National and subnational coverage and other service statistics for reproductive, maternal, newborn and child health from health facility data and surveys

MALAWI

Brief synthesis of the analyses

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Background

This synthesis describes the data, methods, and results of an analysis of the health facility 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 and districts). The set of indicators is limited but can easily be expanded using similar methods into for instance family planning, adolescent health, and nutrition.

The aim of the 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 (kept in DHIS2 software) a clean data set is created for the endline review. This is done through a systematic approach, with ample 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 sets
2. Data quality assessment and adjustment
3. With number 2
4. Denominators or target populations
5. Survey coverage trends and equity
6. Facility data derived coverage trends and inequalities
7. Private sector bias
8. Analysis of subnational progress and performance
9. Potential additional indicators

A. Description of the data sets

The health services in Malawi are delivered through a network of public, Non-Governmental Organizations (NGOs), Private-not-for-Profit, and Private-for-Profit providers and are in total 1098 health facilities. According to the DHIS2 database, there are 1098 health facilities.

Table 1: Distribution of health facilities by type and ownership

Facility Type	Facility Owner					Grand Total
	CHAM	Govt	NGO	Private for profit	Private non profit	
Clinic	7	20	46	233	46	352
Dispensary	2	49	1	2	8	62
Health Centre	109	364	5	4	7	489
Health Post	5	89	1			95
Hospital	41	49		9	1	100
Grand Total	164	571	53	248	62	1098

Source: Malawi Harmonized Health Facility Assessment (2019)

After the Government, privately owned health and Christian Health Association of Malawi (CHAM) facilities are the most numerous. CHAM compliments public facilities through a memorandum of understanding (MOU) with prioritization of government support to CHAM facilities located outside a mandatory 8 Km radius of public facilities from one another. In 2016, there were a total of 5090 outreach clinics, 79% of which were owned by Government while CHAM owned 19% of these. Also, in the same year, there were 3542 village clinics, all of which were owned by Government.

Monthly district data, extracted from DHIS2 were analysed for 16 indicators with data for the period January 2017 to December 2021. After data quality assessment and adjustment, the monthly district data were aggregated to annual regional 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 2016 were MDHS 2016, MPHIA 2017 (HIV), MIS 2017 (malaria), MNNS 2018 (nutrition). The last census was MICS (2019-20).

Table 2: Health facility data summary

Indicator	
Administrative organization	
Number of Health Zones	5
Number of districts	29

Health facilities	
Number of health facilities in country	1098
Data on core health professionals	Yes
Data on hospital beds	Yes
Facility data analysis period	
First month and year with health facility data	January 2017
Last month and year with health facility data	December 2021
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

B. Data quality assessment and adjustments

The data quality score card shows that the quality of the DHIS2 health facility data has been improving over the years (Table 2). The completeness of reporting has been at least 90% across the years for seven indicators: ANC, FP, Institution deliveries, OPD, IPD, PNC and child vaccination. Reporting for Completeness in Dowa, Mchinji and Mulanje districts are consistently low across all RMNCH indicators. However, there has been a lot of variations at subnational level on data completeness. Extreme outliers were few There is an outlier in 2020. This can be attributed to data entry errors as the case in ratio of Penta1 – penta3 numbers (national).and the consistency of reporting of different indicators was good. One of the critical data quality issue is that health workers are not filling in appropriately the data registers due to lack of proper orientation. Data clerks also do not fully understand the difference of zero and blank inputs into the dataset hence providing wrong data.
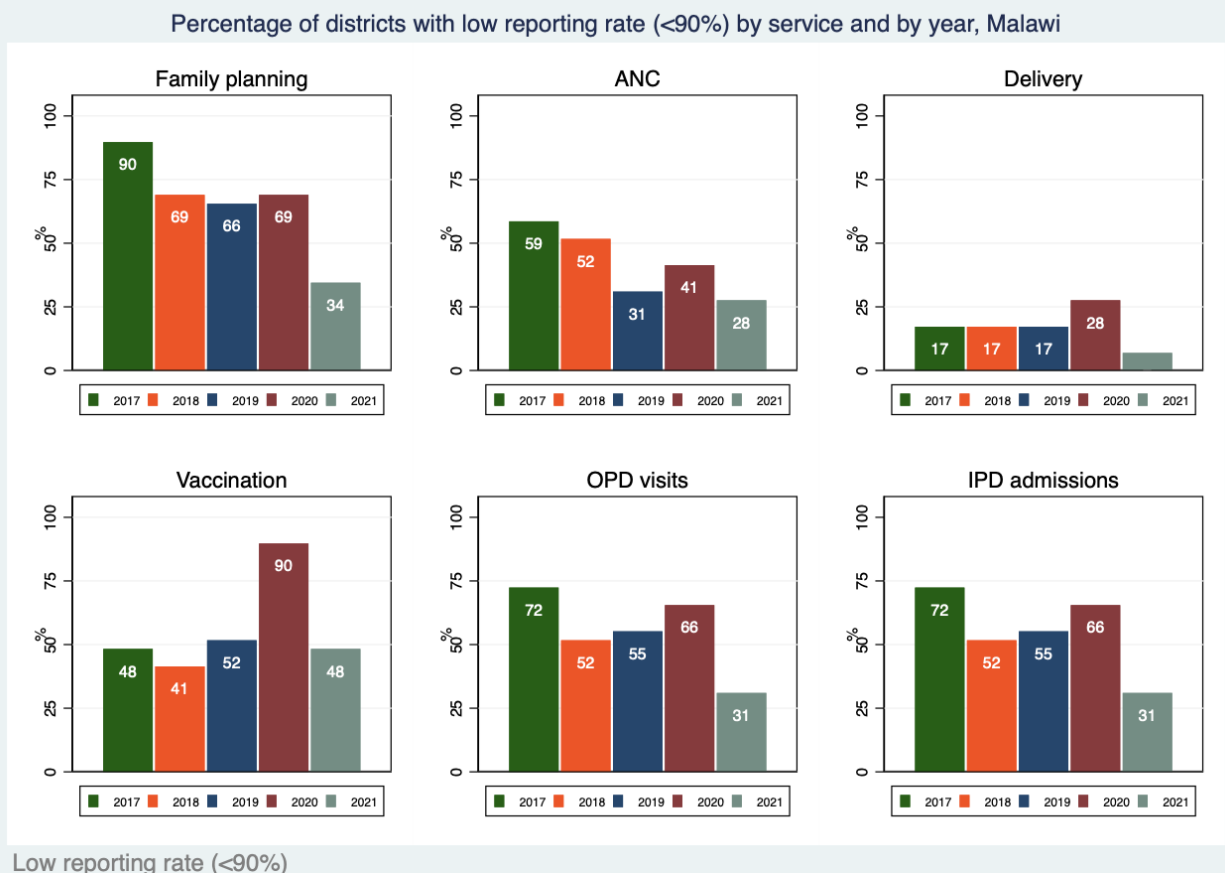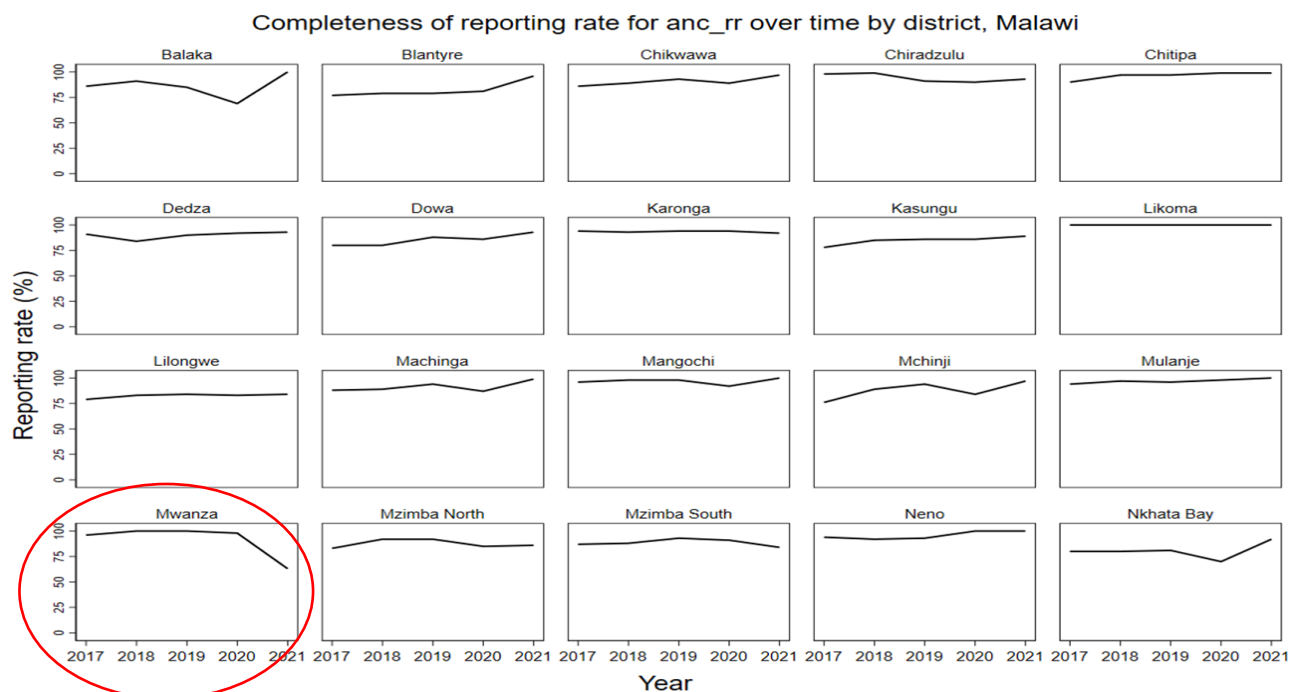
Table 3: Data quality score card for national and subnational levels, 2017-2021

		2017	2018	2019	2020	2021
1	**Completeness of monthly facility reporting (green >90%)**					
1a	Reporting rate (%) by year (National average of ANC, delivery, vaccination, opd)	83	90	90	83	91
1b	% of districts with reporting rate >= 90% by year (National average of ANC, delivery, vaccination, opd)	51	59	61	44	72
1c	% of districts with no missing monthly values by year (National average of ANC1, ANC4, delivery, Penta1, Penta3, opd)	92	100	100	88	94
2	**Extreme outliers (green > 95%)**					
2a	Percentage of monthly values that are not extreme outliers	100	100	98	94	95
2b	Percentage of districts with no extreme outliers in the year	97	98	93	73	87
3	**Consistency of annual reporting (green>85%)**					
3a	Percentage of districts with adequate ratio between ANC1 and Penta1 (between 1.0 and 1.5) by year	75	66	55	45	55
	Ratio Penta1 – penta3 numbers (national)	6.96	1.07	1.34	6.63	1.45
3b	Percentage of districts with adequate ratio between Penta1 and Penta3 (between 1.0 and 1.5) by year	92	93	69	69	59
	Annual data quality score (mean indicator 1a to 3b)	1.05	1.04	0.96	1.03	1.01

Figure 1: Completeness of reporting and percent of district with low reporting rates (<80%).

We can see that the reporting rate in most districts are fairly high. It is Government mandate that there should be 90% and above completeness in reporting rate. However, reporting in Mwanza district in 2020 and 2021 is lower than 90% and Covid pandemic contributed greatly as some data clerks were infected and took days off. There was also data loss in the DHIS server for April to June 2021 and this

compromized data quality. The data was however re-entered in August 2021.

Completeness of reporting rate for anc_rr over time by district, Malawi

Percentage of districts with low reporting rate (<90%) by service and by year, Malawi

Low reporting rate (<90%)

We observed that reporting on most indicators was low and in 2021, it was even worse. This could be attributed to the spikes of the Covid-19 pandemic. We looked at our excel data set and observed that some cells were missing data.
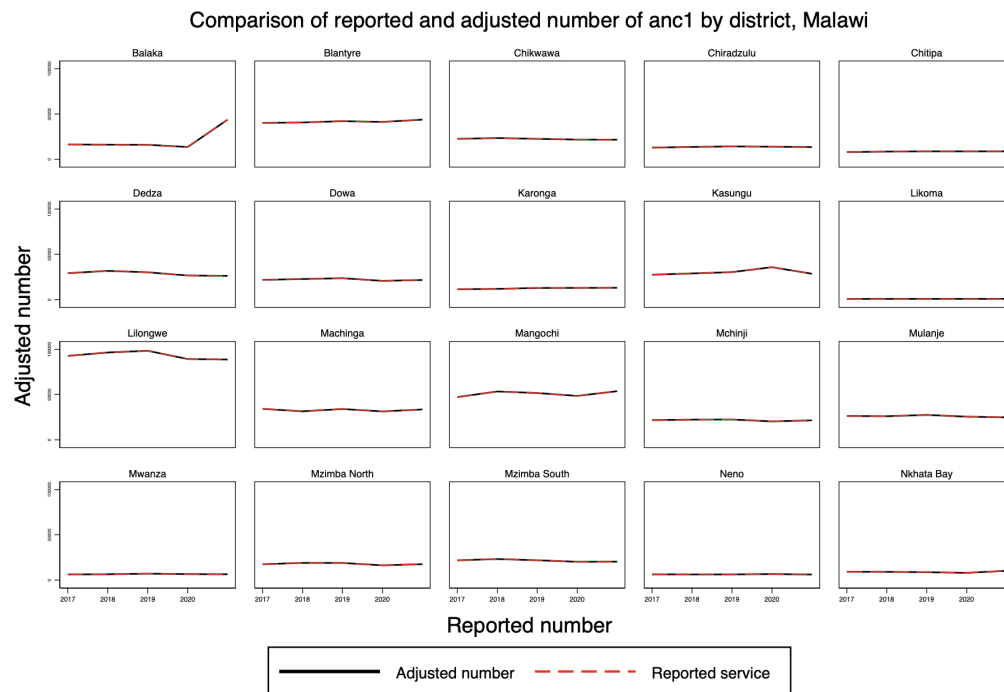
Since all facilities are expected to report we decided not to apply any adjustment so the factor K is assigned to 0.

Figure 2: Example of adjustment for outliers for ANC first visit in two districts before and after correction.

Comparison of adjusted numbers of ANC1 and Penta1 by year, Malawi

R-squared=0.6722
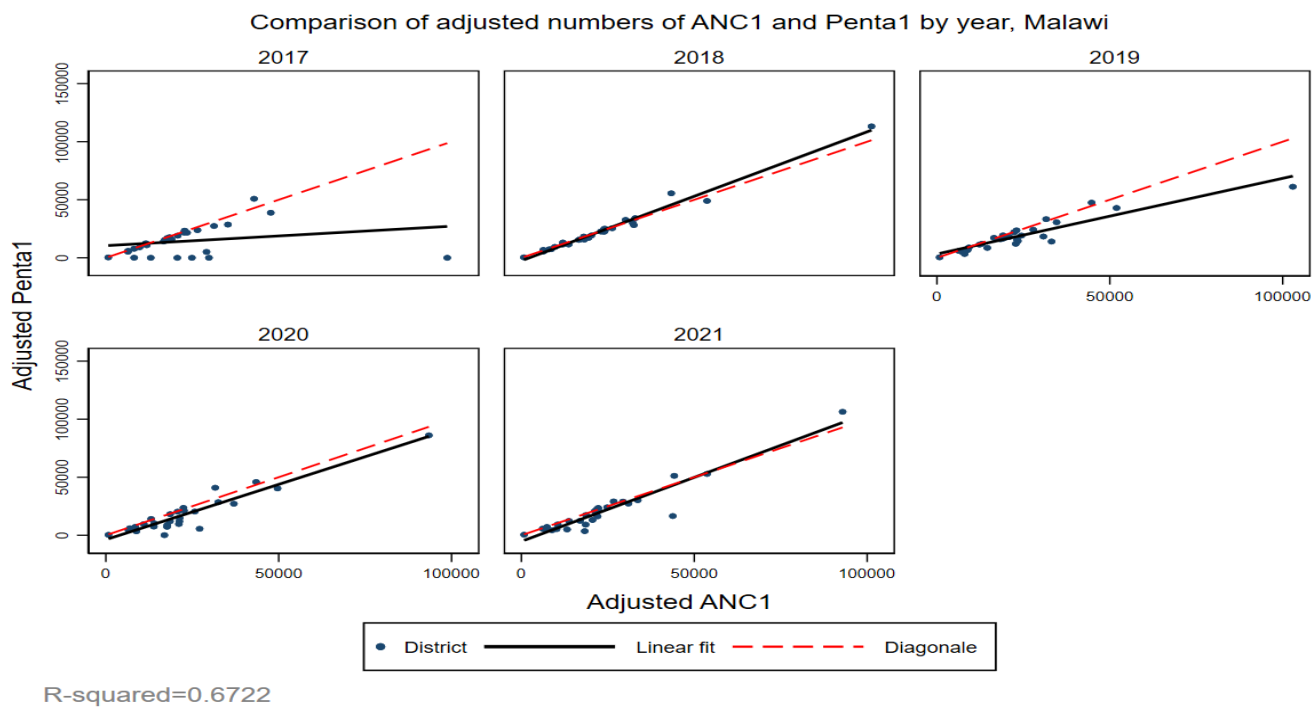
The 2017 graph showed several zeros below the expected line. We checked in the excel data set and observed that several facilities zero reported on these indicators. This was a result of wrong data entry.

C. Denominators or target populations

The denominators based on the 2018 census population projections were considered adequate for estimation of target populations for the coverage indicators. There is a big discrepancy between the Malawi Population data and the UN population data. Malawi had a Census in 2018 so the Malawi census data is more recent hence the marked difference.

The alternative denominator based on the health facility data reports for high coverage interventions would provide plausible results for most indicators.
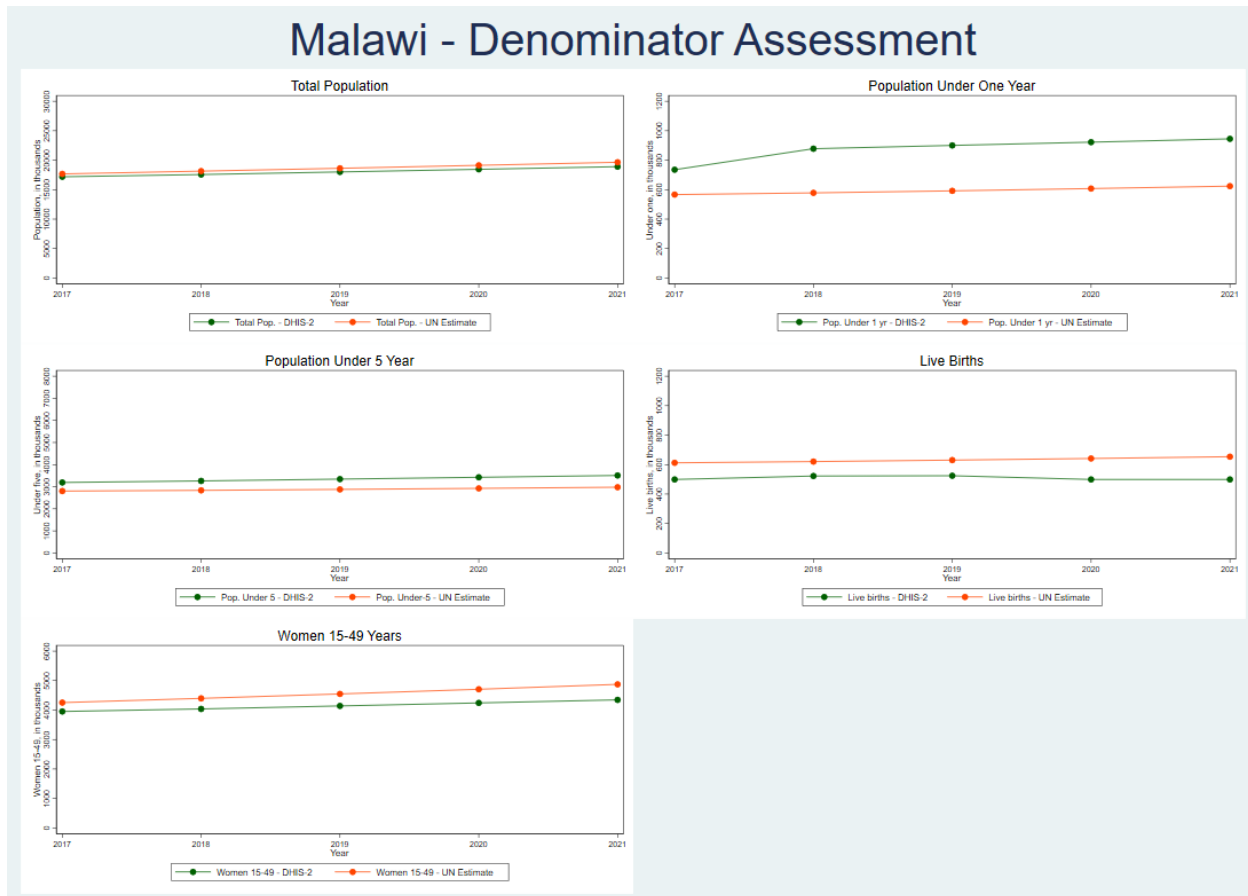
Facility data derived denominators

According to the MICS 2019 (and other surveys), the coverage of selected interventions is close to 100%. ANC1 97%, penta1 97%, BCG 98%, institutional delivery 97%. Coverage of these interventions is high in all regions.

This means that the number of reported ANC1 visits to the facilities reported in the DHIS2 should be close to the number of pregnant women at about 4-5 months (the timing of the 1st visit) in the population. And that the reported number of immunizations (BCG, penta1) should be close to the number of infants eligible for first vaccinations (at birth and at 6 weeks of age).

In this method the denominators or target populations are derived from the reported numbers in the facility data. We used default adjustment figures for the estimations. Malawi will need to develop its own adjustment assumptions based on its data. These will include % of pregnant loss, % of twins, etc.

Coverage based on DPT1 derived denominators, by region
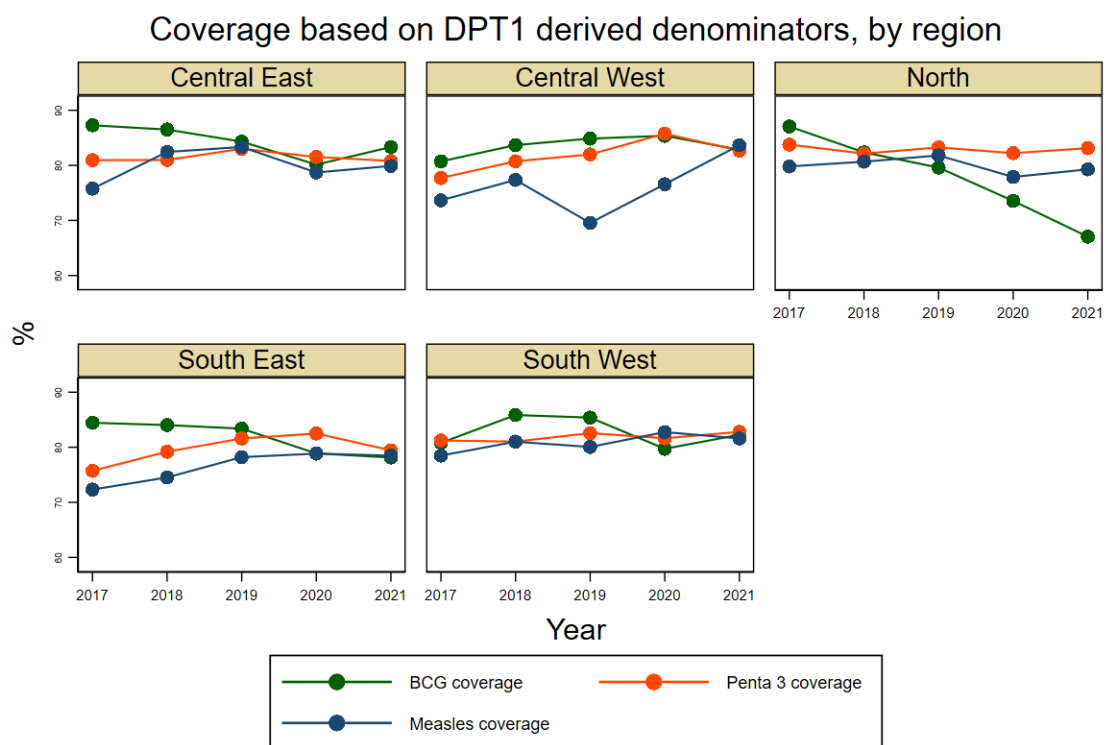
Graphs by First_admin_level

CCI and Sub indicators
Malawi
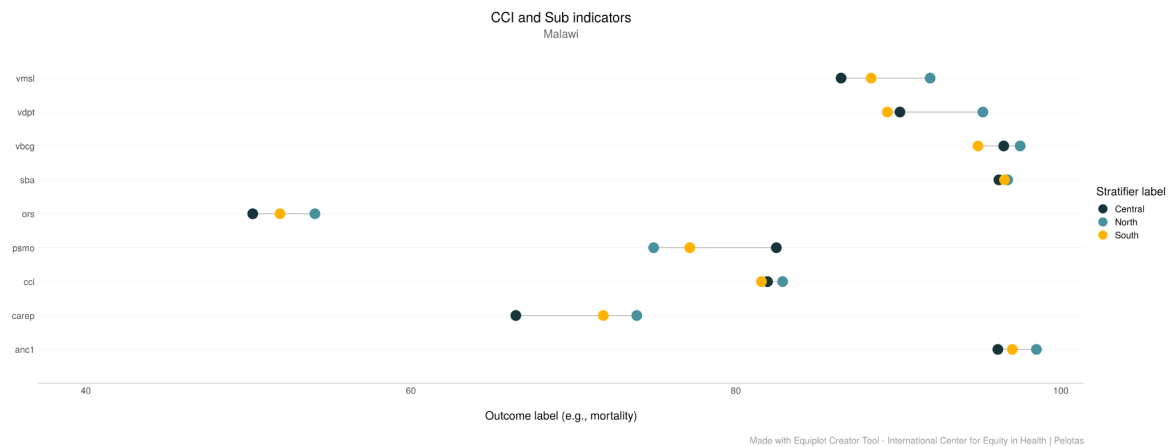
We used the Equiplot to calculate the CCI and the sub-indicators that make it. We found that generally the north has better coverage than the central and southern region. It should be noted that the north has the smallest population so probably has less pressure on its facilities.

Looking at the subnational CCI by district from the equity profile we see that this trend is generally true. However, districts with the biggest cities have better coverage and this could be due to the fact that these cities have major referral hospitals that give specialized services.

Chitipa 76.7
Karonga 75.6
Rumphi 74.9
Mzuzu City 71.9
Nkhata Bay 74.1
Mzimba 74.8
Likoma 85.3
Nkhotakota 72.8
Dowa 80.1
Kasungu 75.9
Ntchisi 80.6
Salima 75.1
Mchinji 79.6
Lilongwe City 81.4
Lilongwe 79.4
Mangochi 67.5
Machinga 72.2
Dedza 78.2
Ntcheu 79.1
Balaka 77.1
Zomba 79.3
Neno 80.4
Mwanza 76.5
Zomba City 89.4
Blantyre 78.1
Phalombe 80.5
Blantyre City 76.6
Thyolo 75.0
Chiradzulu 80.7
Mulanje 77.6
Chikhwawa 76.1
Nsanje 73.4

● Q1 Poorest ● Q2 ● Q3 ○ Q4 ○ Q5 Wealthiest

0   20   40   60   80   100
Coverage (%)

Demand for family planning satisfied with modern methods
Antenatal care (4 or more visits)
Neonatal tetanus protection
Skilled attendant at delivery
Postnatal care for mothers
Postnatal care for babies
Immunization - Rota
Immunization - DPT3
Immunization - Measles
Careseeking for symptoms of pneumonia
Diarrhoea treatment - ORS
Early initiation of breastfeeding
Exclusive breastfeeding
Continued breastfeeding (1 year)
Vitamin A supplementation

0   20   40   60   80   100
Coverage (%)

● Urban   ● Rural