



MINISTRY OF HEALTH

**Readiness for COVID-19 Response and
Continuity of Essential Health Services in
Health Facilities**

April 2021

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Acronyms and Abbreviations

ACT	Artemisinin-Based Combination Therapy
ANC	Ante-Natal Care
ARI	Acute Respiratory Infection
ARV	Antiretroviral
COVID-19	Coronavirus Disease 2019
HCW	Health Care Worker
HF	Health Facilities
HIV	Human Immunodeficiency Virus
HMIS	Health Management Information System
ICU	Intensive Care Unit
IMST	Incident management support team
KHIS	Kenya Health Information System
KHMFL	Kenya Health Master Facility List
MoH	Ministry of Health
MRI	Magnetic Resonance Imaging
OPD	Out-patient department
PNC	Postnatal Care
PCR	Polymerase Chain Reaction
PDT	Photodynamic Therapy
PPE	Personal Protective Equipment
WHO	World Health Organization

Executive summary

This survey was conducted in April-May 2021 to assess health facilities service capacity to respond to the COVID-19 pandemic, as well as maintain essential health services. It was administered in two modules that were developed by WHO and subjected to a process of country adaptation to fit in the Kenyan context. The two modules assessed COVID-19 case management and continuity of essential health services with both having a COVID-19 vaccines subunit. This assessment followed a baseline assessment conducted in July 2020 and a second assessment conducted in December 2020 with the same objective.

This being a sentinel assessment, data were collected from health facilities that participated in the previous surveys (July 2020 and December 2020). In the July assessment, 1457 facilities were included while in December, 121 facilities were included. These 121 facilities are to participate in consecutive quarterly assessments as sentinel facilities.

In addition to including all the facilities that had participated in the first round of rapid assessment in July 2020, we also included at least one level 4 hospital per County. One active COVID-19 treatment center per County and all levels 5 and 6 facilities except for specialized facilities (e.g., National Spinal Injury Hospital and Mathari National Teaching and referral Hospital, Nairobi) were purposively included in the sample (since they all offer COVID -19 management services. One primary level facility (dispensary or health center) per County and a level 4 facility responded to both tools as most were offering COVID-19 treatment and essential services were assessed on continuity of essential health services. In addition to the 121 facilities included in the December 2020 assessment, an additional 15 facilities were added to replace non-responsive facilities in the earlier assessment to ensure all Counties had at least one facility to respond to each of the two tools. The total sample was therefore 136 facilities.

In total, 128 facilities responded, 80/86 (93%) to the COVID-19 case management module and 106/113 (93%) to the continuity of essential health services module. With 58/63 (92%) level 4 facilities responding to both modules.

Overall, there were 3,821 beds dedicated for COVID-19, with just over a half 57% (2,178) being dedicated for patients with severe COVID-19 beds with any oxygen source. It was however noted that only 1,000 beds had connection to piped bedside oxygen.

Infections among clinical staff is higher than that in non-clinical staff in health facilities. Four in ten facilities collected COVID-19 specimens and conducted PCR or RDT testing on site. X-rays, Ultrasounds were available in 7 out of every ten level 4 to 6 facilities but CT scans and MRIs are generally only available in level 5 and 6 hospitals.

Nine out of ten level 4 –6 facilities had oxygen cylinders as a source of oxygen with only 1 in three facilities having PSA oxygen generator or bulk liquid oxygen supply. Only a third of the level 4 to 6 facilities had all the ten trace medicines for COVID-19 management and were more common in level 5 and 6 facilities

IPC supply items were available in hospitals with almost 70% of assessed facilities reporting all IPC items

Preparedness of cold chain for temperature range 2⁰–8⁰ was generally high therefore adequate cold storage capacity for the AstraZeneca vaccine but there was minimal availability of -70⁰c temperature range indicating a gap in case of deployment of other vaccine brands requiring extreme temperatures.

In terms of continuity of essential health services, we observed a general improvement in utilization of services during this assessment period as compared to December 2020. Most facilities had put strategies to ensure that essential services are maintained. However, we noted that mental health conditions were still on the rise throughout the pandemic.

The Ministry of Health recommends maintaining a database of COVID-19 bed capacity and occupancy for the country and availing this information to all stakeholders to support decision making and planning beyond the COVID-19 response for emergency healthcare services.

Implementation of COVID-19 safe environment measures by increasing the number of health facilities implementing all ten measures as well as the availability of IPC tracer items in all the health facilities should be prioritized. Access to the necessary PPE materials and IPC protocols training needs to be strengthened among all the healthcare workers.

In response to the COVID-19 vaccine roll out, increasing the availability of the -70⁰c temperature range infrastructure should be considered in readiness for acquiring vaccine brands that require extreme cold chain systems.

There is need to continually advocate counties on the need to increase piping infrastructure in Covid-19 centers by increasing investment in oxygen plants and piping oxygen to more beds particularly the COVID-19 isolation centers and ICU.

The recommendations informed by the data in this document, if actioned by the Ministry of Health, both at national and county governments will go a long way to improve outcomes for COVID-19 response.

Summary of findings

COVID-19 Case management readiness

Availability of COVID-19 Isolation beds

- Overall, there were 3,821 beds dedicated for COVID with a distribution as follows;
- Only 10% (380) of all bed were for critical patients – ICU beds.
- Just over a half 57% (2,178) were for patients with severe COVID-19 beds with any oxygen source. It was however noted that only 1,000 beds had connection to piped bedside oxygen.
- A higher percentage of inpatient beds are dedicated for COVID-19 at the level 4 facilities compared to level 5 & 6 facilities. 33% vs 14% for at level 5 & 6 facilities
- Overall, there was an increase from 9% COVID-19 cases bed occupancy rate in December to 22% in April 2021.
- Low burden counties could be underutilizing beds set aside for COVID-19.

Capacity for Human Resource for Health

- COVID-19 infections were more in higher level facility staff
- Infections among clinical staff is higher than that in non-clinical staff in health facilities. The highest infections have been among laboratory staff and public health officers and radiology staff.
- There has been an increase in absence of health workers due to COVID-19 from the onset of the pandemic to April 2021 which takes away the capacity to manage COVID-19 patients and ensure continuity of essential health services number in infections
- Training and support supervision on COVID-19 related topics is low especially in level 2 -3 facilities and also in rural facilities.

Laboratory and Radiological Diagnostics

- 40% of the facilities collect COVID-19 specimens and conduct PCR or RDT testing on site
- A third of all the facilities (mainly level 2 and 3) did not collect specimens for COVID-19.

- X-rays and Ultrasounds were available in 7 out of every ten level 4 to 6 facilities but CT scans and MRIs are generally only available in level 5 and 6 hospitals.
- Pulse oximeters are almost universally available in level 4 to 6 facilities but ventilators are only available in half of the facilities.
- Half of the nonfunctional ventilators were due to non-installation and no trained staff to operate them.

Oxygen supply and availability

- Nine out of ten level 4 – 6 facilities have oxygen cylinders as a source of oxygen
- Only 1 in 3 facilities have an PSA oxygen generator or bulk liquid oxygen supply
- Only half of the facilities reported having piped oxygen in crucial areas like the COVID-19 isolation unit, ICU or the emergency rooms.
- Overall, oxygen supply accessories are generally available in seven out of every ten facilities.

Availability of Medical Supplies

- Only a third of the level 4 –6 facilities had all the ten tracer medicines for COVID-19 management and were more common in level 5 and 6 facilities
- Almost all 84% of all facilities had the all the five tracer non-pharmaceuticals.
- Only 1 in ten facilities had all the tracer medicines for ensuring there is continuity of essential services.
- Nonpublic health facilities are more likely to have all the tracer medicines and non-pharmaceutical supplies
- Vaccines for routine immunization were almost universally available across all facilities with rural facilities likely to have all the vaccines compared to urban facilities.

COVID-19 Infection Prevention and Control & Personal Protective Equipment

- IPC supply items were available in hospitals with almost 70% of assessed facilities reporting all IPC items
- Medical/surgical masks were the most widely available PPE item with 94% of all sentinel facilities reporting their availability for all staff.

- Over 60% are segregating the masks in red lined bins and disposing them through incineration/open burning.

Vaccine Readiness

- Preparedness of cold chain for temperature range 2^o-8^o was generally high therefore adequate cold storage capacity for the AstraZeneca vaccine
- There was minimal availability of -70^oc temperature range indicating a gap in case of deployment of other vaccine brands requiring extreme temperatures like Pfizer
- There was higher level of preparedness in public facilities in terms of availability of the vaccine and ancillary products compared to private facilities which is an indication of successful deployment of vaccines accessibility.
- The higher availability of the vaccine in urban facilities compared to rural facilities indicates inequity yet majority of the population is in rural areas
- Generally, counties that received high doses of the vaccine had high uptakes, an indication that availability of the vaccine was proportional to demand of the same

Essential Services delivery and utilization

- There has been a general improvement in utilization of services during this assessment period as compared to the assessment done three months prior.
- Most facilities have strategies to ensure that essential services are maintained, and these strategies are being implemented to a large extent.
- Mental health conditions are still seen to be on the rise during the pandemic.
- Access to ARVs has also been on the rise during the pandemic.
- Access to outreach services is still a major challenge

Table 1: Indicators used in the Assessment for Readiness for COVID-19 Response and Continuity of Essential Health Services in Health Facilities, April 2021

Select indicators	Jul-20 (n=1440)	Dec-20 (n=91)	Apr-21 (n=128)
Mean number of admissions for suspected or confirmed diagnosis of COVID-19 per Hospital	12.9	4.4	10.5

Bed occupancy rate (%)	16.5	9	22
Percentage of health workers absent due to COVID-19 related reasons	1.2	33	41
Percentage of medical doctors infected (in the past 3 months)		5.1	9.3
Percentage of nurses who were infected (in the past 3 months)		3	10.3
Percentage of health facilities performing COVID-19 testing	0.5	14	40
Percentage of health facilities with COVID-19 case management guidelines	22	76	77
Mean number of isolation beds per health facility	3.4	11.5	15.7
Mean number of beds for severe cases per health facility		31.6	27.4
Mean number of ICU beds per health facility		5.5	4.7
Percentage of health facilities having oxygen	58	88	95
Percentage of facilities with functioning ventilators (invasive and non-invasive)	14	45	52
Oxygen concentrator	47	72	78
External supply - bulk	26	39	34
External supply - oxygen cylinders	72	93	91
Oxygen Plant		41	38
Nasal cannula	95	95	96
Oxygen mask	96	96	97
Humidifier	88	91	88
Flowmeter	32	92	96
Hand sanitizers	95	96	93
Liquid soap	61	96	99
Protective gown	71	97	97
Examination gloves	63	99	99
Protective goggles		97	99
Face shield	71	95	96
Respirator masks (N95, KN95 or FFP2)	70	95	95
Medical/surgical mask	93	99	100

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Introduction

As health systems around the world continue to respond to the threat of COVID-19, governments also face the enormous task of ensuring they continue to meet all the health needs of their populations from the needs arising from COVID-19, to ensuring that essential services continue for the rest of the population.

Over view of COVID-19 in Kenya

As of 21st June, a total of **179,293** confirmed cases and **3,461** deaths giving a case fatality rate of **1.9%** have been reported. Of these, 173,189 cases (97%) were local transmissions and 6,103 (3%) are imported cases. All 47 counties have reported cases with Counties in the western region of Kenya having surges in cases. By the time of writing the report (June/July 2021), Kenya seems to be entering the fourth wave of COVID-19 infections¹.

Response to COVID-19

Readiness to respond to COVID-19 pandemic requires health facilities to not only have adequate health infrastructure including critical care beds with functional ventilators and oxygen, but also adequate supply of medical commodities including personal protective equipment (PPE), Infection prevention materials and appropriate drugs. Availability and implementation of COVID-19 sensitive screening and referral systems is critical, as is adequate human resource who are trained, knowledgeable and motivated to respond to COVID-19.

In response to this, the Ministry of Health (MoH) set up routine health systems monitoring mechanisms to provide regularly updated information on the status of service delivery for and during the COVID-19 pandemic. This assessment utilizes a suite of tools to regularly collect selected information from high level facilities and facilities designated as COVID-19 isolation centres, as well as selected primary care facilities. The information collected supplements the routine data on COVID-19 and related services to help in assessing overall preparedness in addressing the pandemic.

This assessment adds to two previous assessments; a baseline assessment conducted in June 2020 using tools developed within MoH and one done in December 2020 done using tools developed by the World Health Organization (WHO) to guide Countries in conducting these assessments in a standard way.

The assessment aimed to gauge the readiness of health facilities to respond to COVID-19 and continue offering essentials services. Data collection was done in April 2021 at the time when the third wave of COVID -19 was on course.

¹ Daily SITREP 22nd June 2021.

The information collected is expected to supplement the routine data on COVID-19 and essential health services, and subsequently inform overall preparedness and response strategies during the COVID-19 pandemic. The assessment additionally collected information on readiness of both health facilities and communities for the COVID-19 vaccine.

The specific objectives of the assessment were to;

1. Collect information on facility readiness and capacity to manage health needs related to COVID-19 including provision of the COVID-19 vaccine.
2. Assess the readiness of facilities to continue offering essential health services amidst the COVID-19 pandemic.
3. Review of progress over time using the service statistics data (from the sentinel sites) from the Kenya Health Information System (KHIS)

Findings from this study are expected to inform planning and resource allocation for the Kenya COVID-19 response and mitigation at both National and County levels.

Methodology

Study Design and Approach

The study, which took place in April 2021, focused on assessing the capacity of health facilities to manage COVID -19 patients as well as continue offering essential health services in the context of the COVID-19 pandemic. Standardized WHO technical guidance for health systems preparedness and performance monitoring during the COVID-19 pandemic guided implementation of this assessment. This cross-sectional survey was the third assessment providing a snapshot of health systems preparedness to offer COVID-19 care and to continue providing essential services. These assessments have been planned every quarter to give an in-depth understanding of the changing scenario in health facilities as the COVID-19 pandemic persists. The first assessment was done in July 2020 using tools developed by the technical team (in Kenya), while the second assessment was done in December 2020 and utilized the standard tools developed by the WHO.

This assessment deployed the WHO tools outlined below.

1. COVID-19 case management capacities
2. Continuity of essential health services.

These were adapted to suit the Kenyan setting through a process of country adaptation.

The community tool, part of the WHO core set of tools and used in the December assessment was not used in this assessment as it was felt that community perspectives may not have changed much within 4 months.

The **COVID-19 case management tool** was organized into eight (8) sections, including: Health facility identification and description, Staffing and Facility incident management support team (IMST), Case management and bed capacity for COVID-19 patients, Selected medicines and supplies for COVID-19 case management, PPEs and infection prevention and control, COVID-19 laboratory diagnostics, medical equipment for diagnosis, patient monitoring and case management and COVID-19 vaccination readiness.

The **Continuity of Essential Services tool** was organized into eight (8) sections as follows: health facility identification and description, staffing, service delivery and utilization, COVID-19 infection prevention and control measures, and PPEs, management of suspected and confirmed COVID-19 cases in primary health facilities (Level 2 and 3 health facilities) and Primary hospitals (Level 4 health facilities), Availability of selected tracer therapeutics, Availability of diagnostics and COVID-19 vaccination readiness.

Routine service statistics: Data from the KHIS was analyzed to assess the impact of COVID-19 on service provision. For this purpose, trends of selected indicators were assessed around utilization of key essential services including outpatient services, RMNCAH, communicable and non-communicable conditions for the periods before and after the COVID-19 Pandemic.

Sampling and Sample Size Determination

This being a sentinel assessment, data were collected from health facilities that participated in the previous surveys (July 2020 and December 2020). In the July assessment, 1457 facilities were included while in December, 121 facilities were included. These 121 facilities are to participate in consecutive quarterly assessments as sentinel facilities. Facilities were included in the sentinel sample based on the following criteria;

1. The health facility had participated in the first round of rapid assessment in July 2020.
2. One level 4 hospital per County

For the case management tool

3. Facilities that were active COVID-19 treatment centers-one per County
4. All levels 5 and 6 facilities except for specialized facilities (e.g., National Spinal Injury Hospital and Mathari National Teaching and Referral Hospital) were purposively included in the sample (since they all offer COVID-19 management services).

For the continuity of essential services tool

5. One primary level facility (dispensary of health center) per County

6. Level 4 facilities responded to both tools as most were offering COVID-19 treatment and essential services.

In addition to the 121 facilities included in December 2020 assessment, an additional 15 facilities were added to replace nonresponsive facilities in the earlier assessment to ensure all Counties had at least one facility to respond to each of the two tools. The total sample was therefore 136 facilities. See table 2 for sample size determination per level of care.

The sentinel survey's sampling frame was based on the Kenya Health Master Facility List (KHMFL). Health facilities of all types of Level 2 to Level 6 (dispensaries, medical clinics, health centers, primary hospitals, secondary and tertiary hospitals) irrespective of ownership (public, private, NGO) were included in the sampling frame. Specialized and stand-alone health facilities such as Eye clinics, dentistry clinics, and Voluntary Counselling and Testing (VCT) centers were excluded from the survey. A total of 12,758 health facilities were included in the sampling frame.

Table 2: Sampled Facilities

Level of care	Number of health facilities sampled	
	Public	Non-Public*
Level 2	27	12
Level 3	5	6
Level 4	49	10
Level 5	10	5
Level 6	4 [#]	0
Total	95	33

*Included FBOs and Private health facilities. [#] National Spinal Injury and Mathari Teaching and Referral Hospitals were purposively excluded as they do not offer any COVID-19 management services.

Data Collection

Prior to the data collection exercise, clearance to conduct the assessment was sought through the Council of Governors, followed by a request to the county directors of health for their selected facilities to participate in the survey.

A pilot exercise preceded the data collection activity to identify any key issues that needed adjustment and improvement before implementing the survey. A total of 7 facilities not included in the sample (3 hospitals, 1 health center, one medical clinic and 2 dispensaries) were selected for the pilot. The 2 tools, the COVID-19 case management and the continuity of essential services were piloted appropriately in these facilities.

The questionnaires were shared prior to the phone interview to enable the respondent to collect the required data. A free and open-source mobile data collection tool (Kobo collect)

was used to collect data via mobile phones for each of the two tools/modules. This was a departure from the web-based lime survey platform used in the December 2020 assessment, to make data collection easier and facilitate offline data collection previously not possible with the lime survey platform.

Although this assessment was initially planned as a filed assessment following a phone-based assessment in December 2020, the assessment was done as a phone survey following restrictions on movement and physical gatherings as the third wave of COVID-19 was on course at the time of data collection. The interviewers (15) collected data through phone interviews while at home or in the office, with the facility in charges or their nominees, (a knowledgeable person about the health facility) using the standardized questionnaires for each module. Interviewers were facilitated with airtime and data bundles to conduct the interviews.

Interviews using the continuity of essential services tool lasted for about 45 minutes to an hour for the hospitals (Level 4), and between 30 to 40 minutes for health centers and dispensaries. Case management tool interviews lasted for about 45 to 50 minutes with higher level facilities generally taking longer to interview. Data was collected across a two weeks' duration. The data were automatically transmitted online and stored into a central database.

The module on continuity of essential services was administered to levels 2, 3 and 4 while the COVID-19 case management module assessed levels 4, 5 and 6 facilities. Level 4 facilities were targeted to respond to both the continuity of care and essential health services modules as they are considered the bridge between primary healthcare offered at lower-level facilities and secondary care offered at higher level facilities.

Mechanisms for data quality assurance

To ensure a significant response rate, health facilities that were difficult to reach due to poor phone network connections or where respondents declined to participate were replaced with a similar level facility within the same County and where this was not possible, a similar level facility from any other County was selected so long as they had participated in the previous survey. To ensure homogeneity with the selected sample, facilities were picked for replacement from a predetermined sample that met all the criteria. When in doubt, respondents were allowed to check multiple service points and departments to verify accuracy of responses. While preserving a sequential skip pattern, validation checks were included into the mobile data collection tool to ensure complete responses.

Data Analysis and Report writing

Data management and analysis was done using Ms. Excel and STATA 132. Chart books were created in Microsoft Excel based on the indicators collected in the assessment. Trend analysis was done by comparing indicators that were collected in the previous two rounds of the assessment.

Findings

This section of the report describes the findings of the survey. It is divided into three sub sections. The first part is the general survey response, the second part describes findings linked to the module on COVID-19 case management aspects and the final part describes the Continuity of essential Health services aspects ranging from human resources for health, availability of commodities and diagnostics etc. For each of the sub areas a conclusion and recommendations are provided.

Response Rate

Data for the two facility assessment modules were collected in 128 (94%) of the 136 health facilities that were targeted. 20% of the targeted level 5 health facilities did not respond. 58 of the 61 level facilities responded to both modules. The distribution of responding health facilities by level of care for facility assessment modules is shown in Table 3

Table 3: Response Rate

Level of care*	No sampled	Number interviewed by assessment module		
		Total	COVID-19 case management capacity	Continuity of essential health services
Level 2-3	50	48 (96%)	0	48
Level 4	63	61 (97%)	61	58
Level 5	19	15 (79%)	15	0
Level 6	4	4 (100%)	4	0
Total	136	128 (94%)	80	106

* Level of care reported is as per the Kenya Master Health Facility List (KMHFL).

Notably, some key COVID -19 treatment facilities did not respond to the assessment and in many cases no other similar facilities were found in those Counties to replace these. These include the following:

- Embu Level 5 Hospital (Embu County)
- Murang'a Level 4 Hospital (Murang'a County)
- Siaya Level 4 Hospital (Siaya County)

Facilities readiness for COVID-19 Case Management

Bed Capacity for COVID-19 Cases

Availability of beds

Hospital bed capacity is core in the response against COVID-19. Several studies have recommended that reporting bed capacity and occupancy be made mandatory. Bed capacity is a good indicator for the capacity of a country to respond to the pandemic. Assessing and documenting this capacity is central for planning. As at May 2021, overall hospitalization rate due to COVID-19 was 19%.

Classification of COVID-19 beds and their distribution in 80 health facilities assessed in May 2021 is shown in figure 1.

From the 80 facilities sampled, there were 3,821 beds dedicated for COVID-19 with distribution as follows; A higher percentage of inpatient beds are dedicated for COVID-19 at the level 4 facilities compared to level 5 & 6 facilities. 33% (2,418/7,322) of the 61 level 4 facilities beds compared to about 14% for the fifteen level 5 and four 6 facilities as shown in figure 1.

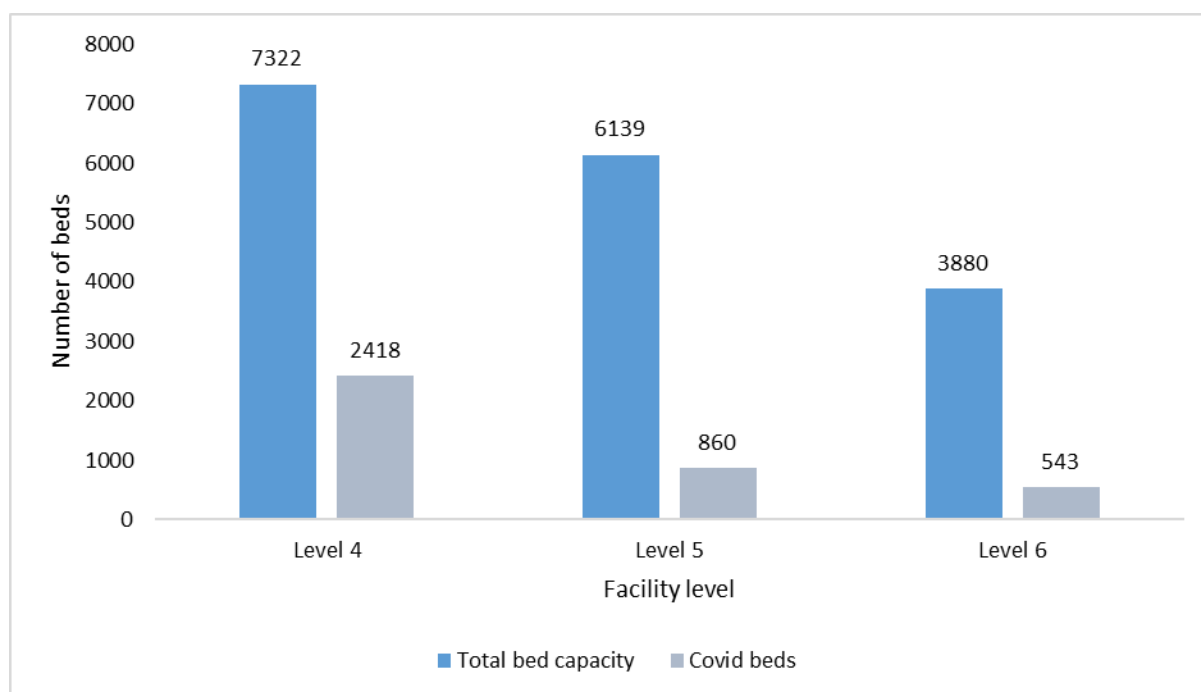


Figure 1: Distribution of COVID 19 beds relative to the inpatient beds (n=80)

- A majority of the assessed COVID-19 case management facilities were those owned by the government. Nearly nine in every ten of the COVID-19 beds were in these public facilities as shown in figure 2.

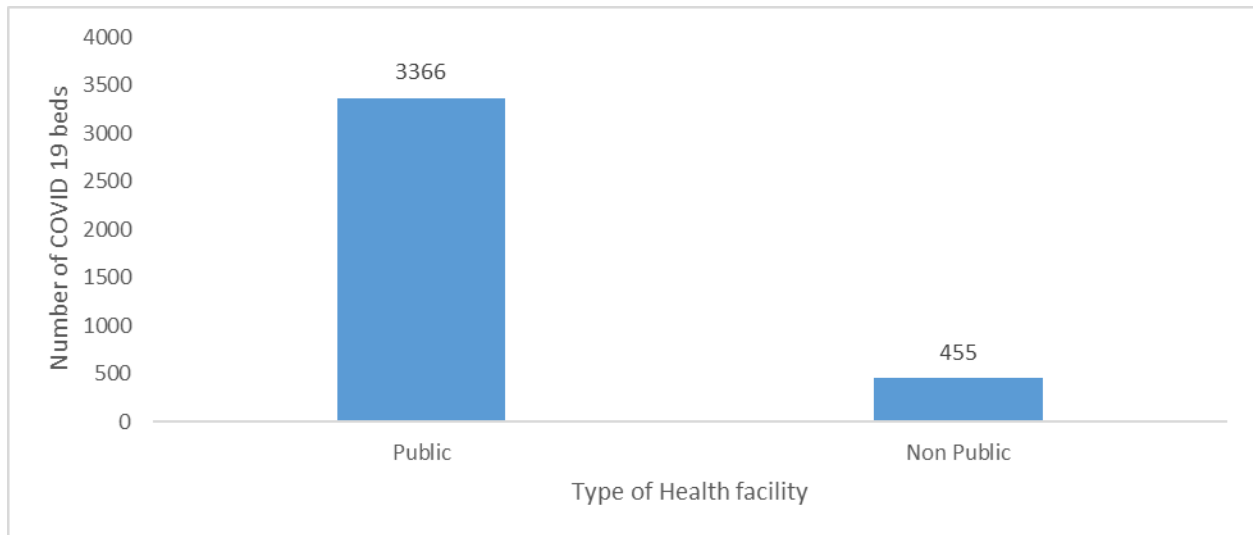


Figure 2: Distribution of COVID-19 beds by ownership (n=80)

Of the dedicated COVID-19 beds;

- 10% of all bed were for critical patients. Critical COVID-19 patients are defined as those patients with respiratory failure and would require mechanical ventilation.
- 57% were for severe patients. Severe COVID-19 patients are those who have shortness of breath and require oxygen as their main form of treatment.
- 33% were for non-severe patient – these are patients with COVID-19 infection but no shortness of breath.

Interestingly, of the over 2,000 beds dedicated for COVID-19 at the level 4 facilities, half of them were plain hospital beds without access to piped oxygen. Distribution of ICU beds for COVID-19 patients in relation to all COVID-19 beds was at 8%, 11% and 6% in levels 4, 5 and 6. Bed occupancy for COVID-19 increased steadily by level of health service delivery. In level 4 facilities, only one in ten COVID-19 beds were found to be occupied in April, while in level 5, three in ten beds and level 6 almost five in ten beds were occupied for the same period as shown in figure 3 below. During the period of assessment, the sentinel sites overall bed occupancy per night was 22% and this compares well to the reported country hospitalization rate of 19% for the same period.

The number of COVID-19 bed occupancy increased with increase in level of healthcare as shown in figure 3. This could have an indication on the variation in capacity to manage COVID-19 cases by levels.

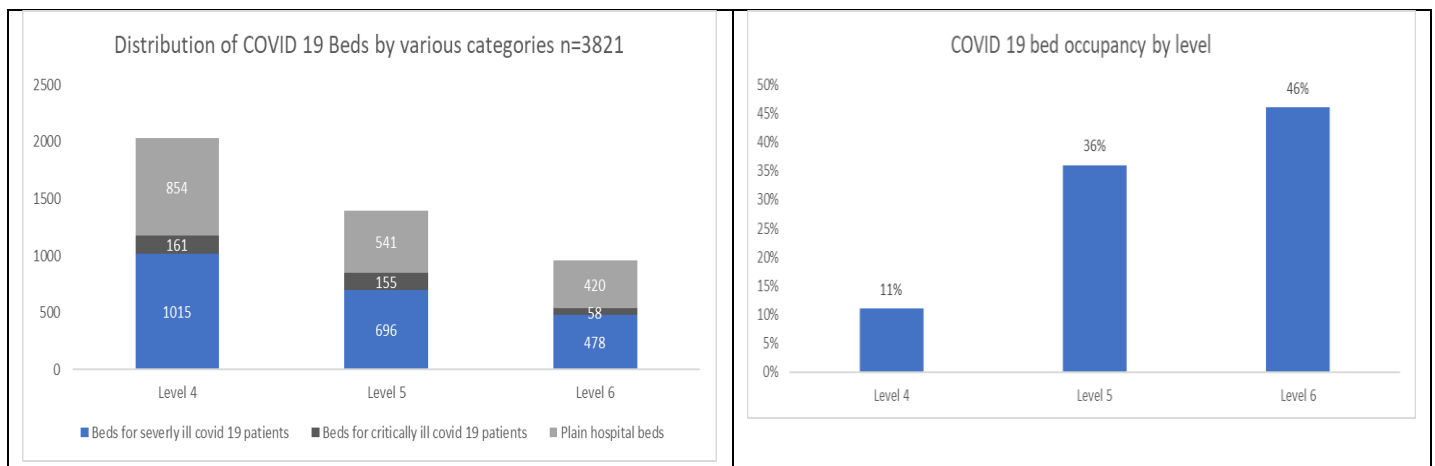


Figure 3: Distribution of COVID-19 Beds by various categories and their occupancy

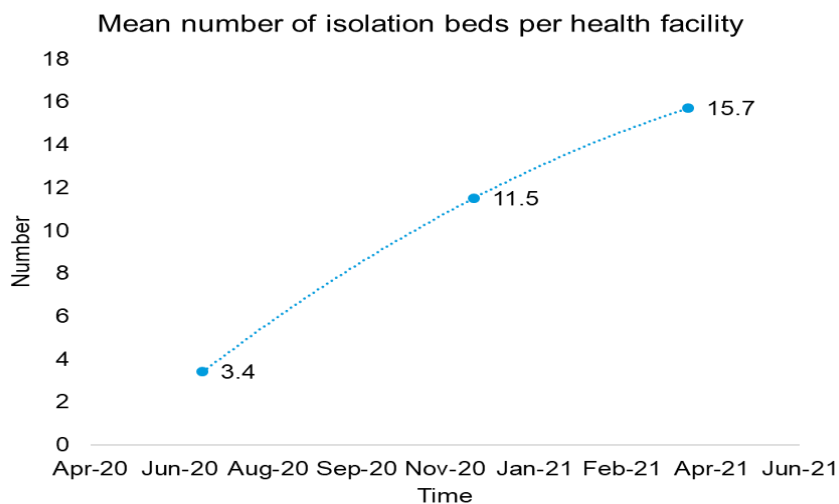


Figure 4: Mean number of isolation beds per health facility n=80

Isolation beds increased from an average of 3.4 to 15.7 per hospital from July 2020 to April 2021.

Overall, although bed occupancy in April was 22%, this was an increase in by 13% from December 2020 as shown in figure 5. This is partly attributed to the 3rd wave that saw an increase in COVID-19 numbers during the month of April 2021.

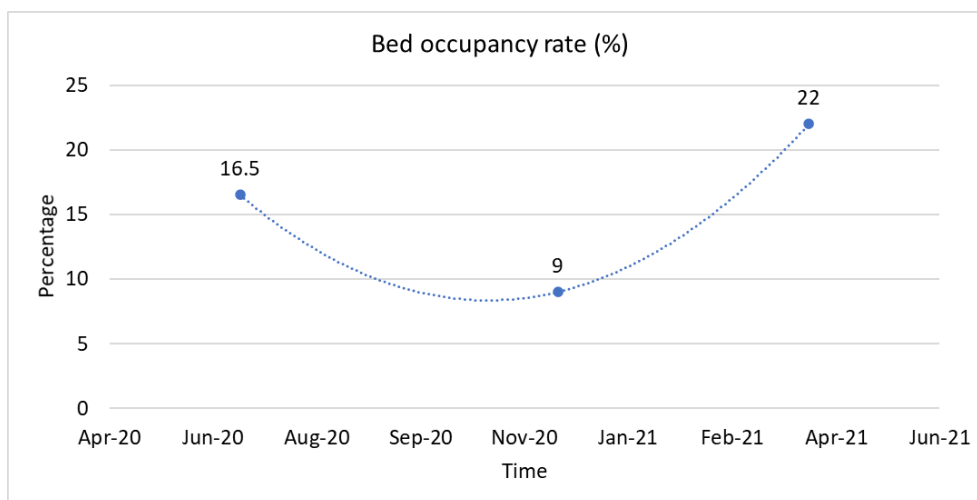


Figure 5 Trends in bed occupancy rates over the last one year

Capacity to respond to a surge is measured by the number of beds that facilities can mobilize and convert to be used for COVID-19 response. From the 80 facilities in levels 4 to 6, an additional 2,290 beds were reported to have capacity to be converted to COVID-19 beds with oxygen. From all the facilities that have ICUs, the additional ICU Beds that can be converted to COVID-19 ICU beds were 216 as shown in figure 6 This translates to an increase in ICU beds by over 50% of the current availability.



Figure 6: Capacity that can be increase bed capacity during surge

Most counties have at least ICU beds which have been set aside for COVID-19 case management. Majority of those beds were in Nairobi (4 in every ten beds), Kisumu, Kiambu

and Nakuru Counties as shown in figure 7. It is worth noting that Embu, Murang'a and Siaya County referrals did not take part in the assessments.

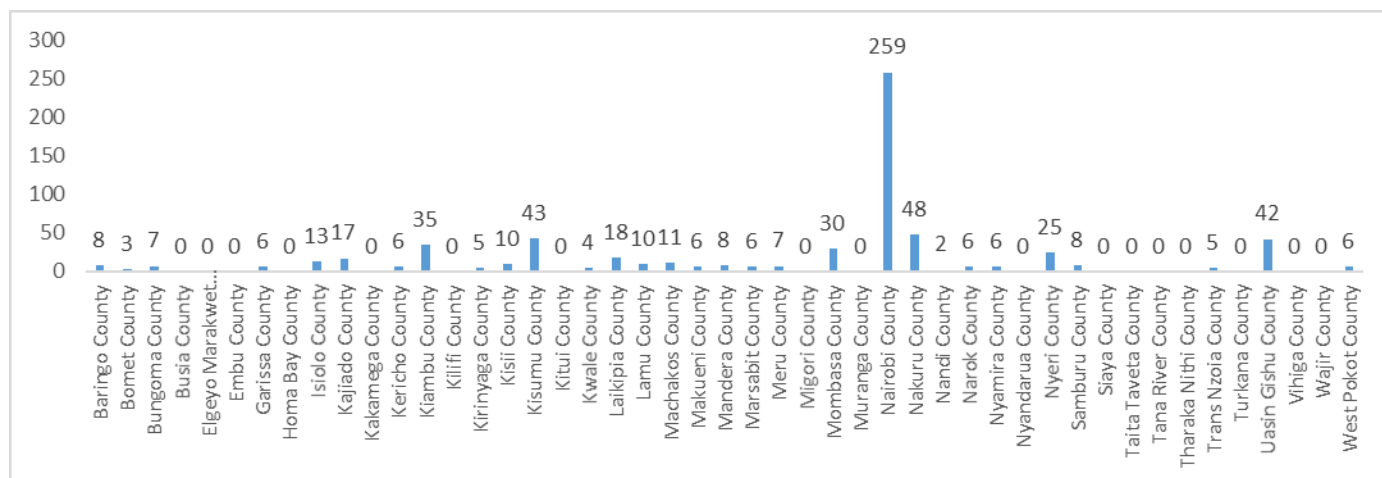


Figure 7: ICU bed capacity by County

Conclusion

There was low bed occupancy of COVID-19 beds accompanied by low availability of ICU beds set aside for care of COVID-19 patients. This could be attributed to several factors;

- **Burden:** Counties have set aside specific number of beds for COVID-19 patients especially following the presidential decree of setting aside at least 300 beds per county for COVID-19 response. While this increases the capacity for COVID-19 response, the burden of COVID-19 has been shown to be highest in only 10 counties accounting for 65% of total burden. This could lead to underutilization of those beds in low burden counties.
- **Functionality:** Data has shown that nearly half of the beds set aside for COVID-19 are plain beds without oxygen piped to them and may hence not provide much reprieve to the patients who require oxygen. The current policy in to admit symptomatic patients who will most likely always require oxygen. Therefore, we may still end up having crowding of higher-level facilities having oxygen.

Recommendations

Keeping a database of COVID-19 bed capacity and occupancy for the country and availing this information to all stakeholders can support decision making and planning beyond the COVID-19 response for emergency healthcare services.

Possible recommendations that low COVID-19 burden counties can consider for the COVID-19 centres are:

- Upgrade – Counties should strive to have a minimum of 30% of their total COVID-19 beds connected to oxygen (Data from the Daily COVID-19 Situation Report show that 25 to 30% of symptomatic COVID-19 patients presented with difficulty in breathing, hence requiring oxygen).
- Burden and projections assessment – Counties should utilize the existing data to inform them on burden and hence plan appropriately.
- Unoccupied beds with oxygen piped to them can be used to support high burden counties during surges.
- Repurpose – Several groups of COVID-19 patients may need isolation space e.g., Paediatric and their parents can be isolated in these unused beds. Alternative uses for these beds include: repurposing them for general inpatients, using them for isolating other cases e.g., MDR TB

Further, the surveillance should also consider collecting data for average length of stay (ALOS) indicator in subsequent assessments to provide more insights on the occupancy and utilization of bed for COVID 19 patients.

Human resources

An adequately trained and supported health workforce is critical in not only managing of COVID-19 patients but also ensuring continuity of provision of other health services. The COVID-19 case management survey sought to assess the effect of COVID-19 on health facility workforce given that they are at a higher risk of contracting COVID-19. The survey also assessed the effect of COVID-19 on staff absence in Level 2-3 facilities which if any would affect the continuity of essential health services. The support provided to staff in terms of training and support supervision was also assessed.

COVID-19 Infections and Mortality Among Health Facility Staff

The survey assessed COVID-19 infections among both clinical and non-clinical staff. Clinical staff have training in and work on direct patient care and management and thus interact with the patient, the patient specimen or equipment. These include: Medical doctors and specialists, nurses and midwives, clinical officers, pharmacists and pharmaceutical technologists, lab technicians, radiographers, public health officers, nutritionist, biomedical engineers, physiotherapist, psychologists. Nonclinical staff comprise of support and administrative staff.

Clinical staff had the higher COVID 19 infections at 10.4% compared to non- clinical staff at 9.5%. Laboratory workers had the highest infection and mortality at 13.4% and 2.3%

respectively. The infections among radiographers (12.8%), public health officers (12.7%), nurses and midwives (10.3%) were above 10% in the sampled facilities.

Despite doctors having the lowest COVID-19 infections (9.3%) among the clinical workers, they had a high mortality of 2.2% as shown in figure 8.

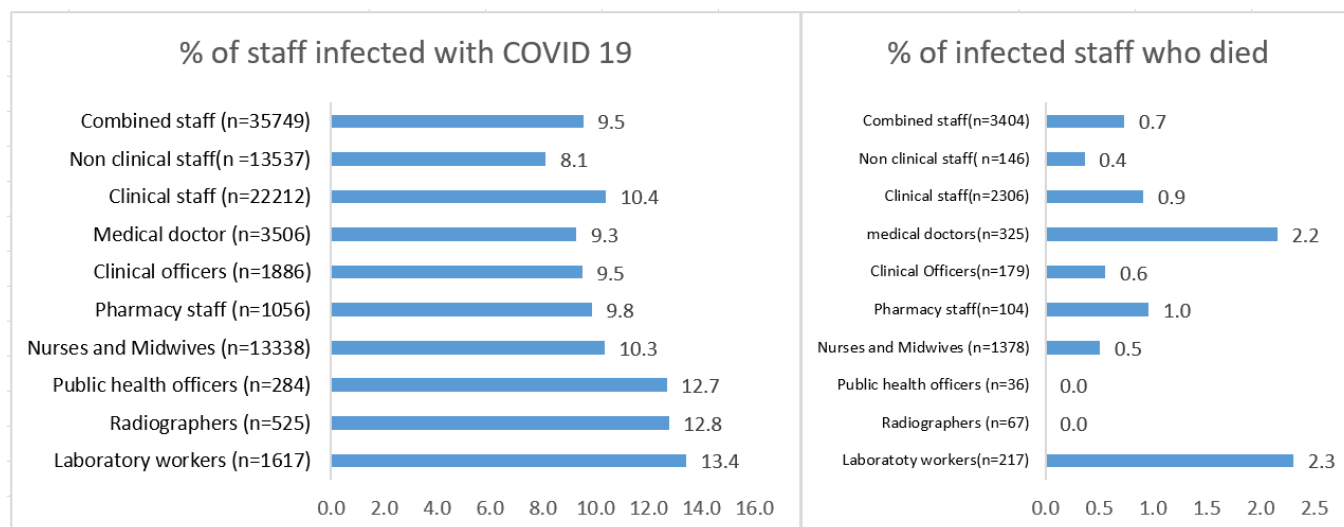


Figure 8 Overall Staff infected with COVID-19 and mortality level for per cadre (N=128 facilities)

Overall, the highest COVID-19 infection rates were in the higher level facilities with level 5 facilities having the highest infections among all staff; 11.2 % of all staff being infected, with 10.4% infection among non clinical staff, and 11.7% among the clinical staff as shown in figure 9.

COVID-19 infections were highest among public health officers, Laboratory workers and radiographers in level 5 and 6 facilities where most severe COVID-19 patients were being managed. The lowest rates of staff infections were seen in level 2-3 followed by level 4 facilities across all cadres except for medical doctors who had the lowest infections in level 6 facilities (8.1%), followed by 8.9% in level 5, 9.1% in level 2-3 and the highest infections at level 4 facilities. The highest fatality rates were recorded among medical doctors and laboratory workers at 2.2% and 2.3% of those infected.

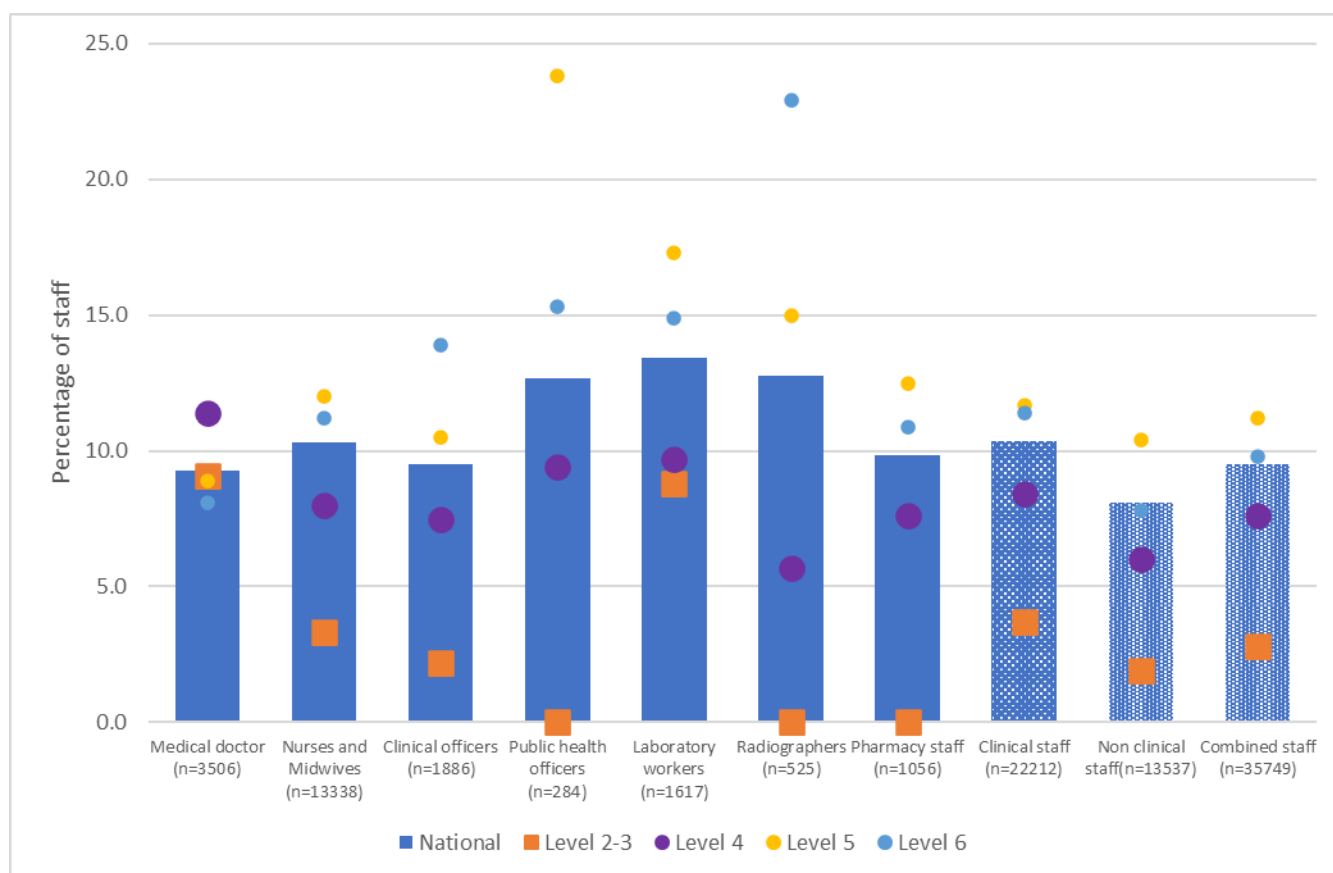


Figure 9: COVID- 19 Infections per cadre and per facility Level (n=128)

COVID-19 infections were higher among staff in the urban facilities (10.2%) compared to the rural facilities (6.3%) which also reflects the overall burden of COVID-19 infections in the country. There were more infections among staff in non public facilities (10.5%) compared to public facilities (9.2%) with a greater proportion of clinical staff being infected compared to non clinical staff as shown in figure 10.

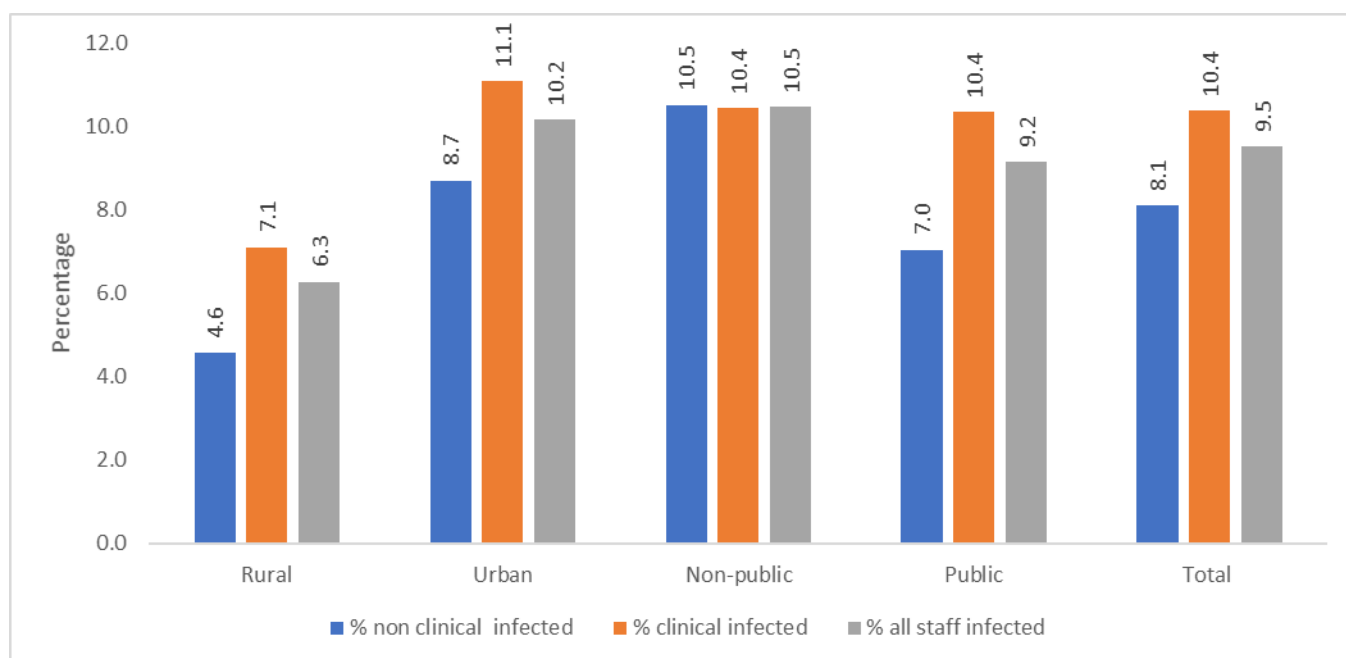


Figure 10: COVID-19 infections by geographical location and ownership (n =128)

Staff Absence

Sampled facilities from level 2 to 6 were assessed by asking the facility in charge if there was any staff absent from work in the last 3 months and to give all the reasons that resulted in the staff absence. The question was multiple choice and could therefore have had staff absent for multiple reasons. 80% of all sampled facilities had had at least one staff away/absent for any of the reasons shown in figure 11.

In facilities reporting staff absence (103/128), 26% of reasons given for staff absence were due to COVID-19 related reasons which including sick leave related to COVID-19, including preventive quarantine, caring for family members who have COVID-19 and burnout or mental health issues related to COVID-19. Most of the reasons given for staff absence were due to the expected non-COVID-19 related reasons which included annual leave (27%), Maternity leave (20%) and study leave (14%). In the period between January and March 2021, there was also absence reported due to industrial action (7%).

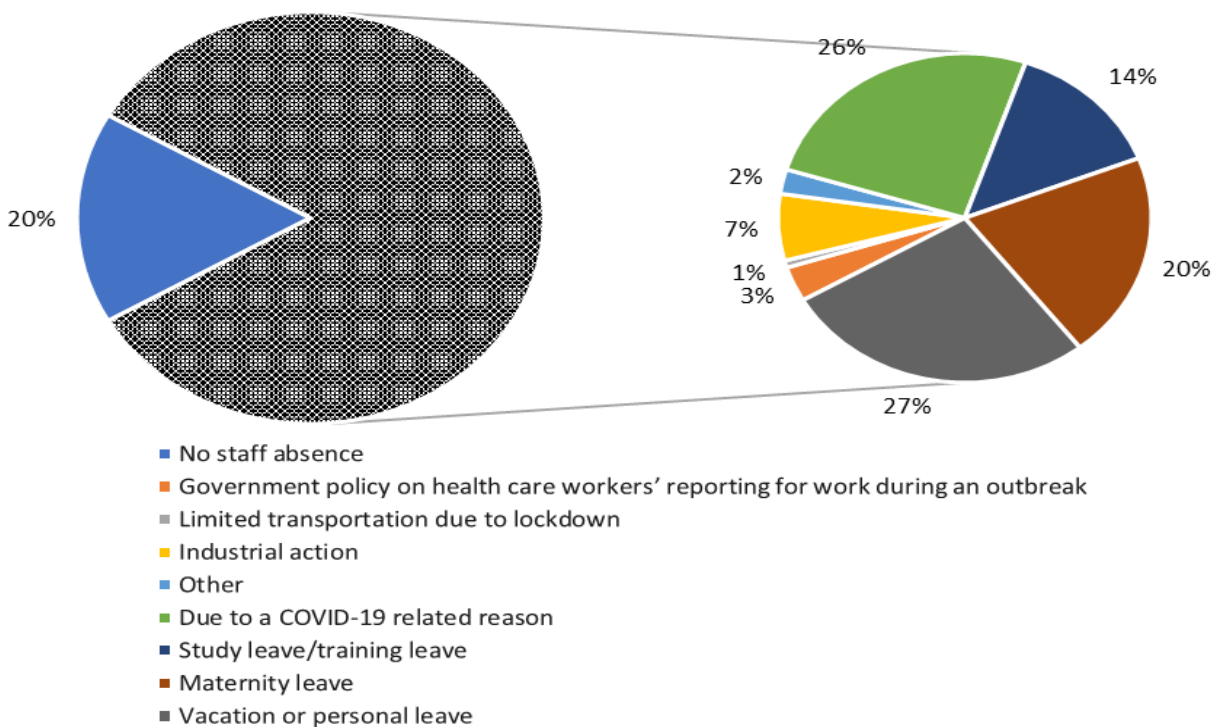


Figure 11: Percentage of facilities reporting staff absence for any reason(n=128), and reasons given for the staff absence (n= 103)

41% of the health facilities reported staff absence due to COVID-19 related reasons in the period between January to April 2021. This has increased from 33% of facilities in December 2020 and 1.2 % in June 2020 as shown in figure 12 below.

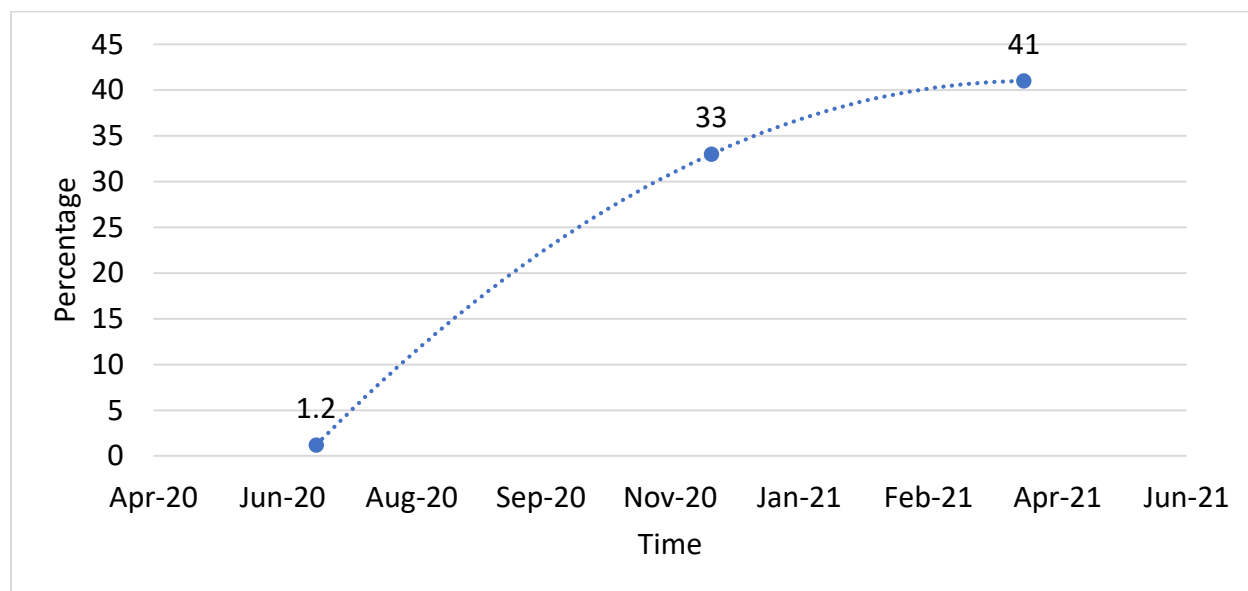


Figure 12: Trend of percentage of facilities reporting any staff absence due to COVID-19

Human Resource Management Changes in Response to COVID-19

There were changes in staff management in 46% of facilities (n=128) in the period between January 2021 to March 2021 in response to COVID-19 Pandemic. The staff changes were not mutually exclusive with most facilities implementing more than 1 change in staff management to respond to service demands due to COVID-19 pandemic. 36% of the sampled facilities increased full time employed staff, 32% reassigned staff within the facility, 31% recruited new staff, 17% increased working hours for existing staff. Only 3% of facilities reported laying off staff in the period between January to March 2021. See figure 13 for further details.

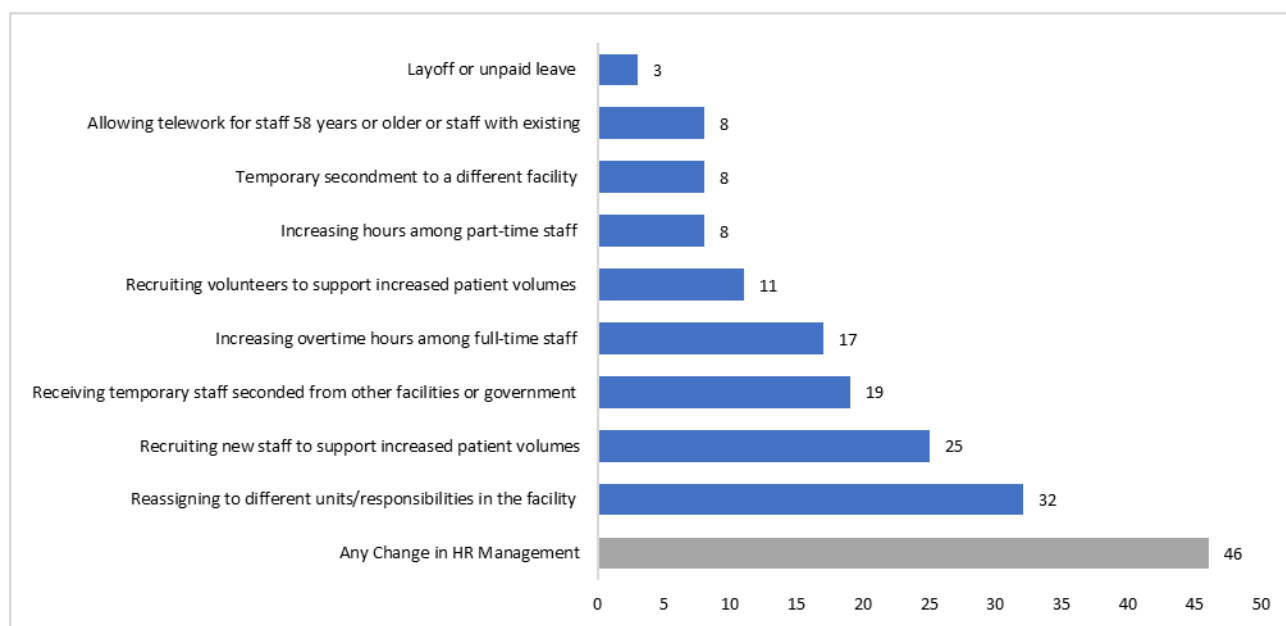


Figure 13: Percentage of facilities that made changes in health worker management in last three months(n=106)

Staff Training and Support Supervision

Staff training and support supervision was assessed for level 2 to 4 facilities. 57% of the facilities were trained on infection prevention and control, 56% trained on use of PPEs with only 38% being trained on management of emergency conditions. 34% were trained on all five training items as shown in figure 14.

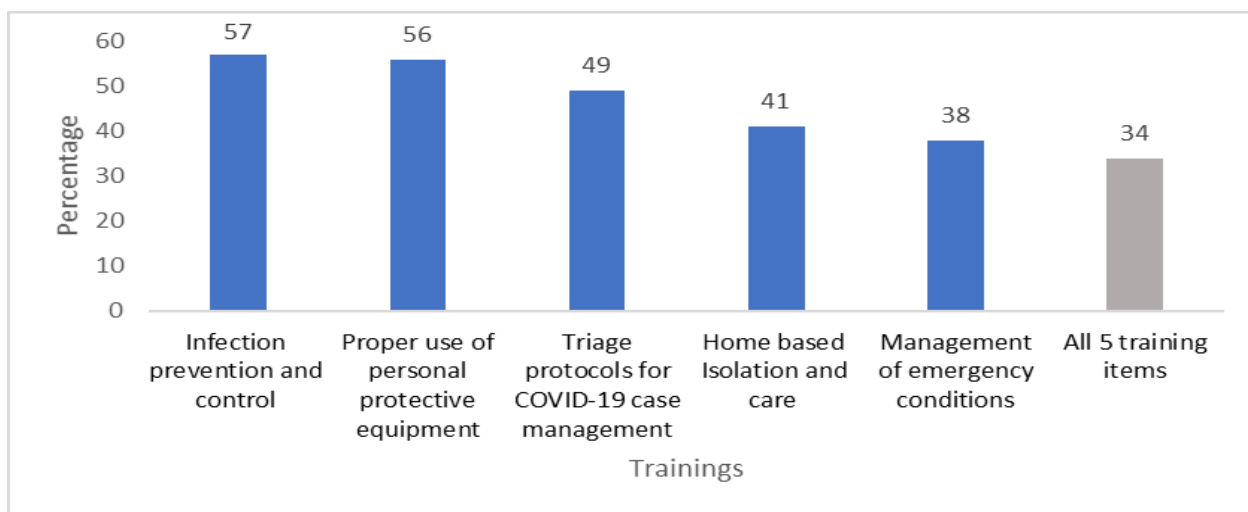


Figure 14: Percentage of level 2 to 4 facilities trained on topics related to COVID-19 (n=106)

In the preceding 3 months of the survey, 41% of level 2-4 facilities had received support supervision for proper IPC, 37% for proper use of PPEs and 23 % for home-based care and isolation, with only 22% having received support supervision in all the 3 key areas shown in figure 15.

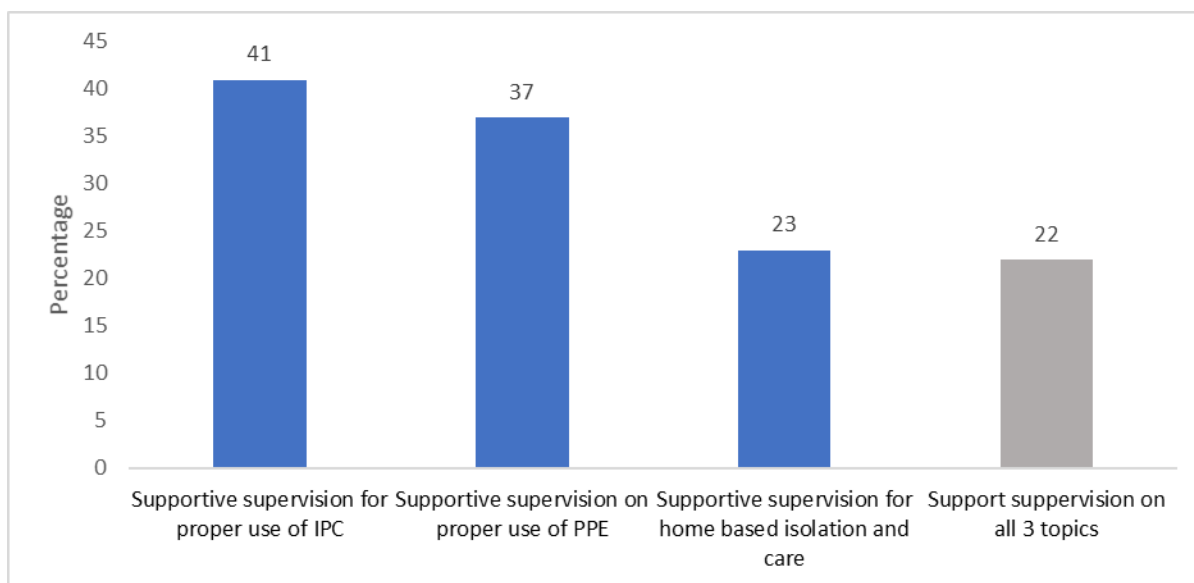


Figure 15: Percentage of level 2 to 4 facilities given supportive supervision on topics related to COVID-19 (n=106)

More level 4 facilities received the training on COVID-19 related topics and support supervision as these were the facilities ear-marked to manage COVID-19 patients. 4% of the level 2-3 facilities and 34% of level 4 facilities received all the 5 training and 3 supervision topics. More facilities in the urban areas than rural areas received training on the 5 COVID-19 related topics and 3 supervision topics with 38% in urban facilities and 12% of rural facilities receiving all training and supervision topics. 46% of non-public facilities and 30% of

public facilities received all 5 training topics, with almost equal proportion receiving all 3 supervision sessions see figure 16 for further details.

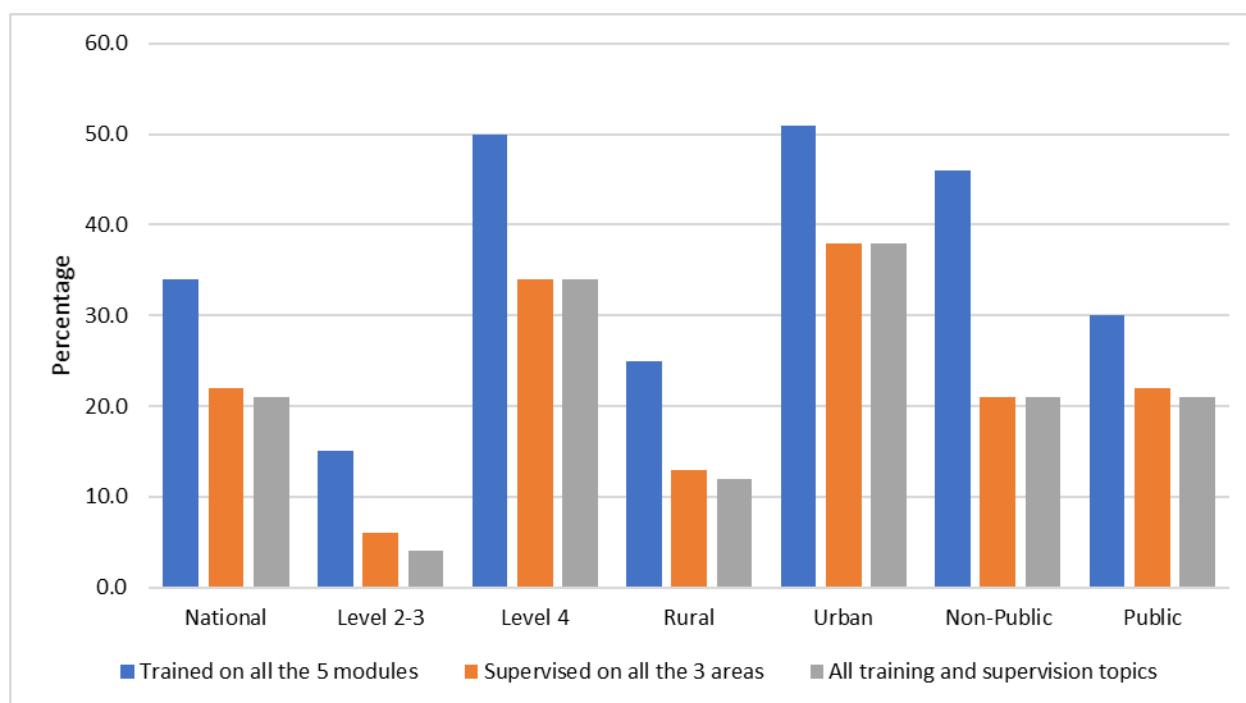


Figure 16: Percentage of level 2 to 4 facilities trained on and given supportive supervision on topics related to COVID-19 by facility level, geographical location and ownership (n=106)

Health Facility Staff Infections Across Counties

The number of staff infected with COVID19 was assessed in 3 to 4 sentinel facilities per county from level 2 to 6. The percentage of staff infected therefore is not representative of the whole county but gives an indication of the COVID-19 infection among staff in the sampled facilities.

The overall infections among health facility staff was 9.5% among the sampled facilities. Nakuru county had the highest percentage of the sampled health facility staff infected with COVID 19 (29%) followed by Garissa (27%), Samburu(22%),Mombasa (16%) Marsabit(15%) ,Kwale(14%), Taita Taveta(13%) and Nairobi(13%) which all had more than 10% of the health facility staff in sampled facilities being infected with COVID-19. Health facilities sampled in Homa Bay, Kakamega, Kilifi, Migori, Nyandarua, Siaya, Turkana, Wajir did not report any staff infected with COVID-19 though the staff in the facilities sampled were few as shown in figure 17.

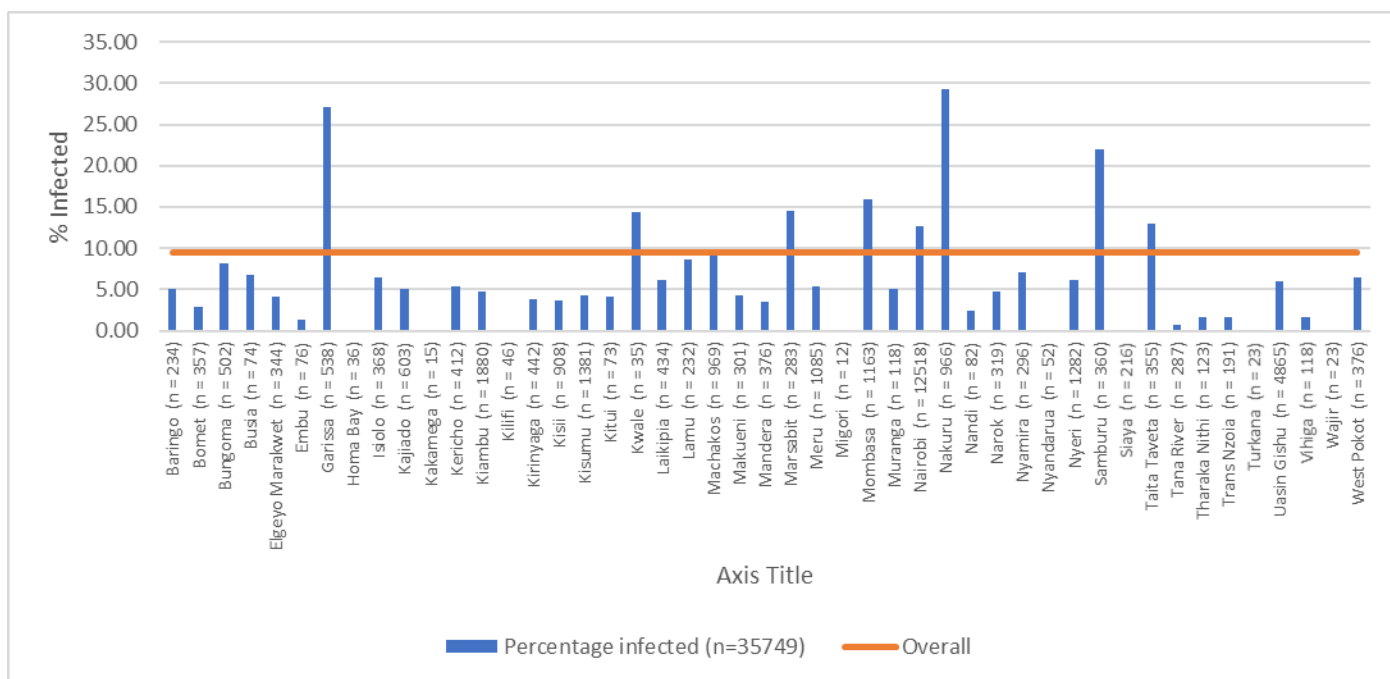


Figure 17: COVID-19 infection among health facility staff in sampled county facilities

Comparing infection rate among staff in sampled facilities, it is key to note that there was no correlation between percentage of sampled health facility staff infected and the overall number of people infected per county as shown in figure 18 below. Counties like Nakuru, Garissa, Isiolo, Samburu, Taita Taveta had a high percentage of health facility staff infected with COVID-19. This could be partly explained by provision of PPEs in these counties as shown in figure 57.

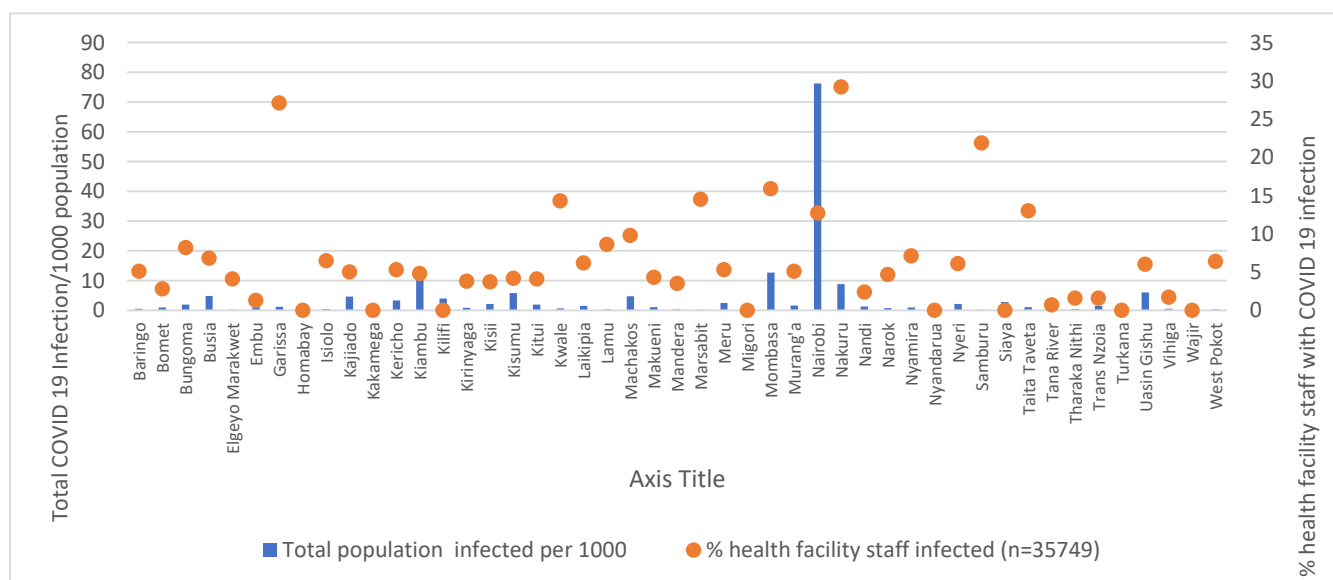


Figure 18 COVID infections and Health workers infections per county

Conclusion

- COVID-19 infections were more in higher level facility staff who saw more COVID-19 patients.
- Infections among clinical staff were higher than that in non-clinical staff in health facilities. The highest infections were among laboratory staff and public health officers and radiology staff.
- There has been an increase in absence of health workers due to COVID-19 from the onset of the pandemic to April 2021 which takes away from the capacity to manage COVID-19 patients and ensure continuity of essential health services number in infections.
- Training and support supervision on COVID-19 related topics was low especially in level 2 -3 facilities and in rural facilities.

Key recommendations

- Provide all staff the necessary with PPE material and training to observe all IPC protocols to avoid infection.
- Emphasis on proper use of PPEs should not only be among clinicians directly managing the patients but also all who come into contact with patient's specimen.
- Precaution is also important among all health workers even in low level COVID-19 infection counties seeing that a high percentage of health facility staff infections was seen in Garissa, Samburu which had a low burden of COVID-19
- There is need to plan for training for COVID-19 related topics in the lower-level facilities especially if there are plans to increase COVID-19 management capacity in the primary care facilities.

Diagnostics: Laboratory and Radiological

When a diagnosis is accurate and made in a timely manner, a patient has the best opportunity for a positive health outcome because clinical decision making will be tailored to a correct understanding of the patient's health problem³.

Diagnostic tests have crucial role in supporting clinical decisions and in patient management where they are used to confirm or rule out a diagnosis in symptomatic patients. For asymptomatic cases or non-specific symptoms, diagnostic tests are used to screen individuals to prevent the spread of a disease in the community. Diagnostic tests are also often used in epidemiological studies and drug resistance surveillance.

³ Diagnostic testing is inclusive of all types of testing, including medical imaging, anatomic pathology, and laboratory medicine, as well as other types of testing, such as mental health assessments, vision and hearing testing, and neurocognitive testing

Laboratory diagnostics

In this assessment, availability of laboratory diagnostic tests was done to determine facility capacity to:

1. Optimally carry out continuation of essential health services
2. Support COVID-19 testing and diagnosis

Continuation of essential health services

Basic diagnostic capacity was determined using availability of rapid diagnostic tests for malaria, glucose, urinalysis and pregnancy. Over 80% of all the level 2 to 4 facilities assessed, reported that they were undertaking these four basic tests as shown in figure 19.

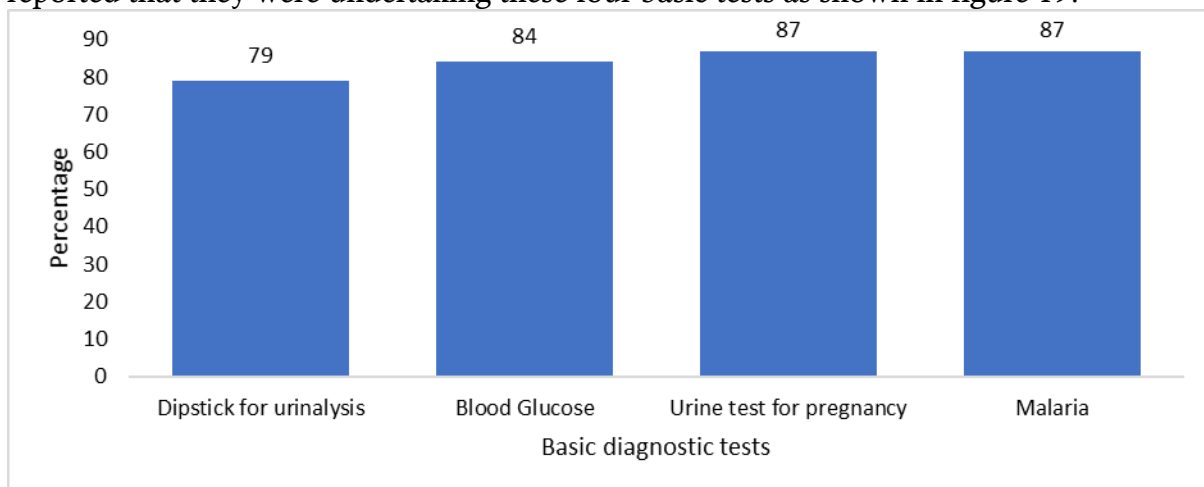


Figure 19 Percentage of health facilities with basic diagnostics (n=106)

Level 4 facilities should ideally, as per the Kenya Essential Package for Health, be able to undertake a few more tests on top of the four basic diagnostic tests. The availability of a select package of tests was assessed at the level 4 facilities.

Of the 58 level 4 facilities assessed, the mean availability of diagnostic services was 70% of all the health facilities had all the select diagnostics. Nine out of every ten facilities conducted HIV testing, Tuberculosis screening, Hemoglobin analysis, while 80% of the facilities conducted Blood typing and cross matching, urine test for pregnancy, Malaria testing, blood glucose analysis and urinalysis using dipstick as shown in figure 20.

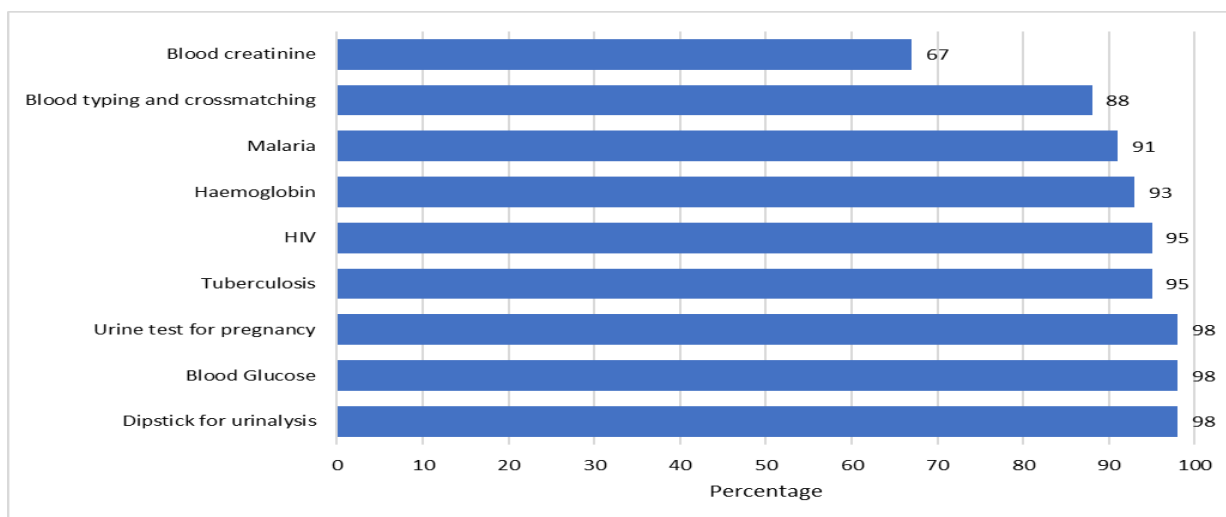


Figure 20: Proportion of level 4 facilities with select diagnostics (N=58)

The most commonly available tests were malaria (92%) and pregnancy test (91%). Most facilities (84%) conduct blood glucose and test, while only 76% conduct urinalysis. Grouping and cross-matching of blood was generally available with 66% of facilities reporting this capacity. Blood creatinine testing was the least available test with only 45% of facilities reporting this capacity.

Analysis shows that 84% of the facilities had basic diagnostic services and 70% with full diagnostic capacity (based on the select 9 diagnostic tests shown in figure 21). Urban facilities had better diagnostic capacity at 95% and 83% for basic diagnostic and full diagnostic capacity respectively. Private sector exhibited greater capacity compared to the public counterparts at 96% and 79% respectively as shown in figure 21.

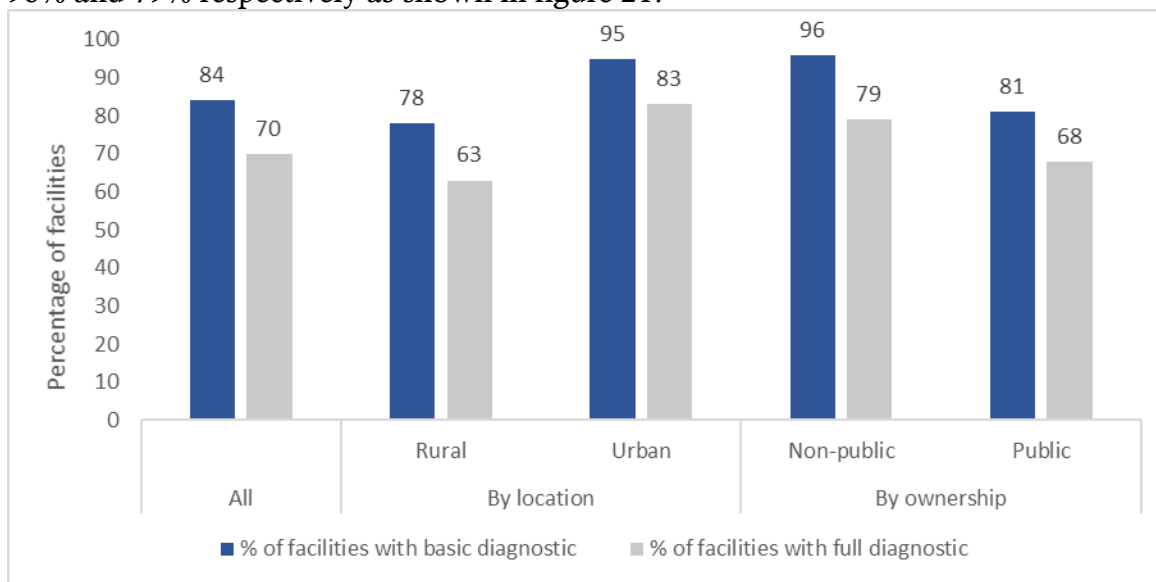


Figure 21: Proportion of facilities with select diagnostics relevant for the type of facilities (N=106)

COVID-19 testing

Capacity for health facilities to test for COVID-19 is critical in COVID-19 surveillance to support case identification, quarantine, and contact tracing efforts.

Given the limited capacity in Kenya, there are two models currently in place for diagnosing COVID-19:

- A facility collects samples and conducts testing on site – this is common in large Health facilities and Private laboratories
- Satellite facilities collect samples and through a well-coordinated transport network, transports samples for processing by central laboratories

Based on these two models, an assessment of the percentage of facilities with capacity to provide COVID-19 testing services (i.e collecting specimens for diagnosis, onsite testing, referrals) was undertaken.

Four in ten facilities collect COVID-19 specimens and conduct PCR or RDT testing on site while only 28% of all facilities collect COVID-19 specimens for further testing in another facility. A third of all the facilities did not collect specimens for COVID-19 diagnosis as shown in figure 22.

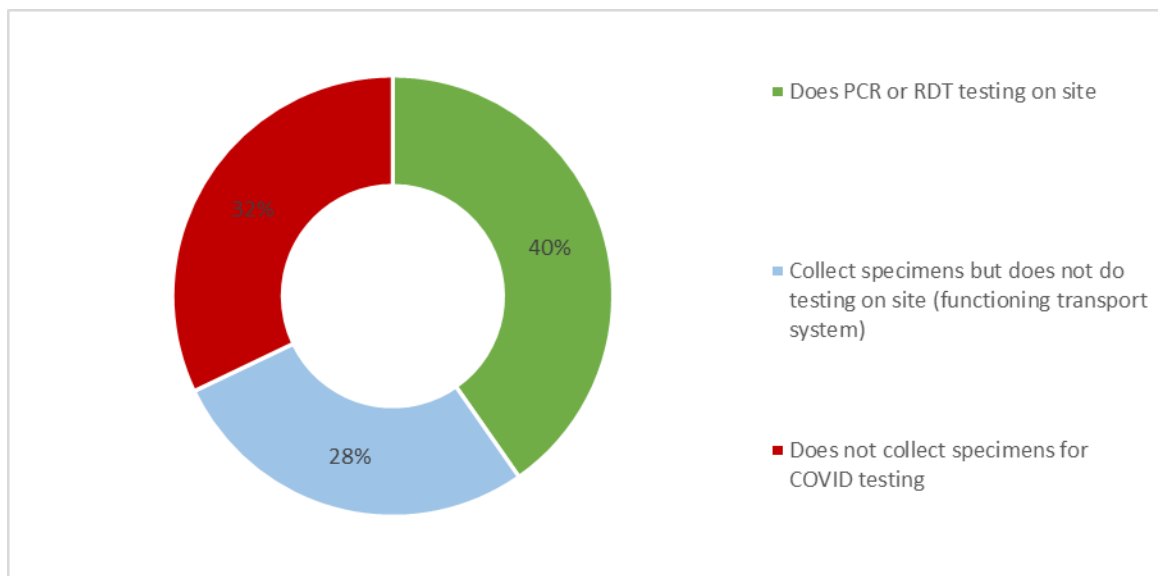


Figure 22 Proportion of facilities that collect COVID-19 specimens and conduct PCR or RDT testing on site (N=128)

Analysis by level of care shows that only 2% of the level 2-3 facilities conducted PCR or RDT tests for Covid-19 while 75 %, 62 % and 44 % of the sampled level 6, level 5 and level 4 respectively, conducted PCR or RDT tests for COVID-19 as shown in figure 23.

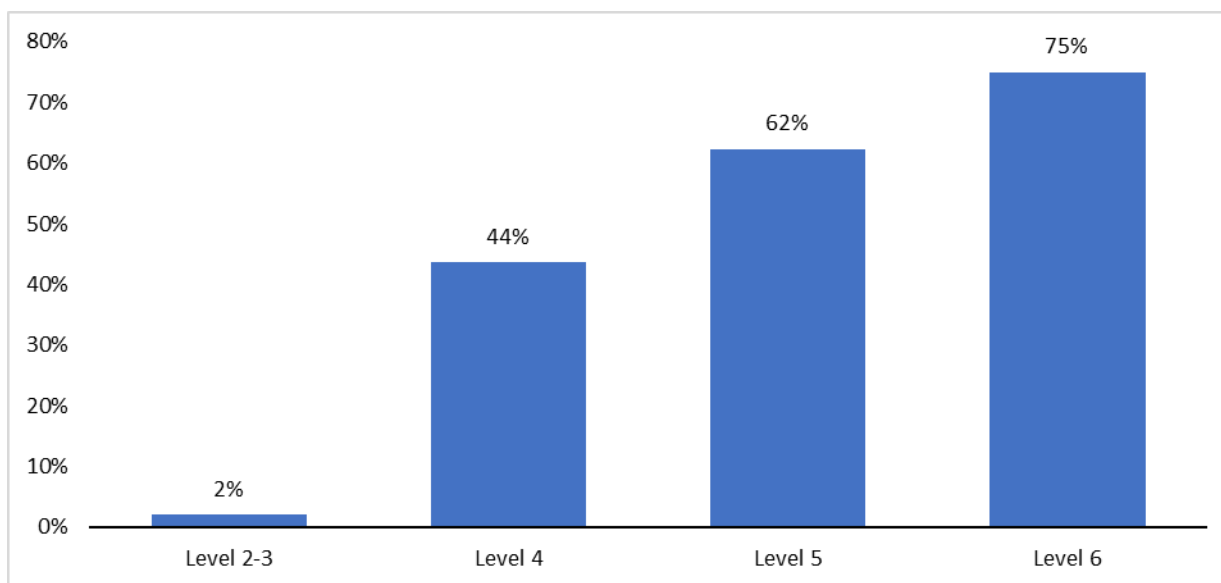


Figure 23: Percentage of health facilities Conducting PCR or RDT Tests for COVID-19 (n=87)

Radiological Diagnostic testing

The survey assessed the availability of radiological diagnostic services (X-Ray, MRI, CT scan and Ultrasound) in level 4 to 6. Of all the facilities, 81 % had Ultrasound services, 74 % had X-ray while four out of every ten had a CT scan which has been shown to be more important in COVID-19 diagnostics as shown in figure 24.

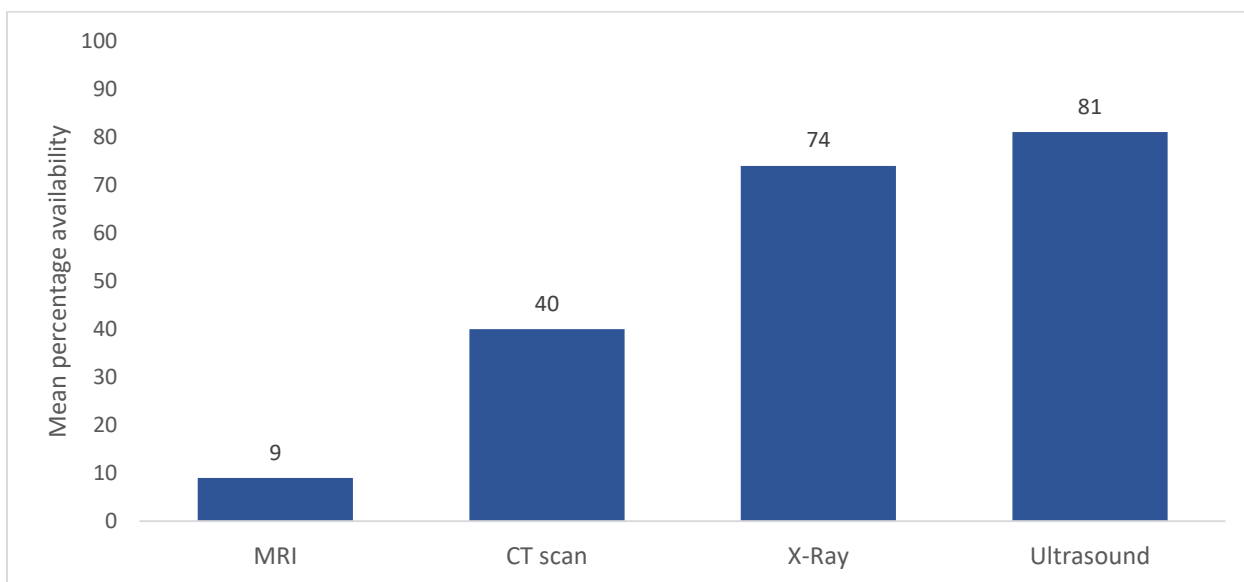


Figure 24: Proportion of level 4-6 facilities with select imaging tests available and functional (N=58)

Select medical equipment for COVID-19 management.

Medical equipment plays an important role in healthcare delivery. It ranges from small and simple devices such as sphygmomanometer to complex and big devices such as Magnetic Resonance Imaging (MRI) machines. The functionality of X-ray machines remains critical even as more COVID-19 cases present with a viral pneumonia and this capacity needs to be improved especially at the facilities.

The survey assessed availability of select medical equipment that is used in management of COVID-19. These included availability of pulse oximeters that are used in ascertaining the level of oxygen saturation and availability of ventilators that are useful in management of severe – critical COVID-19. Functional pulse oximeters were found in 9 out of 10 facilities that were assessed. Functional ventilators were available in approximately 5 out of 10 facilities assessed.

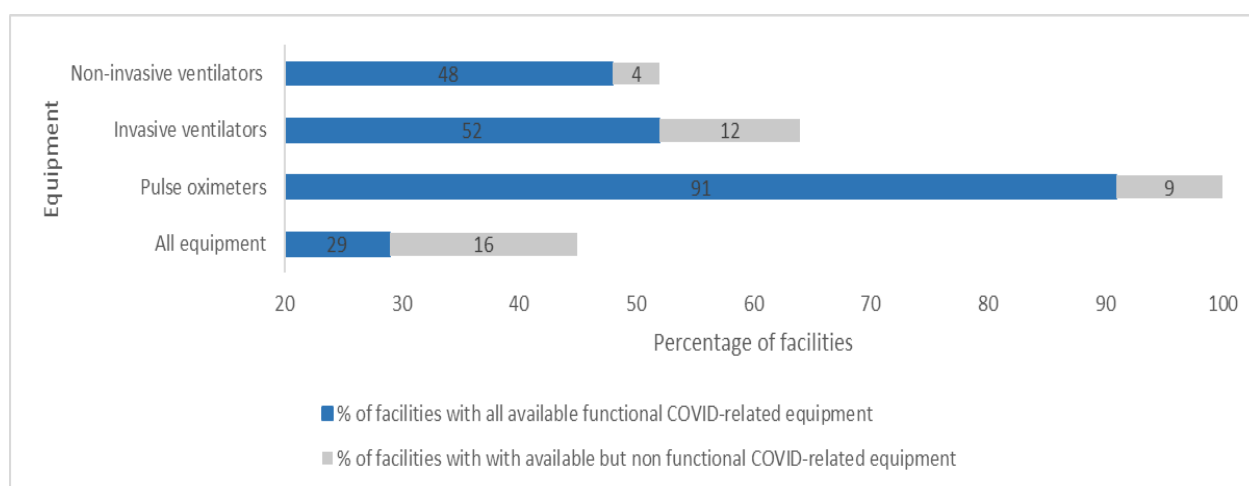


Figure 25: Proportion of facilities with all or some available functional selected COVID-19 related equipment (N=80)

For the functionality of select medical equipment for COVID-19 management, 91% and 48% of the facilities reported having functional Oximeters and non-invasive ventilators recording an improvement from 88% and 46% in the last assessment. This is despite the number of facilities being higher in April compared to December 2020.

Where select equipment for COVID-19 case management were non-functional, the main reason given non-installation or where installation had been done, training had not been done. Analysis shows that capacity issues (no training/no installation at 33%). Other reasons given included staffing issues and unavailability of consumables at 21% for each as shown in figure 26.

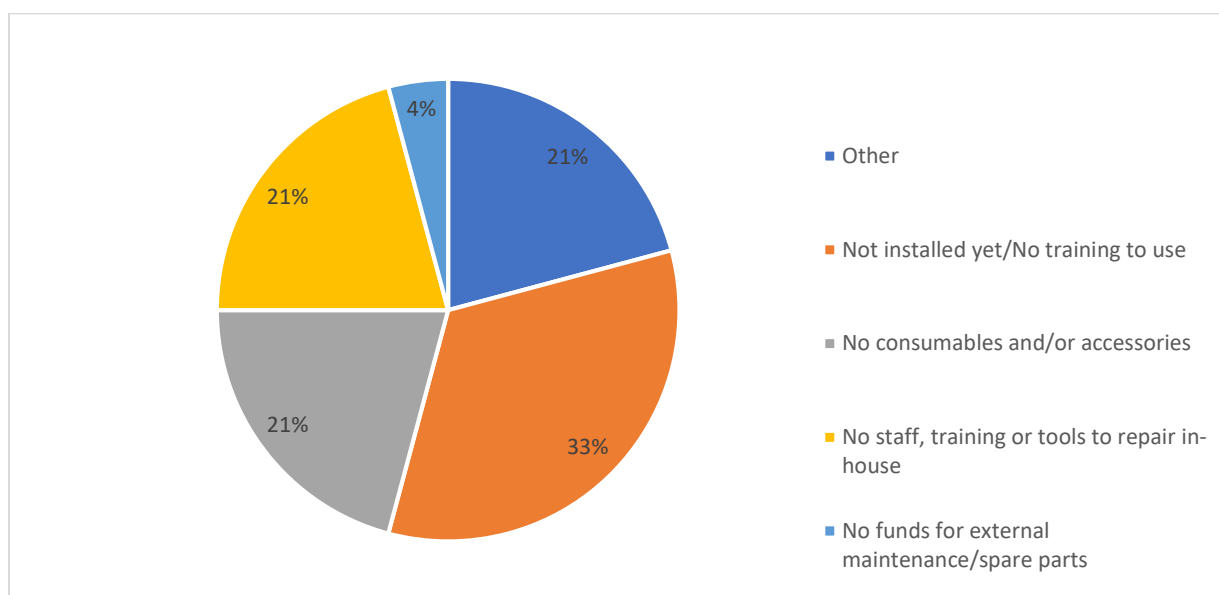


Figure 26: Reasons for non-functionality of selected COVID-19 related equipment (N=32)

Of the select medical equipment used for COVID-19 case management, ventilators were more available in urban based facilities compared to rural. However, it was encouraging to observe that pulse oximeter was available in both urban and rural facilities with the disparity between the two minimal.

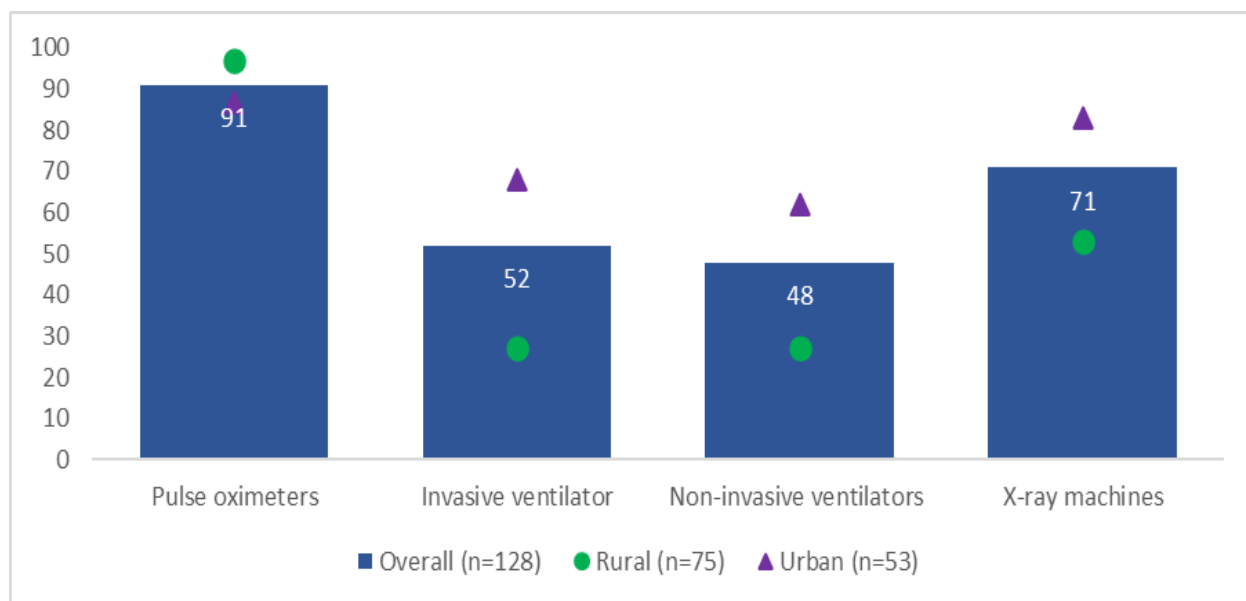


Figure 27: Proportion of facilities with all available functional selected COVID-19 related equipment (N=80)

There has been an increase capacity to provide ventilators services in the case management centers from 14% in July 2020 to 52% in April 2021 as shown figure 28. This could be due to the increase in the ICU/HDU capacity within the country.

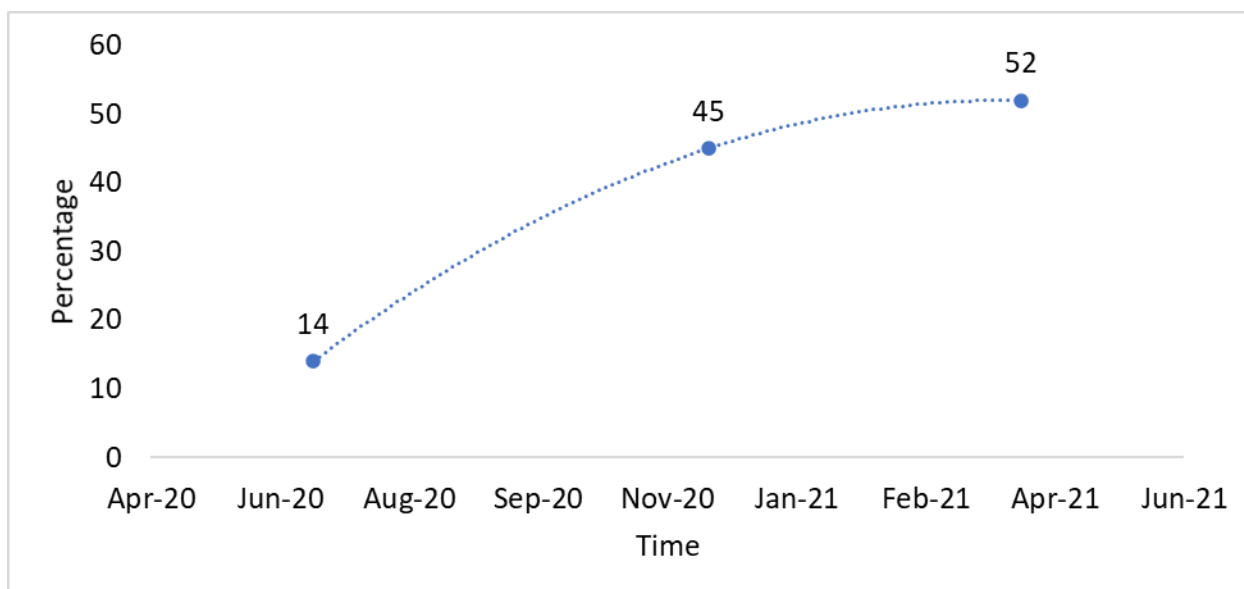


Figure 28: Proportion of facilities with functioning ventilators (invasive and non-invasive) (N=80)

There was county variation as regards availability of the select medical equipment used for COVID-19 case management in availability and functionality of select COVID-19 management equipment as shown in figure 29 and Annex 1. The counties with high infection rates like Nairobi, Mombasa and Kiambu have more equipment available and functional.

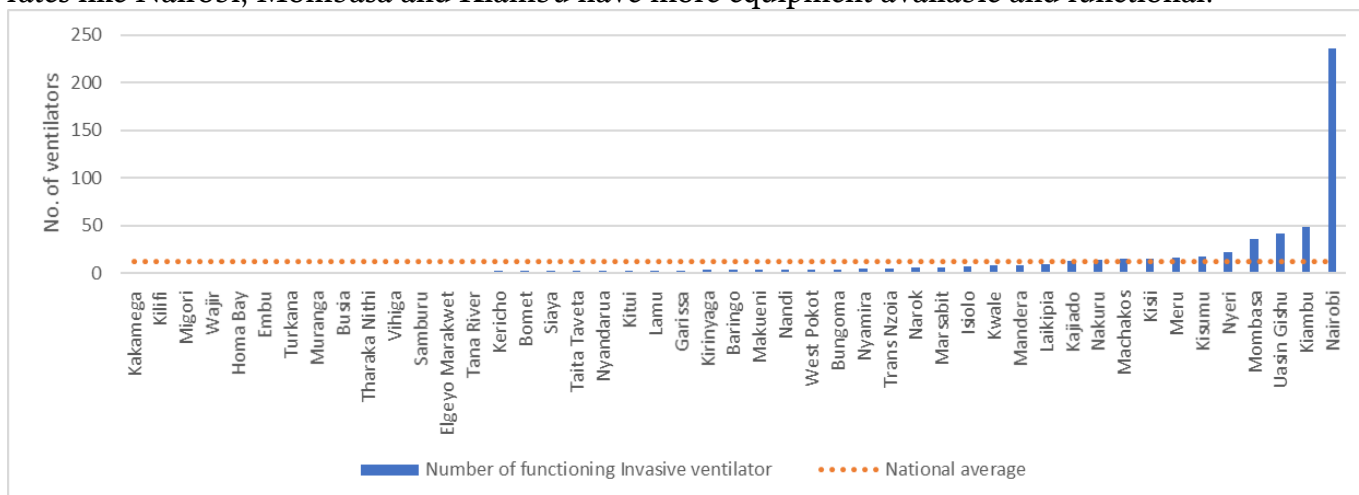


Figure 29 Availability and Functionality of Pulse oximeters and Invasive ventilators by County (ies)

Oxygen availability

COVID-19 primarily affects the respiratory system with symptoms ranging from mild infection to severe infection which results in a severe viral pneumonia which could then progress to life threatening acute respiratory distress syndrome. Oxygen therapy therefore is a key component of management of COVID-19 all through be it at monitoring of oxygen saturation levels to actual provision of oxygen. It is vital to ensure that the medical oxygen supply system provides a safe and reliable supply of oxygen to healthcare facilities and

patients as end users. In a pandemic setting such as the COVID-19 one, setting up of robust oxygen systems for optimal patient management takes time. It is therefore important to routinely assess the status.

In this assessment, data was collected to determine how oxygen is availed to health facilities managing COVID-19, availability of piped oxygen which has been shown to be effective in such settings and availability of oxygen delivery accessories. Oxygen is supplied to hospitals through various options that include: like oxygen cylinders, oxygen concentrators, bulk oxygen cylinders and oxygen plants on site.

95 % of the health facilities reported having any source of oxygen up from 74 % in the last assessment. It is important to note that this was based on availability of reported oxygen delivery modalities such as oxygen cylinders and not actual amount of oxygen that was available. At 91%, oxygen cylinders were the most common modality through which oxygen was supplied in the assessed facilities. This is similar to what was found in the last assessment conducted in December 2020. In the facilities assessed, there was a notable increase in the availability of oxygen concentrators at 51% increase rate, facilities reporting availability.

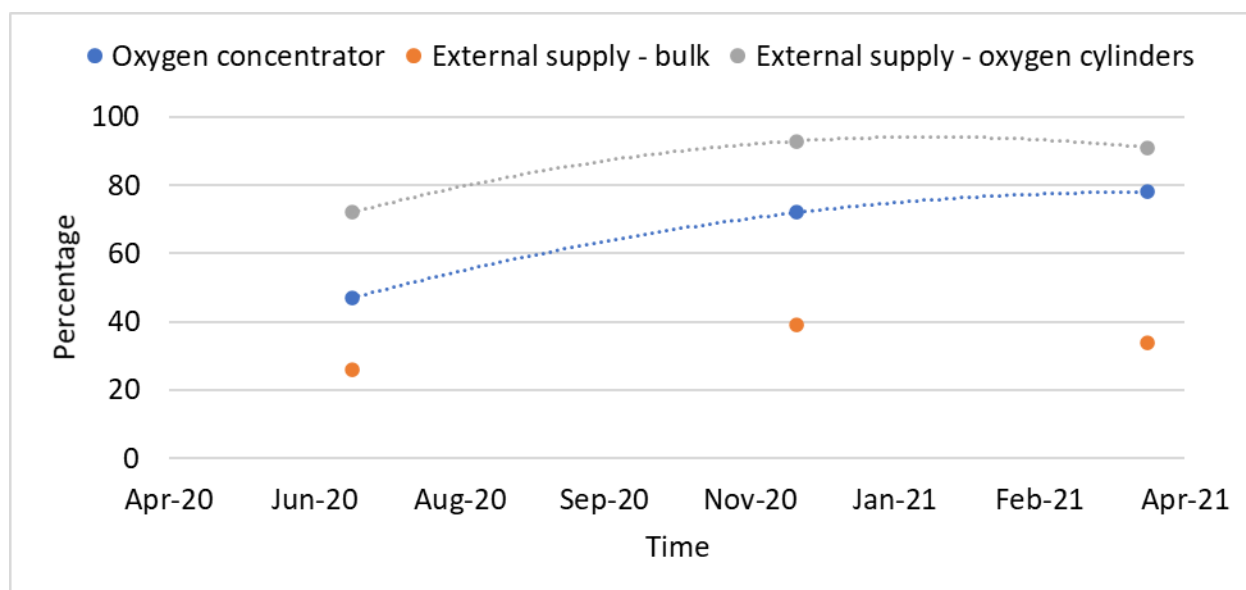


Figure 30: Availability of oxygen delivery modality, by assessment period, in assessed facilities

Over half (56 %) of the facilities reported piped oxygen to the bedside with ICU being the most common site for this oxygen delivery mode as shown in figure 31. This was less than the two thirds (64%) of all facilities assessed the previous period. Given that there was an increase in the number of facilities assessed from 58 in December to 80 in April 2021, this assessment indicates the need to continually advocate to counties the need to increase piping infrastructure in Covid-19 centres.

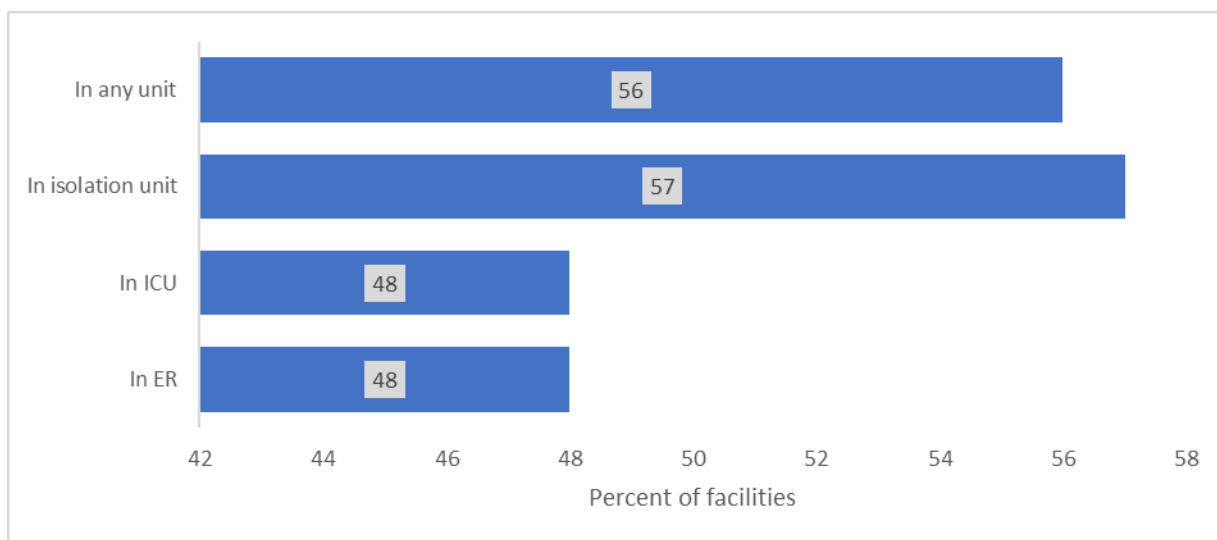


Figure 31: Proportion of facilities (Levels 4 – 6) with piped oxygen sent to bedside units (N=80)

For the piped oxygen to bedside, 57% of the facilities reported having piped oxygen in the isolation unit while 48% had piped oxygen in ICU and Emergency rooms each as shown in figure 32. The previous assessment recorded 53%, 53% and 46% for piped oxygen in Isolation rooms, ICU and Emergency rooms respectively.

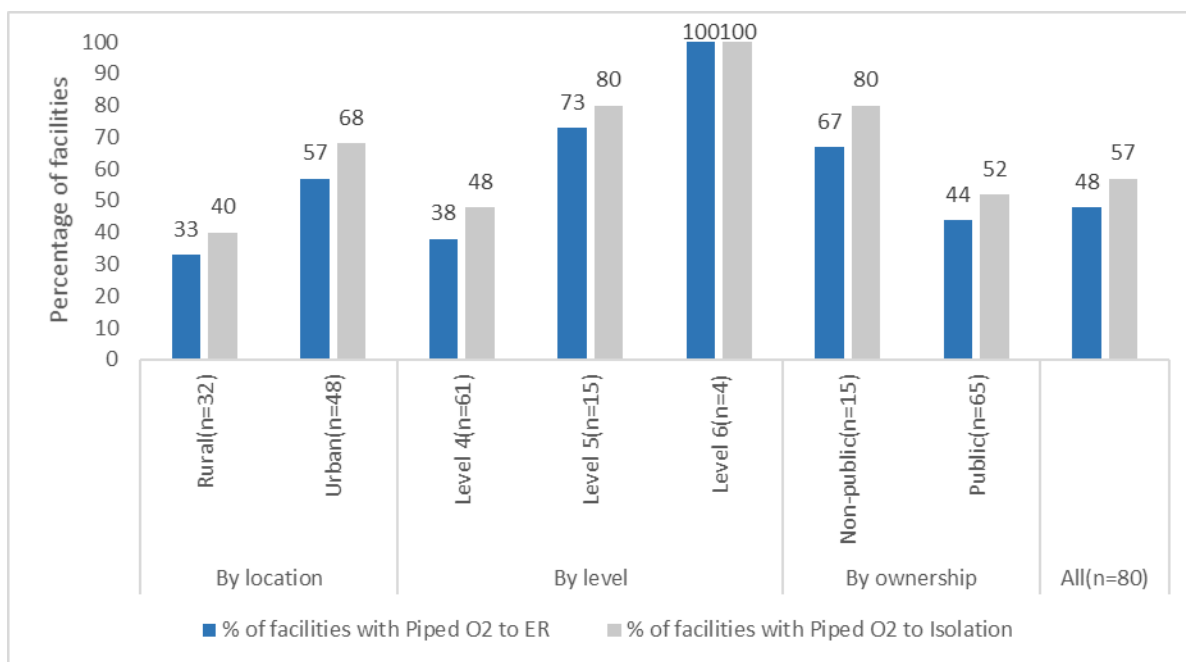


Figure 32: Proportion of facilities (levels 4 – 6) with Piped O2 to ER and Isolation (N=80)

In the facilities assessed, there was a notable increase in the overall availability of oxygen from any source from 58% in June 2020 to 95% in April 2021 as shown in figure 33 below.

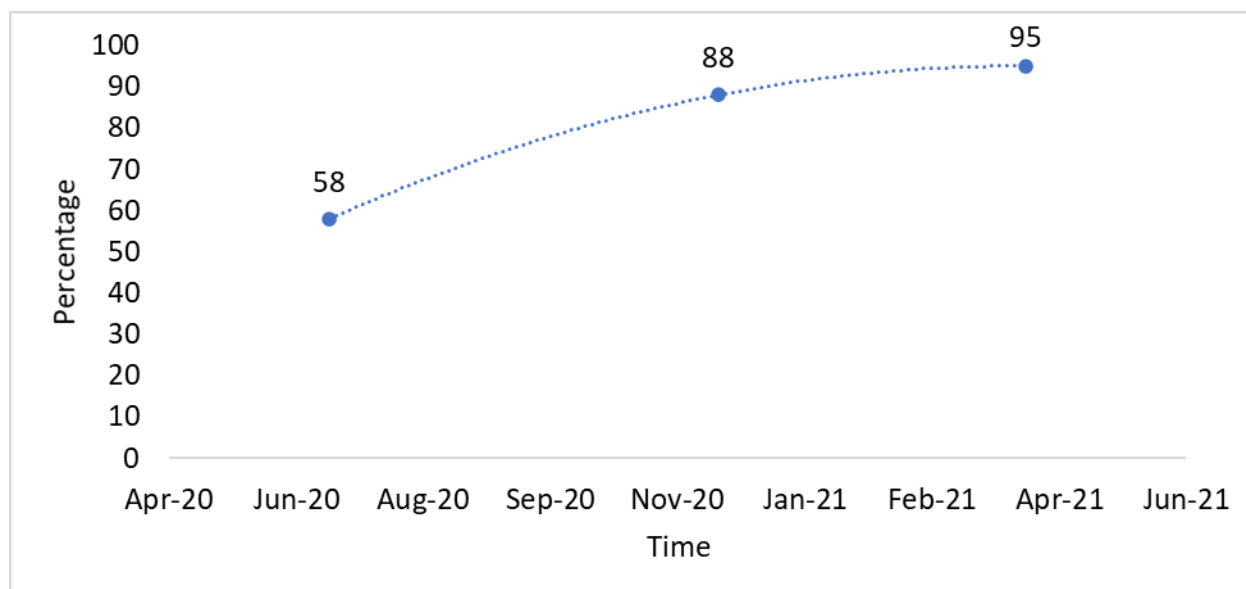


Figure 33: Comparison of oxygen availability in July, Dec 2020 and March 2021 in assessed health facilities (n=80)

Oxygen Administration

As shown in figure 34, masks were the most common mode of oxygen administration to the patient in the facilities assessed at 97% followed by flowmeter at 96% this is similar to what was reported in December 2020 though there was a slight increase in flowmeters compared to the last assessment that recorded 92% and 96% for flowmeter and mask respectively. The oxygen humidifier reported a reduction to 88% from 91% of the facilities from the last

assessment

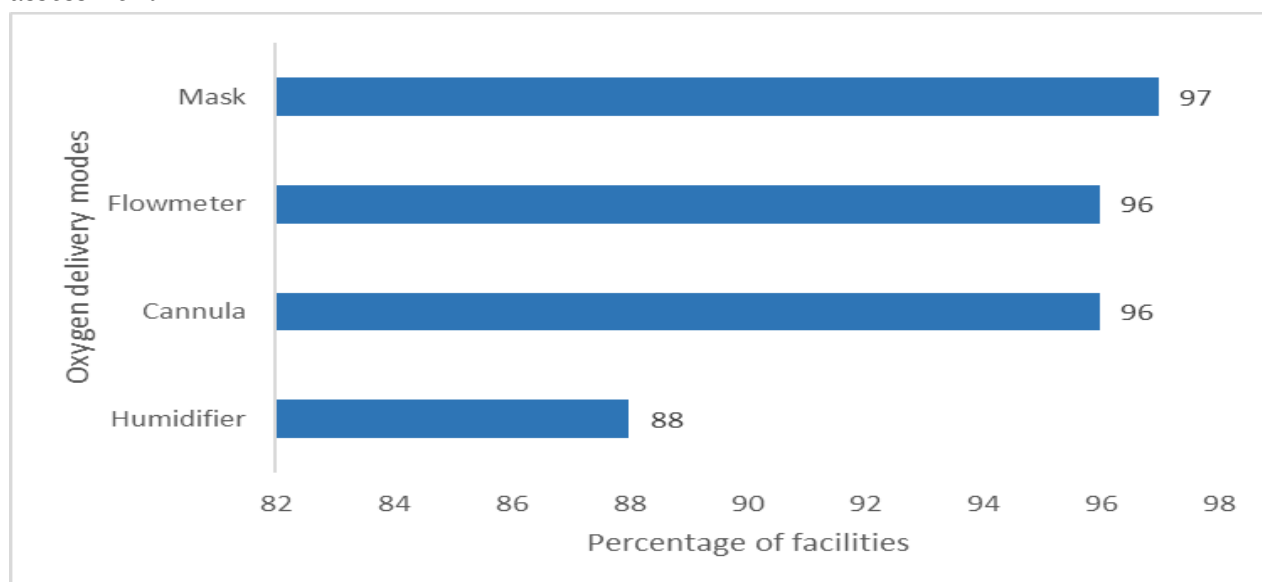


Figure 34: Proportion of facilities with tracer items for oxygen delivery(N=80)

There was marked variation in terms of availability of Liquid or PSA oxygen across the counties with only 19/47 counties having at least one facility reporting this as a source of oxygen as shown in the table 4 below.

Table 4:Counties reporting having liquid oxygen or a PSA as a source of oxygen

S.No	County
1	Bomet County
2	Isiolo County
3	Kajiado County
4	Kericho County
5	Kiambu County
6	Kisii County
7	Kisumu County
8	Laikipia County
9	Machakos County
10	Makueni County
11	Mandera County
12	Meru County
13	Mombasa County
14	Nairobi County
15	Nyamira County

16	Nyeri County
17	Taita Taveta County
18	Trans Nzoia County
19	West Pokot County

Diagnostic and Lab

Basic diagnostic capacity was determined using availability of rapid diagnostic tests for malaria, glucose, urinalysis and pregnancy. Over 80% of all the level 2 to 4 facilities assessed, reported that they were undertaking these four basic tests. Of the 58 level 4 facilities assessed, the mean availability of diagnostic services was 70% of all the health facilities had all the select diagnostics. Nine out of every ten facilities conducted HIV testing, Tuberculosis screening, Hemoglobin analysis, while 80% of the facilities conducted Blood typing and cross matching, urine test for pregnancy, Malaria testing, blood glucose analysis and urinalysis using dipstick.

The most commonly available tests were malaria (92%) and pregnancy test (91%). Most facilities (84%) conduct blood glucose and test, while only 76% conduct urinalysis. Grouping and cross matching of blood was generally available with 66% of facilities reporting this capacity. Blood creatinine testing was the least available test with only 45% of facilities reporting this capacity.

Analysis shows that 84% of the facilities had basic diagnostic services and 70% with full diagnostic capacity (based on the select 9 diagnostic tests shown in figure 21). Urban facilities had better diagnostic capacity at 83% for basic diagnostic and full diagnostic at 95%. Private sector exhibited greater capacity compared to the public counterparts at 79% and 96% respectively. Based on these two models, an assessment of the percentage of facilities with capacity to provide COVID-19 testing services (e.g., collecting specimens for diagnosis, onsite testing, referrals) was undertaken.

Four in ten facilities collect COVID-19 specimens and conduct PCR or RDT testing on site from which only 2% of the level 2-3 facilities conducted PCR or RDT tests for Covid-19 while 75 %, 62 % and 44 % of the sampled level 6, level 5 and level 4 respectively, conducted PCR or RDT tests for COVID-19. 28% of all facilities collected COVID-19 specimens for further testing in another facility. Of all level 4 to 6 facilities assessed, 81 % had Ultrasound services, 74 % had X-ray while for out of every ten had a CT scan which has been shown to be more important in COVID-19 diagnostics. A third of the facilities did not collect specimens for COVID-19 diagnosis.

Most facilities reported to the select medical equipment for COVID-19 management with 91 % and only a half reporting availability of Pulse Oximeters and ventilators, respectively. For the functionality of select medical equipment for COVID-19 management, 91% and 71% of the facility reported having functional Oximeters and X-Ray machines recording an

improvement from 88% and 65% in the last assessment. Further disaggregation of availability and functionality of COVID -19 related equipment shows that urban areas had more equipment overriding the rural areas. There was a variation in availability and functionality of select COVID-19 management equipment where select equipment for COVID-19 case management were non-functional, main reason being non-installation or where installation had been done, training had not been done. Analysis shows that capacity issues (no training/no installation). Other reasons given included staffing issues and unavailability of consumables.

Medical Oxygen

Conclusions

Diagnostics and lab

- The most commonly available tests were malaria and pregnancy tests while Blood creatinine testing was the least available test
- Four in ten facilities collect COVID-19 specimens and conduct PCR or RDT testing on site

Equipment and Oxygen

- Pulse oximeters were widely available
- 95% of the health facilities reported having any source of oxygen up from 74% in the last assessment
- Oxygen cylinders were the most common source of oxygen
- Over half (56%) of the facilities reported piped oxygen to the bedside; This was a decrease from the last assessment as the number of facilities assessed increased slightly hence pointing to a gap.
- There was a wide variation in availability of PSA oxygen generator across the counties; only 19/47 counties reported having this as a source of oxygen
- Marked increase in functional ventilators
- Masks were the most common mode of oxygen administration to the patient in the facilities assessed
- 16% of facilities had equipment that were non-functional; The main reason for non-functional equipment were non-installation or where installation had been done, training had not been done.

Recommendations

- Increase investment in oxygen plants and pipe oxygen to more beds particularly the COVID-19 isolation centers and ICU
- In future assessments, conduct quantitative data collection to ascertain actual availability of oxygen in the health facilities to objectively determine status of oxygen therapy in the country.

- Invest in training across all areas including proper use of PPE, IPC, medical equipment among others
- Increase diagnostic capacity in facilities for all services including non –COVID-19 related services
- Increase COVID-19 testing and sample collection centers

Availability of medicines and supplies

Medicines and supplies for COVID-19 case management

Access to quality and affordable essential health products and technologies (HPTs) is pivotal to successful delivery of health services in Kenya. The effectiveness of the HPT supply chain in assuring security of HPTs through delivery of HPT across all the levels of the healthcare system in an equitable, reliable, and cost-effective fashion, is critical. The increased demand arising from the affordable universal health coverage (UHC) initiative, changing epidemiological patterns and improved health education for Kenyans creates an even more compelling need for a functional HPT supply chain. HPTs generally constitute, medicines and non-pharmaceuticals. During this assessment, the availability [on the day of the survey] of 10 essential medicines and 5 non-pharmaceuticals was assessed.

Overall, only 29% of all assessed 77 level 4 to 6 facilities had all tracer medicines available while 84% had all tracer non pharmaceuticals assessed.

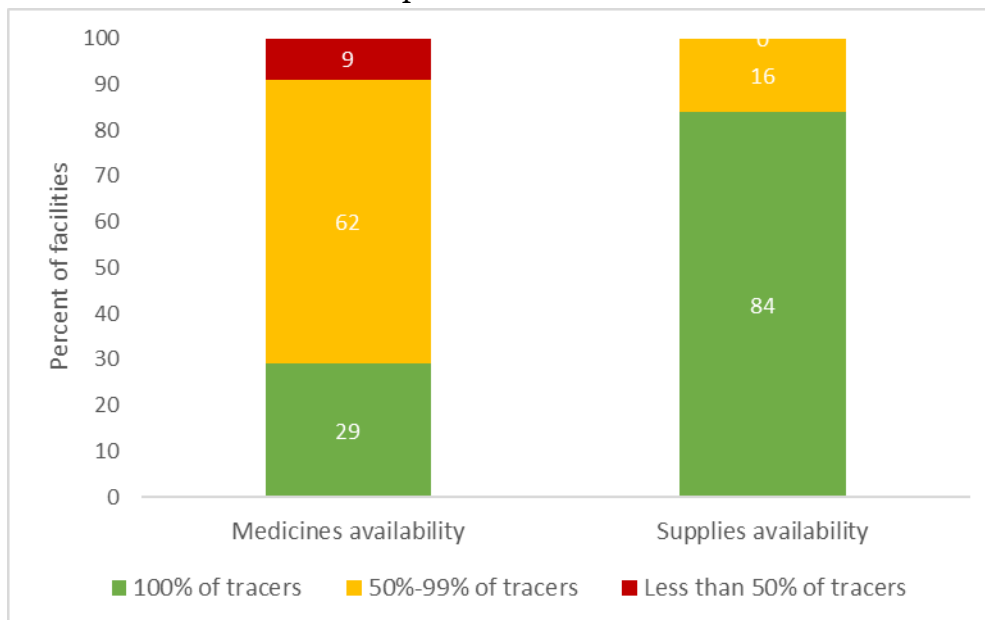


Figure 35 Availability of tracer medicines and supplies

The injectable form of Ampicillin (an antibiotic), was the least available among the antibiotics, while vecuronium, a (muscle relaxant) essential for intubating patients under critical care was available in just over a half of assessed facilities (51%). This may point to the inability of facilities to intubate questioning the available capacity to perform this task. Almost

all facilities had: second generation cephalosporin -Inj.ceftriaxone (94%), oral antibiotic for upper respiratory infections-azithromycin (84%) and medicine for pain management - injectable morphine (78%).

Heparin was available in about 74% of the facilities assessed. Intravenous fluids were available in all facilities (100%). Hydrocortisone/Dexamethasone and epinephrine which may be used for treatment of severe allergies were available in eight out of every ten hospitals as shown in figure 36

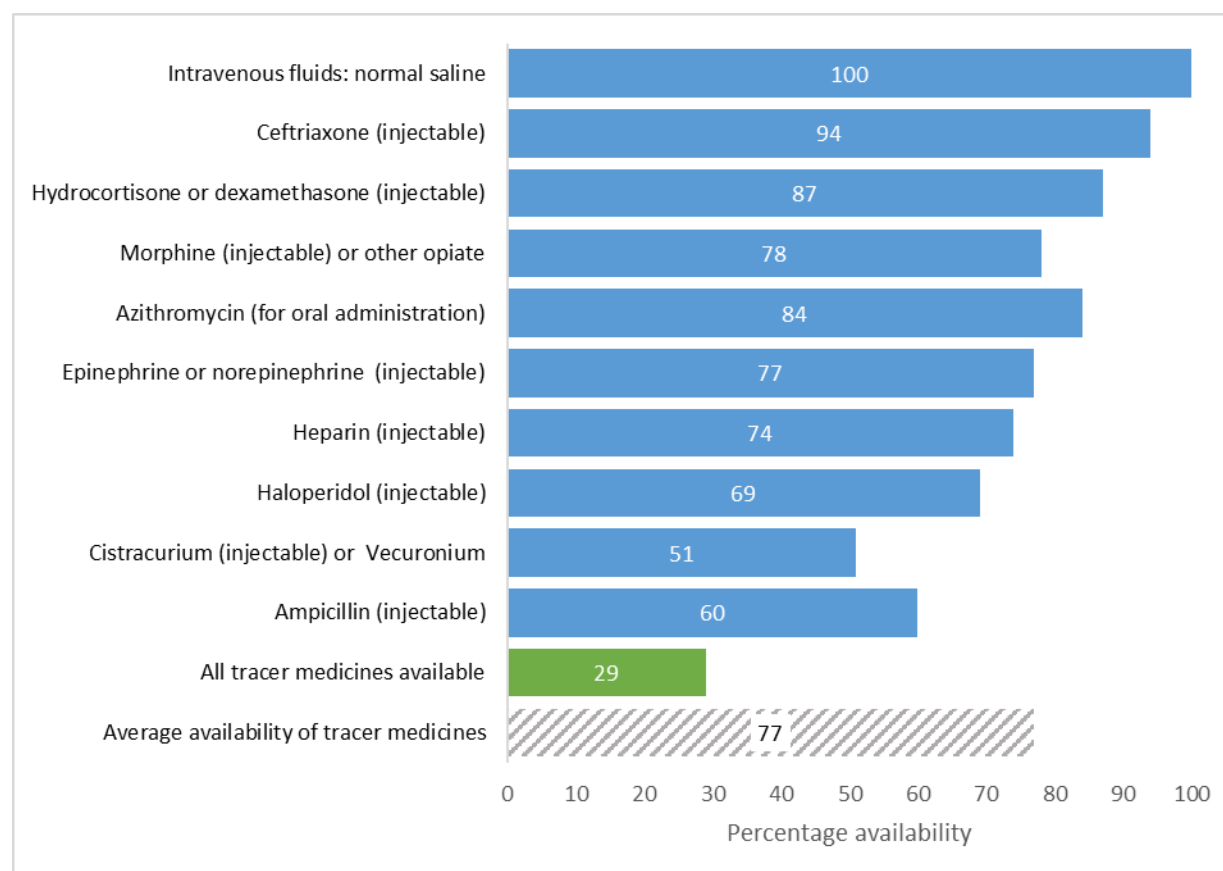


Figure 36 Percentage of hospitals with available tracer medicines for COVID-19 management (n=77)

Non-pharmaceutical supplies were generally available in most facilities with 84% of facilities reporting they had all tracer supplies. Intravenous giving sets, syringes and needles were almost universally available while sodium hypochlorite and 5% Chlorhexidine gluconate being available in 92 and 94% of the facilities assessed. see figure 37 below.

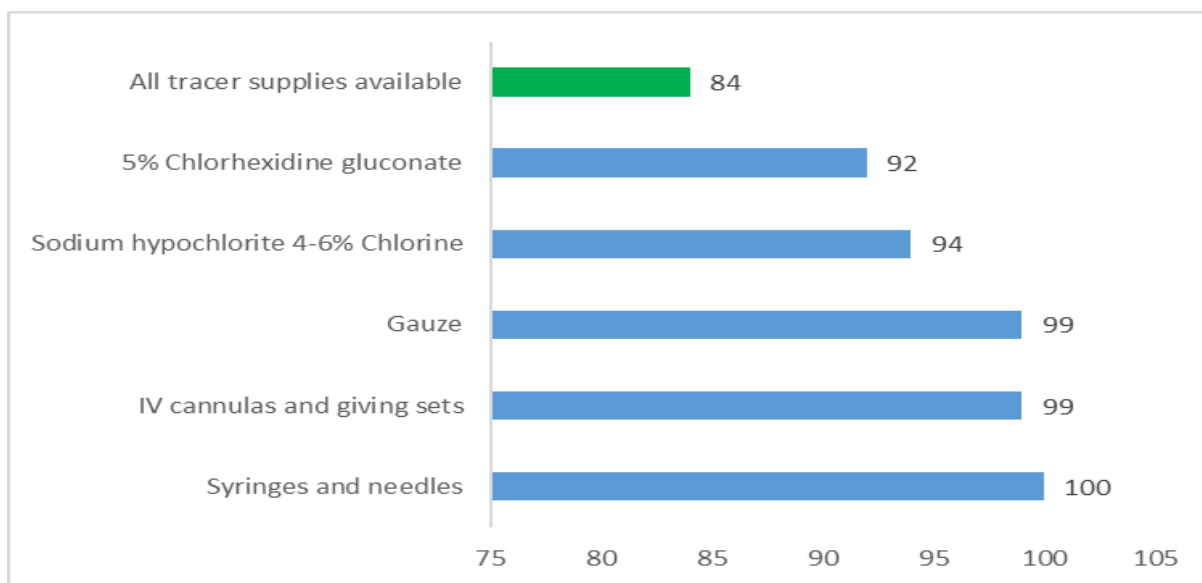


Figure 37 Percentage of facilities with available tracer non pharmaceuticals, by individual item (n=77)

Availability of tracer medicines and non-pharmaceutical by level of care

Overall, 29% of the health facilities had the all the 10 tracer medicines available with 21%, 47% and 75% of the health facilities in level 4, level 5 and level 6 respectively having all the 10 tracer medicines. Generally, all the 5 tracer non-pharmaceuticals were available in 84% of all the facilities assessed with 81%, 93% and 100% of being available in level 4, level 5 and level 6 respectively as shown in figure 38 below

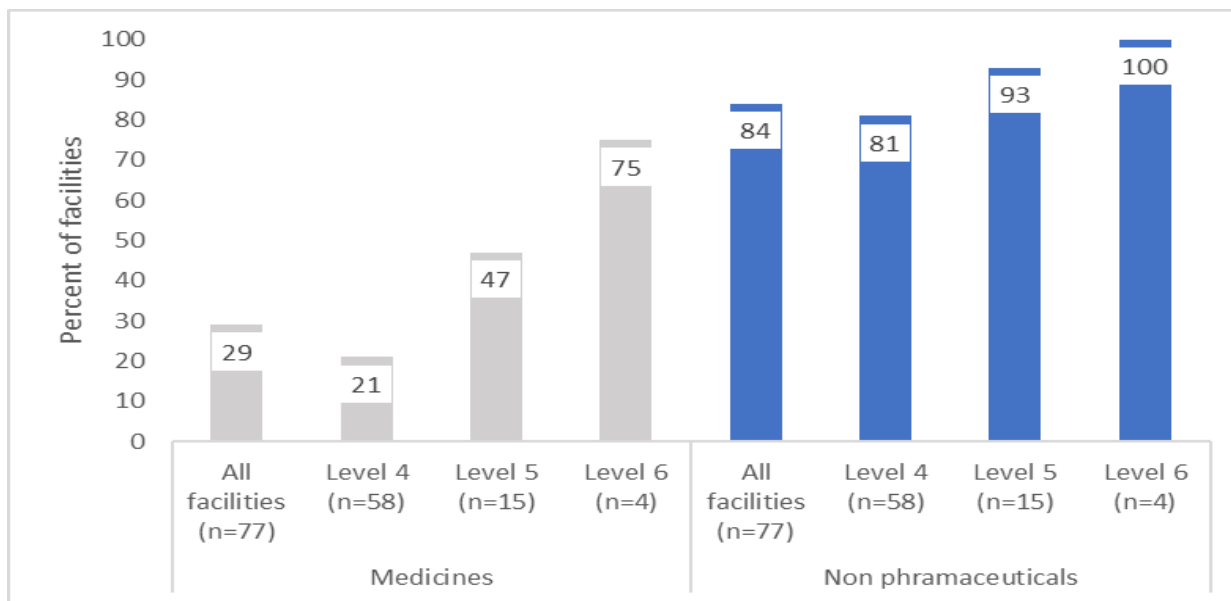


Figure 38 availability of tracer medicines and non-pharmaceuticals by level of care (N=77)

Availability of tracer medicines and non-pharmaceutical by location

All the 10 tracer medicines were available with 13% and 38% being in rural and urban areas respectively. In terms of availability of non-pharmaceuticals, 84% of both rural and urban

facilities had the 5 tracer non-pharmaceuticals available at the time of assessment with 77% and 89% being available in both rural and urban facilities respectively as shown in figure 39

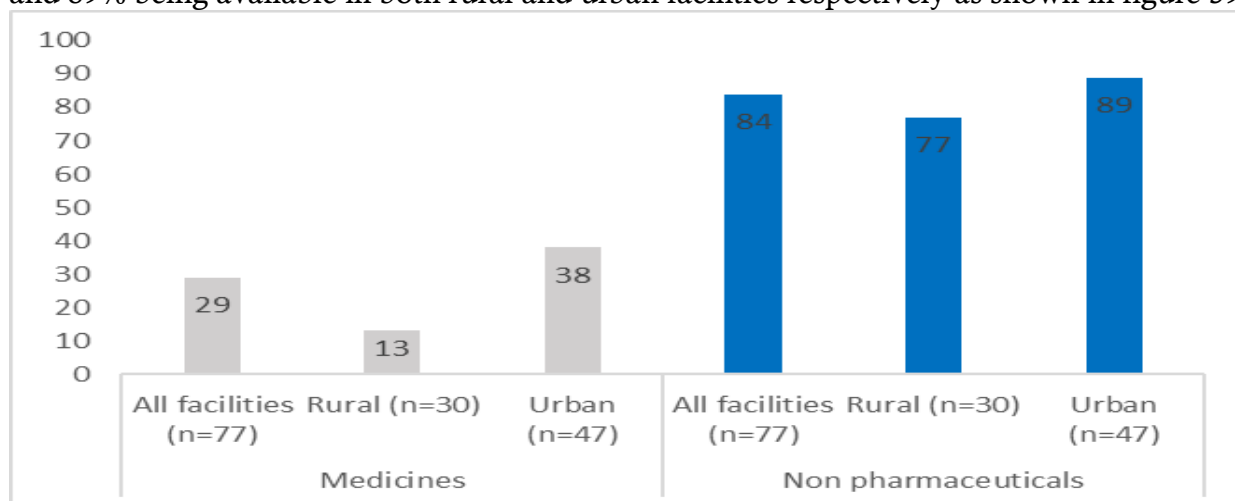


Figure 39 availability of tracer medicines and non-pharmaceuticals by location (N=77)

Availability of tracer medicines and non-pharmaceutical by ownership

Looking at availability by ownership i.e whether the facility is a public or non-public, 29% of both scenarios had the 10 tracer medicines available in the facility assessed with 67% and 19% being available in Non-Public and Public, respectively. Amongst all the facilities assessed at both levels, 84% of non-pharmaceuticals were available with Nonpublic having 93% of non-pharmaceuticals being available. Public facilities had a slightly lower percentage of medical supplies being available and this stood at 82% of all the facilities assessed as shown in figure 40

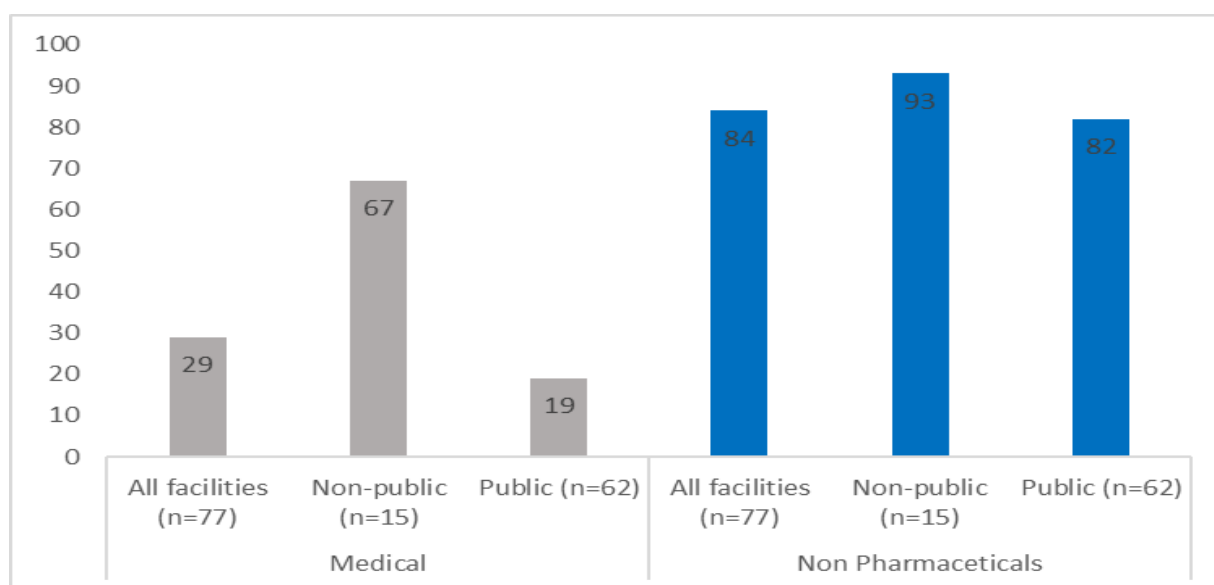


Figure 40 Availability of tracer medicines and non-pharmaceutical by ownership (N=77)

Availability of medicines and supplies for continuity of care services.

A total of 16 tracer medicines were assessed across the 106 level 2, 3 and 4 health facilities. These are key medicines that are used for management of various conditions at health facilities. Almost all facilities (93%) had amoxicillin while only 24% of the facilities had loratadine, an antihistamine. This low availability could be attributed to the fact that this drug was introduced in the Kenya Essential medicines list in 2019 and the dissemination of the document is still happening. Only one in ten of the health facilities had all 16 tracer medicines available see figure 41.

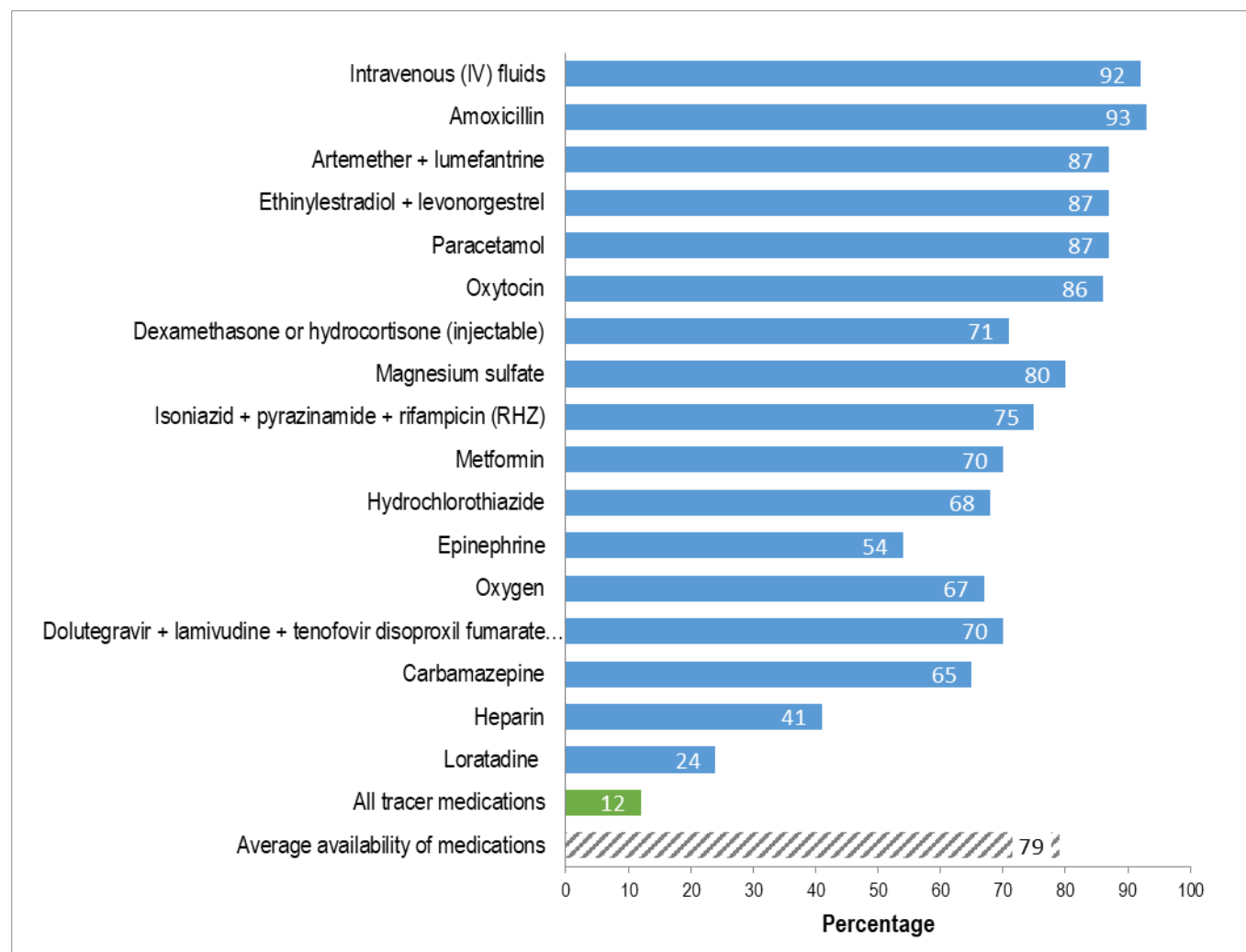


Figure 41 Availability of 16 tracer medicines across the assessed level 2, 3 and 4 facilities (N=106)

Availability of five tracer vaccines that are used for routine immunization was also assessed across the 106 level 2, 3 and 4 health. Overall, 93% of the health facilities had all tracer vaccines as shown in figure 42.

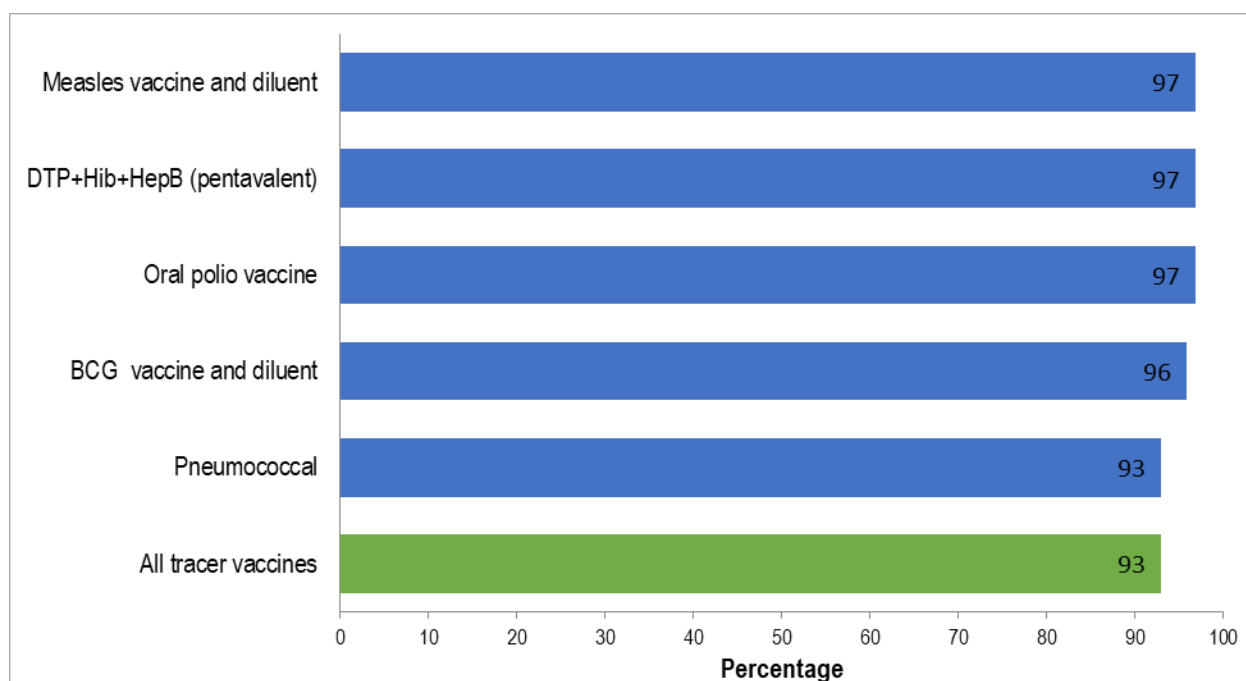


Figure 42 Availability of tracer vaccines for routine immunization (N=106)

Availability of tracer medicines and vaccines by location

During the assessment by location (Rural & Urban), 6% and 24% representing both Rural and urban facilities respectively had tracer medicines available at the time of the assessment. Similarly, on availability of vaccines, both Rural and Urban performed exemplary well and stood at 98% and 84% respectively as shown in figure 43.

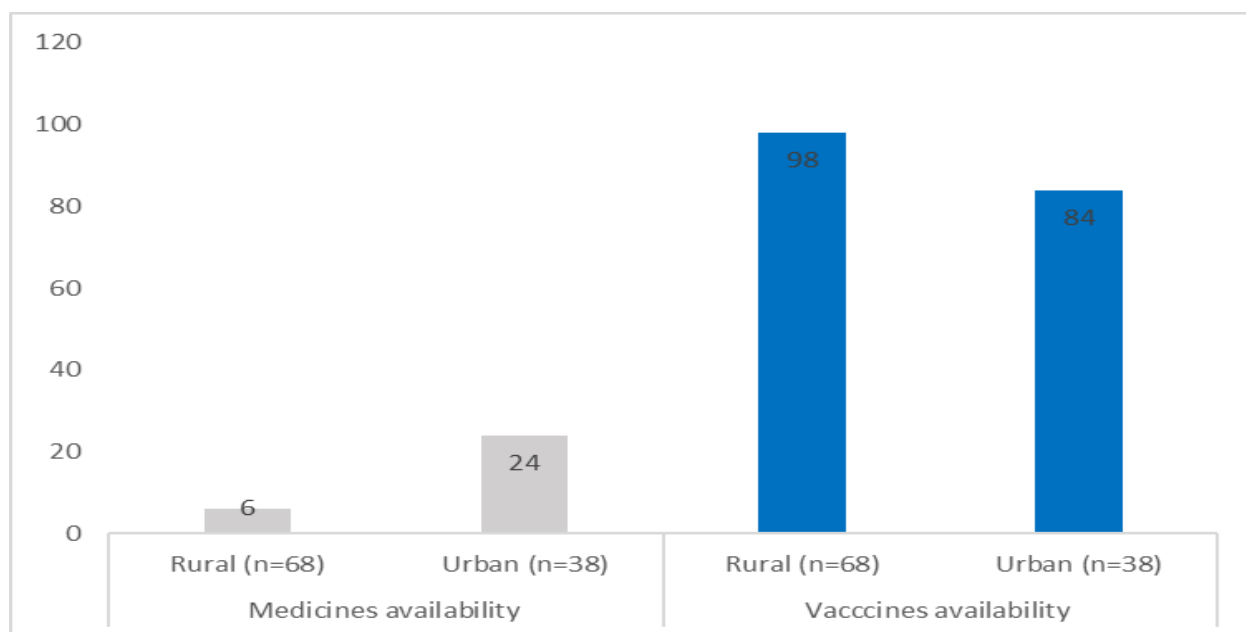


Figure 43 Availability of medicines and vaccines by residency (N=106)

Availability of tracer medicines and vaccines by level of care.

Going by level of health service provision, 21% of level 4 facilities had all tracer medicines available compared to only 2% of the level 2-3 facilities. Generally, vaccines were well stocked and were at 94% and 92% available for Level 2-3 and level 4 respectively as shown in figure 44.

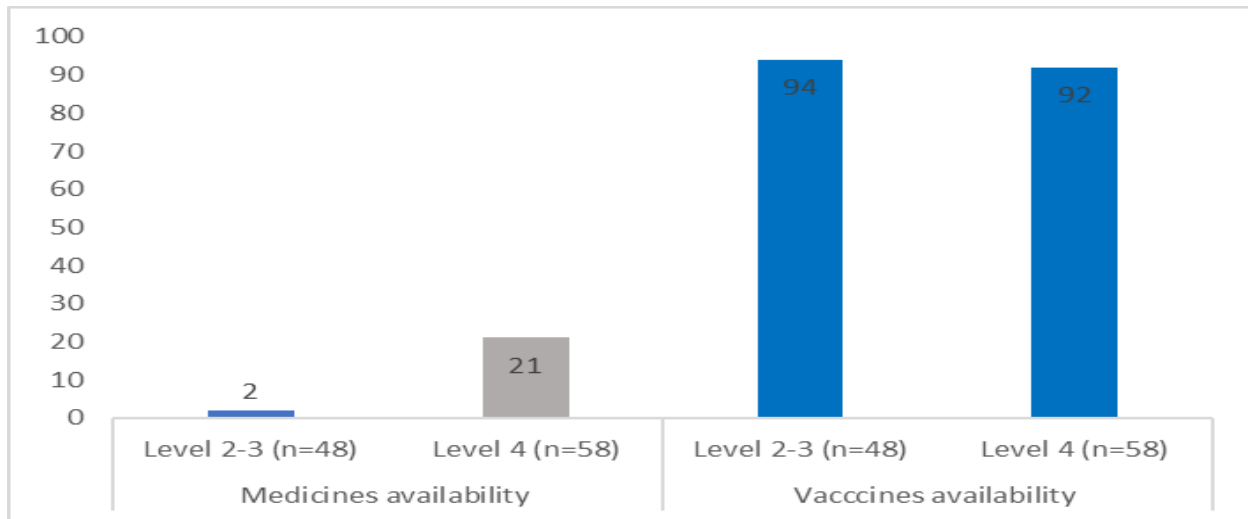


Figure 44 Availability of medicines and vaccines by level of care (N=106)

Availability of essential medicines and vaccines by ownership of the health facility.

Looking at availability of medicines by ownership, 33% of non-public facilities compared to 5% of public facilities had all tracer medicines. For Vaccine's availability, 88% of non-public facilities and 95% of public facilities all tracer vaccines for routine immunization as shown in figure 45.

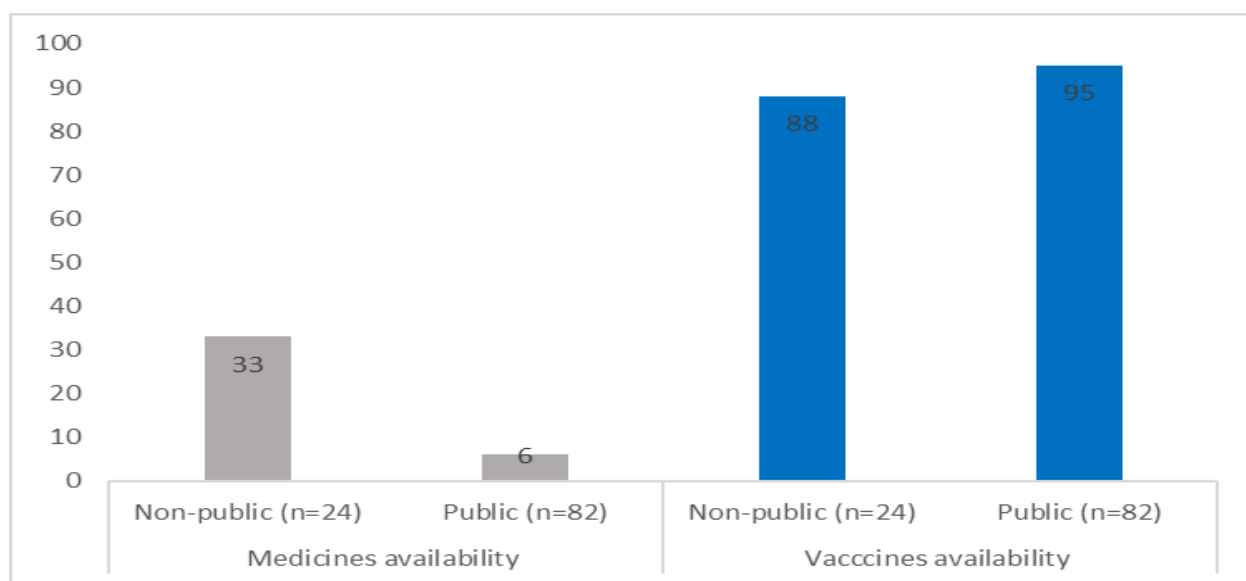


Figure 45 Availability of medicines and vaccines by ownership (N=106)

Availability of tracer non pharmaceuticals—all facilities

Availability of five tracer non pharmaceuticals were assessed across all the 128, level 2-3, 4, 5 and 6 health facilities. Over 95% of health facilities had syringes, IV giving sets and Gauze. 74% of all health facilities had all the five tracer non-pharmaceuticals. As shown in figure 46 below.

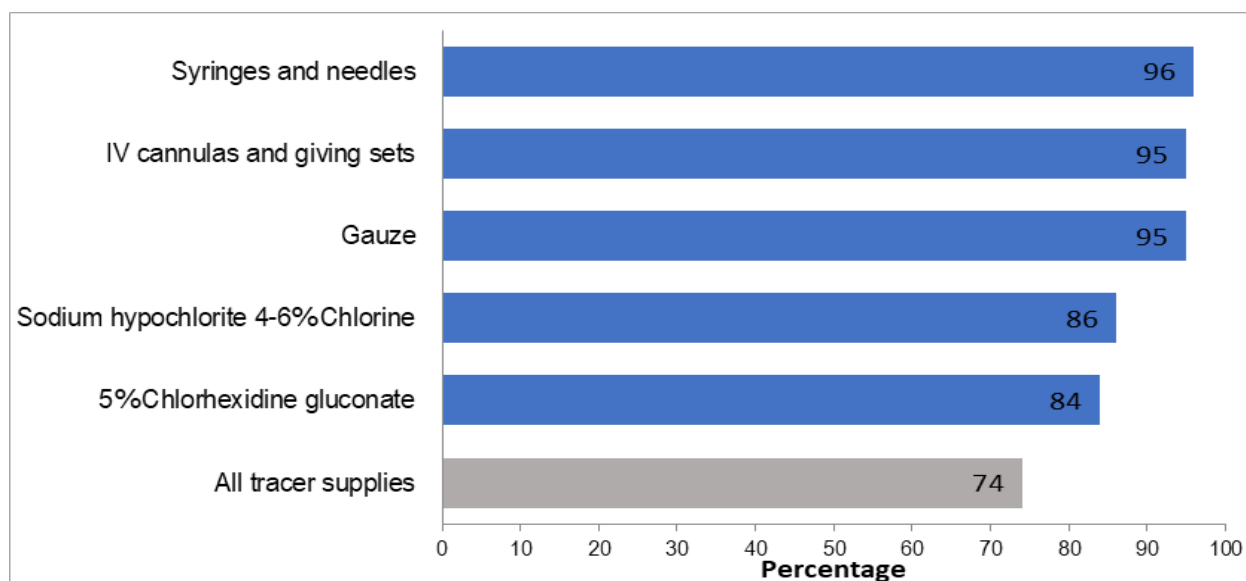


Figure 46 Availability of tracer non-pharmaceuticals across all 128 health facilities

In terms of comparison of availability of tracer non pharmaceuticals either by location, level of care or ownership, tracer non-pharmaceuticals were more available in Urban facilities

(87%) than rural facilities (65%). By level performance, level 6 had all the tracer medicines (100%) at the time of assessment while level 5 and 4 had 93% and 77% of all tracer medicines being available respectively. Nonpublic facilities amongst the 128 facilities assessed had 90% of tracer medicines being available as compared to 69% in public facilities. As shown in figure 47.

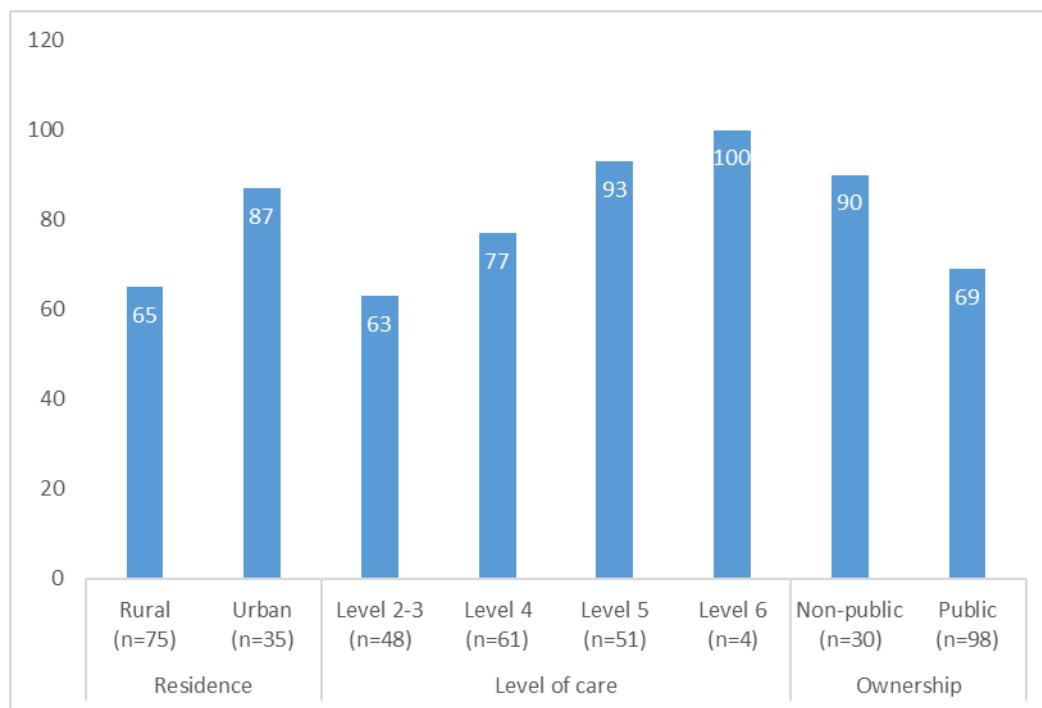


Figure 47 Availability of non-pharmaceuticals (n=128)

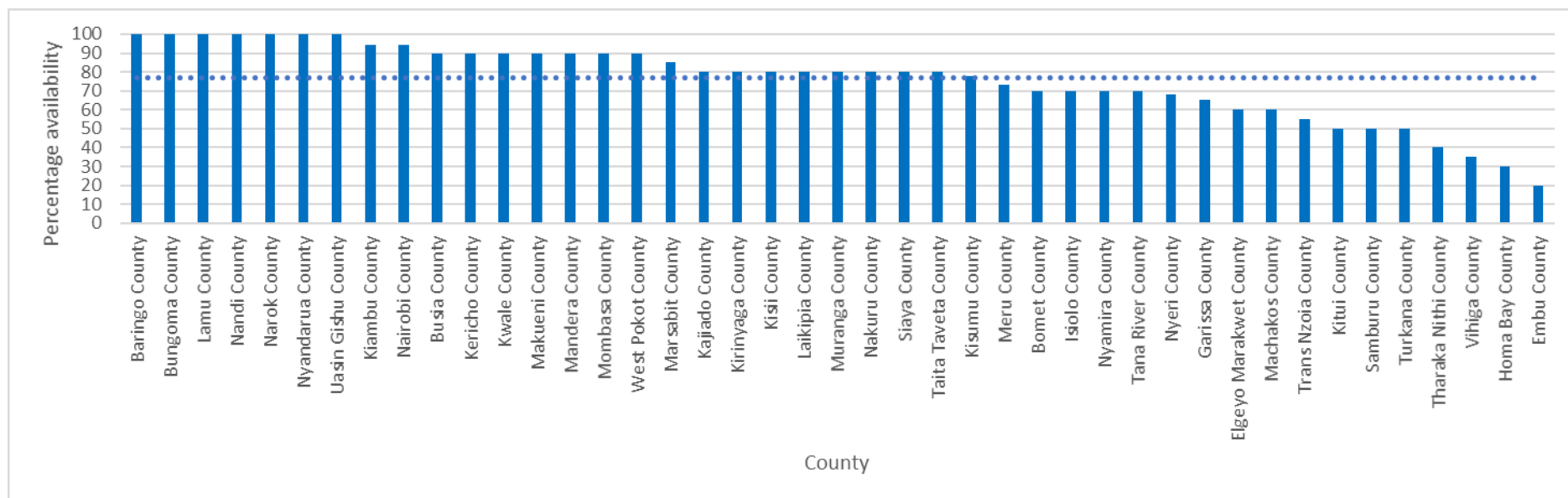


Figure 48 Average availability of ten essential tracer medicines across the counties (N=77)

On average, across the country the assessed facilities had seven out of ten tracer (77%) medicines for management of COVID-19. Almost half of the counties (18/47) had a lower availability than the national average as shown in figure 48 above.

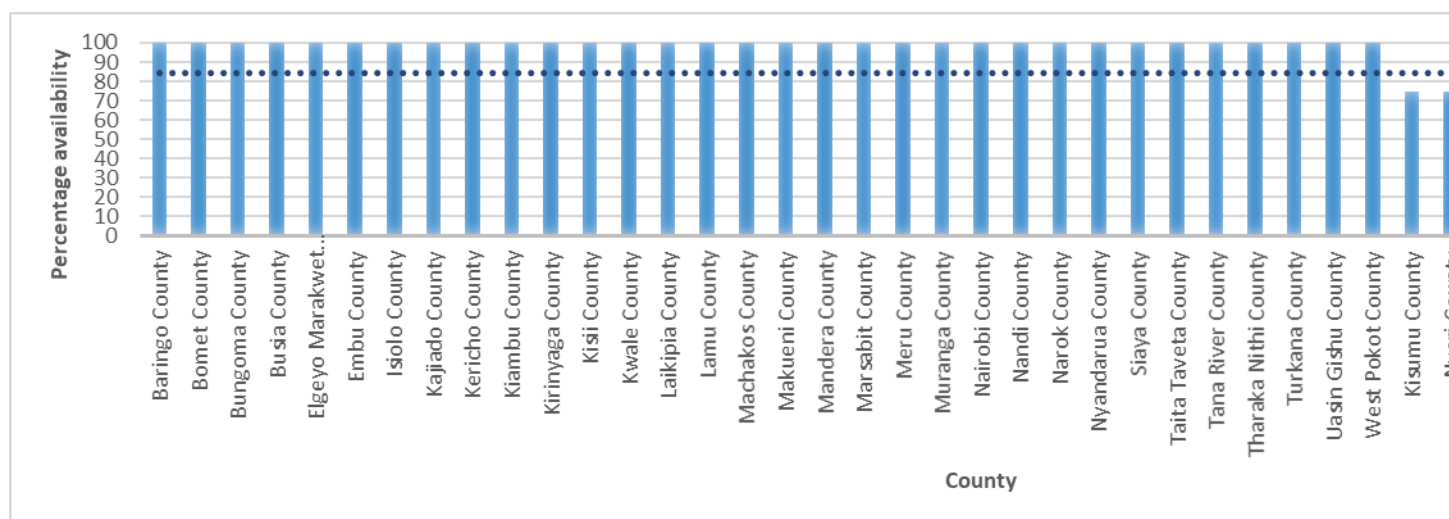


Figure 49 Average availability of all five tracer non pharmaceuticals across the 47 Counties (N=77 facilities)

On average, the assessed facilities had 4 out of the five (84%) of the tracer non pharmaceuticals available. Thirty-six counties had all the tracer items available with 11 having lower than the national average as shown in figure 49 above.

Conclusion

- Tracer medicines & non-pharmaceuticals are more available in higher level and Urban facilities than Lower level and rural facilities.
- Non-Public facilities are more equipped/stocking in terms of availability of both tracer medicines and non-pharmaceuticals.

Recommendations

- Need to invest in lower level and rural facilities to improve access to health care service both for COVID-19 care and essential health services
- Need to invest in public health facilities for majority of poor and vulnerable populations to access health care services

COVID-19 infection prevention and control and personal protective equipment

Infection Prevention and Control (IPC) in healthcare settings is one of the most important measures that can be used to prevent transmission of COVID-19 infection. Implementing water, sanitation and hygiene (WASH) practices, particularly hand washing with soap and

clean running water, should be strictly applied and maintained because these provide an important additional barrier to COVID-19 transmission and many other infections. In terms of IPC, the assessment aimed to assess implementation of COVID-19 safe environment measures as well as the availability of IPC supplies in the selected health facilities. The definition of COVID-19 safe environment is an environment that has hand sanitizers and clean running water which can be used to sanitize and disinfect. The findings are described as per level of care, ownership, and residency of the health facilities.

COVID-19 infection prevention and control and personal protective equipment in hospitals

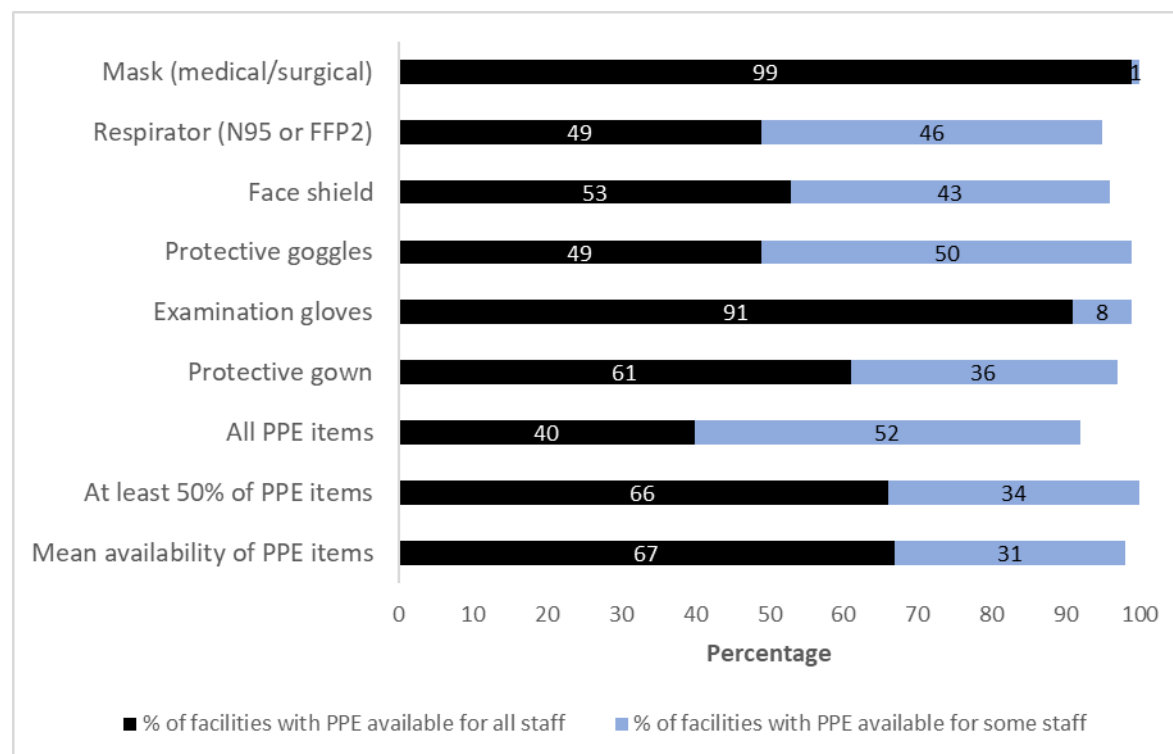


Figure 50 COVID-19 infection prevention and control and personal protective equipment (n=77)

Medical/surgical masks were the most widely available PPE item in COVID-19 treatment centers at 99% of facilities. All PPE items for staff who needed them were available in 4 of every 10 COVID-19 treatment centers

COVID-19 infection prevention and control and personal protective equipment in Primary health facilities (Level 2 to 4 facilities)

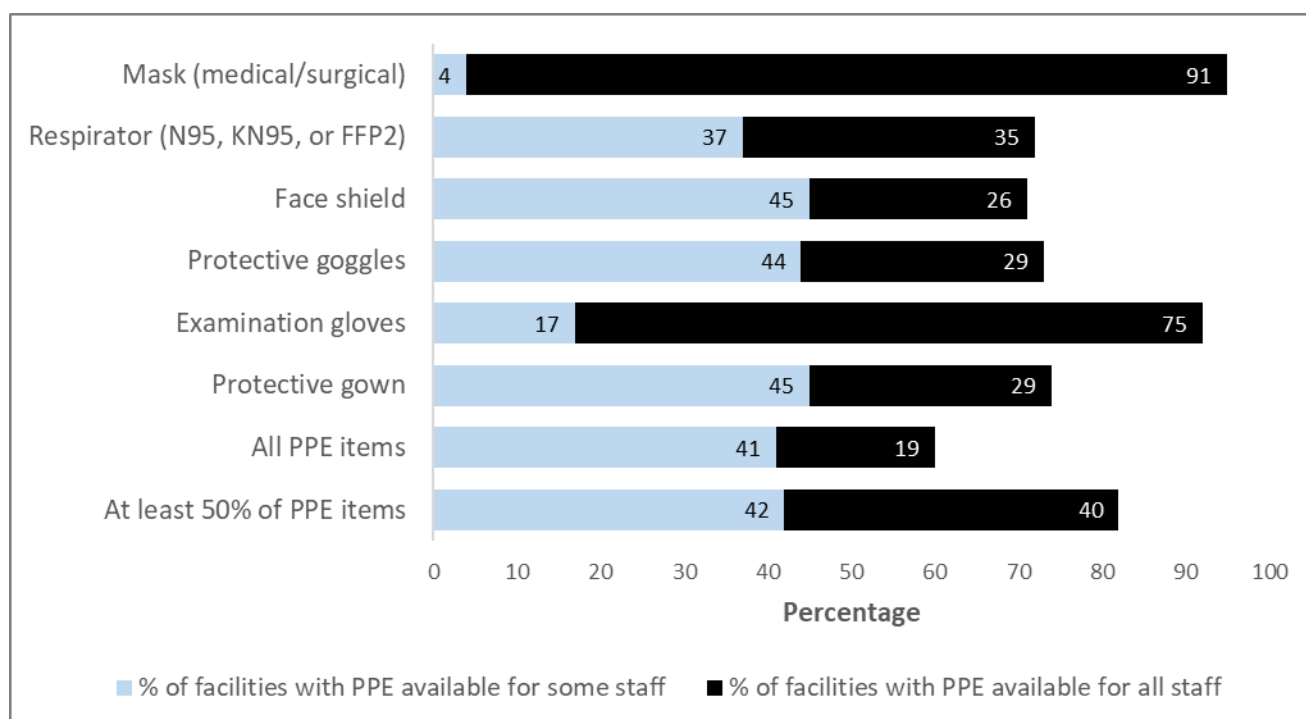


Figure 51 *Percent of primary facilities that provide PPE to staff and that have PPE for all or some staff who are required to use them (N=106)*

An average of eight out of ten health facilities (85%) had implemented IPC measures geared towards a safe COVID-19 environment across all the sentinel facilities assessed. This is similar to the findings of the assessment that was done in December 2020 where implementation level was a similar proportion (85%). However, only a quarter (24%) of the health facilities had implemented all ten measures which is a slight reduction compared to the finding in December 2020 where 27% had implemented all measures as shown in figure 52.

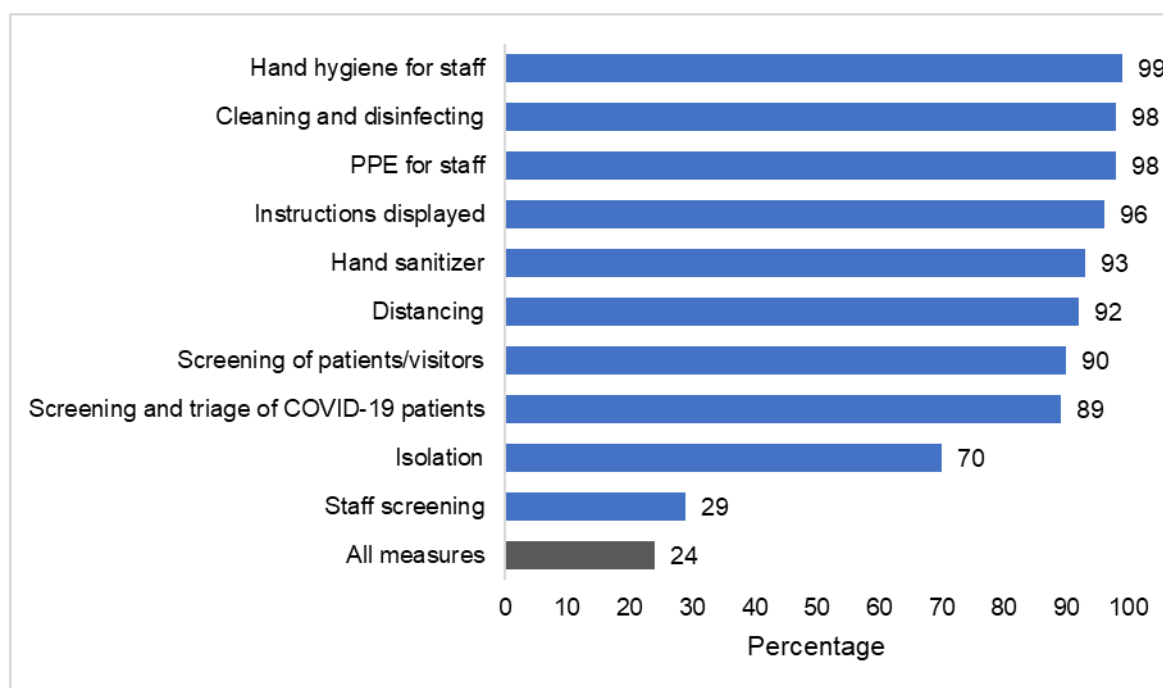


Figure 52 Percentage of facilities that have implemented measures to create COVID-19 safe environment (N=106)

The most implemented measure among the ten measures is hand hygiene for staff with 99% which is slight improvement of the findings in December 2020 where 97% of facilities had hand hygiene. The least implemented measure was staff screening with only 29% of the facilities implementing, this is a reduction from 37% that was recorded in December 2020. The definition of staff screening is there is an entrance and screening for staff only and separate from the patients and visitors at the health facility.

Figure 53 shows the distribution of implemented measures to create a COVID-19 safe environment by level of care (level 2-3 and level 4). Across all then measures the percentage of level 4 facilities is slightly higher than level 2-3 facilities as with average implementation is 91% among level 4 and 79% among level 2-3 facilities geared towards a safe COVID-19 environment across all the health facilities. A slightly higher proportion of facilities in urban areas were implementing COVID-19 safe environment compared to those in rural areas.

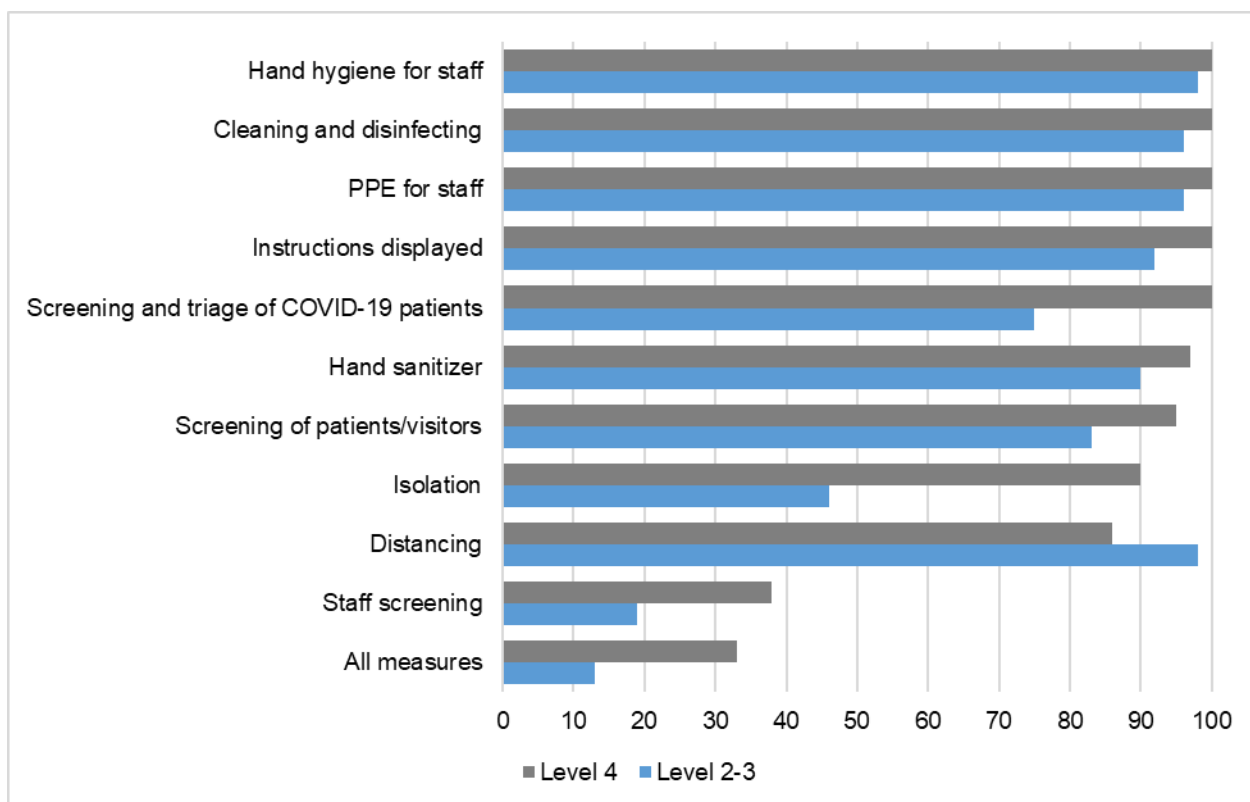


Figure 53 Percentage of facilities that have implemented measures to create COVID-19 safe environment by level of care in primary facilities (N=106)

Availability of IPC Supplies in hospitals

According to below figure 54, IPC supply items were very widely available with 68% of assessed facilities reporting all IPC items and the average availability of these items being 94%. The first five items in the graph: hand sanitizers, safety boxes, bio-hazard bags, liquid soaps, and hand washing stations were available in almost all facilities assessed, while the last item: body bags for handling dead bodies were available in only three quarters 70% of facilities assessed.

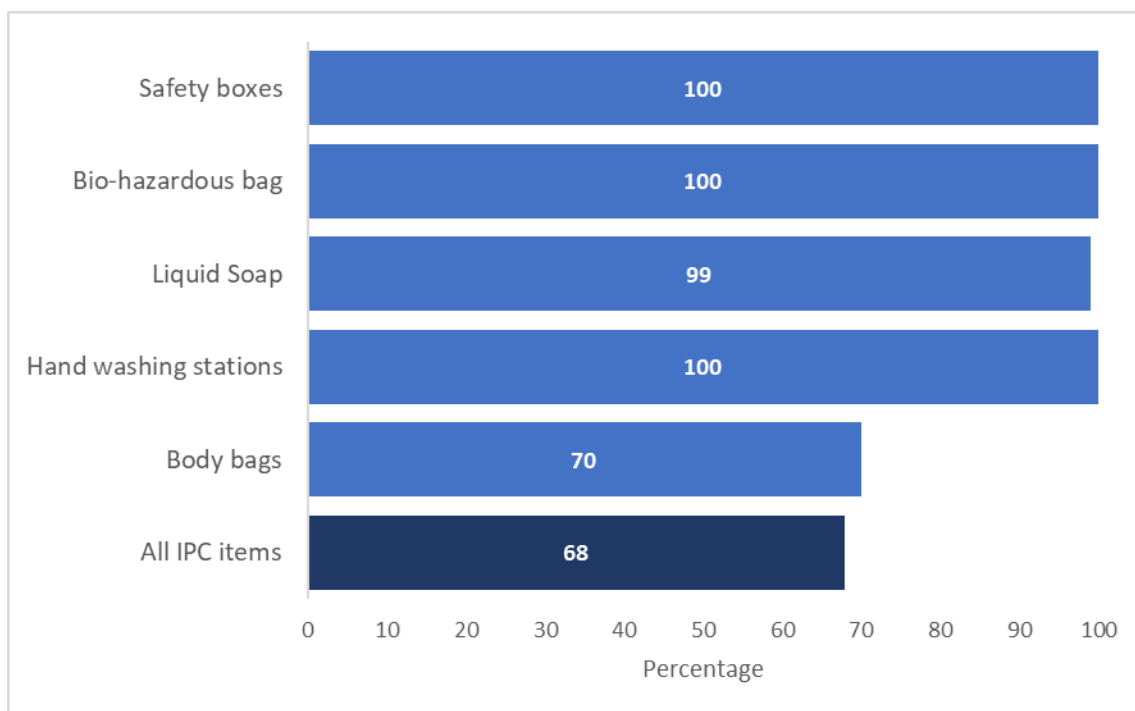


Figure 54 Percentage of facilities that have select IPC tracer items in hospitals (N=77)

Below graph figure 55 show the percentage of facilities that have selected IPC tracer items by level of care (level 4, 5, 6) across all six items. Among the assessed facilities, the level 4 reported the lowest with 60% for all IPC items as well level 4 is slight lower 93% on the average availability of these items.

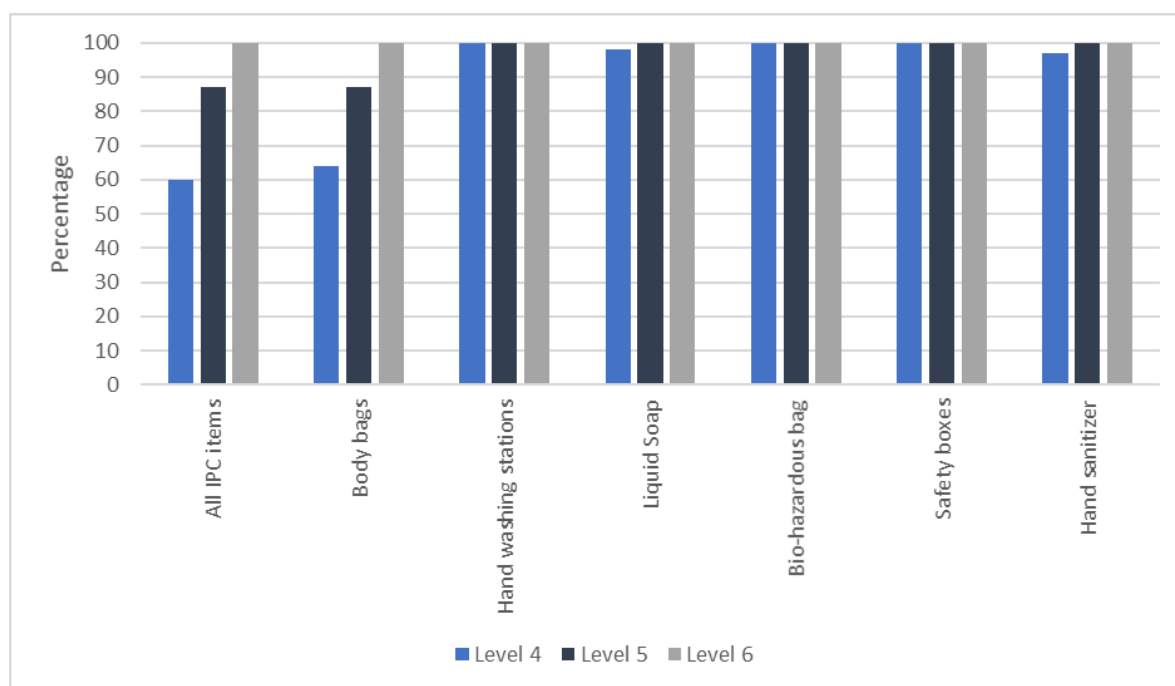


Figure 55 Percentage of hospitals that have select IPC tracer items by level of care (N=77)

Availability of PPE Supplies

Personal Protective Equipment (PPE) is used every day by healthcare personnel to protect themselves, patients/clients, and others when providing care. The people most at risk of infection are those who are in close contact with a COVID-19 patient or who care for COVID-19 patients. Based on the available evidence, COVID-19 is transmitted between people through close contact and droplets, by airborne transmission when an aerosol generating procedure is disseminated. This assessment provides data on the availability of adequate stock for PPEs in the health facilities where PPE includes medical or surgical face masks, respirator (N95, KN95, or FFP2), face shield, protective goggles, examination gloves and protective gown. Some PPEs should be available across all levels of care (medical/surgical masks and gloves) while others are available for facilities that are taking care of COVID-19 patients like protective gowns.

PPE was widely available even though 40% (CM 69%, CEHS 46% Dec 2020) of facilities surveyed had **all** six PPE items for **some** staff (who are required to use them) and only one third 27% (CM 23%, CEHS 10% Dec 2020) of facilities surveyed had **all six** PPE items for **all** staff.

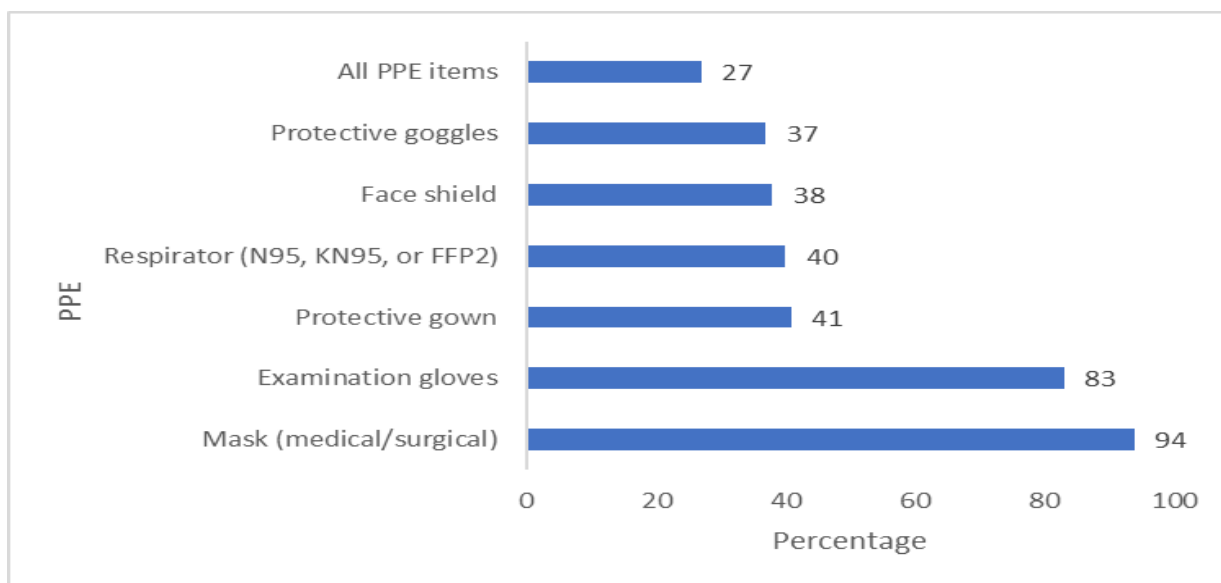


Figure 56 Percentage of facilities that provide PPE to staff and that have PPE for all or some staff who are required to use them (N=128)

Medical/surgical masks were the most widely available PPE item with 94% (CM 95%, CEHS 89% Dec 2020) of facilities reporting their availability for all staff. The second most available PPE item for all staff is the examination gloves with 83% of facilities reporting their availability.

Face shield 38% were the least available PPE items of facilities reporting their availability for all staff and protective goggles 37% were the least available PPE items of facilities reporting their availability for all staff. Just slightly over half of level 4, 5 and 6 facilities had protective gowns, face shields and N95 yet they are the main case management centers. See figure 57

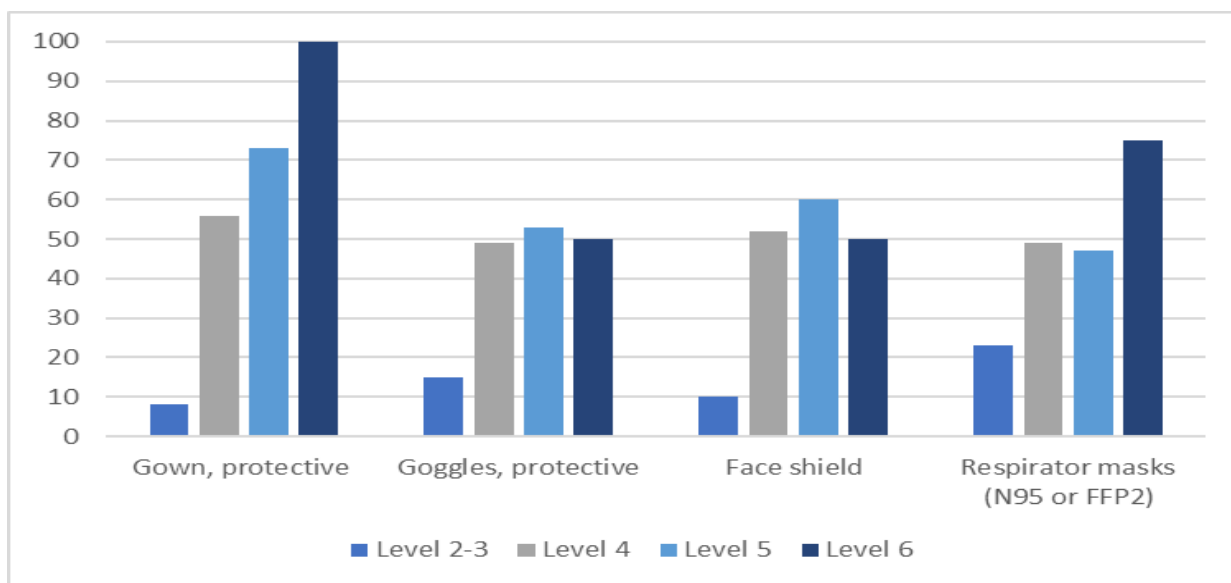


Figure 57 Percentage of facilities that provide masks and gloves for all staff or some staff who are required to use them by level of care (N=128)

Disposal of PPEs

We used, segregation and disposal of masks as a proxy indicator for proper COVID-19 waste disposal. Most facilities segregate masks and coveralls in red lined bins and dispose them through incineration or open burning as shown in figure 58 and 59. More urban facilities have access to incineration compared to rural facilities which are more likely to have burning chambers or open burning. More public facilities indicated that they have access to incinerators compared to non-public facilities.

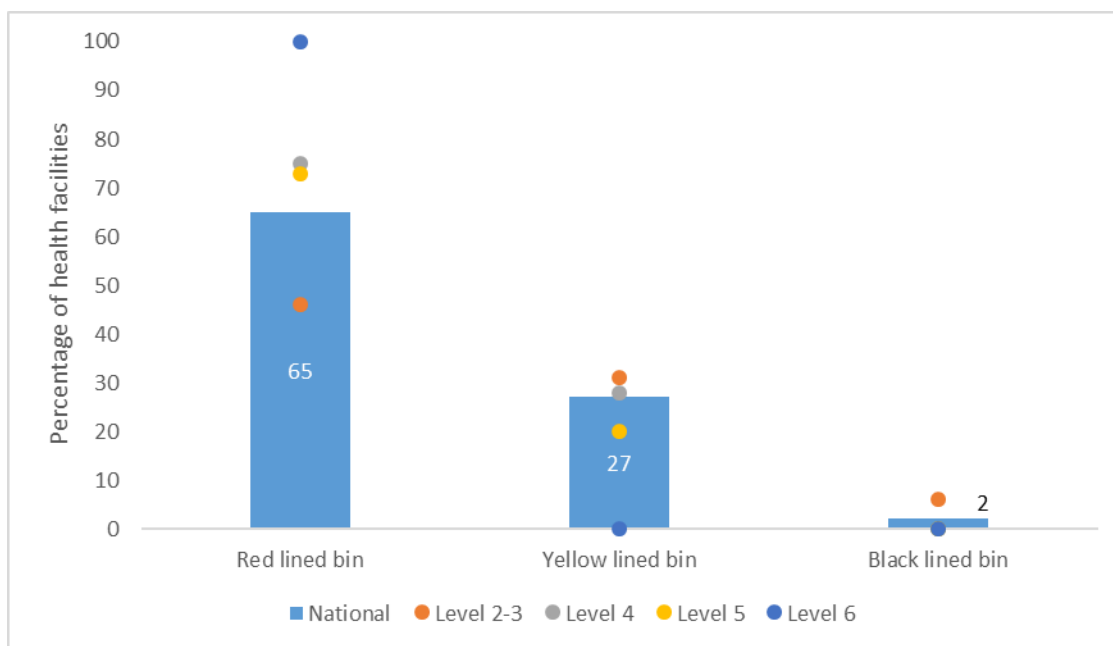


Figure 58 Means of masks segregation by level of care (n=128)

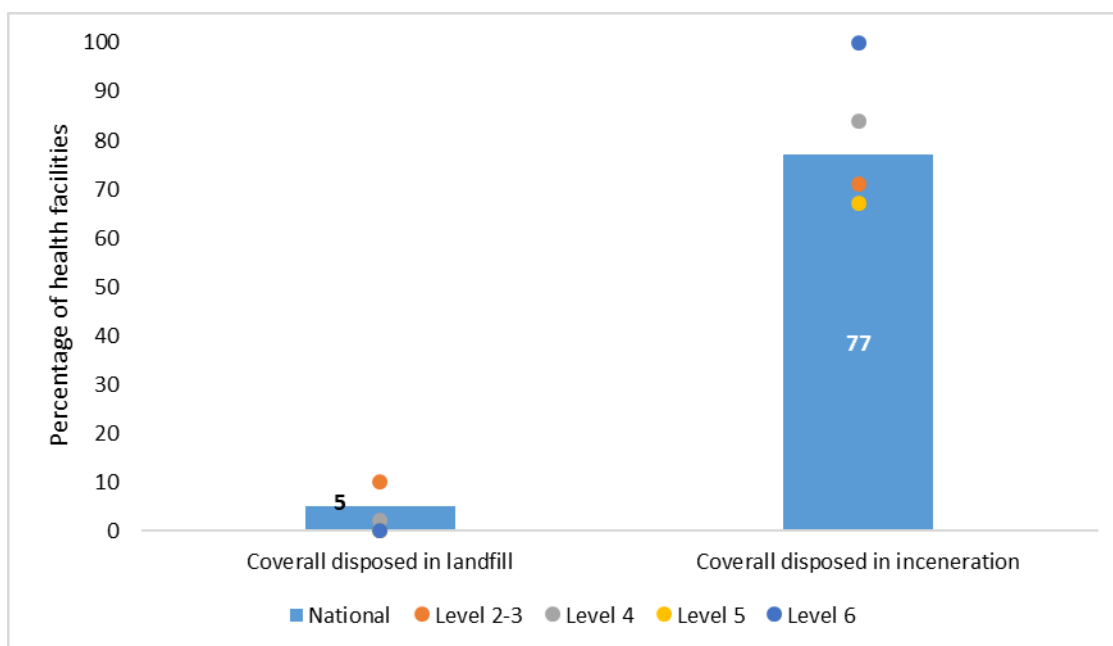


Figure 59 Means of coveralls disposal

On average only 27% of health facilities provided all PPEs that were required by health workers at all levels. Only 4 counties (Kakamega, Kwale, Laikipia, Turkana) reported providing all PPEs as required by health workers. 23 Counties reported provided some of the PPEs only as shown in figure

60 below.

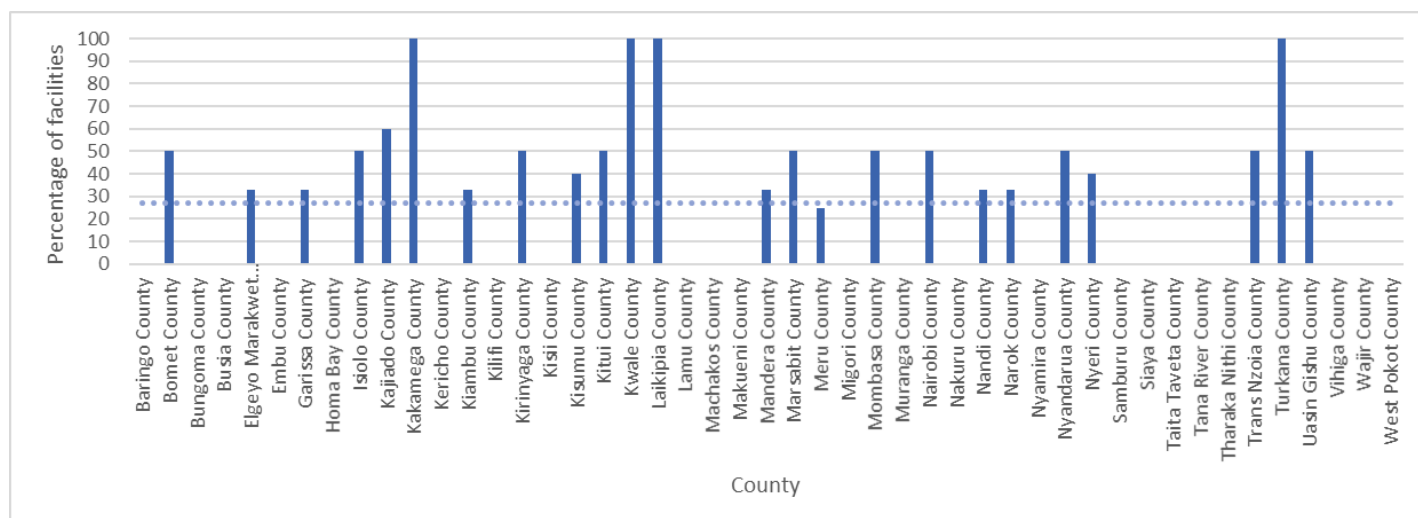


Figure 60 percentage of facilities providing all tracer PPEs required to all health workers (n=128)

Conclusions

- Measures for COVID-19 safe environment were widely implemented except for isolation and staff testing
- IPC supply items were very widely available in hospitals with 68% of assessed facilities reporting all IPC items and the average availability of these items being 94%.
- Medical/surgical masks were the most widely available PPE item with 94% of all sentinel facilities reporting their availability for all staff. The second most available PPE item for all staff is the examination gloves with 83% of facilities reporting their availability.
- As method of waste segregation and disposal of PPEs, a large proportion of health facilities surveyed are using the incinerator as disposal methods 73% for face masks and 77% for coveralls. The second largest option used as means of waste segregation is the red linen bin with respectively 59% for face masks and 65% for coveralls.

Recommendations

- Increase the implementation of COVID-19 safe environment measures by increasing the number of health facilities implementing all ten measures as well as the availability of IPC tracer items in all the health facilities.
- Ensure availability and proper use of the necessary PPEs to all staff across all levels of care (medical/surgical masks and gloves) while others are available for facilities that are taking care of COVID-19 patients like protective gowns.
- Ensure that all health facilities have an incinerator as safe method of waste disposal.

Vaccine availability and Readiness

Vaccine availability and Readiness

In March 2021, Kenya launched a nationwide vaccination with an aim of providing immunity against COVID-19 to susceptible populations like frontline health workers; teachers & security personnel and vulnerable individuals at high risk of developing severe disease. The ability of health facilities to offer COVID-19 vaccine is dependent on availability of the vaccine, the requisite supplies & cold chain system and necessary human resource capacities.

This sentinel survey aimed at assessing the number of health facilities that were providing the vaccine. For those that responded in the affirmative, then the questions on the availability of the vaccine and the cold chain mechanism were assessed. In addition, the study sought to understand the vaccination practice including trainings and the measures to monitor, manage and report any adverse effects.

Findings

Vaccine cold chain equipment

Availability of functional vaccine cold chain equipment across all facilities was assessed by determining availability of a functional fridge, temperature recorder and temperature ranges for the cold chain provision. Disaggregation was done by the level of care, ownership as well as the location (rural/urban).

Majority of facilities across the various levels of care had functional refrigerators (77% of level 2 & 3, 97% of level 4 and 100% of level 5 facilities). Among level 6 facilities, Kenyatta University Hospital did not have a vaccine refrigerator with temperature recorder and depended on a nearby facility for storage of their vaccines.

Almost similar proportions of facilities, across all levels, had a functional refrigerator with a continuous temperature recorder (77% of level 2 & 3, 97% of level 4 and 100% of level 5 and 100% of level 6 facilities) as in figure 61 below. This was comparable to findings in a similar assessment in December 2020 where nearly all facilities across the various levels of service

delivery had functional fridges with temperature recorders (85% of level 2 & 3, 100% of level 4 and 96% of level 5 & 6 facilities).

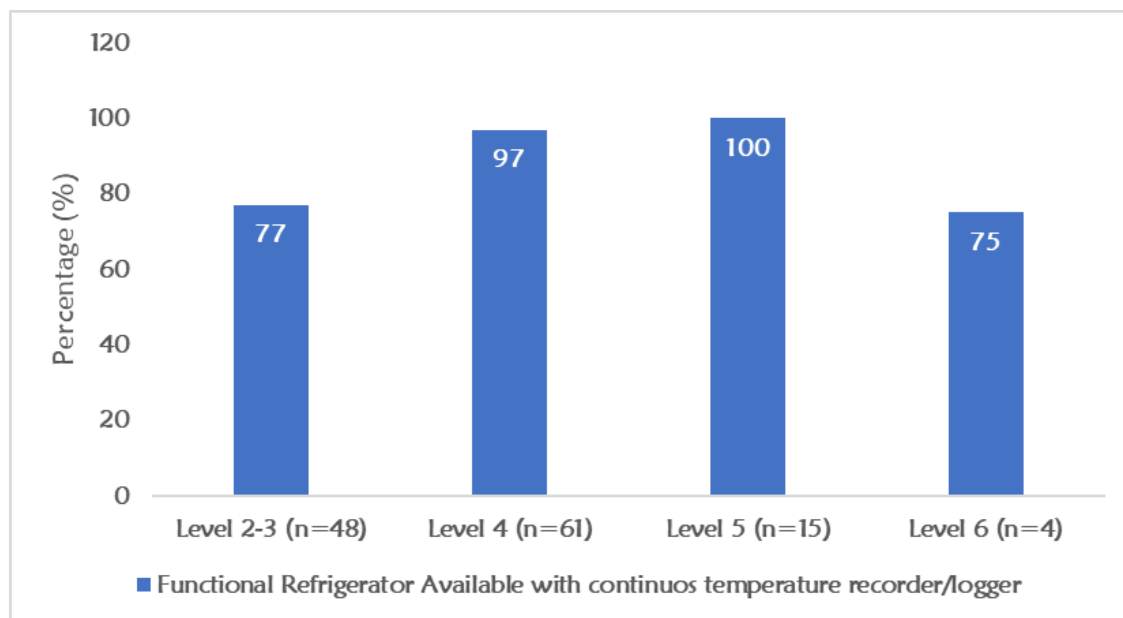


Figure 61: Percentage of facilities with functional cold chain equipment (N=128)

Based on location, 92 % of urban facilities had a functional refrigerator with a continuous temperature recorder compared to 88% of rural facilities. You were more likely to find a functional refrigerator with a continuous temperature recorder in a public facility (92%) than in a non-public facility (83%).

An assessment of available temperature ranges for the vaccine fridges was done. All facilities in Level 2-3; 4 and 5 and 75% of level 6 facilities had cold storage provision for temperature range between 2°C to 8°C. Further, this temperature range was found in all non-public facilities and 98% of public facilities.

In every 5 of the sampled facilities had cold storage provision for temperature range of -20°C. Of these, 28% were in public facilities while 8% were in non-public facilities.

There was minimal availability of cold storage provision for temperature range of -70°C in 2 level 4 and 1 level 6 facilities. This temperature range was most likely found in non-public facilities (8%) compared to public facilities (3%). Only urban facilities had cold storage provisions with -70°C temperature range at 7% as in figure 62 & 63 below.

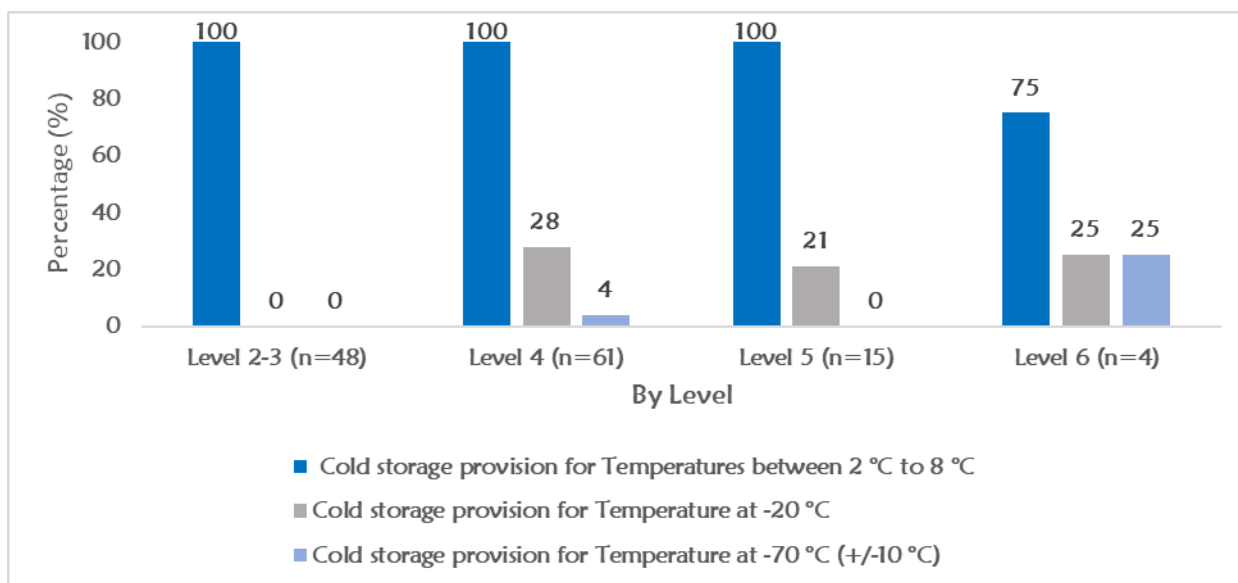


Figure 62 Proportion of facilities with cold storage provision for the various temperature ranges by level (N=128)

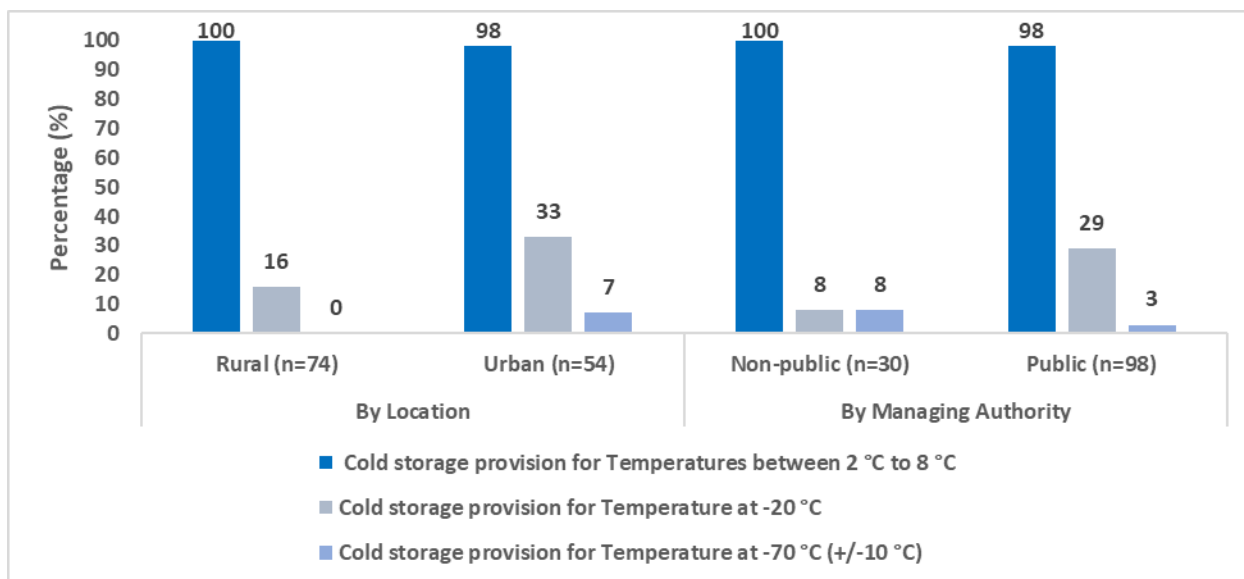


Figure 63 Proportion of facilities with cold storage provision for the various temperature ranges by location and ownership (N=128)

Only three facilities confirmed availability of -70 degrees storage. These are Moi Teaching and Referral Hospital, Nairobi West Hospital and Nanyuki Referral Hospital.

Availability of COVID-19 Vaccine Services

Facilities were assessed on whether they offered COVID-19 vaccine and availability of the vaccine on the day of the assessment. Disaggregation was done by the level of care, ownership as well as the location (rural/urban). More than half of sampled facilities (60%) offered COVID-19 vaccination.

Across the levels of care, all level 6 facilities offered COVID-19 vaccination, 93% of level 4 & 5 and 4% of level 2-3 facilities. More than two thirds (66%) of facilities with COVID-19 vaccine were public while 40% were non-public. More urban facilities (85%) had COVID-19 vaccinations compared to rural facilities (43%) as shown in figures 64 & 65.

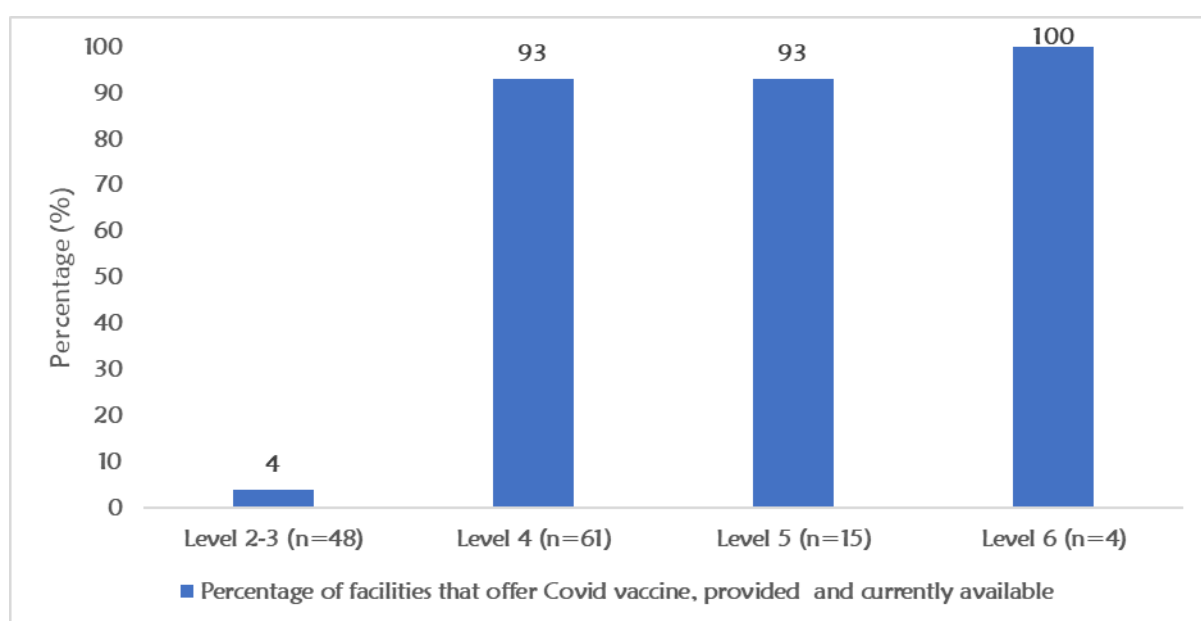


Figure 64 Proportion of facilities providing COVID-19 vaccine services by level (N=128)

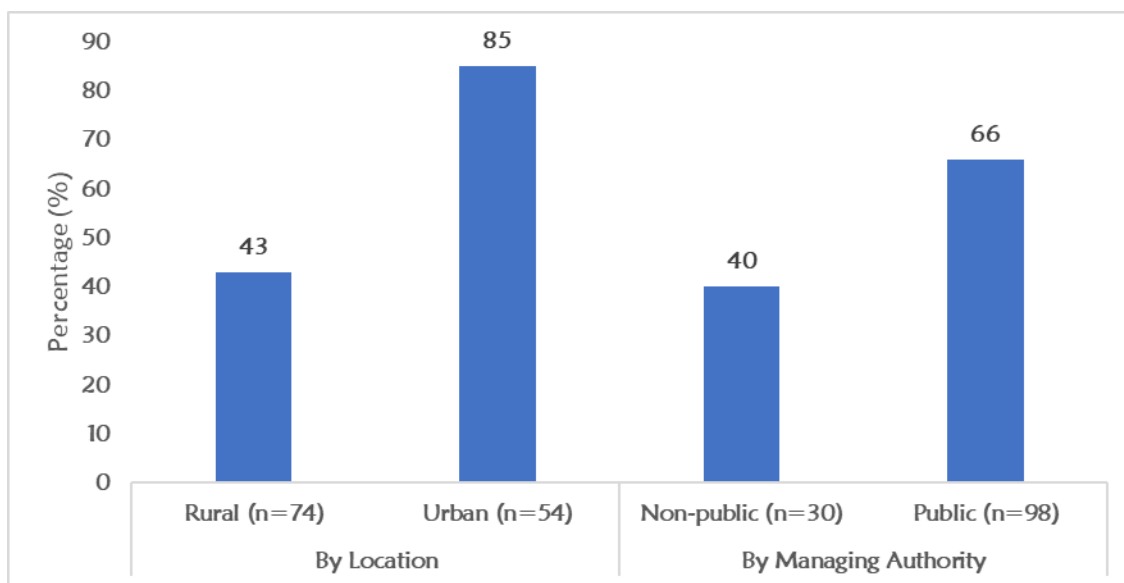


Figure 65 Proportion of facilities providing COVID-19 vaccine services by location and managing authority (N=128)

AstraZeneca was the only vaccine available and being provided in all vaccination facilities.

Regarding availability of the vaccine on the day of the assessment, AstraZeneca vaccine was provided and available in all sampled and vaccination level 2-3 and 6 facilities, 96% of level 4 facilities and 75% of level 5 facilities.

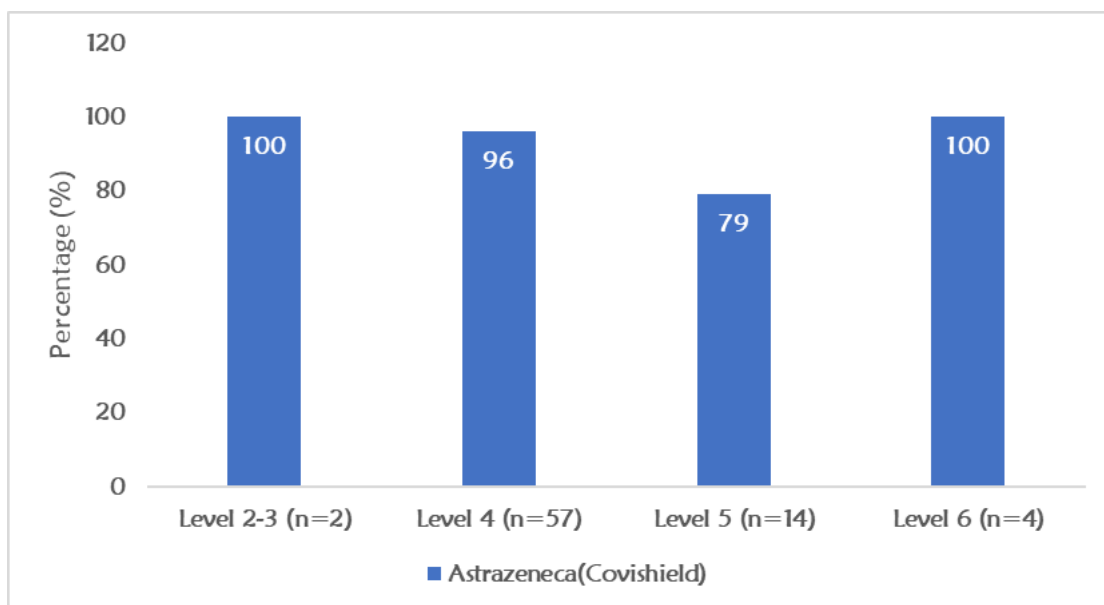


Figure 66 Percentage of facilities with AstraZeneca vaccine type provided and currently available by level (N=77)

Availability of AstraZeneca based on ownership was higher in public facilities at 98% compared to non public facilities at 67%. Based on location, there was almost equal availability for rural and urban facilities at 94% and 93% respectively as shown in figure 67.

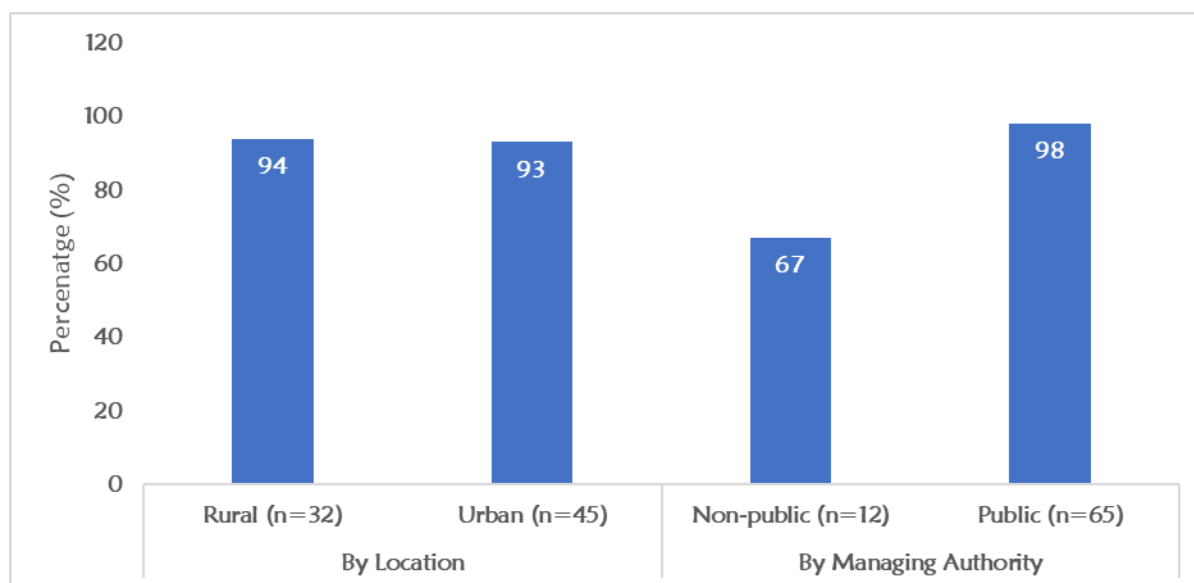


Figure 67 Percentage of facilities with AstraZeneca (Covishield) vaccine type provided and currently available by location and managing authority (N=77)

Regarding received vaccines and vaccinated persons, a total of 273,004 vaccines were received while 223,710 persons were vaccinated in the sampled facilities. Most of the received vaccines (186,274) were in level 4 facilities. Similarly, most of the vaccinated persons (151,294) received the vaccine in level 4 facilities. More vaccines (247,314) were received in public facilities compared to private facilities (25,690). In addition, more vaccines were received in urban facilities (202,053) compared to rural facilities (70,951).

The proportion of administered vaccines (number of people vaccinated as a proportion of vaccines received) was above average across all levels of care with 68%, 81%, 76% and 97% in level 2-3, 4, 5 and 6 respectively. More (95%) non-public facilities had used up the received vaccines compared to 81% of public facilities. Similarly, more (83%) urban facilities had used the received vaccines compared to rural facilities (78%) as shown in figure 68.

Vaccination statistics

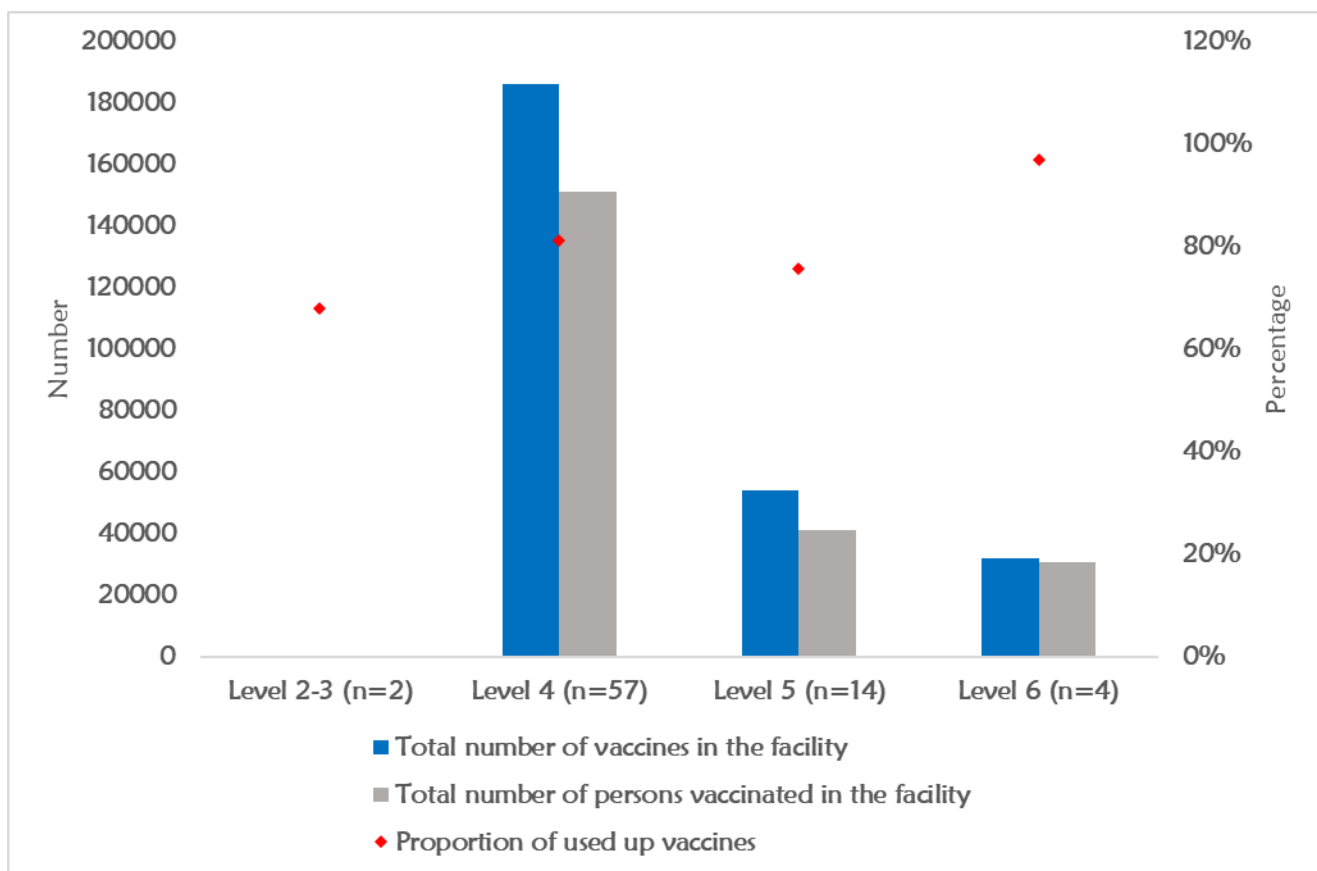


Figure 68 Vaccination statistics by level of care(N=77)

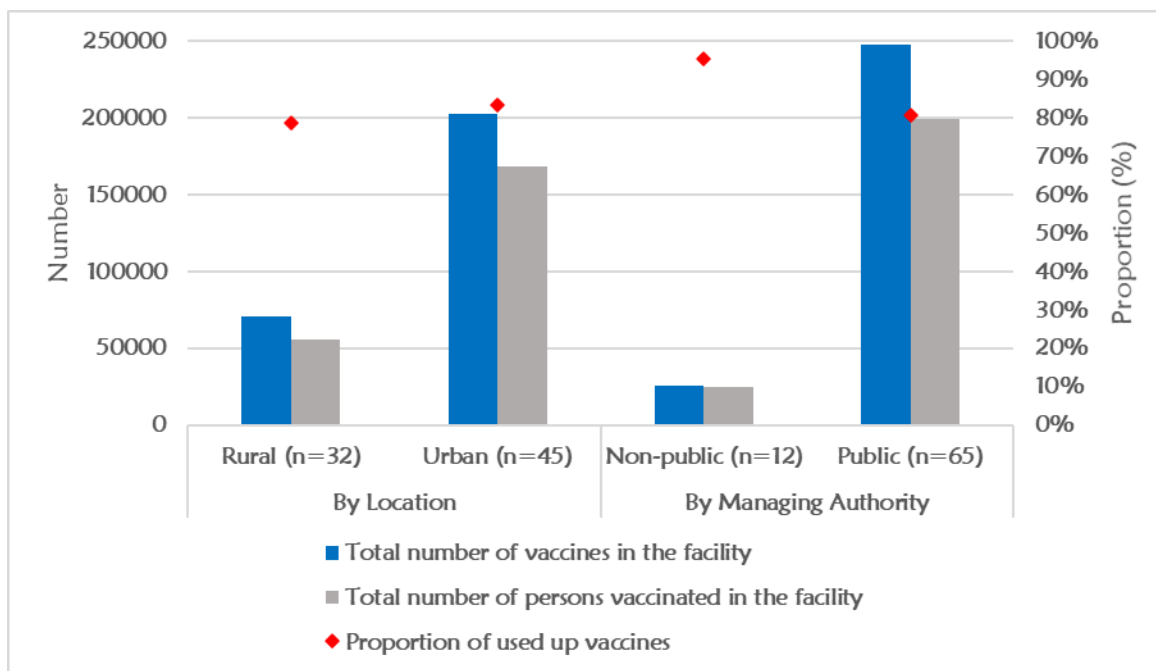


Figure 69 Vaccination statistics by location and managing authority(N=77)

County Vaccine Statistics

The proportion of administered vaccines (number of people vaccinated as a proportion of vaccines received) in the counties showed marked variations. Facilities in Nairobi County received the highest number of vaccine doses (62,650) and also vaccinated the highest number of people (61,067). This was also seen in other counties namely Kajiado, Laikipia Trans Nzoia and Nyeri that received a high number of vaccines and also had the highest uptake of the vaccine. Other than Samburu (80%), ASAL counties reported low uptake of the vaccine at 15% in Garissa; 24% in Wajir and 32% in Marsabit.

The 5 high burden counties in March namely Kiambu, Nairobi, Kajiado, Nakuru and Machakos had high uptake of the vaccine at 100%;97%;65%;80% and 97% respectively as seen in figure 70.

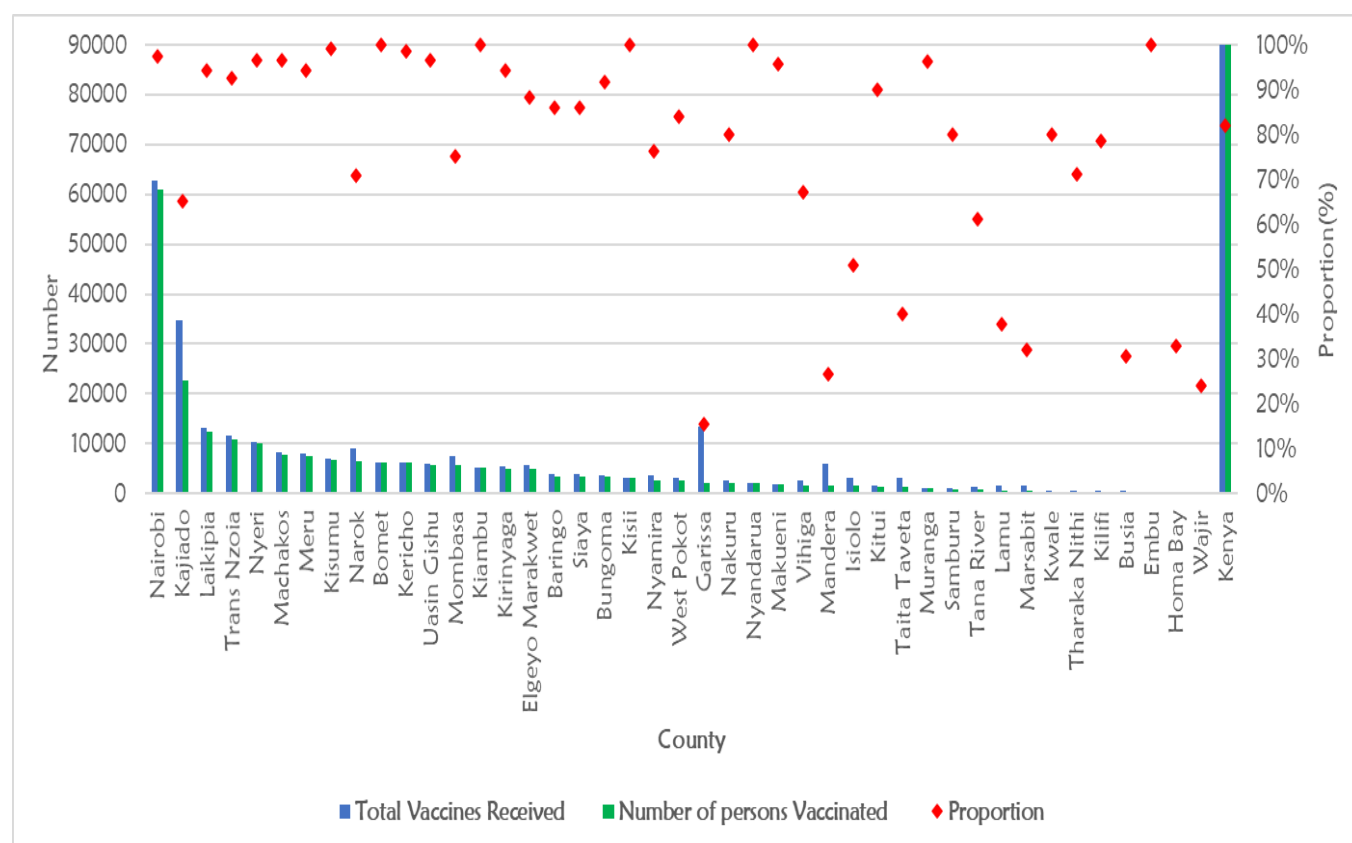


Figure 70 COVID-19 vaccination statistics by County

Availability of COVID-19 Vaccine Ancillary Products

Availability of supplies necessary to support administration of COVID-19 vaccine was assessed based on availability of two tracers, namely syringes and sharps containers. Availability of supplies was generally high with all facilities in level 2-3, 5 and 6 reporting having sufficient syringes for each dose of COVID-19 vaccine dose. The same was available in 96% of level 4 facilities.

Containers for sharps were available in all levels of care.

In terms of ownership, all public facilities had both tracer supplies compared to private facilities that had sufficient syringes and sharps containers in 97% and 98% of facilities respectively. Urban facilities reported equal availability of the tracers at 98% compared to rural facilities where all had sharps containers and 97% had syringes

COVID-19 vaccine related trainings

Facilities were assessed on whether facilities had received training on various topics regarding COVID-19 vaccine including setting up COVID-19 vaccination centre, storage of the vaccine, administration of the vaccine, management of the adverse events, reporting adverse events, health care waste management, infection prevention control, target population and eligibility criteria and data management, reporting and surveillance.

Most facilities in level 4, 5 and 6 said their staff had received training on all select COVID-19 topics at 90%, 93% and 100% respectively. All level 2-3 facilities had received all the trainings.

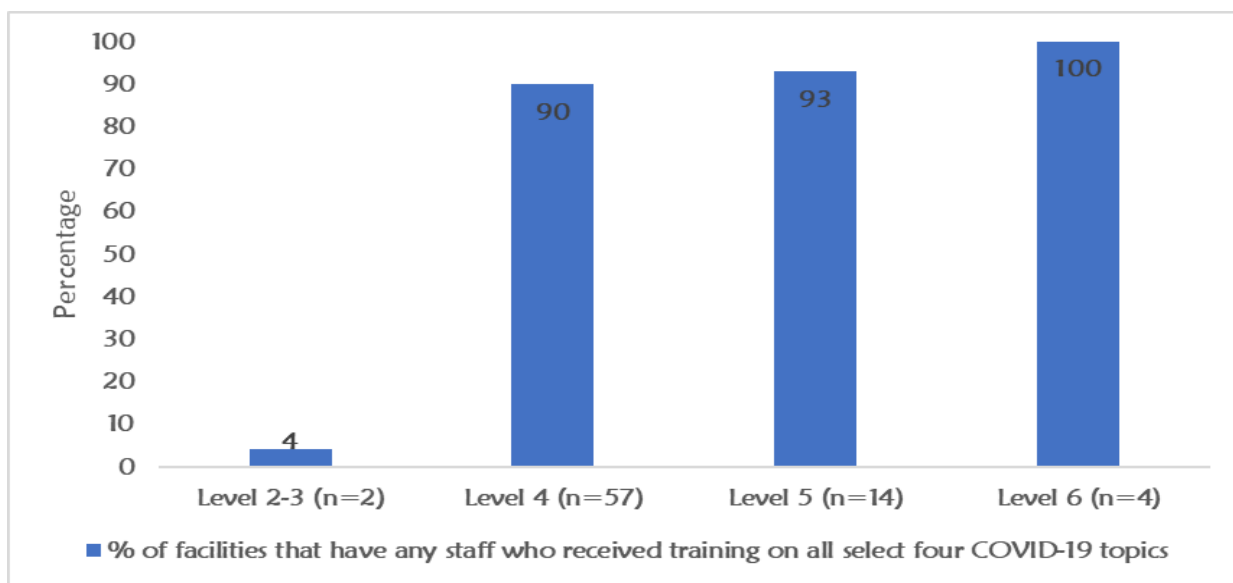


Figure 71 Percentage of health facilities that have staff who received training on all select COVID-19 topics by level (N=77)

Disproportionately more facilities (83%) in urban areas had their staff trained on all the topics compared to those in the rural facilities (41%). Similarly, more government facilities (64%) compared to non-public facilities (40%) as shown in figure 72.

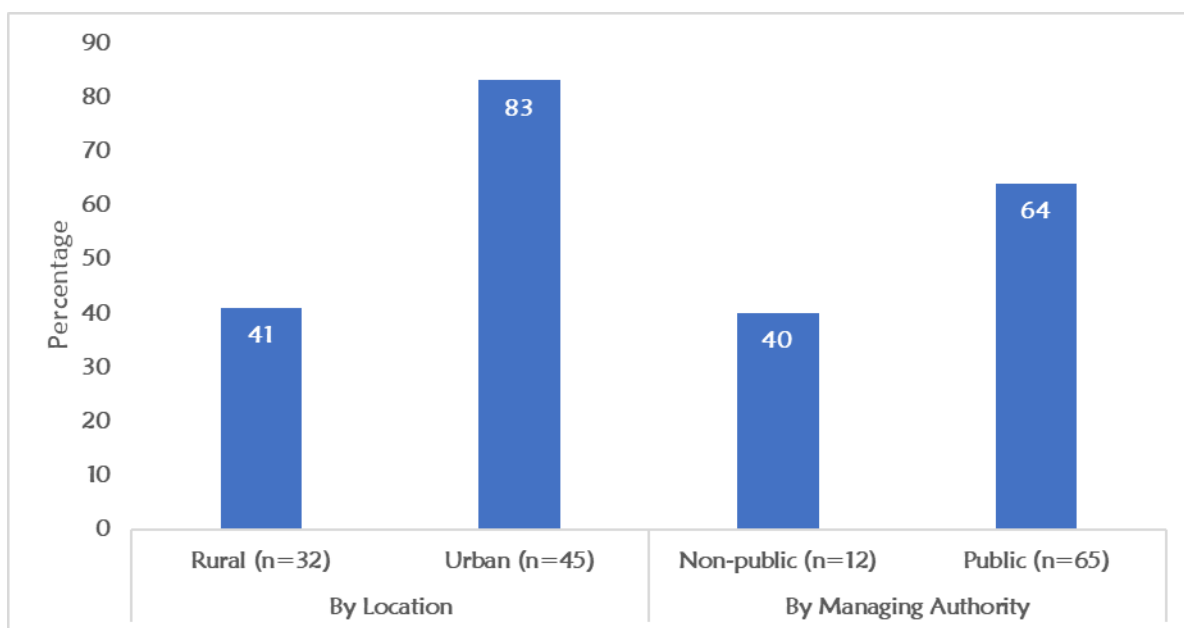


Figure 72 Percentage of health facilities that have staff who received training on all select COVID-19 topics by location and managing authority (N=77)

Management of vaccine related adverse events

Facilities were assessed based on the availability of various capacities to manage vaccine-related adverse events.

All facilities in level 2-3, 5 & 6 and non-public facilities said they informed vaccine recipients of side effects, informed recipients on what to do in case of adverse events following immunization (AEFI), had an “emergency tray” for managing AEFI and had a system in place to report vaccine-associated adverse events to the National Vaccine and Immunization Programme.

Slightly lower availability of an “emergency tray” for managing AEFI and a system in place to report vaccine-associated adverse events to the National Vaccine and Immunization Programme was reported in level 4 facilities at 98% and 96% respectively. The slightly lower availability for the two tracers was also seen in rural facilities at 97%.

CONCLUSION

- Preparedness of cold chain for temperature range 2^o-8^o was generally high therefore adequate cold storage capacity for the AstraZeneca vaccine
- There was minimal availability of -70^oc temperature range indicating a gap in case of deployment of other vaccine brands requiring extreme temperatures like Pfizer
- There was higher level of preparedness in public facilities in terms of availability of the vaccine and ancillary products compared to private facilities which is an indication of successful deployment of vaccines accessibility
- The higher availability of the vaccine in urban facilities compared to rural facilities indicates an inequity with higher availability in urban areas yet majority of the population is in rural areas
- Generally, counties that received high doses of the vaccine had high uptakes, an indication that availability of the vaccine was proportional to demand of the same

- Whereas we have checked general availability of cold chain equipment, this was not counterchecked against the standard requirements as per the norms and standards.

RECOMMENDATIONS

- Need to increase availability of the -70°C temperature range in readiness for acquiring vaccine brands that require extreme cold chain systems
- Need to ensure equity in the distribution of the vaccine
- Need to provide higher doses to facilities for sustained demand

Guidelines for COVID-19 management

Introduction

Clinical guidelines assist healthcare workers make decisions about appropriate management of clinical conditions to enhance appropriateness of practice, improve quality and lead to better patient outcomes. The proportion of facilities that had received guidelines on maintenance of essential health services was at 68 %. Approximately 40 % of level 2-3 facilities had these guidelines, while 60 % of level 4 facilities had the guidelines as shown in figure 73.

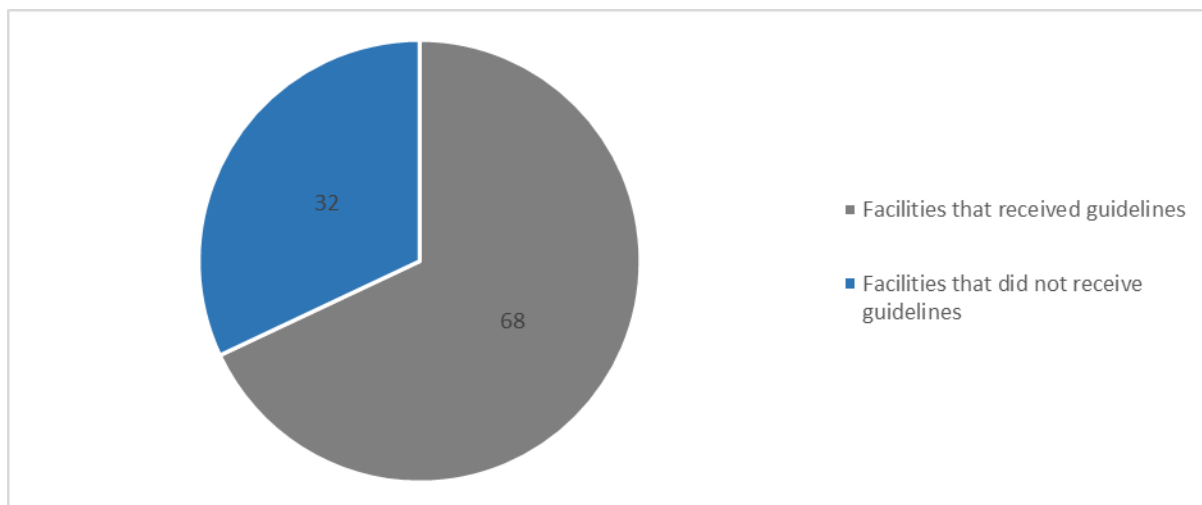


Figure 73 Percentage of facilities that received guidelines on maintaining EHS during the pandemic
N=106

It was observed that less than half of the health facilities 42% had the complete set of all the guidelines assessed, while 78% of the facilities had guidelines on waste management. The least available guidelines were on dead body management as shown in figure 74.

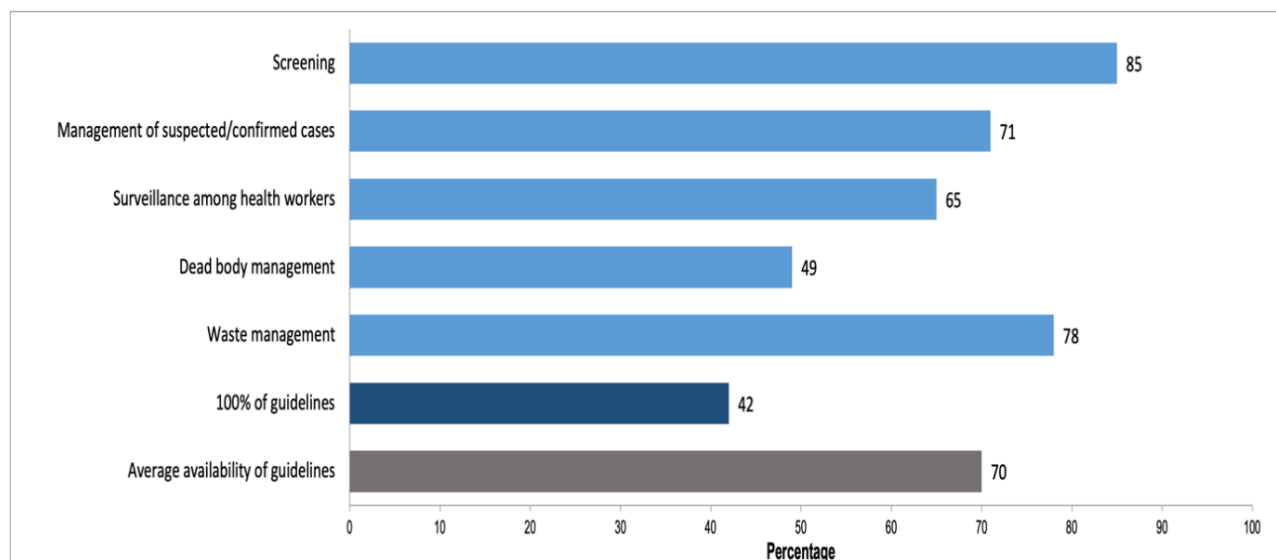


Figure 74 Percentage of facilities that have COVID-19 management and IPC guidelines (N=106)

An assessment of the availability of various guidelines by level of care showed that most level 4 facilities had received all guidelines relating to COVID-19 management. Approximately 70 % of the level 2 and three facilities had received guidelines on IPC and screening for COVID-19, while less than 40 % of level 2 and 3 facilities received guidelines on screening of COVID-19, PPE and surveillance. See figure 75.

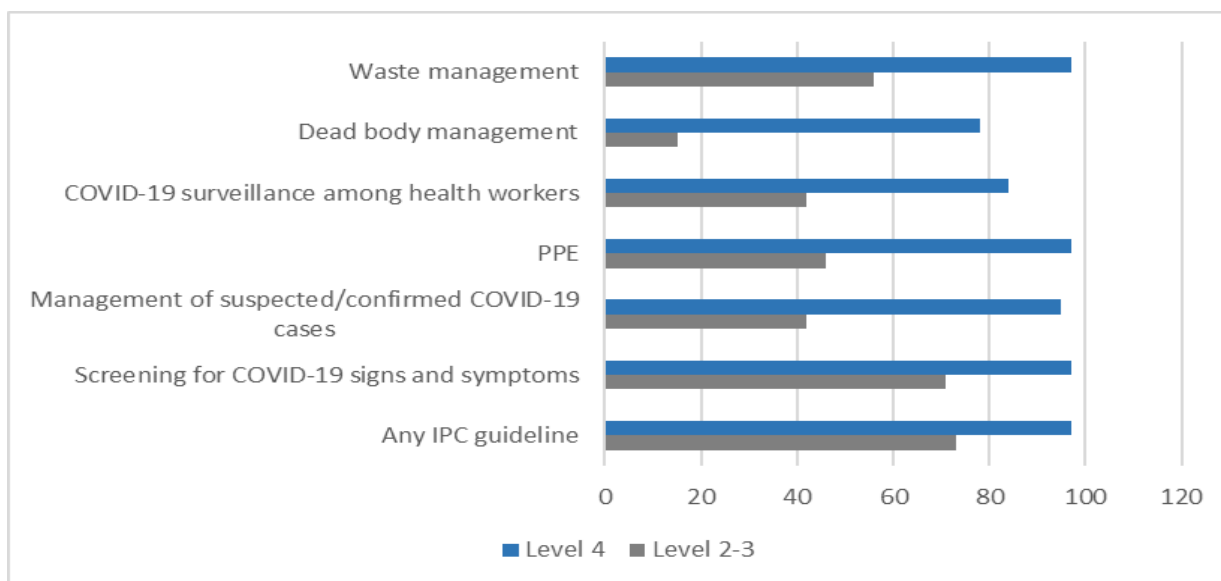


Figure 75 Availability of the specific guidelines by level of care (N=106)

An analysis by ownership showed that most private (non-public) facilities were noted to have a higher access to guidelines as compared to public facilities. However, the guidelines on management of dead bodies were least available, with less than 50 % of facilities having these guidelines.(Figure 76)

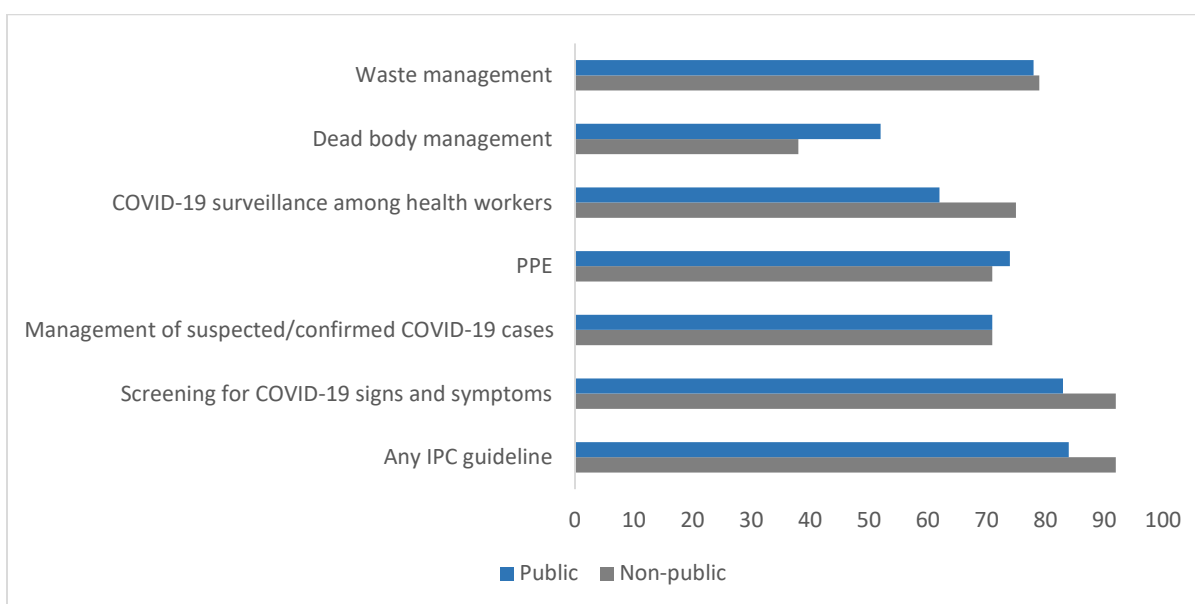


Figure 76 Availability of the specific guidelines by ownership (N=106)

An analysis of the trend of the availability of guidelines for case management of COVID-19 indicated that the guidelines have increasingly been available from the beginning of the pandemic, until the period under review.

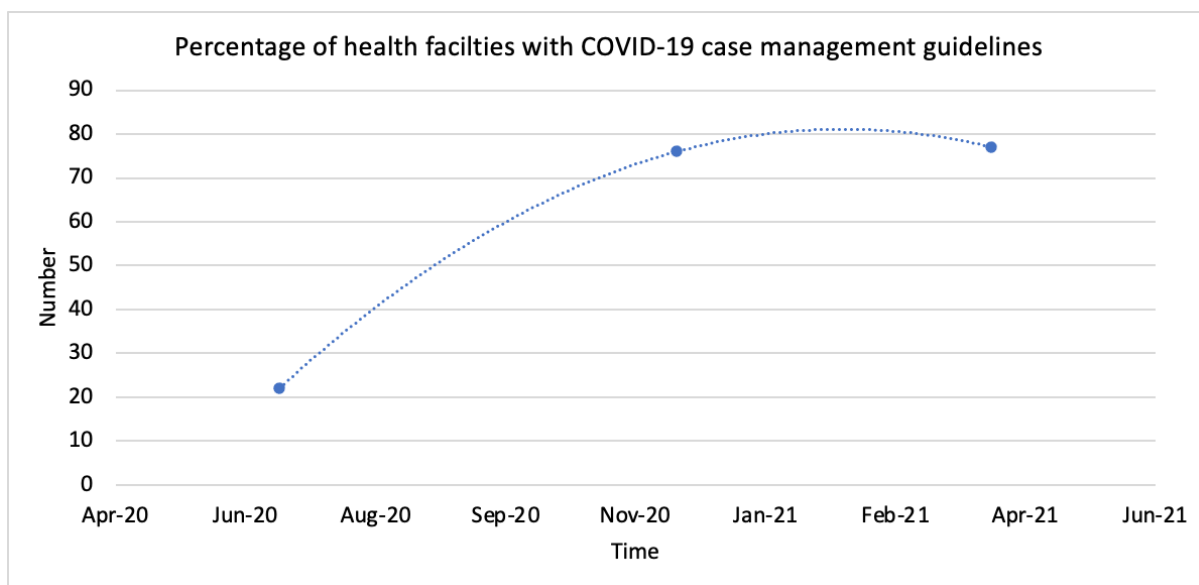


Figure 77 Availability of guidelines for case management of COVID-19 (n=1459 (June 2020), n=90 (Dec 2020), n=106 (April 2021))

Conclusion

Access to guidelines has been generally good in the level 4 facilities, however, most level 2 and 3 facilities still lack the various guidelines for management of COVID-19. The guidelines for management of dead bodies are the least available.

Recommendation

Dissemination of guidelines for management of COVID-19 to lower-level facilities is key.

COVID-19 Case Management in lower level facilities

In terms of COVID-19 case management, guidelines for case management including referral were the most available (in 3 of every 4) primary facilities, while guidelines for home based isolation and care, as well as those of management of asymptomatic cases were available in two of every three facilities.(Figure 78)

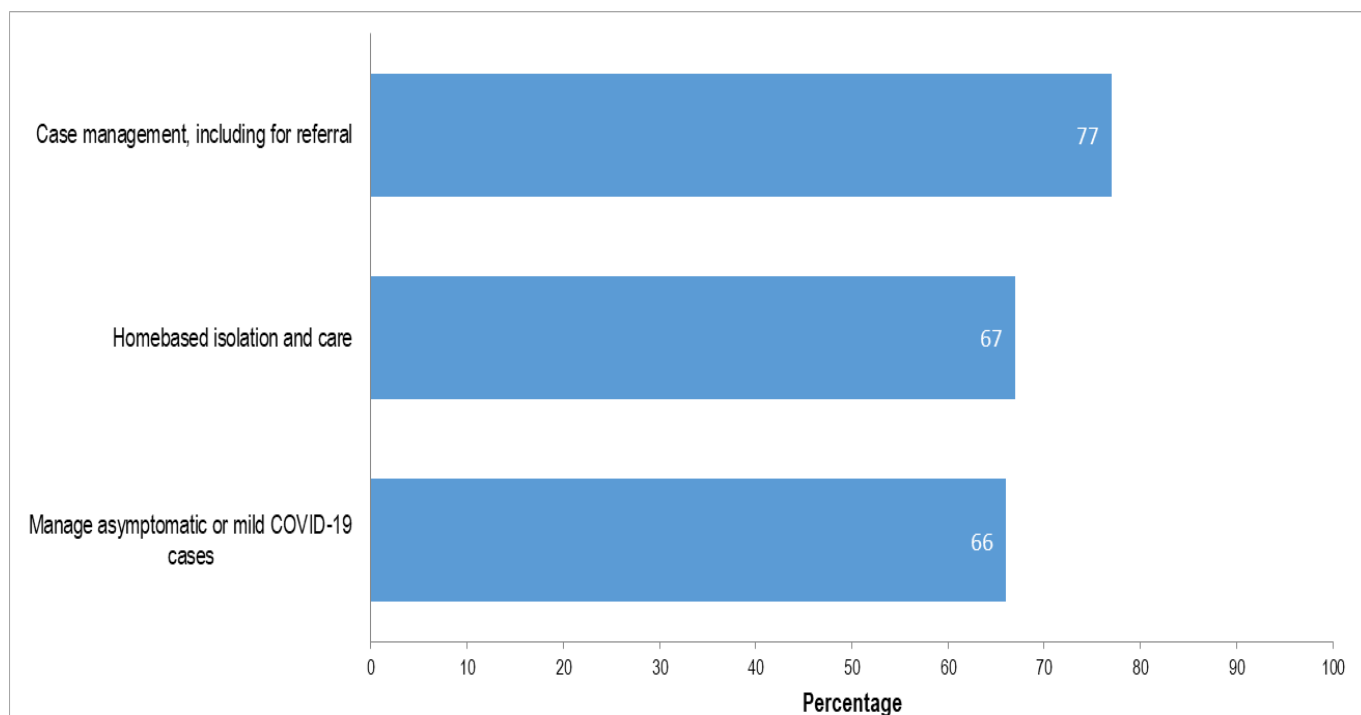


Figure 78: *Percent of primary-level facilities that had received up-to-date information and guidelines to manage COVID-19 cases (N=106)*

When attending to a COVID-19 patients, nearly all of the lower-level facilities checked for the symptoms and measured oxygen saturation with a pulse oximeter. Performing diagnosis and consultation taking place in a separate room was only observed by three quarters of the facilities. Two in three of the lower-level facilities referred their COVID-19 patients to specialized care. Teleconsultations was done by a third of the health facilities See figure 79

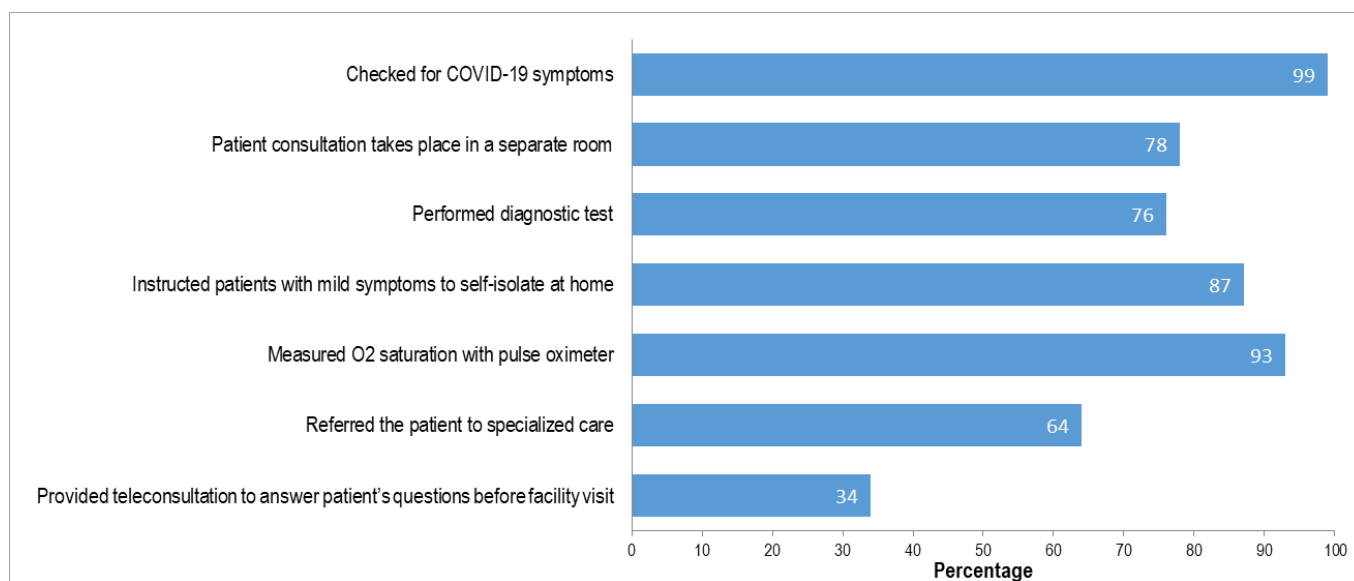


Figure 79 COVID-19 case management practices in lower-level facilities (N=63)

Service Delivery and Utilization

Health service delivery and utilization is the use of healthcare services by persons/patients for promotion, prevention, and restoration of health. COVID-19 has caused fluctuations in utilization of routine and emergency health services due to a number of reasons, including fear of contracting the disease, reduced burden of diseases due to measures taken to curb the pandemic like washing of hands, or limitations in services provided at facility level in order to contain the numbers of clients visiting the facilities, among other reasons.

Service delivery strategies during the COVID-19 pandemic

This section looks at strategies put in place by the health facilities to respond to changes in utilization of some key healthcare services like MNCH, NCD, HIV, TB among others, during the pandemic.

An assessment of the facilities that made changes in how they deliver health services revealed that 85% of facilities assessed changed the service hours, which could be an increase, or a decrease in hours, while 84% combined care for multiple conditions such as hypertension, diabetes into a single visit. Patients at a high risk of COVID-19, together with those eliciting COVID-19-like symptoms, were given priority in around 75% of health facilities. Approximately 72% of facilities advised their clients on self-care for example self-check of blood pressure, oxygen saturation among others, while 64% of health facilities used tele prescriptions while only one in five facilities implemented tele-medicine.

Other strategies put in place included home based management of conditions, where half of the facilities assessed reported to have used home based care. Some facilities (32%), redirected patients to other facilities and reduced the scope, or suspended services offered at the facilities, while only 2% of the facilities assessed closed due to the COVID-19 pandemic as shown in figure 80. These strategies cut across and were not dependent on location, level of the facility or ownership.

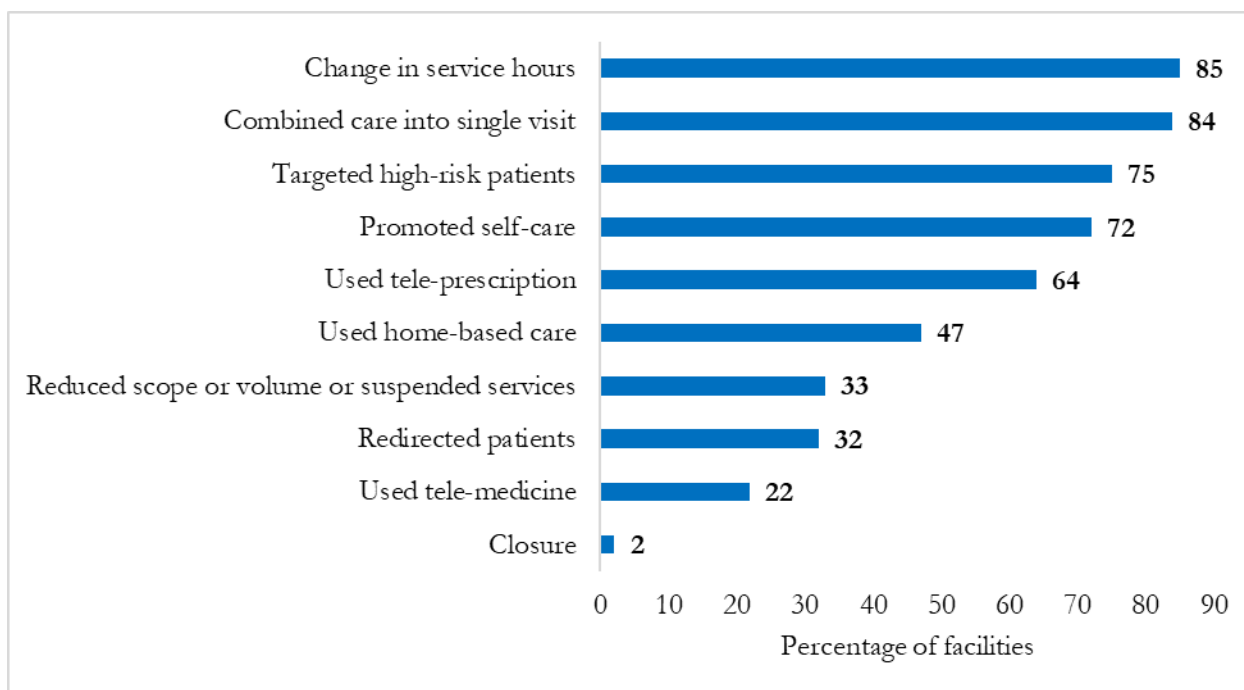


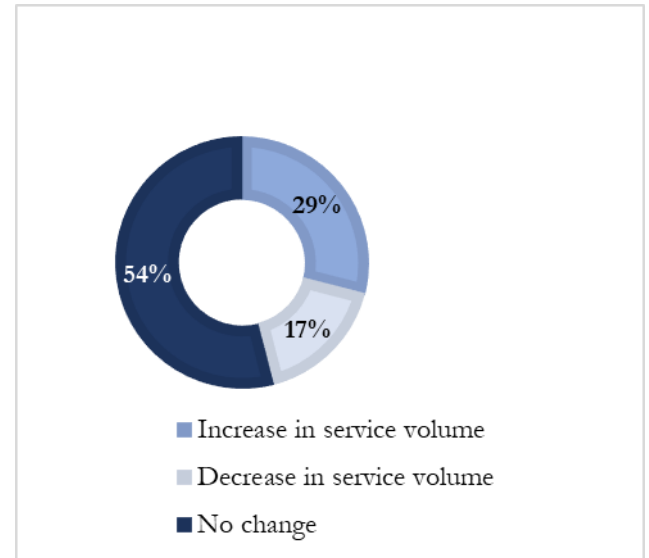
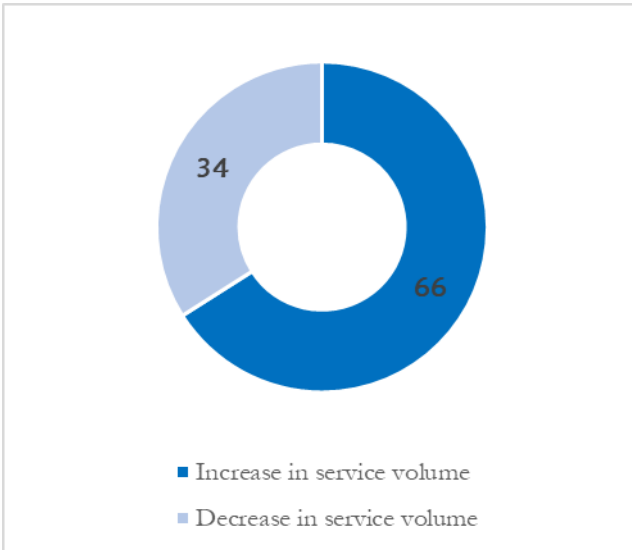
Figure 80 Percentage of facilities that modified service delivery strategies in the past three months (N= 128)

Referral of COVID-19 patients

Nine out of every ten facilities reported to having a designated external facility to refer suspected or confirmed COVID-19 patients for treatment, with approximately all of these facilities (98%), reporting to have access to safe/isolated transportation to transfer these patients following referral. This is a slight improvement from the assessment conducted three months prior, where 86% of the facilities had a designated external facility to refer suspected or confirmed COVID-19 patients for treatment while 95% had reported they had safe/isolated transportation to transfer these patients following referral. An assessment by level, location and ownership showed that over 95% in these categories had safe and isolated transport for COVID-19 patients.

Pre-hospital emergency services

The availability of ambulance services was used as a proxy to assess the availability of prehospital emergency services. The assessment looked at whether there was an increase, or a decrease in pre-hospital emergency services. Among all the facilities providing pre-hospital emergency services, 66% reported an increase in service volume, with disaggregation by level of care and location not revealing a different picture. However, disaggregation by ownership showed that a half of the private facilities had increased their pre-hospital emergency services, while 70% of the public facilities had seen an increase. A comparison with the assessment three months' prior, showed that there has been an improvement in the number of facilities who have reported an increase in the prehospital emergency services as shown in figure 81.



Changes in pre-hospital emergency service volume in April 2021 (N=42) *Changes in pre-hospital emergency service volume in December 2020 (N=52)*

Figure 81 Changes in pre-hospital emergency service volume in April 2021 and December 2020

Emergency services

This section looks at the changes in the volume of emergency services in the health facilities. Specifically, 38% of the facilities assessed reported an increase in overall emergency services, 21% reported a decrease, while the remaining 51% of facilities reported no change in the volume of emergency services. Emergency services relating to injuries and acute NCD emergencies, showed the highest increase in volume, while most emergency surgeries, including caesarean sections showed an increase in service volume in less than 10% of the facilities. It is of note, however, that most of the volume for the emergency services remained the same.

In comparison with the assessment conducted three months prior, there is a significant improvement in the volume of emergency services, where by then, only 20% of the facilities assessed had reported an increase in overall emergency services while 39% reported a decrease. Also, emergency care for injuries and acute conditions related to NCDs had declined in about a third of the facilities while emergency surgery including emergency caesarean section and urgent blood transfusion services had declined in about a quarter (24%) of the facilities assessed.

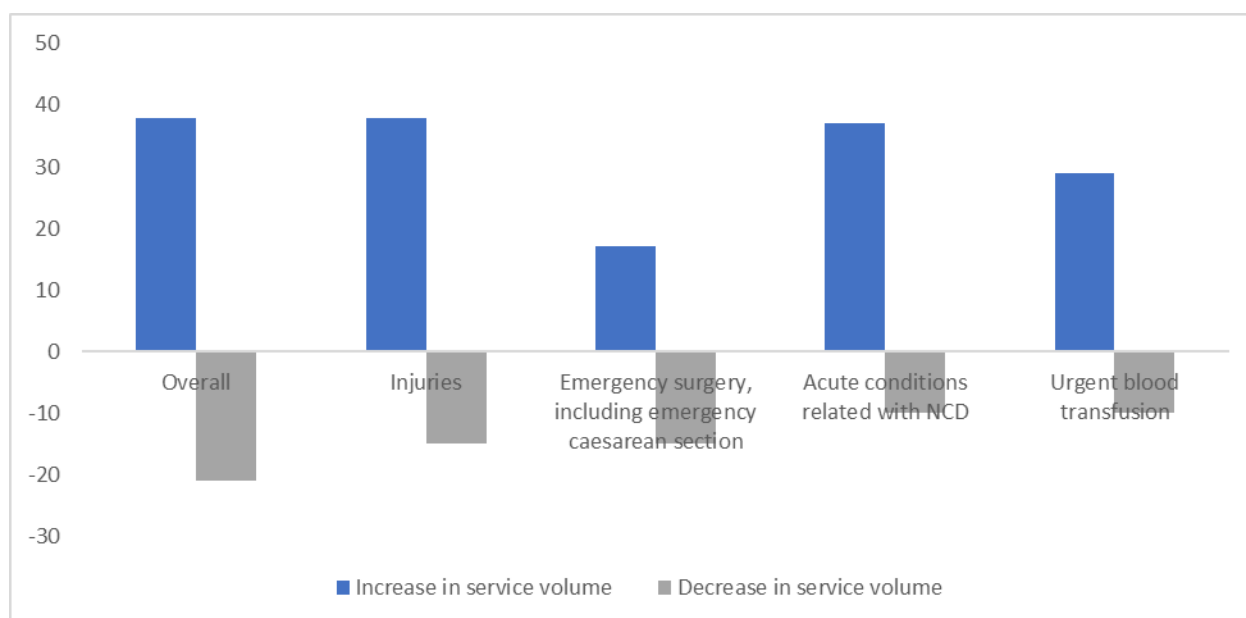
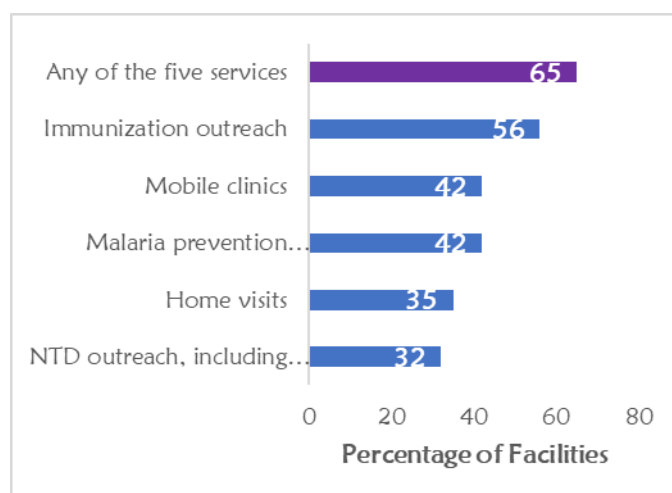


Figure 82 Percentage of facilities providing emergency unit services that have had changes in the service volume (N=67)

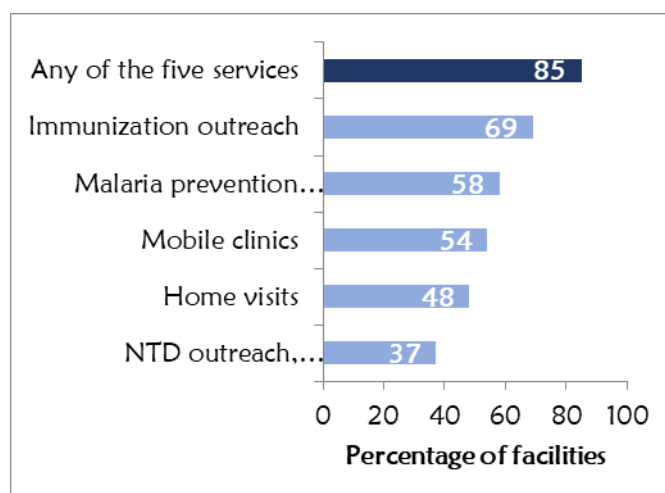
Outreach services

Facilities were assessed on provision of outreach services for key services such as routine immunization and malaria prevention. It looked at facilities that had decreased their outreach services due to the pandemic. The number of facilities that decreased the outreach services, three months prior to this assessment were more (9 out of 10 facilities) than those that decreased their outreach services during this assessment (7 out of 10 facilities). Routine immunization outreach services were the most affected with six out of ten facilities reporting a decrease.

In terms of location and level of facility, more urban and level 4 facilities decreased the outreach services across the given five service areas. However, there was a slight variation by ownership with the public facilities decreasing the outreach services more than non-public ones.



Percentage of facilities providing outreach services that decreased outreach service provision by service area, April 2021 (N=60)

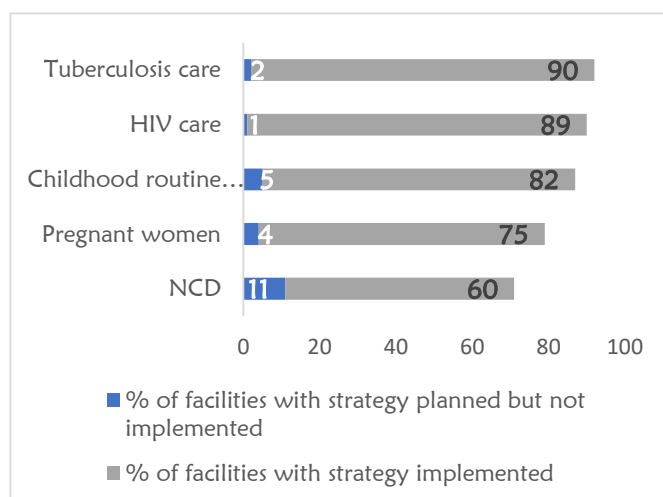


Percentage of facilities providing outreach services that decreased outreach service provision by service area, December 2020 (N=52)

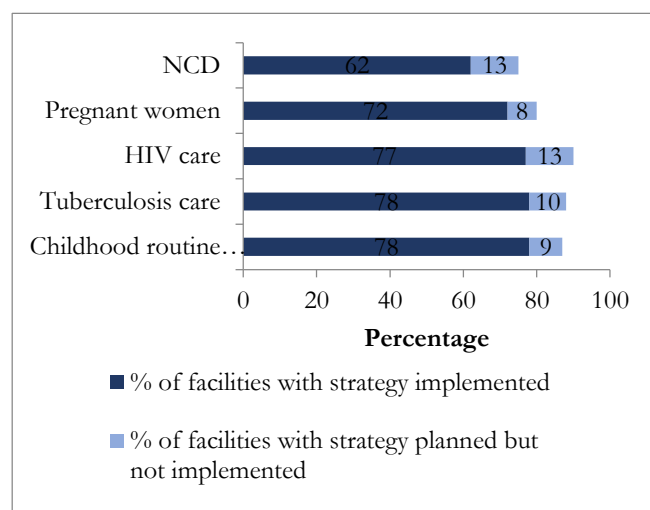
Figure 83 Percentage of facilities providing outreach services that decreased outreach service provision by service area, December 2020 and April 2021

Strategies for missed appointments.

This section looks at whether the facilities have strategies, to reach out to clients who miss their appointments, and whether these strategies are implemented. Among facilities offering tuberculosis services, 92% reported to have in place strategies for missed appointments, though 2% reported that they had not implemented the strategy. Three months prior, 10% of facilities had not implemented their strategies. Other conditions that implemented strategies for missed appointments were HIV (9 out of ten facilities), immunization (8 out of 10 facilities) and antenatal care (7 out of 10 facilities). 71% of the facilities managing NCDs reported to have strategies for clients who missed appointments, however, only six out of ten facilities were implementing these strategies. In general, there was an increase in the proportion of facilities that had implemented strategies during this assessment, as compared to an assessment done three months prior.



Facility strategies for addressing missed appointments, April 2021 (N=106)



Facility strategies for addressing missed appointments, December 2020 (N=91)

Figure 84 Among facilities offering the service, percentage with service restoration plans for missed appointments April 2021 and December 2020

Strategies to ensure patients who had missed appointments were followed up on their care, were widely implemented among the rural and non-public facilities compared to urban and public facilities respectively. TB, HIV and childhood immunization services were the most followed up services. Follow up of pregnant women was better done in rural facilities as compared to urban. NCD follow-up much higher in non-public as compared to public facilities.

Utilization of outpatient services

This section looks at the overall outpatient utilization of specific services, during the review period, in comparison with utilization of the same services, during a similar period in the previous year. It assesses as to whether there was an increase or a decrease in utilization, or whether the utilization remained the same. Twenty percent of facilities assessed reported an increase in utilization of services relating to mental health; 15% of facilities reported an increase in services relating to immunization, while 13% of facilities reported an increase in services relating to intimate partner violence.

There was a reduction in OPD visits for children under the age of 5 and overall bed occupancy rates as from April 2020 when the first COVID-19 case was announced in Kenya, as compared to the years preceding the pandemic, with recovery seen in 2021(see figure 85 and 86).

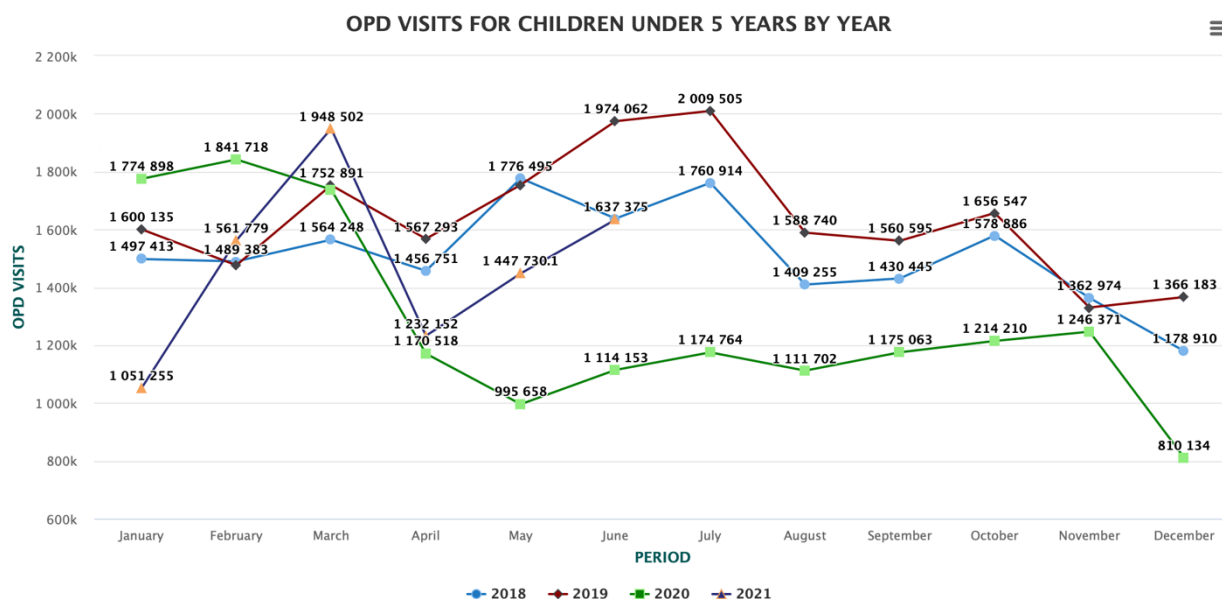


Figure 85 Utilization of outpatient services from January 2018 to May 2021

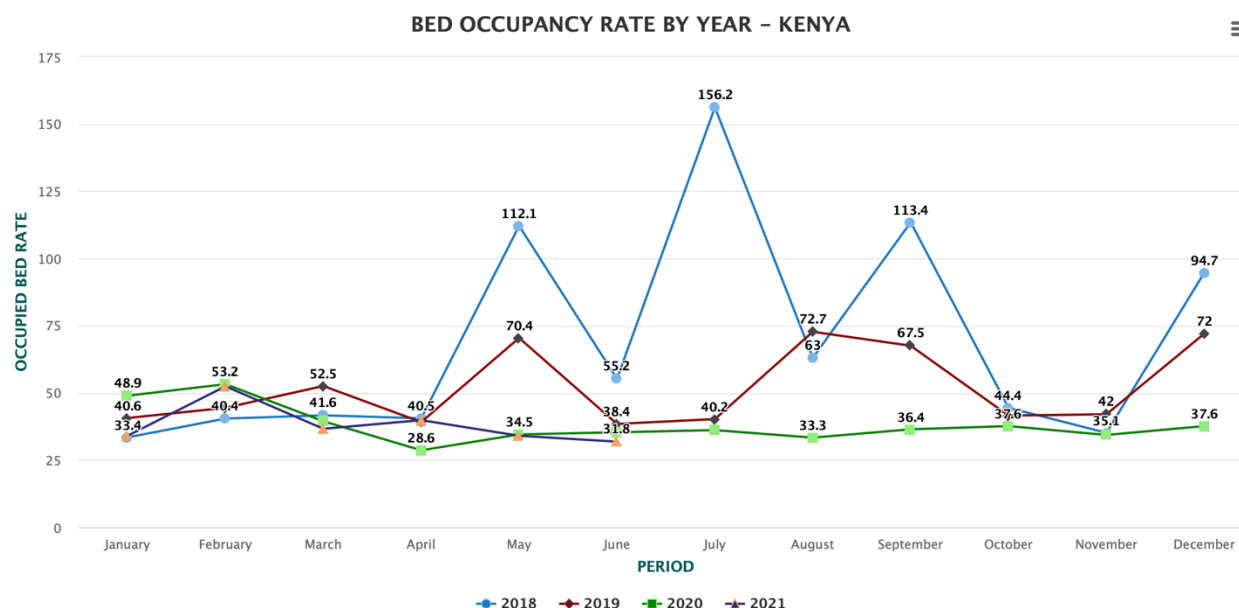


Figure 86 Bed occupancy rate from Jan 2018 to May 2021

RMNCAH Services

An assessment of the trends of RMNCAH services, specifically skilled deliveries and DPT coverage from the pre-COVID-19 period two years prior to the pandemic, showed that these

services were generally maintained during the pandemic in 2020, but dipped in December 2020 to the first quarter of 2021, regaining in March 2021. The number of children accessing the child welfare clinic also reduced in 2020 in comparison with the preceding two years.(Figure 87, 88,89)

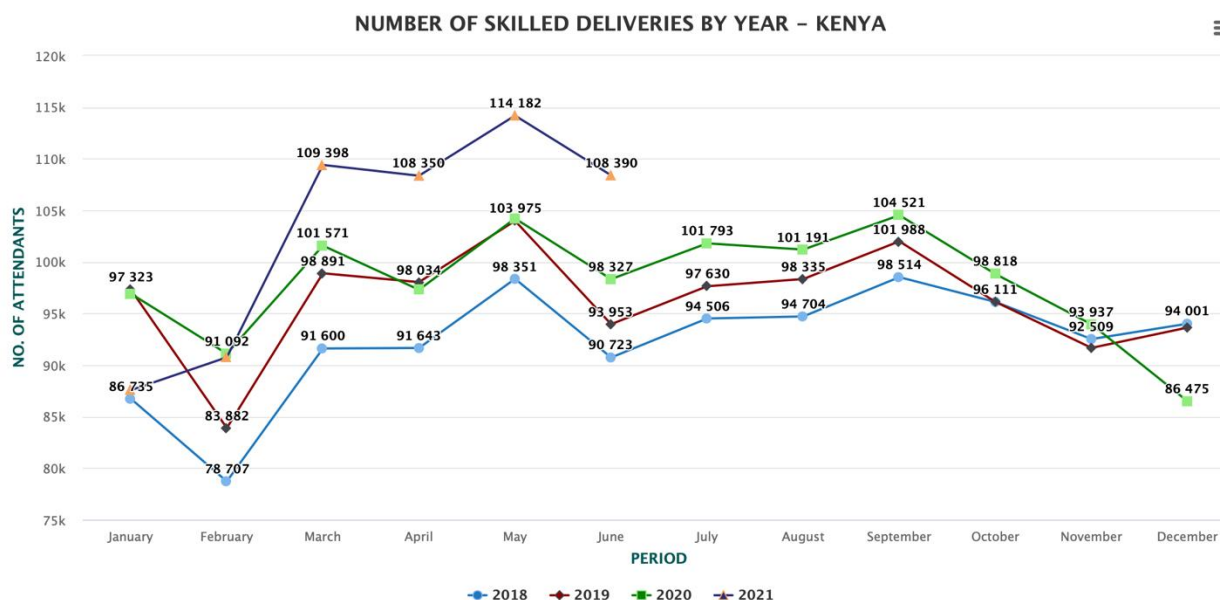


Figure 87 Skilled deliveries between Jan 2018 to May 2021

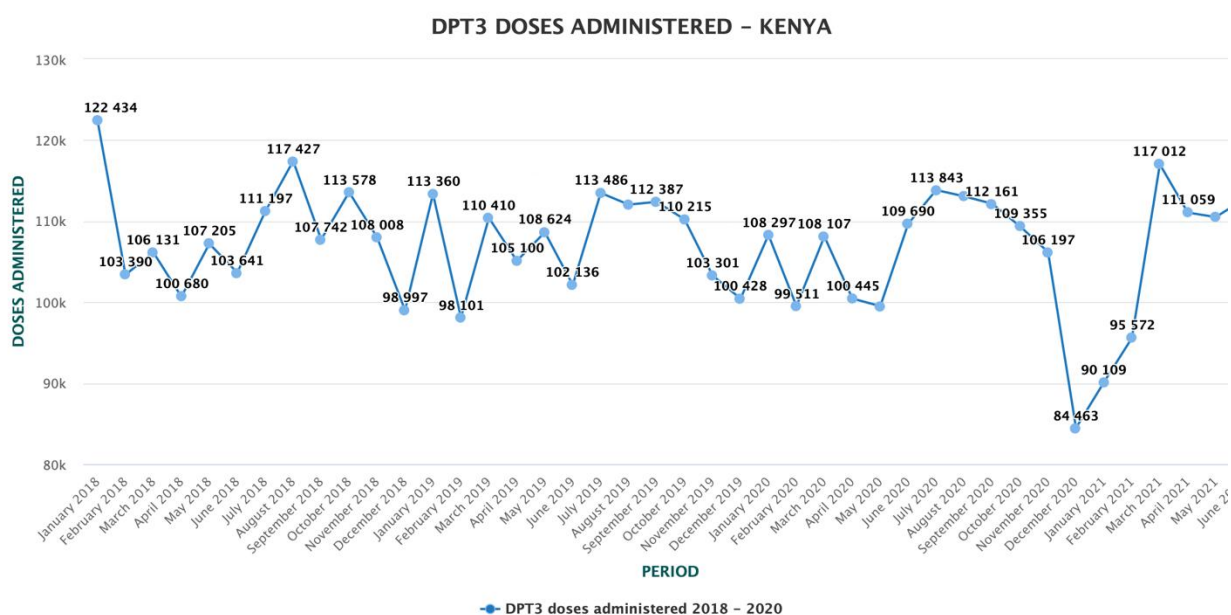


Figure 88 DPT3 doses administered from Jan 2018 to May 2021

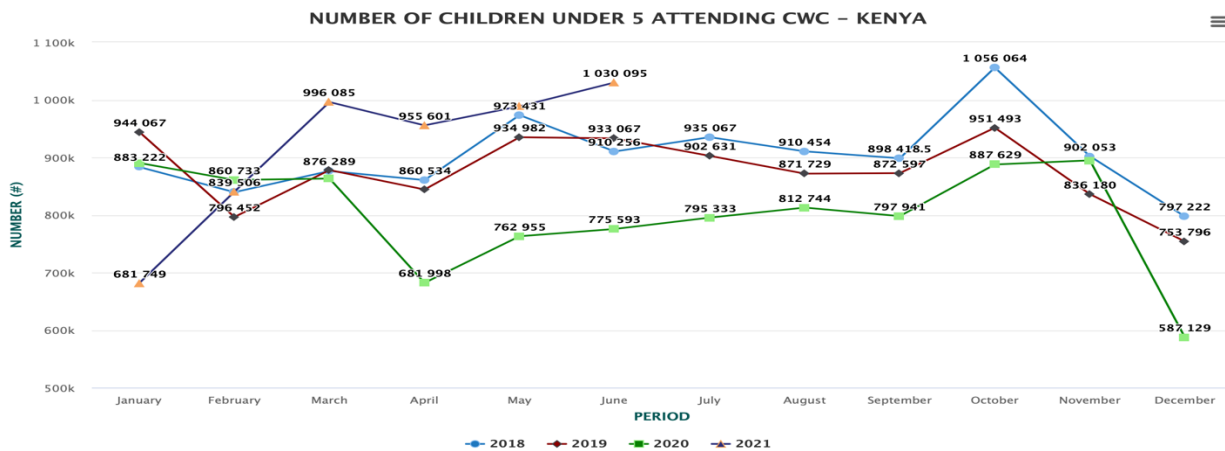


Figure 89 number of under 5 years children attending child welfare clinic over the years

Communicable conditions

An assessment of the trends on access of services for communicable conditions revealed that the enrollment on ART for HIV patients had reduced from the pre-COVID-19 period in January 2020 and only started picking in January 2021, while the trends in HIV testing has significantly reduced. The number of malaria tests done in 2020 significantly reduced as compared to those done in preceding years.(Figure 90,91,92)

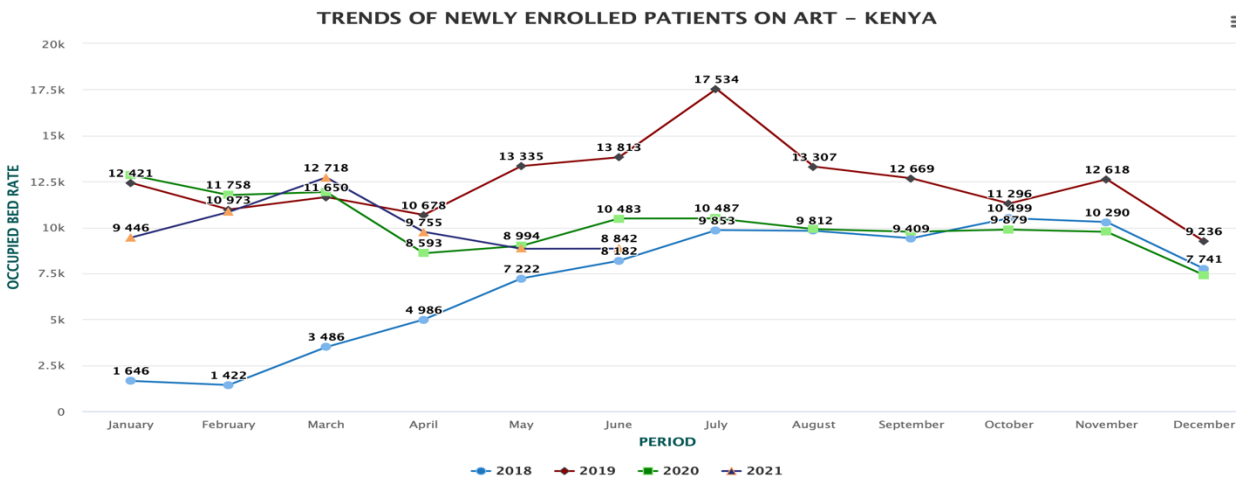


Figure 90 Trends in ARV enrolment Jan 2018-May 2021

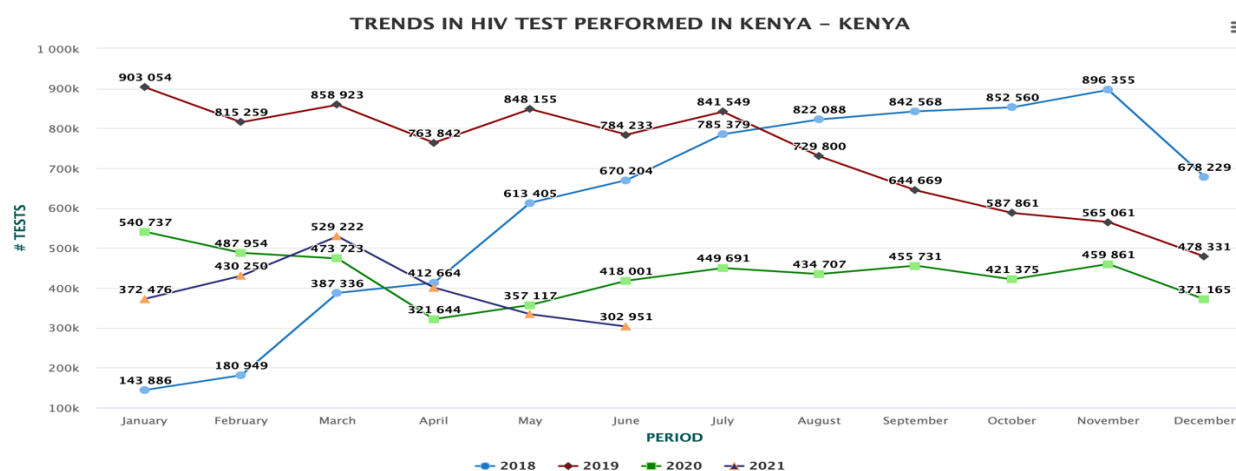


Figure 91 Number of HIV test performed from January 2018 to May 2021

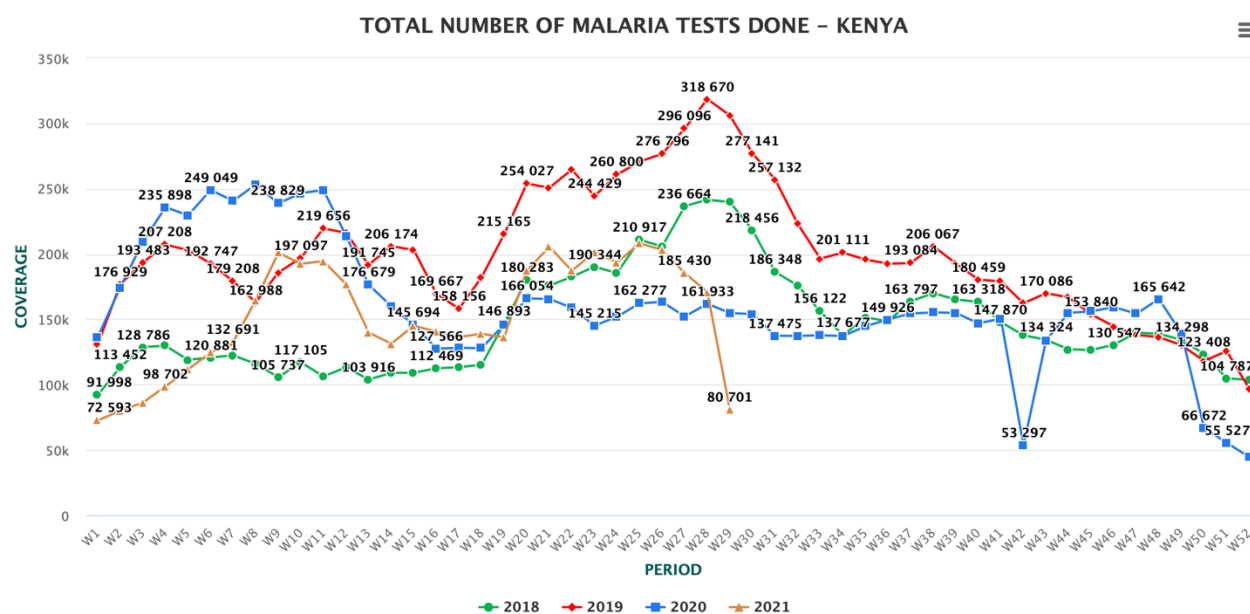


Figure 92 Number of malaria tests done between January 2018 and May 2021

Non communicable conditions

The trend in access to services for management of non-communicable disease, specifically, mental health, cervical screening and hypertension, showed that the access to screening services reduced during the earlier phase of the pandemic, but is gradually increasing. Hypertension cases remained relatively the same during the early phase of the pandemic. There is a decline in the numbers in the first quarter of 2021.(Figure 92)

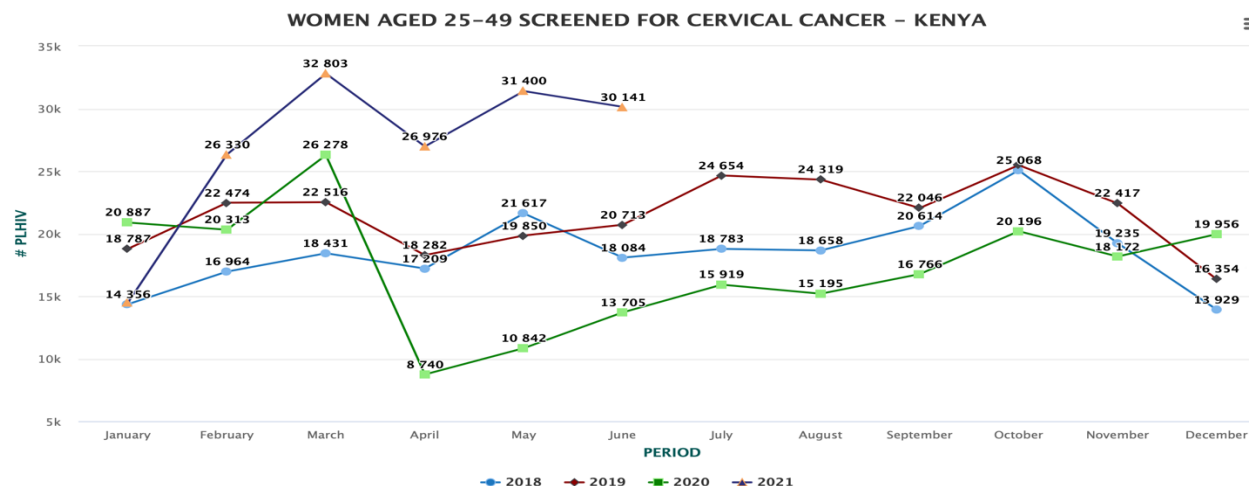


Figure 93 Number of women screened for cervical cancer Jan 2020-May 2021

Access to services relating to mental health conditions revealed that there has been increased access in the course of the pandemic. SGBV survivor numbers have also been on the rise during the pandemic.(Figure 94)

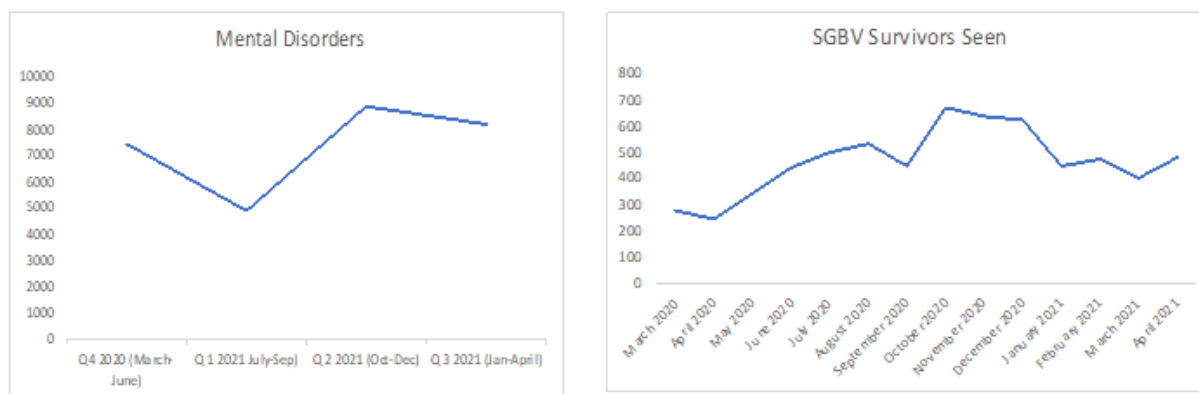


Figure 94 Number of people who sought mental health and Sexual and Gender Based services between March 2020 and April 2021

The most common reason given by the respondents on the reasons behind any increase in outpatient service utilization was the use of communications to promote care seeking. Those with a decrease in utilization, were mainly due to reduction in scope in the provision of specific services and limited availability of medical staff.

Conclusion

- There has been a general improvement in utilization of services during this assessment period as compared to the assessment done three months prior.

- Most facilities have strategies to ensure that essential services are maintained, and these strategies are being implemented to a large extent.
- Mental health conditions are still seen to be on the rise during the pandemic. Access to ARVs has also been on the rise during the pandemic.
- Access to outreach services is still a major challenge

Recommendations.

- Facilities should come up with strategies to improve the integrated outreach services.
- Strategies to improve access to NCD services should be put in place in more facilities.

Field experiences

- A question on health workers who had received their salaries on time indicated that most of the respondents had not received their salaries on time. This was notably an issue since as it would bring about better preparedness and motivation to the facilities to handle the pandemic. As a recommendation, since most of the cases with regards to this issue were found in public facilities it is best to separate it into public and nonpublic then when writing the report or disseminating findings, mention the specific counties that had not paid their workers on time. Also, on the trend analysis under HR there is the need to include trend analysis on salaries payment. Reported best practices include:
 - Nyeri County – delivery of medication to patients especially those with chronic illnesses once the patient orders.
 - At Pine Hospital – Nyandarua County – for patients with chronic diseases two methods are used to enable them to get their medication:
 - Drug dispensing innovation – for high-risk clients such as those with DM and HTN once they have finalized with the clinical visit, they sit at a specified place within the facility and the prescribed drugs are brought to them instead of them going to the pharmacy.
 - Top up of medication is delivered through the community health worker strategy.
- Moi Teaching & Referral Hospital – Uasin Gishu County:
 - Provide a home based kit that includes key items such as thermometers and record book, Jik to all those who are put under home based care management

for Covid-19. This has been costed and is provided as a package at a subsidized cost and hence one does not have to go looking for the various items in different places.

- Have a multi-disciplinary team for Covid-19 vaccine administration and management. For every 5th vaccinee, they are called as part of follow-up. There is a landline dedicated to enable the vaccinees report any side effects post vaccination.
- Ministry of Health was giving facilities fridges and these fridges have not worked since delivery. This makes it hard to get the correct response as well as ask the same question to the same facility during the next survey as the response will still be the same and may also cause frustrations to the respondent. As a recommendation some of these national issues need to be sorted out or an intervention made before the next survey is carried out

Survey Based experiences

- There is need to have a qualitative interview with the top management both at national level and county level which will in turn complement the quantitative interview on the ground.
- Routine data that can be mined from the KHIS should be mined from the KHIS and issues of service changes removed from the questionnaire.
- There's need for better alignment of drugs and diagnostics. It is also necessary to probe whether the drug is currently not available or has never been available
- The suggestion of interchanging between remote and physical data collection was raised to avoid fatigue and resistance from the respondents.
- Dissemination of findings to the relevant stakeholders is key for easier cooperation and ownership of results; This can be done by use of policy briefs and sharing of reports.
- Findings of the previous surveys can be pre-loaded into the data collection app to prompt probing of responses. An example is when asking questions about beds it is expected that the bed capacity should go up but just in case it goes down, a pop up should appear and this will make the interviewer question the reason and in turn help in writing the narratives if the reason is legit for instance the case of Mbagathi
- The issues of the doctors' strike in some counties earlier this year could have affected performance and quality of some responses.

Limitations of the survey

- It is based on self-reported findings which could lead to an over or under reporting. This was however minimized by the tools being sent beforehand to ensure that accurate data was captured.
- Some main County facilities like Embu County Referral, Muranga County Referral and Siaya County Referral did not participate. These are major treatment centers and as such may have led to an underestimation of the findings.
- Highly qualitative and quite subjective especially for some questions such as increase/decrease in services at health facilities.

Recommendations for the next survey

Various recommendations were made to ensure effective and smooth implementation of future assessments, some of which include;

- Harmonization and Updating of KHMFL
- Hosting a meeting with County Directors of Health for proper dissemination of information.
- Ideally, one questionnaire should be developed for each level of health facility.
- Questions concerning disposal of the PPEs, need to be separated to fit the level of the facility especially the section on incinerators
- There is a need to do adapt the survey to give strong County specific analysis.
- The next assessment needs to be a physical data collection process, to validate findings.
- In future assessments, conduct quantitative data collection to ascertain actual availability of oxygen in the health facilities to objectively determine status of oxygen therapy in the country.

Annexes

Annex 1 Availability Oxygen by County (ies)

County	Liquid or PSA oxygen generator plant	Piped O2 sent to bedside units
Baringo	0	100
Bomet	100	100
Bungoma	0	0
Busia	0	100
Elgeyo Marakwet	0	0
Embu	0	0
Garissa	0	100
Homa Bay	0	0
Isiolo	100	100
Kajiado	25	25
Kericho	100	100
Kiambu	67	75
Kirinyaga	0	0
Kisii	100	50
Kisumu	100	66.5
Kitui		0
Kwale	0	0
Laikipia	100	100
Lamu	0	0
Machakos	100	100
Makueni	100	100
Mandera	100	100
Marsabit	0	0
Meru	75	75
Mombasa	100	100
Muranga	0	0
Nairobi	83.5	83.5
Nakuru	0	100
Nandi	0	100
Narok	0	100
Nyamira	100	100
Nyandarua	0	100
Nyeri	50	50
Samburu	0	0
Siaya	0	50
Taita Taveta	50	50

Tana River	0	0
Tharaka Nithi	0	0
Trans Nzoia	50	50
Turkana		0
Vihiga	0	0
West Pokot	100	100

Annex 2 Availability and Functionality of Equipment by County (ies)

County	All functional	vent_ & Pulse oximeter all functional
All	91	36
Baringo County	100	0
Bomet County	100	0
Bungoma County	100	0
Busia County	100	0
Elgeyo Marakwet County	100	0
Embu County	100	0
Garissa County	100	50
Homa Bay County	0	0
Isiolo County	100	100
Kajiado County	100	25
Kericho County	100	100
Kiambu County	80	60
Kirinyaga County	100	100
Kisii County	100	0
Kisumu County	100	50
Kitui County	100	0
Kwale County	100	100
Laikipia County	100	0
Lamu County	100	0
Machakos County	100	50
Makueni County	100	0
Mandera County	100	0
Marsabit County	100	0
Meru County	100	33
Mombasa County	67	33
Muranga County	100	0
Nairobi County	86	57
Nakuru County	100	50
Nandi County	100	100
Narok County	100	0
Nyamira County	100	100

County	All functional	vent_ & Pulse oximeter all functional
Nyandarua County	100	100
Nyeri County	75	50
Samburu County	100	0
Siaya County	50	0
Taita Taveta County	100	50
Tana River County	100	0
Tharaka Nithi County	100	0
Trans Nzoia County	100	50
Turkana County	100	0
Vihiga County	100	0
West Pokot County	0	100