



Policy brief

Improving water and hand-washing services in rural health care facilities in Kitui County, Kenya

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Summary

This study draws upon a diagnostic survey of WASH in health care facilities in Kitui County, Kenya, in 2019, and a pilot intervention providing professional delivery of water and soap services to 11 rural dispensaries in 2020. Three objectives guide the work. First, to estimate the annualised cost of providing safe water and soap in dispensaries. Second, to understand how these costs vary by location. Third, to chart the relative difference in costs of water from piped water schemes and vended water.

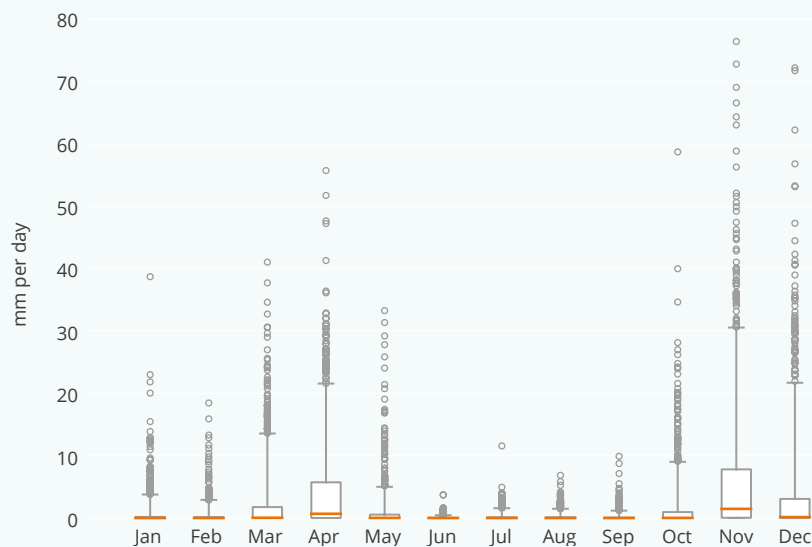
The results estimate an annualised cost of water and soap services of around USD 1 per health care facility visit. Costs vary by remoteness and are higher for dispensaries relying on vended water provision rather than piped water schemes. We propose that county government include these cost estimates in future budget and investment planning, support professional service delivery models, and exploit synergies to manage water services to schools and communities.

1. Introduction

Kenya has over 14,500 primary health care facilities¹ providing services for over 47 million people. Just over half of these facilities (52%) are publicly owned. Delivering health care services in rural areas is challenging due to low population density, lower relative incomes and educational attainment, and less frequent access to networked energy and water services. This study aims to understand the current status and future prospects of water and handwashing services in rural health care facilities in Kitui County.

Kitui County is one of 29 Kenyan counties located in arid and semi-arid lands (ASALs), where low and highly seasonal rainfall means that surface water and groundwater resources vary significantly by location and time of year. Rainfall shocks are common with uncertainty in the timing and extent of the wet (March-May and October-December) and dry seasons (Figure 1). Just over a million people live in Kitui county with the majority residing in rural areas depending on small-scale agriculture, livestock and remittances to get by.

Figure 1: a) Daily rainfall climatology in Kitui County b) Rainy season onset and cessation for 1981–2018 using the accumulation method of Liebmann et al. (2021); c) The distribution of short rains onset dates from 1981–2018. Produced from CHIRPS data, 1981–2018 by Ellen Dyer.



Public services such as education, health, water, and energy are variable and often of low quality. Provision of drinking water is a major challenge with two in five of Kitui's residents reporting drinking from rivers or surface water as their main water source in the 2019 census. Public facilities like schools and health care facilities often depend on rainwater harvesting, which is often insufficient in the long dry season, or share community water supplies, which fail regularly and are not repaired for many weeks or months. Water safety is also a critical issue with bacteriological contamination common in the wet season compounded by naturally elevated levels of salinity or fluoride in groundwater in many areas of the county.

¹ Health care facilities are hospitals, primary health care centres, isolation camps, burn patient units, feeding centres and others. The health care system in Kenya has six official levels – tertiary referral hospitals, secondary referral hospitals, primary care hospitals, health centres, dispensaries, and community services.

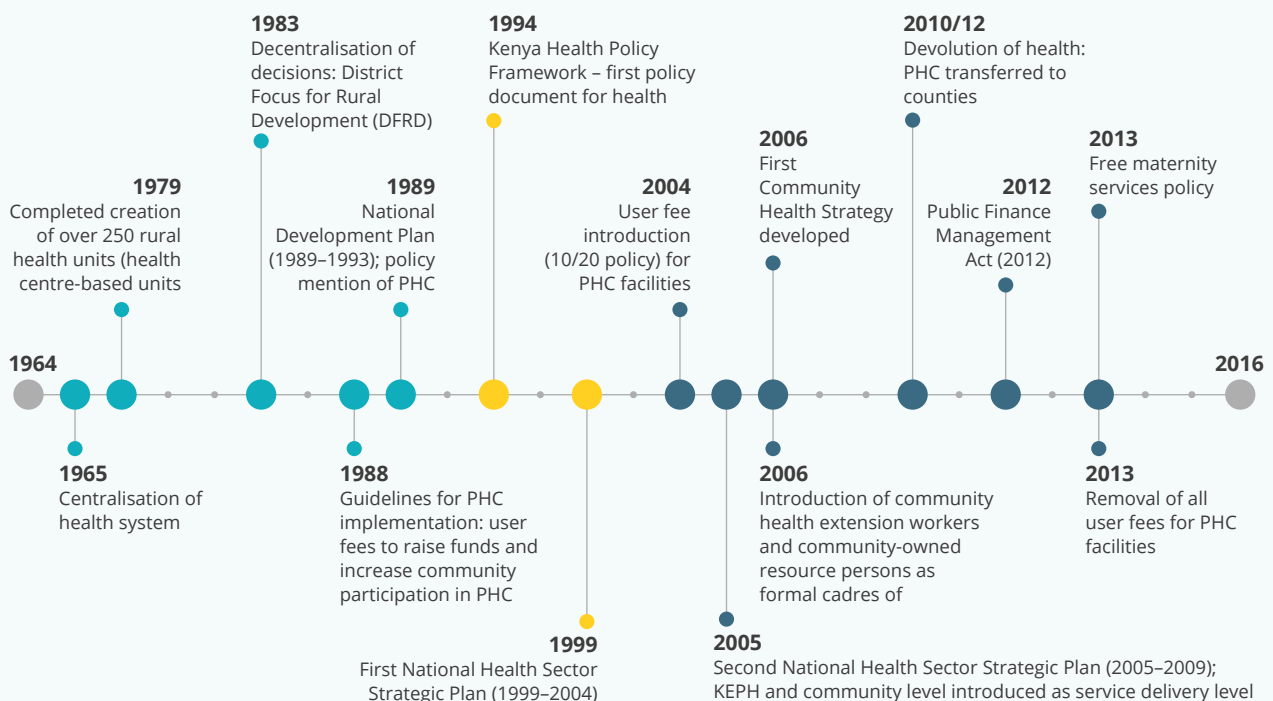
Since 2015, a professional maintenance service provider has operated in one of Kitui’s eight sub-counties offering results-based contract to ensure faults are fixed fast. The company, FundiFix Ltd, has reduced the time to repair piped system and handpump failures from over a month to two days or less for over 50,000 people in communities and schools. This study examines how such a professional service delivery model could be applied to health care facilities to deliver safe water and soap reliably.

The purpose of the report is threefold: first, to understand the status of water and hygiene services in health care facilities at the county level; second, to provide a costed analysis of delivering water and soap in a pilot study of 11 facilities in Mwingi North Sub County during 6 months of the COVID-19 crisis in 2020; and third, to consider the implications for scaling up the pilot to the county level.

1.1 Health policies and water inequalities in Kenya

Progress towards universal health care services in Kenya started in the late 1960s. Actionable strategies emerged in 1983 where the discourse on decentralization, multi-stakeholder collaboration, and community participation in the primary health care system gained traction (Figure 2). Kenya has a policy commitment to consolidate standards and regulations towards completion of the Kenya Water, Sanitation and Hygiene Guidelines and Standards in Health care Facilities by 2022 and to develop a WASH implementation plan and monitoring framework by 2023. Coordination between national and county level is required following devolution of health services to county governments who are responsible for universal public health care targets since 2013.

Figure 2: Development of Kenyan health care policy. Source: Primary health care systems (PRIMASYS).



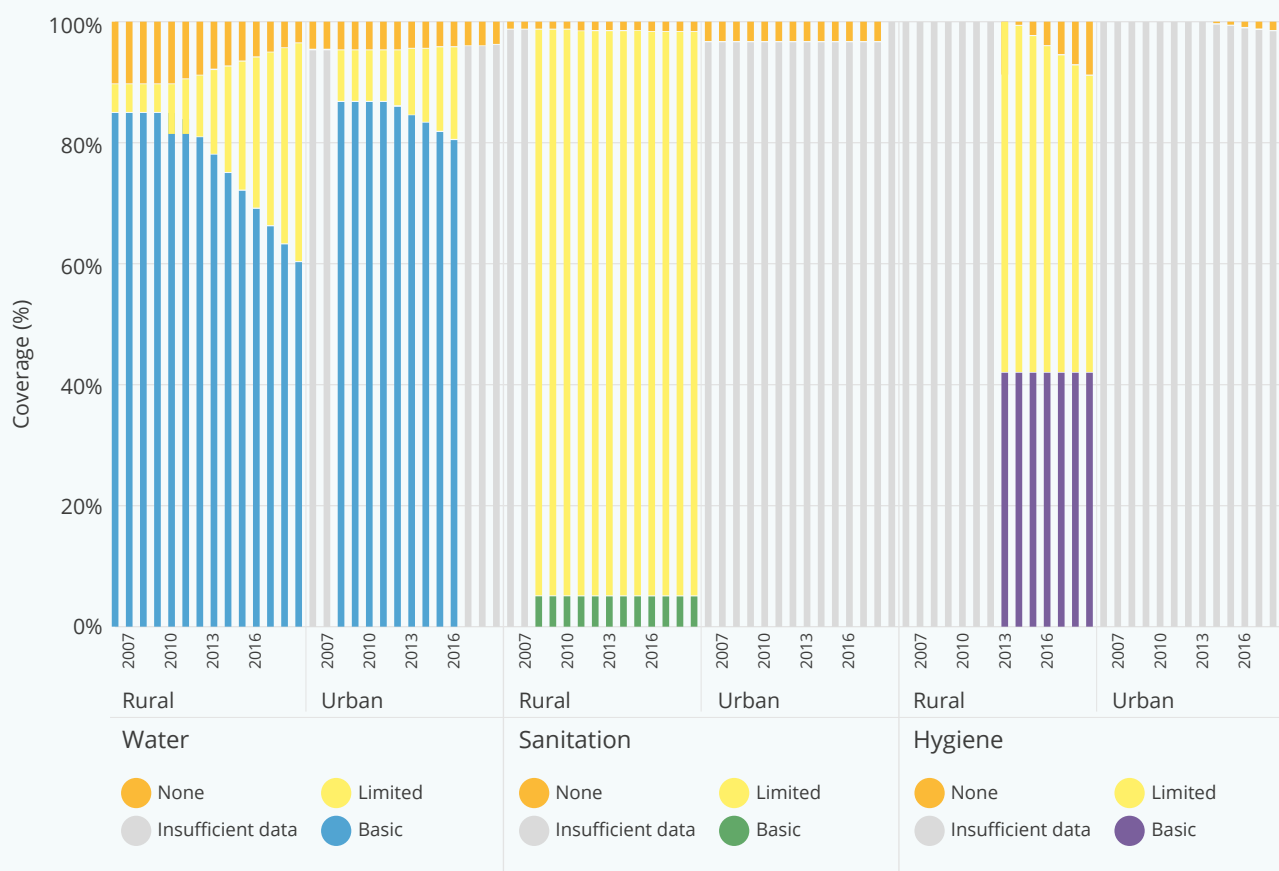
The Kenya Health Policy 2014 - 2030 references the right of every person to clean and safe water. However, water, sanitation, and hygiene (WASH) services are not yet included within health policy performance indicators. Monitoring of WASH in health care facilities has been supported by the Joint Monitoring Programme (JMP) of UNICEF and WHO. The JMP health care facility service ladders, presented below (Figure 3), provide a standard metric for global monitoring. These service ladders differ from metrics used for household services due to the exclusion of safely managed water. Here, the definition for basic service provision includes water that is on premises, available at the time of assessment, and from an improved source, which can include rainwater harvesting systems.

Figure 3: JMP service ladders for WASH in health care facilities. Source: WHO, 2020

	Water	Sanitation	Hygiene
Basic service	Water is available from an improved source on the premises	Improved sanitation facilities are usable, with at least one toilet dedicated for staff, at least one sex-separated toilet with menstrual hygiene facilities, and at least one toilet accessible for people with limited mobility	Functional hand hygiene facilities (with water and soap and / or alcohol-based hand rub) are available at points of care, and within five metres of toilets
Limited service	An improved water source is within 500 metres of the premises, but not all requirements for basic service are met	At least one improved sanitation facility is available, but not all requirements for basic service are met	Functional hand hygiene facilities are available either at points of care or toilets but not both
No service	Water is taken from unprotected dug wells or springs, or surface water sources; or an improved source that is more than 500 metres from the premises; or the facility has no water source	Toilet facilities are unimproved (e.g. pit latrines without a slab or platform, hanging latrines, bucket latrines) or there are no toilets or latrines at the facility	No functional hand hygiene facilities are available either at points of care or toilets

Kenya's performance against global benchmarks for rural health care facilities are presented using JMP data from 2006 to 2019 (Figure 4). Sanitation services remain limited in most rural health care facilities, and basic hygiene services are provided in just over 40%. Over the last decade, basic water access has fallen in rural facilities from a higher position relative to sanitation or hygiene services. There is no data for urban water service levels from 2017, and no data are available for urban sanitation or hygiene service levels for the whole period. Current national monitoring provides limited understanding of the daily or seasonal challenges faced by people seeking health services with implications for policy, planning and investment to determine sector requirements and performance.

Figure 4: JMP monitoring data on WASH in health care facilities in Kenya 2006 to 2019. JMP dashboard



2. Study design

The study draws upon a county-level diagnostic survey of health care facilities in 2019 and a pilot providing professional delivery of water and soap services to 11 dispensaries in 2020. Three main results emerge from the analysis. First, an estimate of the annualised cost of providing safe water and soap in dispensaries. Second, how this cost varies by location. Third, the difference in costs of water from piped water schemes and water vending.

2.1 Health care facility diagnostic survey

A diagnostic survey of water, sanitation and hygiene service levels in health care facilities was undertaken between 16 September and 15 October 2019. A team of 26 local, trained enumerators interviewed facility workers using the 'short' Joint Monitoring Programme (JMP) health care facility questions (WHO/UNICEF 2018), complemented by questions on WASH infrastructure and access.

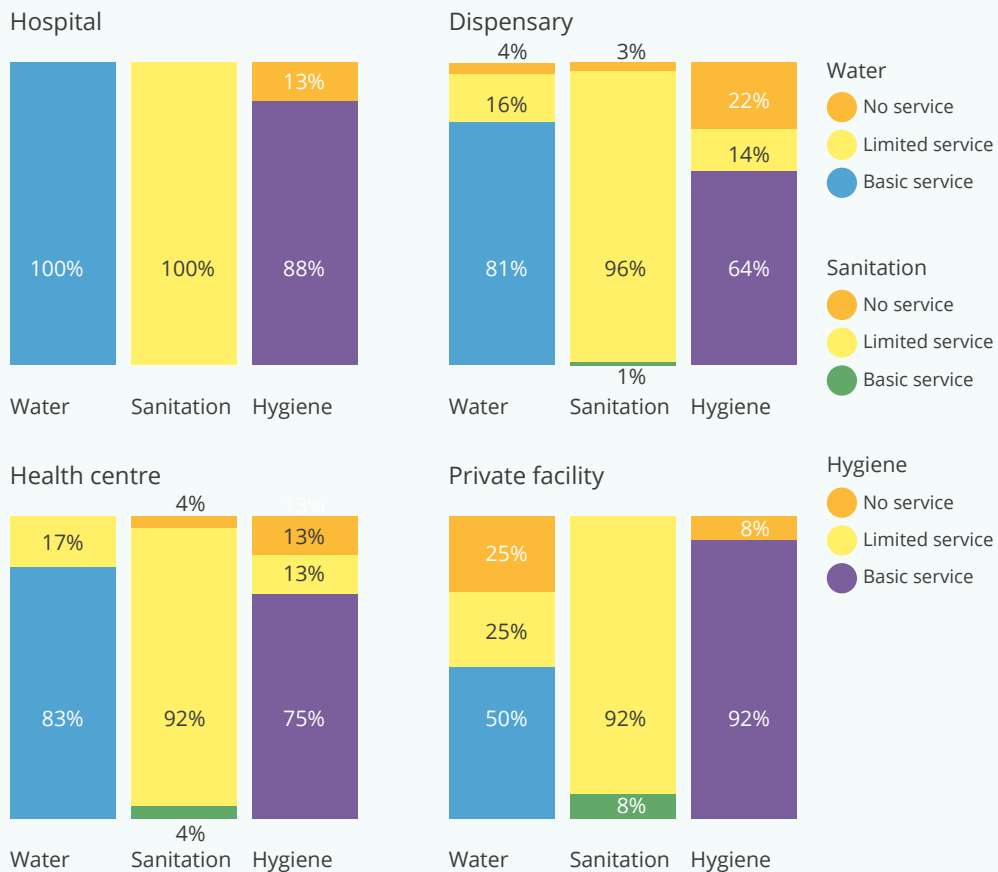
A total of 121 facilities were surveyed including 8 hospitals, 24 health centres, 77 dispensaries and 12 private health care facilities. The respondent chosen was the officer in charge of the facility and, if unavailable, his/her assigned deputy. The majority of respondents were nurses (>59%) and half were women.

Due to a combination of national industrial action, security issues, or declining to participate, the sample of facilities was partial (43% of total), including 36% of dispensaries, 43% of health centres and 57% of medium sized hospitals (sub county government and private).

Both urban and rural data are included in the analysis, as the typology of facilities in urban areas is typically larger county or sub county hospitals (n = 3) and private facilities (n = 2), with few (n = 2) urban dispensaries.

Results present a snapshot of service delivery illustrating trends across the four facility types (Figure 5). First, sanitation service level is low across all facilities, with no sub county or county level hospital achieving basic service provision. Second, basic hygiene services are lower in health centres and dispensaries, at 75% and 64% respectively. Third, water access is lowest in private facilities, with only 50% achieving basic service level.

Figure 5: WASH service levels in a sample of Kitui County health care facilities (n=121)



Additional survey findings are presented for dispensaries as they represent the most common facility and first point of service for the rural population of Kitui. While 80% of dispensaries had 'basic' water supply at the time of assessment, the presence of an improved source does not guarantee consistent service delivery. To illustrate this, of the 19 dispensaries that use piped systems as their 'basic' source of water, respondents at eight of these facilities were concerned with the reliability, availability, or sufficiency of their supply.

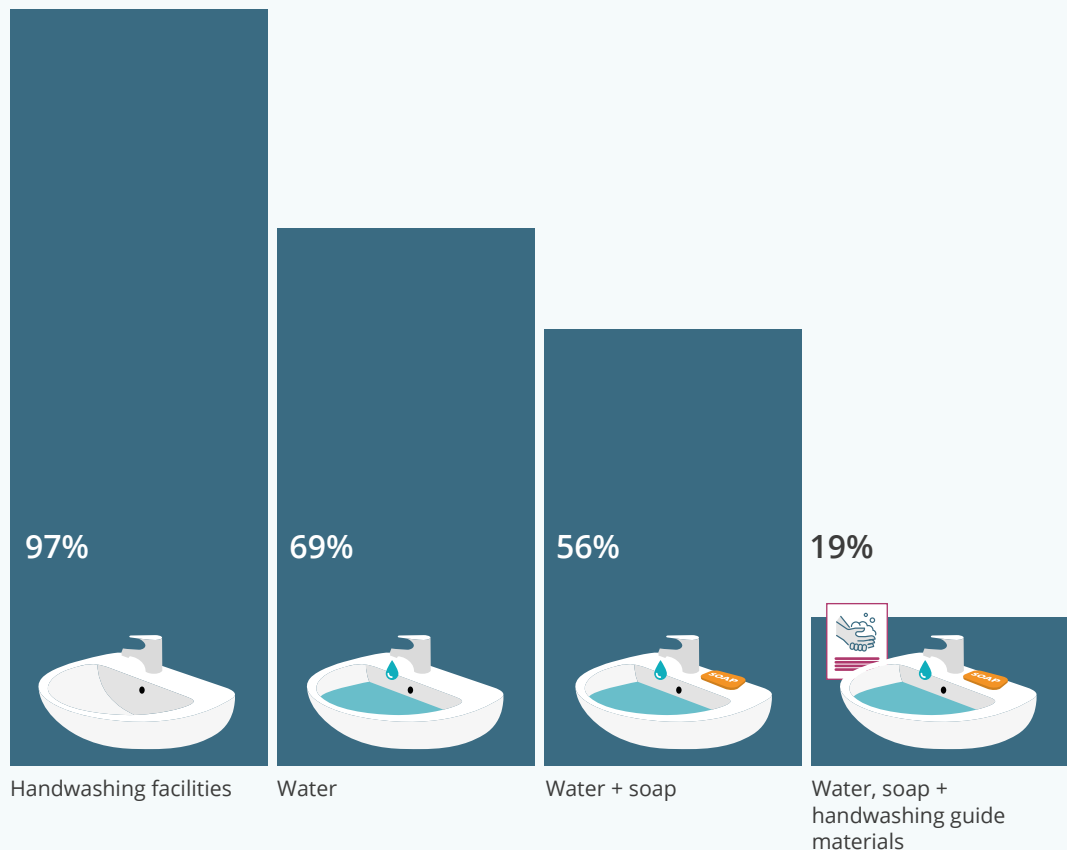
Of the 40 dispensaries that use rainwater harvesting as their primary water source, respondents at 35 facilities (88%) were concerned with supply sufficiency, reliability, safety, and availability, with only two facilities reporting being able to use their rainwater harvesting systems as a drinking water source in the dry season.

2.2 Facility water supply assessment in Mwingi North Sub County

Between 27th July and 29th August 2020, an assessment of selected water supply systems was conducted in Mwingi North, Kitui County. Thirty-two health care facilities were visited, including 23 dispensaries, seven health centres, and two sub county hospitals. Data were collected on the following: water storage, observed handwashing facilities, reported patient visits per month, and a technical assessment of rainwater harvesting systems by storage, guttering and general conditions.

Of the 32 facilities visited, all facilities except one had handwashing facilities on the premises. 22 facilities had water available at the time of visit, and 18 of these had soap also available. Just over half (56%) of facilities visited had both water and soap available at hygiene facilities. At facilities which did have both water and soap, 6 facilities had handwashing guide materials present (Figure 6). FundiFix distributed further guide materials to dispensaries with information on measures to prevent COVID-19, including a poster to promote social distancing at community water points.

Figure 6: Handwashing in health care facilities, Mwingi North Sub County (n=32)



2.3 Piloting a maintenance system in Mwingi North Sub County

With increased attention on promoting hand hygiene during the pandemic, county government and other local stakeholders approved a pilot project to make water and soap available for hand-washing at 12 selected facilities. The aim of the pilot, which took place between October 2020 and March 2021, was to rehabilitate, manage and cost water and hygiene service delivery to guide future policy and planning.

Eleven dispensaries and one county hospital were selected for the pilot reflecting a range of scales and locations as well as maximising the budget available. We exclude the county hospital in the following analysis to focus on cost projections relevant to sub county and county levels.

The location of the dispensaries is not random though is scattered across the sub county (see Figure 8). All pilot sites required rehabilitation work on gutters, replacement or provision of rainwater harvesting tanks, and some also received pipe work for connection into a local piped supplies, including community boreholes and the KIMWASCO piped network, which primarily serves Mwingi Town. Work was carried out by the professional maintenance service provider FundiFix Ltd. We report costs by:

- Regular maintenance costs: new/replacement parts and materials, staff, travel
- Water and soap services: liquid soap, vended or piped water with supporting staff and travel

Regular maintenance costs reflect both rehabilitation of many systems as well as the need to maintain systems in good working order. The water and soap services' costs include water supplies, including treatment, and soap. In both categories, staff, travel and direct management costs are included. This does not include indirect costs incurred due to depreciation or the management costs of the FundiFix company.

Cost data for the 11 dispensaries were analysed to estimate annual operation and maintenance costs (maintenance) and service delivery costs for water and soap (water and soap services). Costs were estimated for the year using estimated maintenance requirements, water supply modelling, and adjusted for rainfall variability. The adjustment for rainfall variability reflects existing regional rainfall analysis and operational analysis to derive a first-best estimate for planning.

Patient visit numbers were documented from facility records, which, when scaled up across the county, suggest that dispensaries receive around 2 million patient visits per year, or roughly two visits per person per year. Patient visit records and cost data were used to estimate an annualised cost of providing safe water and soap per patient visit for dispensaries in Kitui County.

We are aware of limitations to the findings of the study with implications for their wider applicability. First, the sampling process was neither universal nor random with constraints on the generalisability of the findings. Second, the pilot took place during the pandemic and reflects the seasonal distribution of rains in that particular period. Third, the connection of six facilities to a piped system does not mean water will be reliable or safe as a consequence. System failures are common with long lead times to repairs. Fourth, patient numbers reflect available data on the 11 facilities and may not be an accurate reflection of county demand. Demand may potentially change if people who are unwell in the future become aware of local facilities with safe water and soap, and choose to attend them instead.

Fifth, FundiFix Ltd is one of a new cohort of professional service providers in Africa guaranteeing services with results-based contracts. This is uncommon and replication would incur costs in the establishment of new providers or strengthening of existing operators in the county and country. Sixth, Kitui County has a progressive commitment to addressing water service inequalities based on strong leadership in the county water ministry and through partnership with FundiFix and the University of Oxford since 2012. Election cycles may reframe such partnerships and commitments.

3. Results

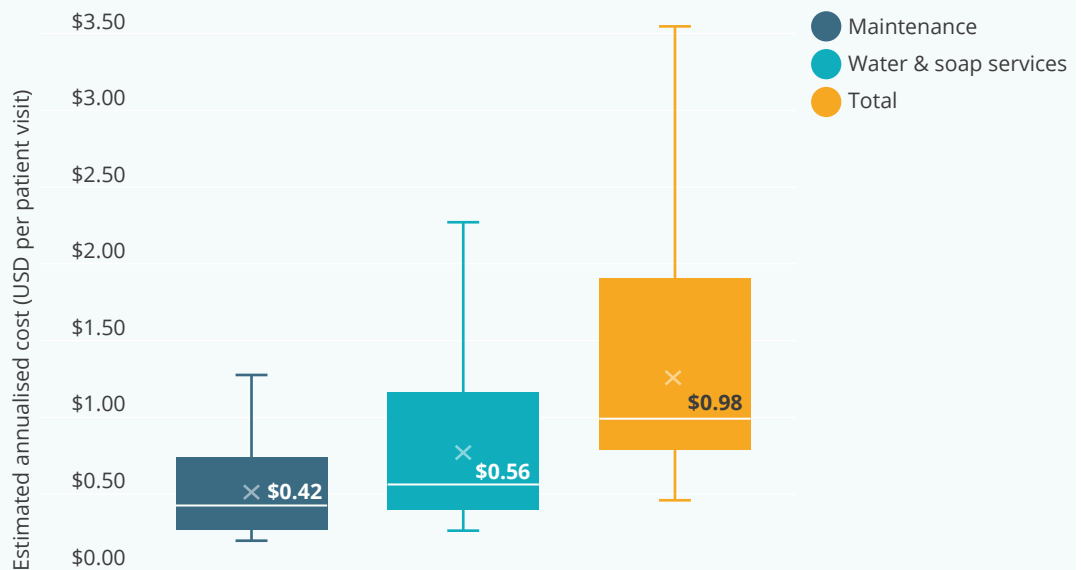
Three main results emerge from the analysis. First, an estimate of the annualised cost of providing safe water and soap in dispensaries. Second, how this cost varies by location. Third, the difference in costs of water from piped water schemes and water vending.

3.1 Annualised cost of safe water and soap provision

Charting the regular maintenance and service costs over a year produces an estimate for the overall cost per year of around one US dollar per patient visit (Figure 7). Service delivery costs represent the majority of the cost and vary more than regular maintenance. Service costs show a wider distribution which we discuss in terms of location and water source.

With caution, one may project costs to the county's rural population of just under one million people (86% of 1.1m people). Assuming an average of two visits to a dispensary per person per year, this equates to roughly USD 2 million (KSH 224 million) to supply water and soap to rural dispensaries. We note how the distribution costs may change based on remoteness and costs of supply.

Figure 7: Estimated annualised costs for safe water and soap delivery in health care facilities per patient visit, based on data from 11 dispensaries in Kitui County

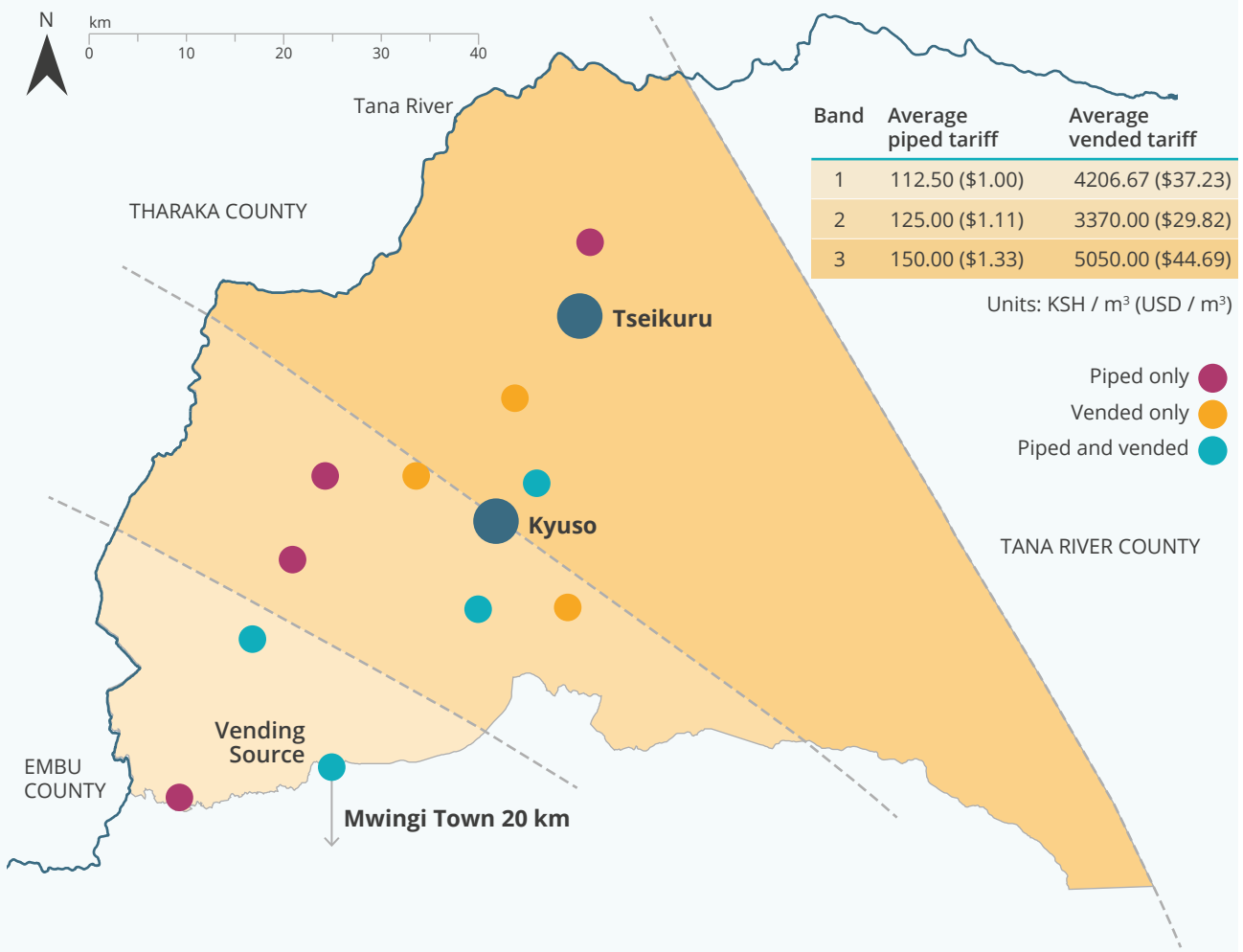


3.2 Cost variation by distance from main piped network

Three of the 11 dispensaries were connected to the KIMWASCO piped network; 5 to community or private boreholes, and three relied solely on vended water. All of the dispensaries connected to KIMWASCO's network and 1 relying on a community borehole also purchased vended water during the study period, suggesting intermittent breakdowns in piped supplies. We find a predictable variation in the cost of water supply as distance from the KIMWASCO network serving the more populated area of the county around Mwingi town and Kyuso increases (Figure 8). The average piped tariff increases by 33% from band 1 to band 3. In comparison, the vended water price increases by 20%. However, vended water costs range from 27 to 33 times more per unit of water than piped water. This explains the larger range in service costs.

Living in remote and semi-arid locations where piped water may be considered too costly to install and where population density falls, the relative costs of public health increases compounding existing inequalities for these residents. By understanding the relative costs and distributing these costs at the county level, the social impacts of droughts can be mitigated. Professional service delivery offers an approach to allocate risk effectively to guarantee water and soap services to improve health provision.

Figure 8: Mwingi North health care facilities pilot: Cost variation by location



3.3 Cost variation between piped and vended supplies

Vended water prices are in the range of 30 times higher than piped water tariffs. This is a crude estimate as it ignores the costs of capital investments in infrastructure, hidden subsidies for many piped systems, and variable availability of sufficient water of reasonable quality in remote areas. For example, the capital costs of infrastructure for a small piped water scheme are in the order of USD 100,000. As such, the argument between piped supply and vended supplies is more nuanced than simply considering the average cost of a litre of water from a piped or vended supply.

Water vending businesses are often considered to charge high prices though this impression may be based on partial understanding of the market. In the absence of alternative sources, water vendors are effectively the provider of last resort. With suppliers facing unpredictable market conditions, costs and risks are passed on to the customer through higher prices. This prompts thinking on how rural dispensaries may be part of a wider solution for safely-managed water in rural communities and schools. A fragmented approach treating water supply to dispensaries, schools and communities separately may exclude or ignore potential synergies and cost efficiencies. Professional service models may support county governments to address such opportunities now that responsibilities are devolved to the local level.

Conclusions

Three recommendations are proposed in conclusion. First, the cost of delivering water and soap services to rural dispensaries is relatively low though varies by location. Climate variability will affect cost profiles and limit the value of rainwater harvesting as a singular intervention in most contexts. County government can now estimate and make provision for safe water and soap services in health care facilities in future county budgets.

Second, the institutional arrangements to monitor and manage service delivery to health care facilities are inadequate with surveys providing limited information of value. The omission of water quality and water safety metrics is remarkable compounding health risks for the most vulnerable. County governments can promote professional service delivery models with accountable mandates and exclusive service contracts to deliver and monitor high-quality services.

Third, county government can explore synergies in professional service delivery to address related gaps in service delivery for schools and communities. Health care facilities and schools are often rural hubs. Children and people live close to and visit these locations regularly. Future policy and investments can consider how to deliver safe services at scale. County governments have inherited a fragmented and often incoherent legacy of infrastructure investments. Weak stakeholder coordination has led to many wasted investments. Kitui county recognises and is working to address these issues through regular stakeholder forums and policy reform. Other ASAL counties may contribute to wider coordination and planning given the social inequalities for the one in five Kenyans who live in these 29 counties.

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