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PERFORMANCE EVALUATION SYSTEM OF HOSPITALS AND HEALTH DISTRICTS IN ETHIOPIA, TANZANIA AND UGANDA

REPORT 2020

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CUAMM

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REPORT 2020

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PERFORMANCE EVALUATION
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* List of indicators is reported in table 1 (chapter 2), on page 15 and following pages.

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INTRODUCTION

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DOCTORS WITH AFRICA CUAMM

Introduction

Healthcare performance evaluation is a relevant topic in all health systems. Since 2000s several countries and international organizations have designed frameworks to assess health systems performance though the monitoring of different key dimensions (1–3). As for example, the OECD suggests accessibility, effectiveness, expenditure or cost, efficiency, equity or patient – centeredness (4).

More particularly, the last two decades saw an extensive effort to develop and implement Performance Evaluation Systems (PES) in high income countries (HIC) to evaluate the multidimensional performance of healthcare, with the purpose to improve performance of the health systems and the quality of the healthcare services. Instead, few evidences are reported in the literature on the evaluation of healthcare performance in low- and middle- income countries (LMIC). Moreover, when available, these frameworks usually imply top-down approaches intended to evaluate outcomes at macro or project level. In addition, they usually refer to specific services or geographical settings and they do not compare performance using a multidimensional perspective (5–8)

The present report collects and illustrates the results of a study aimed at understanding the core features and principles of a PES in the specific contexts in LMICs. More particularly, its primary objective is to evaluate and compare the performance of four different health care settings across national boundaries, providing policy makers and health care managers with a tool that can contribute to improving efficacy when assessing performance of health care services within the local healthcare system.

The entities involved are four health districts and their reference hospitals in Ethiopia, Uganda and Tanzania.

The hospitals and health districts selected for this study are the following:

- five "Woredas" in Shoa-west zone and St. Luke - Wolisso Hospital in the Oromia region, Ethiopia;
- Iringa District Council and Tosamaganga District Designated Hospital in the Iringa region, Tanzania;
- Napak district and St. Kizito - Matany Hospital in the northern region, Uganda
- Oyam district and Pope John XXIII - Aber Hospital in the norther region, Uganda

In all these contexts the hospitals have the same institutional setting: they are private, faith-based and not for profit. These hospitals are part of the public health system and are mainly funded by both regional governments and out of pocket payments. Alongside, the health districts are managed by the regional government and are characterized by similar organizational models, featuring a wide variety of health care providers at different levels. Primary and secondary care is offered by dispensaries and health centres, which are spread within the reference territory and are intended to provide mainly outpatient services, e.g. prevention, health promotion, maternity, and some in-patient curative services. Tertiary care is provided by regional hospitals, which offer more specialized services, including consultation, emergency, and surgical services, and serve as referral hospitals for the districts. The distribution of facilities across levels of care reflect the healthcare needs of the population, with most cases treated at the district level, whilst more complex cases are referred to reference hospitals.

Nevertheless, these contexts differ with respect to these factors: epidemiological priorities and issues, organizational and governance models, levels of development of the hospitals and health districts information and IT infrastructure. For further detail on differences, Table 1 shows the main information related to the four hospitals and districts participating in this study.

Table 1. *List of the analysed hospitals and their relative health districts or catchment areas*

Country	Region	Health District*	Estimated population (Year 2020)	Reference Hospital	Hospital beds (2020)	Surface area (km2)	Population Density (citizens per km2)
Ethiopia	Oromia region	Five Woredas in Shoa-west zone (Wolisso Town, Wolisso Rural, Ameya, Wonchi, Goro)	633 359	St. Luke - Wolisso Hospital	208	27 000	23.5
Tanzania	Iringa region	Iringa District Council	308 009	Tosamaganga District Designated Hospital	165	19 256	16
Uganda	Northern region	Napak District	449 700	St. Kizito - Matany Hospital	250	4978.4	33.5
Uganda	Northern region	Oyam District	166 549	Pope John XXIII - Aber Hospital	217	2190.8	205.3

*With regard to Ethiopia, the information reported in the cell does not refer to an institutional health district, but to the catchment area covered by Wolisso Hospital.

The development of a PES that compares local settings within supranational contexts may support the management and decision-making activities in three main different ways.

Firstly, the system can be adopted as a management tool. It helps identify good practices, providing opportunities to standardise processes and activities in a replicable manner which could be applied to other settings within the system. It also supports the identification of poor performances, thus highlighting potential areas of improvement. In addition, it may serve as a potential tool to appropriately allocate the resources available.

Secondly, another important aspect is related to the improved accountability of the involved hospitals and health districts with respect to all stakeholders, including policy makers and key figures at political and governance level as well as national and international donors.

Thirdly, the system may work as a tool to foster capacity building in the professional environment. Particularly, it can promote the development of skills and competencies

among professionals in data collection and analysis, sharpening their ability to adopt a population-based approach when interpreting the results. In addition, the PES could eventually accelerate the transition from traditional paper-based information system towards a fully digitalized information system.

The abovementioned objectives are made possible by the core features of the described system, which make it innovative in the field of performance measurement and evaluation in LMICs.

This system came into existence as the result of an action research carried out by the Management and Health Laboratory (MeS Lab) of the Institute of Management of the Sant'Anna School of Advanced Studies in Pisa and Doctors with Africa CUAMM (CUAMM), a leading Italian NGO in the delivery of healthcare services in Sub-Saharan African countries. This initiative has been characterized by the voluntary participation of the hospitals involved that, in collaboration with their respective health districts, have favourably welcomed the development of an integrated evaluation system. This aspect is important because the measurement of the integration of different care settings is challenging not only in terms of appropriate measures, but also in relation to their joint acceptability by all healthcare providers and professionals involved in the delivery of healthcare services (9,10).

In order to gain a general knowledge of the broader context in which the CUAMM-MeS PES operates, it may be useful to look at some general indexes regarding the level of development and population health status of the countries involved, analysing the data in comparison with the same figures of Italy. As shown by Figure 1, the three target countries are comparable in terms of median age and life expectancy, level of mortality and child mortality rates and prevalence of infectious diseases, namely Tuberculosis and HIV, as well as the number of physicians per capita. Moreover, Ethiopia, Tanzania and Uganda rank at the lowest scores with reference to the Human Development Index and GDP per capita.

This project arised as a bottom-up initiative and it represents a scalable model that can be applied in different contexts at diverse system level. Therefore, these findings can be of interest also for decision makers at regional and national level.

Moreover, the effective graphical representation of results helps identify the different contributions of the variety of national and international actors involved in the healthcare system. Therefore, the MeS Lab-CUAMM PES combines different contributions in a unique representative solution and highlights the weaknesses and strengths of the integrated system as a whole.

In conclusion, this system is the fruit of a work in progress process oriented towards the identification of strengths in order to boost performance across different levels of the healthcare system.

Figure 1. *Analysed countries in comparison*

	Ethiopia	Tanzania	Uganda	Italy
Population median age (1)	19.5	18	16.7	47.3
Life expectancy at birth (years) (1)	66	65	63	83.4
Maternal mortality ratio, deaths per 100,000 live births (1)	353	398	343	2.9
Under-five mortality, per 1,000 live births (2)	51	50	46	3
Neonatal mortality, per 1,000 live births (2)	28	20	20	2
Number of medical doctors (physicians), per 10,000 people (1)	1	0.4	0.9	40.9
TB prevalence rate at national level (4)	140	237	200	7
Prevalence of HIV, total (% of population aged 15-49) (4)	0.9%	4.8%	5.8%	0.2%
Gini Index (5)	35	40.5	42.8	35.9
GDP per capita (current US$) (6)	$936	$1,077	$817	$31,676
Human Development Index ranking position (1)	173/189	163/189	159/180	29/189

Sources:
(1) United Nation Development programme (UNDP), 2020
(2) World Bank, 2019
(3) World Health Organization (WHO), 2019
(4) World Bank, 2019
(5) World Bank, 2015 - 2017
(6) World Bank, 2020

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METHODOLOGY AND REPRESENTATION OF RESULTS

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Introduction

The PES designed, developed, and implemented in Ethiopia, Tanzania and Uganda is inspired by the PES of Tuscany Region and in the Inter-Regional Performance Evaluation System (IRPES) implemented by the MES Lab since 2004 and 2008, respectively (1,2). It represents a voluntary based governance tool to support healthcare managers and policy makers at regional and local level.

The PES has been developed with scientific rigour in order to guarantee the correctness of computation, thus ensuring transparency of performance results and overcoming of self-referential attitudes.

The ultimate goal of this tool is to share a PES of the hospitals and health districts supported by CUAMM through the development and benchmarking of 128 indicators aimed at describing and analysing the multiple dimensions of healthcare delivery.

Architecture of the PES

In order to offer a multidimensional evaluation of healthcare performance, the results are analysed according to different perspectives. The different subsets, or dimensions, of indicators are intended to highlight the fundamental dimensions of healthcare performance. The eight dimensions, which are in turn subdivided into 24 areas of evaluation, are listed below:

- Regional Health Strategies
- Efficiency and Sustainability
- Users, staff and communication
- Emergency care
- Governance and quality of supply
- Mother and Child care
- Infectious Diseases
- Chronic Diseases

The indicators included in the PES refer to the years 2018, 2019 and 2020 with the aim of better realizing the relevance as well as the consistency of some phenomena and therefore the evaluation of the performance indicators.

Among the selected indicators, some have been considered as observation indicators over the three years while 48 indicators have been evaluated for 2020 according to the methodology designed and implemented as inspired by the IRPES. More particularly, the indicators have been calculated both at hospital and district level. The richness of information of the PES comes from the valorization of a wide spectrum of data sources, which can be grouped under two broad categories: health and administrative registries for hospital indicators and District Health Information System (DHIS) of each country involved in the study for indicators calculated at residential level.

The indicators have been evaluated through the identification of five bands, considering the statistical distribution of indicators values. Evaluation scores have been built through an algorithm associating each band with a value in between 0 and 5, and a color from red to dark green. The bands construction varies according to the sign of the indicator that can be increasing or decreasing (1).

Figure 1 *The evaluation bands*

The evaluation scores are determined based on international standards, when available, or on data assessment in benchmarking. Furthermore, the scores of some indicators are defined according to those already applied in the PES of Tuscany Region and in the IRPES. Each indicator has been evaluated by considering the identified reference standard across the hospitals and health districts included in the study. A context analysis was conducted to ascertain the consistency and sensibility of standards and indicators signs applied in the evaluation process.

Table 1. *List of indicators shared between the network of health districts and hospitals*

Each dimension is subdivided into different areas of evaluation.
Observation indicators are reported in italics, whilst evaluation indicators in bold.

				Extremes of the evaluation bands									
		Computation level	Page										
Regional Health Strategies													
Area	**Vaccination Coverage**												
B7.10	*Vaccination coverage for tetanus (reproductive women)*	*Residence*	*60*										
B7.1A	**Vaccination coverage for measles**	**Residence**	**61**	86	89	89	92	92	95	95	98	98	100
B7.6	**Vaccination coverage against pneumococcal (PCV)**	**Residence**	**62**	86	89	89	92	92	95	95	98	98	100
B7.7A	**Pentavalent vaccine coverage (HIB; diphteria; partusis, tetanus, HBV)**	**Residence**	**63**	86	89	89	92	92	95	95	98	98	100
B7.7B	**Vaccination coverage for polio**	**Residence**	**64**	86	89	89	92	92	95	95	98	98	100
B7.9	**Vaccination coverage for rota virus**	**Residence**	**65**	86	89	89	92	92	95	95	98	98	100
Area	**Hospital Attraction**												
C30.3.1.2	*Percentage of hospital admissions for patients resident in other districts*	*Hospital*	*66*										
C30.3.2.1	*Hospital admissions for patients resident in other districts - Complex cases*	*Hospital*	*67*										
Efficiency and Sustainability													
Area	**Economic and financial viability**												
F1.1	**General economic equilibrium**	**Hospital**	**70**	-25.5	-19.1	-19.1	-12.6	-12.6	-6.2	-6.2	0.3	0.3	6.7
F1.2	**Economic equilibrium of health management**	**Hospital**	**71**	-11.4	-3.8	-3.8	3.7	3.7	11.3	11.3	18.8	18.8	26.4
F1.3	**Return on Investment (ROI)**	**Hospital**	**72**	-5.6	-2.7	-2.7	0.3	0.3	3.3	3.3	6.3	6.3	9.2
Area	**Per capita cost for healthcare services**												
F17.1A1	*Average cost for Inpatient Day Equivalent, PPP (current international $)*	*Hospital*	*73*										
F17.1A2	*Average cost for Inpatient Day Equivalent (without D&A), PPP (current international $)*	*Hospital*	*74*										
F17.3.1A	*Average cost for specialized care per procedure, PPP (current international $)*	*Hospital*	*75*										
F17.3.1.1	*Average cost for specialized care per procedure - medical department, PPP (current international $)*	*Hospital*	*76*										
F17.3.1.3	*Average cost for specialized care per procedure - operating theatre, PPP (current international $)*	*Hospital*	*77*										
F17.3.1.4	*Average cost for specialized care per procedure - department of surgery, PPP (current international $)*	*Hospital*	*78*										
F17.3.1.5	*Average cost for specialized care per procedure - maternity department, PPP (current international $)*	*Hospital*	*79*										
Area	**Assets and liability analyses**												
F3.1	**Current ratio**	**Hospital**	**80**	0.4	0.6	0.6	0.8	0.8	1.0	1.0	1.5	1.5	2.0
Area	**Assets and liability analyses**												
C2A.2	**Bed occupancy rate**	**Hospital**	**81**	65	70	70	75	75	80	80	85	85	90
C2A.3	**Average lenght of stay (ALOS) - inpatients**	**Hospital**	**82**	6.8	7.3	6.2	6.8	5.6	6.2	5.0	5.6	4.4	5.0

		Computation level	Page	Extremes of the evaluation bands									
	Users, staff and communication												
D18	**Percentage of hospitalized patients leaving against medical advice**	**Hospital**	**84**	1.4	1.8	1.1	1.4	0.7	1.1	0.4	0.7	0.0	0.4
E2A	**Percentage of staff absence**	**Hospital**	**85**	13.1	14.0	12.2	13.1	11.4	12.2	10.5	11.4	9.6	10.5
E3	*Employee annual turnover rate*	*Hospital*	*86*										
E4	*Average number of training hour per employee*	*Hospital*	*87*										
	Emergency care												
C16.10A	*Percentage of repeated admissions in Emergency Department within 96 hours*	*Hospital*	*90*										
	Governance and quality of supply												
Area	**Hospital - territory integration**												
C8B.1A	*Emergency room access rate, per 1.000 residents*	*Hospital*	*92*										
C17.1.4.8A	*Hospitalization rate for hospital admissions over 15 days, per 1.000 residents*	*Hospital*	*93*										
Area	**Healthcare demand management capability**												
C1.1A	*Hospitalization rate, per 1.000 residents*	*Hospital*	*94*										
C1.1B	*Per capita hospital beds, per 100.000 residents*	*Hospital*	*95*										
Area	**Care appropriateness of chronic diseases**												
C11A.1.1A	*Heart failure hospitalization rate per 100.000 residents (>15 years)*	*Hospital*	*96*										
C11A.2.1A	*Diabetes hospitalization rate per 100.000 residents (>15 years)*	*Hospital*	*97*										
Area	**Diagnostic appropriateness**												
C13.2A	*Average number of outpatient consult, per resident*	*Residence*	*98*										
C13.2B	*Average number of diagnostic procedures per patient (lab tests)*	*Hospital*	*99*										
C13.2C	*Average number of diagnostic procedures per patient (imaging)*	*Hospital*	*100*										
Area	**Quality of process**												
C16.4	*Percentage of admissions in Emergency Department hospitalised within 8 hours*	*Hospital*	*101*										

		Computation level	Page	Extremes of the evaluation bands									
Area	**Surgery variation**												
C18.9A	*Hysterectomy hospitalization rate, per 100.000 residents (women > 15 years)*	*Hospital*	*102*										
Area	**Repeated hospital admissions for any causes**												
C5.1E.A	*Repeated hospital admissions for any causes*	*Hospital*	*103*										
C5.1E.A1	*Repeated hospital admissions for any causes (medical department)*	*Hospital*	*104*										
C5.1E.A2	*Repeated hospital admissions for any causes (surgical department)*	*Hospital*	*105*										
C5.1E.A3	*Repeated hospital admissions for any causes (maternity department)*	*Hospital*	*106*										
Area	**Clinical risk**												
C6.4.1A	*Infection rate due to surgical wounds (emergency and elective surgery procedures)*	*Hospital*	*107*										
C6.4.2A	*Inpatient mortality rate in low-mortality cases*	*Hospital*	*108*										
C6.4.2B	*Inpatient mortality rate in high-mortality cases*	*Hospital*	*109*										
	Mother and Child care												
Area	**Maternal and child care - residence level**												
C7.28	**Proportion of pregnant women who attended ANC 4+ during the current pregnancy**	**Residence**	**112**	30	40	40	50	50	65	65	80	80	100
C7.29	**Drop out Rate of ANC1 to ANC + 4**	**Residence**	**113**	45	100	35	45	25	35	15	25	0	15
C7.30	**Proportion of pregnant women tested for syphilis**	**Residence**	**114**	40	50	50	60	60	70	70	80	80	100
C7.32	**Proportion of women with early PNC**	**Residence**	**115**	20	35	35	50	50	65	65	80	80	100
C7.31	*Percentage of avoidable referrals*	*Hospital*	*116*										
C7.33A	*Percentage of deliveries in lower level units*	*Residence*	*117*										
C7.34	**Percentage of supervised deliveries in the catchment area (deliveries in the ref. hospital and in the district' lower level units)**	**Residence**	**118**	35	55	55	65	65	75	75	85	85	100
Area	**Maternal and child care - hospital level**												
C7.1	*Percentage of C-section deliveries (NTSV)*	*Hospital*	*119*										
C7.1.1	**Percentage of caesareans**	**Hospital**	**120**	30	100	25	30	20	25	15	20	0	15
C7.1.4	*Percentage of elective caesareans (NTSV)*	*Hospital*	*121*										
C7.1.4A	*Percentage of elective caesareans*	*Hospital*	*122*										
C7.2	*Percentage of induced labours*	*Hospital*	*123*										
C7.20A	**Percentage of peri-/intra-partum asphyxia**	**Hospital**	**124**	5.7	7.1	4.3	5.7	3.0	4.3	1.6	3.0	0.2	1.6
C7.3	*Percentage of episiotomies (NTSV)*	*Hospital*	*125*										
C7.3A	**Percentage of episiotomies**	**Hospital**	**126**	36	44	28	36	20	28	12	20	0	12
C7.6	**Percentage of assisted deliveries (forceps or ventouse)**	**Hospital**	**127**	10	100	7.5	10	5.0	7.5	2.5	5	0	2.5
C7.7.1	*Paediatric hospitalization rate (<1 year) , per 1.000 residents*	*Hospital*	*128*										
C7.7A	*Paediatric hospitalization rate (<15 years), per 1.000 residents*	*Hospital*	*129*										
C7D.19.1A	*Paediatric hospitalization rate for ARI (0-5 years), per 1.000 residents*	*Hospital*	*130*										
C7D.19.2A	*Paediatric hospitalization rate for gastroenteritis (<15 years), per 1.000 residents*	*Hospital*	*131*										

		Computation level	Page	Extremes of the evaluation bands									
Area	**Maternal and child care - child malnutrition**												
C7M.1	*Percentage of mothers who received counselling on improving infant and young child feeding (IYCF) in the reporting period*	*Residence*	*132*										
C7M.2	*Percentage of women who have started breastfeeding within one hour (or by the end of discharge)*	*Hospital*	*133*										
C7M.3	*Percentage of children aged 6-59 months received two doses of vitamin A supplementation*	*Residence*	*134*										
C7M.4	*Percentage of pregnant women received any iron folic acid (IFA) in the reporting period*	*Residence*	*135*										
C7M.5	*Percentage of children aged 6-59 months screened for malnutrition and identified with Moderate Acute Malnutrition (MAM)*	*Residence*	*136*										
C7M.6	*Percentage of complicated SAM amongst children aged 6-59 months treated in the Integrated Management of Acute Malnutrition (IMAM) programme*	*Residence*	*137*										
C7M.7	*Percentage of children aged 6-59 months with SAM who were treated over expected cases in the reference area*	*Residence*	*138*										
C7M.8	*Hospitalization rate of children aged 6-59 months for SAM, per 1.000 inhabitants*	*Hospital*	*139*										
C7M.9	*Percentage of deaths among SAM cases aged 6-59 months (Outpatient Therapeutic Programme + Stabilization Centre)*	*Residence*	*140*										
C7M.10	*Percentage of cured among SAM cases aged 6-59 months (Outpatient Therapeutic Programme + Stabilization Centre)*	*Residence*	*141*										
	Infectious Diseases												
Area	**Infectious Diseases - Malaria**												
IDPM01	*Percentage of ANC visits during which a LLIN (or similar) is distributed*	*Residence*	*144*										
IDPM02	**Average number of sulfadoxine-pyrimethamine (SP) doses per ANC visit**	**Residence**	**145**	0	1.5	1.5	2	2.0	2.5	2.5	3	3	100
IDPM03	**Percentage of confirmed malaria cases (BS+RDT)**	**Residence**	**146**	50	60	60	70	70	80	80	90	90	100
IDPM04	*Percentage of discharges for severe malaria*	*Hospital*	*147*										
IDPM05	**Percentage of treatments with ACT**	**Hospital**	**148**	130	150	120	130	110	120	100	110	90	100
IDPM06	**Percentage of IV/IM (parenteral artesunate or Quinine) treatments**	**Hospital**	**149**	130	150	120.0	130	110.0	120.0	100.0	110	90	100
IDPM07	*Percentage of malaria cases (< 5 years)*	*Hospital*	*150*										
IDPM08	*Percentage of deaths for malaria*	*Hospital*	*151*										
IDPM09	*ALOS (malaria cases)*	*Hospital*	*152*										
Area	**Infectious Diseases - Tubercolosis**												
IDPT01	**Percentage of treatments with isoniazide (IPT)**	**Residence**	**153**	50	60	60	70	70	80	80	90	90	100
IDPT02	**Percentage of TB cases undergoing the HIV screening**	**Residence**	**154**	87	90	90	92.5	92.5	95	95	98	98	100
IDPT03	*Percentage of positive TB cases on number of tests*	*Residence*	*155*										
IDPT04	**Percentage of confirmed TB cases on diagnosed cases**	**Hospital**	**156**	60	65	65	70	70	75	75	80	80	100
IDPT05	**Percentage of confirmed PTB**	**Residence**	**157**	40	60	60	70	70	80	80	90	90	100
IDPT06	**Percentage of positive Xpert cases**	**Hospital**	**158**	0	10	10	15	15	20	20	25	25	100
IDPT06.1	*Percentage of positive Xpert RR*	*Residence*	*159*										
IDPT07	**Percentage of treatments for extrapolmunary TB**	**Residence**	**160**	30	32	27.5	30	25	27.5	22.5	25	20	22.5
IDPT08	*Percentage of PTB MDR initiated treatments*	*Hospital*	*161*										
IDPT09	**Percentage of TB cured patients**	**Residence**	**162**	65	70	70	75	75	80	80	85	85	100
IDPT10	**Percentage of TB treatment success**	**Residence**	**163**	70	75	75	80	80	85	85	90	90	100
IDPT11	*Percentage of TB deaths*	*Residence*	*164*										
IDPT12	**Percentage of TB interrupted treatments**	**Residence**	**165**	10	12	7.5	10	5	7.5	2.5	5	0	2.5
IDPT13	*Percentage of admitted patients due to TB*	*Hospital*	*166*										

		Computation level	Page	Extremes of the evaluation bands									
Area	**Infectious Diseases - Gastroenteritis**												
IDPD02	**Average number of water sources by Hospital**	**Hospital**	**167**	0	0.2	0.2	0.4	0.4	0.6	0.6	0.8	0.8	1.0
IDPD03	*Availability of an hand washing programme (Hospital)*	*Hospital*	*168*										
IDPD04	**Average number of toilets per bed in IPD**	**Hospital**	**169**	0	0.01	0.01	0.02	0.02	0.03	0.03	0.04	0.04	0.05
IDPD05	**Average number of toilets in OPD per number of rooms**	**Hospital**	**170**	0	0.5	0.5	0.6	0.6	0.7	0.7	0.8	0.8	1.0
IDPD06	*Percentage of positive stool tests (for parasites)*	*Hospital*	*171*										
IDPD07	*Percentage of gastroenteritis diagnosed (<5 years - Outpatient)*	*Residence*	*172*										
IDPD08	*Percentage of gastroenteritis diagnosed (>5 years - Outpatient)*	*Residence*	*173*										
IDPD09	*Percentage of diarrhoea cases with severe dehydration due to gastroenteritis and diarrhoea*	*Hospital*	*174*										
IDPD10	**Percentage of discharged patients for diarrhoea and gastroenteritis**	**Hospital**	**175**	9.1	10	7.9	9.1	6.7	7.9	5.4	6.7	0.0	5.4
IDPD11	*Percentage of diarrhoea cases (<5 years)*	*Residence*	*176*										
IDPD12	**Average number of ORS packages delivered per patient with diarrhoea (<5years)**	**Residence**	**177**	0	0.6	0.6	0.7	0.7	0.8	0.8	1	1	100
IDPD13	**Average number of Zinc Tablets doses delivered per patient with diarrhoea (<5years)**	**Residence**	**178**	0	0.6	0.6	0.7	0.7	0.8	0.8	1	1	100
IDPD14	**Percentage of deaths with a diagnosis of gastroenteritis**	**Hospital**	**179**	1.6	2	1.2	1.6	0.8	1.2	0.4	0.8	0	0.4
IDPD15	*ALOS for gastroenteritis*	*Hospital*	*180*										
	Chronic Diseases												
Area	**Chronic Diseases - HIV**												
CPHIV01	*Percentage of HIV screening coverage*	*Residence*	*182*										
CPHIV02	**Percentage of performed tests to pregnant women**	**Residence**	**183**	75	80	80	85	85	90	90	95	95	100
CPHIV03	**Percentage of HIV+ cases undergoing the TB screening**	**Residence**	**184**	75	80	80	85	85	90	90	95	95	100
CPHIV03.1	*Percentage of HIV patients screened for TB with Xpert*	*Hospital*	*185*										
CPHIV04	*Percentage of new diagnosed patients with CD4 < 350cell/ml*	*Hospital*	*186*										
CPHIV05	*Percentage of HIV+ patients with opportunistic infections (or advanced HIV)*	*Hospital*	*187*										
CPHIV06	*Percentage of malnourished patients followed in a HIV unit*	*Residence*	*188*										
CPHIV07	**Percentage of new HIV+ linked to ART**	**Residence**	**189**	70	75	75	80	80	85	85	90	90	100
CPHIV08	**Coverage rate of the therapy**	**Residence**	**190**	75	80	80	85	85	90	90	95	95	100
CPHIV09	*Average number of nutritional supplements delivered per patients currently on ART therapy*	*Residence*	*191*										
CPHIV10	**Percentage of VL tests over the patients undergoing ART therapy**	**Hospital**	**192**	75	80	80	85	85	90	90	95	95	100
CPHIV11	**Percentage of patients undergoing ART therapy andf tested with VL with suppression of viremia**	**Hospital**	**193**	60	70	70	80	80	85	85	90	90	100
CPHIV12	*Percentage of deaths undergoing ART therapy (within 12 months)*	*Residence*	*194*										
CPHIV13	*ALOS (HIV admitted patients)*	*Hospital*	*195*										
Area	**Other Chronic Diseases**												
CP02	*Hospitalization rate for chronic liver diseases, per 100.000 residents (>15 years)*	*Hospital*	*196*										
CP05	*Hospitalization rate of hypertension cases, per 100.000 residents (>15 years)*	*Hospital*	*197*										
CP06	*Hospitalization rate for stroke, per 100.000 residents (>15 years)*	*Hospital*	*198*										

Details on reference time

It is important to specify that for the calculation of indicators data with different time frames were considered according to the distinct data collection procedures of each context analysed. Although such differences, it is relevant to clarify that the data used are comparable because the time periods considered coincide. Table 2 illustrates the different time frames within each setting, respectively for hospital and health district.

Table 2 *Time frames used in different contexts*

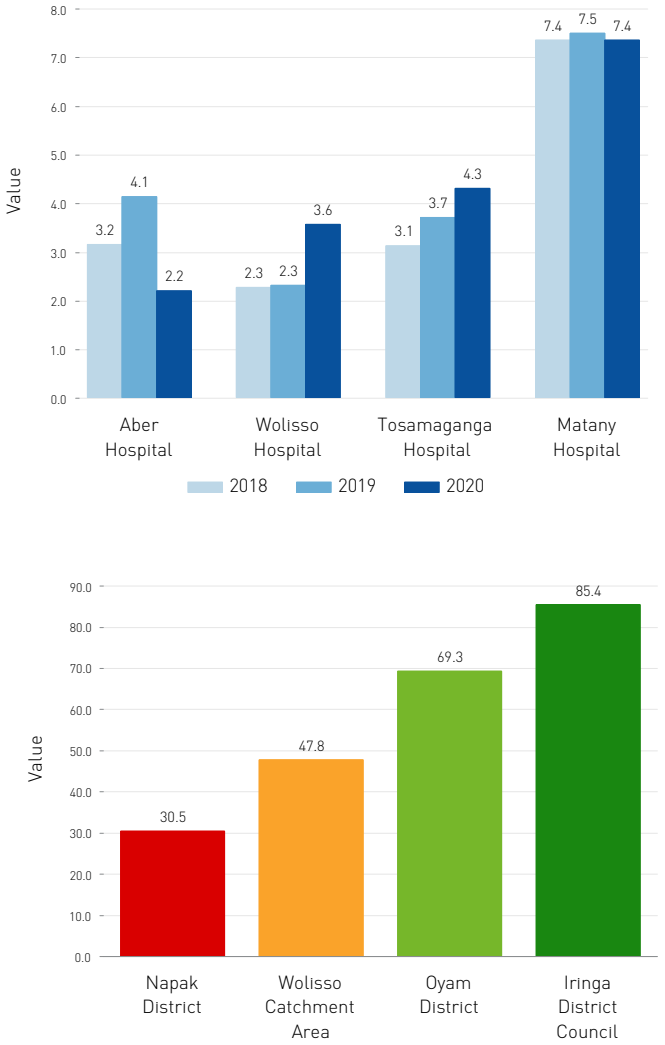
Area	Year 2018		Year 2019		Year 2020	
	Hospital	Health District	Hospital	Health District	Hospital	Health District
Wolisso Catchment Area	Jan 18 - Dec 18	Sep 17 - Aug 18	Jan 19 - Dec 19	Sep 18 - Aug 19	Jan 20 - Dec 20	Sep 19 - Aug 20
Iringa District Council	Jan 18 - Dec 18	Jan 18 - Dec 18	Jan 19 - Dec 19	Jan 19 - Dec 19	Jan 20 - Dec 20	Jan 20 - Dec 20
Napak District	Jul 17 - Jun 18	Jul 17 - Jun 18	Jul 18 - Jun 19	Jul 18 - Jun 19	Jul 19 - Jun 20	Jul 19 - Jun 20
Oyam District	Jul 17 - Jun 18	Jul 17 - Jun 18	Jul 18 - Jun 19	Jul 18 - Jun 19	Jul 19 - Jun 20	Jul 19 - Jun 20

Graphical representation of results

Return of results is based on the use of four different graphical solutions to provide an immediate and effective representation of performance in benchmarking.

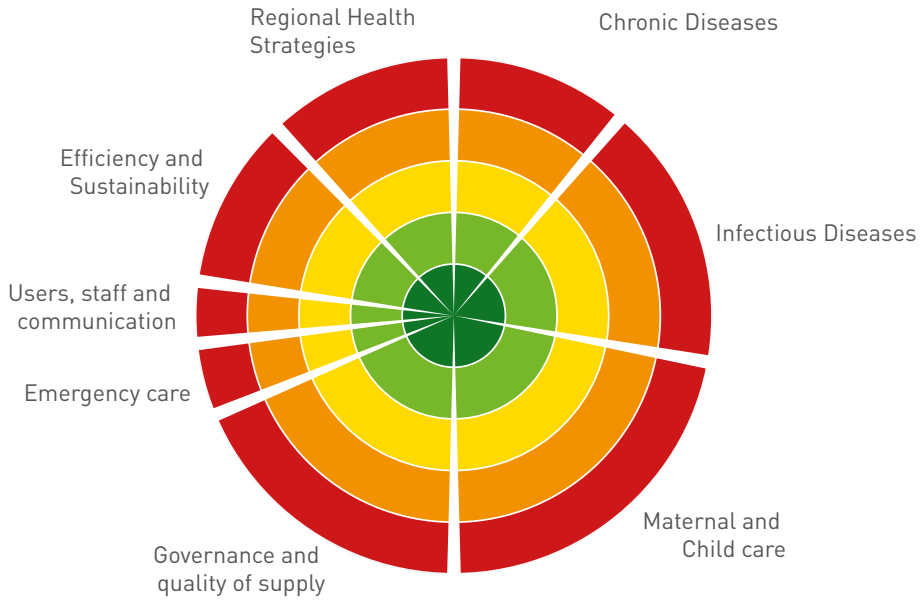
a) Each indicator is represented by histograms. When considering evaluation indicators, two histograms are provided, namely the evaluation bands referring to 2020 and data in trend over the years 2018 – 2020. Instead, when considering observation indicators, only data in trend over the years 2018 – 2020 are provided.

Figure 2 *Examples of the representation of an observation indicator and an evaluation indicator*



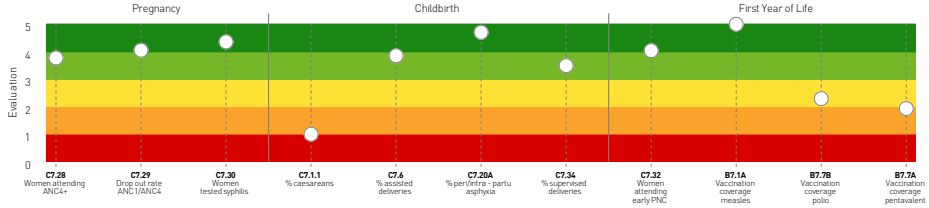
b) In order to provide an intuitive and concise representation of results at both hospital and residential level, the overmentioned evaluation scores are used to populate a target chart (the "dartboard"), which consists of five coloured strips, from red to dark green, corresponding respectively to the five evaluation bands. The dots of the dartboard represent the performance of the indicators and are ordered following the evaluation dimensions. The white dots refer to health district indicators, while the grey ones refer to hospital indicators. The indicators with very good performance are located at the center of the dartboard while those with very poor performance are located on the external band. In practical terms, the objective of the dartboard is to offer a picture of strengths and weaknesses of healthcare institutions and highlight the different contributions of involved national and international organizations (1).

Figure 3 *The dartboard*



c) In order to understand if health services provision is organized so to respond to users needs, the "stave" has been realized to provide an integrated and continuous view of performance between different settings, considering the whole patient journey along different care pathways. Therefore, the stave allows readers to focus on the strengths and weaknesses that characterize the healthcare services delivery along the continuum of care. Also the stave uses five colour bands (from red to dark-green), now displayed horizontally and framed into different phases of healthcare services delivery. The identified care pathways are: the Maternal and Child care pathway (including pregnancy, childbirth and first year of life phases), the Infectious Diseases pathways (including prevention, diagnosis, treatment, and outcome phases) for both tuberculosis and gastroenteritis, and the Chronic Diseases pathway (including screening, diagnosis, treatment, and outcome phases) for HIV (3). In particular, regarding the pathways of infectious diseases and HIV, MeS Lab and CUAMM researchers jointly designed and developed these staves considering the peculiarities of the epidemiological context characterizing the countries included in the analysis.

Figure 4. *Example of a stave*



d) Finally, a performance/trend map further analyzes the improvement margin regarding clinical pathways indicators. It includes:

- on the y axis, the 2019-2020 trend recorded by the hospitals and health districts (re-calculated so that it varies between -2 and +2, where -2 indicates low and +2 high improvement margin);
- on the x axis, the evaluation scores between 0 and 5 obtained in 2020.

Particularly, the crosscheck of these two dimensions identifies 4 areas divided by the four quadrants:

1. upper-right quadrant: area with indicators with good or outstanding performance and improvement, for which the results obtained are confirmed over time;
2. upper-left quadrant: area with under-average but improving performance indicators, which identify the measures with a positive evolution, hopefully also confirmed in the long run;
3. bottom-right quadrant: area with indicators characterized by good or outstanding performance, but worsening, i.e. measures that require specific attention to avoid negative results in the future;
4. bottom-left quadrant: area with under-average and worsening indicators for which priority attention is needed.

Figure 5 *Example of a trend/map*

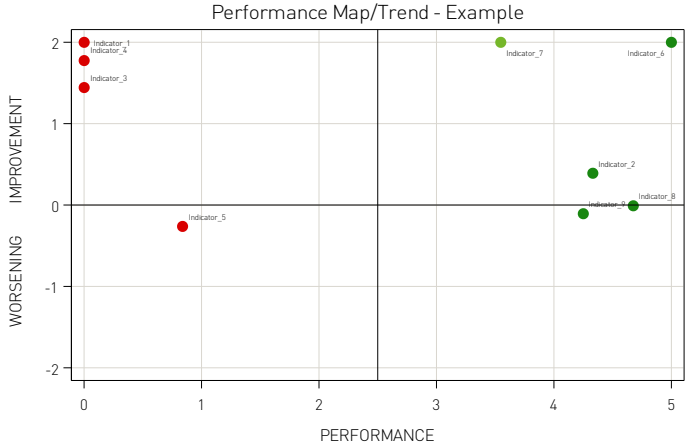


Table 3. *List of indicators populating the Maternal and Child care pathway*

	Maternal and Child care pathway	
C7.28	Proportion of pregnant women who attended ANC 4+ during the current pregnancy	
C7.29	Drop out Rate of ANC1 to ANC + 4	**Pregnancy**
C7.30	Proportion of pregnant women tested for syphilis	
C7.1	*Percentage of C-section deliveries (NTSV)*	
C7.1.1	Percentage of caesareans	
C7.1.4	*Percentage of elective caesareans (NTSV)*	
C7.1.4A	*Percentage of elective caesareans*	
C7.2	*Percentage of induced labours*	
C7.3	*Percentage of episiotomies (NTSV)*	**Childbirth**
C7.3A	Percentage of episiotomies	
C7.6	Percentage of assisted deliveries (forceps or ventouse)	
C7.20A	Percentage of peri/intra-partum asphyxia	
C7.33A	*Percentage of deliveries in lower level units*	
C7.34	Percentage of supervised deliveries in the catchment area	
C7.32	Proportion of women with early PNC	
B7.1A	Vaccination coverage for measles	
B7.7B	Vaccination coverage for polio	
B7.9	Vaccination coverage for rota virus	
B7.7A	Pentavalent vaccine coverage (HIB; difteria; pertussis, tetanus, HBV)	**First Year of Life**
C7.7.1	*Paediatric hospitalization rate (<1 year) , per 1.000 residents*	
C7.7A	*Paediatric hospitalization rate (0-12 years), per 1.000 residents*	
C7D.19.1A	*Paediatric hospitalization rate for ARI (0-5 years), per 1.000 residents*	
C7D.19.2A	*Paediatric hospitalization rate for gastroenteritis (<15 years), per 1.000 residents*	

Observation indicators are reported in italics.

Table 4. *List of indicators populating the Infectious Diseases - Tuberculosis pathway*

Infectious Diseases - Tuberculosis pathway		
IDPT01	Percentage of treatments with isoniazide (IPT)	**Prevention**
IDPT02	Percentage of TB cases undergoing the HIV screening	
IDPT03	*Percentage of positive TB cases on number of tests*	**Diagnosis**
IDPT04	Percentage of confirmed TB cases on diagnosed cases	
IDPT05	Percentage of confirmed PTB	
IDPT06	Percentage of positive Xpert cases	
IDPT06.1	*Percentage of positive Xpert RR*	
IDPT07	Percentage of treatments for extrapolmunary TB	**Treatment**
IDPT08	*Percentage of PTB MDR initiated treatments*	**Outcome**
IDPT09	Percentage of cured patients	
IDPT10	Percentage of completed treatments	
IDPT11	*Percentage of deaths*	
IDPT12	Percentage of interrupted treatments	
IDPT13	*Percentage of admitted patients due to TB*	

Observation indicators are reported in italics.

Table 5. *List of indicators populating the Infectious Diseases - Gastroenteritis pathway*

Infectious Diseases - Gastroenteritis pathway		
B7.9	Vaccination coverage for rota virus	**Prevention**
IDPD02	Average number of water sources by Hospital	
IDPD03	*Availability of an hand washing programme (Hospital)*	
IDPD04	Average number of toilets per beds in IPD	
IDPD05	Average number of toilets in OPD per number of rooms	
IDPD06	*Percentage of positive stool tests (for parasites)*	**Diagnosis**
IDPD07	*Percentage of gastroenteritis diagnosed (<5 years - Outpatient)*	
IDPD08	*Percentage of gastroenteritis diagnosed (>5 years - Outpatient)*	
IDPD09	*Percentage of diarrhoea cases with severe dehydration due to gastroenteritis and diarrhoea*	
IDPD10	Percentage of discharged patients for diarrhoea and gastroenteritis	
IDPD11	*Percentage of diarrhoea cases (<1 year)*	
IDPD12	Average number of ORS packages delivered per patient with diarrhoea (<5years)	**Treatment**
IDPD13	Average number of Zinc Tablets doses delivered per patient with diarrhoea (<5years)	
IDPD14	Percentage of deaths with a diagnos of gastroenteritis	**Outcome**
IDPD15	*ALOS for gastroenteritis*	

Observation indicators are reported in italics.

Table 6. *List of indicators populating the Chronic Diseases - HIV pathway*

Chronic Diseases - HIV pathway		
CPHIV01	*HIV screening coverage*	**Screening**
CPHIV02	Percentage of performed tests to pregnant women	
IDPT02	Percentage of TB cases undergoing the HIV screening	
CPHIV03	Percentage of HIV cases undergoing TB screening	
CPHIV03.1	*Percentage of HIV patients screened for TB w/Xpert*	
CPHIV04	*Percentage of new diagnosed patients with CD4 < 350cell/ml*	**Diagnosis**
CPHIV05	*Percentage of HIV+ patients with opportunistic infections (or advanced HIV)*	
CPHIV06	*Percentage of malnourished patients followed in a HIV unit*	
CPHIV07	Percentage of new HIV+ linked to ART	**Treatment**
CPHIV08	Coverage rate of the therapy	
CPHIV09	*Average number of nutritional supplements delivered per patients currently on ART therapy*	
CPHIV10	Percentage of VL tests over the patient undergoing ART therapy	
CPHIV11	Percentage of patients undergoing ART therapy andf tested with VL with suppression of viremia	**Outcome**
CPHIV12	*Percentage of deaths undergoing ART therapy (within 12 months)*	
CPHIV13	*ALOS (HIV admitted patients)*	

Observation indicators are reported in italics.

Survey on the governance dimension

A literature review was carried out on the state of the art in measuring and evaluating governance mechanisms and models (4–13). Following this review, in order to investigate the governance dimension within the contexts analysed, a qualitative survey was developed for completion by local managers.

The survey investigates five different governance and organizational related areas, corresponding to distinct sections of the questionnaires, that are the following:

- Governance and leadership;
- Human resources management;
- Financial management;
- Quality management;
- Data management.

Two questionnaires were developed ad hoc with specific themes regarding hospital and health district governance models. Overall, the questionnaires consist of 106 questions in the case of hospital and 96 questions in the case of health district. The response types adopted were yes/no format, single and multiple choice closed-ended questions and open-ended questions.

In terms of administration of the survey, the two questionnaires were sent to hospital and health district managers by email to be completed by web. In particular, the invitation to participate to the survey were sent to four hospitals and eight health districts, with hospital and health district response rates equal to respectively 100% and 62.5%.

The Appendix reports the questionnaires submitted to local professionals.

The evaluation of results was performed only on the financial and data management dimensions. In the present report, the evaluation scores of each dimension are computed as the percentage of positive answers over the number of questions.

An evaluation score was assigned to each result according to specific bands by using the same methodology for evaluating the indicators. The bands were defined according to the distribution of values. Evaluation scores are displayed with four coloured dots above each dartboard, one per each evaluated section (financial management and data management) at hospital and health district level.

Standardization of hospitalization rates

One of the core principles of the PES implemented in these contexts is the use of systematic data benchmarking as a practice to improve health care performance.

The indicators presented in the PES are returned as crude rates; however, the comparison of crude rates might be less precise, in particular when the population structure of the different contexts differ in terms of sociodemographic factors.

In order to overcome such a problem, an exercise was performed by the research team to standardize a set of indicators by sex and age.

The first stage of the exercise was related to the identification of a sub-selection of core indicators that could be standardized to allow comparisons in benchmarking of data.

Since there are both evaluation and observation indicators embedded in the PES, it was decided to select hospitalization rates (also specified by disease). Indeed, in the previous version of the report, based on 2019 data, hospitalization rates were left as observation indicators because it was not possible to determine the indicators sign, either increasing or decreasing.

Therefore, the list of indicators considered for the standardization exercise are:

- C1.1A - Hospitalization rate, per 1.000 residents
- C11A.1.1A - Heart failure hospitalization rate, per 100.000 residents (>15 years)
- C11A.2.1A - Diabetes hospitalization rate, per 100.000 residents (>15 years)
- CP02 - Hospitalization rate for chronic liver diseases, per 100.000 residents (>15 years)
- CP05 - Hospitalization rate of hypertension cases, per 100.000 residents (>15 years)
- CP06 - Hospitalization rate for stroke, per 100.000 residents (>15 years)
- C7.7.1 - Paediatric hospitalization rate (<1 year) , per 1.000 residents
- C7.7A - Paediatric hospitalization rate (<15 years), per 1.000 residents
- C7D.19.1A - Paediatric hospitalization rate for ARI (0-5 years), per 1.000 residents
- C7D.19.2A - Paediatric hospitalization rate for gastroenteritis (<15 years), per 1.000 residents

In terms of methodology, a direct standardization procedure was applied for the estimation of the abovementioned hospitalization rates in order to obtain age-sex standardized hospitalization rates for 2020.

The settings considered for the exercise were the Wolisso Hospital in Ethiopia and the Matany Hospital in Uganda. The choice to focus on these indicators was also related to the fact that an electronic information system is in use in these hospitals.

The method adopted was that of direct standardization by patients' sex (male vs. fe male) and age classes (respectively <1, 2-5, <15 and >15). Local population data were

available from Census data provided by local health authorities.

The population of Ethiopia, divided by gender and age classes, was used as the standard population on which we based the standardization of the selected indicators both for Wolisso and Matany hospitals, so as to compare results from different analysed contexts. The standard Ethiopian population was extracted from microdata available from World Bank ELSS Survey for 2018-19.

We decided to use the Ethiopian population as the reference for the standardization because microdata provided the possibility of extracting the same age-sex distribution used in Wolisso and Matany hospitals catchment areas.

We report the results obtained for the general hospitalization rates in Wolisso and Matany hospitals. For other indicators, the broad categorization of age classes, due to data availability, often produced a sex only standardized estimation with crude and adjusted rates not always significantly different. Therefore, for a better consistency with other indicators in the PES, the data presented in Chapter 4 are based on crude rates and reported as observation indicators.

Table 7. *Crude and adjusted hospitalization rates*

	Ethiopia		Uganda	
	Crude	Adjusted	Crude	Adjusted
C1.1A - Hospitalization rate, per 1.000 residents	16.02	17.92	70.71	61.34

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3

RESULTS 2020

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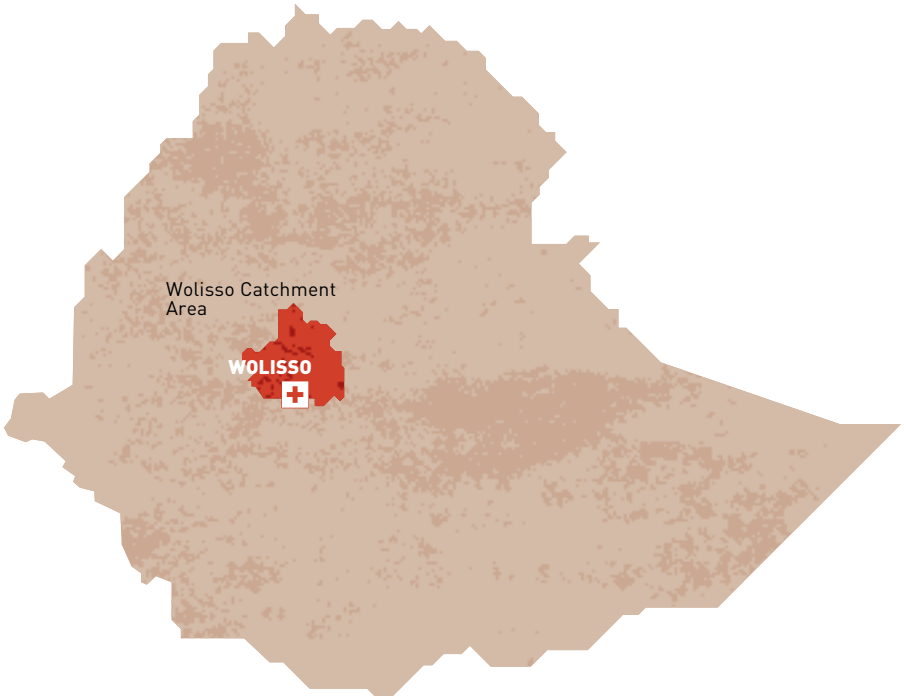
DOCTORS WITH AFRICA CUAMM

ETHIOPIA

Wolisso Catchment Area



The Ethiopia's Health System

The Ethiopia's Health Care System has a federal structure, in which governance is shared, according to mutual agreements, among the National Government, the Regional States, the Woreda Authorities and the Kebele (village) authorities (1).

It is characterized by a mixed financing model, which includes multiple financing sources: government budget financed by general taxation at various federal levels, external funding by international and national agencies and NGOs, and private funding, such as out-of-pocket (OOP) payments by patients or by social insurance companies. According to the World Health Organization (WHO)(2), in 2018 general Government and OOP expenditures amounted for 23% and 35% of the total health expenditure, respectively. In terms of expenditure per capita expressed in PPP US$, the domestic general Government expenditure on health was equal to 16$ and the OOP one equal to 24$.

The current health care system is structured according to three levels of services delivery: i) primary hospitals, health centres, and health posts; ii) general hospitals; and iii) specialized hospitals, serving as referrals from general hospitals.

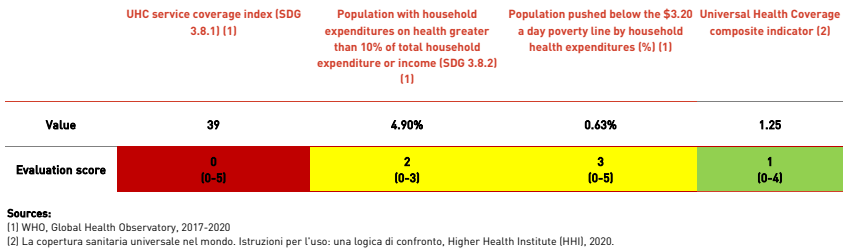
In addition to the abovementioned macroeconomic figures, the following indicators at macro level were considered, in order to evaluate the level of attainment to the Universal Health Coverage (UHC) principle. For this purpose, the scale elaborated by the Italian National Institute of Health (3) was used, which includes three indicators covering two dimensions, namely Universality and Financial Protection.

The dimension of Universality is expressed by the WHO UHC Service Coverage Index (SCI), reported on a unitless scale from 0 to 100 and computed as the geometric mean of 14 tracer indicators regarding health service coverage and referring to the four components of service coverage: i) reproductive, maternal, new born and child health; ii) infectious diseases; iii) noncommunicable diseases; and iv) service capacity and access.

The dimension of Financial Protection is expressed by two indicators, namely the proportion of the population with household expenditures on health greater than 10% of total household expenditure or income and the proportion of the population pushed below the $3.20 a day poverty line by household health expenditures. Each of the three indicators has been associated with an evaluation score, based on a division into classes by source of reference and with every evaluation band associated with a colour (from red for the worst performance to green for the best).

The unique indicator of UHC is calculated as the means of the three scores, in which the SCI weights 100% of its value, while the financial protection indicators weight each 50% of its value. Therefore, UHC is calculated as [(A+B/2+C/2)/2]. There are five bands of UHC performance, associated with five coloured bands, from red to dark green (Figure 1).

Figure 1. *UHC Index*



Sources:
(1) WHO, Global Health Observatory, 2017-2020
(2) La copertura sanitaria universale nel mondo. Istruzioni per l'uso: una logica di confronto, Higher Health Institute (HHI), 2020.

Wolisso Catchment Area

The Wolisso catchment area is located in the South West Shoa Zone, one of the eighteen zones of Oromia Region in central Ethiopia. The catchment area includes five health districts (referred to as a "woreda" in Ethiopia) inhabited by around 631,000 people. In the reference area primary care is offered by a total of 22 health centres that refer to the St. Luke Hospital - Wolisso hospital, a private, not-for-profit institution established in the early 2000s.

Wolisso hospital provides both outpatient and inpatient services. It has a total of 208 beds divided into eight wards: Medical (38 beds), Surgical (23), Paediatric (73), Neonatal unit (6), Orthopaedics (32), Delivery and Maternity (24) and Gynaecology (12). The outpatient department includes a 24hrs emergency service, Mother and Child clinic, Ophthalmology unit, Dental clinic, Mental and Orthopaedic units, the clinic for chronic and non communicable diseases, which comprise the Antiretroviral (ART) clinic. Laboratory, X-ray and ultrasound are the main diagnostic services offered by the hospital. Additionally, in 2020 the hospital provided 66,522 outpatient visits, 12,881 admissions and a total of 4,033 deliveries.

From the macro to the micro perspective

Four indicators were included regarding details of OOP expenditures at hospital level. In particular, Table 1 reports the ratio of OOP and revenues, the ratio of OOP and number of patients stays, expressed by Inpatient Days Equivalent, and the ratio of OOP and Standard Unit of Output (SUO), and the ratio of OOP and number of residents in the Wolisso Catchment Area.

With respect to this reference area, the questionnaires on the governance dimension were completed by the managers of Wolisso Hospital and of two health districts, namely Wolisso Town and Wonchi.

Wolisso Hospital, Wolisso Town, and Wonchi reached a score of 15.6/16, 8.5/16.5 and 14.5/16.5 respectively regarding financial management area and a score of 12/14.5, 5.5/6 and 6/6 with respect to data management area.

In particular, in terms of evaluation, the governance indicators of Wolisso Hospital rank in the dark green band for financial management area and in the green band for data management area. The governance indicators at health district level rank as low in the orange band for financial management area and as excellent in the dark green band for data management area.

Table 1. *OOP ratios in Wolisso Catchment Area - Wolisso Hospital*

	Value
Percentage of revenues from OOP fees over total hospital's revenues (in %)	26%
OOP hospital's revenues per Inpatient days equivalent*, PPP (current international $)	$5.3
OOP hospital's revenues per Standard Unit of Output (SUO)**, PPP (current international $)	$6.0
OOP hospital's revenues per capita***, PPP (current international $)	$2.7

** It is expressed as the sum of inpatient days and the number of outpatient visits multplied by a standard coefficient equal to 4.*
*** The SUO is expressed as the number of inpatients multiplied by a std. coefficient of 15, the number of OPD visits multiplied by 1, the number of deliveries multiplied by 5, the number of vaccinations by 0.2, and the number of ANC visits multiplied by 0.5.*
**** It refers to the estimated resident population in the reference Catchment Area.*

The Performance of Wolisso Catchment Area in 2020

First of all, it is worth noticing that the aim of the present section is to interpret the performance of the health system as a whole. Indeed, the indicators calculated at residence level include the joint contribution of the health district and reference hospital, whilst the indicators calculated at hospital level illustrate specifically the hospital performance. Additionally, with respect to the graphical representation of the previous year, the performance of the health district and the hospital is reported on the dartboard by means of white and grey dots. More particularly, the dartboards and the staves summarize and represent graphically the performance of the local health system, while the performance maps, associated with the respective care pathways, provide a view of the evolution of performance in trend.

The dartboard shows an excellent performance with regards to the vaccination coverage, except for measles, for which however the performance improved with respect to the previous year. In reference to the efficiency and sustainability domain, it is possible to observe that most indicators score on the yellow and orange bands, while the current ratio (F3.1) has an excellent evaluation. In addition, while the hospital bed occupancy rate (C2A.2) decreased with respect to the previous year, for ALOS (C2A.3) an excellent performance was confirmed.

With regards to the domain "user, staff and communication", according to the interpretation of the dartboard, the Wolisso Hospital management should keep under control the percentage of patients leaving the hospital against medical advice (D18).

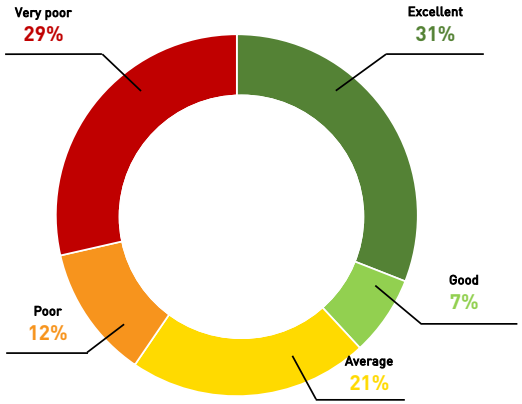
Comparing the evaluation data of this year with the evaluation data of the previous year for the maternal and child pathway, the caesarean section rate (C7.1.1), which is characterized by a good performance, performed less well than the previous year. On the other hand, the percentage of women attending ANC4+ visits (C7.28) has a quite low performance but improved remarkably with respect to the performance evaluation in 2019. The worst scenario is related to the percentage of supervised deliveries (C7.34) that decreased since last year and actually scores on the red band.

Comparing the evaluation data of this year with the evaluation data of the previous year for the tuberculosis pathway, the percentage of EPTB (IDPT07) is performing very well compared to 2019, while the percentage of cured patients (IDPT09) that still shows a good performance is scoring slightly worse. There is an encouraging interpretation of the percentage of TB cases screened for HIV (IDPT02), the percentage of confirmed TB diagnosed cases (IDPT04) and the percentage of PTB screened patients (IDPT05), because although they show a poor performance, they improved over the last year.

Comparing the evaluation data of this year with the evaluation data of the previous year for the gastroenteritis pathway, the average number of toilets per IPD beds (IDPD04) is good and improving in time, and the percentage of deaths (IDPD14) scores on the yellow band but is worsening. For what concerns the percentage of patients admitted with a diagnosis of gastroenteritis (IDPD10), a priority attention is needed because it shows scarce and worsening performance.

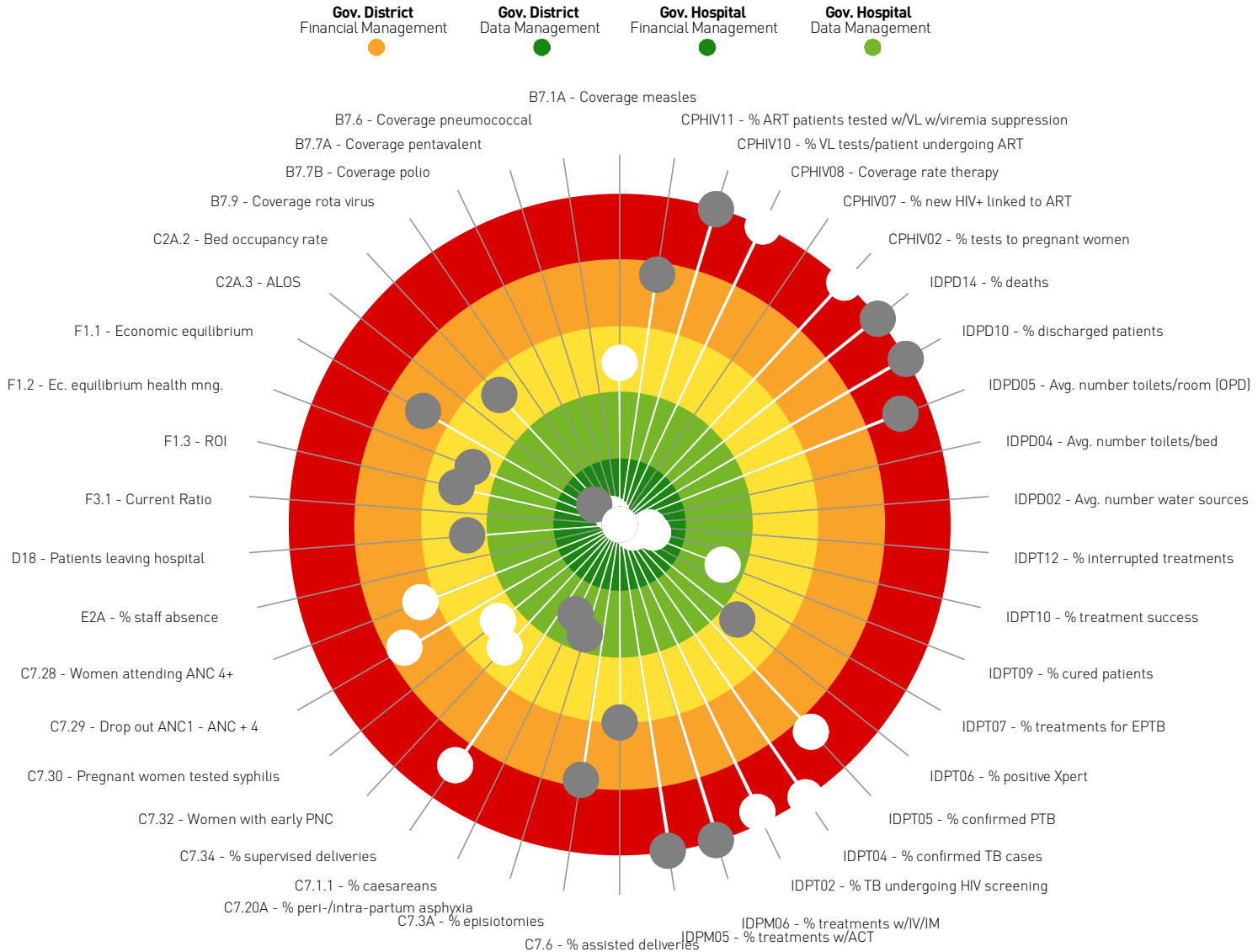
Finally, in line with the evaluation of the previous year, the HIV pathway is confirmed to be the most critical one. However, although it is important to draw attention on the indicators of this pathway, it should be mentioned that there are several indicators with under-average but improving performance, identifying a possible positive evolution. It is worth noticing that the percentage of HIV positive patients linked to the ART therapy (CPHIV07) scores high but is worsening.

The donut chart below summarizes the proportion of evaluated indicators for each performance level.

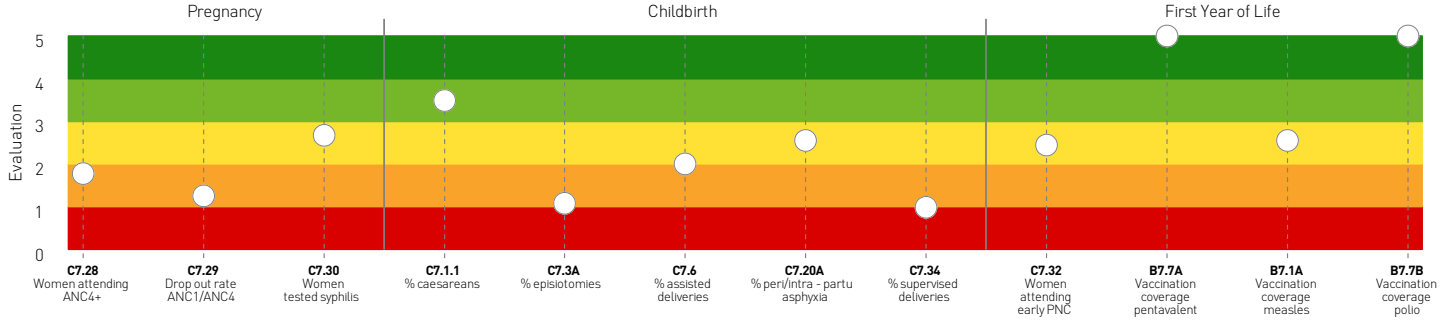


Dartboard

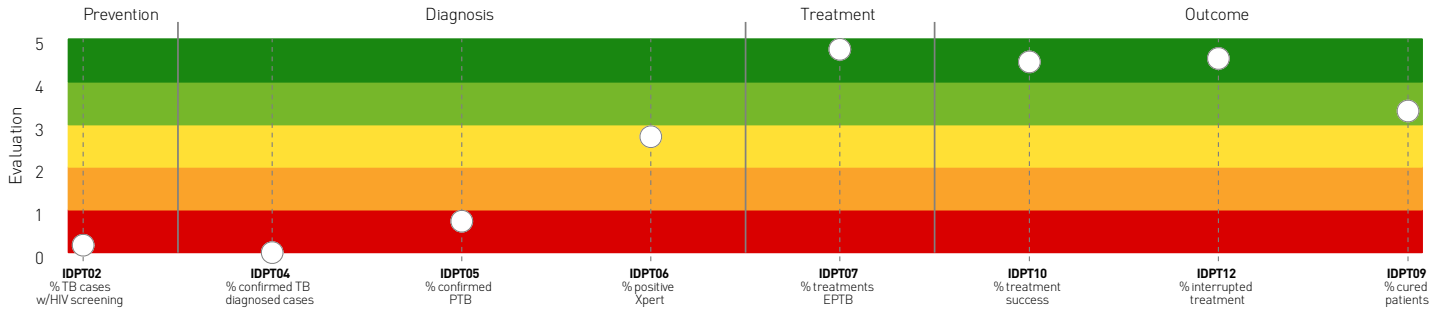
Wolisso Catchment Area -Year 2020



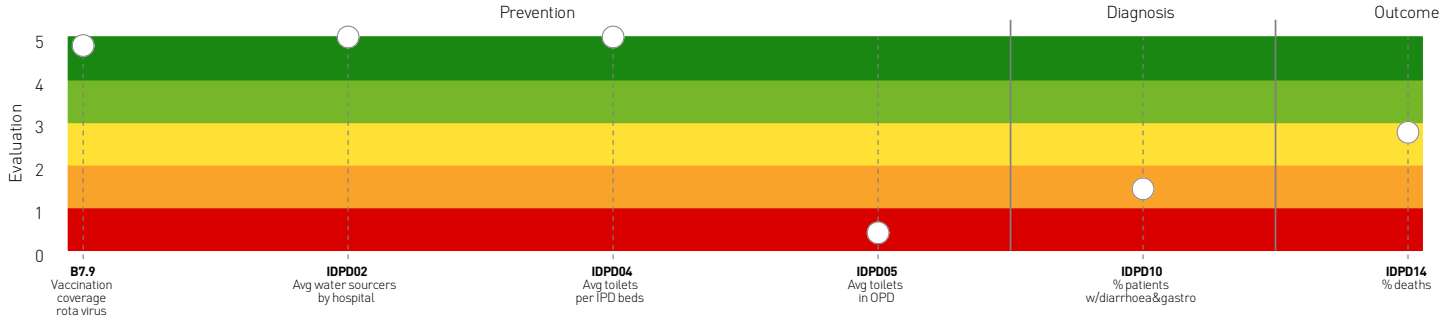
Please note that, as explained in the methodological section, the grey dots on the dartboard refer to the hospital evaluation, while the white dots refer to the health district evaluation.



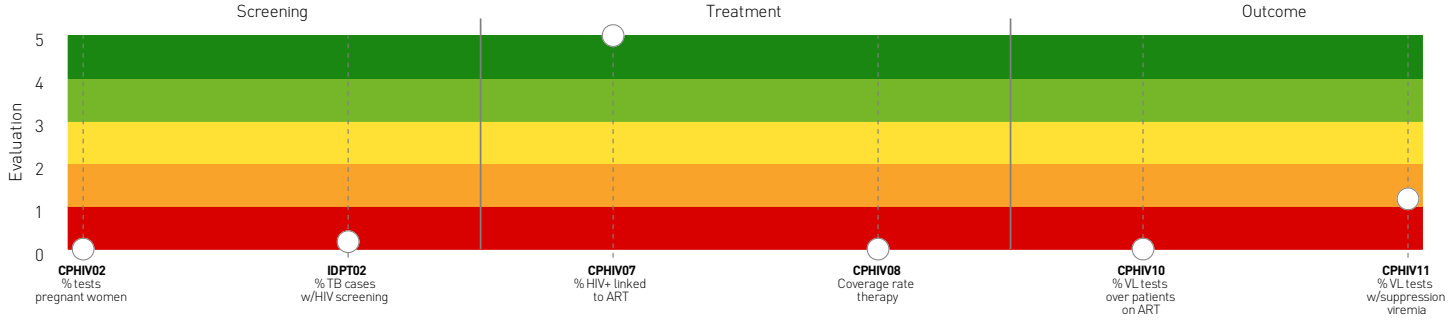
MATERNAL AND CHILD CARE PATHWAY



INFECTIOUS DISEASES - TUBERCULOSIS PATHWAY

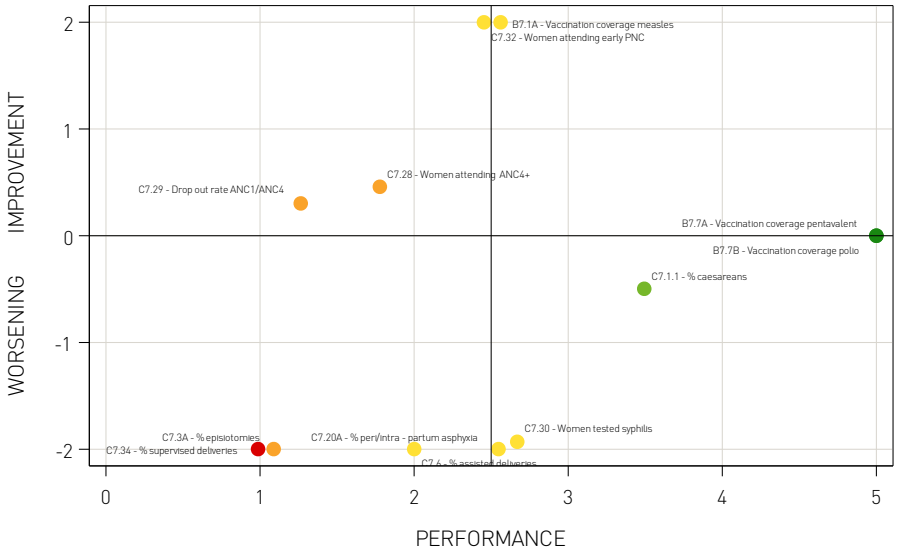


INFECTIOUS DISEASES - GASTROENTERITIS PATHWAY

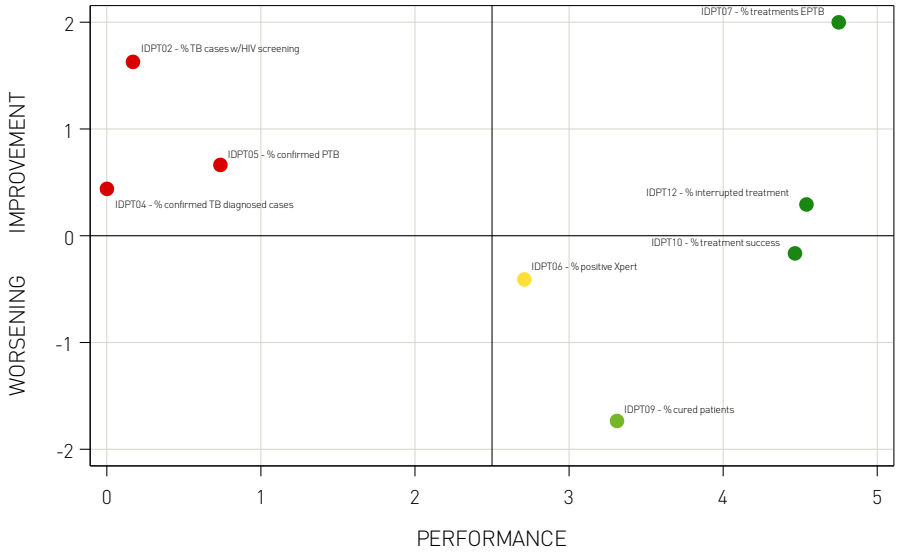


CHRONIC HIV PATHWAY

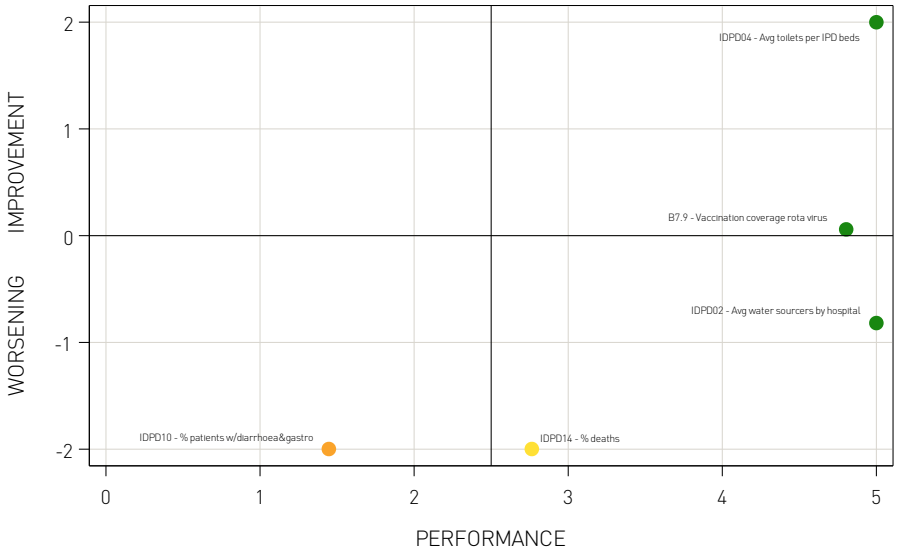
Performance Map/Trend - Mother and Child care



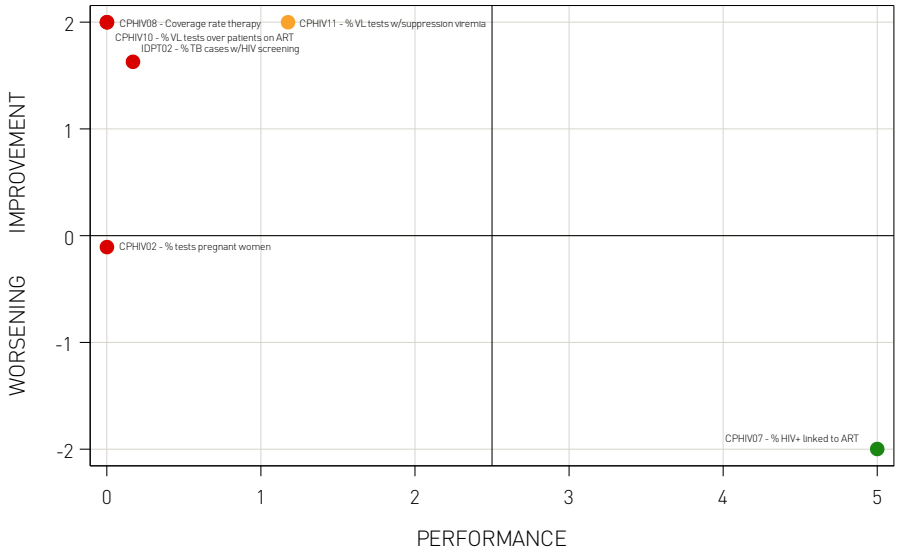
Performance Map/Trend - Tuberculosis



Performance Map/Trend - Gastroenteritis



Performance Map/Trend - HIV



TANZANIA

Iringa District Council

The Tanzania's Health System

The Tanzania's health system is structured according to three territorial levels: local government authorities (districts), regional authorities and national government. Due to the progressive decentralization obtained through recent reforms, both district and regional levels are fully responsible for delivering health services within their area of jurisdiction (4).

It is characterized by a mixed financing model, which includes multiple financing sources: government budget financed by general taxation at various federal levels, external funding by international and national agencies and NGOs, and private funding, such as OOP or payments by social insurance companies. According to the World Health Organization (WHO)(2), in 2018 general Government and OOP expenditures amounted for 43% and 24% of the total health expenditure, respectively. In terms of expenditure per capita expressed in PPP US$, the domestic general Government expenditure on health was equal to 48$ and the OOP one equal to 27$.

The current health care system is structured according to three levels of services delivery: i) dispensaries and health centres; ii) district designated hospital; and iii) regional hospitals, serving as referrals from district designated hospitals.

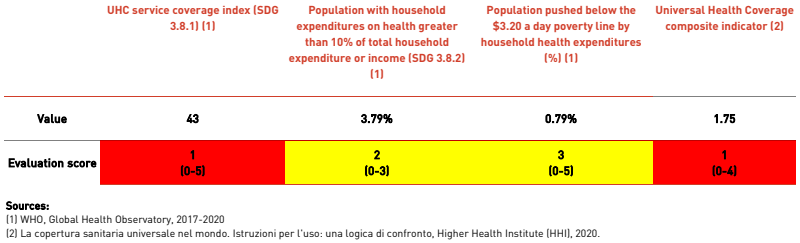
In addition to the abovementioned macroeconomic figures, the following indicators at macro level were considered, in order to evaluate the level of attainment to the Universal Health Coverage (UHC) principle. For this purpose, the scale elaborated by the Italian National Institute of Health (3) was used, which includes three indicators covering two dimensions, namely Universality and Financial Protection.

The dimension of Universality is expressed by the WHO UHC Service Coverage Index (SCI), reported on a unitless scale from 0 to 100 and computed as the geometric mean of 14 tracer indicators regarding health service coverage and referring to the four components of service coverage: i) reproductive, maternal, new born and child health; ii) infectious diseases; iii) noncommunicable diseases; and iv) service capacity and access.

The dimension of Financial Protection is expressed by two indicators, namely the proportion of the population with household expenditures on health greater than 10% of total household expenditure or income and the proportion of the population pushed below the $3.20 a day poverty line by household health expenditures. Each of the three indicators has been associated with an evaluation score, based on a division into classes by source of reference and with every evaluation band associated with a colour (from red for the worst performance to green for the best).

The unique indicator of UHC is calculated as the means of the three scores, in which the SCI weights 100% of its value, while the financial protection indicators weight each 50% of its value. Therefore, UHC is calculated as [(A+B/2+C/2)/2]. There are five bands of UHC performance, associated with five coloured bands, from red to dark green (Figure 2).

Figure 2. *UHC Index*



Sources:
(1) WHO, Global Health Observatory, 2017-2020
(2) La copertura sanitaria universale nel mondo. Istruzioni per l'uso: una logica di confronto, Higher Health Institute (HHI), 2020.

Iringa District Council

The Iringa District Council is one of the 113 health districts of the country and it is located in the region of Iringa, in South-Western Tanzania. The health district comprises a rural area outside Iringa, the regional capital city. Primary care is provided by 89 dispensaries and health centres, serving an estimated population of approximately 308,000 inhabitants.

Tosamaganga District Designated Hospital (Tosamaganga) was designed as the referral center for the health district. Although the hospital is a private facility, it has been officially integrated into the Tanzanian public health system since 2007. The hospital has a capacity of 165 beds distributed as follows: Medical wards (60 beds), Maternity ward (45), Paediatric ward (22), Surgical ward (28) with one major operating theatre, and Neonatal Unit (10). Moreover, the outpatient department includes Adult and Child clinic, Reproductive and Child Health (RCH), the Care and Treatment Centre (CTC), the TB unit, the Dental Unit, and the minor operating theatre. The Laboratory and Radiology departments provide lab tests, x-rays and ultrasounds. In 2020 the hospital offered 38,210 outpatient visits, 8,432 admissions and a total of 2,420 deliveries.

From the macro to the micro perspective

Four indicators were included regarding details of OOP expenditures at hospital level. In particular, Table 1 reports the ratio of OOP and revenues, the ratio of OOP and number of patients stays, expressed by Inpatient Days Equivalent, and the ratio of OOP and Standard Unit of Output (SUO), and the ratio of OOP and number of residents in the Iringa District Council.

With respect to this reference area, the questionnaires on the governance dimension were completed by the managers of Tosamaganga Hospital and Iringa District Council.

Tosamaganga Hospital and Iringa District Council reached a score of 7/16 and 14.5/16.5 respectively regarding financial management area and a score of 9/14.5 and 5/6 with respect to data management area.

In particular, in terms of evaluation, the governance indicators of Tosamaganga Hospital rank in the red band for financial management area and in the orange band for data management area. The governance indicators at health district level rank as good in the green band for both financial management and data management areas.

Table 2. *OOP ratios in Iringa District Council - Tosamaganga Hospital*

	Value
Percentage of revenues from OOP fees over total hospital's revenues (in %)	18%
OOP hospital's revenues per Inpatient days equivalent*, PPP (current international $)	$4.6
OOP hospital's revenues per Standard Unit of Output (SUO)**, PPP (current international $)	$6.1
OOP hospital's revenues per capita***, PPP (current international $)	$2.8

** It is expressed as the sum of inpatient days and the number of outpatient visits multplied by a standard coefficient equal to 4.*
*** The SUO is expressed as the number of inpatients multiplied by a std. coefficient of 15, the number of OPD visits multiplied by 1, the number of deliveries multiplied by 5, the number of vaccinations by 0.2, and the number of ANC visits multiplied by 0.5.*
**** It refers to the estimated resident population in the reference Catchment Area.*

The Performance of Iringa District Council in 2020

First of all, it is worth noticing that the aim of the present section is to interpret the performance of the health system as a whole. Indeed, the indicators calculated at residence level include the joint contribution of the health district and reference hospital, whilst the indicators calculated at hospital level illustrate specifically the hospital performance. Additionally, with respect to the graphical representation of the previous year, the performance of the health district and the hospital is reported on the dartboard by means of white and grey dots. More particularly, the dartboards and the staves summarize and represent graphically the performance of the local health system, while the performance maps, associated with the respective care pathways, provide a view of the evolution of performance in trend.

The dartboard shows a high concentration of indicators evaluated in the central sector of the dartboard both at hospital and health district level. However, there are some aspects that should be analysed carefully. At health district level, these are the coverage rate of pentavalent vaccine (B7.7A), the indicators regarding prevention and diagnosis phases of the tuberculosis pathway (IDPT01, IDPT04, IDPT05, IDPT06) and the coverage rate of the ART therapy (CPHIV08). At hospital level, these are the indicators related to inpatients efficiency (C2A.2, C2A.3), two indicators of the childbirth phase of the maternal pathway (C7.7.1 and C7.6), the percentage of TB patients screened with Xpert (IPDT06), the percentage of patients undergoing ART therapy and tested with VL with suppression of viremia (CPHIV11).

There are some other indicators which require a special attention: the current ratio (F3.1), the percentage of episiotomies performed (C7.3A), the average number of toilets per inpatient room (IDPD05) for the hospital, and the percentage of HIV positive patients undergoing a TB screening (CPHIV03) for the health district.

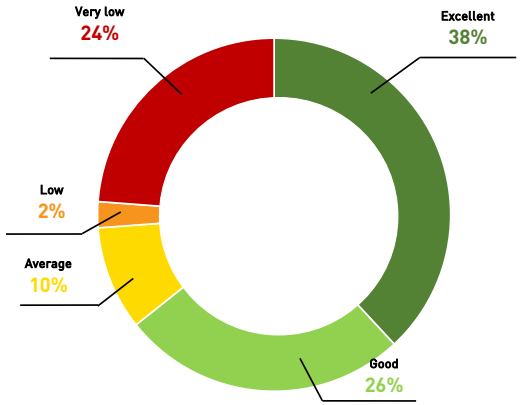
Comparing the evaluation data of this year with the evaluation data of the previous year for the maternal and child pathway, the drop out rate of ANC1-ANC4 (C7.29) presents an excellent performance and has improved remarkably over the last year. On the other hand, the vaccination coverage of pentavalent vaccine (B7.7A) should be monitored because, no matter the good performance, it had a decreasing trend in the past year. Additionally, it is worth noticing that both the caesarean section (C7.1.1) and episiotomies (C7.3A) rates score very low, but the former worsened over time, while the latter improved.

Comparing the evaluation data of this year with the evaluation data of the previous year for the tuberculosis pathway, there are two indicators regarding the outcome phase that perform well, namely the percentage of treatment success (IDPT10) and the percentage of interrupted treatments (IDPT12). However, it is important to keep into consideration that IDPT10 improved as much as the IDPT12 worsened, and this is also affected by a slight decrease of the percentage of cured patients (IDPT09). The performance map confirms the very low performance attained by IDPT01, IDPT04, IDPT05, but it shows that there was a progress of these indicators with respect to the previous year.

Comparing the evaluation data of this year with the evaluation data of the previous year for the gastroenteritis pathway, the performance map illustrates overall a positive scenario, although the vaccination coverage of rota virus (B7.9) and the average number of water sources with the hospital (IDPD02) should be checked more rigorously.

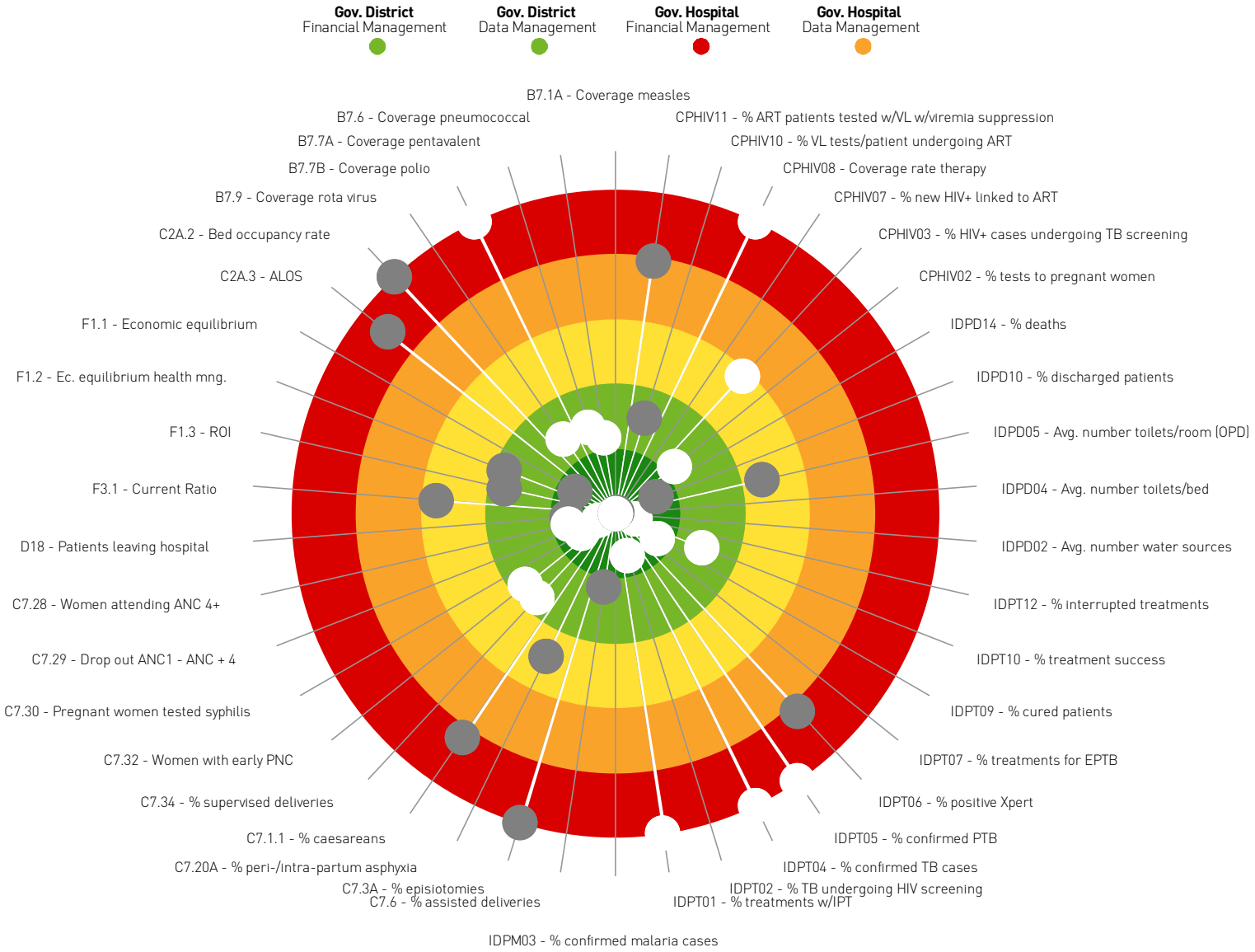
Finally, in line with the evaluation of the previous year, it should be mentioned that two indicators related to the screening phase, i.e. the percentage of tests delivered to pregnant women (CPHIV02) and the percentage of TB cases with HIV screening (IDPT02), perform well and are improving. As counterpoised, it is possible to see that CPHIV08 is bad and worsening.

The donut chart below summarizes the proportion of evaluated indicators for each performance level.

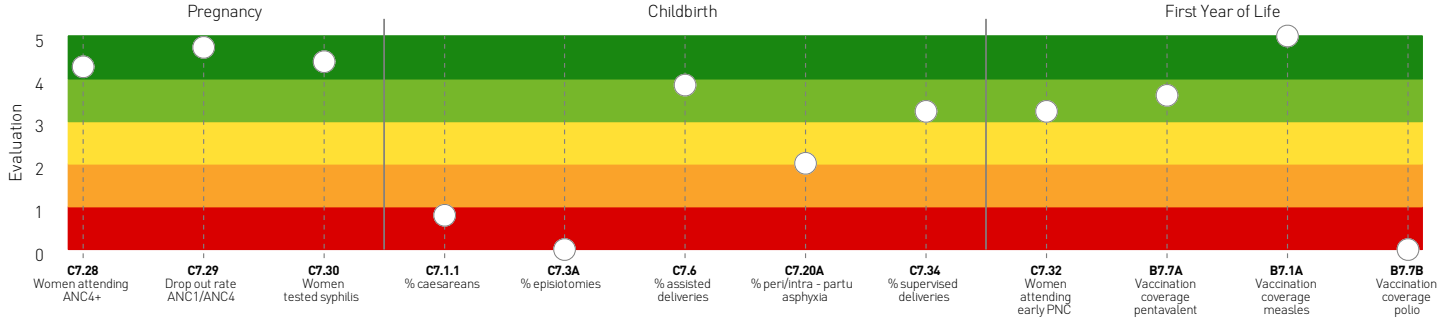


Dartboard

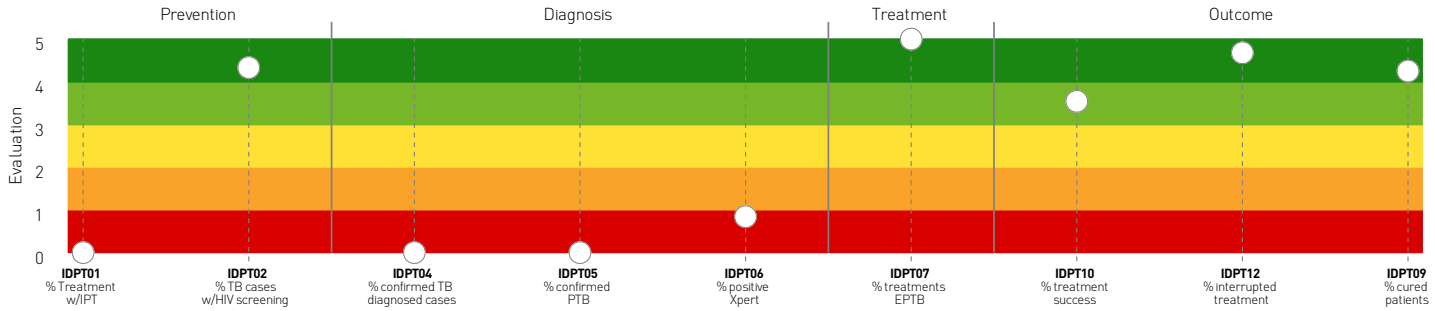
Iringa District Council - Year 2020



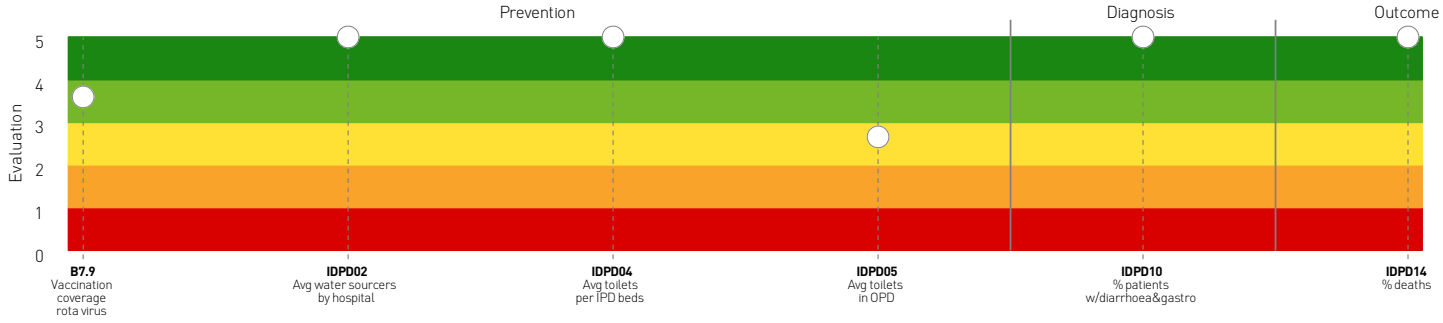
Please note that, as explained in the methodological section, the grey dots on the dartboard refer to the hospital evaluation, while the white dots refer to the health district evaluation.



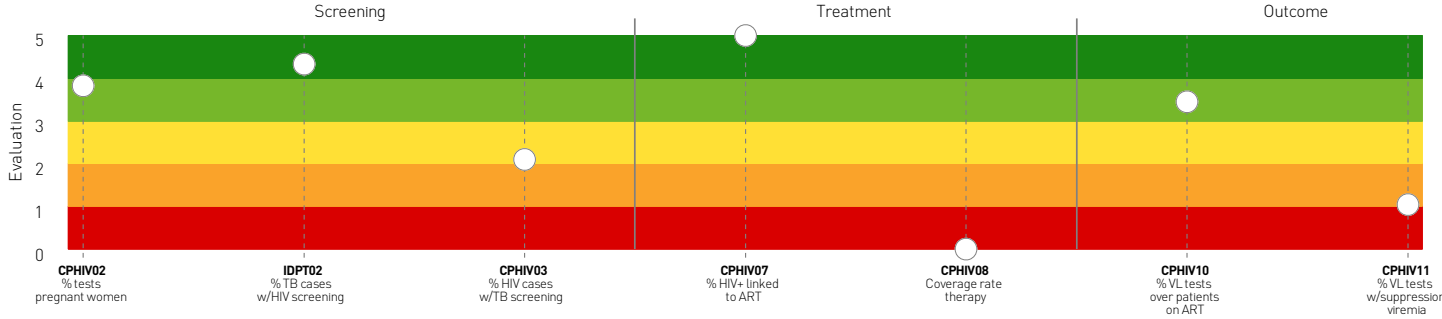
MATERNAL AND CHILD CARE PATHWAY



INFECTIOUS DISEASES - TUBERCULOSIS PATHWAY

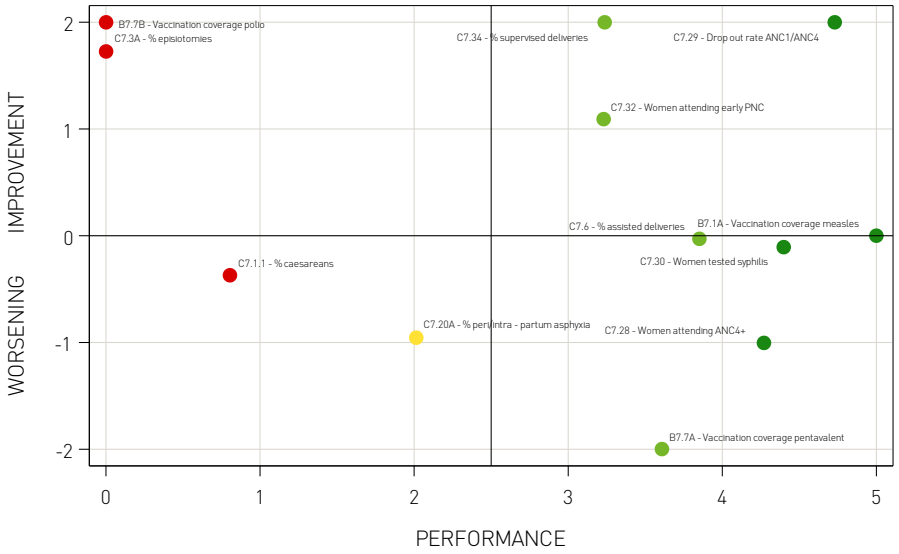


INFECTIOUS DISEASES - GASTROENTERITIS PATHWAY

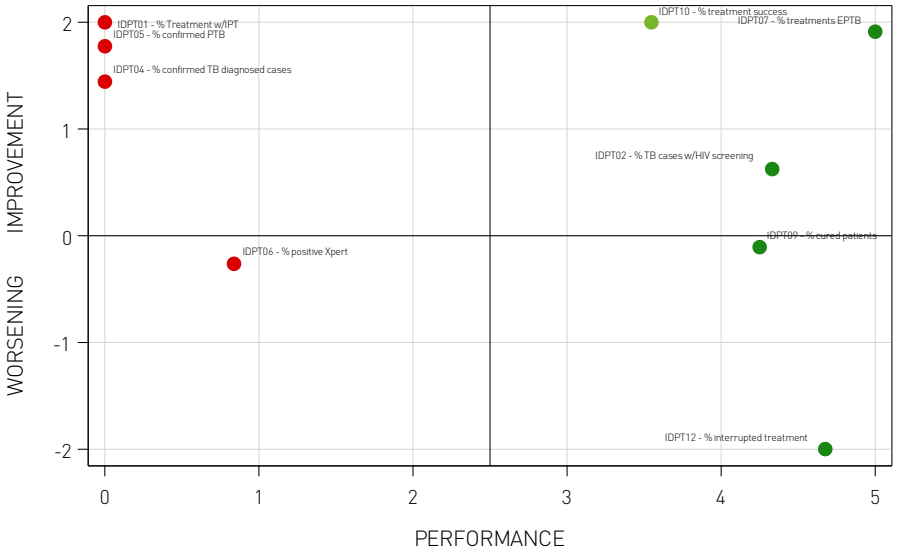


CHRONIC HIV PATHWAY

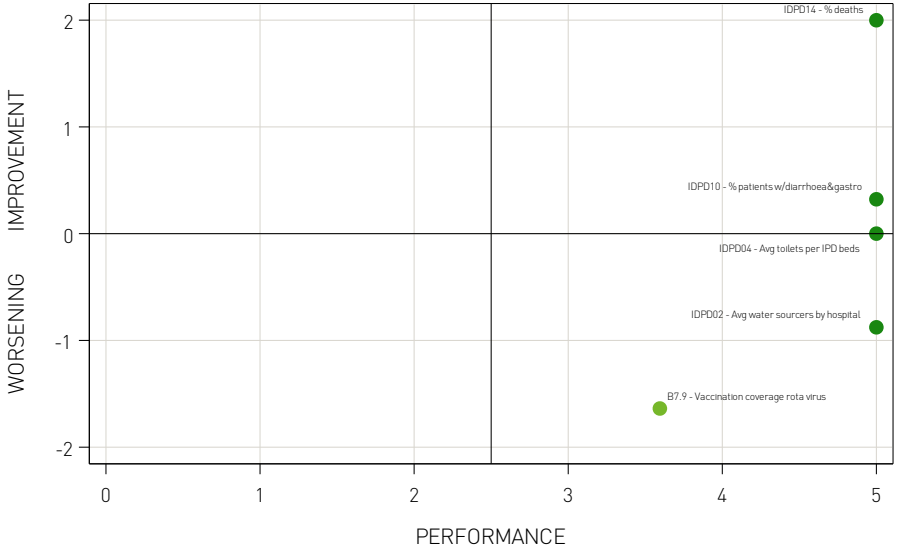
Performance Map/Trend - Mother and Child care



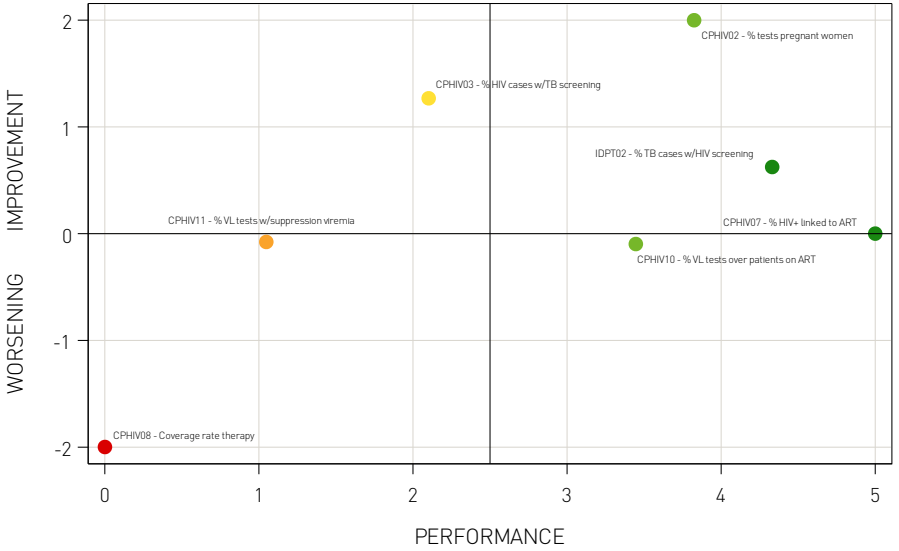
Performance Map/Trend - Tuberculosis



Performance Map/Trend - Gastroenteritis



Performance Map/Trend - HIV



UGANDA

Napak District

The Uganda's Health System

The governance of health system is decentralized, being shared according to mutual agreements between the Central Government (national level) and the local governments (district level)(5).

It is characterized by a mixed financing model, which includes multiple financing sources: government budget financed by general taxation at various federal levels, external funding by international and national agencies and NGOs, and private funding, such as OOP or payments by social insurance companies. According to the World Health Organization (WHO) (2), in 2018 general Government and OOP expenditures amounted for 16% and 38% of the total health expenditure, respectively. In terms of expenditure per capita expressed in PPP US$, the domestic general Government expenditure on health was equal to 22$ and the OOP one equal to 53$.

The current health care system is structured according to three levels of services delivery: i) health subdistricts composed of village health teams, health centres or hospitals; ii) regional referral hospitals; and iii) national referral hospitals.

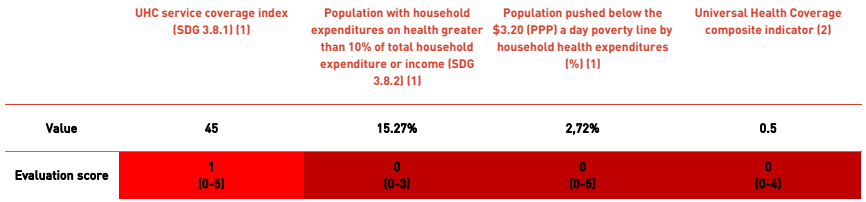
In addition to the abovementioned macroeconomic figures, the following indicators at macro level were considered, in order to evaluate the level of attainment to the Universal Health Coverage (UHC) principle. For this purpose, the scale elaborated by the Italian National Institute of Health (3) was used, which includes three indicators covering two dimensions, namely Universality and Financial Protection.

The dimension of Universality is expressed by the WHO UHC Service Coverage Index (SCI), reported on a unitless scale from 0 to 100 and computed as the geometric mean of 14 tracer indicators regarding health service coverage and referring to the four components of service coverage: i) reproductive, maternal, new born and child health; ii) infectious diseases; iii) noncommunicable diseases; and iv) service capacity and access.

The dimension of Financial Protection is expressed by two indicators, namely the proportion of the population with household expenditures on health greater than 10% of total household expenditure or income and the proportion of the population pushed below the $3.20 a day poverty line by household health expenditures. Each of the three indicators has been associated with an evaluation score, based on a division into classes by source of reference and with every evaluation band associated with a colour (from red for the worst performance to green for the best).

The unique indicator of UHC is calculated as the means of the three scores, in which the SCI weights 100% of its value, while the financial protection indicators weight each 50% of its value. Therefore, UHC is calculated as [(A+B/2+C/2)/2]. There are five bands of UHC performance, associated with five coloured bands, from red to dark green (Figure 3).

Figure 3. *UHC Index*



Sources:
(1) WHO, Global Health Observatory, 2017-2020
(2) La copertura sanitaria universale nel mondo. Istruzioni per l'uso: una logica di confronto, Higher Health Institute (HHI), 2020.

Napak District

The Napak District is located in the Karamoja region in North-Eastern Uganda, near the border with Kenya. The Karamoja region is a semi-arid and vulnerable region that is inhabited by a nomadic population. The district, which is in turn subdivided into 6 sub-counties and 200 villages, comprises 16 health centres providing primary healthcare services to approximately 166,549 people.

St. Kizito – Matany (Matany) Hospital, a private, not-for-profit institution, was built at the beginning of the 70's and it is designed as the referral center for Napak District. The Hospital capacity constitutes 250 beds distributed through Obstetrics/Gynaecology, Internal Medicine, Tuberculosis, Paediatrics and general Surgery departments. Other services provided by the Hospital include: Diagnostic Laboratory, Diagnostic Imaging, General surgery, Orthopaedic and Physiotherapy, Counselling, HIV/AIDS Clinic, Antenatal Clinic, Prevention of Mother to Child Transmission (PMTCT). In 2020 the hospital offered 40,637 outpatient visits, 14,331 admissions and a total of approximately 1,375 deliveries.

From the macro to the micro perspective

Four indicators were included regarding details of OOP expenditures at hospital level. In particular, Table 1 reports the ratio of OOP and revenues, the ratio of OOP and number of patients stays, expressed by Inpatient Days Equivalent, and the ratio of OOP and Standard Unit of Output (SUO), and the ratio of OOP and number of residents in the Napak District.

With respect to this reference area, the questionnaires on the governance dimension were completed by the managers of Matany Hospital and Napak District.

Matany Hospital and Napak District reached a score of 16/16 and 15/16.5 respectively regarding financial management area and a score of 12.5/14.5 and 6/6 in respect of data management area.

In particular, in terms of evaluation, the governance indicators of Matany Hospital rank in the dark green band for financial management area and in the green band for data management area. The governance indicators at health district level rank as excellent in the dark green band for both financial management and data management areas.

Table 3. *OOP ratios in Napak District - Matany Hospital*

	Value
Percentage of revenues from OOP fees over total hospital's revenues (in %)	13%
OOP hospital's revenues per Inpatient days equivalent*, PPP (current international $)	$1.8
OOP hospital's revenues per Standard Unit of Output (SUO)**, PPP (current international $)	$1.6
OOP hospital's revenues per capita***, PPP (current international $)	$2.7

** It is expressed as the sum of inpatient days and the number of outpatient visits multplied by a standard coefficient equal to 4.*
*** The SUO is expressed as the number of inpatients multiplied by a std. coefficient of 15, the number of OPD visits multiplied by 1, the number of deliveries multiplied by 5, the number of vaccinations by 0.2, and the number of ANC visits multiplied by 0.5.*
**** It refers to the estimated resident population in the reference Catchment Area.*

The Performance of Napak District in 2020

First of all, it is worth noticing that the aim of the present section is to interpret the performance of the health system as a whole. Indeed, the indicators calculated at residence level include the joint contribution of the health district and reference hospital, whilst the indicators calculated at hospital level illustrate specifically the hospital performance. Additionally, with respect to the graphical representation of the previous year, the performance of the health district and the hospital is reported on the dartboard by means of white and grey dots. More particularly, the dartboards and the staves summarize and represent graphically the performance of the local health system, while the performance maps, associated with the respective care pathways, provide a view of the evolution of performance in trend.

The dartboard shows a very disperse configuration of evaluated indicators over the evaluation bands both at hospital and health district level. At health district level, attention should be focused on vaccination coverage rates, on the pregnancy phase of the maternal and child pathway, on the screening and outcome phases of the tuberculosis pathway and, regarding the malaria area, on the percentage of confirmed malaria cases (IPDM03). At hospital level, there are criticalities related to ALOS (C2A.3), two indicators regarding the childbirth phase of the maternal and child pathway, namely the caesarean section rate (C7.7.1) and the percentage of peri-/infra partum asphyxia, the average number of toilets per room in OPD (IDPD05), the percentage of deaths caused by gastroenteritis related diseases (IDPD14), and the percentage of VL tests over the patients undergoing ART therapy (CPHIV10).

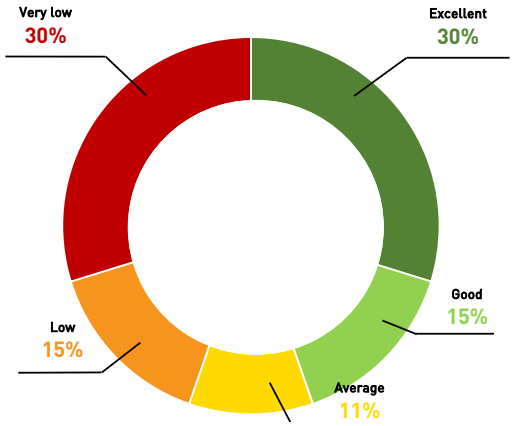
Comparing the evaluation data of this year with the evaluation data of the previous year for the maternal and child pathway, there are problems concerning all phases of the pathway, both for the health district and the hospital. A special attention should be drawn on the indicators, namely the percentage of women attending more than four ANC visits (C7.28), the drop out rate ANC1-ANC4 (C7.29), and the indicator C7.7.1, which over the last year worsened their already poor performance.

Comparing the evaluation data of this year with the evaluation data of the previous year for the tuberculosis pathway, the performance map shows that most of the indicators decreased their performance with respect to the previous year. However, there are two indicators related to the outcome phase, i.e. the percentage of cured patients (IDPT09) and the percentage of interrupted treatments (IPDT12) that, although the poor performance, showed an improving trend compared with 2019 evaluation.

Comparing the evaluation data of this year with the evaluation data of the previous year for the gastroenteritis pathway, the coverage rate for rota virus (B7.9) shows a poor but steady improving performance. Nevertheless, a special attention should be given to the average number of ORS tablets and packages per patient (IDPD12 and IDPD13) that decreased importantly during the last year.

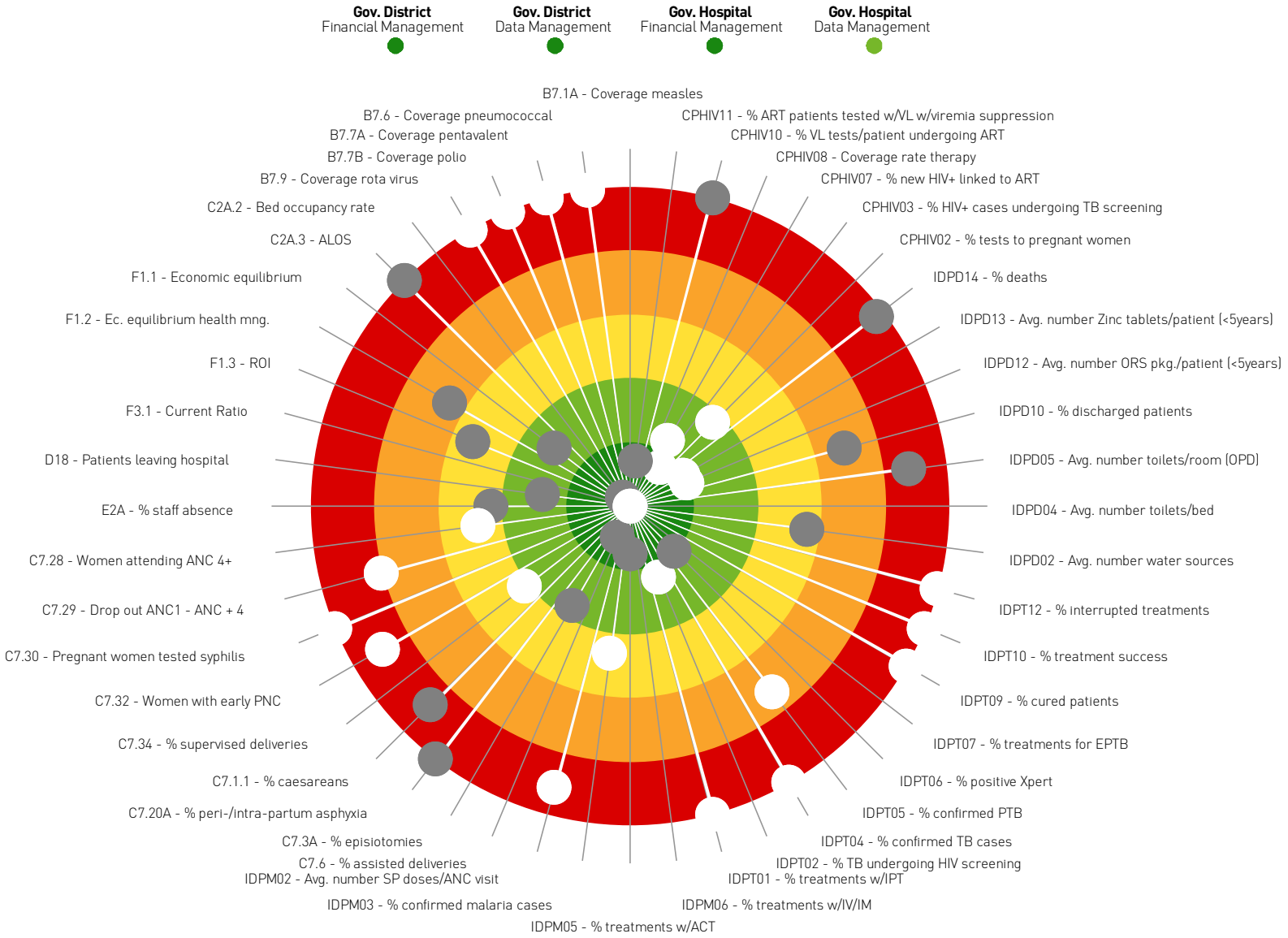
Finally, with respect to HIV pathway, except the percentage of HIV cases with a TB screening (CPHIV03) that increased, although its performance was already very good, all the other indicators are worsening.

The donut chart below summarizes the proportion of evaluated indicators for each performance level.

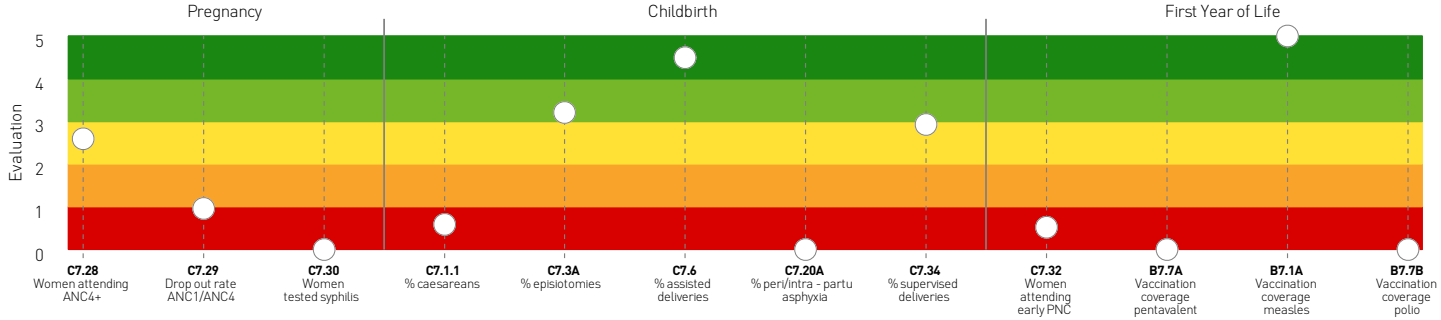


Dartboard

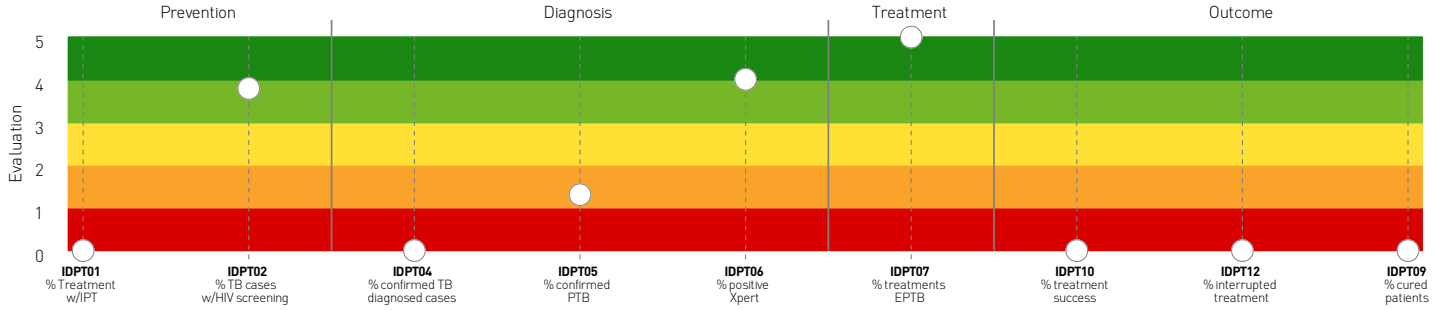
Napak District - Year 2020



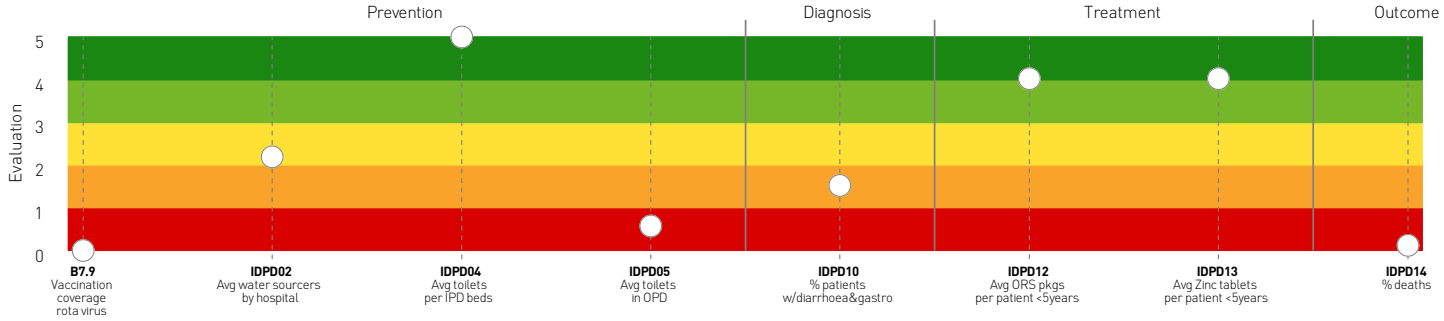
Please note that, as explained in the methodological section, the grey dots on the dartboard refer to the hospital evaluation, while the white dots refer to the health district evaluation.



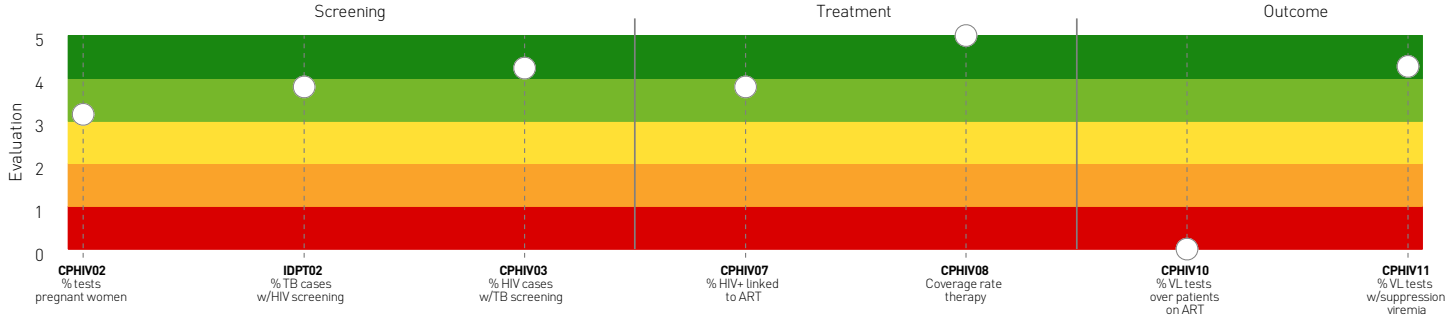
MATERNAL AND CHILD CARE PATHWAY



INFECTIOUS DISEASES - TUBERCULOSIS PATHWAY

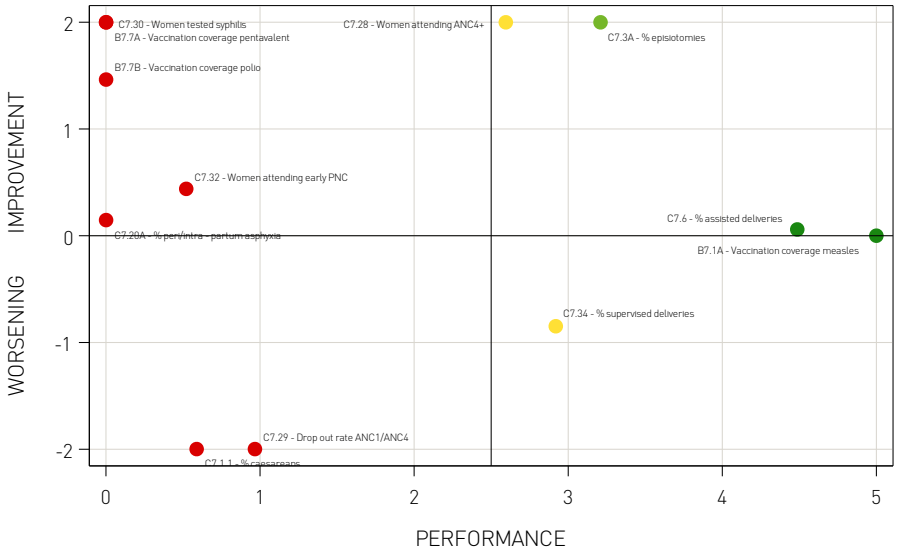


INFECTIOUS DISEASES - GASTROENTERITIS PATHWAY

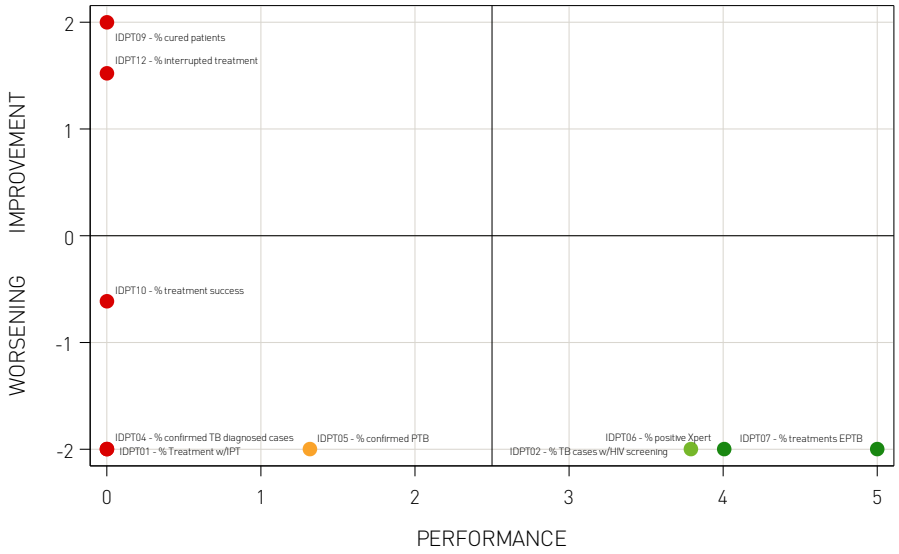


CHRONIC HIV PATHWAY

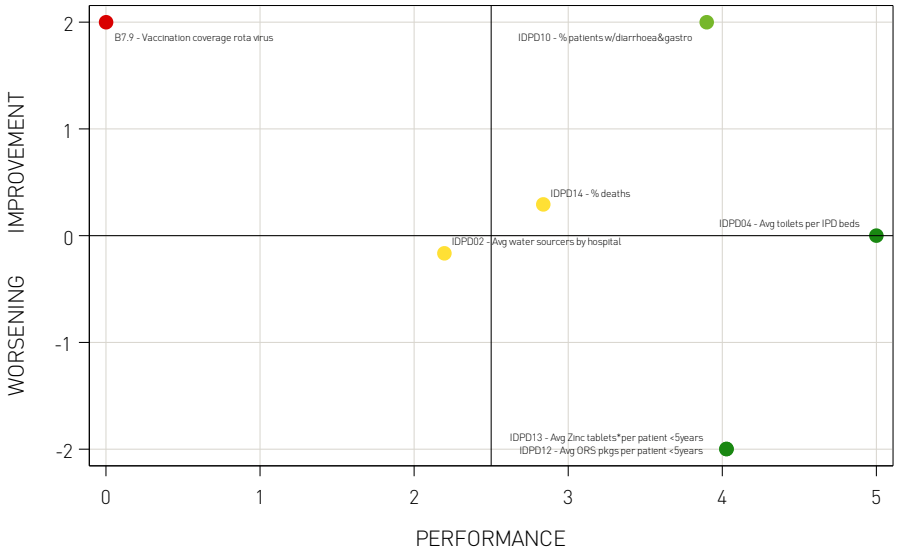
Performance Map/Trend - Mother and Child care



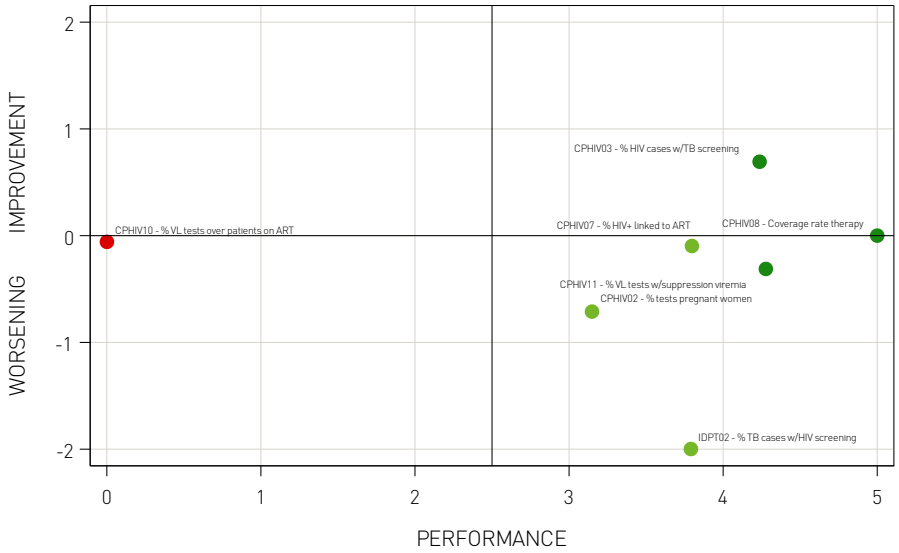
Performance Map/Trend - Tuberculosis



Performance Map/Trend - Gastroenteritis



Performance Map/Trend - HIV



UGANDA

Oyam District

The Uganda's Health System

The governance of health system is decentralized, being shared according to mutual agreements between the Central Government (national level) and the local governments (district level)(5).

It is characterized by a mixed financing model, which includes multiple financing sources: government budget financed by general taxation at various federal levels, external funding by international and national agencies and NGOs, and private funding, such as OOP or payments by social insurance companies. According to the World Health Organization (WHO) (2), in 2018 general Government and OOP expenditures amounted for 16% and 38% of the total health expenditure, respectively. In terms of expenditure per capita expressed in PPP US$, the domestic general Government expenditure on health was equal to 22$ and the OOP one equal to 53$.

The current health care system is structured according to three levels of services delivery: i) health subdistricts composed of village health teams, health centres or hospitals; ii) regional referral hospitals; and iii) national referral hospitals.

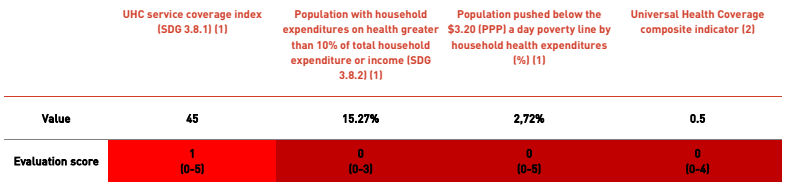
In addition to the abovementioned macroeconomic figures, the following indicators at macro level were considered, in order to evaluate the level of attainment to the Universal Health Coverage (UHC) principle. For this purpose, the scale elaborated by the Italian National Institute of Health (3) was used, which includes three indicators covering two dimensions, namely Universality and Financial Protection.

The dimension of Universality is expressed by the WHO UHC Service Coverage Index (SCI), reported on a unitless scale from 0 to 100 and computed as the geometric mean of 14 tracer indicators regarding health service coverage and referring to the four components of service coverage: i) reproductive, maternal, new born and child health; ii) infectious diseases; iii) noncommunicable diseases; and iv) service capacity and access.

The dimension of Financial Protection is expressed by two indicators, namely the proportion of the population with household expenditures on health greater than 10% of total household expenditure or income and the proportion of the population pushed below the $3.20 a day poverty line by household health expenditures. Each of the three indicators has been associated with an evaluation score, based on a division into classes by source of reference and with every evaluation band associated with a colour (from red for the worst performance to green for the best).

The unique indicator of UHC is calculated as the means of the three scores, in which the SCI weights 100% of its value, while the financial protection indicators weight each 50% of its value. Therefore, UHC is calculated as [(A+B/2+C/2)/2]. There are five bands of UHC performance, associated with five coloured bands, from red to dark green (Figure 4).

Figure 4. *UHC Index*



Sources:
(1) WHO, Global Health Observatory, 2017-2020
(2) La copertura sanitaria universale nel mondo. Istruzioni per l'uso: una logica di confronto, Higher Health Institute (HHI), 2020.

Oyam District

The Oyam District is located in a rural region in the northern part of the country and in 2020 registered an estimated population of approximately 449,700. In comparison to the Napak District, the Oyam District covers a territory with a higher density of population and healthcare services are provided by 30 health facilities, including the reference Pope John XXIII – Aber (Aber) Hospital, a private not-for-profit hospital.

Aber Hospital offers both clinical and community-based services. Clinical services are provided through four inpatient departments: Internal Medicine, Obstetrics and Gynaecology, Paediatrics and Surgery. The hospital also has an outpatient department with Diagnostic Laboratory, Diagnostic Imaging, Antenatal Clinic and HIV/AIDS Clinic. In 2020 the hospital provided a total of 38,566 outpatient visits, 8,432 admissions and a total of 2,420 deliveries.

From the macro to the micro perspective

Four indicators were included regarding details of OOP expenditures at hospital level. In particular, Table 1 reports the ratio of OOP and revenues, the ratio of OOP and number of patients stays, expressed by Inpatient Days Equivalent, and the ratio of OOP and Standard Unit of Output (SUO), and the ratio of OOP and number of residents in the Oyam District.

With respect to this reference area, the questionnaires on the governance dimension were completed by the managers of Aber Hospital and Oyam District.

Aber Hospital and Oyam District reached a score of 15/16 and 9.5/16.5 respectively regarding financial management area and a score of 12.5/14.5 and 6/6 with respect of data management area.

In particular, in terms of evaluation, the governance indicators of Aber Hospital rank in the yellow band for financial management area and in the dark green band for data management area. The governance indicators at health district level rank as excellent in the dark green band for financial management and as good in the green band for data management areas.

Table 4. *OOP ratios in Oyam District - Aber Hospital*

	Value
Percentage of revenues from OOP fees over total hospital's revenues (in %)	26%
OOP hospital's revenues per Inpatient days equivalent*, PPP (current international $)	$4.3
OOP hospital's revenues per Standard Unit of Output (SUO)**, PPP (current international $)	$4.6
OOP hospital's revenues per capita***, PPP (current international $)	$1.9

** It is expressed as the sum of inpatient days and the number of outpatient visits multplied by a standard coefficient equal to 4.*
*** The SUO is expressed as the number of inpatients multiplied by a std. coefficient of 15, the number of OPD visits multiplied by 1, the number of deliveries multiplied by 5, the number of vaccinations by 0.2, and the number of ANC visits multiplied by 0.5.*
**** It refers to the estimated resident population in the reference Catchment Area.*

The Performance of Oyam District in 2020

First of all, it is worth noticing that the aim of the present section is to interpret the performance of the health system as a whole. Indeed, the indicators calculated at residence level include the joint contribution of the health district and reference hospital, whilst the indicators calculated at hospital level illustrate specifically the hospital performance. Additionally, with respect to the graphical representation of the previous year, the performance of the health district and the hospital is reported on the dartboard by means of white and grey dots. More particularly, the dartboards and the staves summarize and represent graphically the performance of the local health system, while the performance maps, associated with the respective care pathways, provide a view of the evolution of performance in trend.

The evaluated indicators displayed in the dartboard are spread across all the five evaluation bands both at hospital and health district level. At health district level, the dartboard shows some criticalities relating to vaccination coverage, to several aspects of the pregnancy phase of the maternal and child care pathway, attention should be paid to the percentage of confirmed malaria cases (IPDM03), the percentage of treatments with IPT (IDPT01) and the percentage of cured TB patients (IDPT09) within the tuberculosis pathway, and the coverage rate of ART therapy (CPHIV08) along the HIV care pathway. At hospital level, there is opportunity for improvement in the efficiency and sustainability area, in particular with respect to these indicators: bed occupancy rate (C2.A.2), the economic equilibrium of healthcare management (F1.2), and the return on investment, namely ROI (F1.3). Moreover, the dartboard highlights poor performance concerning the percentage of caesarean sections (C7.1.1), the percentage of Xpert tests for TB suspected cases (IDPT06), and the percentage of ART patients tested with viral load with the suppression of viremia (CPHIV11).

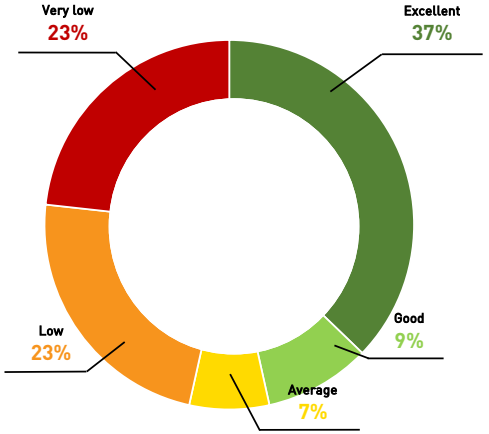
Comparing the evaluation data of this year with the evaluation data of the previous year for the maternal and child pathway, the performance map shows that most of the indicators decreased their performance with respect to the previous year. More particularly, indicators regarding the pregnancy phase, although their performance is placed in the yellow and green bands, worsened over time. As far it concerns the childbirth phase, the map illustrates a decreasing trend of C7.1.1, as counterposed to an increasing trend of the percentage of peri/infra – partum asphyxia (C7.20A) and the percentage of assisted deliveries (C7.6).

Comparing the evaluation data of this year with the evaluation data of the previous year for the tuberculosis pathway, the map highlights that the majority of indicators are scoring better than the previous year, except for IDPT09 and the percentage of treatment success (IDPT10), although the latter is performing very well.

Comparing the evaluation data of this year with the evaluation data of the previous year for the gastroenteritis pathway, although most of the indicators have a good or excellent performance, their trend has worsened with respect to the previous year. The worst scenario concerns the vaccination coverage for rota virus (B7.9).

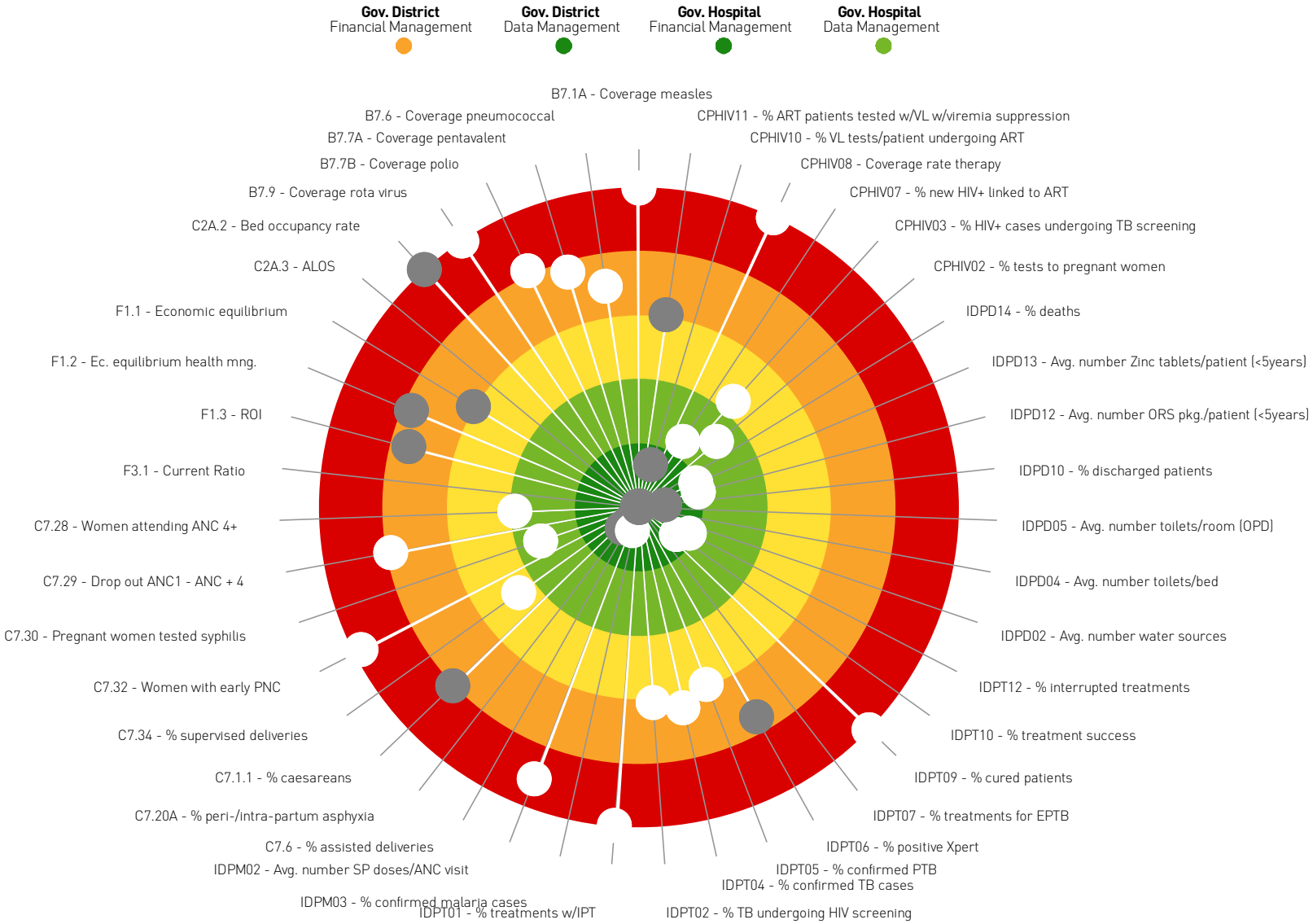
Finally, with respect to HIV pathway, there is a high dispersion of indicators values within the performance map. In particular, attention should be focused on CPHIV11, which presents a poor performance, as well as the percentage of tests delivered to pregnant women (CPHIV02) and the percentage of viral load tests over the patients currently on ART therapy (CPHIV10), although the starting evaluation level is high.

The donut chart below summarizes the proportion of evaluated indicators for each performance level.

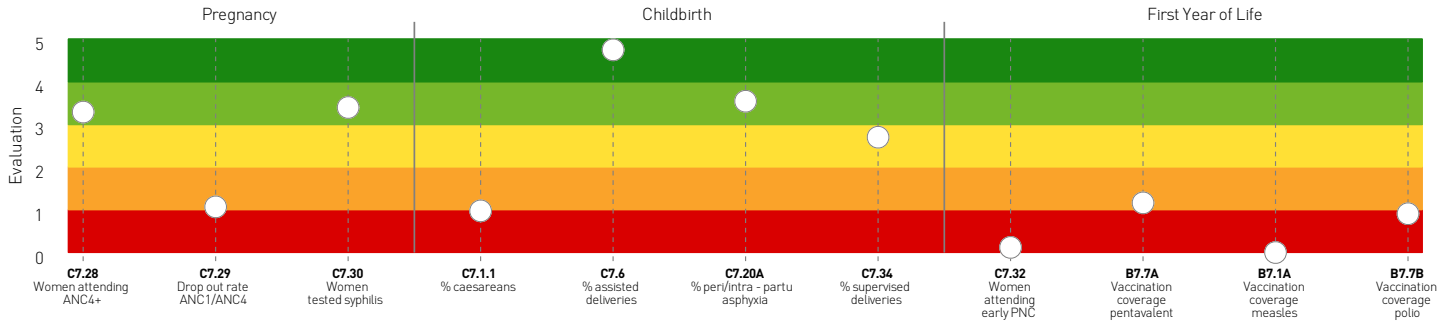


Dartboard

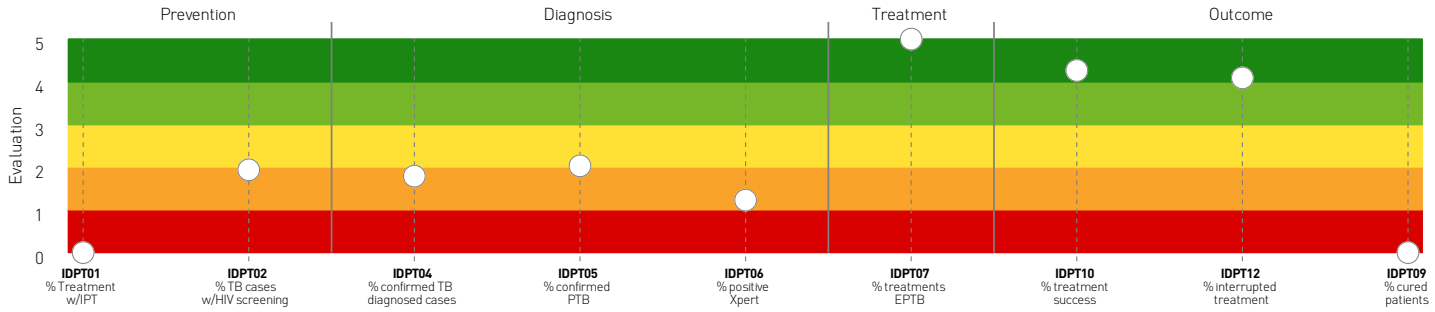
Oyam District - Year 2020



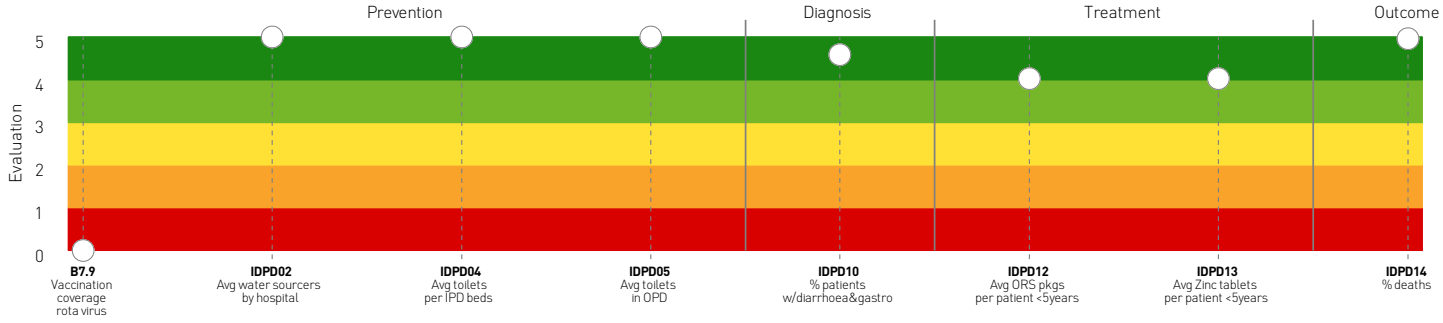
Please note that, as explained in the methodological section, the grey dots on the dartboard refer to the hospital evaluation, while the white dots refer to the health district evaluation.



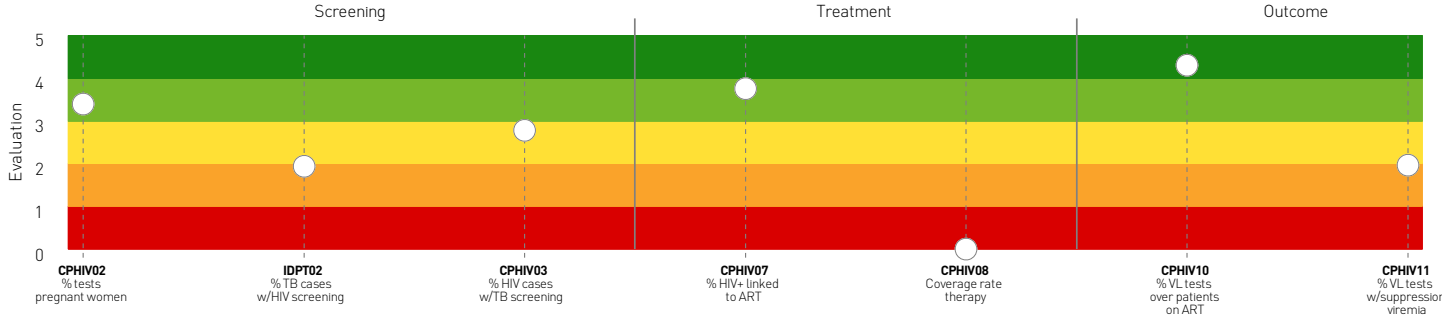
MATERNAL AND CHILD CARE PATHWAY



INFECTIOUS DISEASES - TUBERCULOSIS PATHWAY

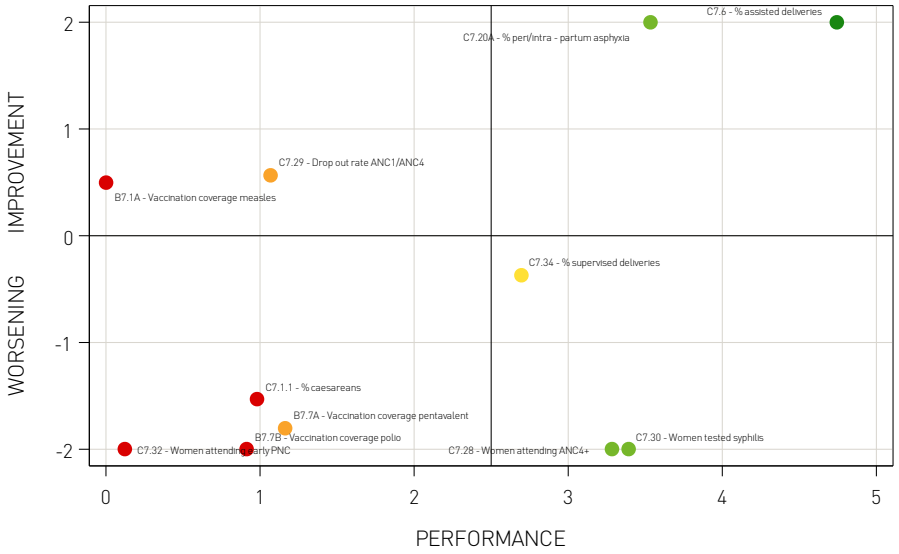


INFECTIOUS DISEASES - GASTROENTERITIS PATHWAY

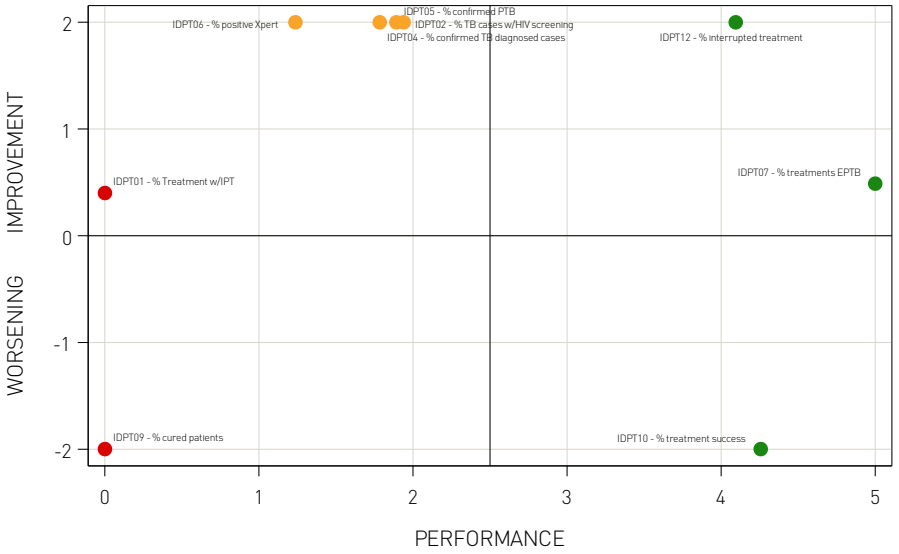


CHRONIC HIV PATHWAY

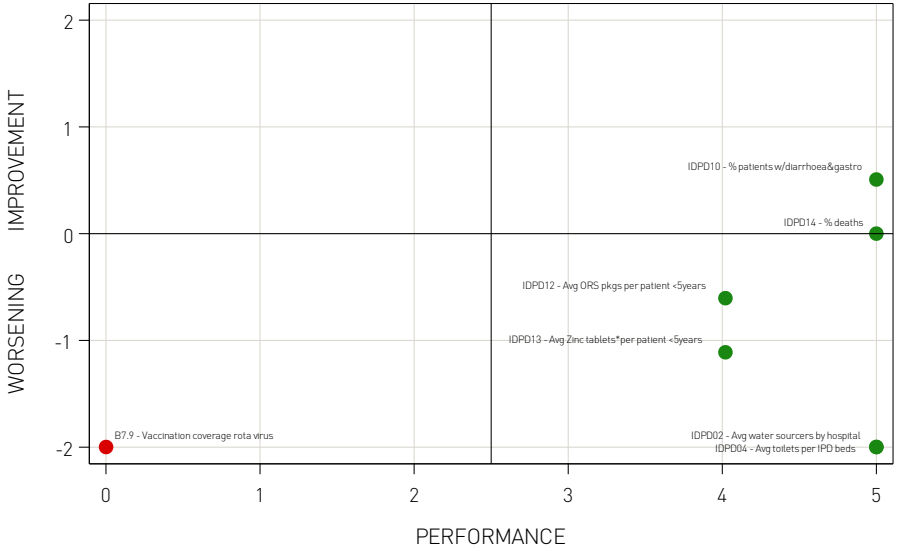
Performance Map/Trend - Mother and Child care



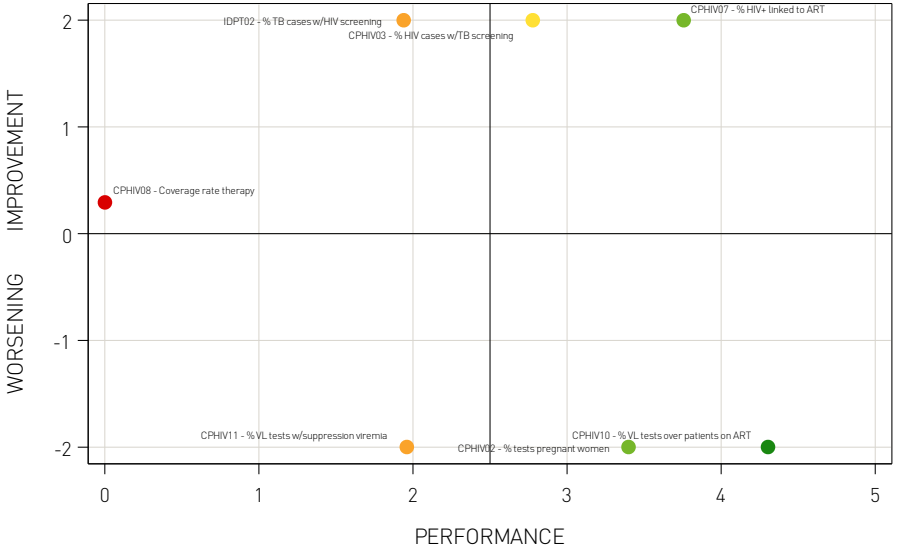
Performance Map/Trend - Tuberculosis



Performance Map/Trend - Gastroenteritis



Performance Map/Trend - HIV



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2. World Health Organization. Global Health Expenditure Database [Internet]. World Health Organisation. 2018. Available from: https://apps.who.int/nha/database
3. Marchetti G, Marco S, Declich S, Dente MG, Ferrelli R, Tosti ME. La copertura sanitaria universale nel mondo. Istruzioni per l'uso: una logica di confronto. 2020.
4. World Health Organization. Primary Health Care Systems (Primasys). Comprehensive case study from United Republic of Tanzania [Internet]. World Health Organization. 2017. Available from: http://www.who.int/alliance-hpsr
5. World Health Organization. Primary health care system. Case study from Uganda [Internet]. 2017. Available from: http://apps.who.int/bookorders.

4

INDICATORS
2018 - 2020

management sanità

DOCTORS WITH AFRICA CUAMM

REGIONAL HEALTH STRATEGIES

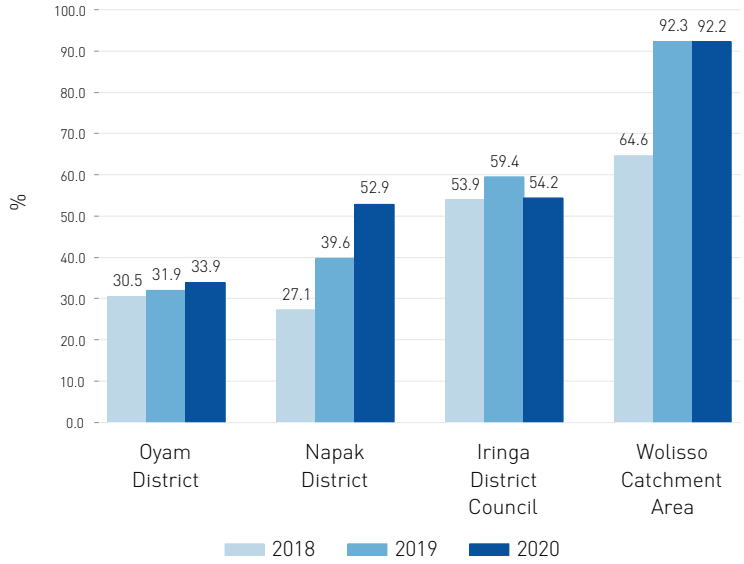
management sanità

DOCTORS WITH AFRICA CUAMM

B7.10 Vaccination coverage for tetanus (reproductive women)

Computational level : Residence

According to WHO recommendation, all women giving birth should be protected against tetanus. A dose of tetanus toxoid should be given at first contact or as early it is possible in pregnancy. If the mother is not immunized with the correct number of doses of tetanus toxoid vaccine, neither she nor her newborn infant are protected against tetanus at delivery. This indicator is an observation indicator. It is expressed as a ratio between the number of women who received at least two doses of vaccine to prevent tetanus during their pregnancy, as recommended by WHO, and the overall number of expected deliveries in the reference area.

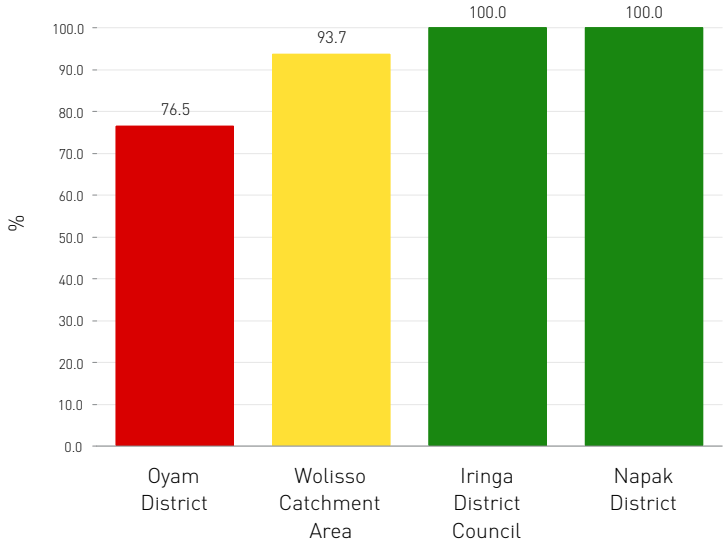


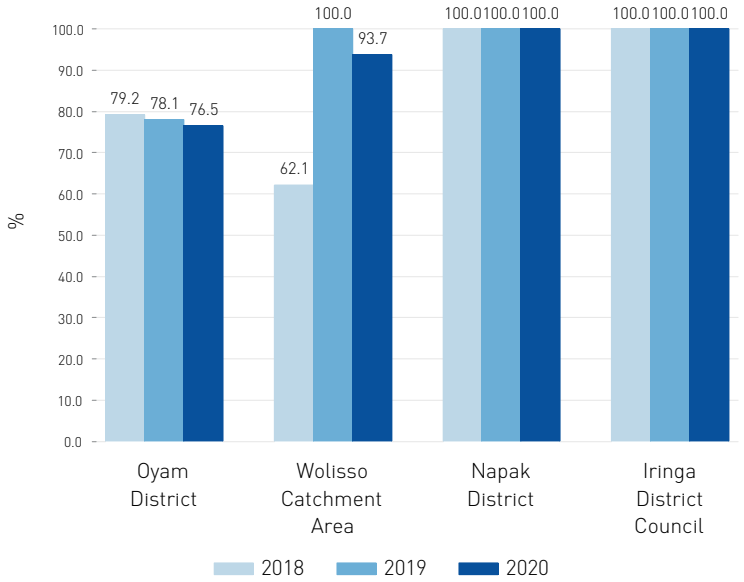
Numerator	Number of pregnant women who have received protetictive doses of TT (x100)
Denominator	Number of expected deliveries
Sources	Ethiopian HMIS/DHIS2, Tanzanian DHIS2, Ugandan eHMIS/DHIS2 (electronic source)

B7.1A Vaccination coverage for measles

Computational level : Residence

Measles is a highly contagious disease caused by a virus, which usually results in a high fever and rash, and can lead to blindness, encephalitis or death. This vaccine is a single vaccine preventing measles. The calculation of vaccine coverage for measles is the ratio between the percentage of vaccination cycles completed each year, and the number of children aged less than one year. The goal was fixed to 98% coverage of the target population based on the guidelines followed in the IRPES.



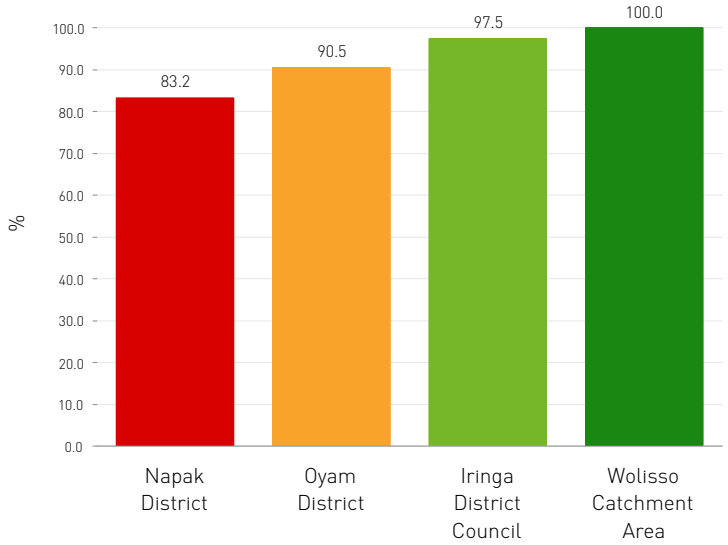


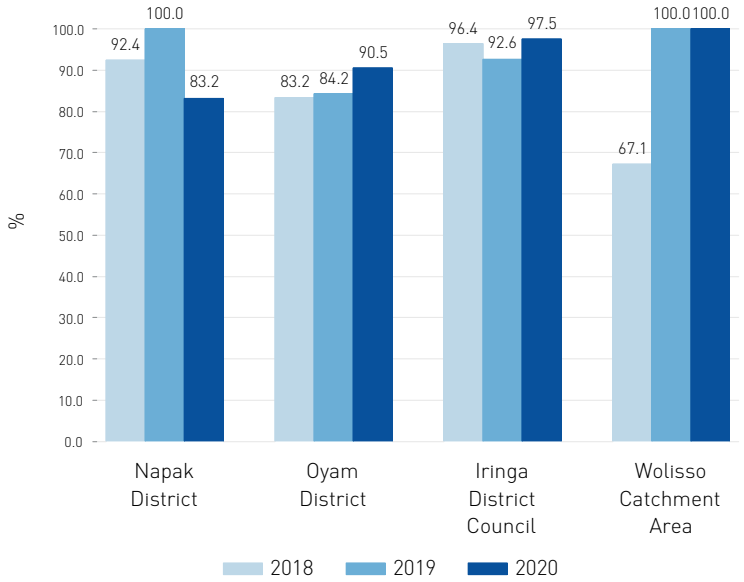
Numerator	Number of children under one year of age who have received measles vaccine (x100)
Denominator	Estimated number of infants aged less than 1 year
Sources	Ethiopian HMIS/DHIS2, Tanzanian DHIS2, Ugandan eHMIS/DHIS2 (electronic source)

B7.6 Vaccination coverage against pneumococcal (PCV)

Computational level : Residence

Pneumococcus (Streptococcus pneumoniae) belongs to a family of bacteria with approximately 80 subtypes, some of which are responsible for infections in childhood. Transmitted from person to person through saliva droplets, the bacterium is often found in the throat and nose of many healthy individuals, without producing symptoms. However, if it gets into the bloodstream, it can cause the so-called "invasive pneumococcal disease". Although this serious infection can affect people of all ages, the under-twos and especially chronic disease sufferers are mostly at risk. The availability of a safe, effective vaccine is the most important prevention tool against the most serious pneumococcal diseases in children. The goal was fixed to 98% coverage of the target population based on the guidelines followed in the IRPES.



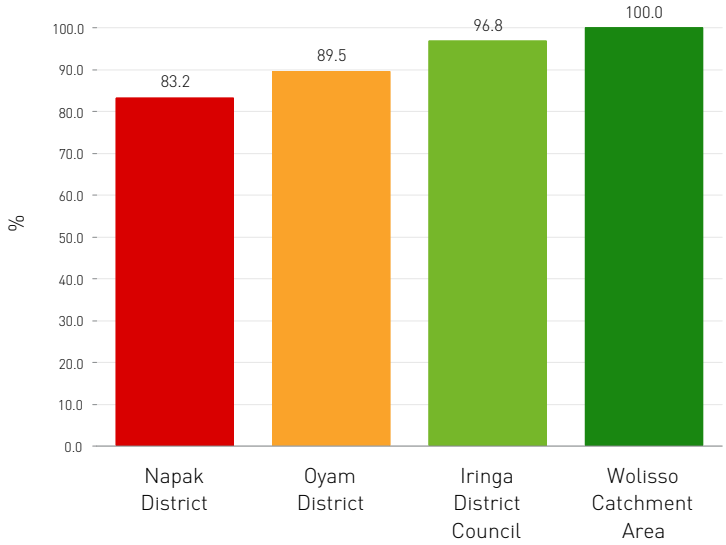


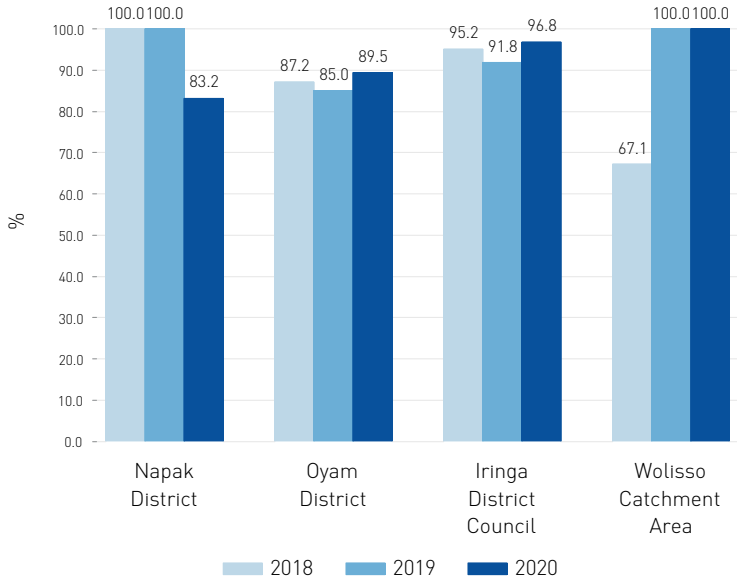
Numerator	Number of children under one year of age who have received third dose of pneumococcal vaccine (x100)
Denominator	Estimated number of infants aged less than 1 year
Sources	Ethiopian HMIS/DHIS2, Tanzanian DHIS2, Ugandan eHMIS/DHIS2 (electronic source)

B7.7A Pentavalent vaccine coverage (HIB; diphteria; pertussis, tetanus, HBV)

Computational level : Residence

Immunization is one of the most important public health interventions and a cost effective strategy to control the infectious diseases especially in children. Pentavalent vaccine contains 5 antigens designed to protect against pertussis, tetanus, diphtheria, viral hepatitis B and Haemophilus influenzae type B. The goal was fixed to 98% coverage of the target population based on the guidelines followed in the IRPES.



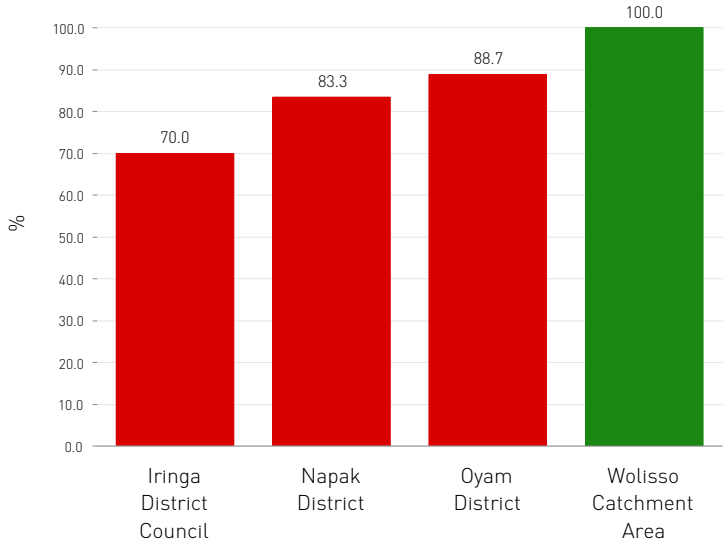


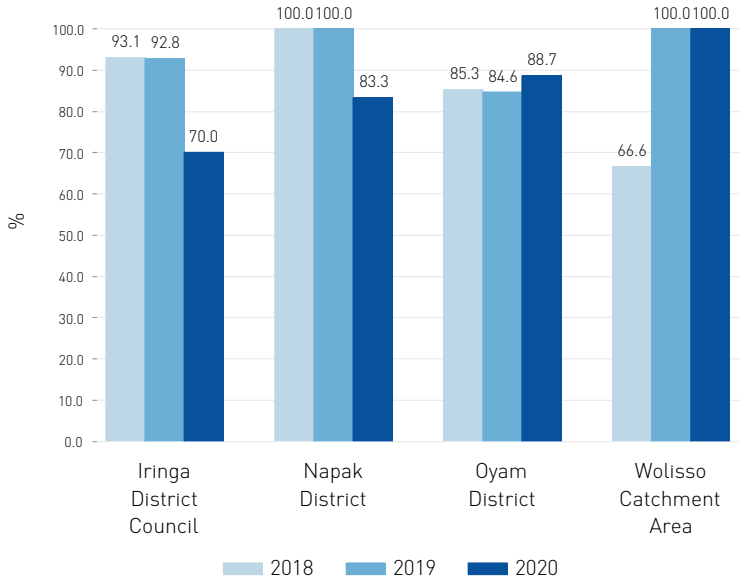
Numerator	Number of children under one year of age who have received third dose of pentavalent vaccine (x100)
Denominator	Estimated number of infants aged less than 1 year
Sources	Ethiopian HMIS/DHIS2, Tanzanian DHIS2, Ugandan eHMIS/DHIS2 (electronic source)

B7.7B Vaccination coverage for polio

Computational level : Residence

Polio is a highly infectious viral disease that can cause irreversible paralysis. According to WHO data, in 2013, 84% of infants around the world received 3 doses of polio vaccine. This indicator is expressed as a ratio between the children that received at least three doses of vaccine to prevent polio in the reference year and the overall number of children aged less than one year. The goal was fixed to 98% coverage of the target population based on the guidelines followed in the IRPES.



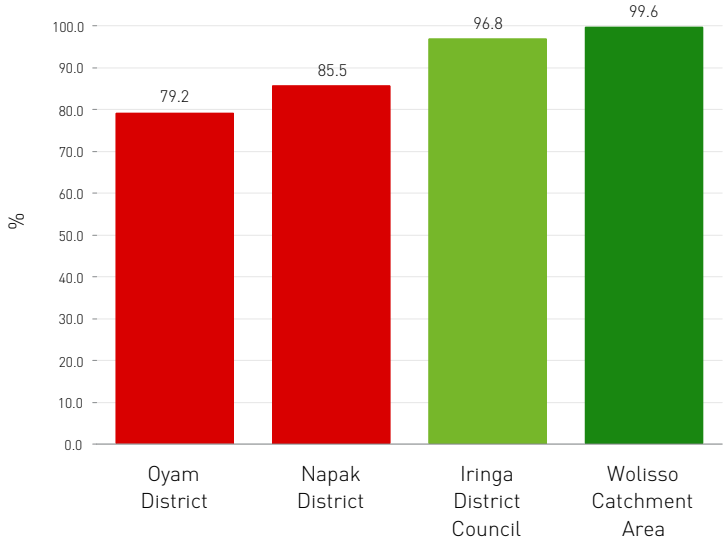


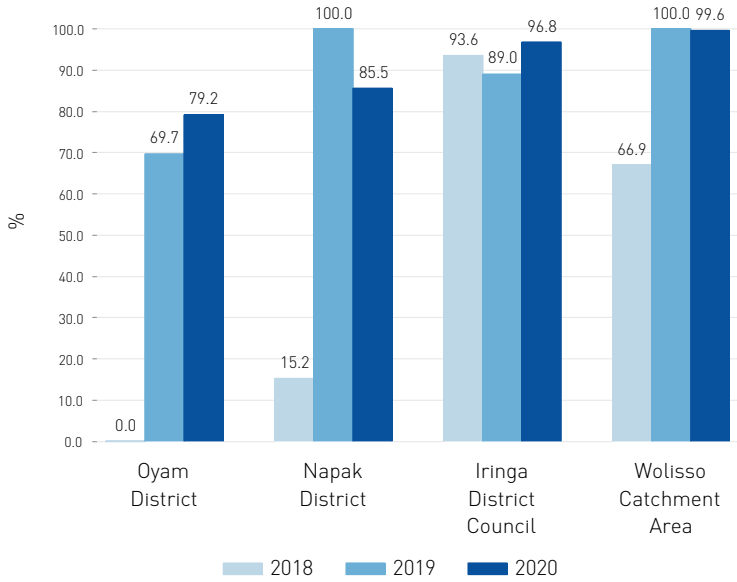
Numerator	Number of surviving infants who have received three doses of oral polio vaccine (x100)
Denominator	Estimated number of infants aged less than 1 year
Sources	Ethiopian HMIS/DHIS2, Tanzanian DHIS2, Ugandan eHMIS/DHIS2 (electronic source)

B7.9 Vaccination coverage for rota virus

Computational level : Residence

Since 2009 the WHO recommends the use of rotavirus vaccines in all national immunization programs and at the end of 2018 rotavirus vaccine was introduced in 101 countries. This indicator is expressed as a ratio between the children that received at least two doses of vaccine to prevent rota virus in the reference year and the overall number of children aged less than one year. The goal was fixed to 98% coverage of the target population based on the guidelines followed in the IRPES.



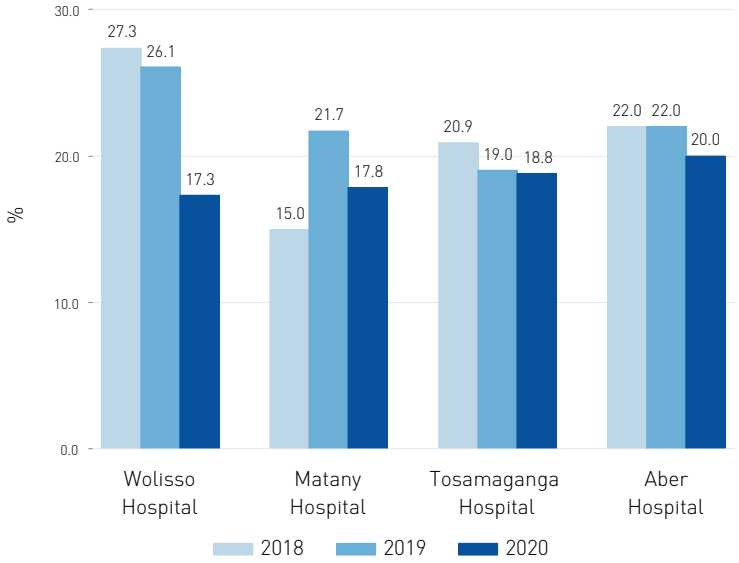


Numerator	Number of children under one year of age who have received two doses of Rotavirus vaccine (x100)
Denominator	Estimated number of infants aged less than 1 year
Sources	Ethiopian HMIS/DHIS2, Tanzanian DHIS2, Ugandan eHMIS/DHIS2 (electronic source)

C30.3.1.2 Percentage of hospital admissions for patients resident in other districts

Computational level : Hospital

This measure monitors the percentage of hospital discharges delivered to patients resident in other districts. In LMICs there are many factors that can influence this ratio and, because of the complexity of the interrelatedness of such factors, this indicator is considered as an observation indicator. Attraction can be considered for each specific context and the same conclusion can not be drawn for every setting.

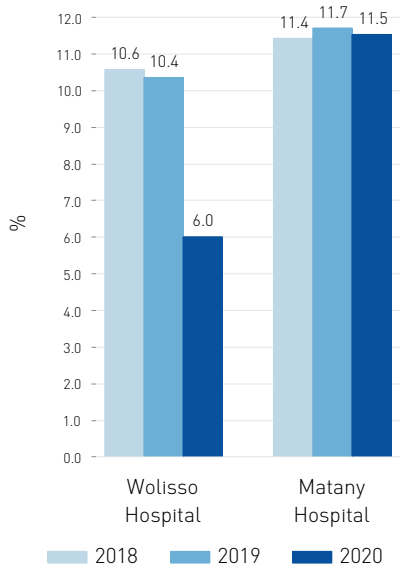


Numerator	Number of admissions for patients resident in other districts (x100)
Denominator	Number of inpatients
Sources	Wolisso hospital's registers (electronic source); Matany hospital's registers (electronic source); Tosamaganga hospital's registers (paper - based source); Aber hospital's registers (paper - based source)/Ugandan eHMIS/DHIS2 (electronic source)

C30.3.2.2 Percentage of hospital admissions for patients resident in other districts - Complex cases

Computational level : Hospital

This measure monitors the percentage of hospital discharges delivered to patients resident in other districts for complex related diseases. In LMICs there are many factors that can influence this ratio and, because of the complexity of the interrelatedness of such factors, this indicator is considered as an observation indicator. Attraction can be considered for each specific context and the same conclusion can not be drawn for every setting. The definition of "complex and non complex condition" is based on individual experience and judgement considering the setting as well as the selection of diagnosis available in that specific context and present in the diangosis list of local HMIS. In the future, a more accurate codes diagnosis and defintion of complex/non complex with a broader consensus among physicians is envisaged.



Numerator	Number of admissions for patients resident in other districts – complex cases (x100)
Denominator	Number of inpatients
Sources	Wolisso hospital's registers (electronic source); Matany hospital's registers (electronic source)

EFFICIENCY AND SUSTAINABILITY

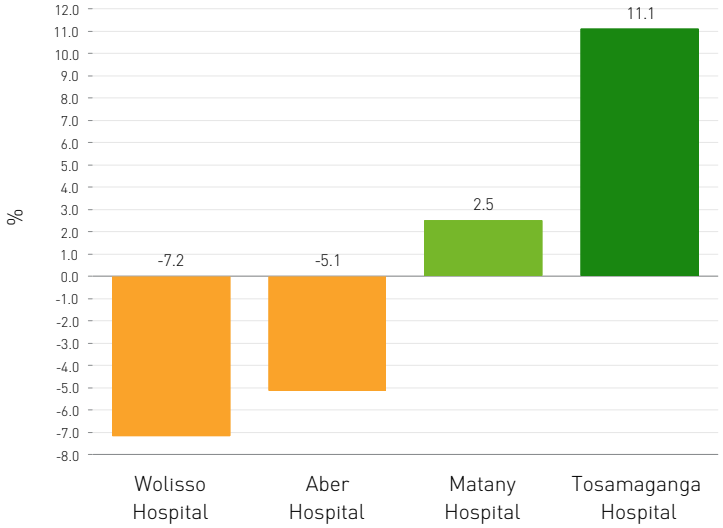
management sanità

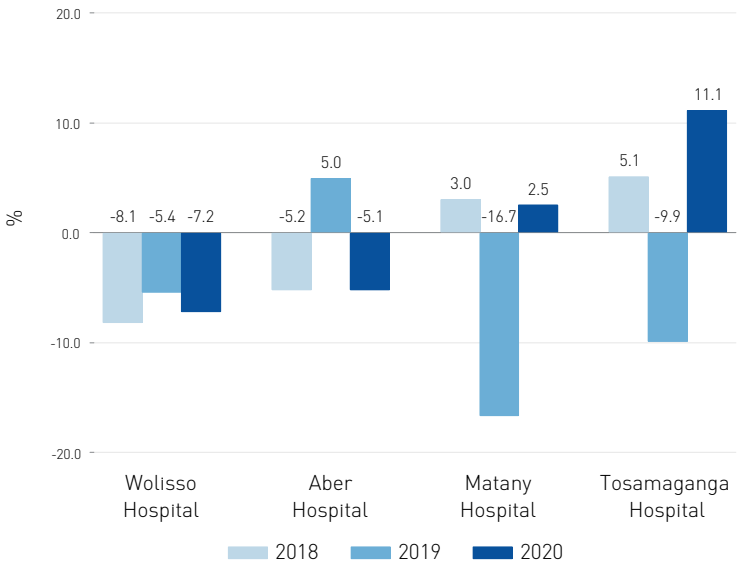
DOCTORS WITH AFRICA CUAMM

F1.1 General economic equilibrium

Computational level : Hospital

The general economic equilibrium is computed as a ratio between the net income and total revenues as reported in the hospital income statement. The indicator shows the ability of the management to lead hospital activities supporting costs in terms of budget, by considering the effect of all operations. The reference standard was established starting from the indications followed in the PES of the Tuscany Region.



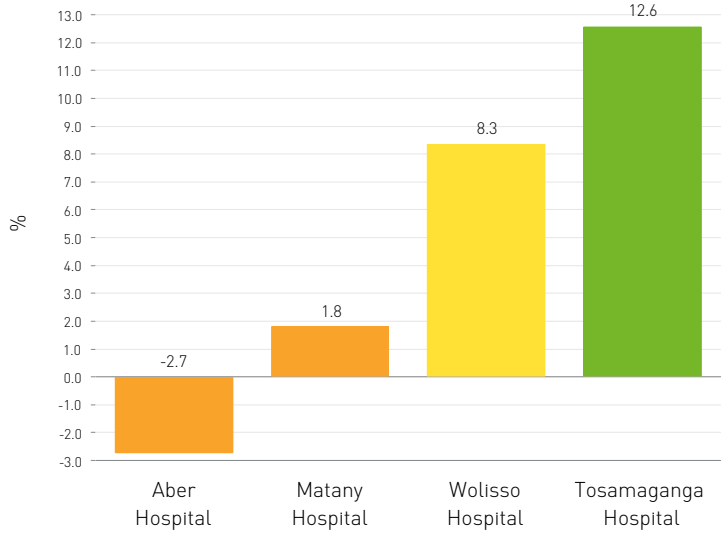


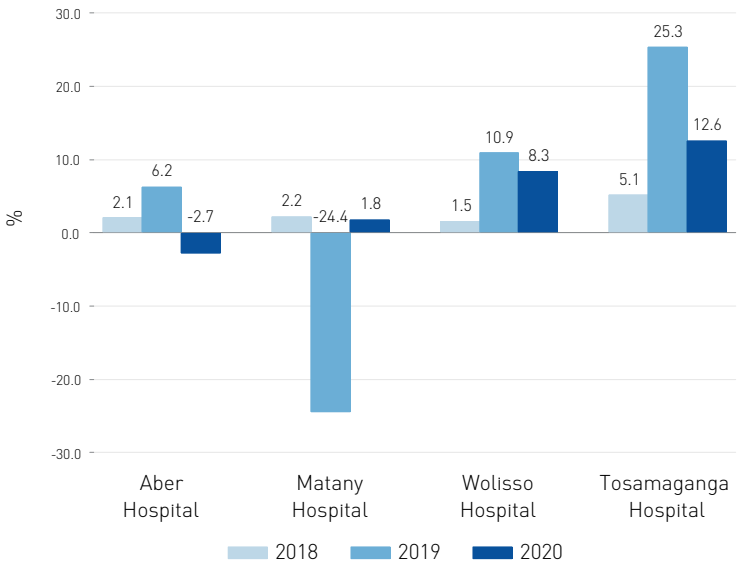
Numerator	Net income (x100)
Denominator	Total revenues
Sources	Hospitals income statements

F1.2 Economic equilibrium of health management

Computational level : Hospital

This indicator shows the hospital's ability to reach the economic balance relative to core operations, excluding either extraordinary factors (capital gains or contingent liabilities), or the positive or negative results based on the other operations. It is the ratio between health net margin (that is the equilavent of the EBITDA), calculated as the difference between revenues and operational costs. This index, widely used at international level, is known as Return on Sales ("ROS"). The reference standard was established starting from the indications followed in the PES of the Tuscany Region.



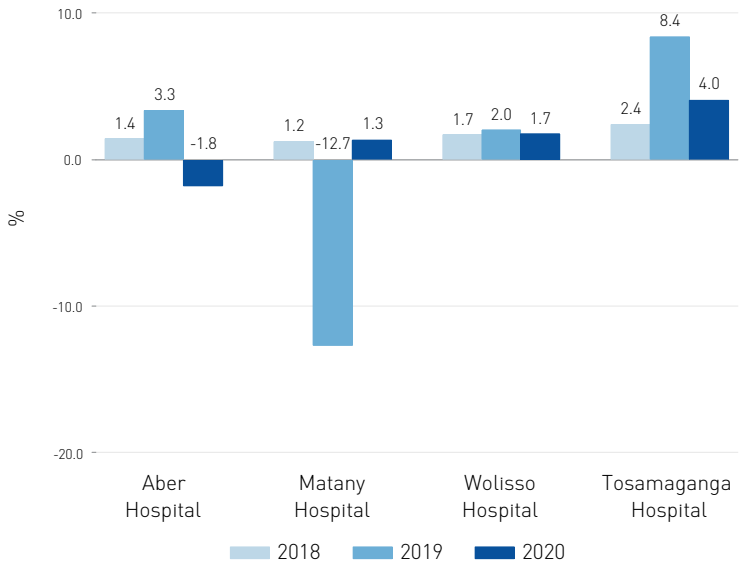


Numerator	Earnings before interest and taxes (EBIT) (x100)
Denominator	Total revenues
Sources	Hospitals income statements

F1.3 Return on Investment (ROI)

Computational level : Hospital

This indicator is calculated as the ratio between the health net margin (difference between revenues and operational costs) and the capital invested. This indicator shows the efficiency of using the capital invested, that is equivalent to the return on investment ("ROI"). In the healthcare sector, in particular, it explaines the necessity to guarantee continuosly investements and the possibility to provide citizens with excellent services with adequate resoruces allocation. The reference standard was established starting from the indications followed in the PES of the Tuscany Region.

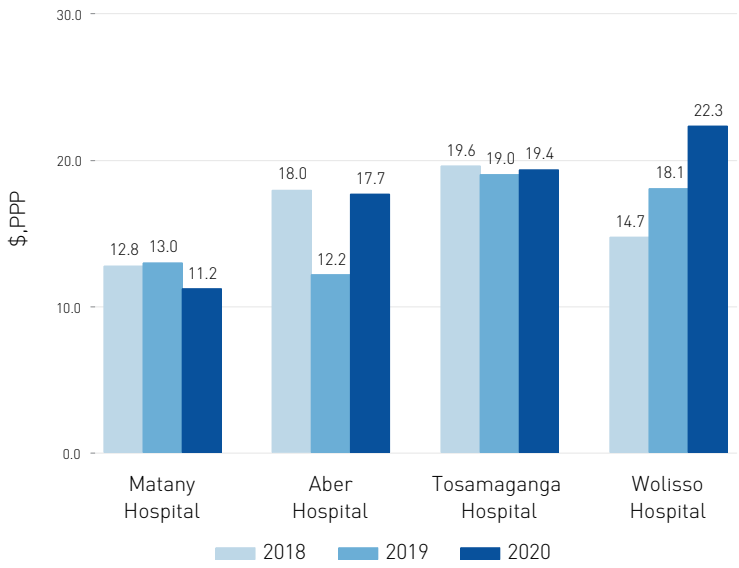


Numerator	Earnings before interest and taxes (EBIT) (x100)
Denominator	Total assets
Sources	Hospitals income statements and Hospitals balance sheets

F17.1A.1 Average cost for Inpatient Day Equivalent, PPP (current international $)

Computational level : Hospital

This indicator measures the average inpatient cost at the hospital level. It is calculated as the total running expenses related to healthcare activities divided by the inpatient day equivalent, expressed as the sum of inpatient days and the number of outpatient visits multiplied by a standard coefficient equal to 4. Secondly, in order to compare values between the different hospitals, all the average costs were adjusted according to the Purchasing Power Parity (PPP) conversion factor provided by the World Bank for each involved country.

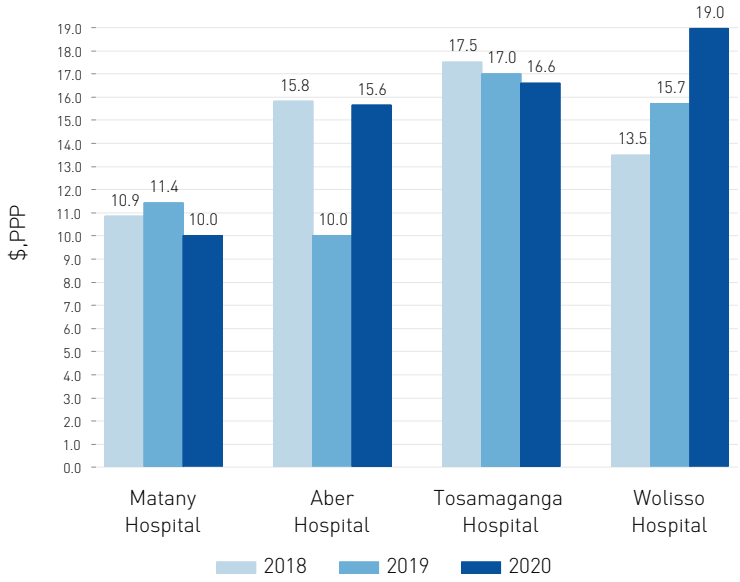


Numerator	Total running costs
Denominator	Inpatient Day Equivalent
Sources	Hospitals income statements and hospitals registers (electronic sources)

F17.1A.2 Average cost for Inpatient Day Equivalent (without D&A), PPP (current international $)

Computational level : Hospital

This indicator measures the average inpatient cost at the hospital level at the net of depreciation and amortization (D&A). It is calculated as the total running expenses related to healthcare activities (excluded D&A) divided by the inpatient day equivalent, expressed as the sum of inpatient days and the number of outpatient visits multiplied by a standard coefficient equal to 4. Secondly, in order to compare values between the different hospitals, all the average costs were adjusted according to the Purchasing Power Parity (PPP) conversion factor provided by the World Bank for each involved country.

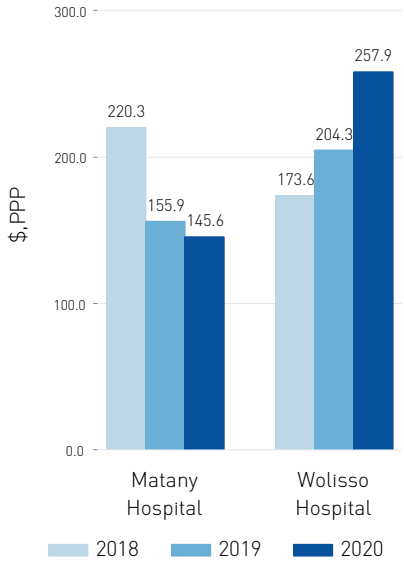


Numerator	Total running costs (excluding D&A expenses)
Denominator	Inpatient Day Equivalent
Sources	Hospitals income statements and hospitals registers (electronic sources)

F17.3.1A Average cost for specialized care per procedure, PPP (current international $)

Computational level : Hospital

This indicator monitors the average inpatient cost at the hospital level for specialized services. It is calculated as the total running expenses related to specialized activities divided by the reference accesses. In order to compare values between the different hospitals, all the average costs were adjusted according to the Purchasing Power Parity (PPP) conversion factor provided by the World Bank for each involved country.

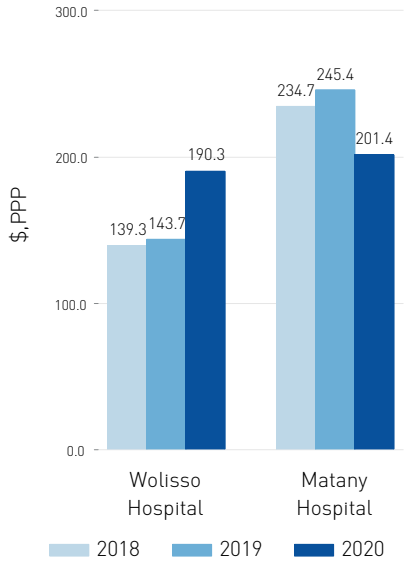


Numerator	Costs related to specialized care
Denominator	N. of accesses
Sources	Hospitals income statements and hospitals registers (electronic sources)

F17.3.1.1 Average cost for specialized care per procedure - medical department, PPP (current international $)

Computational level : Hospital

This indicator monitors the average inpatient cost at the hospital level for specialized services in the medical department. It is calculated as the total running expenses related to specialized activities in the medical department divided by the reference accesses. In order to compare values between the different hospitals, all the average costs were adjusted according to the Purchasing Power Parity (PPP) conversion factor provided by the World Bank for each involved country.

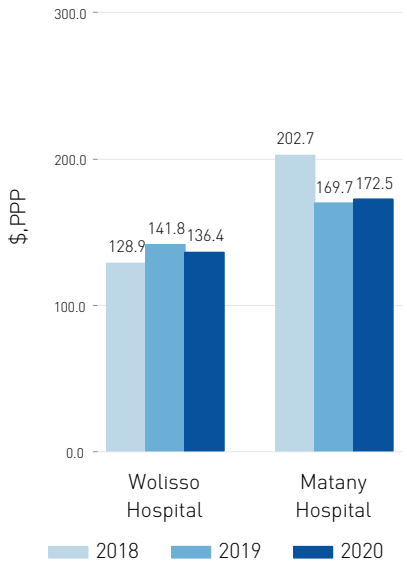


Numerator	Costs related to specialized care (medical department)
Denominator	N. of accesses (medical department)
Sources	Hospitals income statements and hospitals registers (electronic sources)

F17.3.1.3 Average cost for specialized care per procedure - operating theatre, PPP (current international $)

Computational level : Hospital

This indicator monitors the average inpatient cost at the hospital level for specialized services (all major operations) in the operating theatre. It is calculated as the total running expenses related to specialized activities in the operating theatre divided by the reference accesses. In order to compare values between the different hospitals, all the average costs were adjusted according to the Purchasing Power Parity (PPP) conversion factor provided by the World Bank for each involved country.

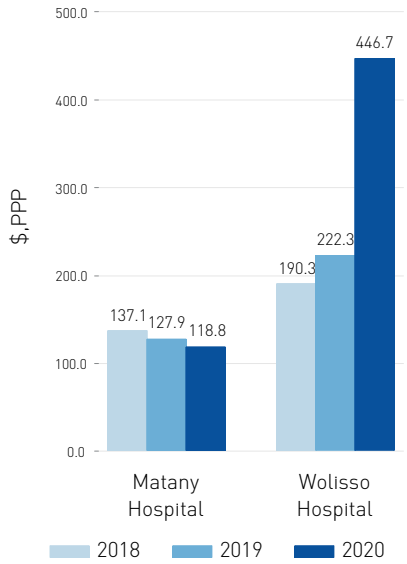


Numerator	Costs related to specialized care (operating theatre)
Denominator	N. of accesses (operating theatre)
Sources	Hospitals income statements and hospitals registers (electronic sources)

F17.3.1.4 Average cost for specialized care per procedure - department of surgery, PPP (current international $)

Computational level : Hospital

This indicator monitors the average inpatient cost at the hospital level for specialized services in the surgery department. It is calculated as the total running expenses related to specialized activities in the surgery department divided by the reference accesses. In order to compare values between the different hospitals, all the average costs were adjusted according to the Purchasing Power Parity (PPP) conversion factor provided by the World Bank for each involved country.

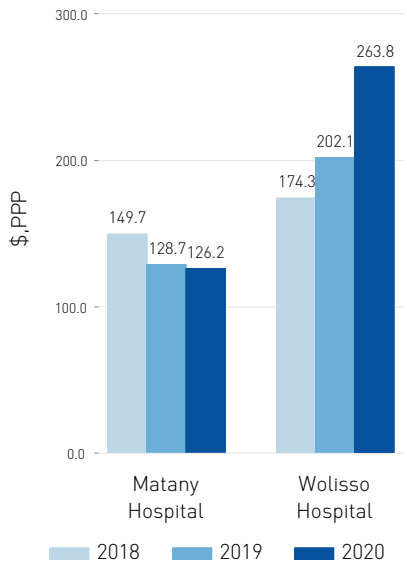


Numerator	Costs related to specialized care (department of surgery)
Denominator	N. of accesses (department of surgery)
Sources	Hospitals income statements and hospitals registers (electronic sources)

F17.3.1.5 Average cost for specialized care per procedure - maternity department, PPP (current international $)

Computational level : Hospital

This indicator monitors the average inpatient cost at the hospital level for specialized services in the maternity department. It is calculated as the total running expenses related to specialized activities in the maternity department divided by the reference accesses. In order to compare values between the different hospitals, all the average costs were adjusted according to the Purchasing Power Parity (PPP) conversion factor provided by the World Bank for each involved country.

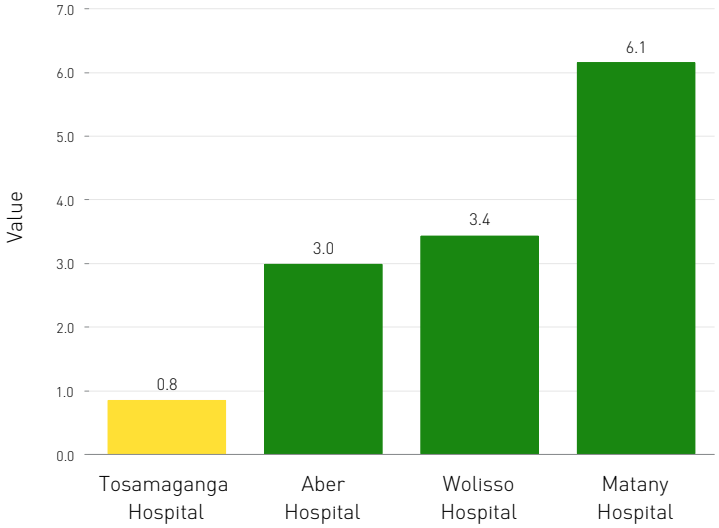


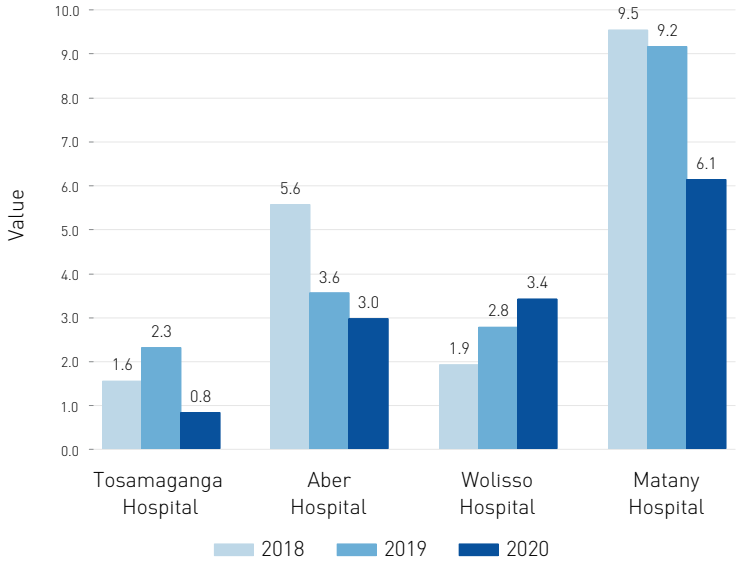
Numerator	Costs related to specialized care (maternity department)
Denominator	N. of accesses (maternity department)
Sources	Hospitals income statements and hospitals registers (electronic sources)

F3.1 Current Ratio

Computational level : Hospital

The current ratio assesses the hospital's solvency, intended as the ability to cope with short-term commitments through ordinary activities, namely short-term credits, cash, and inventories. The sources of data are extracted from the balance sheet. The reference standard was established starting from the indications followed in the PES of the Tuscany Region.



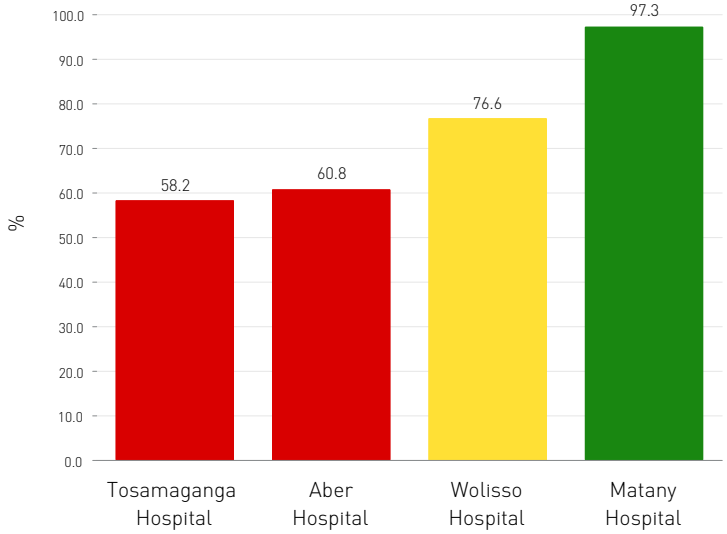


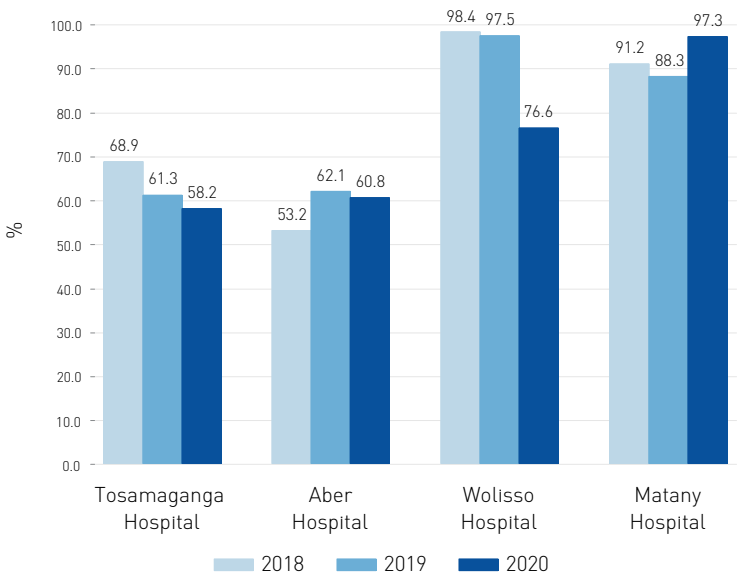
Numerator	Current Assets
Denominator	Current Liabilities
Sources	Hospitals balance sheets

C2A.2 Bed occupancy rate

Computational level : Hospital

The bed occupancy rate ("BOR") indicates the percentage between the effective inpatient days and the total number of possible days of admissions (that are calculated by multiplying the number of beds by the days of the reference year). In an operational perspective, the BOR allows to understand the degree of efficiency by which hospitalizations are planned and managed and the resources used.



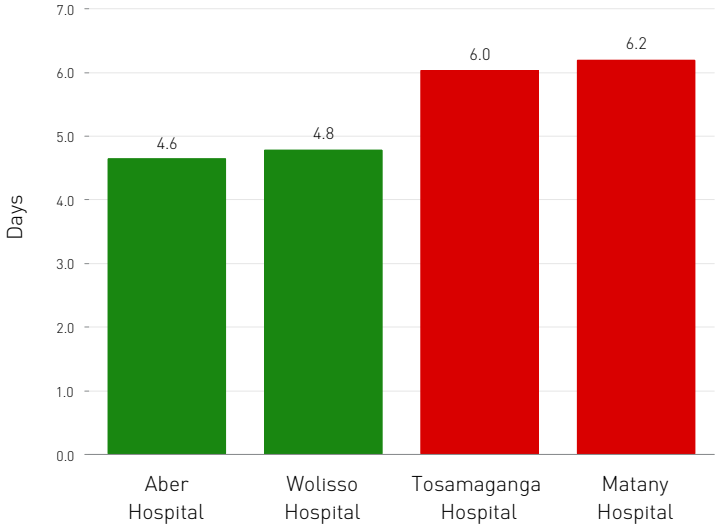


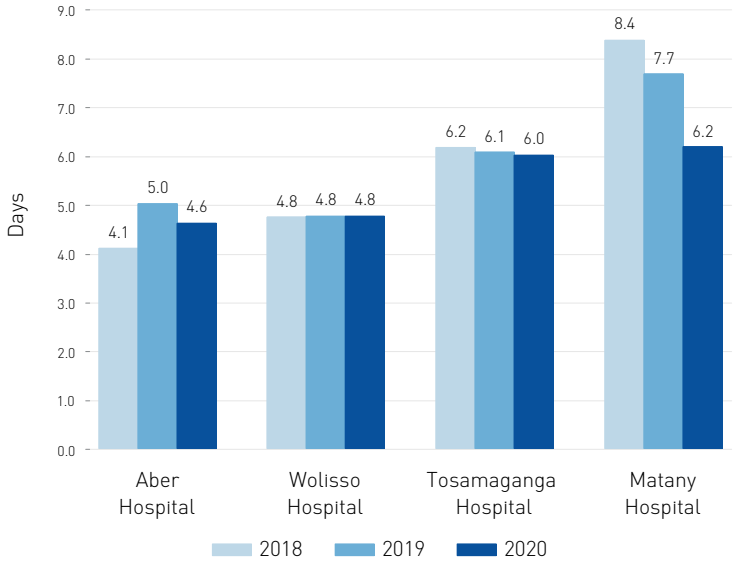
Numerator	Number of inpatient days (x100)
Denominator	Number of inpatient beds
Sources	Wolisso hospital's registers (electronic source); Matany hospital's registers (electronic source); Tosamaganga hospital's registers (paper-based source); Ugandan eHMIS/DHIS2 (electronic source)

C2A.3 Average lenght of stay (ALOS) - inpatients

Computational level : Hospital

The average length of stay in hospitals (ALOS) can be considered as an indicator of efficiency. All other factors being equal, a shorter stay will reduce the cost per discharge and shift care from inpatient to less expensive post-acute settings. The ALOS refers to the average number of days that patients spend in hospital and it is expressed as the ratio between number of inpatient days and number of inpatients. The OECD argues that longer stays in hospital could be determined by inefficient hospital processes causing delays in providing treatment; or by errors and poor-quality care or poor care co-ordination that cause patients' need for further treatment or recovery time.





Numerator	Number of inpatient days
Denominator	Number of inpatients (x365)
Sources	Wolisso hospital's registers (electronic source); Matany hospital's registers (electronic source); Tosamaganga hospital's registers (paper-based source); Ugandan eHMIS/DHIS2 (electronic source)

USERS, STAFF AND COMMUNICATION

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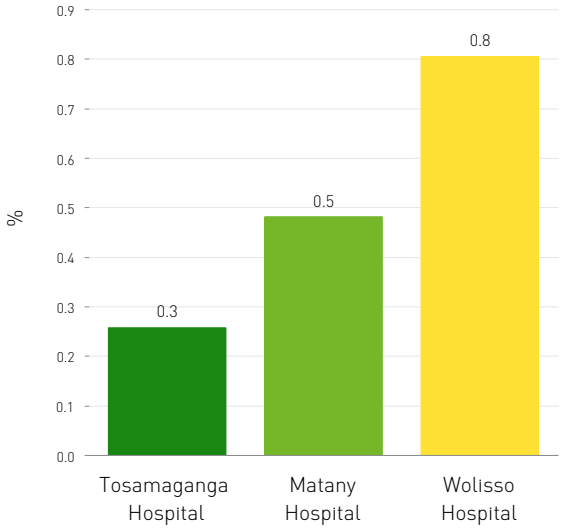
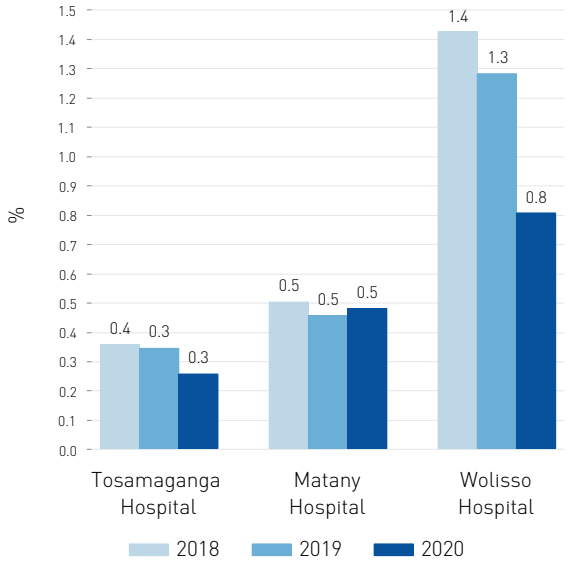
DOCTORS WITH AFRICA CUAMM

D18 Percentage of hospitalized patients leaving against medical advice

Computational level : Hospital

The patient can choose to "abandon" the hospital (the so called "self discharge"). The motivations behind such a decision may vary. This indicator has been included in the performance evaluation system. Since, in the majority of cases, this phenomenon can be considered as a proxy for patient dissatisfaction or it may be associated with social and antropological reasons. The standard was fixed based on the guidelines followed in the IRPES Network.



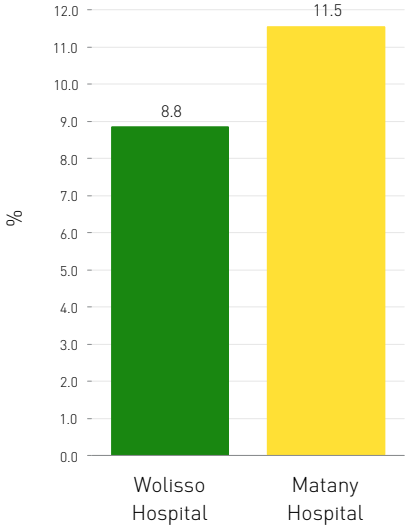


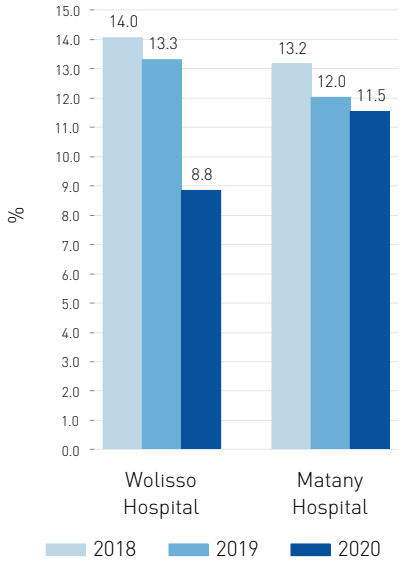
Numerator	Number of hospitalized patients leaving against medical advice (x100)
Denominator	Number of admissions
Sources	Wolisso hospital's registers (electronic source); Matany hospital's registers (electronic source); Tosamaganga hospital's registers (paper - based source); Aber hospital's registers (paper - based source)

E2A Percentage of staff absence

Computational level : Hospital

This indicator monitors the percentage of staff absence and it is considered a proxy of the organizational climate. The indicator is computed as the ratio between the days of absence for public holidays, annual leave, maternal leave and paternity leave, sick leave and the number of working days net of taken holidays. The standard was fixed based on the guidelines followed in the IRPES Network.



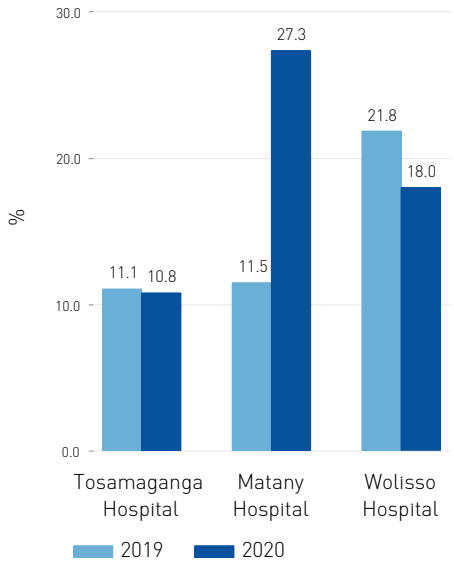


Numerator	Number of days of absence (x100)
Denominator	N. of working days (net of taken holidays) of all hospital's employees
Sources	Hospitals registers - human resources department (electronic sources)

E3 Employee annual turnover rate

Computational level : Hospital

The employee turnover rate measures the number of employees who leave the hospital during the year over the average number of personnel employeed in the same year.

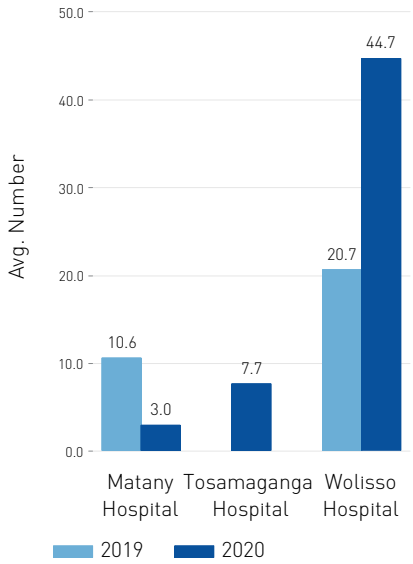


Numerator	Number of employees who left during the year (x100)
Denominator	(Beginning + ending number of employees)/2
Sources	Hospitals registers - human resources department (electronic and paper-based sources)

E4 Average number of training hours per employee

Computational level : Hospital

This indicator illustrates the number of training hours delivered to all hospital's employees. We include internal/external and voluntary/mandatory training programs.



Numerator	Number of training hours delivered to all hospital's employees
Denominator	Number of hospital's employees
Sources	Hospitals registers - human resources department (electronic and paper-based sources)

EMERGENCY CARE

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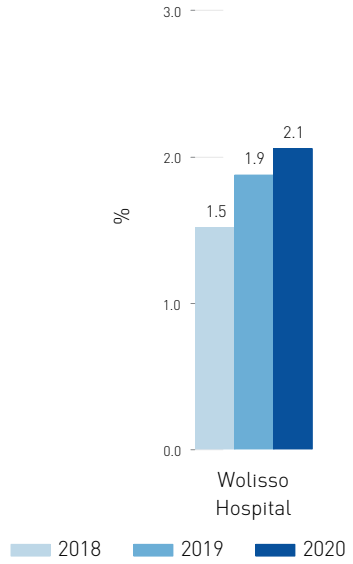
C16.10A Percentage of repeated admissions in Emergency Department within 96 hours

Computational level : Hospital

Repeated admissions in Emergency Department within a short period of time may be due to ineffective and poor quality care by the Emergency Department. This indicator monitors the percentage of patients who are re-admitted in the Emergency Department (ED) within 96 hours since the last access, on the total number of accesses to the ED registered.



Numerator	Repeated admissions in Emergency Department within 96 hours (x100)
Denominator	Number of admissions in Emergency Department (for any reason)
Sources	Hospital's register - emergency department (electronic source)

GOVERNANCE AND QUALITY OF SUPPLY

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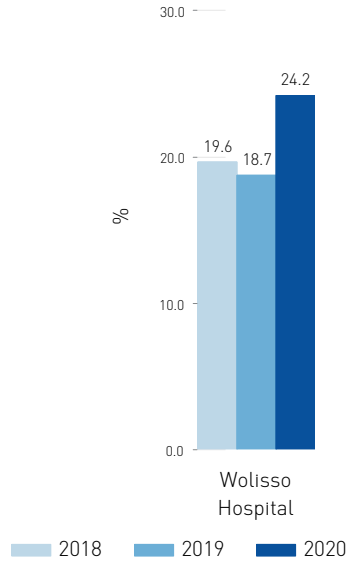
C8B.1A Emergency room access rate, per 1.000 residents

Computational level : Hospital

Admission rates to Emergency Department (ED) indicates the ratio between the overall number of accesses to ED of resident population and the residence population. This indicator does not monitor the activites of the ED but it is an indicator that indirectly measures the efficacy to respond to demand for care in the reference area.

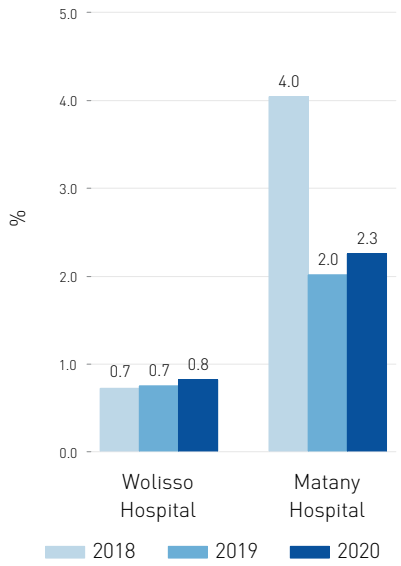


Numerator	Number of admissions in ED (x1.000)
Denominator	Estimated resident population
Sources	Hospital's emergency department register and Ethiopian HMIS/DHIS2 (electronic sources)

C17.1.4.8A Hospitalization rate for hospital admissions over 15 days, per 1.000 residents

Computational level : Hospital

This indicator illustrates the percentage of admissions lasting more than 15 days. It is calculated based on the reference population and not on the number of admissions. This indicator can be linked with the inefficiency or lack of district services that should take in charge patients in the post-acute phase. There may also be other contextual factors, also with reference to population groups, affecting this indicator that is not therefore evaluated.

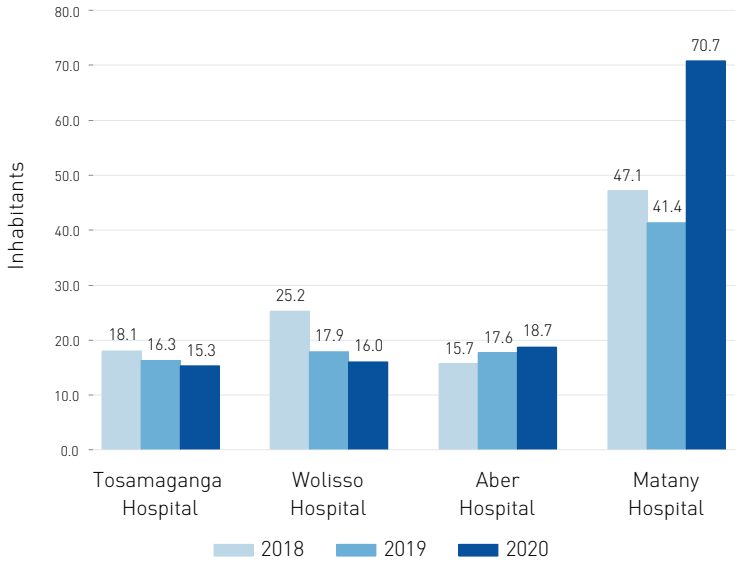


Numerator	Number of discharged patients with hospital admissions over 15 days (x1.000)
Denominator	Estimated resident population (> 1 year)
Sources	Wolisso hospital's registers and Ethiopian HMIS/DHIS2 (electronic sources); Matany hospital's registers and Ugandan eHMIS/DHIS2 (electronic sources)

C1.1A Hospitalization rate, per 1.000 residents

Computational level : Hospital

The role of hospitals has progressively changed from being the place of reference for any kind of health problems to organizations able to provide care in response to acute and complex problems. Excessive recourse to hospitals implies an inappropriate use of resources. In LMICs hospitalization rates may vary according to a number of factors that can be interrelated and coxtext-specific. The denominator consists of the admissions of residence in that specific reference area.

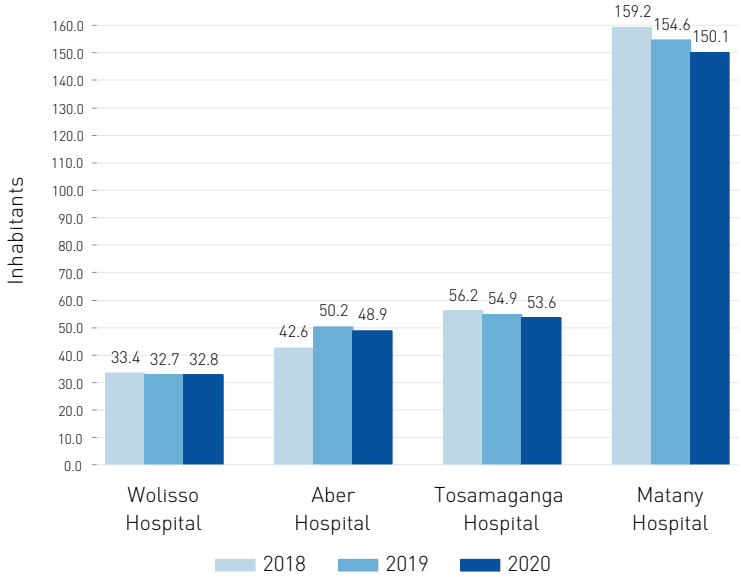


Numerator	Number of hospital admissions (x 1.000)
Denominator	Estimated resident population
Sources	Wolisso hospital's registers and Ethiopian HMIS/DHIS2 (electronic sources); Matany hospital's registers and Ugandan eHMIS/DHIS2 (electronic sources); Tosamaganga hospital's registers (paper-based source) and Tanzanian DHIS2 (electronic source); Ugandan eHMIS/DHIS2 (electronic source)

C1.1B Number of hospital beds per 100.000 residents

Computational level : Hospital

This indicator shows the number of hospital beds per 100.000 residents, according to the reference population. It provides a measure of the resources availability to deliver inpatients services, in terms of number of beds that are maintained, staffed and immediately available for use.

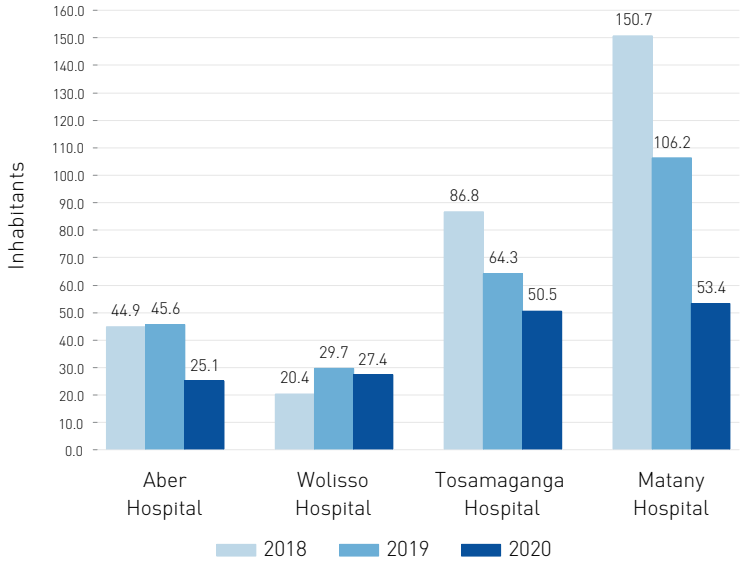


Numerator	Number of hospital beds
Denominator	Estimated resident population
Sources	Ethiopian HMIS/DHIS2, Tanzanian DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

C11A.1.1A Heart failure hospitalization rate per 100.000 residents (>15 years)

Computational level : Hospital

In LMICs, as in HICs, the prevalence of heart failure has gradually increased. The challenge is to treat heart failures at residence level. Indeed, more accurate assessment of primary care appropriateness and effectiveness requires the addition of further information regarding the complexity of the cases considered. The denominator consists of the admissions of residence in that specific reference area. It is standardized by 100.000 inhabitants from the reference area.

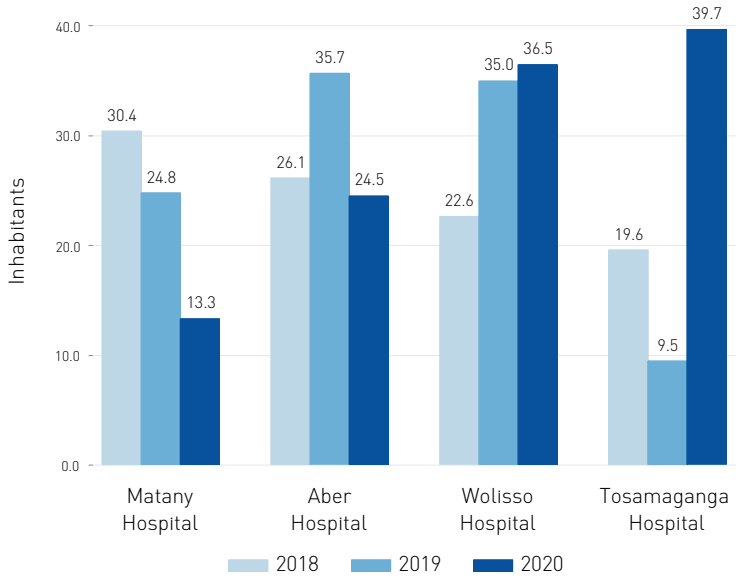


Numerator	Number of hospitalizations for heart failure per 100.000 residents aged >15 years
Denominator	Estimated resident population
Sources	Wolisso hospital's registers and Ethiopian HMIS/DHIS2 (electronic sources); Matany hospital's registers and Ugandan eHMIS/DHIS2 (electronic sources); Tosamaganga hospital's registers (paper-based source) and Tanzanian DHIS2 (electronic source); Ugandan eHMIS/DHIS2 (electronic source)

C11A.2.1A Diabetes hospitalization rate per 100.000 residents (>15 years)

Computational level : Hospital

Diabetes is a chronic disease that can give rise to complications in the long-term, if not properly and constantly controlled. Decompensated diabetes may require hospitalization. Integrated disease management combining prevention, diagnosis and treatment is fundamental to avoid worsening of clinical conditions and subsequent hospitalization. The diabetes hospitalization rate is used as a proxy to monitor primary care organizational appropriateness. The denominator consists of the admissions of residence in that specific reference area. It is standardized by 100.000 inhabitants from the reference area.

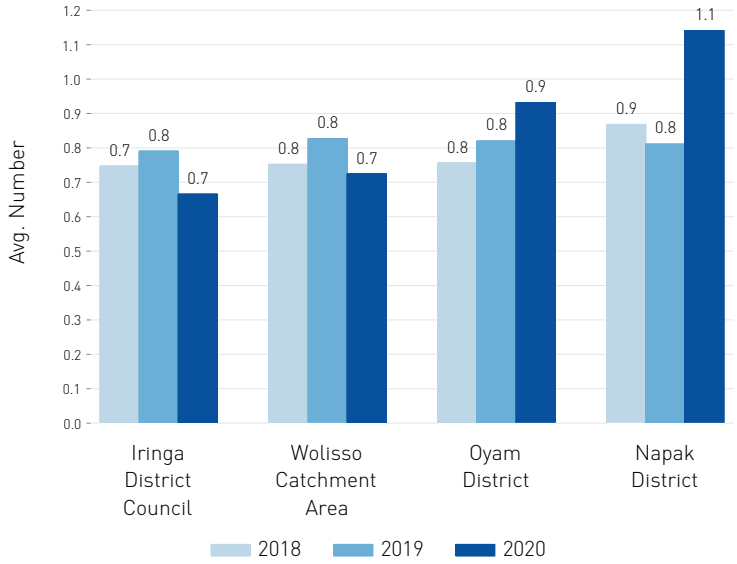


Numerator	Number of hospitalizations for diabetes per 100.000 residents aged >15 years
Denominator	Estimated resident population
Sources	Wolisso hospital's registers and Ethiopian HMIS/DHIS2 (electronic sources); Matany hospital's registers and Ugandan eHMIS/DHIS2 (electronic sources); Tosamaganga hospital's registers (paper-based source) and Tanzanian DHIS2 (electronic source); Ugandan eHMIS/DHIS2 (electronic source)

C13.2A Average number of outpatient consult, per resident

Computational level : Residence

This indicator is an observation indicator. It measures the average number of consultations in the reference area, including all health centers and the respective hospital. It offers an overview of the number of visits provided in the reference area over the three years.

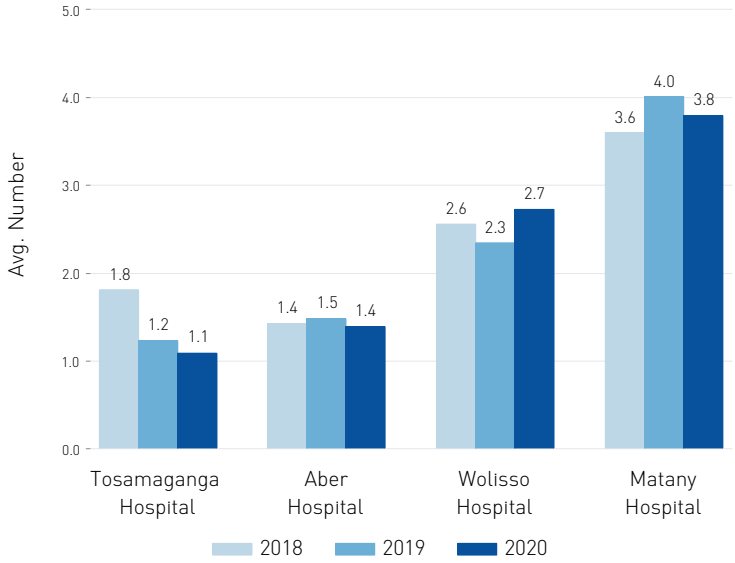


Numerator	Number of outpatient consults
Denominator	Estimated resident population
Sources	Ethiopian HMIS/DHIS2, Tanzanian DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

C13.2B Average number of diagnostic procedures per patient (lab tests)

Computational level : Hospital

This indicator is an observation indicator. It measures the average number of lab tests in the hospital insisting on the reference area. It includes examinations for HIV, malaria and tuberculosis. It offers an overview of the number of lab tests provided in the reference hospital over the three years.

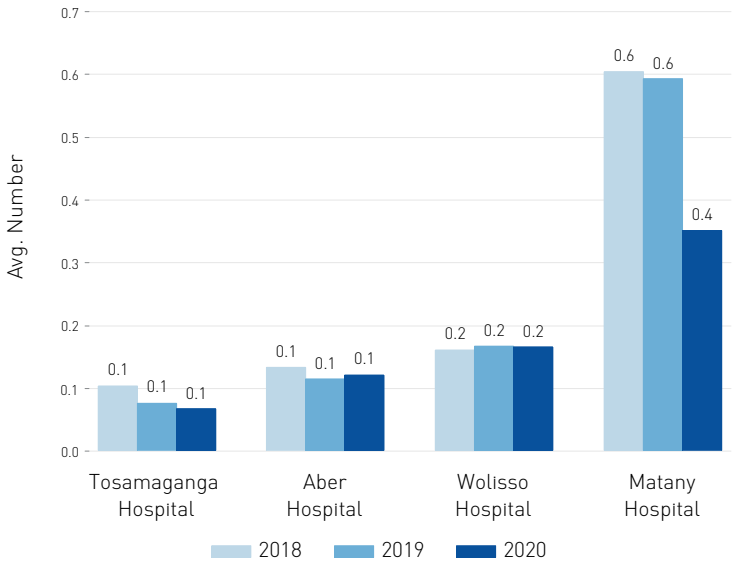


Numerator	Number of diagnostic procedures (laboratory tests)
Denominator	Number of patient discharges (OPD and IPD)
Sources	Hospitals registers - laboratory departments (electronic/paper-based); Wolisso hospital's registers (electronic source); Matany hospital's registers (electronic source); Tosamaganga hospital's registers (paper-based source); Ugandan eHMIS/DHIS2 (electronic source)

C13.2C Average number of diagnostic procedures per patient (imaging)

Computational level : Hospital

This indicator is an observation indicator. It measures the average number of diagnostic imaging in the hospital insisting on the reference area. It includes both ultrasounds and x-rays examinations. It offers an overview of the number of diangostic imaging provided in the reference hospital over the three years.

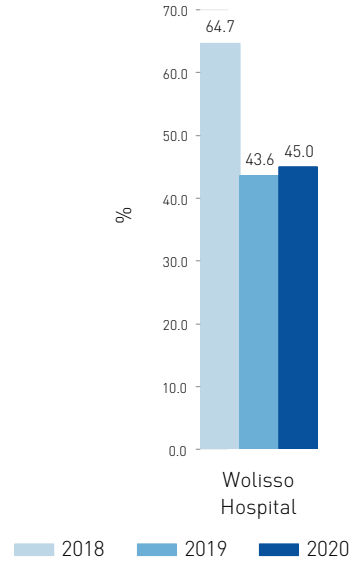


Numerator	Number of diagnostic procedures (imaging procedures)
Denominator	Number of patient discharges (OPD and IPD)
Sources	Hospitals registers - diagnostic departments(electronic/paper-based); Wolisso hospital's registers (electronic source); Matany hospital's registers (electronic source); Tosamaganga hospital's registers (paper-based source); Ugandan eHMIS/DHIS2 (electronic source)

C16.4 Percentage of admissions in Emergency Department hospitalised within 8 hours

Computational level : Hospital

The indicator allows evaluation of the effectiveness of the hospital as a whole, monitoring promptness in the management of patients who are referred by the Emergency Department (ED) for hospitalization or other medical exams. The indicator measures the percentage of patients with a length of stay in the ED of less than 8 hours, from the moment of the triage to discharge or transfer to another deparment.

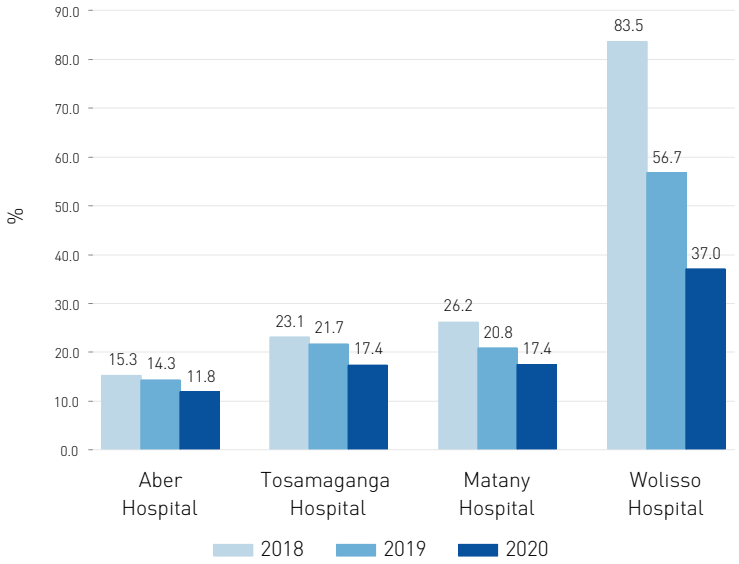


Numerator	Number of patients referred to one clinical or surgical hospital' department with a length of stay in ED of less than 8 hours (x100)
Denominator	Total number of patients referred to one clinical or surgical hospital' department from ED
Sources	Hospital's register - emergency department and hospital's registers (electronic sources)

C18.9A Hysterectomy hospitalization rate, per 100.000 residents (women > 15 years)

Computational level : Hospital

Hysterectomy is the surgical removal of the uterus and cervix. This indicator measures the percentage of women aged more than 15 years who underwent hysterectomy procedure for both benign and malignant cases. It is standardized by 100.000 inhabitants from the reference area.

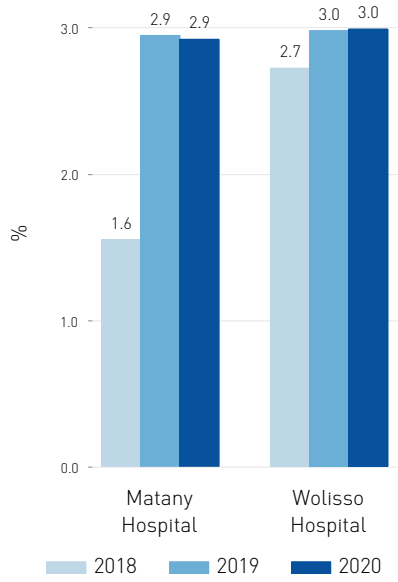


Numerator	Number of hospitalizations for hysterectomy procedures (x100.000)
Denominator	Estimated number of resident women aged > 15 years
Sources	Hospitals registers - surgical department (paper - based sources) and Ethiopian HMIS/DHIS2, Tanzanian DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

C5.1E.A Repeated hospital admissions for any causes

Computational level : Hospital

If appropriately treated, the patient should not be re-admitted before one month of discharge. The indicator measures the number of patients readmitted to a hospital within 30 days of the previous admission for any cases. The causes of re-admission can be due to individual and contextual factors and the indicator is not evaluated.

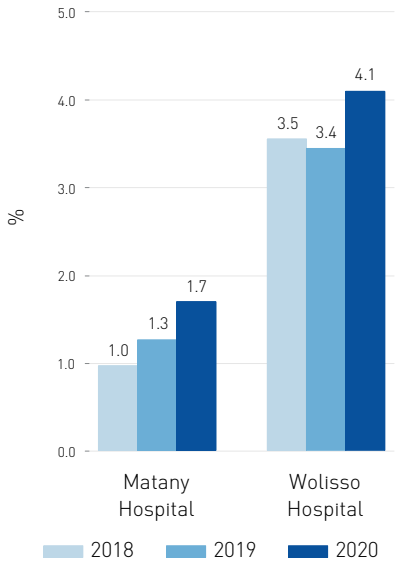


Numerator	Number of repeated hospital admissions within 30 days for any cases (x100)
Denominator	Number of admissions
Sources	Hospitals registers (electronic sources)

C5.1E.A1 Repeated hospital admissions for any causes (medical department)

Computational level : Hospital

The general indicator of repeated hospital admissions for any causes is here focused on medical problems. The indicator measures the number of patients readmitted to a hospital within 30 days of the previous admission for any causes in medical department. If appropriately treated in this department, the patient should not be re-admitted before one month of discharge.

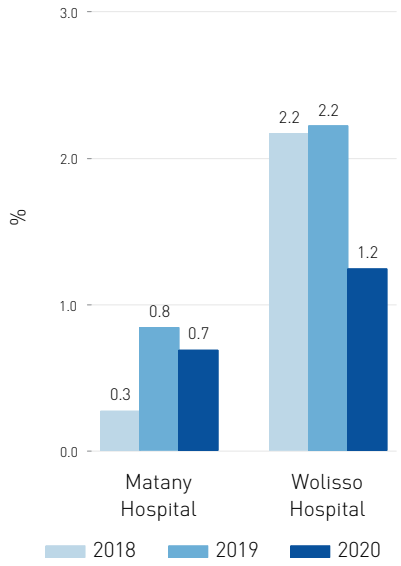


Numerator	Number of repeated hospital admissions within 30 days for any cases (medical department) (x100)
Denominator	Number of admissions (medical department)
Sources	Hospitals registers - medical department (electronic sources)

C5.1E.A2 Repeated hospital admissions for any causes (surgical department)

Computational level : Hospital

The general indicator of repeated hospital admissions for any causes is here focused on surgical problems. The indicator measures the number of patients readmitted to a hospital within 30 days of the previous admission for any causes in surgical department. If appropriately treated in this department, the patient should not be re-admitted before one month of discharge.

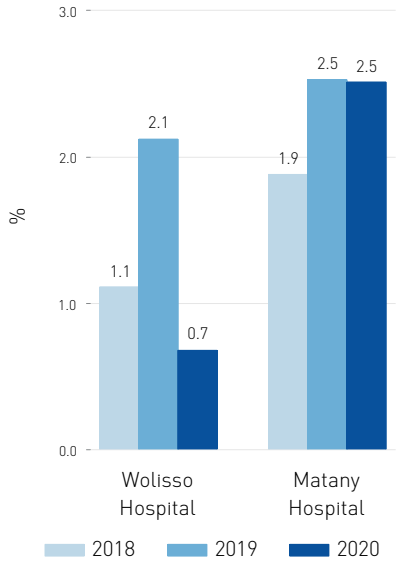


Numerator	Number of repeated hospital admissions within 30 days for any cases (surgical department) (x100)
Denominator	Number of admissions (surgical department)
Sources	Hospitals registers - surgical department (electronic sources)

C5.1E.A3 Repeated hospital admissions for any causes (maternity department)

Computational level : Hospital

The general indicator of repeated hospital admissions for any causes is here focused on maternal health problems. The indicator measures the number of patients readmitted to a hospital within 30 days of the previous admission for any causes in maternity department. If appropriately treated in this department, the patient should not be re-admitted before one month of discharge.

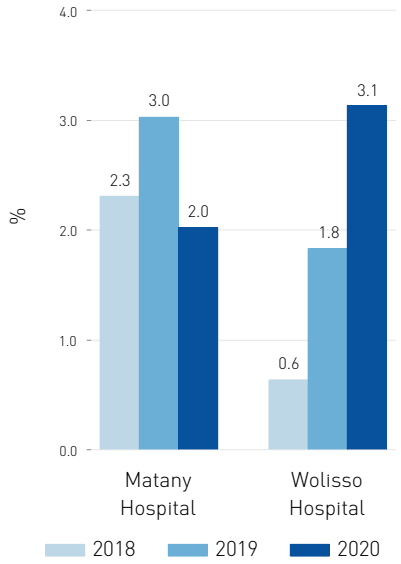


Numerator	Number of repeated hospital admissions within 30 days for any cases (maternity department) (x100)
Denominator	Number of admissions (maternity department)
Sources	Hospitals registers - maternity department (electronic sources)

C6.4.1A Infection rate due to surgical wounds (emergency and elective surgery procedures)

Computational level : Hospital

Surgical wound infection is a major subgroup of all nosocomial infections that are considered a serious public health risk and drain of resources from the health care system. The indicator monitors the infection rate due to surgical wounds assessed after at least 5 days from the surgical intervention.

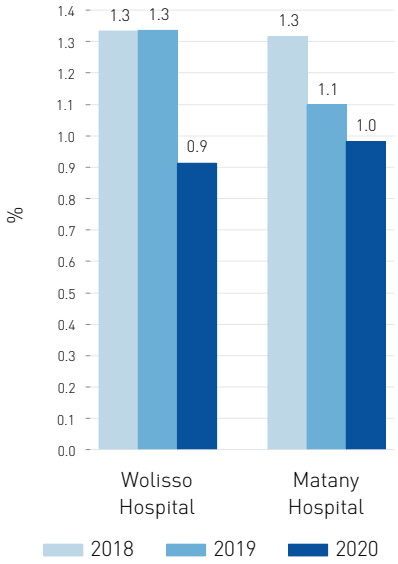


Numerator	Number of wound infections in patients assessed after at least 5 inpatient days (x100)
Denominator	Number of surgical patients with at least 5 inpatient days
Sources	Hospitals registers - surgical department (electronic sources)

C6.4.2A Inpatient mortality rate in low-mortality cases

Computational level : Hospital

Inpatient mortality rate can be considered as a predictor of the quality of care, but it requires adjustment for severity of illness. This indicator illustrates the inpatient mortality rate due to low-mortality causes. The definition of low-mortality cases was defined internally according to the hospital coding system. In the future a more accurate codes diagnosis and defintion of complex/non complex with a broader consensus among physicians is envisaged.

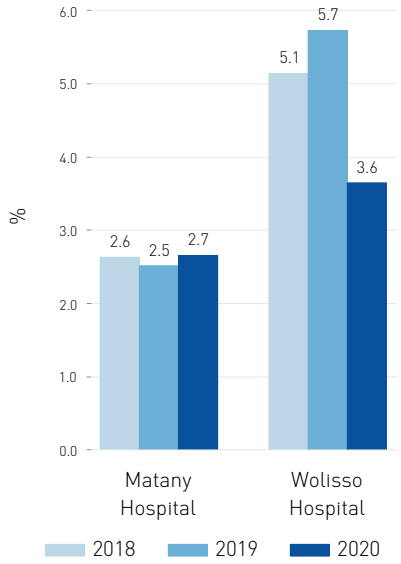


Numerator	Number of patients died with low complex cases mortality (x100)
Denominator	Number of discharged patients with low complex cases mortality
Sources	Hospitals registers - surgical department (electronic sources)

C6.4.2B Inpatient mortality rate in high-mortality cases

Computational level : Hospital

Inpatient mortality rate can be considered as a predictor of the quality of care, but it requires adjustment for severity of illness. This indicator illustrates the inpatient mortality rate due to high-mortality causes. The definition of high-mortality cases was defined internally according to the hospital coding systems and individual experience and judgement. In the future a more accurate codes diagnosis and defintion of complex/non complex with a broader consensus among physicians is envisaged.



Numerator	Number of patients died with high complex cases mortality (x100)
Denominator	Number of discharged patients with high complex cases
Sources	Hospitals registers - surgical department (electronic sources)

MATERNAL AND CHILD CARE

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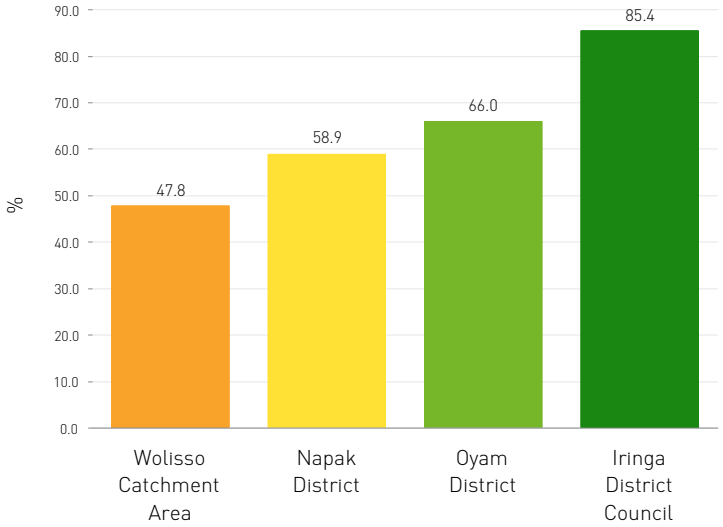
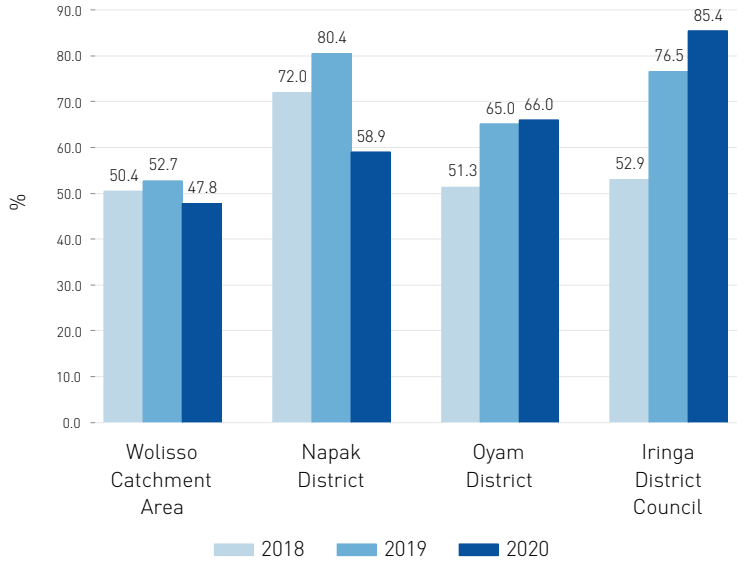
C7.28 Proportion of pregnant women who attended ANC 4+ during the current pregnancy

Computational level : Residence

The indicator measures the number of pregnant women who attended more than four antenatal care (ANC) visits in the reference area with respect to the total number of expected deliveries in the reference year. The rationale of this indicator comes from the guidelines of the WHO that recommended a minimum of four antenatal care contacts (actually eight) to reduce perinatal mortality and improve women's experience of care. It was also used as an indicator for assessing maternal health in the context of the Millennium Development Goals (MDGs). The target adopted was fixed taking into account the WHO standards and the average value of this indicator among African countries.



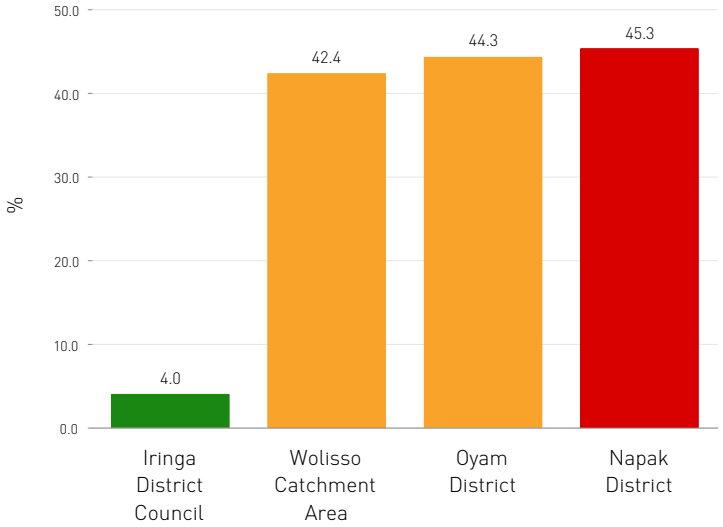


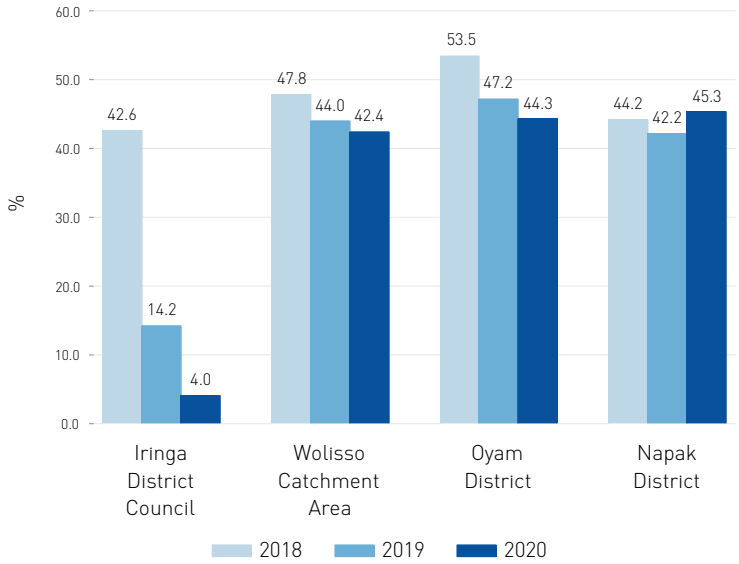
Numerator	Number of pregnant women who attended more than four ANC (x100)
Denominator	Total number of expected pregnancies
Sources	Ethiopian HMIS/DHIS2, Tanzanian DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

C7.29 Drop out Rate of ANC1 to ANC + 4

Computational level : Residence

This indicator provides a view of the drop-out rate from ANC visits, namely the rate of pregnant women who did not attend up to 4 ANC visits in the reference area. The indicator contributes to capture pregnant women attending at least one ANC visit with a live birth within the reference area who were unable to attend the recommended four ANC visits and to point out the missed opportunity for health services to retain pregnant women within maternal care pathway. The target adopted was fixed taking into account the WHO standards and the average value of this indicator among African countries.



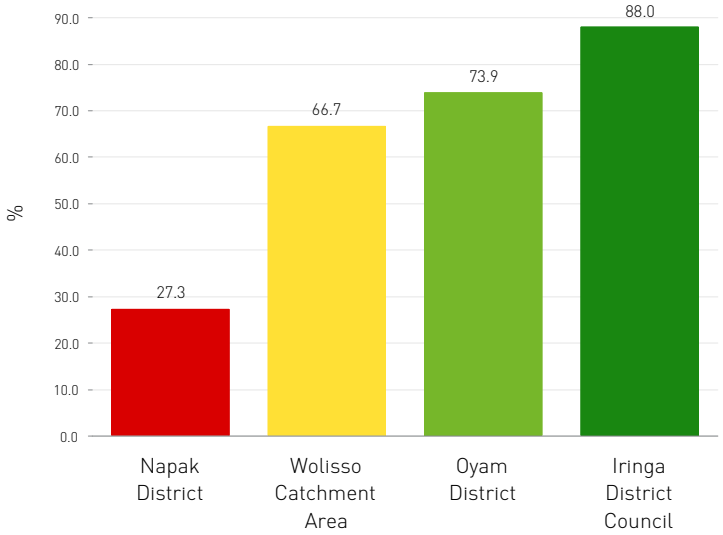


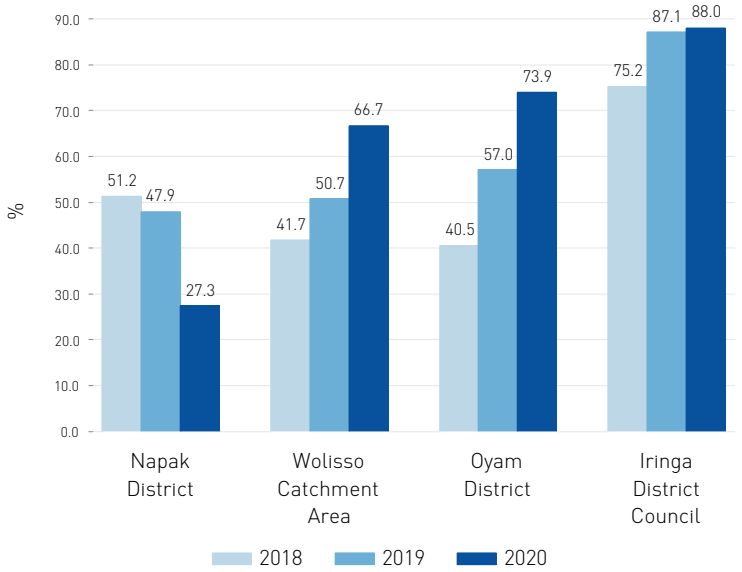
Numerator	(ANC visits I -ANC visits IV) (x100)
Denominator	ANC visits I
Sources	Ethiopian HMIS/DHIS2, Tanzanian DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

C7.30 Proportion of pregnant women tested for syphilis

Computational level : Residence

Syphilis testing and treatment during pregnancy can effectively prevent adverse pregnancy outcomes related to syphilis. The WHO recommends the syphilis testing of all pregnant women within the basic ANC package in order to eliminate mother-to-child transmission of syphilis. This indicator shows the percentage of pregnant women who are tested for syphilis in the reference area. It is considered as a proxy of the quality of care because the output depends on the correct functioning of a wide series of healthcare activities. The target adopted was fixed taking into account the WHO standards and the average value of this indicator among African countries.



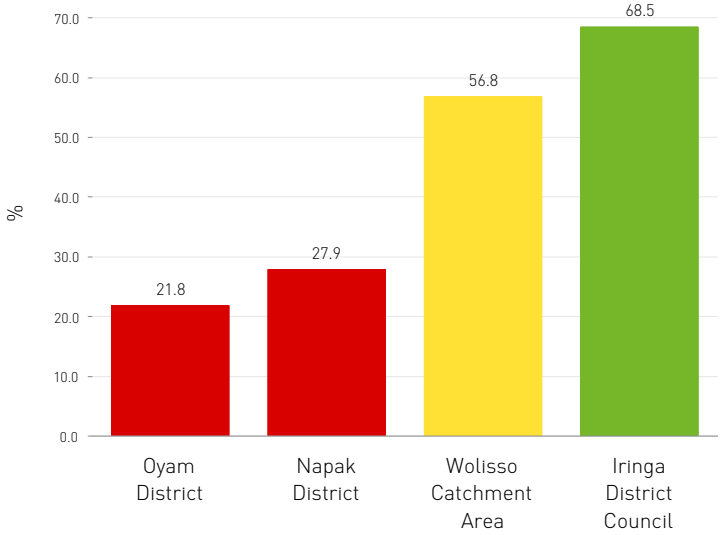


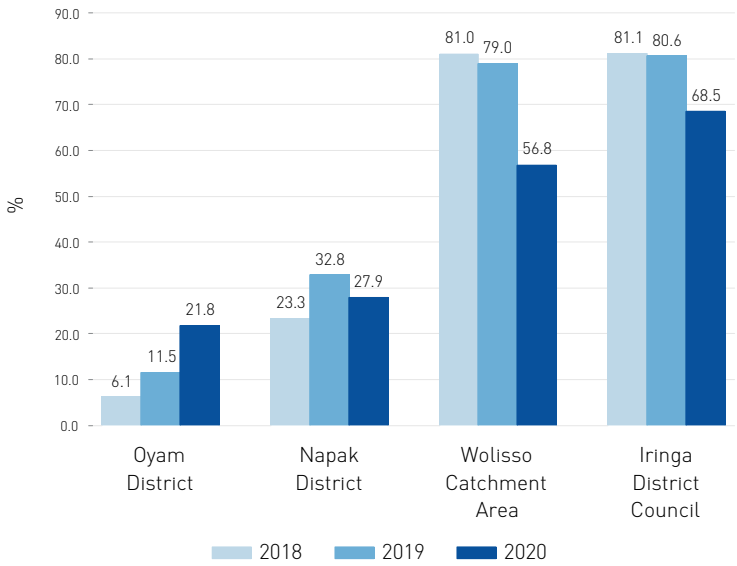
Numerator	Number of pregnant women tested for syphilis (x100)
Denominator	Total number of pregnant mothers attended at least one ANC visit
Sources	Ethiopian HMIS/DHIS2, Tanzanian DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

C7.32 Proportion of women with early PNC

Computational level : Residence

The postnatal period is critical to the health and survival of a mother and her newborn, especially during the hours and days after birth. According to the WHO, lack of care in this vulnerable time period may result into death or disability as well as missed opportunities to promote healthy behaviours, affecting women, newborns, and children. This indicator illustrates the percentage of women who received at least one postnatal care visit within 7 days from childbirth with respect to the total number of expected deliveries in the reference year. The target adopted was fixed taking into account the WHO standards and the average value of this indicator among African countries.



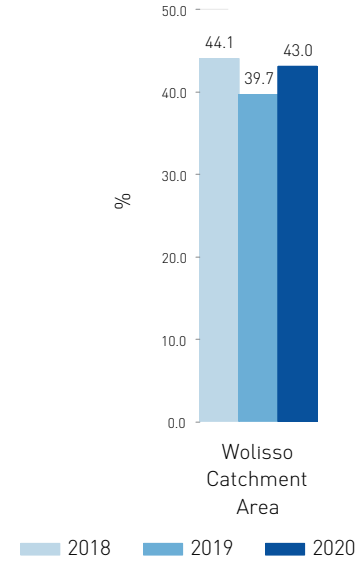


Numerator	Number of postnatal visits within 7 days of delivery (x 100)
Denominator	Number of expected deliveries
Sources	Ethiopian HMIS/DHIS2, Tanzanian DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

C7.31 Percentage of avoidable referrals

Computational level : Residence

The referral system is particularly important in pregnancy care and childbirth for providing access to emergency obstetric care. However, the referral system should be used appropriately. The indicator is an observation indicator and it expresses the percentage of referrals from the residential health centers to the reference hospital that were evaluated as avoidable by a public health officer. This indicator is available only in the Wolisso area because these processes are monitored only there.

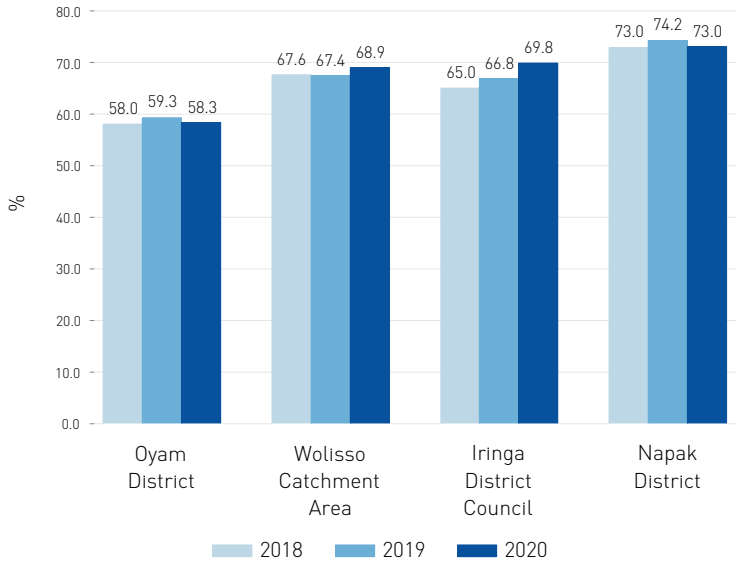


Numerator	Number of avoidable referrals (x100)
Denominator	Total number of referrals
Sources	Hospital's registers - public health department (paper-based source)

C7.33A Percentage of deliveries in lower level units

Computational level : Residence

This indicator expresses the percentage of deliveries which were performed at residential level and not in the hospital with respect to the total number of effective deliveries. It helps to monitor the proportion of deliveries that are managed in health centers at residence level. It is an observation indicator.

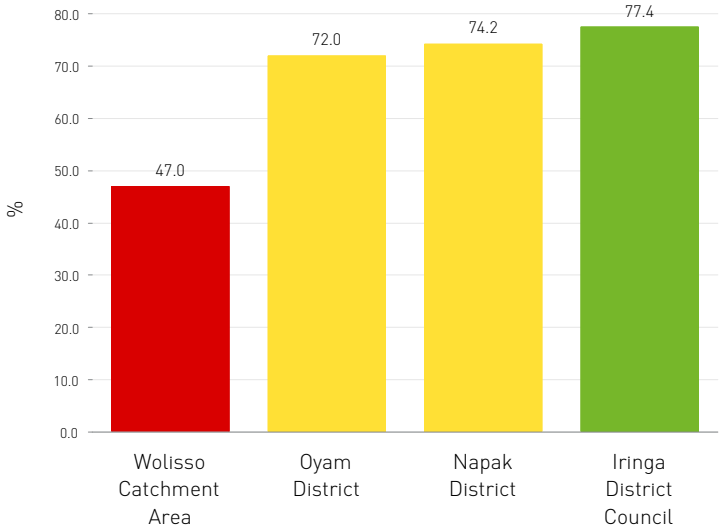


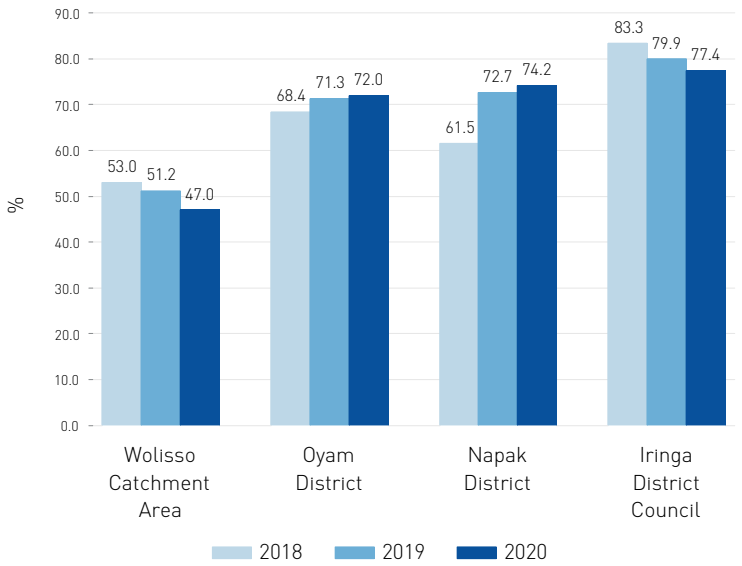
Numerator	Number of deliveries performed in HCs (x100)
Denominator	Total number of deliveries
Sources	Ethiopian HMIS/DHIS2, Tanzanian DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

C7.34 Percentage of supervised deliveries in the catchment area (deliveries in the reference hospital and in the district lower level units)

Computational level : Residence

Supervised delivery has the potential to improve birth outcomes for both women and newborns since it should ensure safe birth, by reducing both actual and potential complications. This indicator shows the percentage of supervised deliveries performed by skilled health professionals both in the reference hospital and in lower level units with respect to the total number of expected deliveries in the reference area. The target adopted was fixed taking into account the WHO standards and the average value of this indicator among African countries.



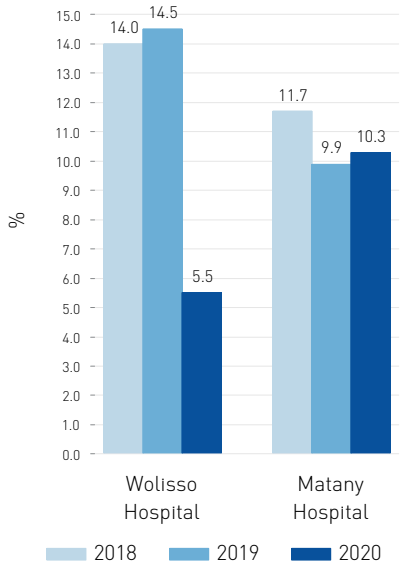


Numerator	Number of total assisted deliveries (x100)
Denominator	Number of expected deliveries
Sources	Ethiopian HMIS/DHIS2, Tanzanian DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

C7.1 Percentage of C-section deliveries (NTSV)

Computational level : Hospital

The American College of Gynaecologists and Obstetricians suggests using a specific indicator that limits the analysis to the NTSV case-mix (Nulliparous, Term, Singleton, Vertex - NTSV), in order to compare hospital performance. This measure is also required by the Joint Commission. The percentage of caesarean section NTSV deliveries represents the most appropriate indicator to evaluate the quality of maternal care pathways delivered at hospital level. This indicator remains an observation indicator because data were not available in all the hospitals involved in the study.

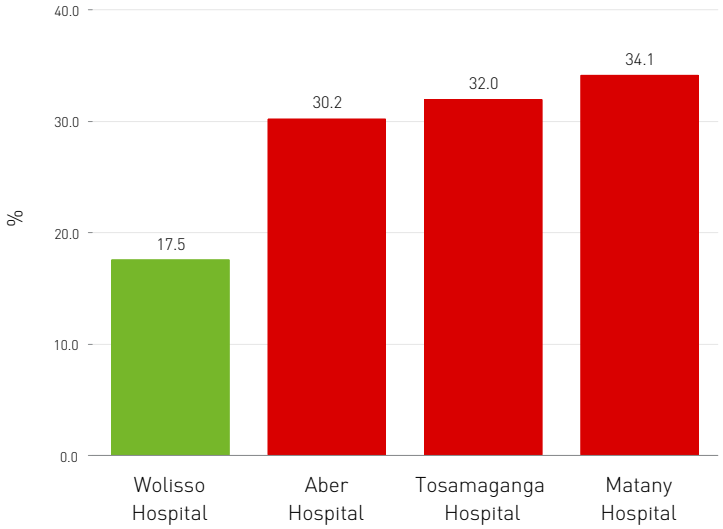


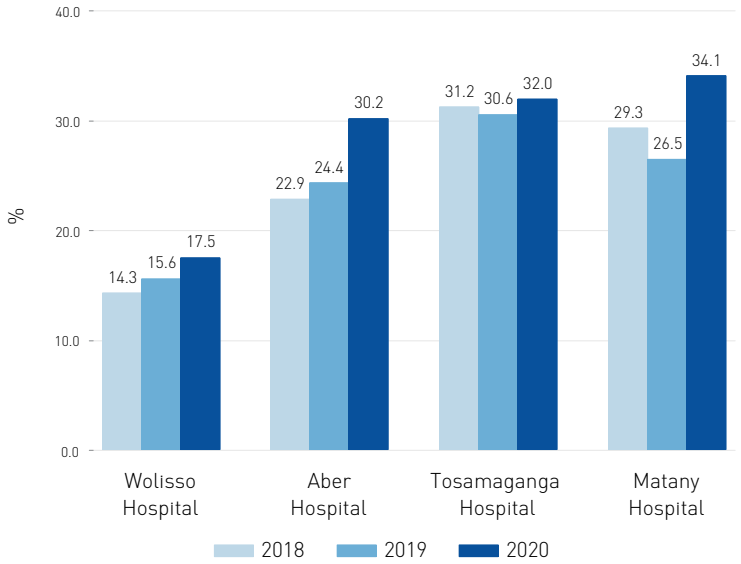
Numerator	Number of C-section NTSV deliveries (x100)
Denominator	Number of NTSV deliveries
Sources	Hospitals registers - maternity department (electronic sources)

C7.1.1 Percentage of caesareans

Computational level : Hospital

Although data comparison of caesarean sections among hospitals is more critical when including deliveries due to the variability between different groups of pregnant women, it is important to monitor the use of a caesarean section. This indicator expresses the raw percentage of deliveries performed with a caesarean section (all cases included). To evaluate this indicator, the target proposed by the WHO was adopted, which is fixed equal to 15%. The same target is currently in use in the IRPES Network as well.



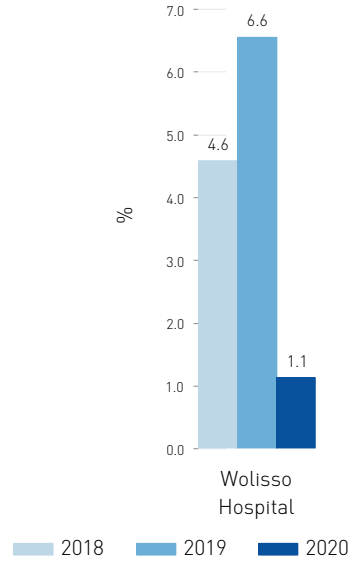


Numerator	Number of caesareans (x100)
Denominator	Number of deliveries
Sources	Hospitals registers - maternity department (paper-based and electronic sources)

C7.1.4 Percentage of elective caesareans (NTSV)

Computational level : Hospital

Considering the progressive rise of cesarean section rate in many countries, which is not associated with improvement in perinatal mortality or morbidity, the rationale of the indicator is to monitor the elective cesareans among the NTSV deliveries. This indicator refers to group 2b of the Robson Classification: NTSV deliveries (Nulliparous, Term, Singleton, Vertex - NTSV) with elective C-section. It measures the percentage of elective C-sections out of the total of NTSV deliveries and it is an observation indicator.

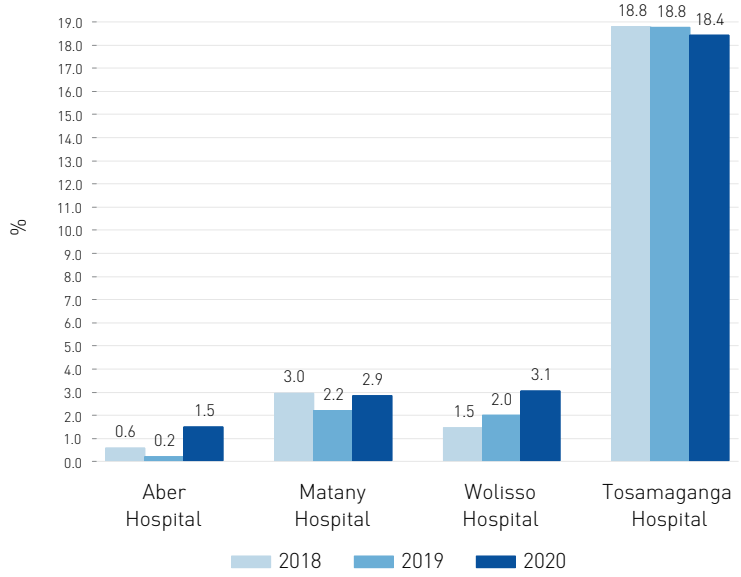


Numerator	Number of elective C-section NTSV deliveries (x100)
Denominator	Number of NTSV deliveries
Sources	Hospitals registers - maternity department (electronic sources)

C7.1.4A Percentage of elective caesareans

Computational level : Hospital

Considering the progressive rise of cesarean section rate in many countries, which is not associated with improvement in perinatal mortality or morbidity, the rationale of the indicator is to monitor the elective caesareans. This indicator expresses the percentage of deliveries performed with an elective caesarean section (all cases included). It is an observation indicator.

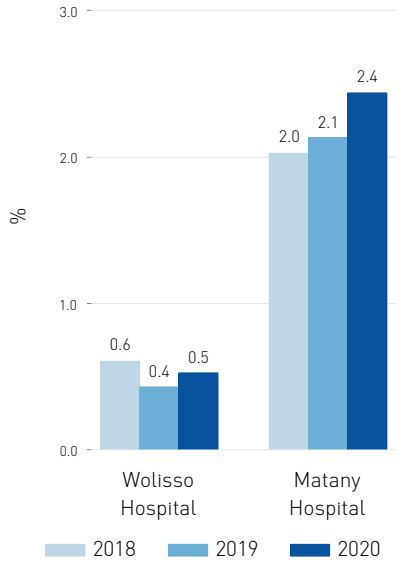


Numerator	Number of elective C-section deliveries (x100)
Denominator	Number of deliveries
Sources	Hospitals registers - maternity department (paper-based and electronic sources)

C7.2 Percentage of induced labours

Computational level : Hospital

Induction of labour is defined as the process of artificially stimulating the uterus to start labour. Induced labours should be used under specific medical indications only. However, the percentage of induced labours has been increasing in the last years in high income countries, as well as in some low- and middle-income countries. This indicator measures the induced labours on the total number of deliveries at hospital level and it is an observaton indicator.

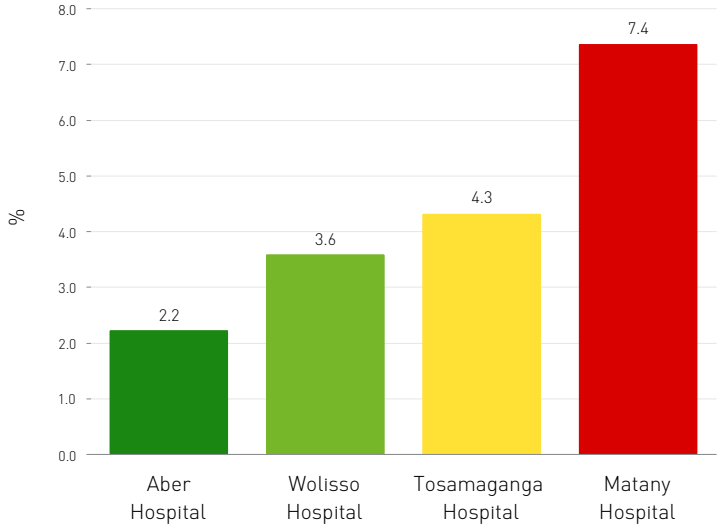


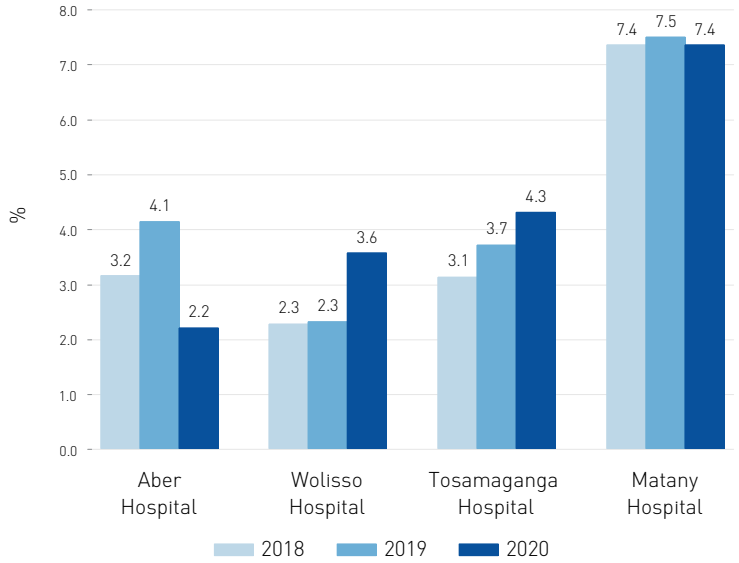
Numerator	Number of induced labours (x100)
Denominator	Number of deliveries
Sources	Hospitals registers - maternity department (paper-based and electronic sources)

C7.20A Percentage of peri-/intra-partum asphyxia

Computational level : Hospital

This indicator contributes to evaluate the services during the childbirth measuring the severe peri/intrapartum asphyxia. Birth asphyxia is caused by a lack of oxygen to organ systems due to a hypoxic or ischemic insult that occurs within close temporal proximity to labor (peripartum) and delivery (intrapartum). It is one of the primary causes of early neonatal mortality. The indicator refers to full-term births (>=37 weeks) with severe asphyxia or subject to hypothermia. In absence of a pre-defined standard, evaluation was performed starting from benchmarking data assessment.



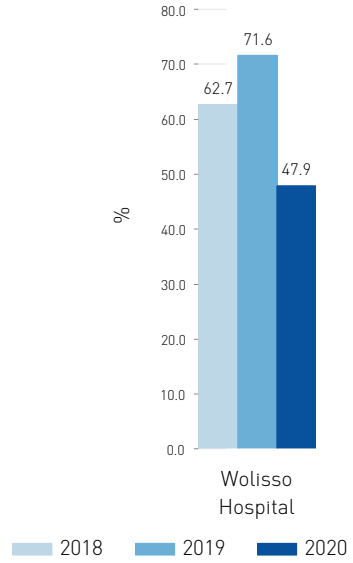


Numerator	Number of newborn children with a diagnosis of severe peri-/intra-partum asphyxia in NICU (Neonatal Intensive Care Unit) (x100)
Denominator	Number of newborn children
Sources	Hospitals paediatric registers (paper-based and electronic sources)

C7.3 Percentage of episiotomies (NTSV)

Computational level : Hospital

Episiotomy is a frequently used intervention during vaginal delivery. It has become a routine practice even without evidence of its effectiveness both in the short- and in the medium- and long-term. Indeed, according to the WHO policies, routine or liberal use of episiotomy is not recommended for women undergoing spontaneous vaginal birth. This indicator focuses only on nulliparous, term, singleton, vertex (NTSV) deliveries with episiotomies. It is an observaton indicator.

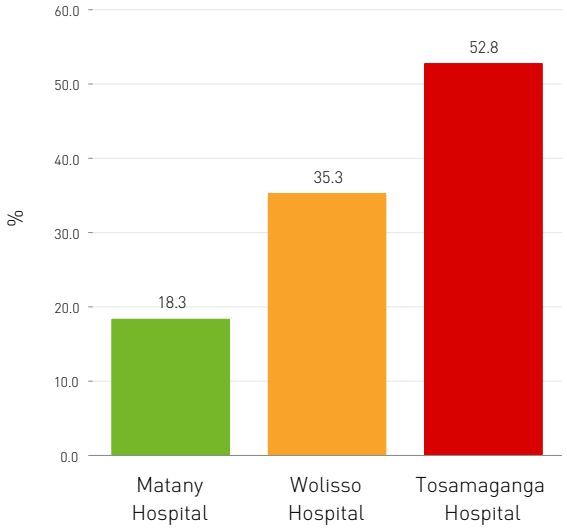


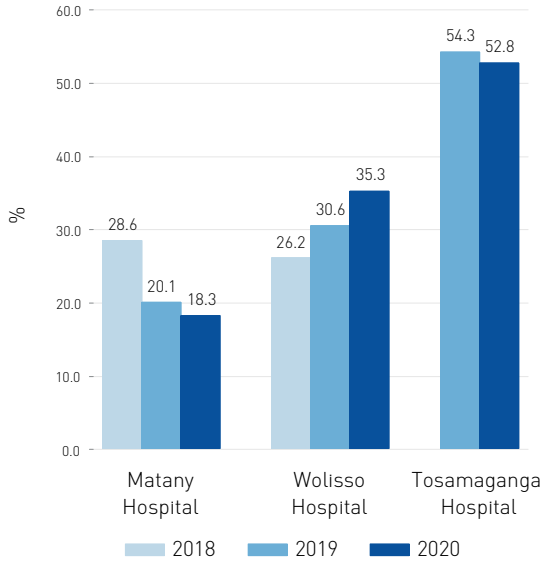
Numerator	Number of NTSV episiotomies performed (x100)
Denominator	Number of NTSV deliveries
Sources	Hospitals registers - maternity department (electronic sources)

C7.3A Percentage of episiotomies

Computational level : Hospital

Episiotomy is a frequently used interventions during vaginal delivery. It has become a routine practice even without evidence of its effectiveness both in the short, in the medium and long-term. Indeed, according to the WHO policies, routine or liberal use of episiotomy is not recommended for women undergoing spontaneous vaginal birth. This indicator expresses the percentage of episiotomies performed, when considering all the vaginal deliveries in the reference year at the hospital level. The standard of 12% was fixed based on the stardand emerging from the benchmarking in the IRPES Network.



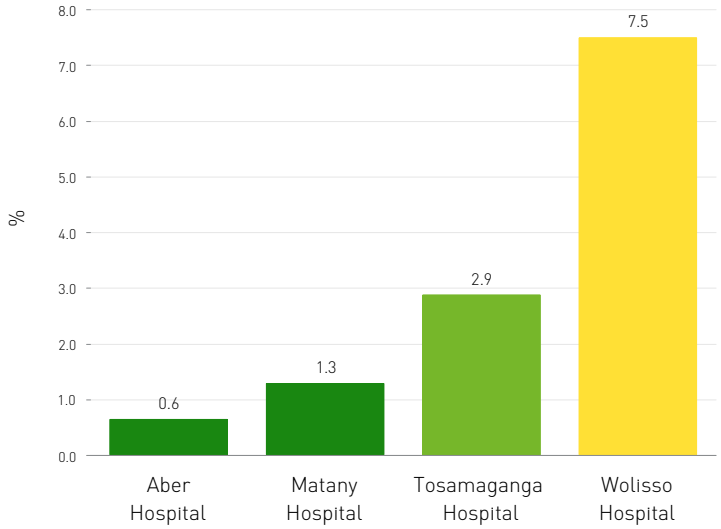


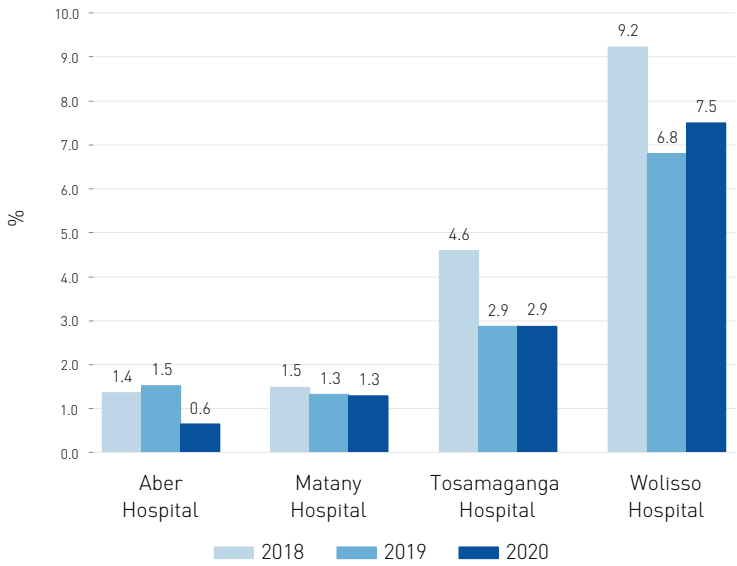
Numerator	Number of episiotomies performed for vaginal deliveries (x100)
Denominator	Number of vaginal deliveries
Sources	Hospitals registers - maternity department (paper-based and electronic sources)

C7.6 Percentage of assisted deliveries (forceps or ventouse)

Computational level : Hospital

Operative vaginal births refer to deliveries of the fetal head assisted either by vacuum extractor or by forceps. The indicator shows the percentage of vaginal assisted deliveries performed through the use of forceps or ventouse. It should be considered together with the percentage of caesarean births, in order to identify any possible correlation between a lower percentage of caesarean births and an increased use of operative deliveries. The standard of 2,5% was fixed based on the guidelines followed in the IRPES Network.



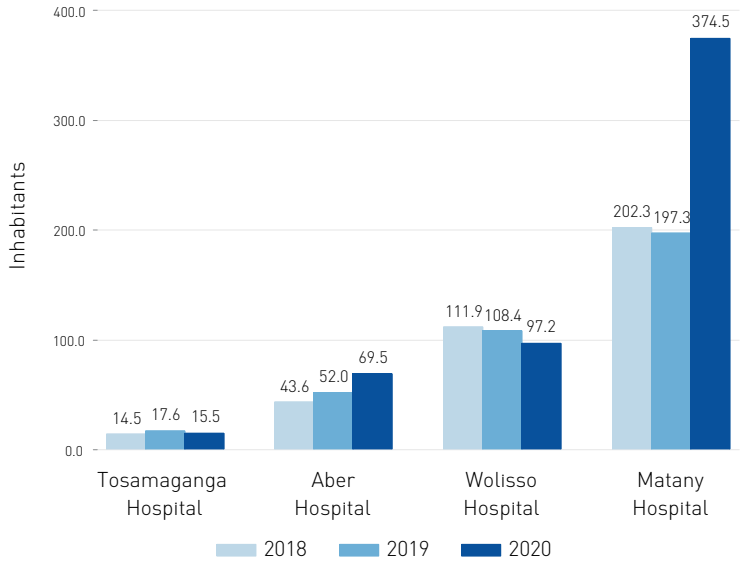


Numerator	Number of vaginal deliveries with forceps or ventouse (x100)
Denominator	Number of vaginal deliveries
Sources	Hospitals registers - maternity department (paper-based and electronic sources)

C7.7.1 Paediatric hospitalization rate (<1 year) , per 1.000 residents

Computational level : Hospital

The rationale of measuring hospitalization rate of children aged less than 1 year is to monitor how health organisations are able to answer to the children's health needs. In high income countries, the purpose is to keep hospitalizations low and prefer care at district level. In the areas of interest, this indicator may depend on the interconnectedness of a number of clinical, social and cultural factors peculiar of different contexts of analysis. For this reason it is an observation indicator.

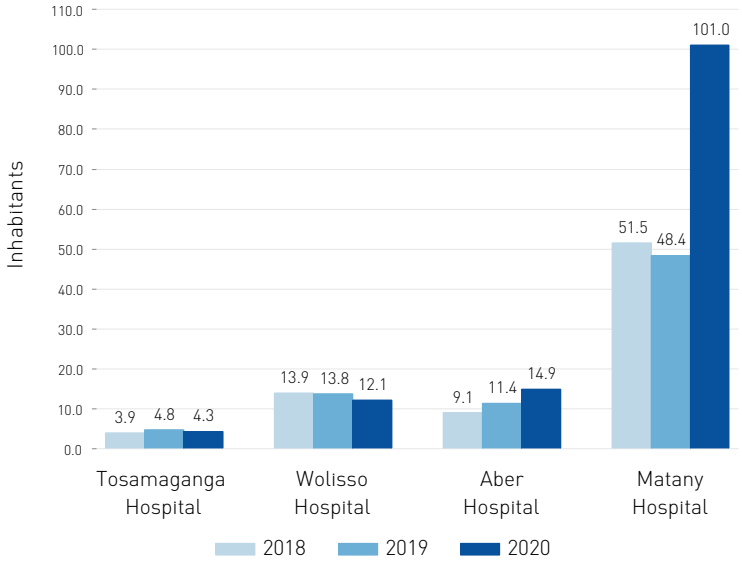


Numerator	Number of hospitalizations (< 1 year) (x1.000)
Denominator	Estimated resident population (<1 year)
Sources	Wolisso paediatric registers and Ethiopian HMIS/DHIS2 (electronic sources); Matany paediatric registers and Ugandan eHMIS/DHIS2 (electronic sources); Tosamaganga paediatric registers and Tanzanian DHIS2 (paper - based and electronic sources); Aber paediatric registers and Ugandan eHMIS/DHIS2 (paper - based and electronic sources)

C7.7A Paediatric hospitalization rate (<15 years), per 1.000 residents

Computational level : Hospital

The rationale of measuring hospitalization rate of children aged less than 12 year is to monitor how health organisations are able to answer to the children's health needs. In high -income countries, the purpose is to keep hospitalizations low and prefer care at district level. The hospitalization rate of children in paediatric age (from 0 to 12) is standardized by 1.000 inhabitants from the reference area. In the districts of interest, this indicator may depend on the interconnectedness of a number of clinical, social and cultural factors peculiar of different contexts of analysis. For this reason it is an observation indicator.

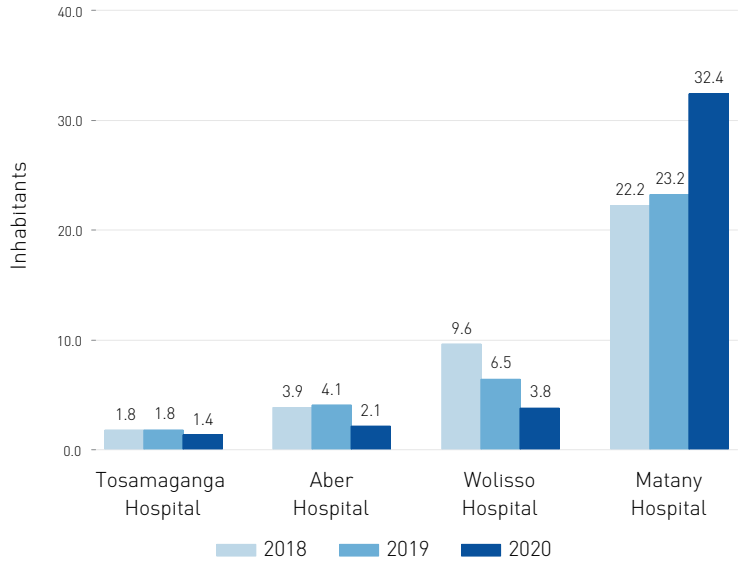


Numerator	Number of hospitalizations (<15 years) (x1.000)
Denominator	Estimated resident population (<15 years)
Sources	Wolisso paediatric registers and Ethiopian HMIS/DHIS2 (electronic sources); Matany paediatric registers and Ugandan eHMIS/DHIS2 (electronic sources); Tosamaganga paediatric registers and Tanzanian DHIS2 (paper - based and electronic sources); Aber paediatric registers and Ugandan eHMIS/DHIS2 (paper - based and electronic sources)

C7D.19.1A Paediatric hospitalization rate for ARI (0-5 years), per 1.000 residents

Computational level : Hospital

In low-income countries, acute respiratory infections (ARI) are an important cause of hospitalization of children younger than 5 years. The hospitalization rate of children aged from 0 to 5 years for ARIs may depend on the interconnectedness of a number of clinical, social and cultural factors peculiar of different contexts of analysis. This indicator is standardized by 1.000 inhabitants from the reference area and it is an observation indicator.

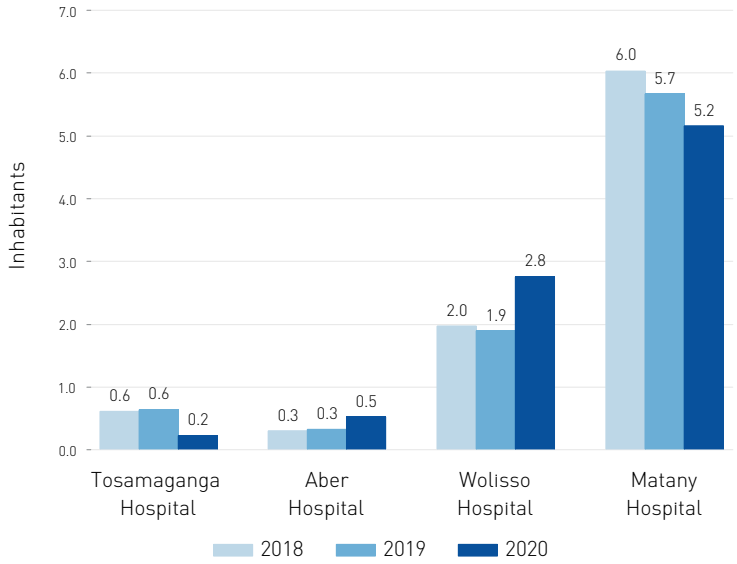


Numerator	Number of hospitalizations for ARI (0-5 years) (x1.000)
Denominator	Estimated resident population (<5 years)
Sources	Wolisso paediatric registers and Ethiopian HMIS/DHIS2 (electronic sources); Matany paediatric registers and Ugandan eHMIS/DHIS2 (electronic sources); Tosamaganga paediatric registers and Tanzanian DHIS2 (paper - based and electronic sources); Aber paediatric registers and Ugandan eHMIS/DHIS2 (paper - based and electronic sources)

C7D.19.2A Paediatric hospitalization rate for gastroenteritis (<15 years), per 1.000 residents

Computational level : Hospital

In low-income countries each year millions of children die because of acute gastroenteritis. Treatment at district level should be provided for these diseases and hospitalization is recommended for children who do not respond to oral rehydration therapy. The hospitalization rate of children aged less than 15 years for gastroenteritis may depend on the interconnectedness of a number of clinical, social and cultural factors peculiar of different contexts of analysis. This indicator is standardized by 1.000 inhabitants from the reference area. It is an observation indicator.

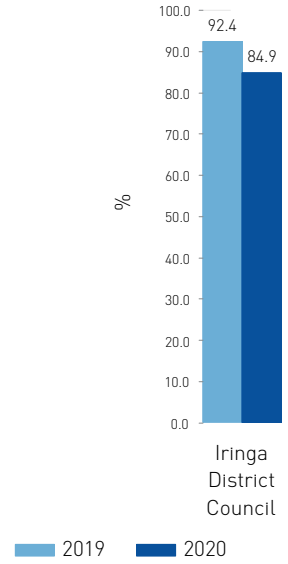


Numerator	Number of hospitalizations for gastroenteritis (<15 years) (x1.000)
Denominator	Estimated resident population (<15 years)
Sources	Wolisso paediatric registers and Ethiopian HMIS/DHIS2 (electronic sources); Matany paediatric registers and Ugandan eHMIS/DHIS2 (electronic sources); Tosamaganga paediatric registers and Tanzanian DHIS2 (paper - based and electronic sources); Aber paediatric registers and Ugandan eHMIS/DHIS2 (paper - based and electronic sources)

C7M.1 Percentage of mothers who received counselling on improving infant and young child feeding (IYCF) in the reporting period

Computational level : Residence

Proper feeding of infants and young children may increase their chances of survival. It may also promote optimal growth and development, especially in the critical window from birth to 2 years of age. It is crucial for mothers to be aware of the importance of breastfeeding practice and to have advice on combining breastfeeding with safe, age-appropriate feeding of solid, semi-solid and soft foods.

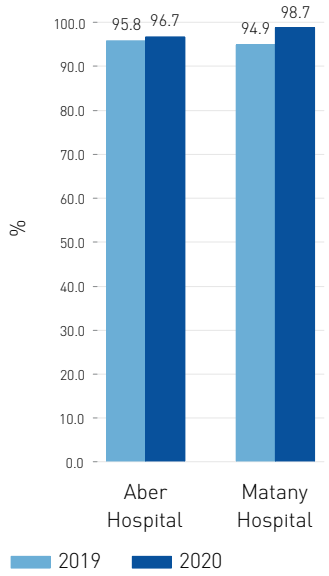


Numerator	Number of mothers who received counselling on IYCF in the reporting period (x100)
Denominator	Number of mothers of children 0-23 in the reference area
Sources	Tanzanian DHIS2

C7M.2 Percentage of women who have started breastfeeding within one hour (or by the end of discharge)

Computational level : Hospital

Early initiation of breastfeeding confers a host of benefits. Putting newborns to the breast necessitates skin-to-skin contact, and this closeness between mother and baby in the moments after delivery provides both short- and long-term benefits. Immediate skin-to-skin contact helps regulate the body temperature of newborns and allows their bodies to be populated with beneficial bacteria from their mother's skin. Putting babies to the breast within an hour of birth is strongly predictive of future exclusive breastfeeding. Children who are not put to the breast within the first hour after birth face a higher risk of common infections and death.

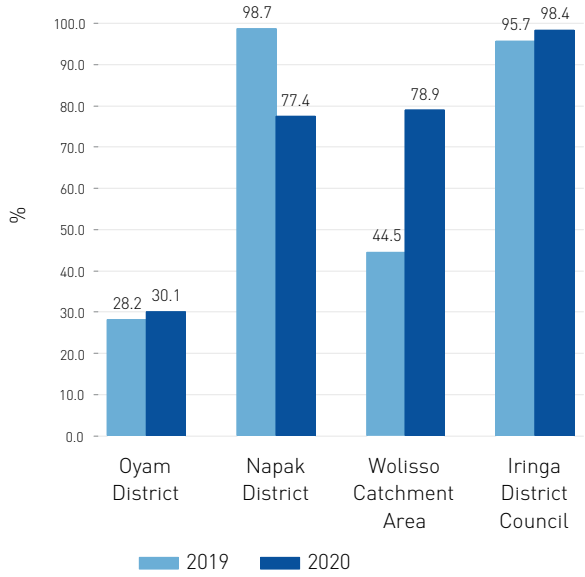


Numerator	Number of mothers who have started Breast Feeding within 1 hour (or by the end of discharge) (x100)
Denominator	Number of assisted deliveries
Sources	Matany registers - maternity department (electronic and paper-based sources), Aber - maternity department (electronic and paper-based sources)

C7M.3 Percentage of children aged 6-59 months received two doses of vitamin A supplementation

Computational level : Residence

Vitamin A is vital to child health and immune function. In settings where vitamin A deficiency is a public health problem, vitamin A supplementation is recommended in infants and children aged 6-59 months as a public health intervention to reduce child morbidity and mortality. Supplementation with vitamin A is a safe, cost-effective and efficient means for eliminating deficiency of this vitamin and improving child survival. Measuring the proportion of children who have received two doses of vitamin A within the past year can be used to monitor coverage of interventions aimed at increasing child survival rates.

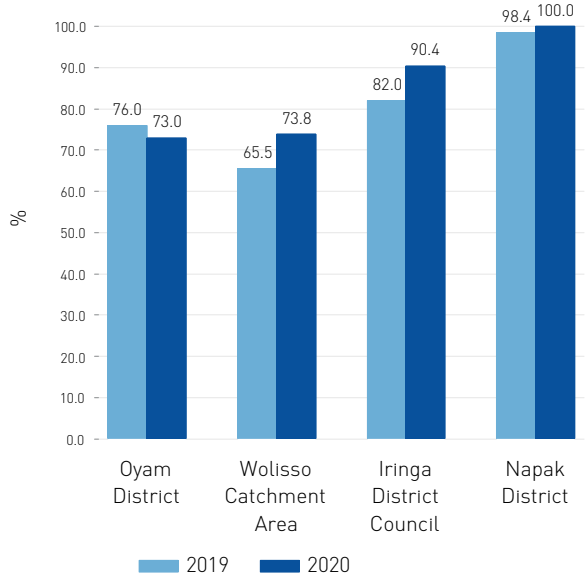


Numerator	Number of children aged 6-59 months who received two doses of vitamin A supplementation (x100)
Denominator	Total number of children aged 6-59 months
Sources	Ethiopian HMIS/DHIS2, Tanzanian DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

C7M.4 Percentage of pregnant women received any iron folic acid (IFA) in the reporting period

Computational level : Residence

This indicator measures the percentage of mothers receiving any IFA over the total number of ANC visits. Iron deficiency is a common nutrient deficiency and the resulting iron deficiency anemia is a major contributor to the global burden of disease. Anemia is a common problem among women of reproductive age, especially in low- and middle-income countries where low dietary intake of bioavailable iron combined with endemic infectious diseases such as helminthiasis puts women at increased risk in the preconception period. Low preconception hemoglobin and ferritin levels increase the risk of poor fetal growth and low birth weight. Anemia during pregnancy is associated with increased risks for maternal mortality, premature birth, and low birth weight.



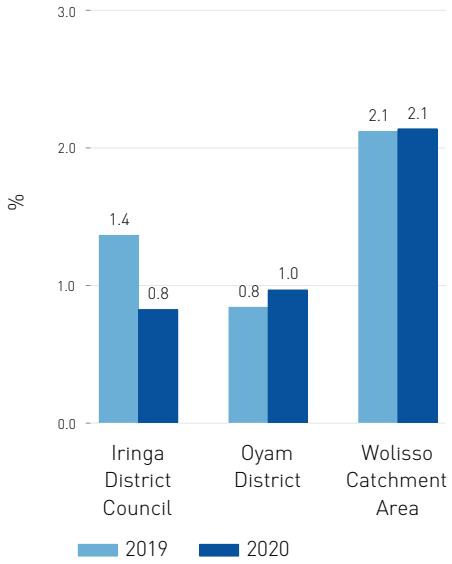
Numerator	**Number of pregnant women who have who received any IFA in the reporting period (x100)**
Denominator	**Total number of ANC visits***
Sources	**Ethiopian HMIS/DHIS2, Tanzanian DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)**

* With respect to Oyam and Napak districts, the denominator refers to the number of ANC first instead of total number of ANC visits since Ugandan DHIS2 collects only the number of pregnant women receiving at least 30 IFA during ANC first contact.

C7M.5 Percentage of children aged 6-59 months screened for malnutrition and identified with Moderate Acute Malnutrition (MAM)

Computational level : Residence

Wasting in children is a symptom of acute undernutrition, usually as a consequence of insufficient food intake or a high incidence of infectious diseases, especially diarrhoea. In turn, wasting impairs the functioning of the immune system and can lead to increased severity and duration of, and susceptibility to, infectious diseases, and an increased risk of death. Children with moderate acute malnutrition (MAM) if not identified timely, can progress into SAM. The main aim of screening programs for detecting malnourished children is to prevent mortality.

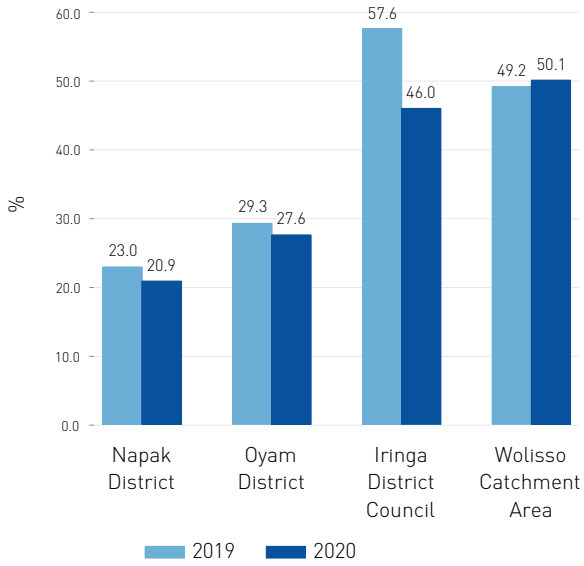


Numerator	Number of children aged 6-59 months screened for malnutrition and identified with MAM (x100)
Denominator	Total number of children aged 6-59 months in the reference area
Sources	Ethiopian HMIS/DHIS2, Tanzanian DHIS2 (electronic sources)

C7M.6 Percentage of complicated SAM amongst children aged 6-59 months treated in the Integrated Management of Acute Malnutrition (IMAM) programme

Computational level : Residence

IMAM is an integrated program to fight back against acute malnutrition. It is a nutritional program designed especially for children of 6-59 months of age and has four components: community outreach/mobilization; outpatient treatment of SAM without complication; in-patient treatment of SAM with complication; and management of moderate acute malnutrition. This indicator aims to measure the health system's ability to include children identified with SAM within the treatment program.

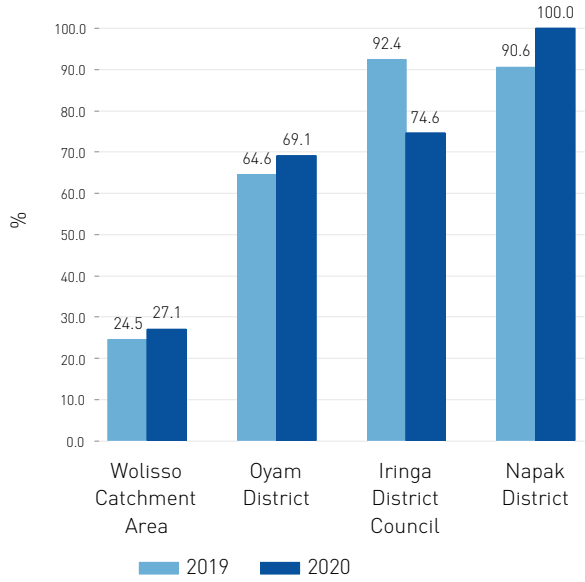


Numerator	Number of children aged 6-59 months with SAM admitted for treatment in the programme in the reporting period (x100)
Denominator	Total number of SAM patients aged 6-59 months (OTP + SC)
Sources	Ethiopian HMIS/DHIS2, Tanzanian DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

C7M.7 Percentage of children aged 6-59 months with SAM who were treated over expected cases in the reference area

Computational level : Residence

All patients with SAM as defined above should be admitted for therapeutic treatment in either an outpatient therapeutic programme (OTP) or Stabilization Centre (SC), depending on the presence or absence of medical complications and appetite. This indicator aims at measuring the health system's ability to reach and treat children with SAM in the targeted reference area based on the regional prevalence estimates available from the Demographic and Health Surveys.

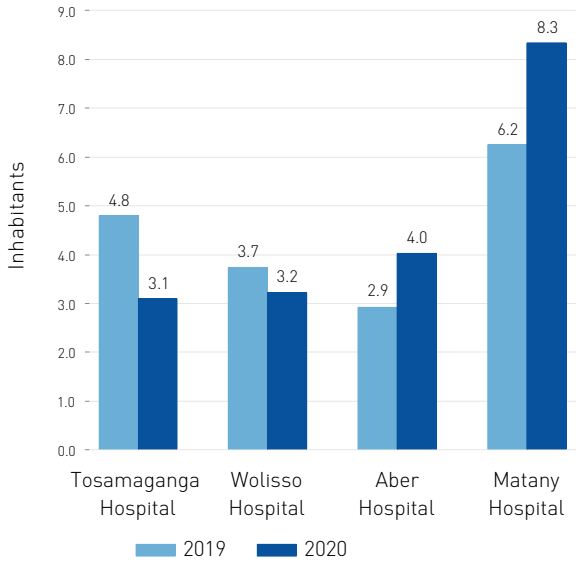


Numerator	Number of children aged 6-59 months with SAM admitted into outpatient therapeutic program (x100)
Denominator	Estimated number of children aged 6-59 months with SAM in the reference area
Sources	Ethiopian HMIS/DHIS2, Tanzanian DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

C7M.8 Hospitalization rate of children aged 6-59 months for SAM, per 1.000 inhabitants

Computational level : Hospital

Guidelines classify uncomplicated and complicated SAM according to the absence or presence of medical complications. Currently, only children with complications such as edema, lack of appetite, or infections are hospitalized for nutritional rehabilitation. The hospitalization rate is standardized by 1.000 inhabitants from the reference area and it may depend on the interconnectedness of a number of clinical, social and cultural factors peculiar of different contexts of analysis.

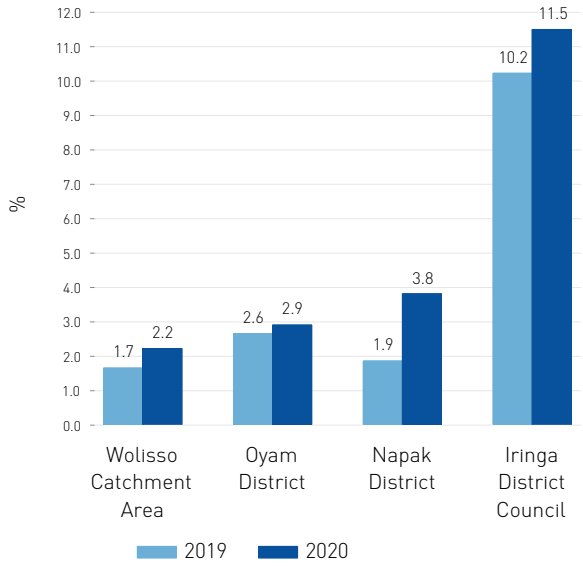


Numerator	Number of children aged 6-59 months admitted with SAM (x1.000)
Denominator	Total number of children aged 6-59 months in the reference area
Sources	Wolisso paediatric registers (electronic sources), Matany paediatric registers (electronic sources), Tosamaganga paediatric registers (paper - based and electronic sources), Aber paediatric registers (paper - based and electronic sources)

C7M.9 Percentage of deaths among SAM cases aged 6-59 months (Outpatient Therapeutic Programme + Stabilization Centre)

Computational level : Residence

It has been estimated that more than one-fourth of SAM deaths occur during hospitalization. Studies suggest that the possible causes for high mortality rate could be attributed to the severity of illness at presentation, comorbidities and faulty in management. This indicator is calculated to evaluate the percentage of deaths among patients with a diagnosis of SAM treated by the health system. It gives therefore an indication of the capacity and quality of care at hospital level where the complicate and severe cases are managed.

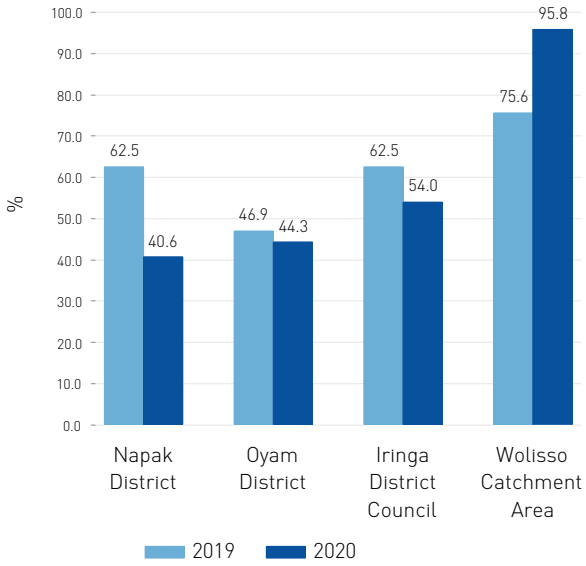


Numerator	Number of deaths among SAM cases aged 6-59 months (OTP + SC)
Denominator	Total number of SAM patients aged 6-59 months (OTP + SC)
Sources	Ethiopian HMIS/DHIS2, Tanzanian DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

C7M.10 Percentage of cured among SAM cases aged 6-59 months (Outpatient Therapeutic Programme + Stabilization Centre)

Computational level : Residence

This indicator shows the percentage of cured SAM patients over the total number of SAM patients under treatment. Patients are defined "cured" when the child has reached adequate anthropometric levels that SAM is no longer diagnosed.



Numerator	Number of cured among SAM cases aged 6-59 months (OTP + SC)
Denominator	Total number of SAM patients aged 6-59 months (OTP + SC)
Sources	Ethiopian HMIS/DHIS2, Tanzanian DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

INFECTIOUS DISEASES

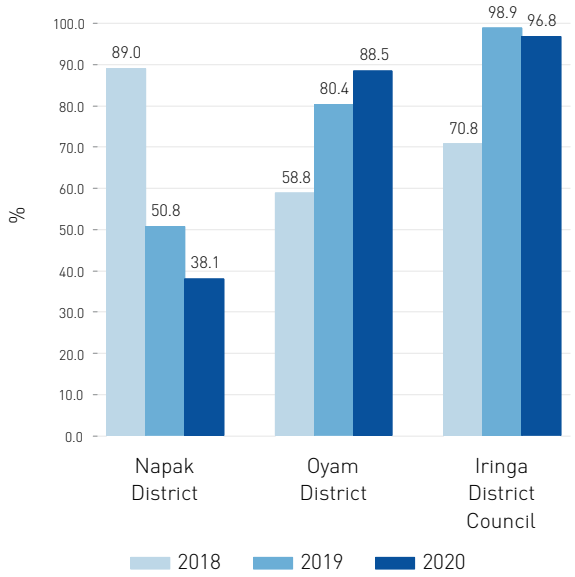
management sanità

DOCTORS WITH AFRICA CUAMM

IDPM01 Percentage of Long Lasting Insecticidal Nets (LLIN) distributed

Computational level : Residence

This indicator is an observation indicator. It expresses the percentage of ANC visits during which a LLIN was delivered to pregnant women for protection against malaria.

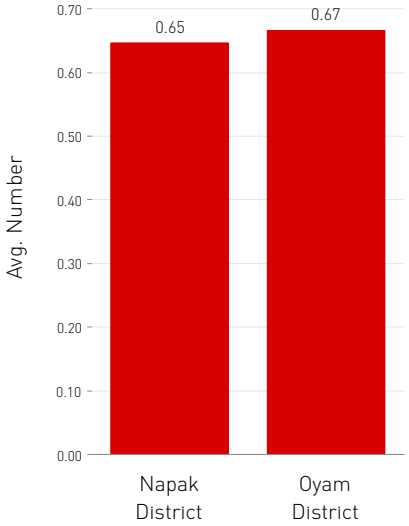


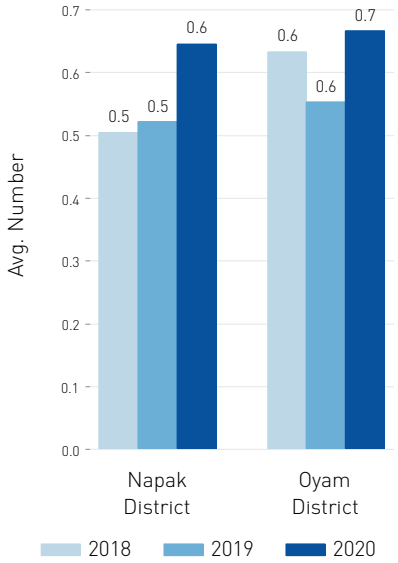
Numerator	LLINs distribuited (x100)
Denominator	Number of first ANC visits
Sources	Ugandan eHMIS/DHIS2 (electronic source)

IDPM02 Average number of sulfadoxine-pyrimethamine (SP) doses per ANC visit

Computational level : Residence

The indicator shows, in terms of average number, how many sulfadoxine-pyrimethamine (SP) doses were administered to pregnant women with respect to the total number of ANC visits in the reference area. The standard of 3 doses per expected delivery was fixed based on the WHO guidelines.



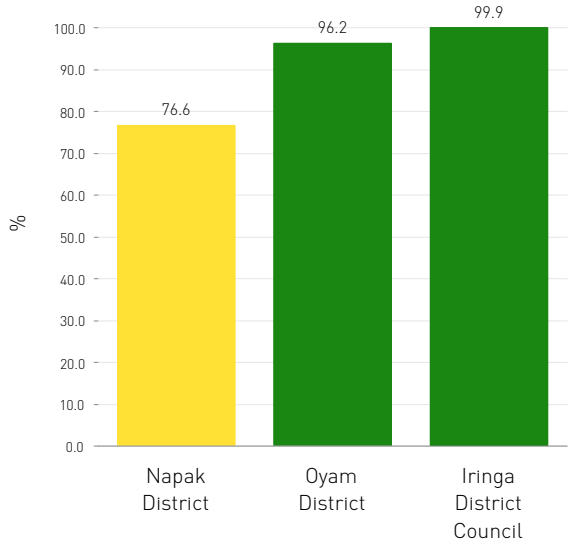


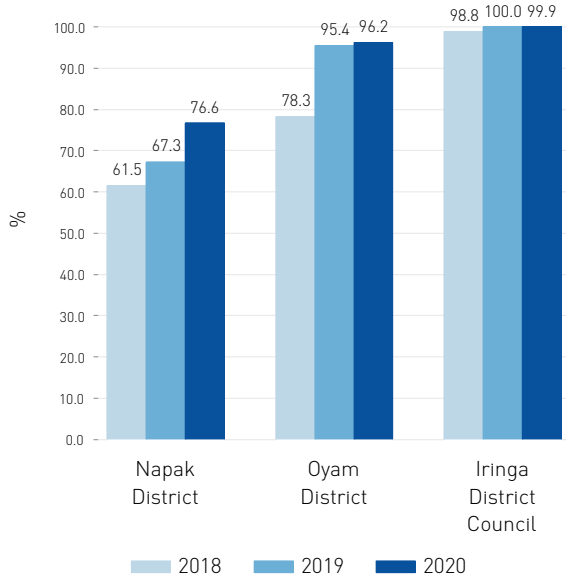
Numerator	Number of SP doses
Denominator	Number of total ANC visits
Sources	Ugandan eHMIS/DHIS2 (electronic source)

IDPM03 Percentage of confirmed malaria cases (BS+RDT)

Computational level : Residence

This indicator measures the percentage of malaria cases that were confirmed following the blood smear (BS) on a microscope slide and rapid diagnostic testing (RDT) examinations with respect of the total number of diagnosis of malaria cases. The standard of 90% was fixed based on the WHO standard.



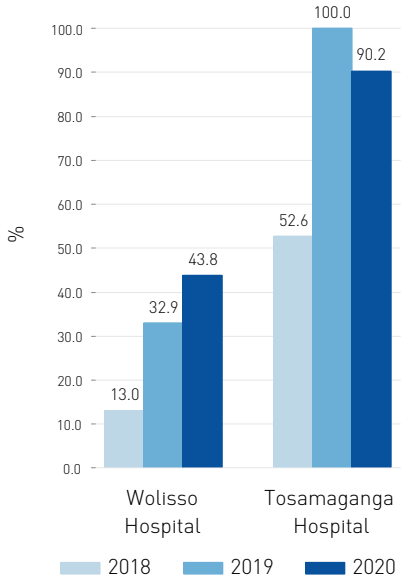


Numerator	Malaria cases confirmed (BS+RDT) (x100)
Denominator	Total number of diagnosis of malaria cases
Sources	Tanzanian DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

IDPM04 Percentage of discharges for severe malaria

Computational level : Hospital

This indicator is an observation indicator at the hospital level. It provides the percentage of the total number of discharged patients with a diagnosis of severe malaria over the total number of patients discharged with a diagnosis of malaria. However, the indicator may depend on how severe malaria is defined and on the possibility to capture it correctly from the HIMS system, without mixing severe with non severe cases.

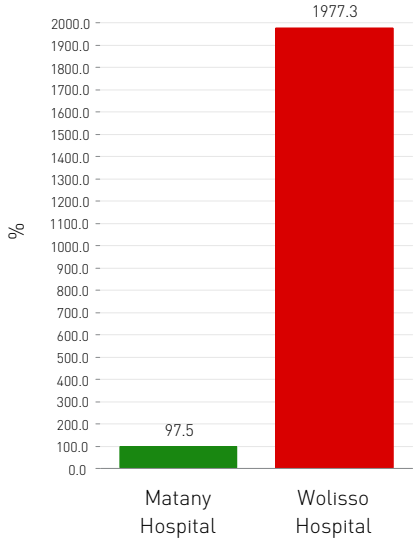


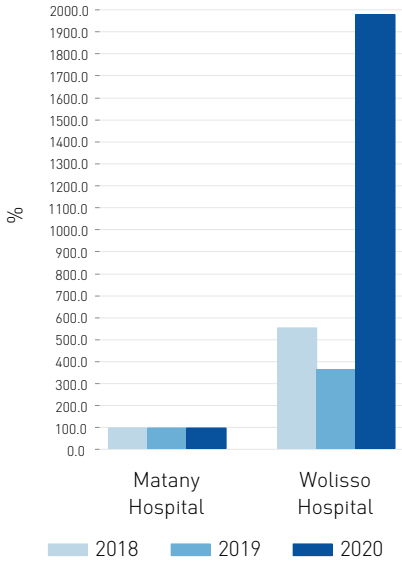
Numerator	Number of discharged with a diagnosis of severe malaria (x100)
Denominator	Number of patients discharged with malaria
Sources	Hospitals registers - medical departments (electronic sources)

IDPM05 Percentage of treatments with ACT*

Computational level : Hospital

This indicator shows the percentage of patients treated with artemisinin-based combination therapy (ACT) over the total number of cases affected by malaria at the hospital level both in inpatient and outpatient deparments (IPD and OPD). The indicator plays a crucial role in defining the appropriateness of the treatment and helps identify problems of over/under treatment. The standard of 90% was fixed based on the WHO standard.





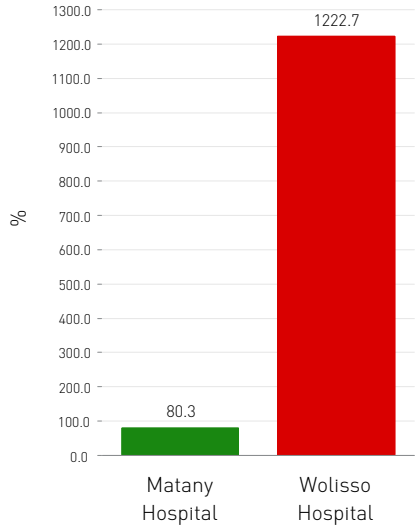
Numerator	Number of treatments with ACT (x100)
Denominator	Total number of malaria cases
Sources	Hospitals registers - medical departments (electronic sources)

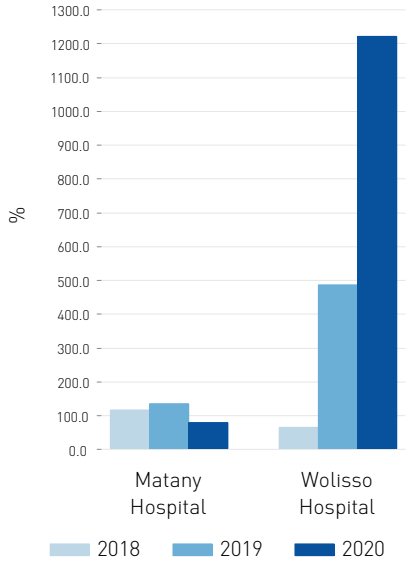
* With respect to Wolisso Hospital, it is worth noticing that this indicator shows a very high discrepancy among the number of tratments with ACT and number of diagnoses of malaria. The number has been verified and we confirm that it is correct.

IDPM06 Percentage of IV/IM (parenteral artesunate or Quinine) treatments*

Computational level : Hospital

This indicator shows the percentage of patients treated with intravenous artesunate/parenteral quinine treatments over the total number of cases affected by malaria at the hospital level. The indicator plays a crucial role in defining the appropriateness of the treatment and helps identify problems of over/under treatment. The standard of 90% was fixed based on the WHO standard.





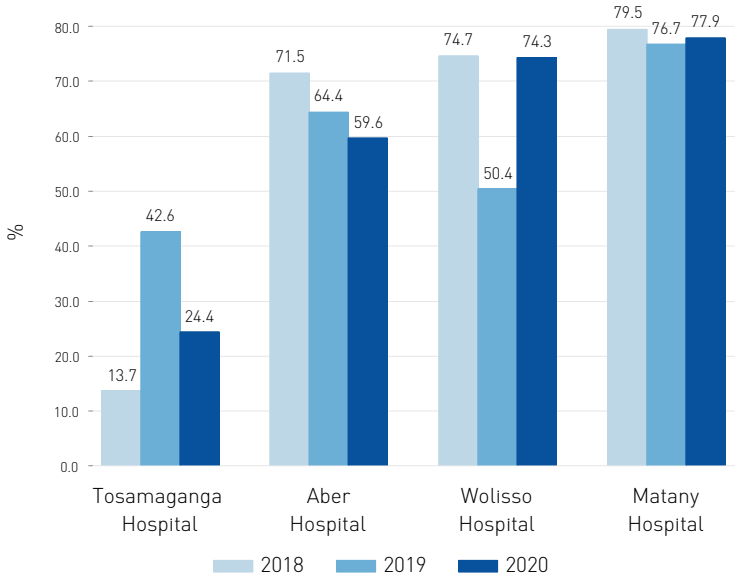
Numerator	**Number of intravenous artesunate/parenteral quinine treatments (x100)**
Denominator	**Number of discharged patients with confirmed malaria**
Sources	**Hospitals registers - medical departments (electronic sources)**

* With respect to Wolisso Hospital, it is worth noticing that this indicator shows a very high discrepancy among the number of IV/IM tratments and number of discharged patients with confirmed malaria. The number has been verified and we confirm that it is correct.

IDPM07 Percentage of malaria cases (< 5 years)

Computational level : Hospital

This indicator is an observation indicator at the hospital level. It gives the percentage of malaria cases in children aged less than five years over the total number of malaria inpatients. This indicator can be considered as a proxy of indication of endemic/ or epidemic situation of malaria in the reference area. If the situation is endemic, children are more affected than adults; this difference decreases if the situation is epidemic.

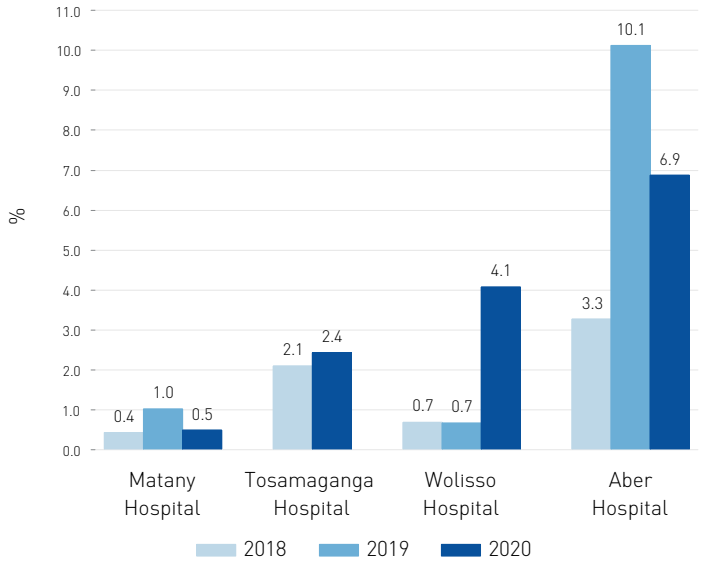


Numerator	Number of inpatients with malaria (children < 5 years) (x100)
Denominator	Number of inpatients with malaria
Sources	Hospitals registers - medical departments (electronic sources)

IDPM08 Percentage of deaths for malaria

Computational level : Hospital

This indicator is an observation indicator at the hospital level. It gives the percentage of deaths due to malaria over the total number of discharges for malaria.

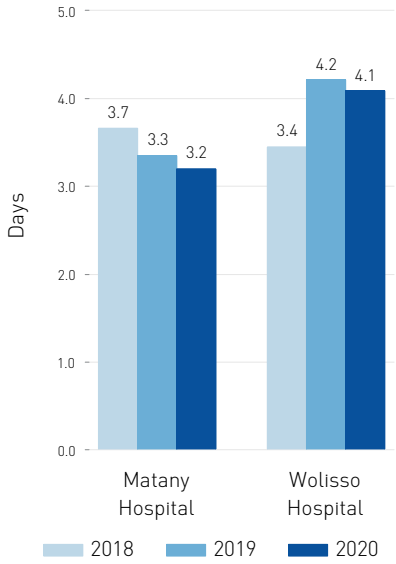


Numerator	Number of deaths with malaria (all ages) (x100)
Denominator	Number of discharged patients for malaria
Sources	Hospitals registers - medical departments (electronic sources); Tanzanian DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

IDPM09 ALOS (malaria cases)

Computational level : Hospital

This indicator is an observation indicator at the hospital level. It provides a view of the average lenght of stay (ALOS) in hospital due to malaria. The indiator can be a proxy of severity of malaria cases treated at hospital level and, if compared with the percentage of severe malaria treated patients (indicator IDPM04), it can raise questions about the appropriateness of the defintion of severe malaria.

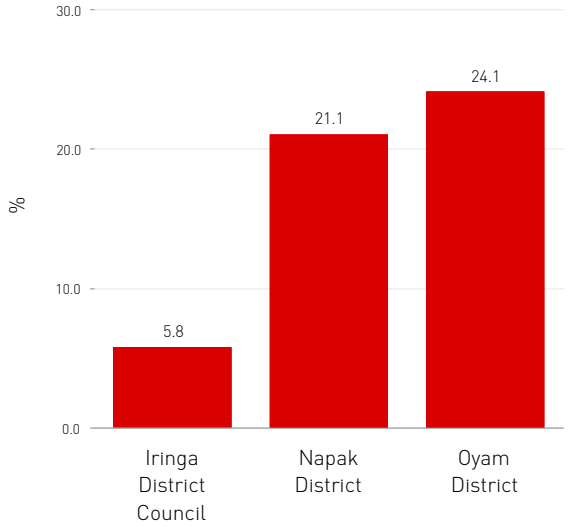


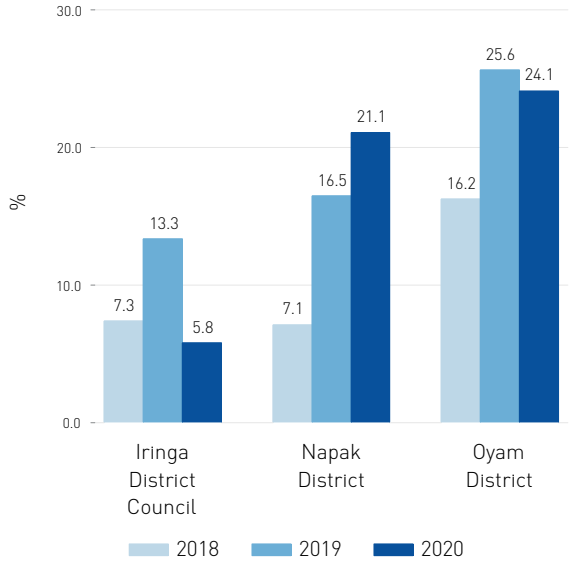
Numerator	Number of inpatient days for malaria
Denominator	Number of inpatients for malaria
Sources	Hospitals registers - medical departments (electronic sources)

IDPT01 Percentage of treatments with isoniazide (IPT)

Computational level : Residence

The indicator shows the percentage of isoniazide preventive therapy (IPT) in children aged less than five years. It represents a proxy of the ability of the system to perform contact tracing at the residence level, identifying patients eligible for prophylaxis as well as the possible infected ones, thus reducing the spreading of the disease. The standard of 90% was fixed based on the WHO standard.



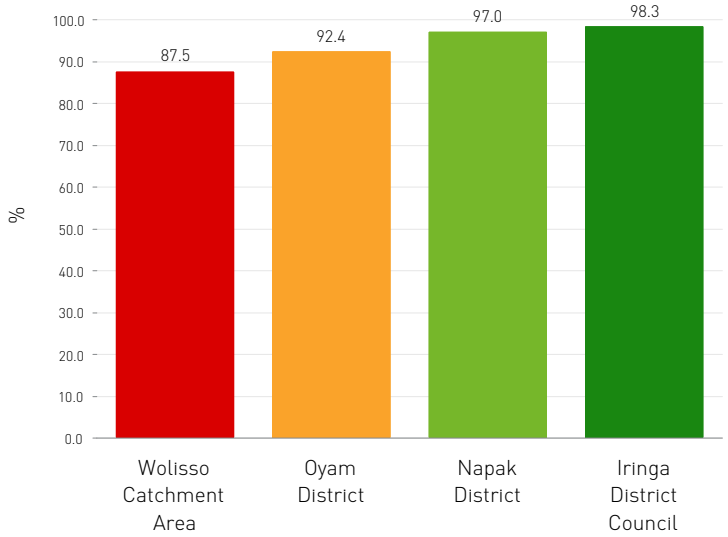


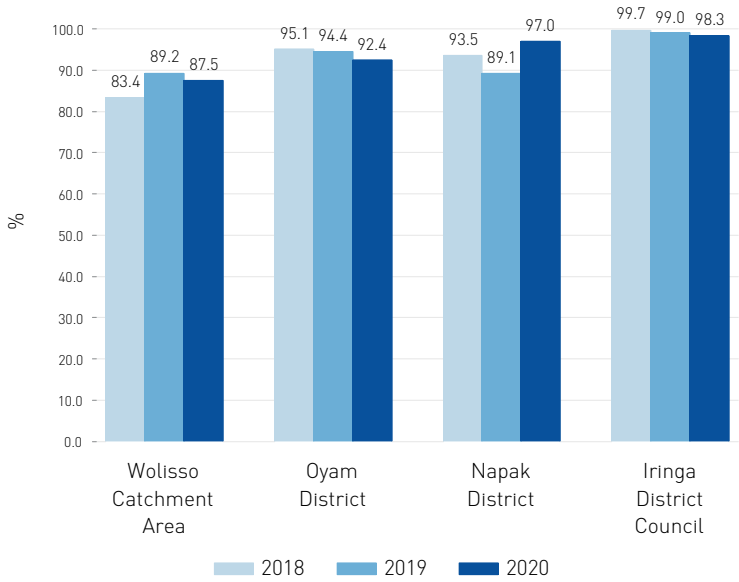
Numerator	Number of treatments with isoniazide (IPT) (x100)
Denominator	Total number of eligible treatments
Sources	Tanzanian ETL/DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

IDPT02 Percentage of TB cases undergoing the HIV screening

Computational level : Residence

This indicator expresses the percentage of TB patients who underwent an HIV screening during the reference year over the total number of patients diagnosed with TB in the reference area. The standard of 98% was fixed based on the WHO standard.



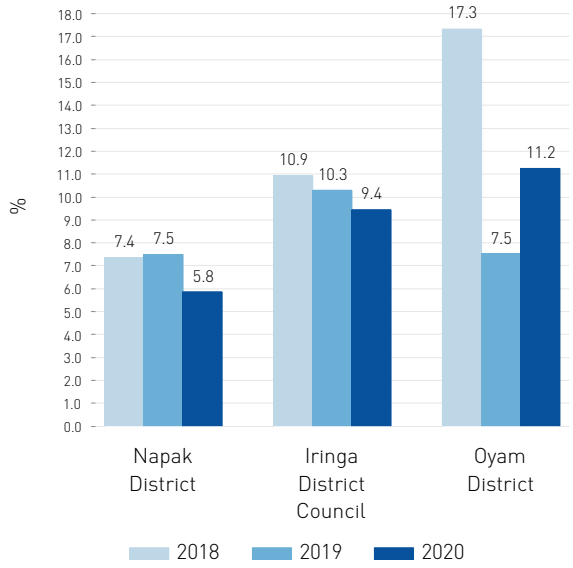


Numerator	Number of TB cases undergoing the HIV screening (x100)
Denominator	Number of TB diagnosed patients
Sources	Ethiopian HMIS/DHIS2, Tanzanian ETL/DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

IDPT03 Percentage of positive TB cases on number of tests

Computational level : Residence

This is an observation indicator at the residence level. It shows the percentage of positive diagnoses of TB confirmed through lab tests or Xperts with respect to the total number of tests performed over presumptive cases. It gives an indication of the capability of selecting potential positive cases and, consequently, it helps evaluate the quality of the laboratory processes.

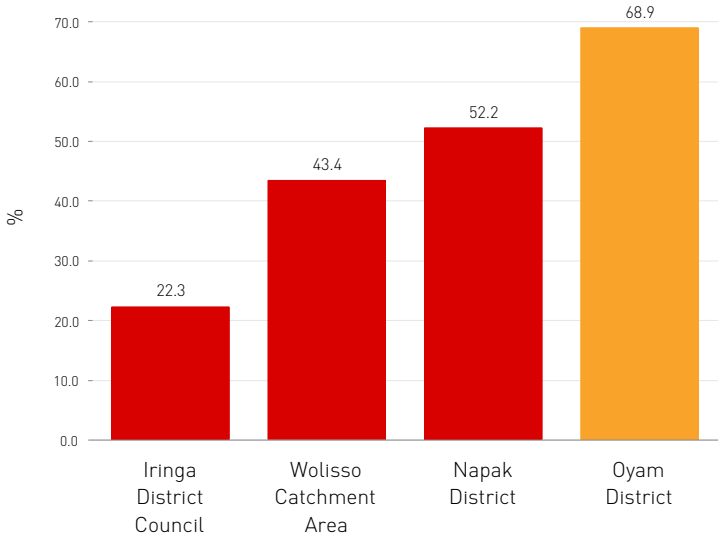


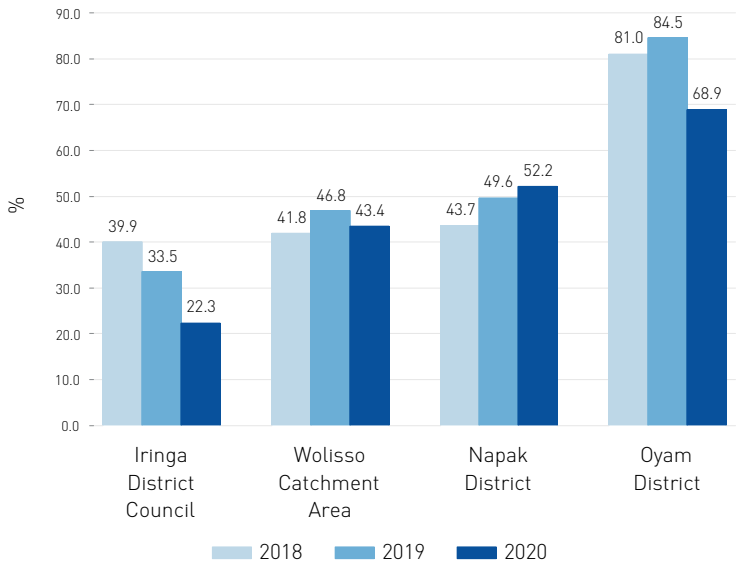
Numerator	Number of positive TB cases (confirmed by lab tests or Xpert) (x100)
Denominator	Number of tests (presumptive cases)
Sources	Tanzanian ETL/DHIS2, Ugandan eHMIS/DHIS2 (electronic sources) and WHO global tuberculosis reports

IDPT04 Percentage of confirmed TB cases on diagnosed cases

Computational level : Residence

This indicator expresses the percentage of bacteriologically confirmed polmunary TB patients (PTB) over the total number of patients diagnosed with TB in the reference year. The standard of 80% was fixed based on the WHO standard.



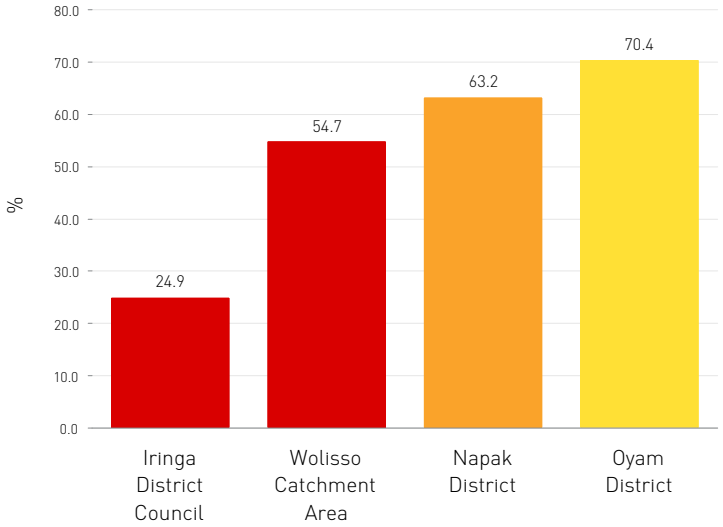


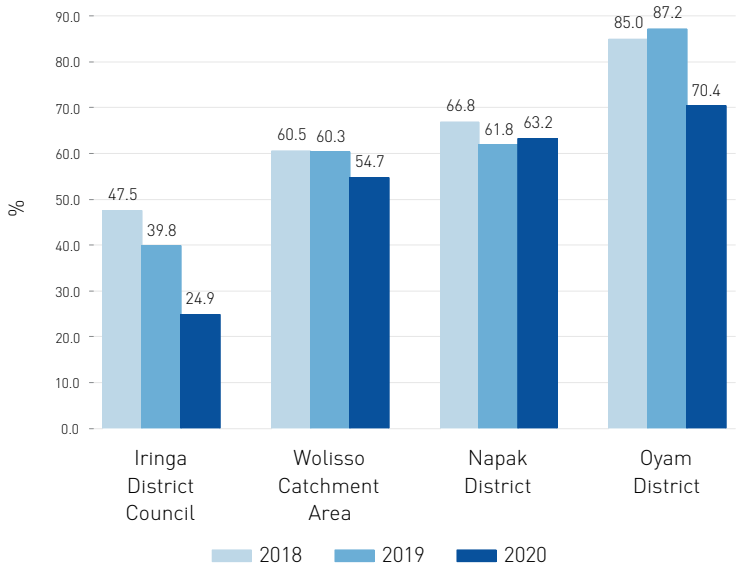
Numerator	Number of positive PTB cases (bacteriologically confirmed) (x100)
Denominator	Number of TB diagnosed patients
Sources	Hospitals registers - laboratory departments (electronic and paper-based sources)

IDPT05 Percentage of confirmed PTB

Computational level : Residence

This indicator expresses the percentage of bacteriologically confirmed polmunary TB patients (PTB) over the PTB cases in the reference year. It evaluates the diagnostic capacity, including the diagnosis of other pulmonary conditions in addition to TB. The standard of 90% was fixed based on the WHO standard.



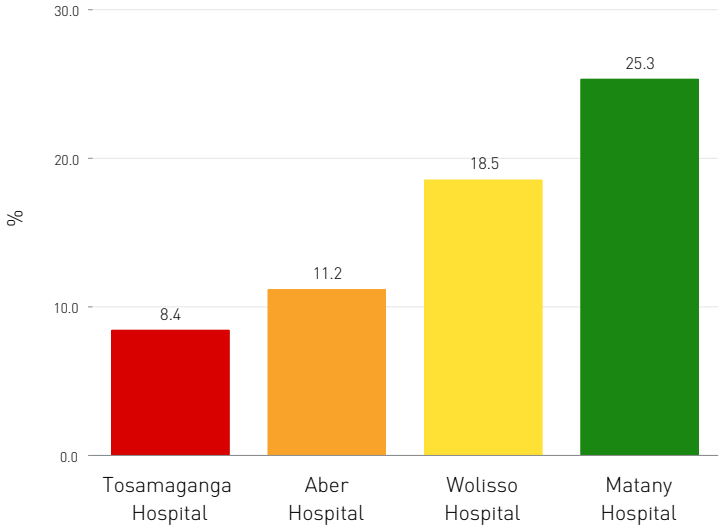


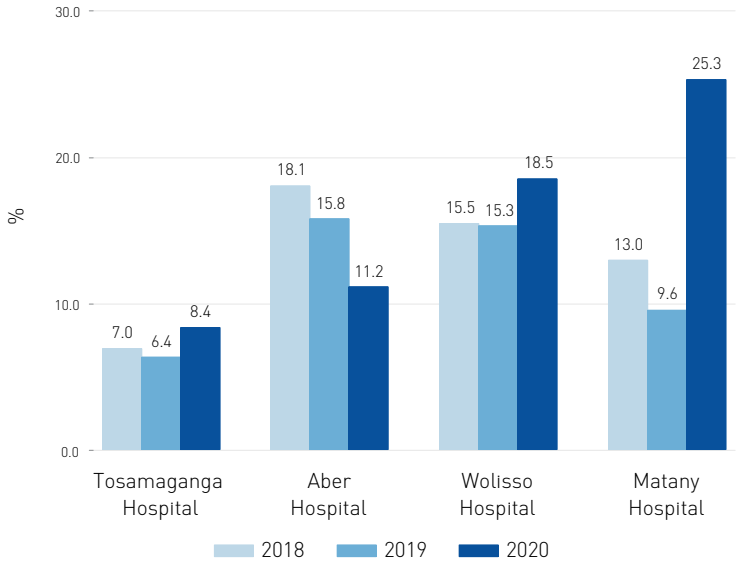
Numerator	Number of positive PTB cases (bacteriologically confirmed) (x100)
Denominator	Number of PTB cases
Sources	Ethiopian HMIS/DHIS2, Tanzanian ETL/DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

IDPT06 Percentage of positive Xpert cases

Computational level : Hospital

This indicator expresses the percentage of positive Xpert cases over the total number of Xpert examinations performed in the reference year. It is related to the utilization of Xpert in an efficient way. Xpert has to be used only according to strict indications in order to get the appropriate measures of positive cases. The standard of 25% was fixed based on the WHO standard.



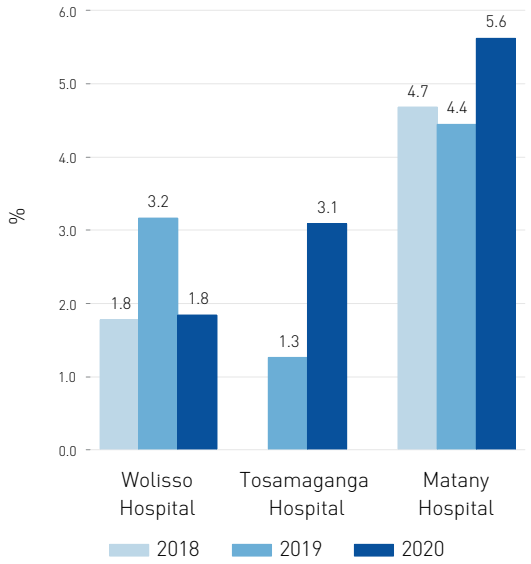


Numerator	Numer of positive Xpert cases (x100)
Denominator	Number of Xpert cases
Sources	Hospitals registers - laboratory departments (electronic and paper-based sources)

IDPT06.1 Percentage of positive Xpert RR

Computational level : Hospital

This is an observation indicator at the residence level. It shows the percentage of positive Xpert rifampicin-resistance (RR) over the total number of positive TB cases diagnosed with Xpert.

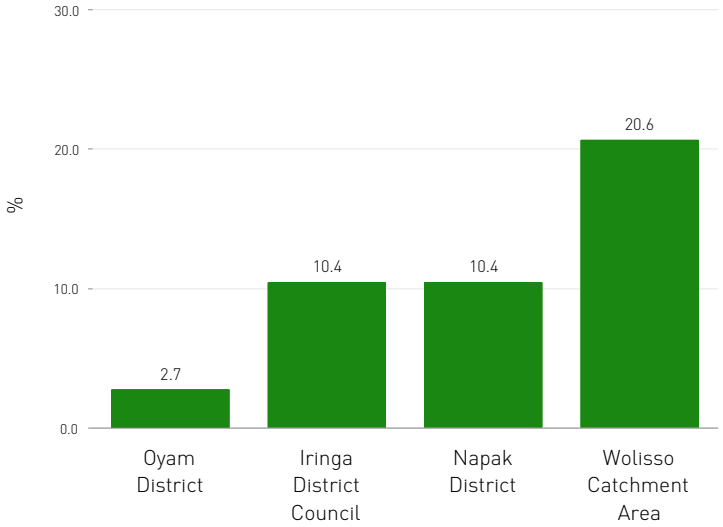


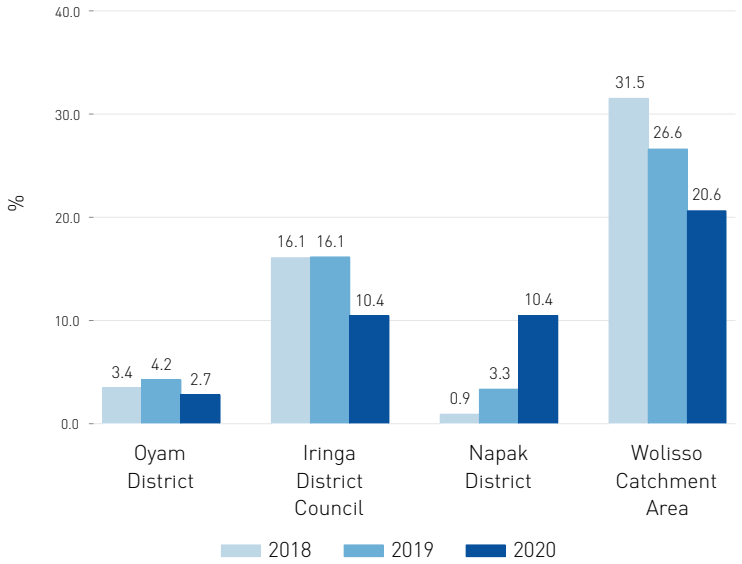
Numerator	Number of positive Xpert RR (x100)
Denominator	Number of positive Xpert
Sources	Hospitals registers - laboratory departments (electronic and paper-based sources)

IDPT07 Percentage of treatments for extrapulmunary TB

Computational level : Residence

The indicator expresses the percentage of patients treated for extra-pulmonary TB (EPTB) over the total number of TB diagnoses in the reference year at the residence level. It gives an evaluation of the diagnostic capacity and it helps diagnose other conditions in addition to extrapulmonary TB. The standard of 22,5% was fixed based on the WHO indications according to local epidemiological context analysis.



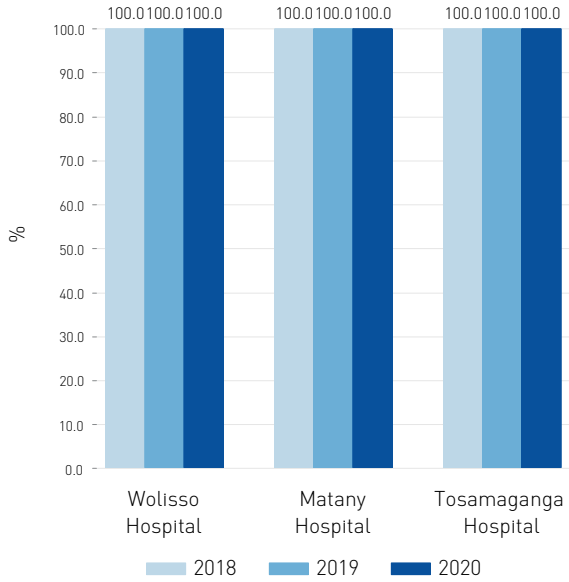


Numerator	Number of treatments “initiated” for extrapolmunary TB (x100)
Denominator	Number of TB diagnoses
Sources	Ethiopian HMIS/DHIS2, Tanzanian ETL/DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

IDPT08 Percentage of PTB MDR initiated treatments

Computational level : Hospital

This indicator is an observation indicator at the hospital level. It is calculated as the ratio between the number of multidrug-resistant (MDR) initiated treatments and the number of multidrug-resistant (MDR) diagnoses.

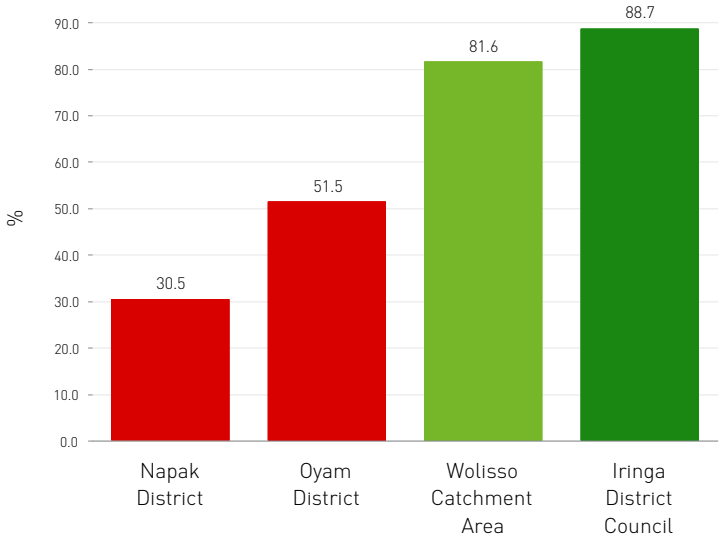


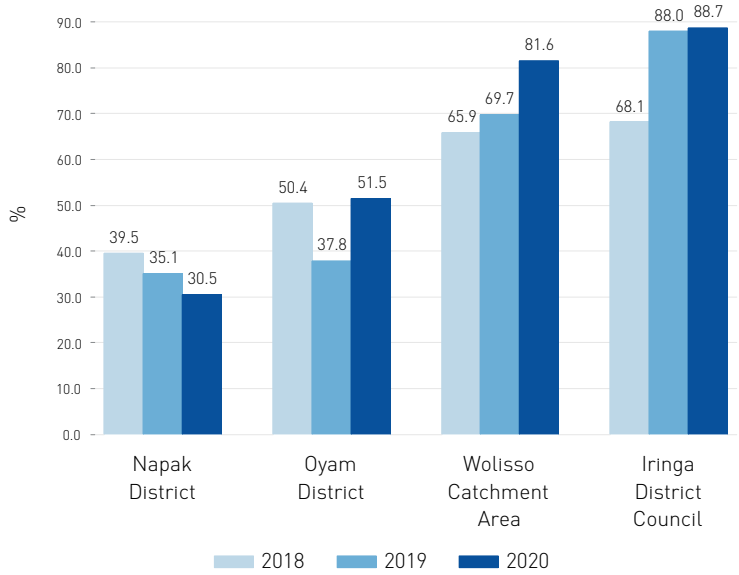
Numerator	Number of MDR initiated treatments (x100)
Denominator	Number of MDR TB diagnoses
Sources	Hospitals registers - laboratory departments (electronic and paper-based sources)

IDPT09 Percentage of TB cured patients

Computational level : Residence

This indicator shows the percentage of cured TB patients under treatment over the total number of bacteriologically confirmed polmunary TB patients. Patients are defined "cured" when they are negative for two times consequently in three months. The standard of 85% was fixed based on the WHO guidelines.



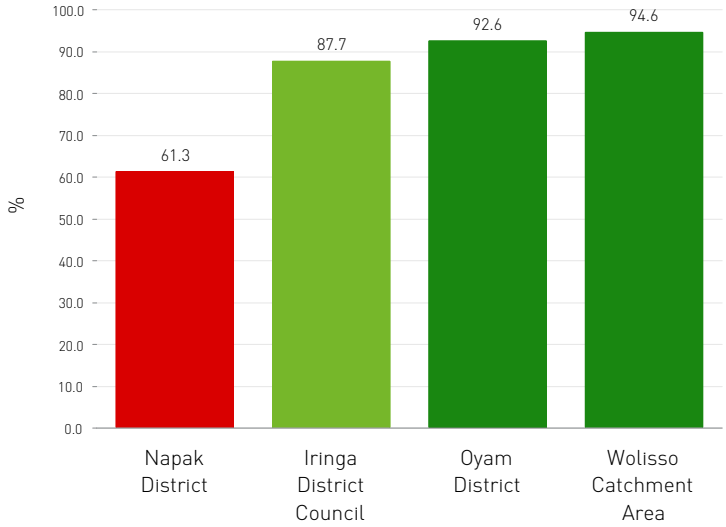


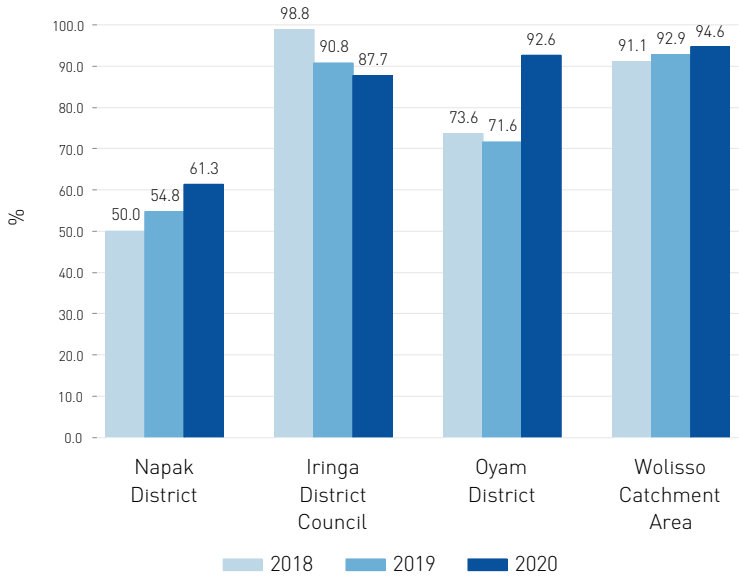
Numerator	Number of cured patients (x100)
Denominator	Number of PTB+ (bacteriologically confirmed)
Sources	Ethiopian HMIS/DHIS2, Tanzanian ETL/DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

IDPT10 Percentage of TB treatment success

Computational level : Residence

This indicator shows the percentage of TB patients who completed the treatment in the reference period over the total number of TB patients under treatment. The standard of 90% was fixed based on the WHO guidelines.



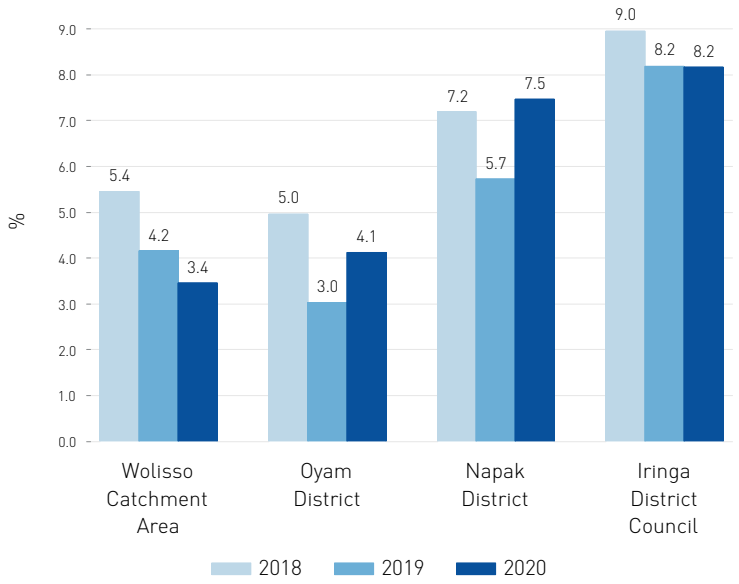


Numerator	Number of completed treatments (x100)
Denominator	Number of treated cases
Sources	Ethiopian HMIS/DHIS2, Tanzanian ETL/DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

IDPT11 Percentage of TB deaths

Computational level : Residence

This indicator is an observation indicator at the residential level. It expresses the percentage of TB patients who died in the reference year over the total number of TB patients under treatment.

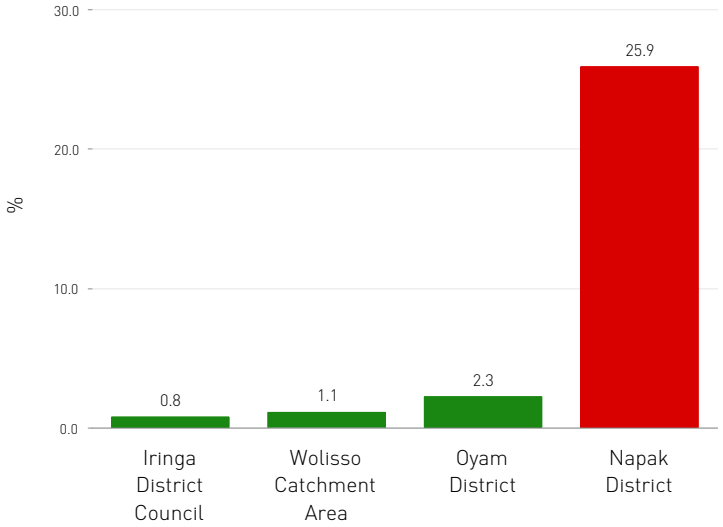


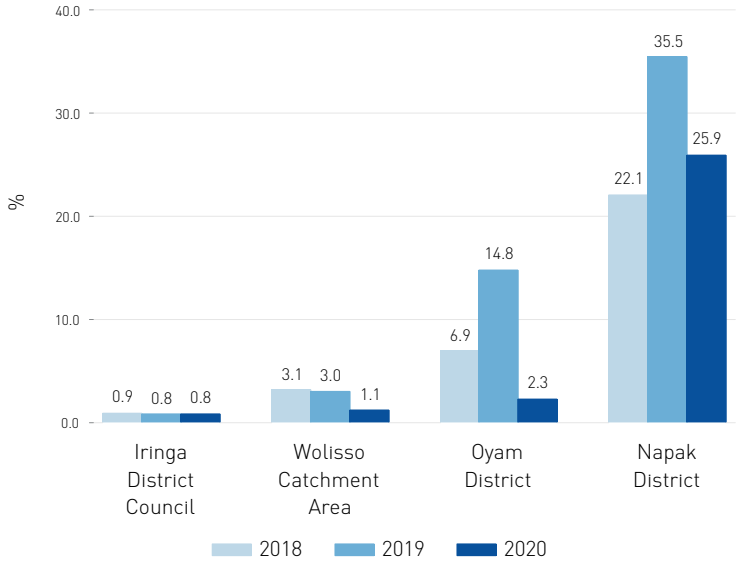
Numerator	Number of deaths (x100)
Denominator	Number of treated cases
Sources	Ethiopian HMIS/DHIS2, Tanzanian ETL/DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

IDPT12 Percentage of TB interrupted treatments

Computational level : Residence

This indicator gives the percentage of TB patients who interruprted the treatment in the reference year (all causes included) over the total number of TB patients under treatment. The standard of 2,5% was fixed based on the WHO guidelines.



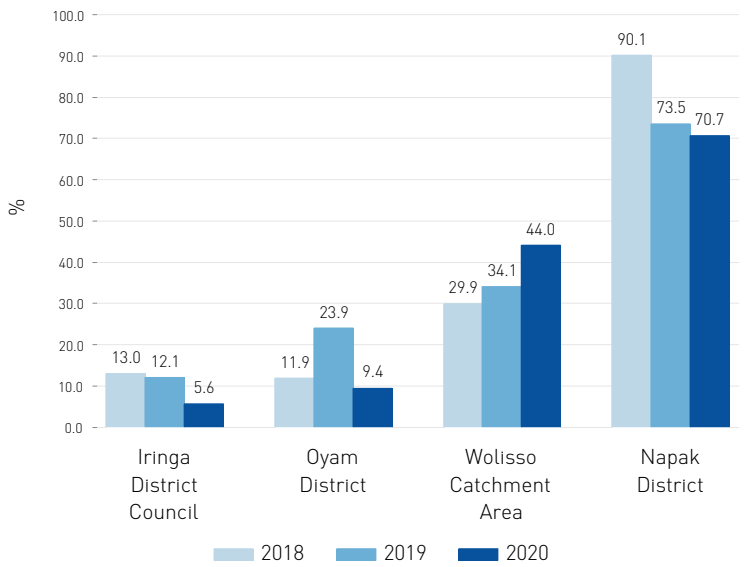


Numerator	Number of interrupted treatments (x100)
Denominator	Number of treated cases
Sources	Ethiopian HMIS/DHIS2, Tanzanian ETL/DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

IDPT13 Percentage of admitted patients due to TB

Computational level : Residence

This indicator is an observation indicator at the hospital level and it shows the percentage of TB patients who were admitted in the reference hospital in the reference year. It gives an idea of the relevance of the hospital in terms of overall diagnostic capacity of the health system.

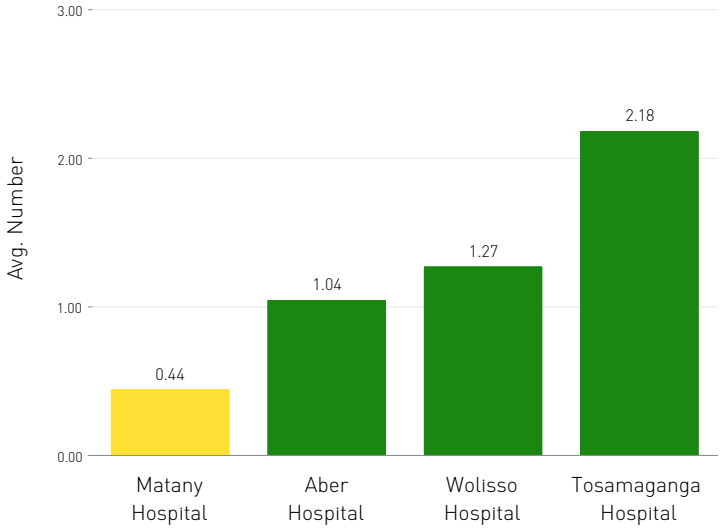


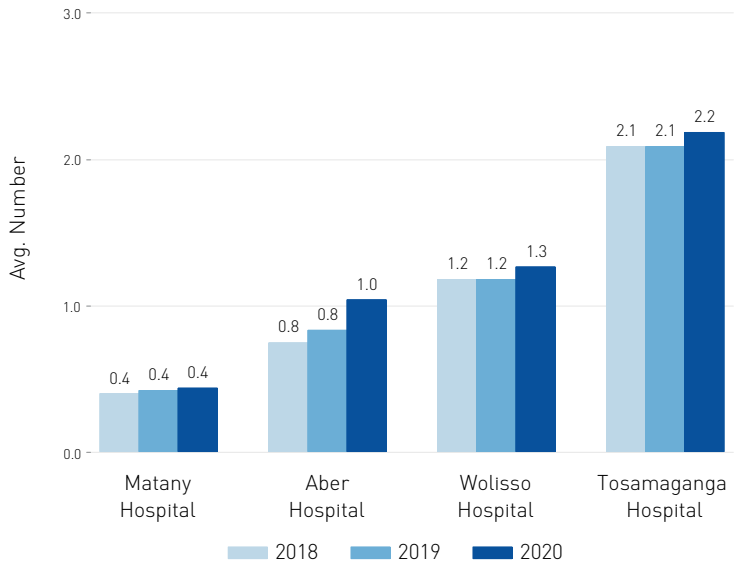
Numerator	Number of admitted patients for TB in reference hospital (x100)
Denominator	Total number of TB cases at residence level
Sources	Hospitals registers - medical departments (electronic sources) and Ethiopian HMIS/DHIS2, Tanzanian ETL/DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

IDPD02 Average number of water sources by Hospital

Computational level : Hospital

This indicator is calculated to evaluate the average number of water taps by each hospital room. The standard number equals 0,8 according to the Infection Prevention Control (IPC) of the WHO Framework.





Numerator	Number of water taps
Denominator	Total wards and outpatient rooms
Sources	Hospital tecnhical departments

IDPD03 Availability of an hand washing programme (Hospital)

Computational level : Hospital

This is a qualitative indicator that results from the answers provided to the following question: "Does the hospital have an hand washing programme?", with possible answer options "Yes" or "No".

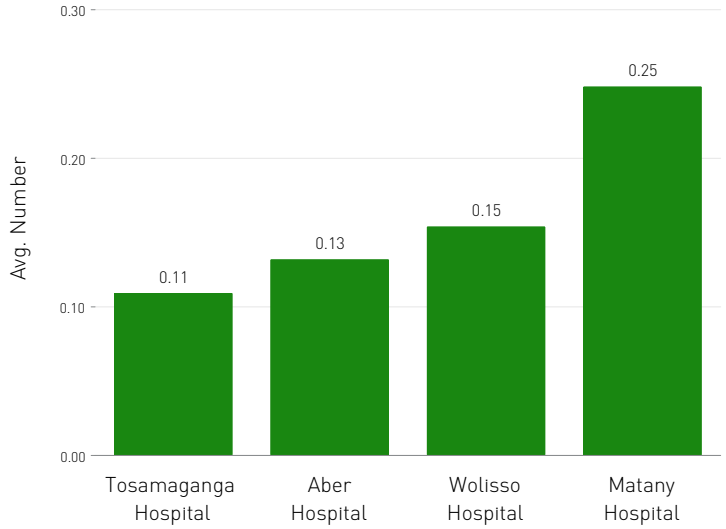
Hospital	Availability of an hand washing programme
St. Luke Hospital - Wolisso Hospital	NO
Tosamaganga District Designated Hospital	NO
St. Kizito - Matany Hospital	YES
Pope John XIII - Aber Hospital	NO

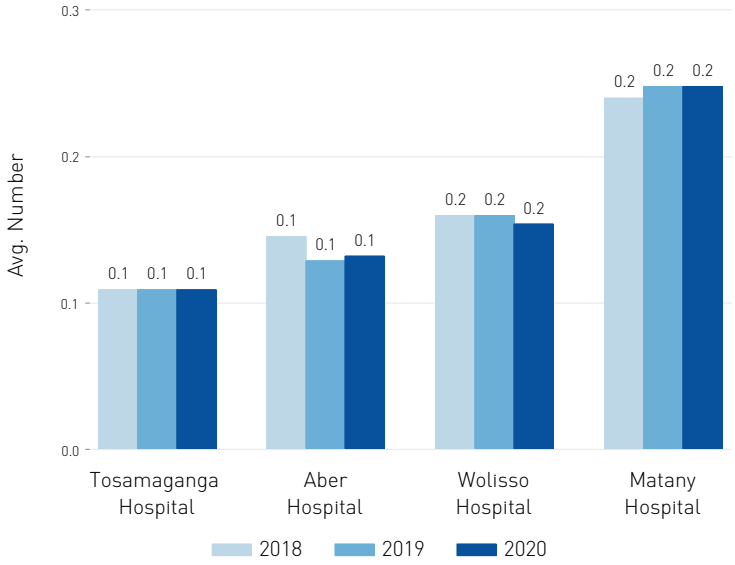
Numerator	-
Denominator	-
Sources	Hospital tecnhical departments

IDPD04 Average number of toilets per bed in IPD

Computational level : Hospital

This indicator is calculated to evaluate the average number of toilets by hospital bed. The standard equals 0,05 (namely one toilet every 20 beds) according to the Infection Prevention Control (IPC) of the WHO Framework.



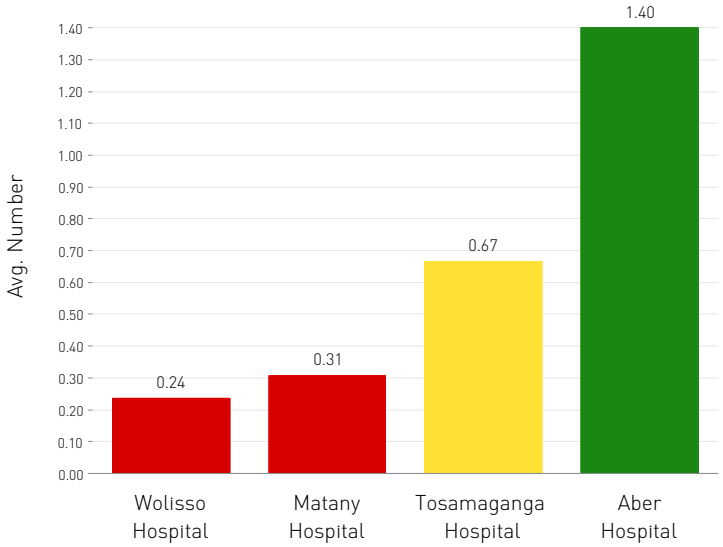


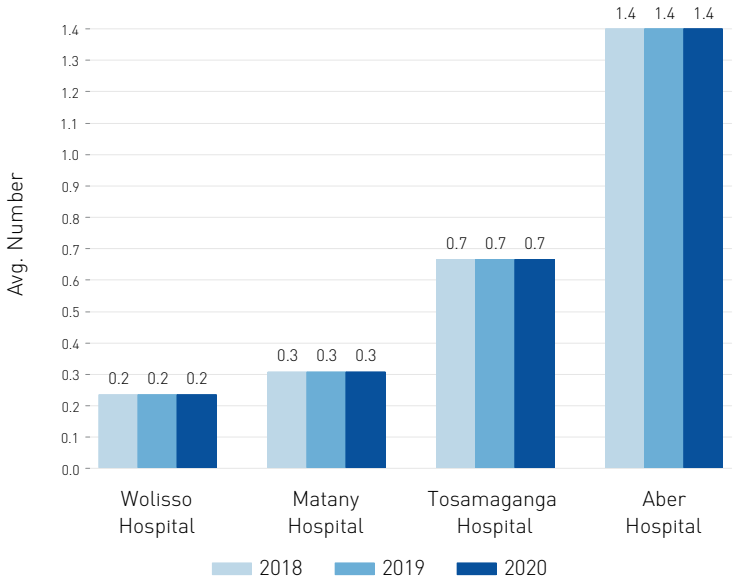
Numerator	Number of toilets
Denominator	Number of beds
Sources	Hospital tecnhical departments

IDPD05 Average number of toilets in OPD per number of rooms

Computational level : Hospital

This indicator is calculated to evaluate the average number of toilets per number of rooms in the outpatient department (OPD). The standard number equals 0,80 according to the Infection Prevention Control (IPC) of the WHO Framework.



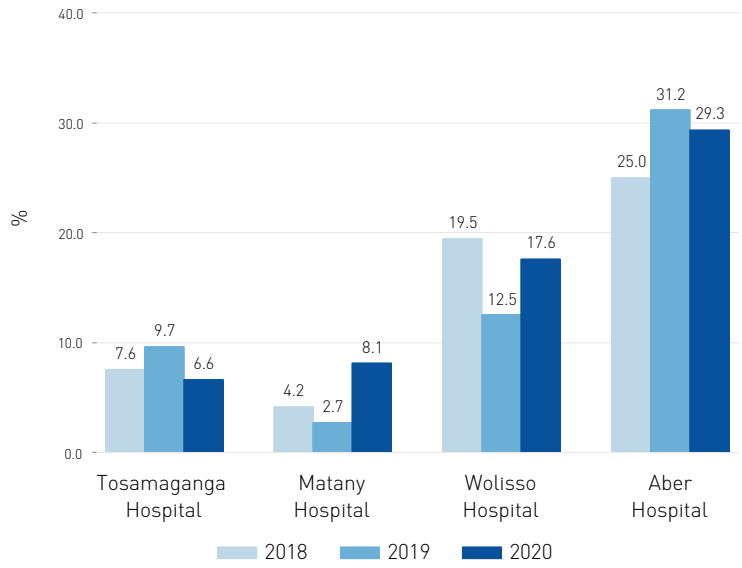


Numerator	Number of toilets in outpatient department (OPD)
Denominator	Number of rooms in outpatient department (OPD)
Sources	Hospital tecnhical departments

IDPD06 Percentage of positive stool tests (for parasites)

Computational level : Hospital

This indicator is an observation indicator and it expresses the percentage of positive stool tests over the total number of faeces examinations provided by the laboratories of the reference hospital.

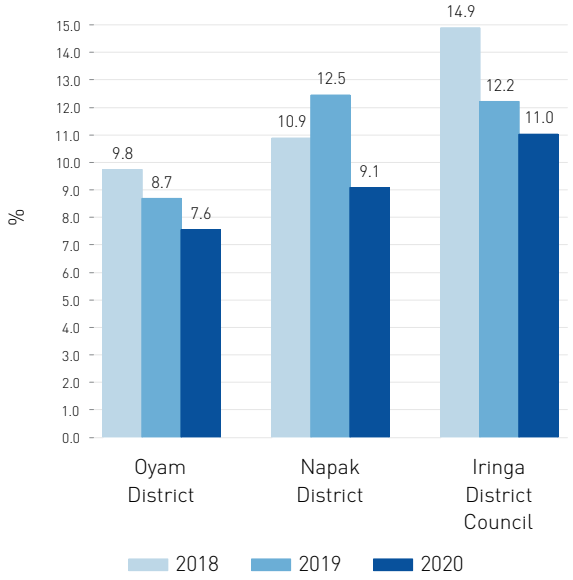


Numerator	Number of positive stool tests (for parasites) (x100)
Denominator	Total faeces examinations
Sources	Hospitals registers - laboratory departments (electronic and paper-based sources)

IDPD07 Percentage of gastroenteritis diagnosed (<5 years - Outpatient)

Computational level : Residence

This indicator is an observation indicator at the residential level and provides the percentage of patients (aged less than five years) who were diagnosed with gastroenteritis in the reference year.

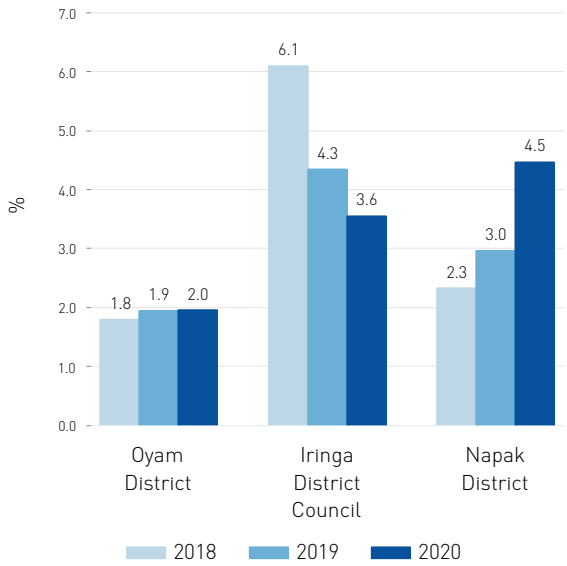


Numerator	Number of gastroenteritis diagnosed (<5 years) in OPD and HCs (x100)
Denominator	Number of OPD access for children <5yr
Sources	Tanzanian DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

IDPD08 Percentage of gastroenteritis diagnosed (>5 years - Outpatient)

Computational level : Residence

This indicator is an observation indicator at the residential level and provides the percentage of patients (aged more than five years) who were diagnosed with gastroenteritis in the reference year.

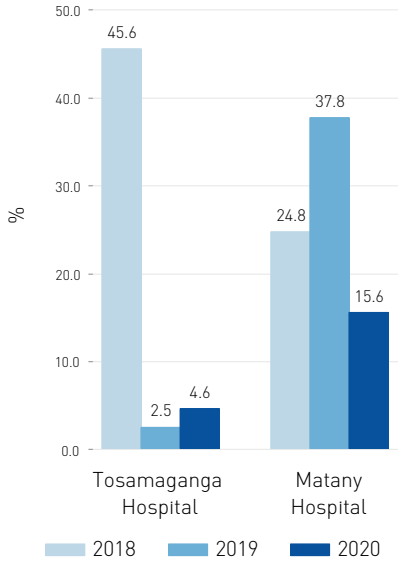


Numerator	Number of gastroenteritis diagnosed (>5 years) in OPD and HCs (x100)
Denominator	Number of OPD access f>5yr
Sources	Tanzanian DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

IDPD09 Percentage of diarrhoea cases with severe dehydration due to gastroenteritis and diarrhoea

Computational level : Hospital

This indicator is an observation indicator at the hospital level and reports the percentage of patients diagnosed with severe dehydration due to gastroenteritis and diarrohea. It gives an indication of the relevance of the complicated cases as a proxy of preventive measure or management of early conditions. Also, it depends on the ability of the HMIS to capture the severe cases.

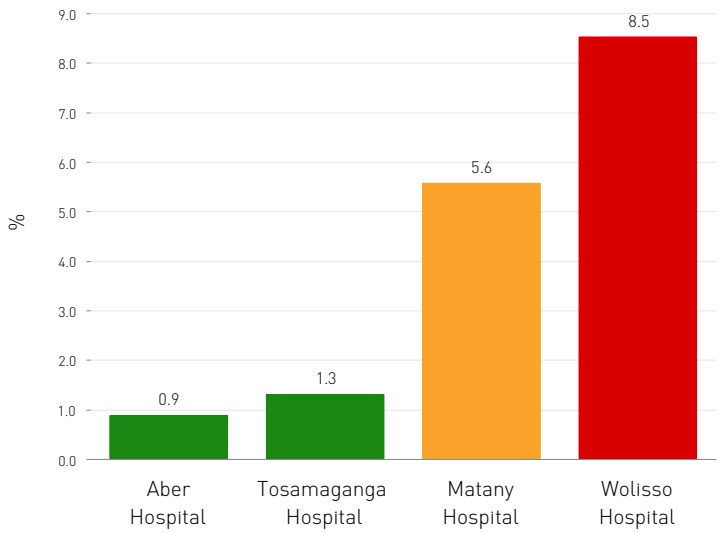


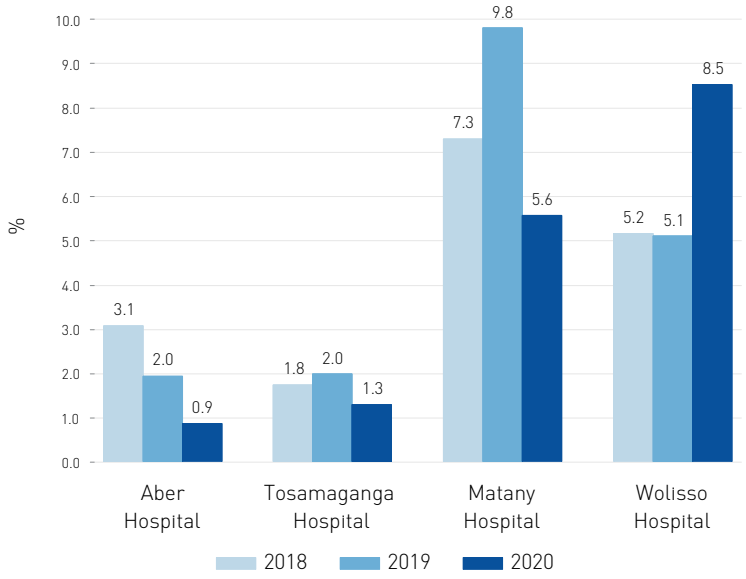
Numerator	Number of diarrhoea cases with severe dehydration (x100)
Denominator	Total number of cases
Sources	Wolisso and Matany hospital's registers, Tanzanian DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

IDPD10 Percentage of discharged patients for diarrhoea and gastroenteritis

Computational level : Hospital

This indicator is calculated to evaluate the percentage of discharged patients for diarrhoea and gastroenteritis over the total number of patients discharged from the hospital during the reference year. The standard was fixed starting from benchmarking data assessment. It is therefore a proxy of appropriateness of admissions that should be only for moderate/ severe cases.



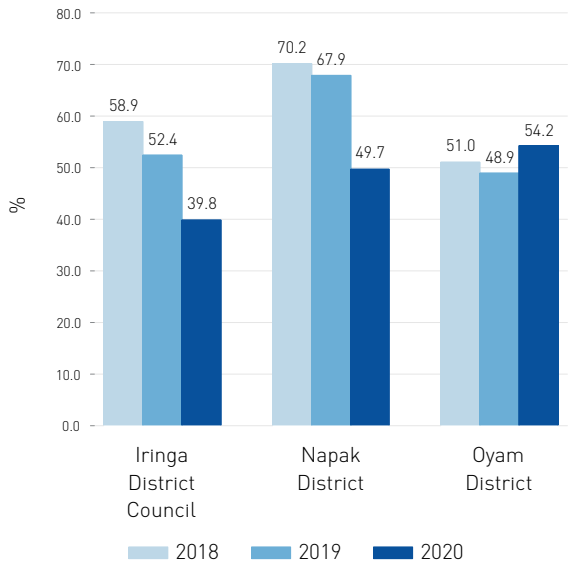


Numerator	Number of discharged patients for diarrhoea and gastroenteritis (x100)
Denominator	Total number of discharged patients (adults and children)
Sources	Wolisso and Matany hospital's registers, Tanzanian DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

IDPD11 Percentage of diarrhoea cases (<5 years)

Computational level : Residence

This indicator is an observation indicator at the residential level and provides the percentage of patients (aged less than one year) who were diagnosed with diarrhoea in the reference year.

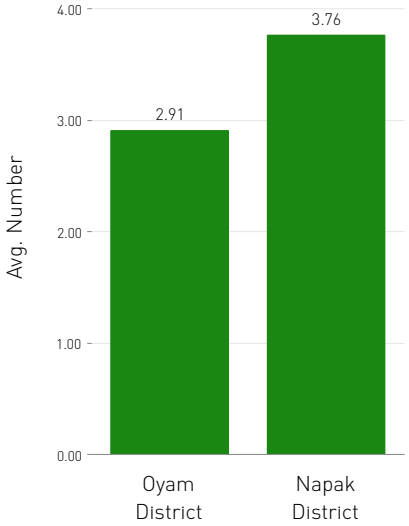


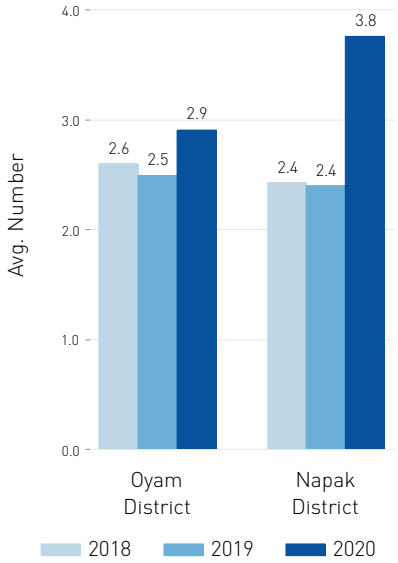
Numerator	Number of diarrhoea cases (<5 years - acute cases) (x100)
Denominator	Total number of diarrhoea cases
Sources	Tanzanian DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

IDPD12 Average number of ORS packages delivered per patient with diarrhoea (<5years)

Computational level : Residence

This indicator measures the average number of Oral Rehydration Salts (ORS) tablets delivered to patients (aged less than five years) at the residential level. The standard of one tablet per patient was fixed according to the WHO guidelines.



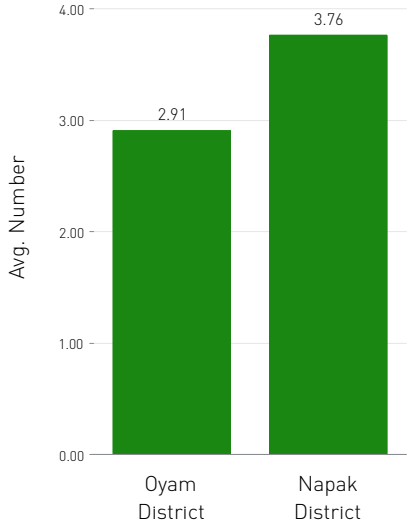


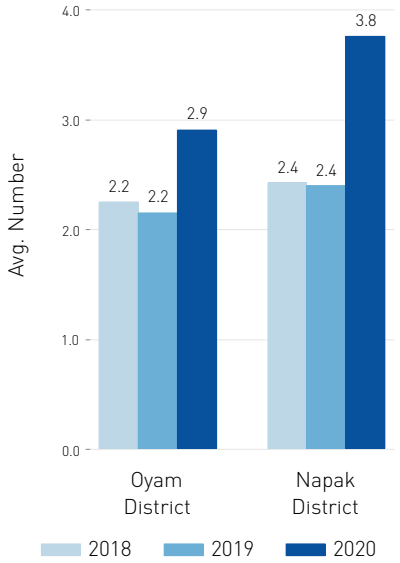
Numerator	Number of ORS packages delivered (Hospital + Health Centers)
Denominator	Total number of diarrhoea cases (<5 years)
Sources	Ugandan eHMIS/DHIS2 (electronic sources)

IDPD13 Average number of Zinc Tablets doses delivered per patient with diarrhoea (<5years)

Computational level : Residence

This indicator measures the average number of Zinc tablets delivered to patients (aged less than five years) at the residential level. The standard of one tablet per patient was fixed according to the WHO guidelines.



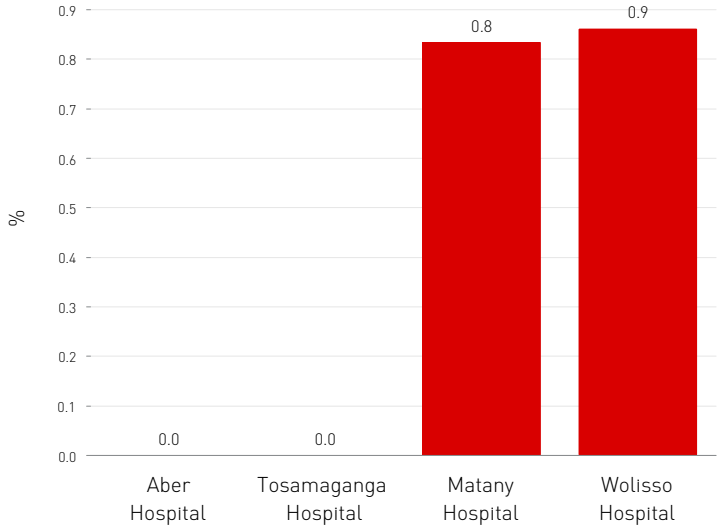


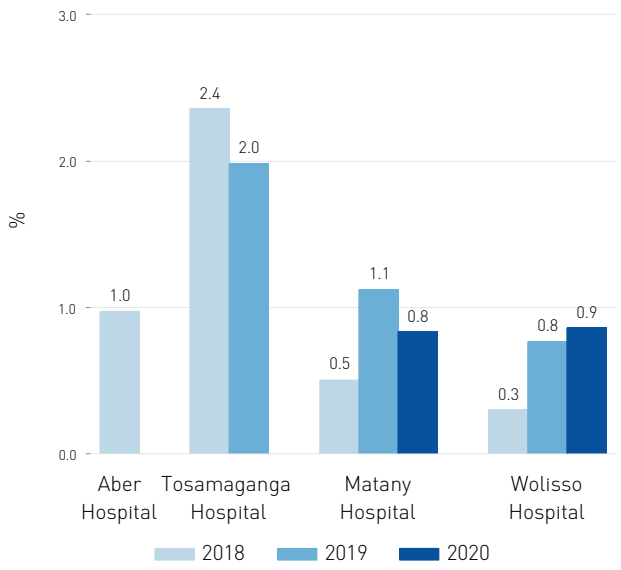
Numerator	Number of Zinc Tablets doses delivered (Hospital + Health Centers)
Denominator	Total number of diarrhoea cases (<5 years)
Sources	Ugandan eHMIS/DHIS2 (electronic sources)

IDPD14 Percentage of deaths with a diagnosis of gastroenteritis

Computational level : Hospital

This indicator is calculated to evaluate the percentage of deaths with a diagnosis of gastroenteritis and diahorrea in the reference hospital among patients aged less than five years. The standard of 0,4% was fixed starting from benchmarking data assessment.



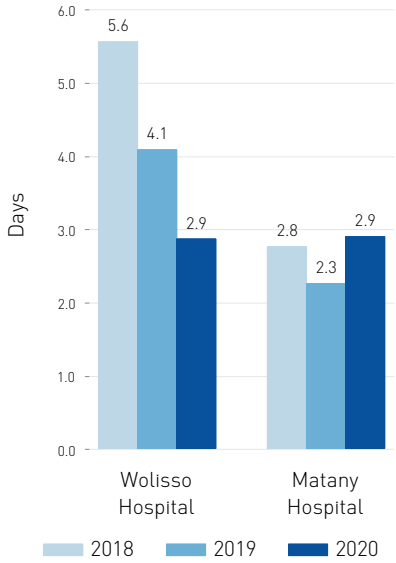


Numerator	Number of deaths diagnosed with gastroenteritis (patients aged < 5 years) (x100)
Denominator	Number of discharged patients with a diagnosis of gastroenteritis (patients aged < 5 years)
Sources	Wolisso and Matany hospitals registers, Tanzanian DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

IDPD15 ALOS for gastroenteritis

Computational level : Hospital

This indicator is an observation indicator at the hospital level. It provides a view of the average lenght of stay (ALOS) in hospital due to gastroenteritis. It is a proxy of appropriatness of admission: when ALOS decreases, probably too many less severe cases are admitted.



Numerator	Number of inpatient days for gastroenteritis
Denominator	Total number of inpatients (for gastroenteritis)
Sources	Wolisso and Matany hospitals registers - medical department (electronic sources)

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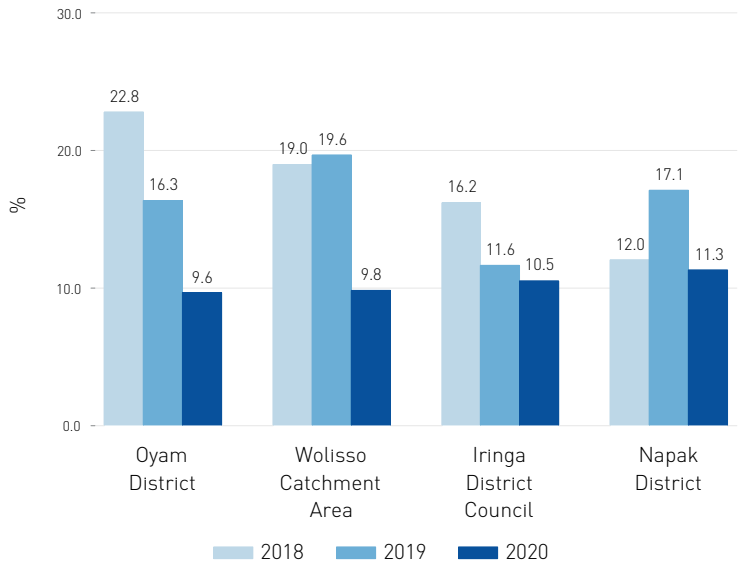
CPHIV01 Percentage of HIV screening coverage

Computational level : Residence

This indicator is an observation indicator and it illustrates the percentage of HIV screening coverage, expressed as the ratio between the total number of tests and the number of admissions in the outpatient department both in the reference hospital and in the lower level units.

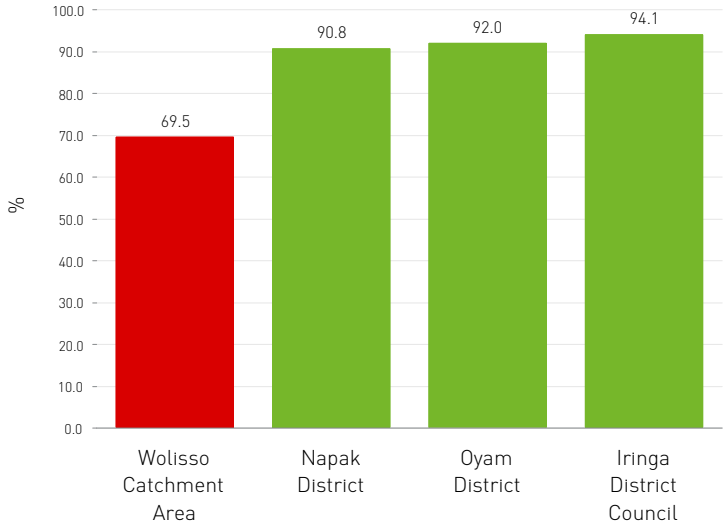


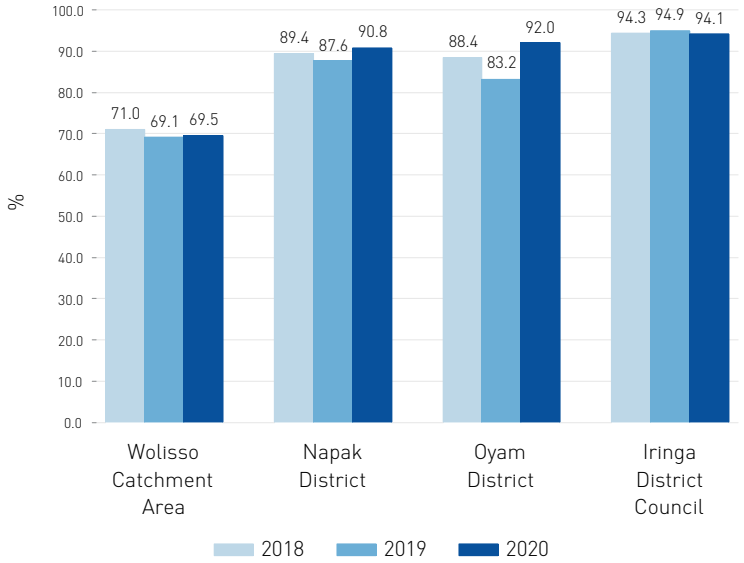
Numerator	Number of performed tests (x100)
Denominator	Number of admissions in OPD (hospital and HCs) and IPD
Sources	Ethiopian HMIS/DHIS2, Tanzanian ETL/DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

CPHIV02 Percentage of performed tests to pregnant women

Computational level : Residence

This indicator is calculated to evaluate the HIV screening coverage among pregnant women followed at hospital and discrict level. The standard of 95% was fixed according to the WHO guidelines.



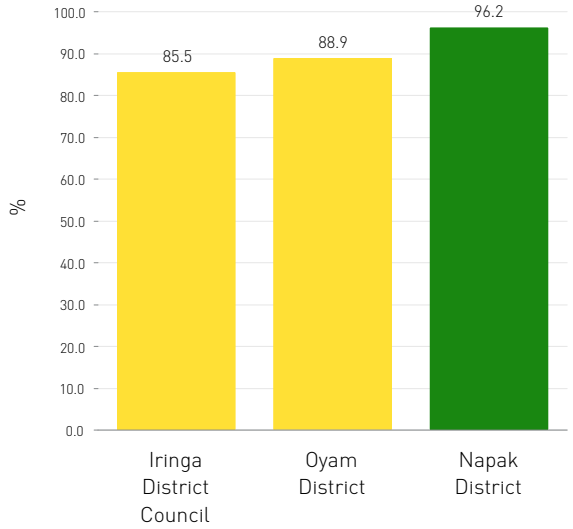


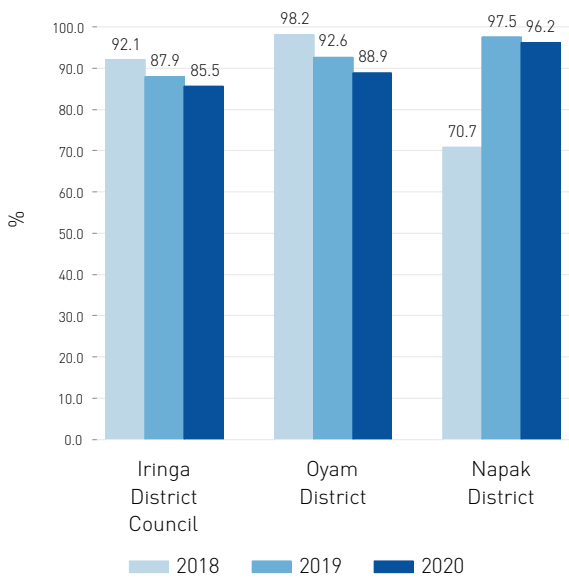
Numerator	Number of HIV performed tests to pregnant women followed at residence level (x100)
Denominator	Total number of pregnant women with at least one ANC visit
Sources	Ethiopian HMIS/DHIS2, Tanzanian ETL/DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

CPHIV03 Percentage of HIV positive cases undergoing the TB screening

Computational level : Residence

This indicator expresses the percentage of HIV positive patients who underwent a TB screening by means of all testing methods (sputum, symptom questionnaire, Xpert) during the reference year over the total number of HIV positive patients diagnosed in the reference area. The standard of 98% was fixed based on the WHO standard.



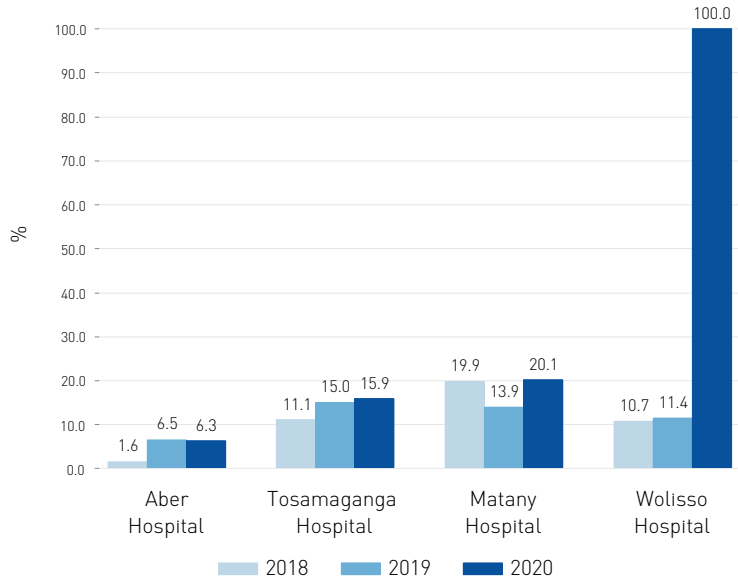


Numerator	Number of HIV cases undergoing the TB screening (sputum, symptom questionnaire, Xpert) (x100)
Denominator	Number of HIV+ cases
Sources	Ethiopian HMIS/DHIS2, Tanzanian ETL/DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

CPHIV03.1 Percentage of HIV patients screened for TB with Xpert

Computational level : Hospital

This indicator is an observation indicator and represents a specific trait of the indicator CPHIV03, relative to the percentage of HIV positive patients who undewent TB screening only with Xpert. Such measure is then divided by the total number of HIV positive patients screened for TB.

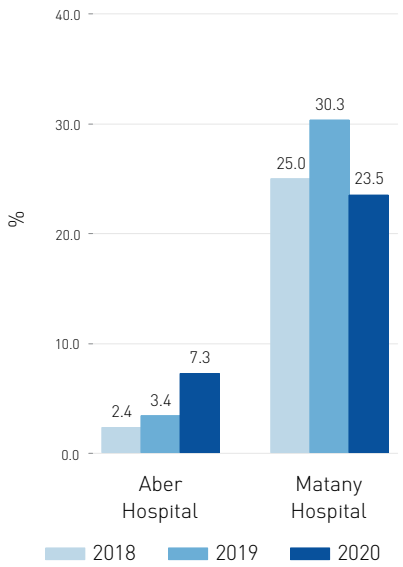


Numerator	Number of HIV patients screened with Xpert for TB (x100)
Denominator	Number of HIV + screened patients for TB
Sources	Hospitals registers - laboratory departments (electronic and paper-based sources) and Ethiopian HMIS/DHIS2, Tanzanian ETL/DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

CPHIV04 Percentage of new diagnosed patients with CD4 < 350cell/ml

Computational level : Hospital

This indicator is an observation indicator that includes all those cases of HIV diagnosis with CD4 less than 350 cell/ml. It can be used as a proxy of the inability of the healthcare system to timely take care of these patients.

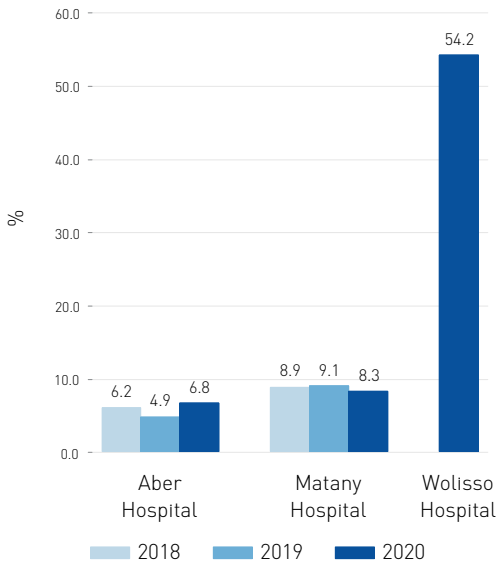


Numerator	Number of diagnosed patients with CD4 < 350cell/ml (x100)
Denominator	Number of new diagnosed HIV+ patients
Sources	Hospitals registers - laboratory departments (electronic and paper-based sources) and Ugandan eHMIS/DHIS2 (electronic sources)

CPHIV05 Percentage of HIV+ patients with opportunistic infections (or advanced HIV)

Computational level : Hospital

This indicator is an observation indicator and it expresses the percentage of positive HIV patients diagnosed with opportunistic infections. It can be used as a proxy of the inability of the healthcare system to timely take care of these patients.

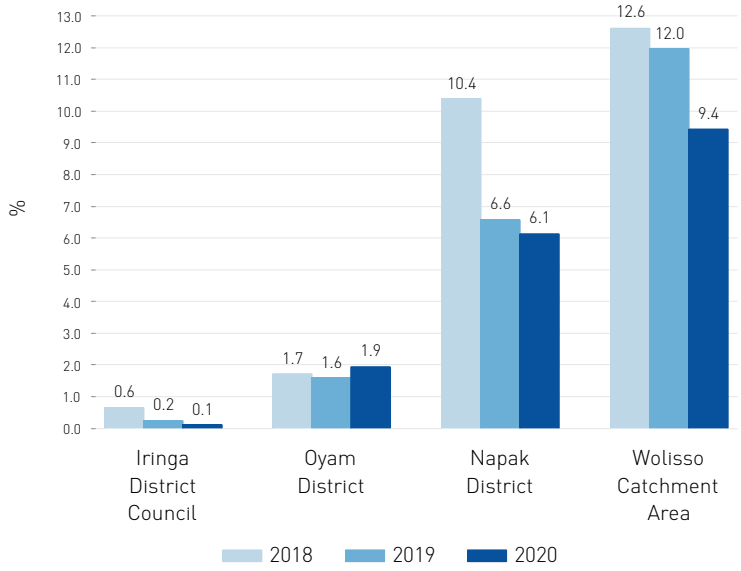


Numerator	Number of HIV+ patients with opportunistic infections diagnosed at the time of HIV diagnosis (x100)
Denominator	Number of new HIV+ patients diagnosed
Sources	Hospitals registers - laboratory departments (electronic and paper-based sources) and Ugandan eHMIS/DHIS2 (electronic sources)

CPHIV06 Percentage of malnourished patients followed in a HIV unit

Computational level : Residence

This indicator is an observation indicator and it repors the percentage of malnourished patients that are currently followed in ART clinic at residence level.

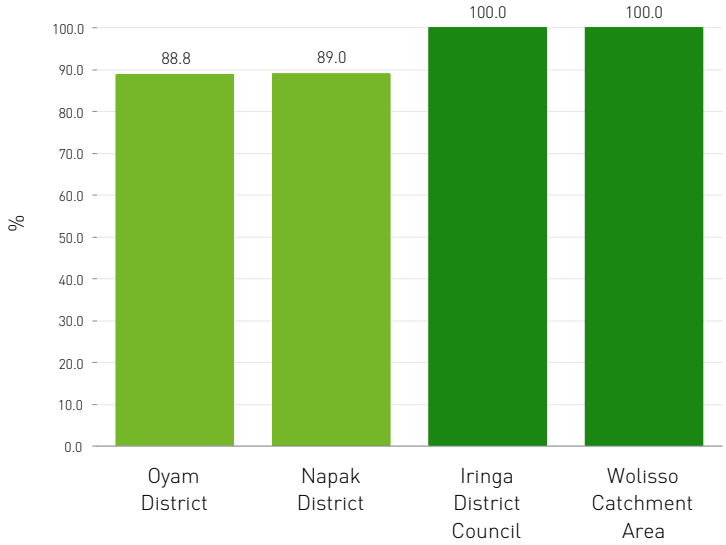


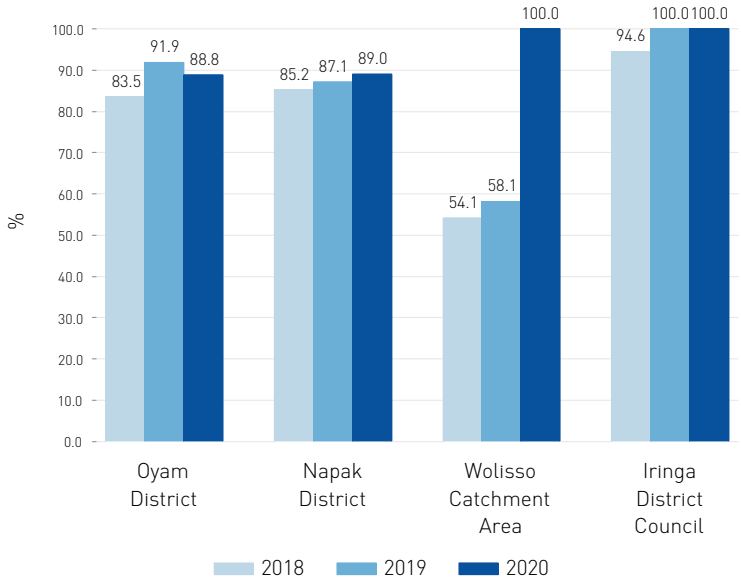
Numerator	Number of HIV+ malnourished patients currently on ART in a HIV unit (x100)
Denominator	Number of patients currently in HIV unit
Sources	Ethiopian HMIS/DHIS2, Tanzanian ETL/DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

CPHIV07 Percentage of new HIV+ linked to ART

Computational level : Residence

This indicator is calculated to evaluate the percentage of positive HIV cases who started the therapy in an ART clinic at the residential level, over the total number of HIV patients tested positive during the reference year. The standard of 90% was fixed based on the WHO standard.



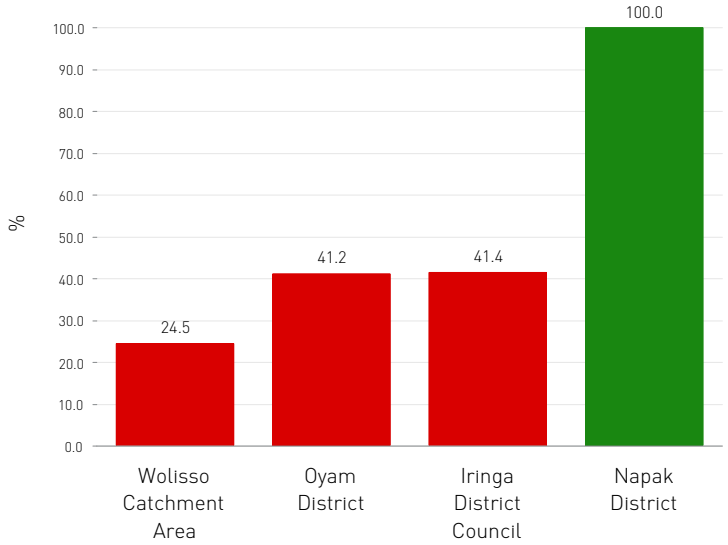


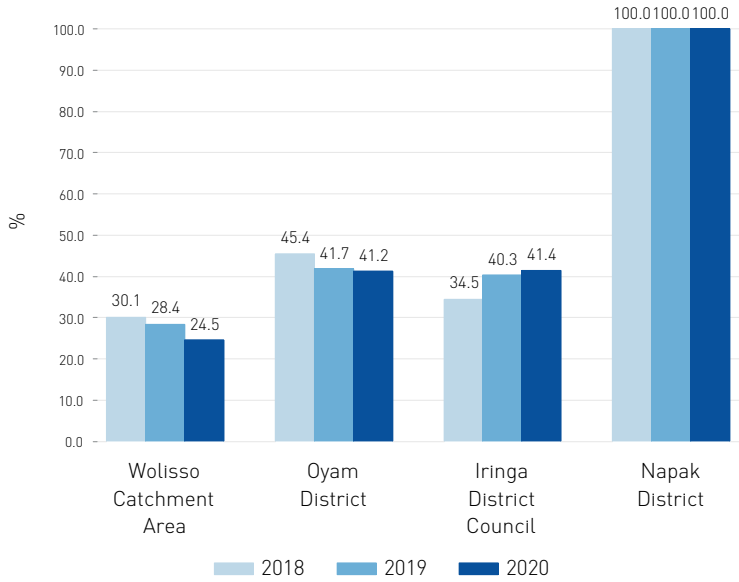
Numerator	Number of HIV+ starting ART (x100)
Denominator	Number of new patients tested HIV+ in OPD and IPD
Sources	Ethiopian HMIS/DHIS2, Tanzanian ETL/DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

CPHIV08 Coverage rate of the therapy

Computational level : Residence

This indicator is measured to estimate the coverage rate of the therapy, by setting a ratio between the number of positive patients that are currently followed in an ART clinic and an estimation of the prevalence of the HIV among residents in the reference area. The standard of 95% was fixed based on the WHO standard.



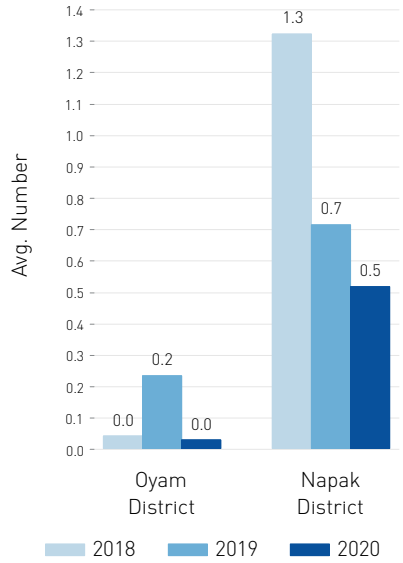


Numerator	Number of HIV+ patients currently on ART therapy (x100)
Denominator	Number of HIV+ residents (estimated)
Sources	Ethiopian HMIS/DHIS2, Tanzanian ETL/DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

CPHIV09 Average number of nutritional supplements delivered per patient currently on ART therapy

Computational level : Residence

This indicator is an observation indicator and it measures the average number of nutritional supplements delivered, such as Plumpinat, enriched flavour, to each HIV patient currently followed in an ART clinic in the reference area.

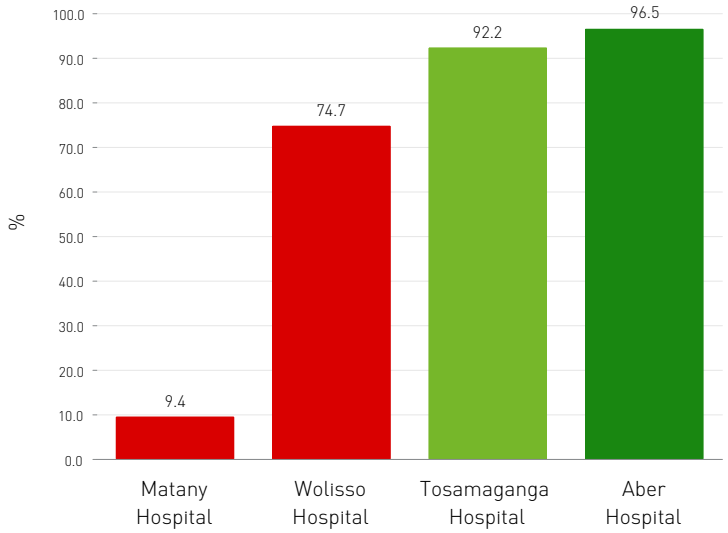


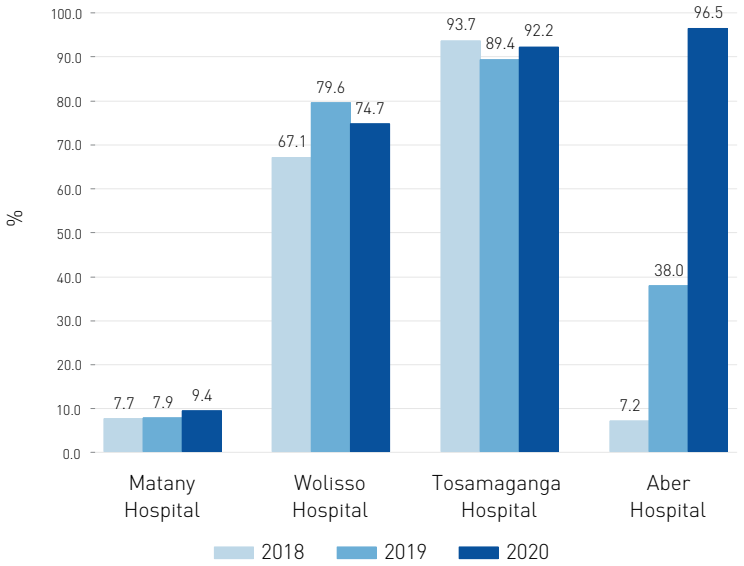
Numerator	Number of nutritional supplements (Plumpinat, enriched flawour ect.) delivered
Denominator	Number of patients currently on ART therapy
Sources	Ugandan eHMIS/DHIS2 (electronic sources)

CPHIV10 Percentage of VL tests over the patients undergoing ART therapy

Computational level : Hospital

This indicator provides the percentage of patients undergoing viral load (VL) tests over those that are currently followed in the ART clinic of the reference hospital. This indicator is calculated only at hospital level because data for the reference area were not available. The standard of 95% was fixed based on the WHO standard.



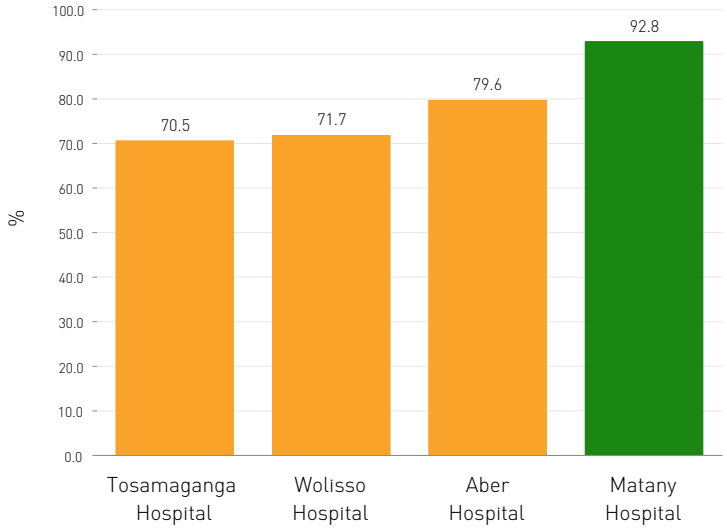


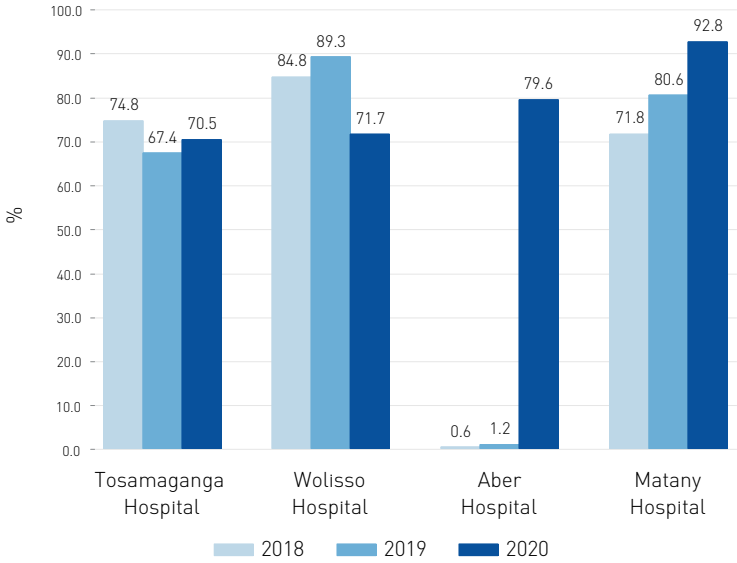
Numerator	Number of patients undergoing VL tests (x100)
Denominator	Number of patients currently on ART therapy
Sources	Hospitals registers - ART clinic/CDC departments (paper-based sources) and Tanzanian ETL/DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

CPHIV11 Percentage of patients undergoing ART therapy and tested with VL with suppression of viremia

Computational level : Hospital

This indicator provides the percentage of patients undergoing viral load (VL) tests with viremia suppression over those that are currently followed in the ART clinic of the reference hospital and were tested with a VL test within the last 12 months. This indicator is calculated only at hospital level because data for the reference area were not available. The standard of 90% was fixed based on the WHO standard and clinical protocol implemented by the health authorities involved in the present study.



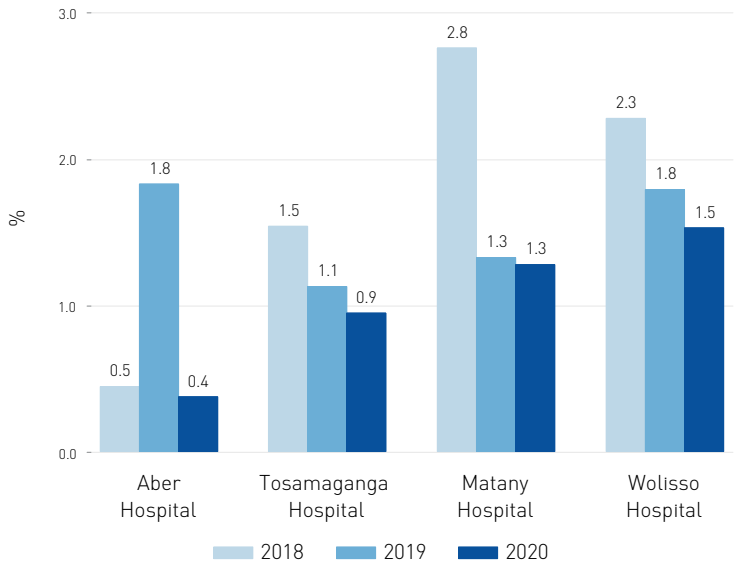


Numerator	Number of patients undergoing VL tests with viremia suppression (x100)
Denominator	Number of patients currently on ART therapy and tested with VL within last 12 months
Sources	Hospitals registers - ART clinic/CDC departments (paper-based sources) and Tanzanian ETL/DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

CPHIV12 Percentage of deaths undergoing ART therapy (within 12 months)

Computational level : Hospital

This indicator is an observation indicator at the residential level that expresses the percentage of HIV patients who died while undergoing an ART therapy in the reference area within the last 12 months.

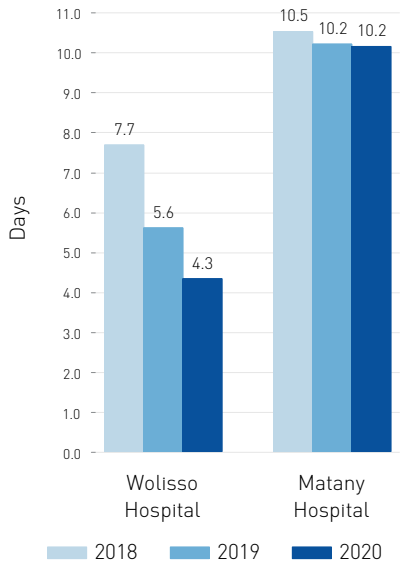


Numerator	Number of patients undergoing ART therapy who died within 12 months from the beginning of the therapy (x100)
Denominator	Number of patients who started ART therapy as of at least 12 months
Sources	Ethiopian HMIS/DHIS2, Tanzanian ETL/DHIS2, Ugandan eHMIS/DHIS2 (electronic sources)

CPHIV13 ALOS (HIV admitted patients)

Computational level : Hospital

This indicator is an observation indicator at the hospital level and it provides a view of the average lenght of stay (ALOS) in hospital due to HIV related health issues and complications.

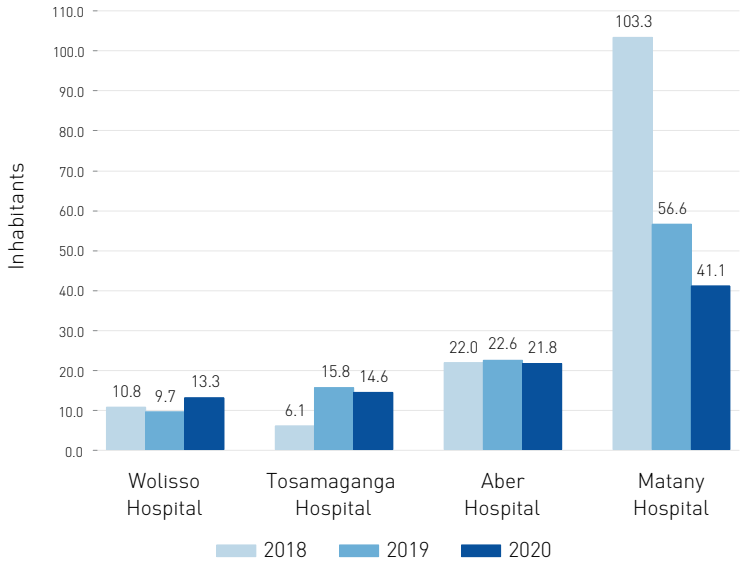


Numerator	Number of inpatient days for HIV and its complication
Denominator	Number of inpatients for HIV and its complications
Sources	Wolisso and Matany hospitals registers - medical department (electronic sources)

CP02 Hospitalization rate for chronic liver diseases, per 100.000 residents (>15 years)

Computational level : Hospital

This is an observation indicator at the hospital level that provides the hospitalization rate for chronic liver diseases standardized by 100.000 residents in the reference area aged more than 15 years.

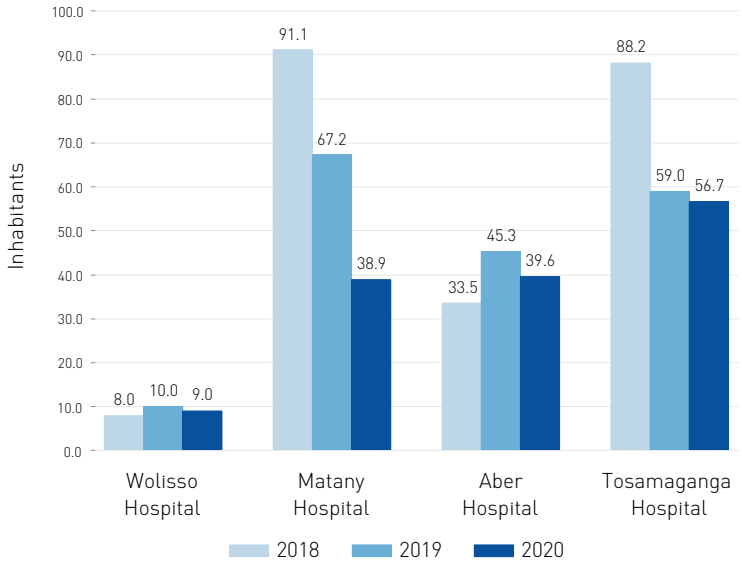


Numerator	Number of admissions for Chronic Liver Diseases (x100.000)
Denominator	Estimated resident population (>15 years)
Sources	Wolisso hospital's registers and Ethiopian HMIS/DHIS2 (electronic sources); Matany hospital's registers and Ugandan eHMIS/DHIS2 (electronic sources); Tosamaganga hospital's registers (paper-based source) and Tanzanian DHIS2 (electronic source); Ugandan eHMIS/DHIS2 (electronic source)

CP05 Hospitalization rate of hypertension cases, per 100.000 residents (>15 years)

Computational level : Hospital

This is an observation indicator at the hospital level that provides the hospitalization rate for hypertension standardized by 100.000 residents in the reference area aged more than 15 years.

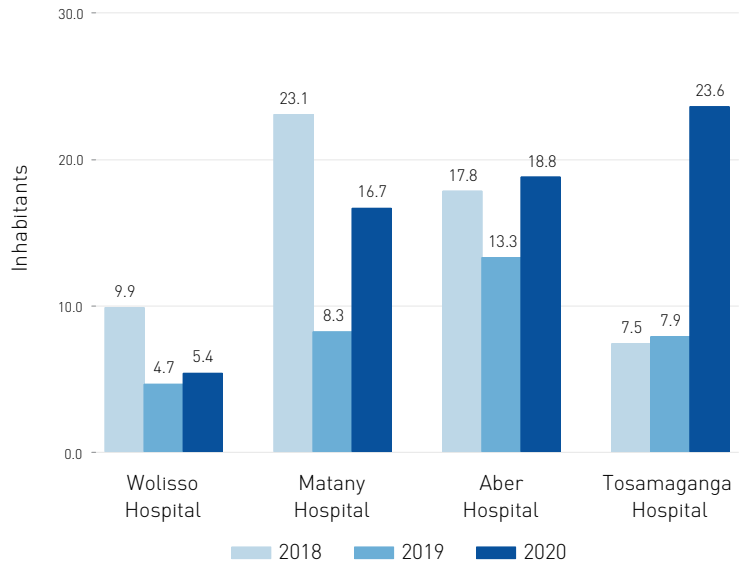


Numerator	Number of admissions for Hypertension (x100.000)
Denominator	Estimated resident population (>15 years)
Sources	Wolisso hospital's registers and Ethiopian HMIS/DHIS2 (electronic sources); Matany hospital's registers and Ugandan eHMIS/DHIS2 (electronic sources); Tosamaganga hospital's registers (paper-based source) and Tanzanian DHIS2 (electronic source); Ugandan eHMIS/DHIS2 (electronic source)

CP06 Hospitalization rate for stroke, per 100.000 residents (>15 years)

Computational level : Hospital

This is an observation indicator at the hospital level that provides the hospitalization rate for stroke in patients older than 20 years standardized by 100.000 residents in the reference area aged more than 15 years.



Numerator	Number of admissions for stroke (> 20 years) (x100.000)
Denominator	Estimated resident population (>15 years)
Sources	Wolisso hospital's registers and Ethiopian HMIS/DHIS2 (electronic sources); Matany hospital's registers and Ugandan eHMIS/DHIS2 (electronic sources); Tosamaganga hospital's registers (paper-based source) and Tanzanian DHIS2 (electronic source); Ugandan eHMIS/DHIS2 (electronic source)

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APPENDIX

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Table 1. *Governance survey - Health District*

The questionnaire is subdivided into five areas of analysis.

		Health District (Country)				
		Wolisso Town (Ethiopia)	Wonchi (Ethiopia)	Iringa District Council (Tanzania)	Oyam (Uganda)	Napak (Uganda)
Area	**Governance and leadership**					
1.	Does the Health District (HD) office have an institutional chart?	✓	✓	✓	✓	✓
1.1	Does it define the mission of the HD?	✓	✓	✓	✓	✓
1.2	Does it identify the three levels of owernship, governance and management of the Health District Services?	✓	✓	✓	✓	✓
2.	Does the Health District Management Team (HDMT) meet regularly?	X	✓	✓	✓	X
2.1	Are the minutes of HDMT meetings for the previous quarter with the attendance list available?	X	✓	✓	✓	X
2.2	Does it include evidence of discussion on the activities/targets/levels of funding or other mechanisms?	X	✓	✓	✓	X
2.3	Does it include bottlenecks identified and recommendations taken?	X	✓	✓	✓	X
2.4	Does it include progress made in achieving recommendations/actions agreed on during the previous meeting (if any)?	X	✓	✓	✓	X
3.	What is the expertise of the HDMT members?	Healthcare and Administrative	Healthcare and Administrative	Healthcare and Administrative	Healthcare and Administrative	Healthcare and Administrative
	What is the expertise of the HDMT members? [Other]				Health Management	
4.	What are the main functions of the HDMT (select max. 3 options)?					
	Planning	X	✓	✓	✓	✓
	Organizing	✓	✓	✓	X	✓
	Managing	✓	✓	✓	✓	X
	Monitoring	✓	✓	✓	✓	✓
	Other	X	X	X	X	X
5.	Is there an HD annual report signed and approved by the District Medical Officer?	✓	✓	✓	✓	✓
5.1	How much have the results/objectives been achieved from the previous year?	>20%	>40%	>60%	>20%	>40%
6.	Are there regular meetings with the higher-level of governmental authorities (zone, region, national)?	X	✓	✓	✓	X
6.1	How often?		Every 2 weeks	Every 1 year	Every month	-
7.	Is there a district/zonal/regional health plan?	✓	✓	✓	✓	✓

		Health District (Country)				
		Wolisso Town (Ethiopia)	Wonchi (Ethiopia)	Iringa District Council (Tanzania)	Oyam (Uganda)	Napak (Uganda)
Area	**Human resource management**					
1.	Does the HD have an updated electronic Human Resources Information database indicating staff on leave, training, retired or recruited during the quarter?	X	X	✓	X	X
1.1	Is there a monthly evaluation of the attendeces?	X	X	X	X	X
1.2	Are actions taken based on the last performance?	X	X	✓	X	X
2	Is there a proper healthcare workforce registry (staff audit) in the HD?	✓	✓	X	✓	✓
3	Does the HD follow specific recruitment and retention policies provided by the MoH?	✓	✓	✓	✓	✓
3.1	How often is it updated?	Less than 1 year	Every 3 years	More than 3 years	Every 3 years	Less than 1 year
4.	Has the HD formalized job descriptions for its employees?	X	✓	✓	✓	✓
	For physicians	X	✓	✓	✓	✓
	For nurses	X	✓	✓	✓	✓
	For health officers	X	✓	✓	✓	✓
	For midwifes	X	✓	✓	✓	✓
	For administrative staff	X	✓	✓	✓	✓
	For technical staff	X	✓	✓	✓	✓
5.	Does the HD have a proper compensation program that describes salary and benefits according to the MoH HR guidelines?	✓	✓	✓	✓	✓
5.1	How often is it updated?	Every 3 years	Every 2 years	Every year	Every 3 years	Less than 1 year
6.	Are financial incentives used as a HR management tool?	✓	✓	✓	X	✓
7.	Has the HD implemented continuing education activities?	✓	✓	✓	✓	✓
	For physicians	✓	✓	✓	✓	✓
	For nurses	✓	✓	✓	✓	✓
	For health officers	✓	X	✓	✓	✓
	For midwifes	✓	✓	✓	✓	✓
	For administrative staff	✓	✓	✓	✓	✓
	For technical staff	✓	✓	✓	✓	✓
8.	What is the percentage of compensation fees for continuing education activities in relation to the average daily salary?	50-70%	>80%	<10%	✓	✓
9.	Is the training database available and up-to-date?	X	✓	X	X	X
	What are the main training tools adopted? [Direct training]	X	X	X	X	X
	What are the main training tools adopted? [Evidence-based practice]	X	X	X	X	X
	What are the main training tools adopted? [Peer education]	X	✓	X	X	X
	What are the main training tools adopted? [External education]	X	✓	X	X	X
	What are the main training tools adopted? [E-learning]	X	✓	X	X	X

Area	Financial Management	Wolisso Town (Ethiopia)	Wonchi (Ethiopia)	Health District (Country) Iringa District Council (Tanzania)	Oyam (Uganda)	Napak (Uganda)
1.	Is there a finance department directly in charge of developing and controlling the accounting systems?	✓	✓	✓	✓	✓
1.1	Is it appointed by an head of department?	✓	✓	X	X	✓
2.	Has the HD developed a computerised accounting system?	X	✓	✓	✓	✓
3.	Which kind of accounting system has been developed/used?	General Account	General Account	General and Analytic Account	I Don't know	General Account
4.	Does the HD formalize a yearly budget plan?	✓	✓	✓	✓	✓
5.	Does the district management track and report expenses/revenues budget variances?	✓	X	✓	✓	✓
6.	Does the HDMT publish an yearly income statement?	X	✓	✓	X	✓
6.1	Is it shared with main stakeholders?	X	✓	✓	X	✓
6.2	Does it include data able to provide the trend of the economic performance?	X	✓	X	X	✓
7.	Does the HD accounting department have records of source of revenues breakdown?	✓	✓	✓	✓	✓
8.	Does the HD have a statement of cash flow?	✓	✓	✓	✓	✓
8.1	Is the operating cash flow regularly reviewed to ensure financial liquidity?	✓	✓	✓	✓	✓
9.	Is there any inventory of fixed assets?	✓	✓	✓	✓	✓
9.1	How often has it been updated?	Less than 2 times/yr.	Less than 2 times/yr.	Every year	Less than 2 times/yr.	Less than 2 times/yr.
10.	Does the HD publish a yearly balance sheet?	X	✓	✓	X	✓
10.1	Is it audited by an external body?	X	X	✓	X	✓
10.2	Is it shared with the main stakeholders?	X	✓	✓	X	✓
10.3	Does it include data able to provide the evolution of the assets/liabilities position?	X	✓	✓	X	✓
11.	Does the HD perform a quarterly review on the economic and financial performance?	X	✓	✓		

		Health District (Country)				
		Wolisso Town (Ethiopia)	Wonchi (Ethiopia)	Iringa District Council (Tanzania)	Oyam (Uganda)	Napak (Uganda)
Area	**Quality Management**					
1.	Has the HD conducted Integrated Support supervision to all health facilities during the quarter?	✓	✓	✓	✓	✓
1.1	Does the supervision file report for all facilities supervised with dates and names of supervisors?	✓	✓	✓	✓	✓
1.2	Does the supervision file report key problem area per facility?	✓	✓	✓	✓	✓
1.3	Does the supervision file report feedbacks given on progress with actions/recommendations to be undertaken by the HDMT or health facility?	✓	✓	✓	✓	✓
2.	Has the HD perfomed quality performance review meetings during the year?	X	✓	✓	X	✓
2.1	Is the report of review meeting with the attendance list available?	X	✓	✓	X	✓
2.2	Is there evidence on discussion of implementation of the quarterly workplans?	X	✓	✓	X	✓
2.3	Have bottlenecks been presented and recommendations for improvement discussed?	X	✓	✓	X	✓
3.	Does the HD have a Health District Quality Improvement plan?	X	✓	X	✓	✓
3.1	Has the HD held Monthly District QI Committee meetings during the last quarter?	X	✓	X	X	X
3.2	Does the system assess by QI Committee the implementation of the District QI action plan during the year?	X	✓	X	✓	✓
3.3	How often?	X	Evey 6 months	X	Evey 6 months	Evey 6 months
4.	Have the HDMT designed and implemented clinical policies and procedures?	✓	✓	✓	X	✓
4.1	How often?	Not regular meeting	Every month	Every 1 year	X	Every 6 months
5.	Has the health district department implemented quality improvement programs?	✓	✓	✓	✓	✓
5.1	How often is it updated?	Every 1 year	Every 1 year	Every 1 year	Every 6 months	Every 6 months
6.	Does the HD have functional MPDSR Committees at district level?	X	✓	✓	✓	X
6.1	Have MPDSR Committees notified to MoH within 24 hrs all health facility based maternal and perinatal deaths in the previous 3 months?	X	✓	✓	✓	X
6.2	Have MPDSR Committees conducted the reviews for all health facility reported maternal and perinatal deaths in the previous 3 months?	X	✓	✓	✓	X
6.3	Have MPDSR Committees submitted the MPDSR forms completed for all maternal and perinatal deaths in the previous 3 months and submitted to the district by the 7th day of the following month?	X	✓	✓	✓	X
6.4	Has the HD held monthly District MPDSR committee meetings during the year, with minutes available?	X	✓	✓	✓	X
6.5	Has the HD implemented and reviewed MPDSR Action plan for the previous quarter and plan for the current quarter?	X	✓	X	✓	X

		Health District (Country)				
		Wolisso Town (Ethiopia)	**Wonchi (Ethiopia)**	**Iringa District Council (Tanzania)**	**Oyam (Uganda)**	**Napak (Uganda)**
7.	Is an incident reporting system used by health personnel?	✓	✓	X	✓	X
7.1	How often is it discussed?	Not regular meeting	Every 6 months	X	Every 1 year	X
8.	Has the District a functional Medicines and Health Supplies Management?	✓	✓	X	✓	✓
8.1	Is there a management of drug supplies out of stock?	✓	✓	X	✓	✓
8.2	Have actions been taken to address facility performance gaps identified during the HDMT meetings?	✓	✓	X	✓	✓
Area	**Health information system (data management)**					
1.	Does the HD timely collect HMIS reports?	✓	✓	✓	✓	✓
1.1	Are HMIS reports collected monthly?	✓	✓	✓	✓	✓
1.2	Are HMIS reports collected quarterly?	✓	✓	X	✓	✓
2.	Does the HD timely submit HMIS reports, quantity and quality verification forms?	✓	✓	✓	✓	✓
2.1	Are present in the DHT Biostatician office Copies of the HMIS reports from all the health facilities for the last three months are present in the district database (manual or computerized)?	✓	✓	✓	✓	✓
2.2	Are the reports verified/checked by the DHO before submission?	X	✓	✓	✓	✓
2.3	Are HMIS reports submitted monthly?	✓	✓	✓	✓	✓
2.4	Are HMIS reports submitted quarterly?	✓	✓	X	✓	✓
3.	Does the HD perform a quality assessment of the data collected before their submission?	✓	✓	✓	✓	✓

Table 2. *Governance survey - Hospital*

The questionnaire is subdivided into five areas of analysis.

		Hospital (Country)			
		Wolisso (Ethiopia)	**Tosamaganga (Tanzania)**	**Matany (Uganda)**	**Aber (Uganda)**
Area	**Governance and leadership**				
1.	Does the hospital have an institutional chart?	✓	✓	✓	✓
1.1	Does it define the mission of the hospital?	✓	✓	✓	✓
1.2	Does it identify the three levels of ownership, governance and management of the hospital?	✓	X	✓	✓
1.3	Does it include the dynamics of interaction between these three levels?	✓	X	✓	✓
1.4	Does it clarify the specific roles and responsibilities of the three levels: owners, Board of Directors (BoD) and Management Team (MT)?	✓	X	✓	✓
2.	Is the hospital governance provided with a Board of Directors (BoD)?	✓	✓	✓	✓
2.1	Is the BoD led by a Board Chairperson?	✓	✓	✓	✓
2.2	How many members does it consist of?	>3	>3	>3	>3
2.3	What are the expertise included into the board?	Healthcare and Administrative	Healthcare and Administrative	Healthcare and Administrative	Healthcare and Administrative
3.	Have the BoD members been trained with introduction courses on their roles within the BoD?	X	X	✓	✓
4.	Has the BoD defined the hospital strategic plan?	✓	✓	✓	✓
4.1	How many years does the strategic plan take into consideration?	Five years	Five years	Five years	Five years
4.2	Have external stakeholders been involved into the definition of the plan and of related accounting objectives?	✓	✓	✓	X
5.	What are the main functions of the BoD?				
	Planning	✓	✓	✓	X
	Organizing	✓	X	✓	X
	Managing	✓	✓	X	X
	Monitoring	✓	✓	✓	✓
	Other			strategy,policy and setting up structures	
6.	Does the BoD meet regularly?	✓	✓	✓	✓
6.1	How often?	Every 3 months	Every 3 months	Every 3 months	Every 3 months
6.2	Are minutes of each Board meeting available?	✓	✓	✓	✓
6.3	Are they signed by the present members?	✓	✓	✓	✓
7.	Does the BoD review the CEO annually?	✓	X	✓	✓
8.	Is there a Management Team (MT) supporting the leading BoD?	✓	✓	✓	✓
8.1	How many members does it consist of?	>5	>5	4-5	4-5

		Hospital (Country)			
		Wolisso (Ethiopia)	**Tosamaganga (Tanzania)**	**Matany (Uganda)**	**Aber (Uganda)**
9.	What is the expertise of the MT members?	X	✓	✓	✓
	Healthcare	X	✓	✓	✓
	Administrative	X	X	✓	✓
	Both	✓	✓	✓	✓
	Other	X	X	X	X
10.	What are the main functions of the MT?	✓	X	✓	✓
	Planning	✓	X	✓	✓
	Organizing	✓	✓	✓	✓
	Managing	✓	✓	✓	✓
	Monitoring	✓	✓	✓	X
	Other	X	X	X	X
11.	Does the MT meet regularly?	✓	X	✓	✓
11.1	How often?	Every week or less	-	Every month	Every 2 weeks
12.	Is there a hospital annual report signed and approved by BoD?	✓	X	✓	✓
12.1	How much have the results/objectives been achieved from the previous year?	>40%	-	>40%	>40%
13.	Are there regular meetings with the District and Local Authorities?	✓	✓	✓	✓
13.1	How often?	Every month	Every month	Every 2 weeks	Every month
14.	Is there a District/regional health Plan known and available to the BoD and MT?	✓	✓	✓	✓
Area	**Human resource management**				
1.	Does the hospital have a formal HR department that handles all employees matters?	✓	✓	✓	✓
1.1	Is it appointed by a head of department?	✓	✓	✓	X
2.	Is there a proper healthcare workforce registry in this hospital?	✓	✓	✓	✓
3.	Does the hospital have recruitment and retention policies, or is it used the one provided by the MoH?	✓	✓	✓	✓
3.1	How often is it updated?	Less than 1 year	Less than 1 year	Every year	Every 3 years
4.	Has the hospital formalized job descriptions for its employees?	✓	X	✓	✓
	For physicians	✓	X	✓	✓
	For nurses	✓	✓	✓	✓
	For health officers	✓	✓	✓	✓
	For midwifes	✓	✓	✓	✓
	For administrative staff	✓	✓	✓	✓
	For technical staff	✓	X	✓	✓

		Hospital (Country)			
		Wolisso (Ethiopia)	**Tosamaganga (Tanzania)**	**Matany (Uganda)**	**Aber (Uganda)**
5	Does the hospital have a proper compensation program that describes salary and benefits, or is it used the one provided by the MoH?	✓	✓	✓	✓
5.1	How often is it updated?	Less than 1 year	Less than 1 year	Every year	Every 3 years
6	Are financial incentives used as a HR management tool?	✓	X	✓	✓
7	Has the hospital implemented continuing education activities?	✓	X	✓	✓
	For physicians	✓	X	✓	✓
	For nurses	✓	X	✓	✓
	For health officers	✓	X	✓	✓
	For midwifes	✓	X	✓	✓
	For administrative staff	✓	X	✓	✓
	For technical staff	✓	X	✓	✓
7.1	Is the training database available and up-to-date?	X	X	✓	✓
8.	What are the main training tools adopted for physicians?	✓	X	✓	✓
	Direct training	✓	X	✓	✓
	Evidence-based practice	✓	X	✓	✓
	Peer education	✓	X	✓	✓
	External education	✓	X	✓	✓
	E-learning	X	X	✓	✓
9.	What are the main training tools adopted for nurses?	✓	X	✓	✓
	Direct training	✓	X	✓	✓
	Evidence-based practice	✓	X	✓	✓
	Peer education	✓	X	✓	✓
	External education	✓	X	✓	X
	E-learning	X	X	✓	X
10.	What are the main training tools adopted for health officers?	✓	X	✓	✓
	Direct training	✓	X	✓	✓
	Evidence-based practice	✓	X	✓	✓
	Peer education	✓	X	✓	✓
	External education	✓	X	✓	✓
	E-learning	X	X	✓	✓
11.	What are the main training tools adopted for midwifes?	✓	X	✓	✓
	Direct training	✓	X	✓	✓
	Evidence-based practice	✓	X	✓	✓
	Peer education	✓	X	✓	✓
	External education	✓	X	✓	X
	E-learning	X	X	✓	X

		Hospital (Country)			
		Wolisso (Ethiopia)	**Tosamaganga (Tanzania)**	**Matany (Uganda)**	**Aber (Uganda)**
12.	What are the main training tools adopted for administrative staff?	✓	X	✓	✓
	Direct training	✓	X	✓	✓
	Evidence-based practice	✓	X	✓	✓
	Peer education	✓	X	✓	✓
	External education	✓	X	✓	✓
	E-learning	X	X	✓	X
13.	What are the main training tools adopted for technical staff?	✓	X	✓	✓
	Direct training	✓	X	✓	✓
	Evidence-based practice	✓	X	✓	✓
	Peer education	✓	X	✓	✓
	External education	✓	X	✓	✓
	E-learning	X	X	✓	X
Area	**Financial Management**				
1.	Is there a finance department directly in charge of developing and controlling the accounting systems?	✓	✓	✓	✓
1.1	Is it appointed by an head of department?	✓	✓	✓	X
2.	Has the organization developed a computerised accounting system?	✓	✓	✓	✓
3.	Which kind of accounting system has been developed/used?	General Account	General Account	General Account and Analytical Account	Analytic account
4.	Does the hospital formalize a yearly budget plan?	✓	✓	✓	✓
5.	Does the hospital management track and report expenses/revenues budget variances?	✓	✓	✓	✓
6.	Does the hospital publish an yearly income statement?	✓	X	✓	✓
6.1	Is it shared with the BoD and the ownership or main stakeholders?	✓	X	✓	✓
6.2	Does it include data able to provide the trend of the economic performance?	✓	X	✓	✓
7.	Does the hospital have records of source of revenues breakdown?	✓	X	✓	✓
8.	Does the hospital have a statement of cash flow?	✓	✓	✓	✓
8.1	Is the operating cash flow regularly reviewed to ensure financial liquidity?	✓	X	✓	✓
9.	Is there any inventory of fixed assets?	✓	✓	✓	✓
9.1	How often has it been updated?	Less 2 times	Less 2 times	More than 1 yr	Less 2 times
10.	Does the hospital publish a yearly balance sheet?	✓	X	✓	✓

		Hospital (Country)			
		Wolisso (Ethiopia)	**Tosamaganga (Tanzania)**	**Matany (Uganda)**	**Aber (Uganda)**
10.1	Is it audited by an external body?	✓	X	✓	✓
10.2	Is it shared with the BoD and the ownership or main stakeholders?	✓	X	✓	✓
10.3	Does it include data able to provide the evolution of the assets/liabilities position?	✓	X	✓	✓
11.	Have accounting objectives been defined explicitly?	✓	X	✓	✓
11.1	Which is the degree of the defined objectives?	General objectives/whole hospital	X	Specific sub-objectives/clinical depart.	General objectives/whole hospital
Area	**Quality Management**				
1.	Has the hospital management set a quality management team (QMT)?	✓	X	✓	✓
1.1	Is it appointed by a team coordinator?	✓	X	✓	✓
1.2	What are the expertise included in the team?	Healthcare and Administrative	X	Healthcare and Administrative	Healthcare and Administrative
2.	Does the QMT meet regularly?	✓	X	✓	✓
2.1	How often?	Every 1 year	X	Every 3 months	Every 6 months
3.	Has the QMT designed and implemented clinical policies and procedures?	✓	X	✓	✓
3.1	How often?	Every month	X	Every six months	Every six months
4.	Has the hospital implemented a quality improvement program?	✓	X	✓	✓
4.1	How often is it updated?	✓	X	✓	✓
5.	Has the hospital implemented appropriate channels for reporting quality problems?	✓	X	✓	✓
6.	Does the hospital set goals for quality?	✓	✓	✓	✓
6.1	How often?	Every month	Others	Every 1 year	Every six months
6.1	How often? [Other]	-	Every five years	-	-
7.	Is an incident reporting system used by health personnel?	✓	X	✓	✓
7.1	How often is it discussed?	Every 3 months	X	Every 1 year	Every 3 months

		Hospital (Country)			
		Wolisso (Ethiopia)	Tosamaganga (Tanzania)	Matany (Uganda)	Aber (Uganda)
Area	**Health information system (data management)**				
1.	Is there any unit in charge of managing data and statistics?	✓	X	✓	✓
1.1	Is it appointed by a team coordinator?	✓	X	✓	✓
1.2	What are the expertise included in the team?	✓	X	✓	✓
	Healthcare	✓	X	✓	✓
	Administrative	✓	X	✓	✓
	Informatics	✓	X	✓	✓
	Statistics	✓	X	✓	✓
	Other	X	X	X	X
2.	Is there an information system in the hospital?	✓	✓	✓	✓
2.1	Is it in electronic or paper form?	Electronic and paper form	Electronic and paper form	Electronic and paper form	Electronic and paper form
3.	Is there an annual report on hospital volumes of activity data?	✓	✓	✓	✓
4.	Is there a monthly report of hospital activity data?	✓	✓	✓	✓
5.	Does the information system track the clinical activities at ward level?	✓	✓	✓	✓
5.1	Does it include all the hospital wards?	✓	✓	✓	✓
6.	Does each patient have a unique medical record number?	✓	✓	✓	✓
6.1	Is it in electronic or paper form?	Electronic and paper form	Electronic and paper form	Electronic and paper form	Electronic and paper form
6.2	Does it include front sheet (e.g. patient name, contacts, etc.)?	✓	✓	✓	✓
6.3	[illegible]	✓	✓	✓	✓
6.4	Does it include laboratory results?	✓	✓	✓	✓
6.5	Does it include radiology reports?	✓	✓	✓	✓
6.6	Does it include consultation summaries?	✓	✓	✓	✓
6.7	Does it include the discharge sheet?	✓	✓	✓	✓
7.	Does the hospital have a patient master file to retrieve patients?	X	✓	✓	✓

The Management and Healthcare Laboratory (MeS), established in 2004 by the Sant'Anna School of Advanced Studies in Pisa, carries out research and educational activities in health economics and management in collaboration with public and private healthcare institutions at regional, national and international level.

Its mission consists of enhancing the founding logics of the national health system, studying and evaluating its specificities, comparing different regional and international systems, building organizational and management innovation aimed at improving citizens' health, and training managers and professionals of healthcare institutions.

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