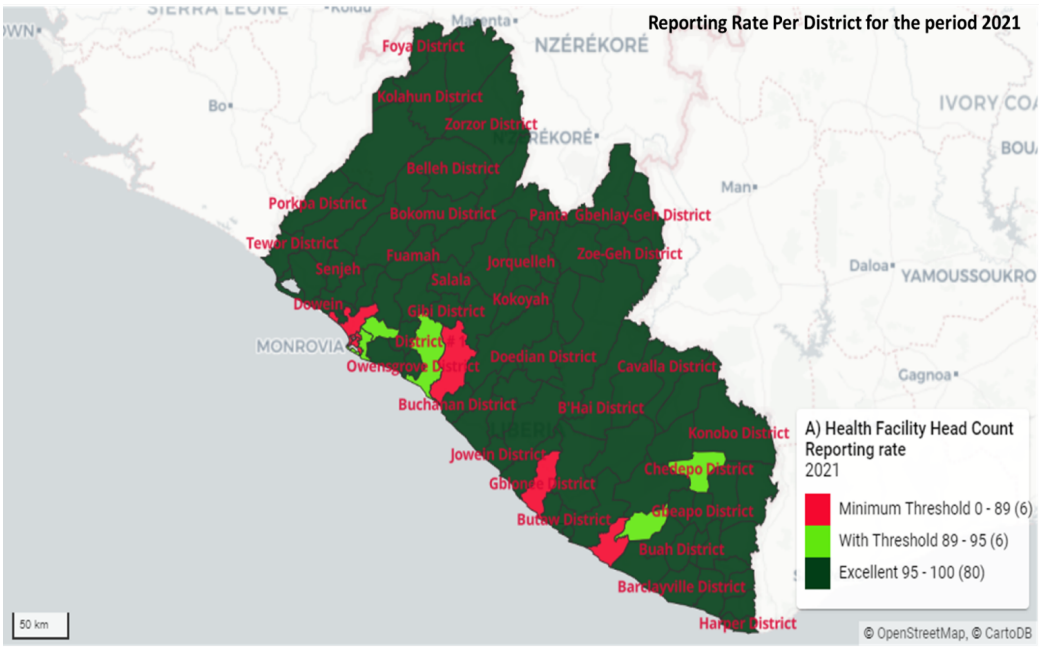
Internal consistency or reported data generally improved overtime

Reporting Rate per County



Of the total of fifteen (15) counties submitting data through the dhis2 in Liberia. Based on the reporting rate analysis, it shows that; Thirteen (13) (Lofa, Bong, Nimba, Gbarpolu, Cape Mount, Bomi, Margibi, Bassa, RiverCess, Grand Gedeh, RiverGee, Grand Kru counties reached 95%-100% reporting rate while two counties (Sinoe and Montserrado)achieved between 89-94% for the year 2021.

Reporting Rate per district



During the period under review of 2021, Ninety-Three (93) districts submitted report through the national system DHIS2. Of the total report submitted, when it comes to reporting rate on time, Six (6) districts fall between minimum threshold of rate 0-89% , Six (6) districts reached a threshold of 89-95 while Eighty-One (81) districts reached the threshold of 95-100%

Denominators / target populations

Assessment of the population projections in DHIS2

Summarize with tables or graphs the population projection data at national and subnational levels with an assessment of annual statistics for:

- Population growth rates, considering crude birth rate and crude death rates as well
- Population distribution (under 1, under 5, women 15-49 years)
- Live births

This may include comparisons with UN projection parameters and other data sources. Details can be found in the Stata code and Excel files for #4.

Testing facility data derived denominators

Describe the results of the computations of population denominators from facility data for high coverage interventions, especially ANC1 and pentavalent / DPT1 (or BCG).

Show results of selected testing of the denominators obtained with the ANC1 derived denominator:

- Compute coverage for ANC4 and for institutional deliveries (and PNC); Compare the results with the surveys if possible

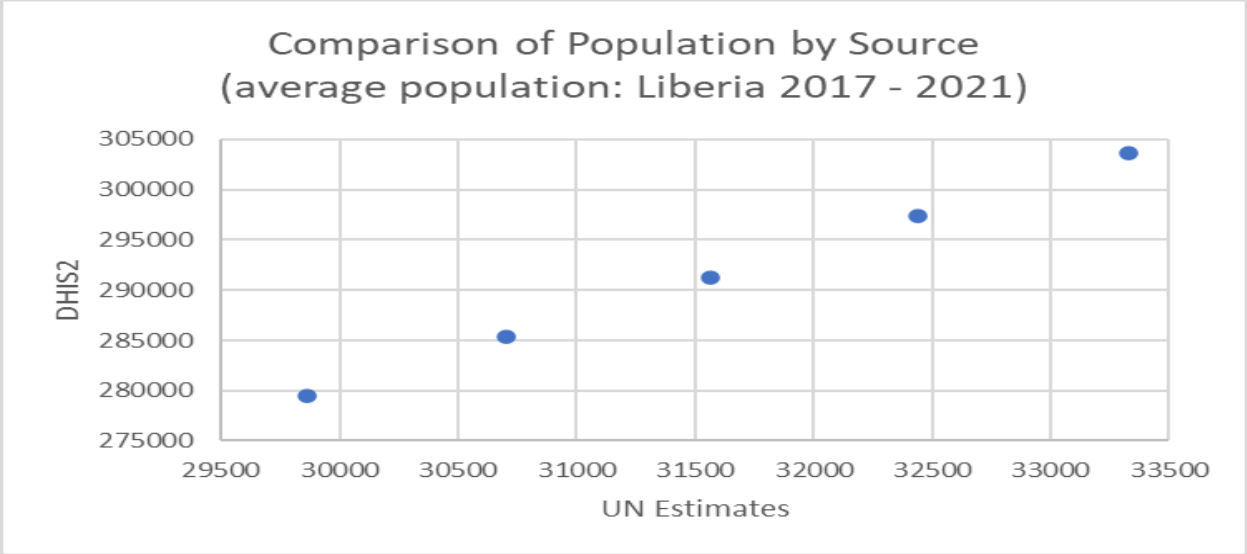
The same may be done for the pentavalent/DPT1 derived denominator:

- Compute coverage for 3rd dose of DPT/pentavalent vaccination and for measles vaccination to infants; Compare the results with surveys if possible
- Document the decisions in the country report and poster
    - Ensure that the data set has the final denominators

Document decision on the final denominators for the endline review data set

The report should describe the final decision on which denominators to use for national and subnational coverage and service utilization analyses. (And make the necessary steps in the data set finalization)

Population Based Denominators Values



Population Variance: DHIS2 (Census projection versus UN Estimate; Liberia

Year	Total Population	Under 5 pops.	Under 1 pop	live birth	WRA	Pop Growth
2017	10.86%	-0.15%	-13.76%	99.24%	14.04%	
2018	11.19%	-0.96%	-14.53%	97.91%	14.77%	14.83%
2019	11.50%	-1.74%	-15.20%	98.22%	15.49%	14.01%
2020	11.79%	-2.42%	-15.75%	98.05%	16.18%	13.44%
2021	12.07%	-2.93%	-16.19%	95.23%	16.80%	12.97%
Total	11.48%	-1.64%	-15.08%	97.73%	15.45%	13.81%

a. In comparison to UN estimates, Census projection is under reported by about 11% in total population; between 14 to 16% in Women of reproductive age and by nearly 100% of live births

b. Conversely, Census projection is over reported in in Children under the ages of 5 and 1 years respectively

Progress and performance assessment Using an index of coverage for the regions, progress and performance can be assessed in multiple ways**:**

- ✓ Simple comparison of coverage and changes over time (ranking), equity, effectiveness
- ✓ Stratified ranking of outputs by level of socioeconomic development, meaningful ranking
- ✓ Stratified ranking of outputs – strength of the health services / system – requires computation of a measure of health system inputs measures, e.g., core health professionals per 10,000 population or a measure of health infrastructure, or a combined measure
- ✓ Analysis according to program effort/prioritization of counties, e.g., GFF priority area

Maternal mortality and stillbirth rates

- ✓ Maternal mortality in health facilities – number of deaths divided by the number of live births multiply by 100,000 – is a useful indicator of overall maternal mortality and the of the quality of care, especially now that high proportions of women deliver in health facilities in most our settings. The reporting is often problematic and the numbers will need to be scrutinized for data quality. (Ratios between 100 and 300 are expected in most settings).
- ✓ Stillbirth rates can be analyzed as a whole (number of stillbirths per 1,000 births in the health facilities) or with fresh and macerated separate. Fresh stillbirth rates are considered as a good indicator of intrapartum mortality.

OPD visits per child (0-4 years) per year

There are no good indicators of population treatment coverage in health facility data. It would be possible to obtain the number of children who have presented with a specific health issue, or are diagnosed with a certain condition (such as lab confirmed malaria) and include information on the number of diagnosed children who have received treatment. However, the challenge is; the denominator is not known: the number or proportion of children with the condition in the population. There will be children who have not used the health services and these numbers are needed to compute treatment coverage.

OPD visits per child per year is an indicator of service access and utilization. In general, we expect the rate not to fluctuate too much over time, and not to differ much by counties unless there are differences in access. If not, there may be data quality issues that may need to be highlighted.

In-patient data for children:

admission and case fatality rate the number of children under 5 admitted to hospital per 1,000 population under-5 years is both an indicator of both the burden of disease among under-fives and the access to in-patient services. Therefore, subnational comparisons are of interest. Case fatality rates are an indicator of the quality of care for sick children who do not need population denominators, these are defined as the number of under-fives who died in health facilities divided by the number of under-fives children admitted. The numbers may be small for counties and combining years may help address this problem