Countdown to 2030 country analysis: Synthesis and way forward

Countdown to 2030
Women's Children's & Adolescent's Health

Countdown Technical Report, November 2023

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Introduction

The objectives of the Countdown country analysis activities are to improve country monitoring of reproductive, maternal, newborn, child and adolescent health and nutrition (RMNCAH+N), and strengthen country analytical capacity, which should lead to improved resource allocation and accountability. Countdown to 2030 operates through country collaborations, which are led by a country public health institutions, in close collaboration with the ministries of health, with support from an international Countdown partners and the Countdown network. The Africa network of 22 country collaborations is led by the African Population and Health Research Center.

The country collaborations are active throughout the year through regular virtual team meetings and in-country analytical workshops. Each year, a one-week multi-country analysis workshop (called the country annual meeting or CAM) is conducted in collaboration with the Global Financing Facility (GFF), World Health Organization (WHO), UNICEF and the West African Health Organization (WAHO). Additional virtual and face-to-face workshops are conducted as part of multi-country analysis projects on specific topics including family planning coverage (with Track20), maternal and newborn health and immunization (supported by GAVI). The results of these projects feed into the overall country monitoring process and advance country research.

This report reviews the progress to date, primarily based on a review of the process and results of the country collaborations and the CAM, Dakar, June 2023, and outlines the way forward for 2024. It includes:

- Review of the RMNCAH+N indicators in national health plans to assess gaps and propose expansions to better meet country (and global) needs for timely reliable health statistics.
- Synthesis of the main results produced by country teams during CAM2023 to identify strengths and weaknesses in the approach and gaps in the tools. This includes an assessment of data quality work on numerators of health facility data, the selection of denominators for population statistics from facility data, the coverage and equity analyses, analyses of reported data on maternal mortality and stillbirths in health facilities, curative service use for under-fives (ambulatory and admissions), and health system strength.
- The multi-year incremental pathway of country analysis, with priority areas that need to be addressed in the coming years.

Incremental Approach to Strengthening Analysis by Countries

Countdown has primarily focused on strengthening the analysis of health facility data, as an important but underused source of regular country health statistics, and on trend and equity analysis with survey data. A major output of the CAM 2023 analysis was a short report with a set of improved statistics for key indicators to inform national reviews of progress and performance of RMNCAH+N plans and programs. This report was based on a Countdown template with tools in Stata and Excel.

By October 2023, country CAM reports and the raw master data set had been shared for Countdown review by 21 of the 22 participating countries. No report or data were available from Nigeria, where the team was still working on the data cleaning. The current and targeted technical components are summarized in Table 1, including data requirements, analytical approach and tools, and outputs for each component.

Table 1 ***Countdown analysis plan by component with data needs, analytical features, current and needed tools (italics) and outputs.***

#	Component	Data needs	Analysis	Tools	Outputs
1	**Facility data quality - numerators**	DHIS2 data by month, year, district	Completeness; outliers, consistency; adjustment	Stata #1-3, xls	Overall DQ score card
2	**Facility data - denominators**	DHIS2 data; UN population estimates; survey results admin1	Demographic analysis; consistency with surveys (national, admin1); selection best denominator	Stata #4, xls	Performance summary denominators; best denominator
3	**National coverage and trends, equity**	DHIS2 clean data set from step 1 and 2; survey results	Facility and survey coverage for trends inequality	Stata #5, xls; FPET model; WUENIC approach (imm.)	Annual trend coverage, based on all data sources
4	**Subnational coverage trends, equity (admin1 and 2)**	DHIS2 clean data and survey results for admin1/2; SES classi-fication regions/ districts	Coverage and inequality admin1 and admin2; stratified rankings	Stata #5, xls; equity; model to integrate statistics	Annual coverage trends and equity admin1 and admin2;
5	**Mortality - population**	Survey/census data; UN estimates	Age-specific mortality statistics; equity over time	Stata for survey data; IGME; mapping	Synthesis mortality trends and inequalities
	Mortality - institutional	DHIS2/MPDSR data by month/year; UN estimates	DQ assessment; national/regional trends	xls for unadjusted data;	MMR/SBR over time with data quality
6	**Curative services use**	DHIS2 outpatient department (OPD)/ inpatient	Descriptive, DHIS2; sick children treatment indicators surveys	Excel tool for summary; survey analysis code	Trend equity service utilization

#	Component	Data needs	Analysis	Tools	Outputs
		department (IPD) by age; surveys			children, with treatment recall
7	**Health system performance (subnational)**	Health system data (fin, HRH, infrastructure); SES by admin1/2; coverage;	Basic system statistics by admin1/2; scatter plots; frontier analysis; allocative/ technical efficiency	Excel tool for summary health system data; analytical tool for performance	Rankings of subnational performance, controlled for SES;

Key RMNCAH and Nutrition Indicators - CAM 2023 review (Table 1 in Country Reports)

All countries summarized the main indicators and targets in the national health sector strategic plan or RMCNAH plan. In some cases, the listing of indicators appeared incomplete. Additional information was extracted from country five-year plans, where available. This crude assessment is shown in Table 2 with the implications for the Countdown approach. To better meet the country monitoring needs, two analytical expansions are needed. First, the number of indicators for which DHIS2 data are needed will have to be expanded including e.g., early antenatal care (ANC) visit, IPT3, low birthweight and vitamin A supplementation. Second, the analytical workshops should consider for the CAM output report an expansion to survey-based indicators, including the mortality indicators (heavily drawing upon IGME), nutrition indicators (stunting, wasting, but also combined stunting and wasting), breastfeeding and treatment coverage indicators.

Table 2 ***Most common indicators in national health plans in 21 CAM country reports (N of countries listing an indicator in parenthesis); indicators in bold in 2023 CAM.***

Group	Lead indicators in national plans
Antenatal care	**ANC4** (18), **IPT2** or IPT3 (10), 1st trimester ANC (5), **ANC1** (3), IFA (2)
Delivery care	**SBA** (19), **C-section** (15), **institutional birth** (4), low birthweight (7)
Postnatal care	**PNC within 48 hours (14)**
Immunization	**Penta3**(17), full (14), **measles** (5), **BCG** (2), **penta1** (2)
Family planning	**Contraceptive prevalence rate** (19), teenage pregnancy / ASFR 15-19 (14), **unmet need for FP** (11), **demand satisfied FP** (11), couple years of protection (6), TFR (5), HPV (1)
Nutrition	Stunting U5 (17), wasting U5 (10), underweight (6); vit A supplementation 6-59 mo. (6); exclusive breastfeeding 0-5 months (9), early initiation BF (3), supplementary feeding 6-11 mo. (2); treatment success severe acute malnutrition (3), deworming (2)
Mortality (population)	MMR (12), U5MR (9), neonatal (12), infant (12), stillbirths (3), child 1-4 (2)

Group	Lead indicators in national plans
Mortality (institutional)	MMR (5), maternal deaths audited (3), institutional case fatality rate (2), neonatal/infant/child (2), malaria child mortality (1)
Curative services	OPD visits -U5 (10), ORS for diarrhoea (6), antibiotics for child pneumonia (3), newborns resuscitated (2), ACT for fever (1), malaria parasitemia (2), KMC among LBW (1)
Health system	Not included in assessment

*Districts with penta3 coverage, PCV, rotavirus coverage, MCV1 and MCV2

Component 1: Facility data quality assessment and adjustments - numerators (table 2 and 3)

Main findings

Use of the numerator data quality (DQ) scorecard good: The DQ score card was included in all country reports, with some interpretations to flag the most problematic DQ indicators and the trend of the DQ index.

Findings: reporting rates were high in most countries, districts with extreme outliers were uncommon, but internal consistency was not good. ANC1 to penta1 ratios were the most problematic with many districts falling outside the wide range of 1.0-1.5 considered acceptable. Penta1 to 3 ratios were outside the acceptable range in more than 10% of districts in half of the countries. The overall data quality score was the same in 2022 as in 2018 (85-86%).

Adjustments: The next step on data adjustments was described well in a few reports. Most countries stuck with the standard description in the template and used the default adjustment factor for incomplete reporting, method for missing values and correction of extreme outliers.

Way forward:

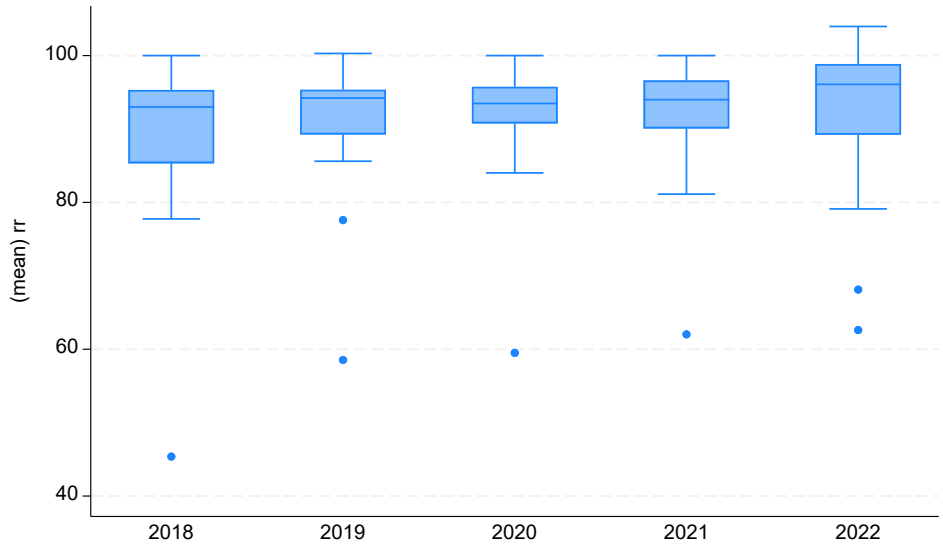
- Add national ANC1 to penta 1 and penta 1 to 3 ratios; produce fewer graphs but make them standard for the country reports (template) – national completeness by form (FP, ANC etc.) and district ANC1 to penta1 scatter plot
- For adjustments add the magnitude of the adjustments on the number of events (for ANC1, delivery, immunization, OPD) as a percentage, e.g., number of events +5% after adjustment. This provides greater insight into how the final clean data differs from the raw data.

Reporting completeness

A health facility reporting completeness index (indicator 1a of the DQ score card) was computed as the unweighted average of monthly facility reporting rates for ANC, delivery, immunization, OPD and IPD (Figure 1). The annual country median reporting completeness was 93%, 94%, 93%, 94% and 96% during 2018-2022.[1] The completeness rate was at least 90% for all reporting years in 11 countries, over 85% in 15 countries, and over 75% in 19 countries. Only Cameroon had a consistently low reporting rate of around 60%. Nigeria had a reporting rate of 80-86%.

The country median for district indicator for reporting completeness (indicator 1b) was 93% of districts with at least 90% completeness in 2022 (Table 3). The lowest scores were observed for Cameroon (13%), Senegal (55%), Sierra Leone (55%) and Ethiopia (57%). Nigeria (76%) and Malawi (84%) were also below 90%. Targeting of districts with low reporting rates would be necessary. Missing values (indicator 1c) were uncommon for the key indicators in most countries (mean for ANC, deliveries, immunization and OPD). In 2022, 12 countries were over 95%, 14 90% or higher. Countries below 90% included Cameroon, DRC, Ethiopia, Ghana, Mali, and Mozambique.

Figure 1 Health facility reporting completeness (%) based on four services (ANC, delivery, immunization and OPD) 2018-2022, 22 countries



Extreme outliers

Extreme outliers were found in all countries. The country median for the percent of monthly values that are *not* extreme outliers (mean for ANC, deliveries, immunization, OPD) was 97% (indicator 2a). Only

[1] Based on the tables in the country reports the scores in 2018 and 2022 were lower than computed here from the raw data sets, and did not show change over time: 86% and 85% (country medians)

Mali and Guinea had scores below 90% (80% and 86% respectively). The same indicator for districts (indicator 2b: % of districts with no monthly extreme outliers in any of the 4 reports in the year) was about one-tenth lower than indicator 2a, meaning more outliers, in most countries.[2] The added value of this indicator may be limited as the pattern in most countries seemed well captured by indicator 2a.

The country reports did not give an indication of the size of the adjustments for incomplete reporting, missing values and extreme outliers. This would be useful to enhance the discussion about adjustments and the understanding of what is done to improve the quality of the estimates.

Table 3 Summary statistics on reporting and data completeness (1a-1c), absence extreme outliers (2a-2b) and international consistency (3a-3b), from country reports, CAM 2023

	DQ index 2018	DQ index 2022	Indicators (2022)						
			1a	1b	1c	2a	2b	3a	3b
Burkina Faso	86	86	88	67	94	99	95	73	87
Chad			96	95	98	81	71	30	100
Cameroon	55	63	63	13	73	99	91	73	78
Cote d'Ivoire	81	87	100	100	100	95	89	28	78
DR Congo	83	91	101	97	88	97	85	74	99
Ethiopia	89	84	79	57	79	99	90	83	100
Ghana	75	74	96	98	86	97	89	15	39
Guinea	89	91	104	99	95	86	73	84	100
Kenya	90	95	96	93	100	100	98	87	87
Liberia	96	85	96	93	100	96	85	40	80
Malawi	86	90	96	84	100	100	100	62	90
Mali	73	80	97	94	80	80	88	28	91
Mozambique	89	80	92	94	83	94	75	45	75
Niger	80	83	99	97	90	93	80	22	100
Nigeria	70	74	86	76	97	90	61	11	100
Rwanda	90	95	100	100	95	98	93	87	93
Senegal	76	68	86	55	99	97	87	1	47
Sierra Leone	91	81	89	55	99	97	87	56	63
Tanzania	88	85	99	100	94	98	89	53	69
Uganda	81	89	97	93	93	98	89	69	86
Zambia	96	93	99	99	100	99	97	84	76

[2] Only Mozambique better reporting by districts (unlikely) and Nigeria major drop (possible) showed different patterns.

	DQ index 2018	DQ index 2022	Indicators (2022)						
Zimbabwe	92	86	95	89	93	96	86	65	81
Median	86	85	96	94	95	97	89	59	87

Internal consistency

The indicator with the most problems was indicator 3a: the ratio ANC1 to penta1 for district reports. An acceptable ratio was considered 1.0 – 1.5.[3] The country median score was 62%: in other words, 38% of districts were outside this wide range. The poor score was noted in several reports, but few country reports provided explanations for this poor consistency. Several countries showed the scatter plot of ANC1 to penta1 by district, but there was not much interpretation given to the worrying findings.

Here, we examine the national ratios which are currently not included in the report. These national ratios can help provide more insight into the problem. ANC1 was lower than penta1 in a large number of country years, which is difficult to explain unless many women go to the private sector for ANC (which is unlikely). Most notable are Senegal and Ghana, both with very low ANC1 to penta1 ratios. Mozambique has far too many ANC1 for penta1.

[3] For every 1000 pregnant women at the time of first ANC visit (median about 20 weeks in most countries), we expect 950 infants eligible for immunization, which yields at ratio of 1.05. In most countries, ANC1 (per 100 live births in surveys) and penta1 (per 100 infants) coverage in surveys are close. Therefore, a range of 1.0-1.5 is wide and few should be outside unless there is a good explanation.

Figure 2 Ratio of the reported number of ANC1 visits to penta1 vaccinations in health facility data, by country and year, 2018-2022

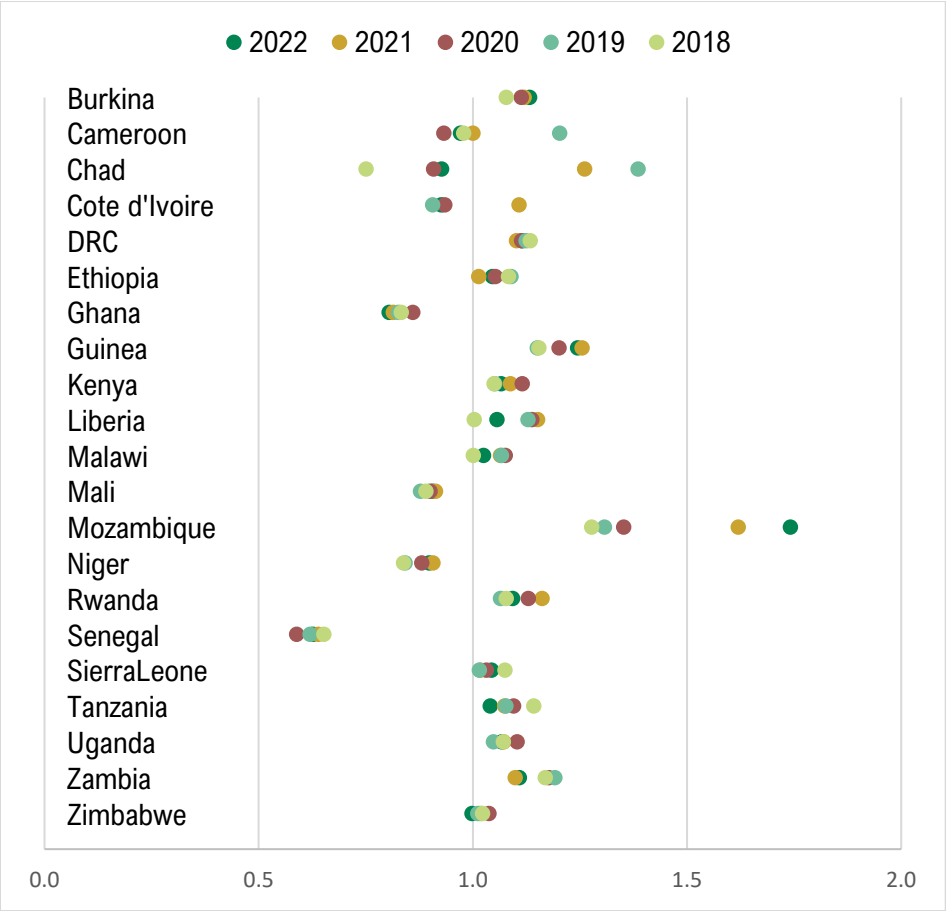
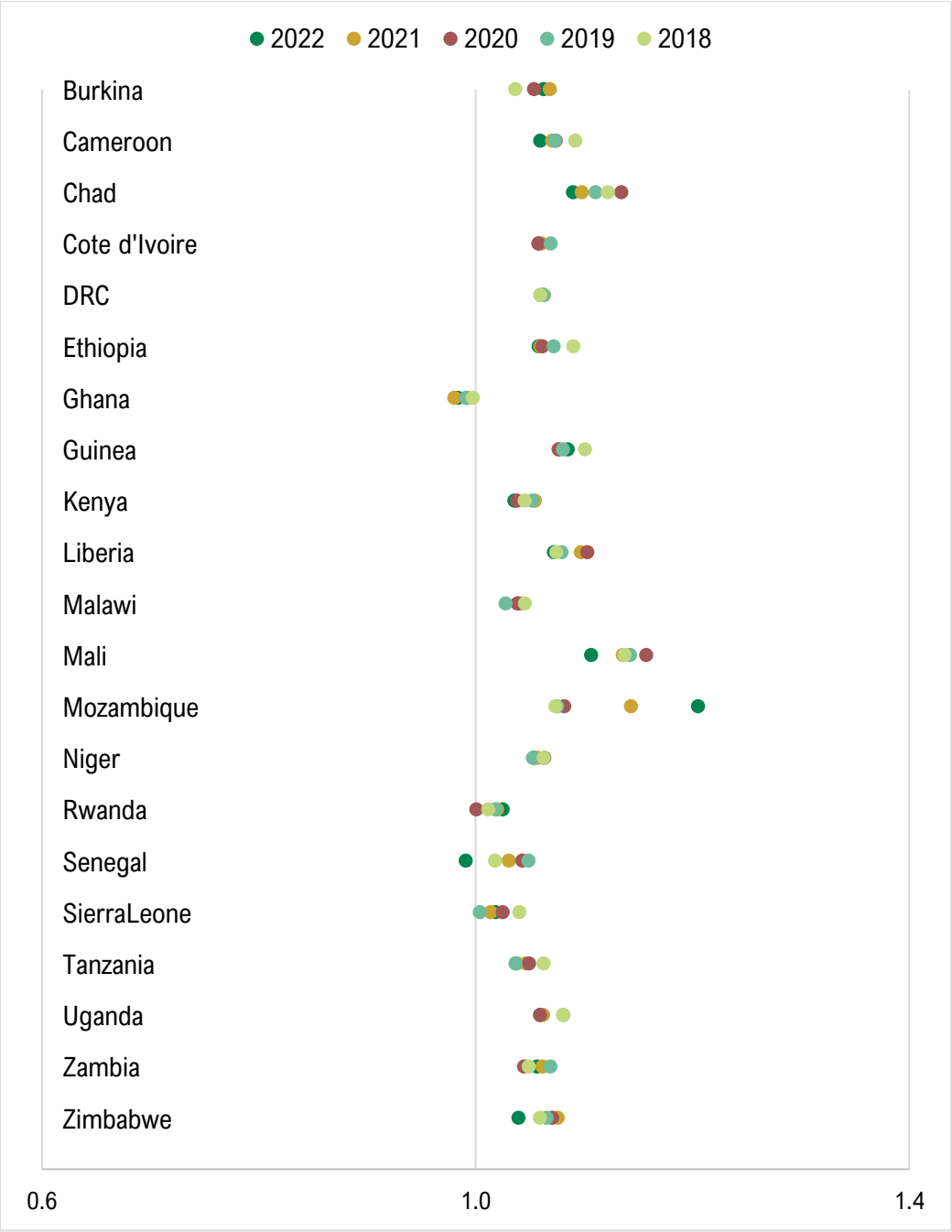


Figure 3 shows indicator 3b: penta1 to penta3 ratios. The ratio has to be above below 1, which is the case in all countries except Ghana. This further complicates the interpretation of Ghana's reported data, with a ANC1 to penta1 ratio below 1 (meaning too few ANC1 or too many penta1 reported) and a penta1 to 3 ratio below 1 (too few penta1 or too many penta3 reported), which have to be classified as poor. Otherwise, almost all country years ended up in the range for the ratio of 1.00 to 1.10 which is compatible with survey findings (penta1 to penta3 dropout rates of up to 10%). Only Chad and Mali fall consistently outside this range.

Figure 3 Ratio of the reported number of penta1 to penta3 vaccinations in health facility data, by country and year, 2018-2022



Component 2: Facility Data – Denominators (Tables 4 and 5 in template)

- Overall, the country reports present good evidence of progress in this area but further guidance is needed to help with the interpretation. This applies to the Excel tables on demographic consistency and the comparison of facility and survey results with different denominators. The UN estimates were useful to assess quality of the projections.
- The demographic analysis will be expanded and simplified to focus on the key indicators used in this analysis, including guidance for the interpretation of results.
- Most countries completed an empirical selection of the best denominator for the coverage indicators, using national and subnational estimates of institutional birth and penta3 coverage from a recent survey as the gold standard. Almost all countries selected the facility-data-derived denominators, as the DHIS 2 denominators did not perform well.

Demographic assessment (Table 4):

This table assesses the internal consistency of DHIS2 projections, including live births and total population, as well as external consistency with United Nations (UN) projections. In general, the population projections within the DHIS2 in many countries were inconsistent. Several countries had inconsistent time series in total population or crude birth rates. Others had improbable crude death rates resulting from the DHIS2 inputs. Computations in the standard spreadsheet, and included in the reports, led to improbable crude death rates, which should be in the range of 5 to 10 per 1,000 population for most countries.

National coverage comparison (Table 5):

The second step was to compare coverage rates obtained from the health facility data with different denominators with the most recent results from a national survey such as Demographic Health Survey (DHS) or Multiple Indicator Cluster Survey (MICS). For the national level, the denominators included DHIS2, UN, ANC1-derived and penta1-derived. Almost all reports used this correctly, and several marked the denominator that was closest to the survey estimate as the best denominator. Some countries got confused with the number of digits (the table used proportions rather than the more conventional percentages) which needs to be fixed. The use of standard errors can be done, but simpler methods such as absolute differences between the estimates should be preferred.[4]

Subnational coverage comparisons (Table 5):

This step considers the coverage analyses by region (admin 1) for which survey estimates are often available (with standard errors). Three denominators were considered: DHIS2, ANC1-derived and penta1-derived. About half of the countries were able to complete this analysis. Some lacked the

[4] The aim is to select the best performing denominator. This can be done by the number of survey standard errors difference but the results are the same if simply the absolute difference between the survey and facility data derived coverage estimates is taken. The latter would be simpler to comprehend.

coverage inputs from a recent survey. Several countries showed evidence that this step had been considered in the selection of the best denominator.

Selection of best denominator:

Countries used the ANC1 and penta1 coverage rates form the surveys in the computation of alternative denominators.[5] Almost all countries selected the facility-data-derived denominators. Some used two denominators (ANC1 and penta1), depending on the indicator. The template needs to be strengthened to ensure that countries clearly summarize their choice with the reasons, and all subsequent country coverage analysis tables need to indicator in the title or in a footnote which denominator was used.

Component 3: National Coverage Analyses

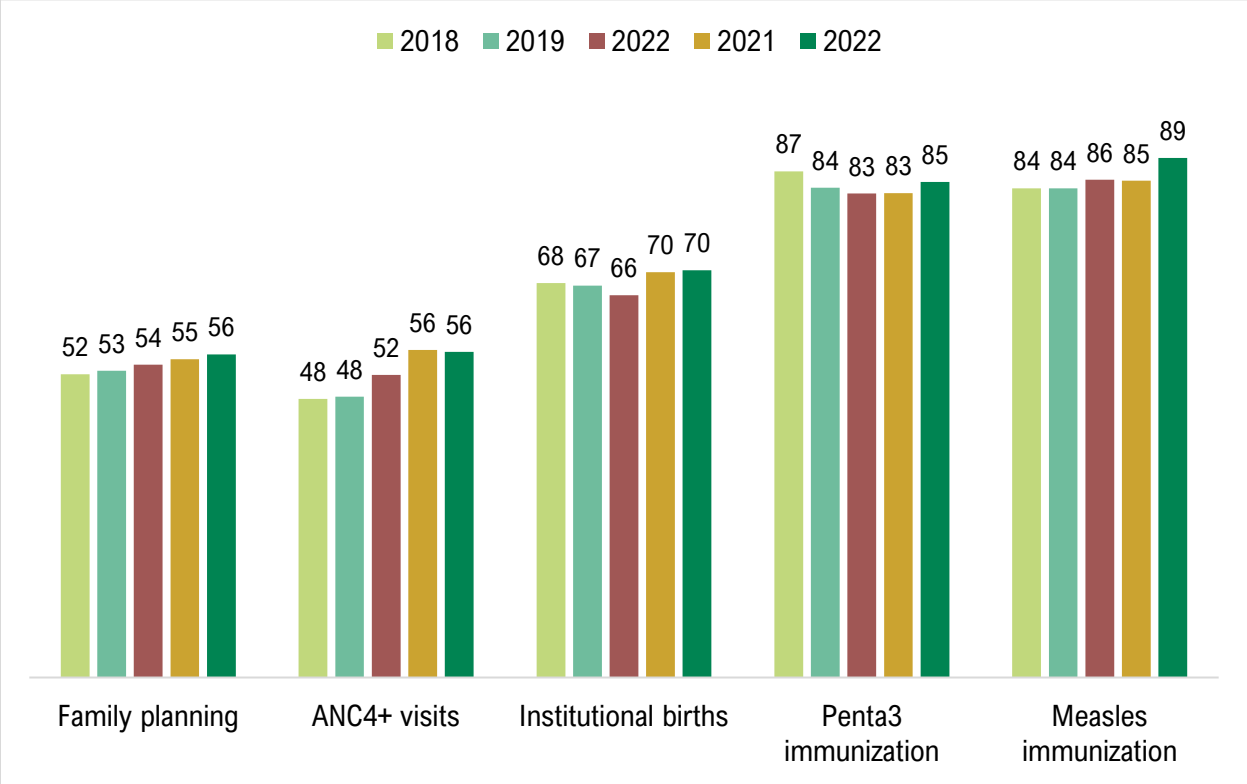
- Most countries produced time series for coverage indicators based on the health facility data and put those in a table, while family planning (FP) estimates were brought in a preceding Track20 workshop.
- The results, obtained with adjusted numerators and facility-based denominators, show a modest increase during 2018-2022 for most coverage indicators (ANC4, institutional deliveries, measles immunization, FP use), except penta3. In 2020, coverage increases stagnated but resumed the gradual increasing trend in 2021 and 2022.
- Some country reports included some integration of facility-based estimates and the most recent survey results in graphs. There is a need to advance integrated analysis for MNH and immunization indicators, using a web-based tool such as FPET.
- Even though institutional birth or delivery is a much more reliable indicator than SBA, more countries use SBA as an indicator in their national plans. Both indicators should be included. Other coverage indicators (in addition to IPT2 and C-sections, not used here) that should be considered are early ANC (first trimester), and full immunization coverage.

The summary of trends in coverage during 2018-2022 is shown in Figure 4. Family planning coverage (demand satisfied with modern methods) is based on the FPET application using survey and facility-based estimates. ANC4 and institutional delivery coverage are derived from the adjusted health facility data and ANC1-based denominators. The immunization coverage indicators are estimated from the adjusted health facility data and the DPT1-based denominators. The 21-country median increased over time for FP, ANC4, institutional deliveries and measles immunization, but not for the third dose of pentavalent vaccination. There may have been some adverse effects on coverage from the COVID pandemic on institutional deliveries in 2020 and immunization in 2020-21.

[5] However, the most recent surveys in 7 countries had ANC1 coverage below 90% and 11 countries were below 90% for penta1/DTP1. The method is more suited to those countries with near universal coverage, but it would be good to evaluate the results for lower-contact coverage countries for 2024.

Only FP coverage uses a model that integrated survey and facility data (national, subnational under further development by Track20). For MNH and immunization indicators, further work is needed to better integrate the estimates at national and subnational levels (admin1).[6]

Figure 4 Country median for coverage of family planning (demand satisfied), ANC 4 or more visits), institutional births, penta3 immunization, and measles immunization, 2018-2022



Family planning

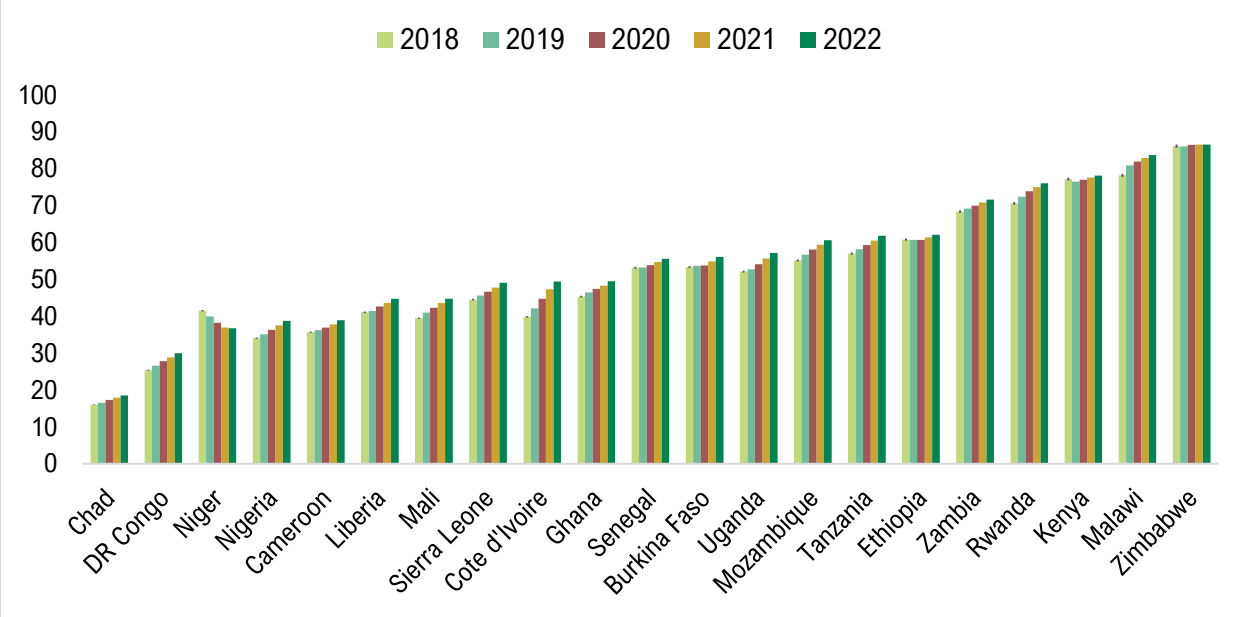
The outputs of the Track20 workshop, attended by Countdown country staff, were used. The resulting FPET tool graphs and table with survey and sometimes health facility data derived coverage were used most countries, some for all three indicators (modern CPR, unmet need and demand satisfied). Some country reports included facility data derived estimates (using three inputs commodities to clients, commodities to facilities and FP visits), obtained form using the SS-EMU tool. The impact of these facility-based analyses on family planning coverage trends was negligible as estimates were well off the survey data. Continued training of Countdown country teams as part of the Track20 annual workshops would be

[6] For admin2 the procedure is the same. There is one added complication: surveys are not designed to provide district estimates and modeling is required to produce such estimates. DHS indicated a few years ago that it would make such estimates available upon request for 10 or so indicators. Alternatively, Univ of Southampton has also made progress in this direction.

useful. Subnational analysis of FP indicators was conducted by just a few countries, primarily because the analysis tool does not yet run multiple admin1 areas in a single run. This is under development by Track20.

Family planning coverage (demand satisfied with modern methods among currently married women) increased from 52.1% in 2018 to 53.8% in 2020 and 55.6% in 2022 (median for the 22 countries), according to the FPET estimates. Only Niger did not have an increase in coverage (Figure 5).

Figure 5 Family planning coverage (demand satisfied with modern methods among currently married women)



Maternal and newborn health indicators

The preference is to use ANC1-derived indicators as an alternative to population projections if those result in implausible coverage trends. In some instances, however, DPT1-based denominators should be used if there is a problem with the ANC1 data. Most countries selected ANC1-based denominators for their analyses. For ANC4, the trends look plausible in most countries, although this can only be confirmed by comparison with overlapping survey results (Figure 5). It looks like the approach also works reasonably well with countries that have lower ANC1 coverage, but this needs to be examined further. The country

median for ANC 4 or more visits was 47.9% in 2018 and increased to 48.3% in 2019, 52.0% in 2020, 56.3% in 2021 and 56.0% in 2022 (Figure 6).

For institutional birth coverage, the facility data also gave consistent results in most countries with the ANC1-based denominator. Senegal was excluded, as all coverage estimates were well over 125%, presumably due to a faulty denominator (ANC1).[7] The Mali dataset in the master data file did not have data on numbers of live births in health facilities. The country median was 67.8% in 2018, dropped to 64.7% in 2019 and 65.7% in 2020, and increased to 69.7% in 2021 and 70.0% in 2022 (Figure 7).

[7] With a DPT1 based denominator Senegal's coverage was still "noisy" but much better: 86.5%, 71.1%, 82.7%, 81.7% and 95.9% during 2018-2022.

Figure 6 ANC4 coverage (%), based on health facility reports (adjusted) and ANC1-derived denominators, 21 countries, 2018-2022.

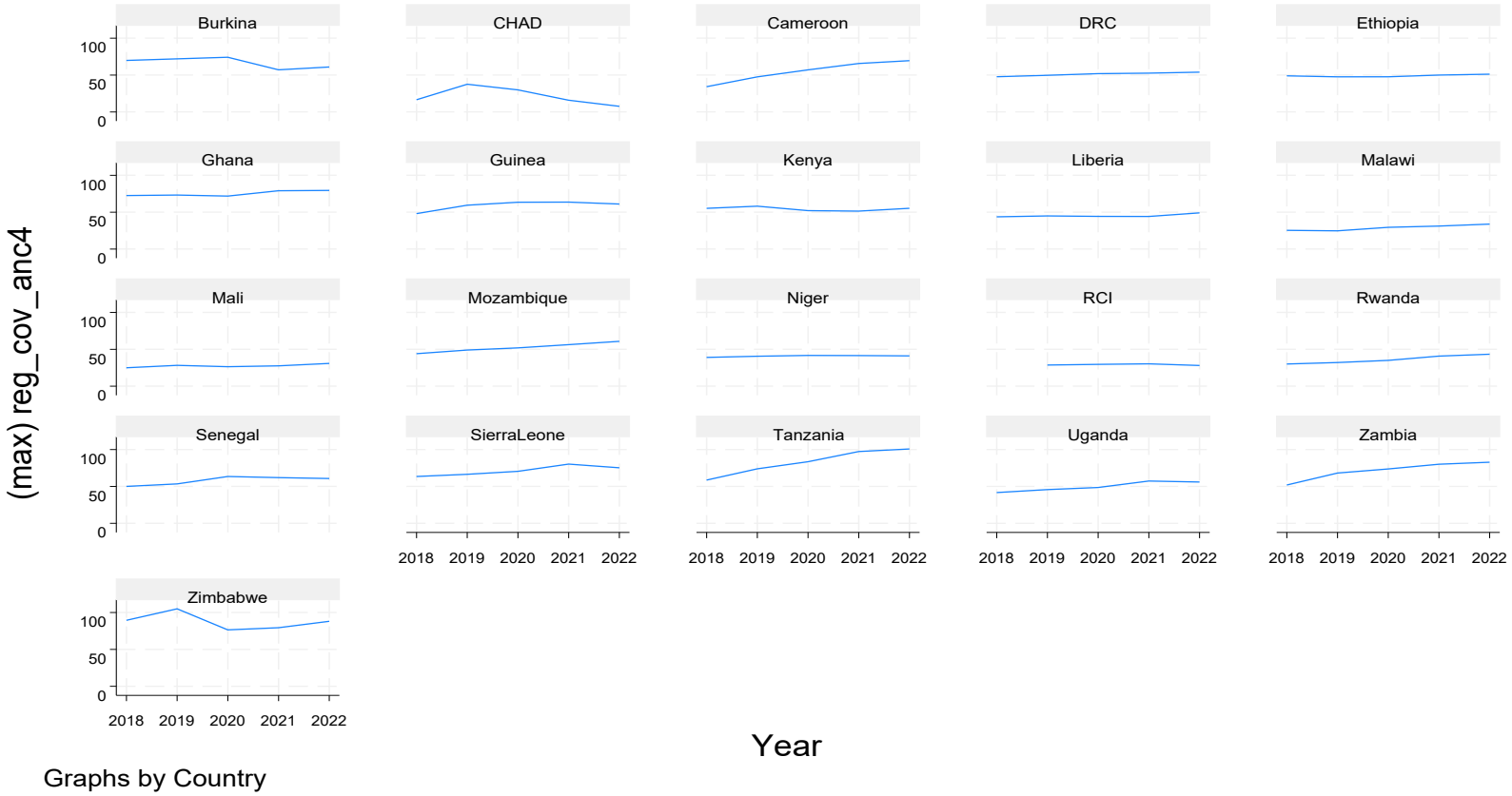
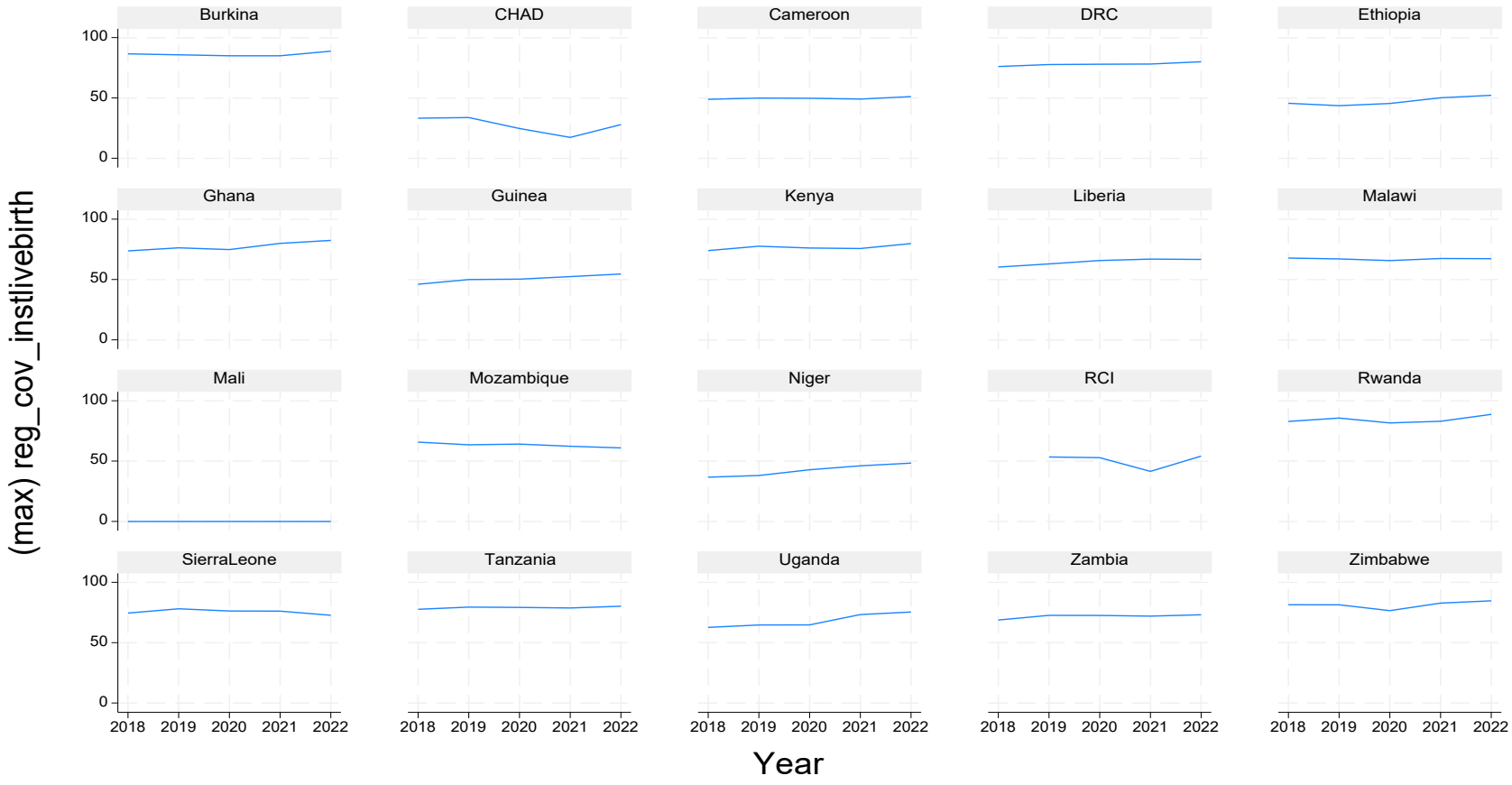


Figure 7 Institutional birth coverage (%), based on health facility reports (adjusted) and ANC1-derived denominators, 2018-2022



If the reported data are of good quality, the coverage results should be similar for ANC1-based and DPT1-based denominator. Figure 8 shows a comparison of ANC4 coverage between the ANC1 based (X-axis) and DPT1-based results (Y axis). Complete agreement would mean all points are on the diagonal. For most countries, the two denominators gave similar results, but some countries have major discrepancies, such as Mozambique or Senegal.

Immunization coverage

The preference is to use DPT1-derived indicators as an alternative to population projections if those result in implausible coverage trends. This is what most countries did. The country median was 87.0% in 2018, dropped to 84.2% in 2019 and 83.2% in 2020, and remained at 83.3% in 2021 and increased to 85.2% in 2022. For measles (MCV1) coverage, there was no such dip: 84.1% in 2018, 84.1%in 2019, 85.6% in 2020, 85.4% in 2021 and 89.3% in 2022 (Figure 9).

Figure 8: Comparison of ANC4 coverage based on ANC1-based and on DPT1-based denominators, 21 countries, 2018-2022

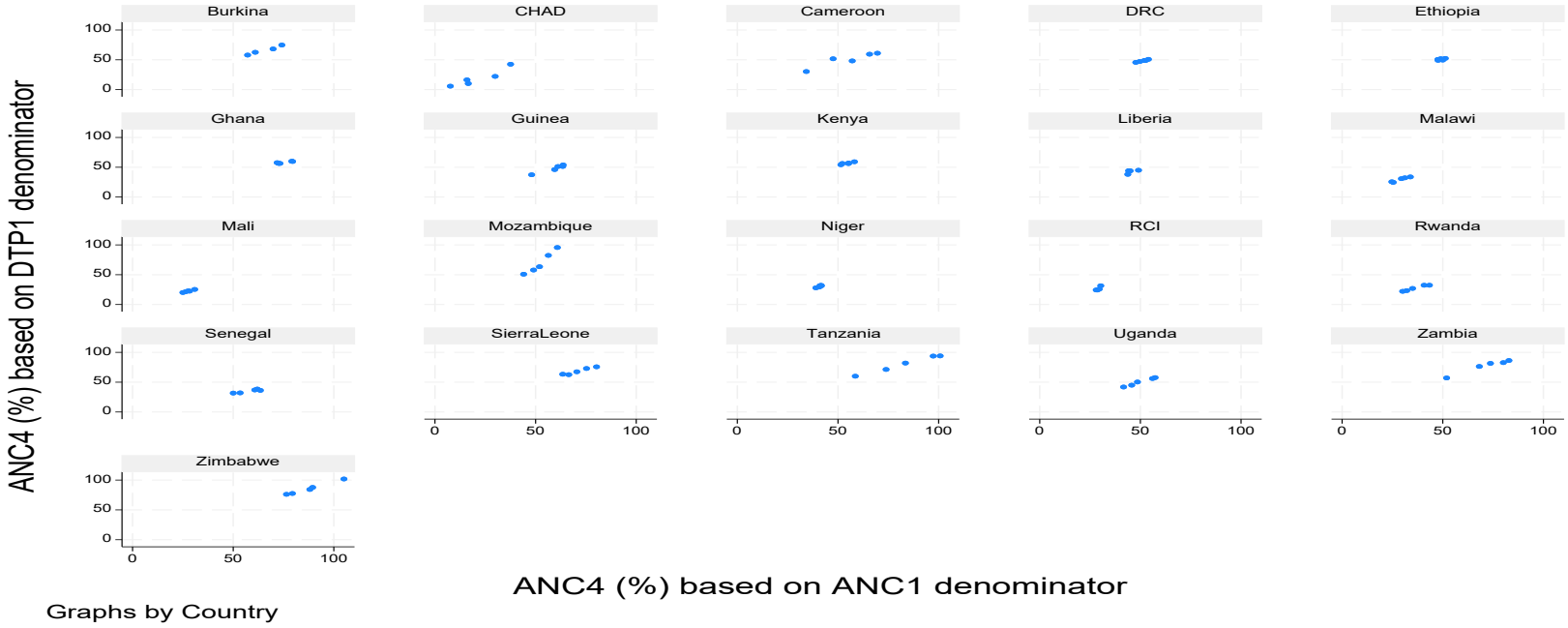
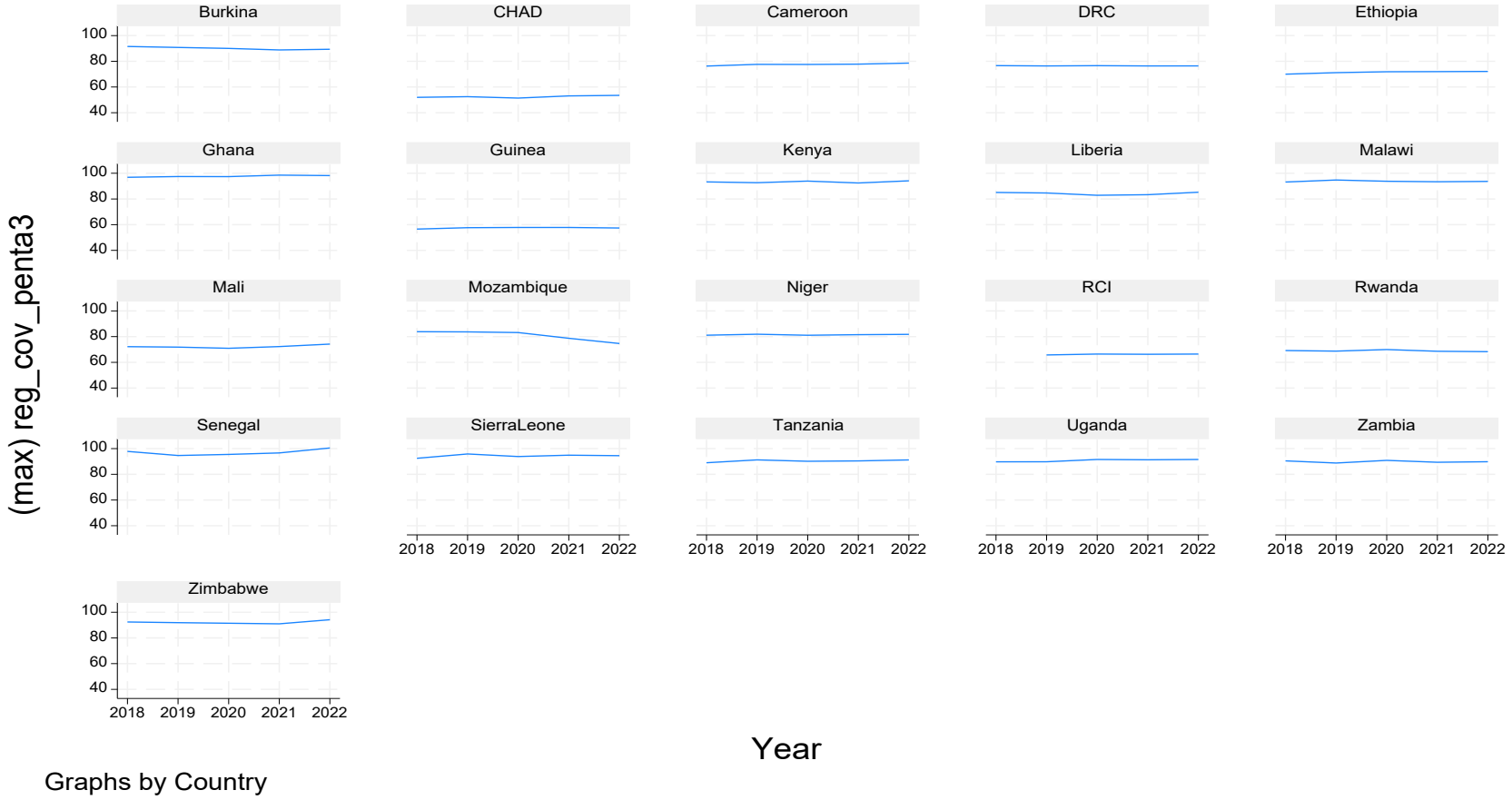


Figure 9: Penta3 coverage (%), based on health facility reports (adjusted) with DPT1-derived denominators.



Component 4: Subnational coverage analyses (Tables 9 and 10)

- The analysis focus was on institutional delivery/birth and penta3 vaccination in admin1 provinces/ regions/ counties), based on the adjusted health facility data.
- About half of the countries used the scatter plot with the annual summary statistic about the inequality to synthesize the result. There was little reduction of subnational inequalities in the two indicators. A similar scatter plot and equity summary statistics should be used for admin2 (districts) should be explored in 2024.
- A few countries compared survey and facility-based coverage by admin1. This should become standard practice (a scatter plot comparing the two estimates for the most recent year).
- This section could benefit from expansion with "standard" equity analyses for the stratifiers wealth (quintiles or percentiles), urban/rural/city (if sample size allows) for the CCI with the survey data, as done during the Countdown workshops in Africa from 2017-2019. A simple summary measure of whether or not inequalities are changing in the right direction should be included.

Institutional delivery / birth coverage

About half of the countries used the informative graph of the distribution of coverage by year, with a summary measure of inequality, as shown for DR Congo in Figure 10. The analyses outputs can be taken further to analyze trends in individual subnational areas. In most countries, the subnational trends were consistent over time. Figure 11 shows the examples of Niger and Zambia.

Figure 8 Example of the distribution of institutional births coverage, based on facility data, 2018-2022, with mean absolute deviation from mean, DR Congo, 2018-2022

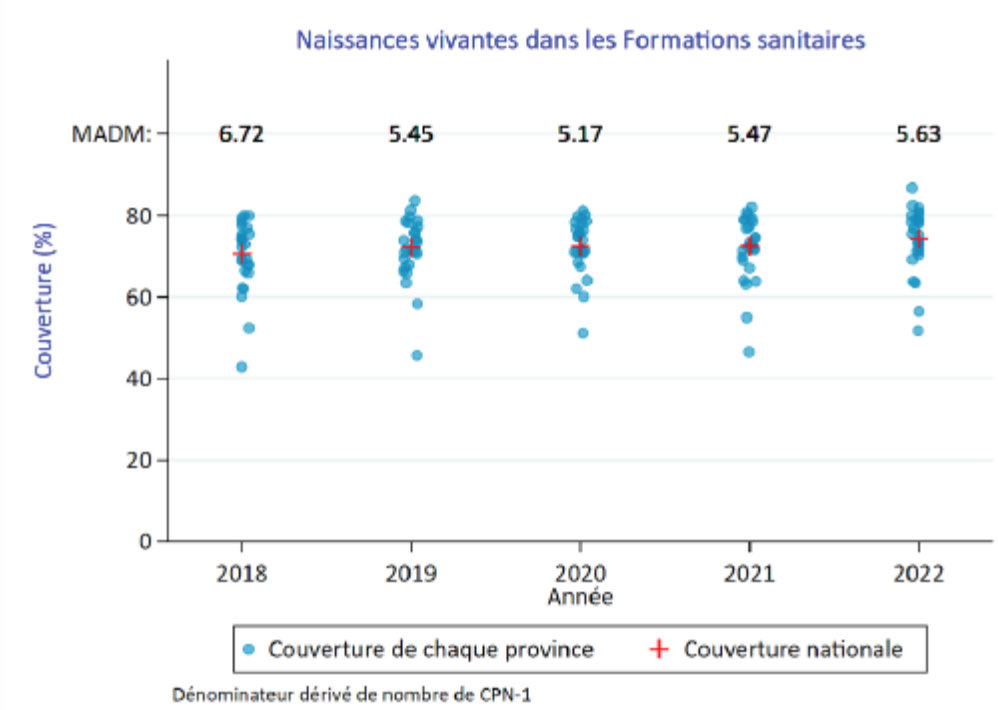
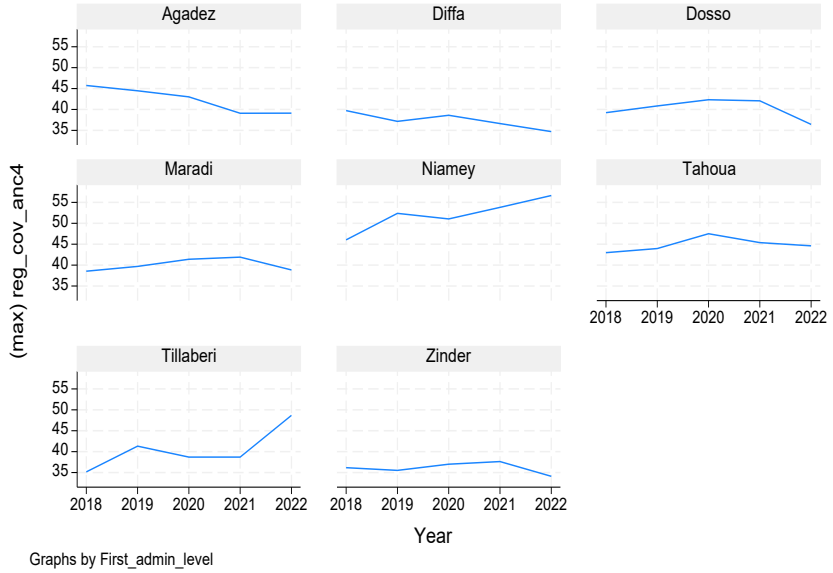
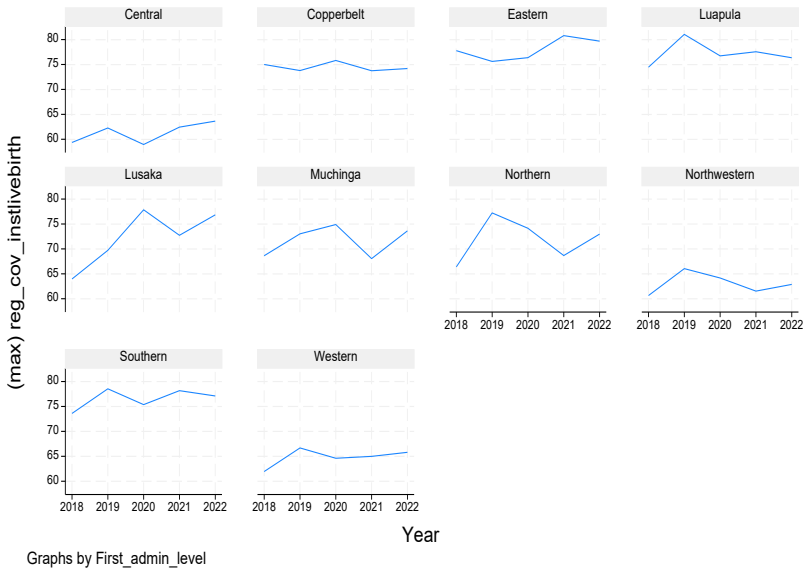


Figure 9 Trends in institutional birth coverage based on adjusted facility data and ANC1-based denominators, by admin1 in Niger and Zambia, 2018-2022.





The subnational inequalities for institutional delivery coverage are often large. The reduction in inequalities between 2018 and 2022 was modest: the 20-country median (no data for Mali) of the mean absolute deviation from the national mean (MADM) was 8.6 in 2018, declined to 7.7 in 2019 and 7.1 in 2021, but increase to 8.2 in 2021 and 7.7 in 2022. Inequalities were very large in Cameroon, and large in Chad and Niger. Rwanda and Malawi had the smallest inequalities (Figure 12). A few countries compared coverage between survey and facility-based estimates.

Penta3 coverage

Similar graphs showing the distribution of coverage in subnational areas and the trend in individual admin1 areas over time were produced for immunization coverage. For penta3 immunization coverage, the inequalities are much smaller with little change over time (country median MADM 2.6 over the 5-year period). This pattern occurred in most countries. Some individual countries, however, showed an increase in inequalities (e.g., Mozambique 2020-22 and Senegal 2022), while others showed a decline (e.g., Cameroon, Niger, Sierra Leone) (Figure 13).

Also, for immunization coverage, only a few countries produced a scatter plot of the most recent survey coverage estimate and the results from the facility data analysis for the same year for admin1 (or near). This would be important to evaluate the results, and good to include this graph for admin1 in the next round.

Figure 10 Median absolute deviation from the national mean (MADM) for institutional delivery/birth coverage by admin1, using health facility-based coverage estimates, 2018-2022

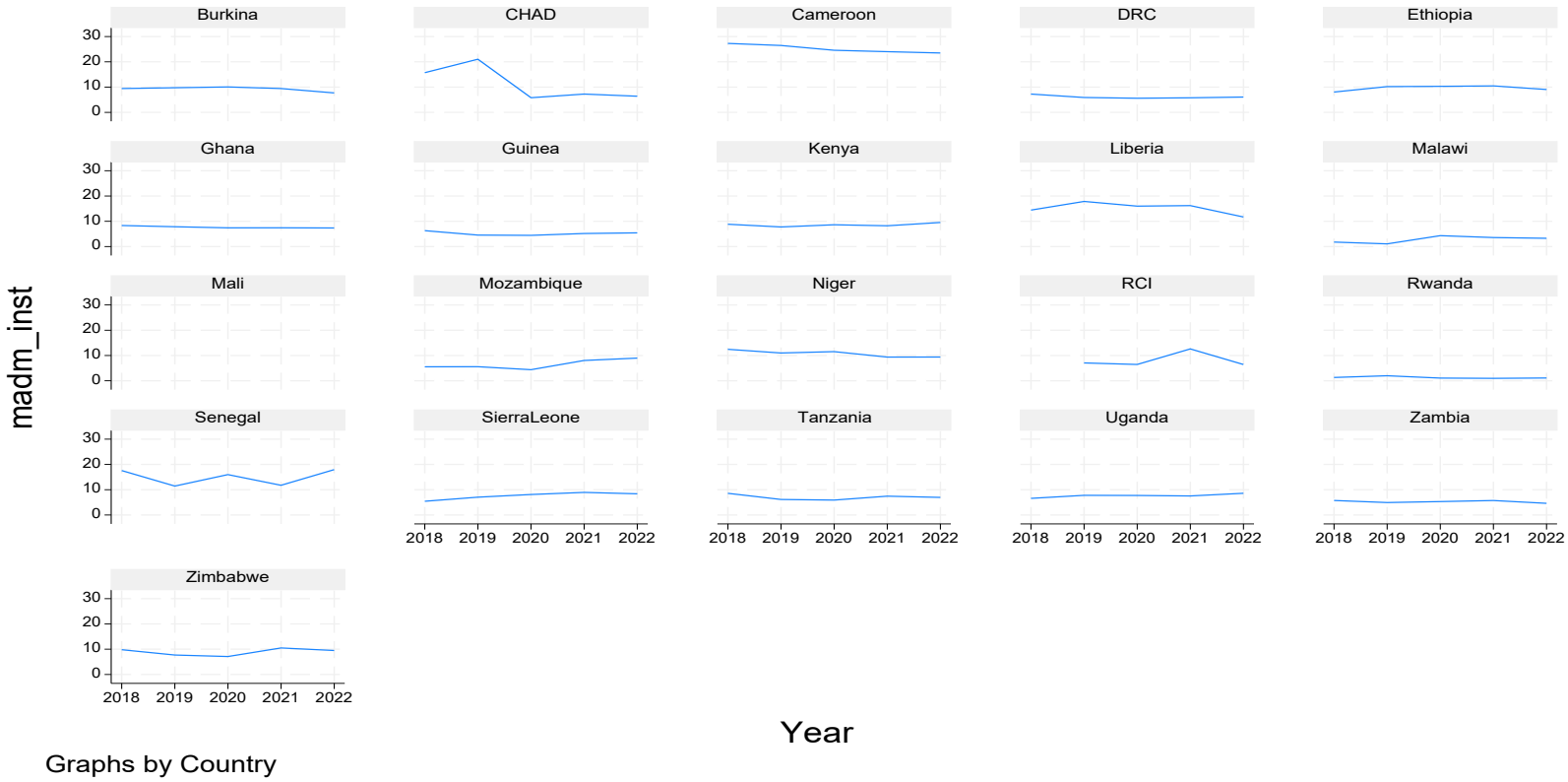
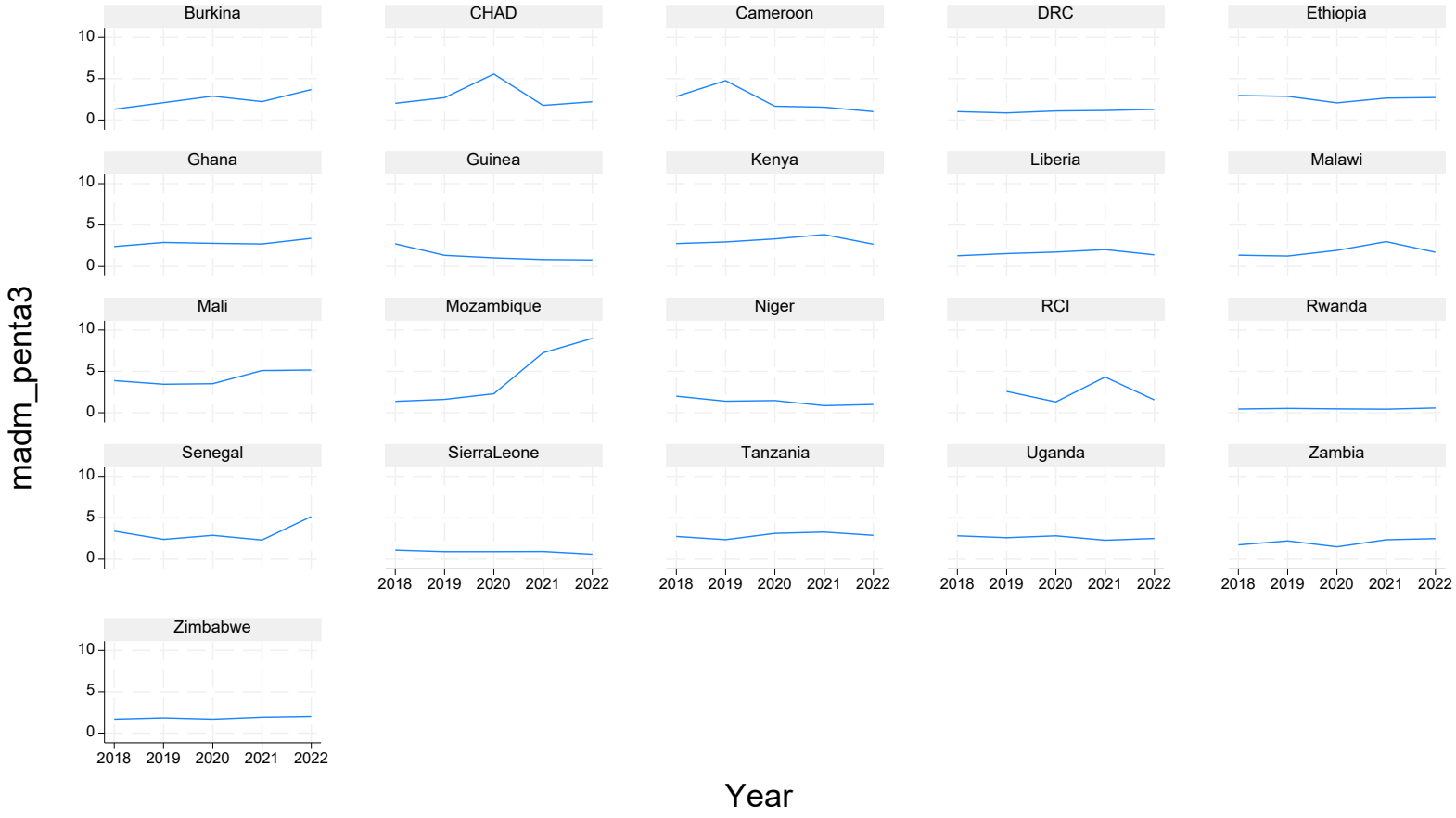


Figure 11 Median absolute deviation from the national mean (MADM) for penta3 immunization coverage by admin1, using health facility-based coverage estimates, 2018-2022



Component 5: Maternal mortality and stillbirths

- Based on the health facility data, the median institutional maternal mortality was 102 per 100,000 live births, and the median stillbirth rate was 18 per 1000 live births.
- The mortality data quality assessment in Excel worked well. Many countries were able to complete the table. There was, however, little interpretation, especially for the poor results on the community to institutional mortality ratio. Better ways to present these results can be developed (estimated of completeness of death reporting).
- The DQ score cards also looked good for some indicators. There seems to be better consistency than expected over time, but consistent underreporting seems to be the main problem .
- Modification to the mortality data quality assessment tool are proposed.

The mortality data analysis is done on the unadjusted data since adjustment of deaths for non-reporting or extreme outliers is likely to lead to errors. Nineteen countries reported maternal death data and 21 stillbirth data. The main results on the institutional mortality:

- The country median maternal mortality ratio for 2017-2021 was 102 per 100,000 live births (interquartile range [IQR]: 83-135), ranging from 56 in Tanzania and 61 in Malawi to 239 in Liberia and implausibly high in Sierra Leone (nearly 1000).
- The country median stillbirth rate for 2017-2021 was 18 per 1,000 births (IQR: 15-20), ranging from less than 10 in Chad (unlikely low) and 11 in Tanzania, to over 30 in Guinea, Cote d'Ivoire and Niger.

The main observations on the data quality assessment:

- The completeness of reporting for labor and delivery ward forms was high in almost all countries but does not give an indication of how well mortality is reported.
- The consistency check of the ratio stillbirths to maternal deaths is highly informative and suggests that underreporting of maternal deaths was much greater than for stillbirths, as the ratios were much higher than expected in almost all countries (median: 17 stillbirths per maternal deaths, which was much higher than an expected ratio of 5-10).
- Consistency over time of the number of deaths was generally good, but this may only indicate a consistent level of underreporting. The proposal is to replace this indicator by the proportion of districts with highly unlikely mortality levels based on the reported data (lower than high-income countries).
- The computations of community mortality based on the observed institutional mortality and UN estimates was done by most countries, but there was little interpretation. This may be due to its novelty. An alternative is to use a similar method to compute the completeness of reporting of maternal deaths (and stillbirths) by health facilities based on expected numbers that are derived from

the median, lower and upper bounds of UN estimates and the observed institutional mortality rates. This would lead to outputs that are easier to communicate, e.g., 40% (30-55%) completeness of reporting of maternal deaths.

Component 6: Curative service utilization

- Data quality is an issue in several countries, though the consistency over time is encouraging. The big question is whether the large differences between countries are true or due to differences in recording and reporting practices (e.g., recording of re-visits, extent to which preventive visits are included). It will be possible to develop a set of DQ indicators such as consistency between years in terms of OPD utilization and percentage that are under 5, and the proportion of OPD visits that are under 5 (e.g., acceptable range 15-40%). This will also include assessment of consistency across OPD and IPD utilization and patterns.
- It will be useful to compute adjusted rates, based on completeness of reporting. Senegal and Cameroon have low reporting rates to be included.
- CAM 2024: Given these results it will be useful to ask countries to continue these analyses and add number of deaths reported in health facility which allows for an assessment of case fatality rates (which tends to be of the order of 1-2% under "normal" circumstances).

In general, there is only limited information about curative service utilization. Utilization statistics on care-seeking behavior among children with recent illnesses (diarrhea, acute respiratory infection [ARI] or fever) can only be obtained from household surveys, as the incidence/prevalence in the population is not known.

Most country systems include a simple age breakdown in the routine OPD and admission services: under-5 and 5 years and over. In the CAM 2023, we analyzed the health facility data to assess the service utilization for OPD care and health facilities (inpatient care, IPD) among children under 5 years and for all ages. Using the unadjusted health facility data and UN population estimates as denominator, the mean annual number of OPD utilization rates and the annual number of hospital admissions per 100 persons were computed for the whole population and for children under 5.

A few results are shown here (more complete report available). For children under 5 years, the country median of the mean number of visits per year decreased from 1.3 per year in 2018 and 2019, to 1.1 in 2020 and 2021, and 1.0 in 2022. Also here, there was good consistency between the years in most countries. The range was wide. The higher utilization rates (at least 2 visits per year) were observed in Burkina Faso with a 5-year median of 2.8, Mozambique (if based on 2018-2020 but 2021 missing and 2022 much lower), DR Congo and Zambia. The annual means were below 1 visit per child per year in Chad, Guinea, Mali, Niger and Tanzania, as well as the underreporting countries of Cameroon and Senegal.

Six countries were not able to provide data on admissions for under-fives: Ethiopia, Guinea, Mali, Mozambique, Senegal and Uganda. Cameroon provided data for 2020-2022 even though no overall utilization data were available. Consistency was good in most countries, except Burkina Faso (and Cameroon) (Figure 14). The country median for the 5-year period was 4.1 admissions per 100 under-fives, declining from 4.6 in 2018 to 4.2 in 2022. Ghana had the highest admission rate (10), followed by Kenya, Rwanda and Sierra Leone (range of 5-6). Low admission rates for children were observed in Chad, Cote d'Ivoire and Niger (all below 2). Zimbabwe was also low (2.3).

Figure 12 Mean OPD visits per child per year, health facility data, 2018-2022 (unadjusted data) (Note: no data for Zimbabwe)

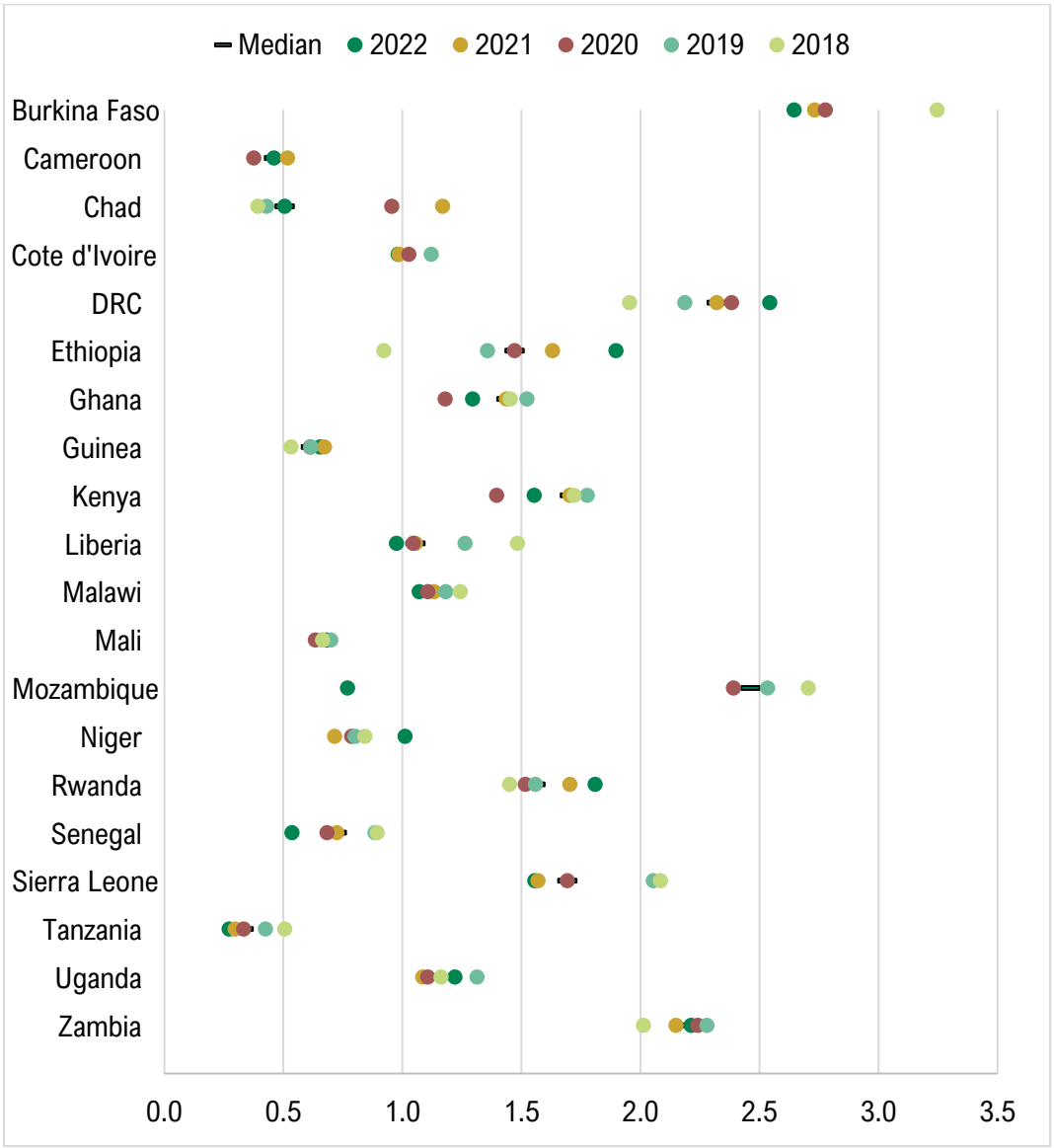


Figure 13 Mean inpatient department (IPD) admissions per 100 children under 5 years per year, health facility data, 2018-2022 (unadjusted data) (Note: No data for Ethiopia, Mali, Mozambique, Senegal, or Uganda)

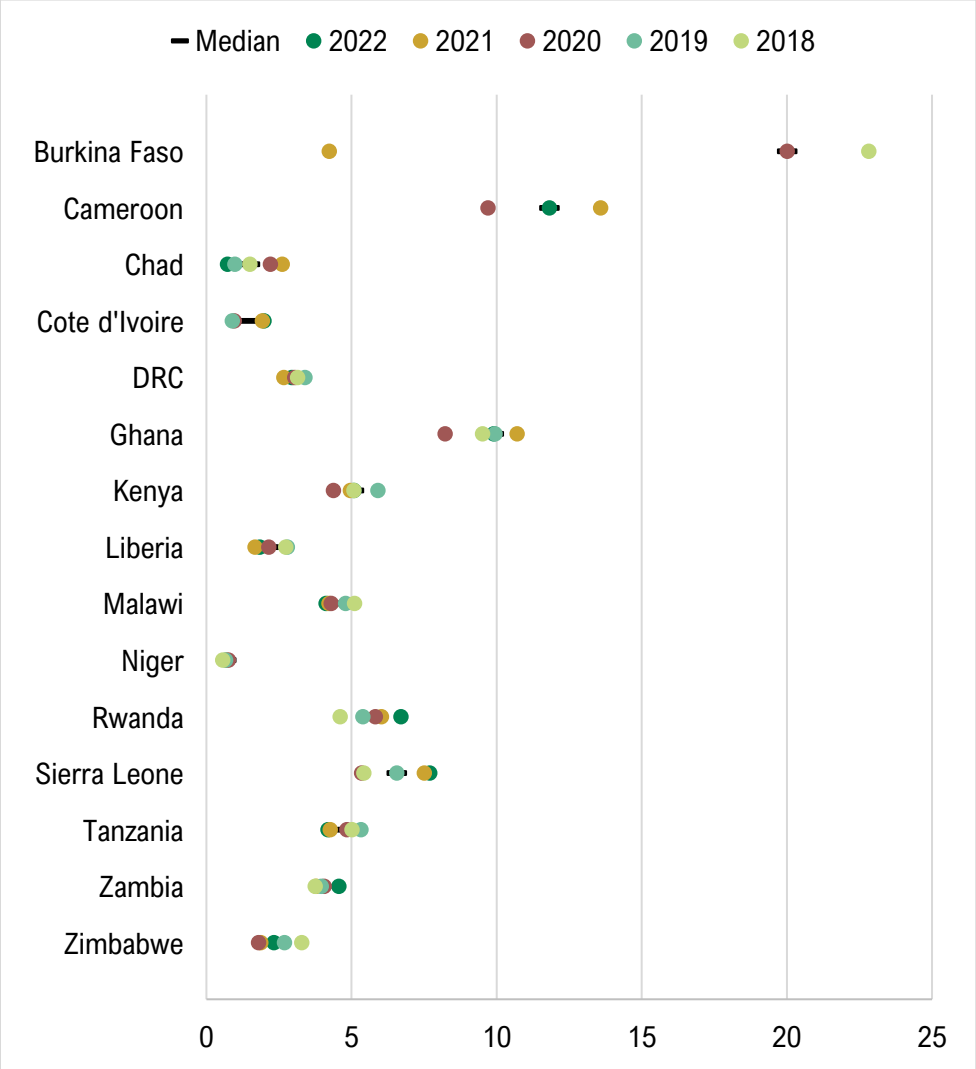
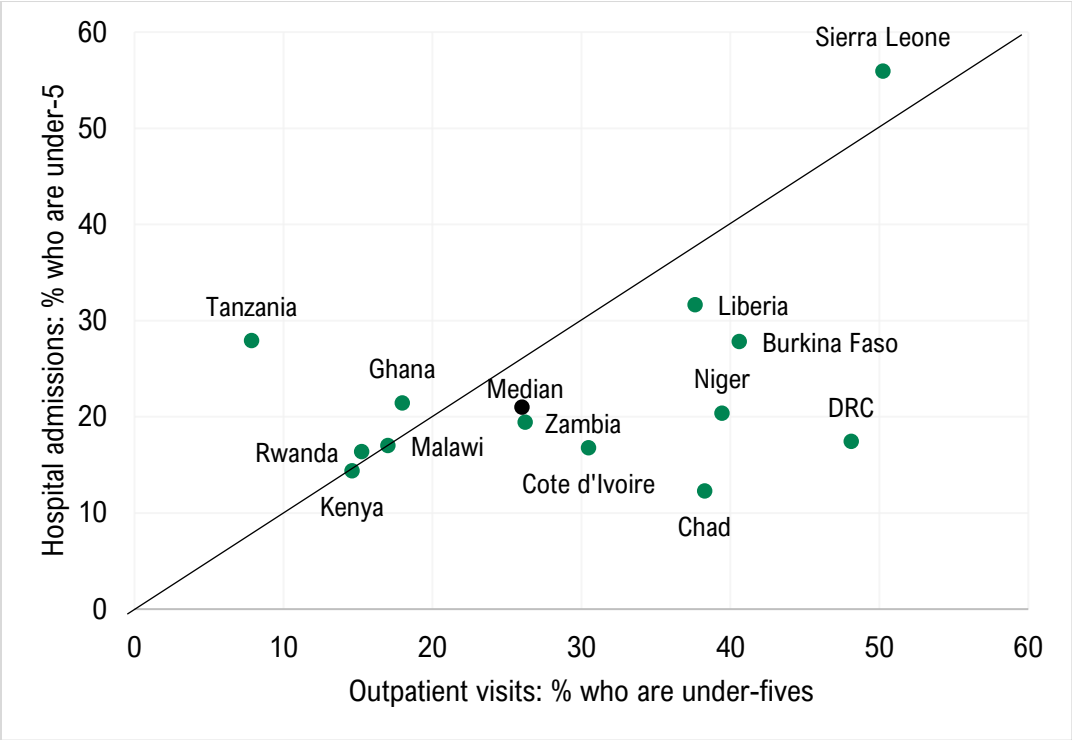


Figure 15 shows the 13 countries with data on under-fives and the whole population for both indicators (median for the five-year period). Seven countries were close to the diagonal, especially Kenya, Rwanda, Malawi, and Ghana, while Zambia, Liberia and Sierra Leone were fairly close. Inconsistent patterns were observed in Tanzania with 8% of OPD visits and 28% of the admissions being under-fives, which is unlikely (especially the OPD). Five countries in West and Central Africa had lower proportions under-5s in the hospital admission data than expected based on the OPD data (Burkina Faso, Chad, Cote d'Ivoire, DR Congo, Niger).

Figure 14 Percent of OPD visits and admissions children who were under—5, by country, 2018-2022 medians



Component 7: Health System Data and Performance

Synthesis of the 2023 health systems analysis has not been completed yet. Future analyses may consider include synthesis of survey data on size of private sector to inform the otherwise uninformed debate about the role of the private sector: Discrepancies between facility and survey statistics can be due to the role of the private sector if private sector reporting in the DHIS2 is inadequate. Some countries have a sizeable private sector which reports poorly, and attention needs to be given to this issue in the report. Showing the proportion of coverage that comes from the private sector – with survey data on institutional delivery or other indicator – should be done.

Proposed plan for Country Annual Meeting Reports in 2024

In 2024, an important goal will be to develop a more comprehensive report template that can partly be completed before the CAM and becomes an advanced draft the CAM. This report will be published by Countdown collaborations, wherever feasible with government endorsement. Editing and layout will be supported by Countdown, so that it becomes a high-quality publication ready for wide dissemination. This should help increase the uptake of the analytical outputs in country reviews of progress and performance and inform global monitoring work, including the GFF annual reports.

The CAM 2024 report will:

- build on the tools and outputs of the CAM 2023 and multi-country analytical projects. The 2023 report will be the starting point for the 2024 report, adding the year 2023 analyses;
- expand the number of key indicators in line with national and global plans;
- be based on all relevant data sources, with further inclusion of survey-based analyses (on e.g. mortality, nutrition and treatment coverage) and improved tools for integrating survey and facility-based statistics;
- will focus on national, regional and district level trends and inequalities; include facility assessment data where possible (SARA, SPA, FASTR);
- have more extensive text and table/graph templates, resulting from the analyses; the template will be ready by January 2024; and
- have completed sections prior to the CAM, by the country collaborations, with guidance from the core team.

The CAM 2024 will take place late April. The advanced draft will be presented and discussed at a technical meeting of key stakeholders in-country within 4 weeks after the CAM (by June 1). Revisions will be made, and all country reports will go into production by mid-June at the latest so that they can be ready by mid-July. All country collaborations, with support from GFF, will organize a dissemination meeting before September 2024 with key country stakeholders, including relevant policy makers. Table 4 summarizes preparations needed.

Table 4 ***Expansion and revision of Countdown suite of tools for analysis to inform country reviews, by component, with required actions***

#	Component	Revisions, new tools	Actions (2024-2025)
1	**Facility data quality - numerators**	Expand indicators/data elements based on review of CAM national plans	• Proposal for data request 2024
		Revise numerator DQ score cards CAM 2023	• Add national ratio ANC1/penta1 and penta1/3 to score card; • Show impact adjustments on total ANC1, live births and penta1
2	**Facility data - denominators**	Add guidance for basic demographic assessment	• Improve spreadsheet to assess demographic parameters, add text
		Improve national and subnational assessment of coverage result for denominator selection	• Improve Stata/Excel tool for analysis of performance denominators with (sub)national data
3	**National coverage and trends and equity**	Combined analyses of survey and facility estimates (new tool)	• Develop tool for key MNH and immunization indicators, using FP2020 methods
		Survey analysis of trends in inequalities for key coverage indicators (wealth, city/other urban/rural)	• Incorporate code from Pelotas Africa work, develop equity summary measures, graphs
4	**Subnational coverage trends, equity**	CAM 2023 tool for regional analysis and presentation; also for district	• Make admin2 standard output
		Combined analyses of survey and facility estimates (new tool)	• Develop tool for combined analysis as done for FP (under development) • Produce district estimates from surveys (possibly request DHS)
		Stratified rankings of admin1/2 based on coverage	• Develop tool for systematic ranking (stratified league tables)
5	**Mortality**	Population: survey/census data; UN estimates (IGME);	• Incorporate IGME tool

		geospatial analysis admin 1/2 (UW)	• Consider subnational modeling results
		Institutional: improve data quality and trend assessment tool	• Review in this report • Add further detail on subnational reporting quality to assessment
6	Curative services use	Expand tool and include mortality data; consider top diagnoses	• Review in this report • Expand xls with mortality data
		Survey analyses for treatment - seeking behaviour; trends, equity	• Synthesis tool based on provided outputs from surveys
7	Health system performance (subnational)	Quality assessment subnational health services data (facility assessments)	• Review CAM 2023, develop more extensive DQ assessment
		Performance assessment (utilization/coverage by inputs)	• Simple bivariate analyses • multivariate analysis (controlling for SES) • frontier analyses and allocative/technical efficiency analyses