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Using routine health facility for monitoring Child and maternal health utilization including OPD indicators

Summary

Routine health facility data were used to assess the trends child and maternal health utilization indicators. To assess the external consistencies, we compared the estimates with available national surveys and UN projection.

Maternal indicators

- Attending ANC at least four times was increase 41.3% in 2018 to 56% in 2022, and the percentage of pregnant women receiving the second dose of Intermittent Preventive Therapy (IPT) increased from 66% -n 2018 to 72% in 2022.
- The coverage of institutional live deliveries increased from 62% in 2018 to 75% in 2022, with the highest increase observed in Bugisu (33.4% increase) and Bukedi (24.3% increase).
- There was also modest increase in cesarean section rate, rising from 11.2% in 2018 to 12.1% in 2022.
- While the ANC and institutional delivery estimates are not consistent with the external estimates, the DHIS-estimates in these indicators show a consistent trend.

Immunization

- Regarding Immunization, between 2018 and 2022, there are no changes in BCG (95% over the years) and DPT-3 (89% over the years), while measle vaccination increased by 10% (from 82% in 2018 to 92% in 2022).
- While the ANC and institutional delivery estimates are not consistent with the external estimates, the DHIS-estimates in these indicators show a consistent trend.

INTRODUCTION

In 2011/2012, the Ministry of Health (MoH) of Uganda approved and adopted DHIS2 as the national platform for health data reporting [1]. Since then, DHIS2 has been implemented across all districts, regional referral hospitals, and other health units in the country [2]. Health facilities routinely collect data using health management information system standardized forms. Using the standardized monthly reporting format, the data are aggregated and submitted to the district health offices where the data is entered into the DHIS-2.

This brief therefore presents the findings of a comprehensive analysis of health facility and other relevant data, focusing on key indicators of maternal, newborn, and child health. The analysis has been supported by survey analyses and routine health facility data. The primary objective is to provide valuable insights to national and global reviews, evaluating the progress and performance of the national plan and strategy for RMNCH.

METHODS

Results of this report were generated through the review of reports and health sector performance reports, review of DHS reports, and analysis of routine health facility data. The facility data used for all this assessment and analyses were obtained from the monthly district data extracted from the DHIS-2 from January 2018 to December 2022 across different health facilities in the country. Our focus was on maternal, newborn, and child health indicators.

FINDINGS

Institutional delivery

Data on maternal and newborn care indicators specifically antenatal care, the coverage of the second dose of Intermittent Preventive Therapy (IPT) to prevent malaria, the coverage of institutional live births, and the caesarean section rate for the years 2015 to 2022 are shown in table 1. For external consistence assessment, we compare the DHIS-2 results with recent survey results.

Table 1: Maternal and newborn care indicators – national

	2015	2016	2017	2018	2019	2020	2021	2022
Antenatal care 4 or more visits[1]								
Surveys[2]	60.3	60.3		57.6	-	-	-	-
HMIS				41.3	45.3	48.2	56.9	55.6
Intermittent preventive therapy second dose (IPT2)								
Surveys		45	-	-	-	-	-	-
HMIS				65.7	66.5	70.1	75.3	72.0
Institutional live birth coverage								
Surveys		73.4	-	-	-	-	-	-
HMIS				62.1	64.1	64.2	72.6	74.8
Caesarean section rate								
Surveys		7.3	-	-	-	-	-	-
HMIS				11.2	11.8	12.2	11.8	12.1
Note: ANC4+ visits and Institutional delivery are based on ANC-1 as a denominator								

1 ANC4 and IPT2 statistics are also part of Malaria Indicator Surveys.

2 If the reference period for the statistic from the survey is 2 or 3 years, use the year before the survey ended as the midpoint. If the reference period for the statistic is 5 years, use two years before the survey ended as midpoint.

Relative to recent survey data, such as the 2018 Malaria Indicators Survey (MIS), a noticeable external inconsistency concerning DHIS-2 records for antenatal care (ANC) attendance of at least four sessions. Specifically, the attendance rate for a minimum of four ANC sessions was observed to be 16 percentage points lower (41.6%) compared to the data reported in the 2018 MIS. However, a positive trend was evident as the estimated attendance for at least four ANC sessions within the DHIS-2 increased to 55.5% as of 2022. Likewise, when compared with findings from recent surveys, such as the 2016 Uganda Demographic and Health Survey (UDHS), the percentage of pregnant women receiving the second dose of Intermittent Preventive Therapy as reported in the HMIS was 11 percentage points higher (66%) than the corresponding figure in the 2016 UDHS. Furthermore, this upward trend persists, with HMIS data indicating that as of 2022, 72% of pregnant women had received the second dose of Intermittent Preventive Therapy.

Furthermore, in comparison to results from the 2016 UDHS, a decline of 14 percentage points (62.1%) was observed in the coverage of institutional live deliveries reported in 2018. However, subsequent years have witnessed substantial improvement, with 75% of women choosing health facilities for childbirth as of 2022. Similarly, comparing the 2016 UDHS, the caesarean section rate reported in the HMIS data displayed a slight variation. Specifically, an increase of 5 percentage points (11%) in the caesarean section rate was noted compared to the figures from the 2016 UDHS. This trend persisted, with estimates indicating a caesarean section rate of 12.1% as of 2022.

The coverage of live births by health facilities in various regions of the country over a five-year period from 2018 to 2022 are presented in table 9. From the results, there has been notable changes in coverage across the regions. Compared to other regions, Acholi, Karamoja, Lango, Teso and West-Nile had not made substantial changes, from 2018 to 2022. Bugisu and Bukedi regions stand out with an impressive increase, showing substantial progress in institutional delivery. Generally, results show a consistent increase in the proportion of institutional live births from 2018 to 2022. However, despite this positive trend, the data unveiled a concerning trend of widening disparities between regions and the national average over the years, as indicated by MADM and MRDM.

Table 2: Coverage of live births by health facilities

Region	2018	2019	2020	2021	2022	2022-2018 difference
Acholi	68.2	70.6	65.1	70.0	69.4	1.2
Ankole	71.7	74.9	71.8	79.5	84.2	12.5
Bugisu	61.3	66.8	75.8	93.7	94.7	33.4
Bukedi	64.5	71.0	71.4	85.2	88.8	24.3
Bunyoro	49.3	51.1	53.1	63.3	67.3	18
Busoga	48.2	49.2	48.9	60.3	59.9	11.7
Kampala	68.9	70.7	77.3	74.4	78.4	9.5
Karamoja	62.4	68.4	66.6	68.1	68.6	6.2
Kigezi	73.1	75.3	77.3	84.0	89.9	16.8
Lango	57.3	57.4	53.7	63.6	61.6	4.3
North Central	57.2	58.6	61.7	69.4	71.9	14.7
South Central	59.6	59.7	60.4	68	72.2	12.6
Teso	66.2	69.4	67.3	73.5	73.5	7.3
Tooro	69.9	71.8	71.2	83	83.4	13.5
West Nile	72.1	73.7	70.4	74.1	78.5	6.4
Mean absolute difference to the mean (MADM)	6.4	7.5	7.5	7.4	8.4	
Weighted MADM	6.9	7.8	7.6	7.2	7.9	
Mean relative difference to the mean (MRDM)	10.5	12.0	11.9	10.3	11.4	
Weighted MRDM	11.3	12.5	12.0	10.0	10.7	

While ANC1 serves as the most suitable denominator for estimating institutional delivery coverage, the results presented in Table 3 revealed that, for the majority of subregions, the coverage was notably lower than that reported in the 2016 UDHS survey. This finding indicated a potential disparity between facility data and survey data. Notably, subregions such as Kampala, Busoga, South Central, and North Central exhibited substantial variations in coverage. For instance, in the case of Kampala, facility data suggests a significantly lower coverage of institutional live births in contrast to the survey data. Conversely, in certain subregions like Ankole and Tooro, the coverage estimates derived from facility data closely align with the figures reported in the survey.

Immunization

Relative to the most recent Uganda Demographic and Health Survey (UDHS) data, distinct external inconsistencies were evident in relation to the DHIS-2 estimates for immunization rates. We observed discrepancy in the penta-3 vaccination, which stood at 9 percentage points higher (87.9%) when compared with the corresponding 2016 DHS estimates. Similarly, a comparison with the findings from the recent 2016 UDHS surveys revealed a marked positive trend in the percentage of children receiving the measles vaccine, as reported in the DHIS-2. The recorded percentage slightly exceeded the analogous figure documented in the 2016 UDHS, demonstrating an improvement to 92% as of the year 2022. Furthermore, during this same reporting duration, the Bacillus Calmette-Guérin (BCG) immunization rate was marginally lower than the estimates from the 2016 DHS data. Nonetheless, it exhibited a sustained consistency, remaining proximate to the 90% mark over the entire reporting period.

In essence, these observations underscore a notable divergence between the DHIS-2 estimates and the recent UDHS data concerning immunization rates. Specifically, the penta-3 vaccination rates have consistently presented higher figures in the DHIS-2 records compared to the UDHS estimates since 2016. Additionally, the HMIS-reported measles vaccination rates have showcased a favorable uplift when evaluated against the 2016 UDHS figures.

Table 4: Child health indicators - immunization

	2015	2016	2017	2018	2019	2020	2021	2022
Immunization: three doses of DTP / pentavalent vaccine coverage								
Surveys		78.9	-	-	-	-	-	-
HMIS				87.9	87.9	87.9	87.9	87.9
UN estimates				102.0	104.0	100.0	102.0	101.0
Measles vaccination (MCV1) coverage								
Surveys		79.6	-	-	-	-	-	-
HMIS				82.0	81.6	89.0	90.1	92.1
UN estimates				96.0	97.0	99.0	103.0	103.0
BCG vaccination coverage								
Surveys	-	96.4	-	-	-	-	-	-
HMIS				90.9	90.5	91.7	89.5	91.7
UN estimates				106.0	107.0	103.0	102.0	103.0

Findings revealed variations in the coverage of the DTP3 (Diphtheria, Tetanus, Pertussis) or pentavalent 3rd dose vaccination among infants in different regions over a five-year period from 2018 to 2022. Between 2022 and 2018, all regions had at least 85% of children immunized with penta-3 and no substantial changes were observed.

Table 5: Coverage of DTP3 / pentavalent 3rd dose among infants based on Penta 1 as denominator

Region	2018	2019	2020	2021	2022	2022-2018 difference
Acholi	92.0	91.1	89.7	89.8	88.3	-3.7
Ankole	92.4	91.6	93.2	92.8	92.3	-0.1
Bugisu	87.0	87.5	88.6	91.5	91.0	4.0
Bukedi	87.0	90.6	91.3	89.4	89.9	2.9
Bunyoro	86.2	85.0	88.7	88.9	88.7	2.5
Busoga	80.4	81.9	86.5	85.5	86.6	6.2
Kampala	86.4	86.5	84.7	84.5	86.3	-0.1
Karamoja	94.3	95.4	85.6	93.8	92.3	-2.0
Kigezi	93.3	91.0	95.8	92.0	93.9	0.6
Lango	87.7	87.8	93.4	91.0	94.9	7.2
North Central	87.0	85.3	85.5	85.8	85.1	-1.9
South Central	88.3	88.9	89.0	88.7	89.0	0.7
Teso	89.4	90.0	93.3	90.7	94.0	4.6
Tooro	91.8	89.4	92.3	91.8	91.4	-0.4
West Nile	86.4	88.1	91.8	92.5	90.2	3.8
Mean absolute difference to the mean (MADM)	8.8	9.0	7.3	8.5	9.1	
Weighted MADM	9.2	8.5	7.4	7.9	9.0	
Mean relative difference to the mean (MRDM)	10.0	10.1	8.4	9.6	10.2	
Weighted MRDM	10.5	9.5	8.5	8.9	10.1	

The results also indicated disparities in Penta 3 vaccination at the subnational level when compared to national coverage.

In summary, the data reveals both encouraging and concerning trends in vaccination coverage across various regions. While some regions have made significant improvements, others have witnessed declines. To ensure comprehensive vaccination coverage for all infants, it is imperative to closely monitor vaccination rates and identify regions with low coverage.

A significant level of alignment between Pentavalent vaccination 3rd dose coverage, as calculated from facility data using DPT1 as the denominator, and the coverage reported in the 2016 UDHS survey across most subregions was observed as indicated in Table 6. This indicated a good level of consistency between the two data sources regarding Pentavalent vaccination. However, some subregions, such as Bugisu, Bukedi, South Central, and Teso, showed slightly higher coverage estimates in the facility data compared to the survey data. Importantly, these variations fall within acceptable margins of difference, suggesting that the facility data remains largely reliable in portraying vaccination coverage levels.

Table 6: Assessment of Pentavalent vaccination 3rd dose coverage results for 2018 using DPT1 as the denominator in comparison to the most recent survey result

Region	2016 DHS survey				DHIS-2
	estimates	Standard error (SE)	95% CI		
Acholi	85.0%	0.032	77.6%	90.3%	92.0
Ankole	84.5%	0.025	79.0%	88.8%	92.4
Bugisu	72.9%	0.037	65.0%	79.6%	87.0
Bukedi	76.9%	0.030	70.5%	82.3%	87.0
Bunyoro	80.1%	0.033	72.9%	85.7%	86.2
Busoga	70.5%	0.028	64.7%	75.7%	80.4
Kampala	81.2%	0.033	73.9%	86.9%	86.4
Karamoja	86.5%	0.038	77.1%	92.5%	94.3
Kigezi	88.7%	0.034	80.2%	93.9%	93.3
Lango	79.5%	0.032	72.5%	85.2%	87.7
North Buganda	75.8%	0.024	70.7%	80.2%	87.0
South Buganda	74.2%	0.023	69.5%	78.5%	88.3
Teso	90.8%	0.021	85.7%	94.1%	89.4
Tooro	75.1%	0.028	69.2%	80.2%	91.8
West Nile	82.3%	0.027	76.4%	86.9%	86.4

Curative health service utilization for children

Understanding health services utilization patterns helps in evaluating the accessibility and effectiveness of healthcare interventions.

Table 7: Outpatient and inpatient service utilization for children and all ages, 2018-2022, DHIS2 data.

National	2018	2019	2020	2021	2022	Change 2018-2022
Total population (DHIS2 proj.)	37,633,000	38,851,000	42,252,000	43,577,000	44,925,000	7,292,000
Population under-5 (DHIS2)	6,575,668	6,735,633	7,243,943	7,387,472	7,528,827	953,159
Population 5+ years	31,057,332	32,115,367	35,008,057	36,189,528	37,396,173	6,338,841
Data Inputs OPD						
Completeness reporting OPD (%)	90	90	99	99	99	9
Number of OPD visits per year:						
Under-fives	8,196,695	9,477,883	8,291,652	8,338,848	9,592,795	1,396,100
5 and older	23,638,601	26,222,493	27,112,828	25,542,864	28,652,985	5,014,384
Total	31,835,296	35,700,376	35,404,480	33,881,712	38,245,780	6,410,484
Indicators OPD						
Mean OPD visits per child under-5 per year	1.25	1.41	1.14	1.13	1.27	0.03
Mean OPD visits per person 5+ years per year	0.76	0.82	0.77	0.71	0.77	0.01
Mean OPD visits per person per year, all ages	0.85	0.92	0.84	0.78	0.85	0.01
Percent of OPD visits that are under-5	25.7%	26.5%	23.4%	24.6%	25.1%	-0.01
Data inputs in-patient admissions / discharges						
Completeness reporting IPD (%)	32	32	87	90	92	60
Number of admissions per year:						
among under-5	-	-	-	-	-	-
5 and older	2,684,621	3,162,606	2,923,014	3,029,223	3,453,739	769,118
Total	2,684,621	3,162,606	2,923,014	3,029,223	3,453,739	769,118
Indicators IPD						
Mean admissions per child under-5 per year	-	-	-	-	-	-
Mean admissions per person 5+ years per year	8.64	9.85	8.35	8.37	9.24	0.59
Mean admissions per person per year, all ages	7.13	8.14	6.92	6.95	7.69	0.55
Percent of admissions that are under-5	-	-	-	-	-	-
Note: - data not available						

The total number of OPD visits increased steadily, from 31,835,296 in 2018 to 38,245,780 in 2022, reflecting an overall increase in healthcare utilization across all age groups. The mean OPD visits per child under-5 per year slightly fluctuated but remained relatively stable over the years, with a marginal increase from 1.25 in 2018 to 1.27 in 2022. Similarly, the mean OPD visits per person aged 5 years and older per year also showed slight variations but generally remained consistent, with a small increase between 2018 and 2022. Overall, the mean OPD visits per person per year for all ages followed a similar trend, showing a marginal increase.

Regarding inpatient admission, the total number of IPD admissions increased from 2,684,621 in 2018 to 3,453,739 in 2022, reflecting an overall rise in hospitalizations across all age groups. The mean admissions per person per year increased steadily, from 8.64 in 2018 to 9.24 in 2022, indicating an increase in inpatient healthcare utilization for this age group. Similarly, the mean admissions per person per year for all ages increased slightly.

CONCLUSION

In conclusion, results highlight an overall positive trend in healthcare service utilization, both in outpatient and inpatient departments, for all age groups. The increase in OPD visits and IPD admissions reflects an improved utilization of health services over the years. The stability in the percentage of OPD visits for children under 5 years old indicates that this age group has consistently accounted for around 25% of all outpatient visits. However, it is concerning that no recorded inpatient admissions for children under 5 years old during the entire period, which may warrant further investigation to understand the reasons behind this finding. The significant improvement in completeness reporting for IPD admissions indicates progress in data reporting and quality for inpatient services.

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