## Family Planning Services in Kenya during a Transition: Utilization Trends across Counties

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## **ABBREVIATIONS**

FP	family planning
HMIS	health management information system(s)
KDHS	Kenya Demographic Health Survey(s)
MNH	maternal and newborn health
MOH	Ministry of Health

## **EXECUTIVE SUMMARY**

**Background:** Kenya reports one of the highest maternal and child mortality rates in the world. Family planning (FP), which is used both for limiting and spacing pregnancies, is a crucial element in increasing child survival and reducing maternal mortality. Recently, Kenya has been undergoing changes in its health system, transitioning from a centralized to a devolved system of health governance. Thus, county governments are facilitating health services, such as FP provision. We sought to understand the trends in FP utilization within the counties over this period of transition.

**Objectives:** The objectives of this study were to estimate the general prevalence of FP use among women of childbearing age and the prevalence of FP use by county; analyze the trends in FP utilization over the period of transition, from 2012 to 2015; and estimate the extent to which counties had integrated reporting of FP services in Kenya's national district health information system, known by the name of the software that runs it: DHIS 2.

**Method:** We extracted FP-related DHIS 2 data for the period January 2012 to October 2015. We analyzed FP utilization for each county for every year of the study period. We analyzed FP usage over the years for each county by applying a nonparametric test for trend based on the Kruskal Wallis Equality of Populations Test. We compared 2014 FP utilization as worked out by our analysis with 2014 FP utilization as reported in the 2014 Kenya Demographic and Health Survey (KDHS) report. We generated county choropleth maps based on 2014 FP utilization data. The significance level was maintained at the standard five percent.

**Findings:** During the four-year period of transition, we observed little change in FP utilization in most counties. We also observed significant disparity in FP utilization between counties in the Central and Western regions and those in the North Eastern and Coast regions. There was significant discrepancy between FP utilizations analyzed from DHIS 2 data and that reported in the KDHS 2014 report.

**Conclusion and Recommendations:** Data systems are still broken, and existing data are grossly inaccurate. Facility-level health management information systems (HMIS) that interact directly with the DHIS 2 would enhance data accuracy. Overall FP utilization is dismal, and great intercounty disparities exist that call for an affirmative action in counties that are least-served.

## INTRODUCTION

One mother dies in Kenya for every 250 successful deliveries, and one newborn dies for every 37 who are born. These deaths are a result of poor access to antenatal, obstetric, and postnatal care (Kenya National Bureau of Statistics [KNBS] & ICF Macro, 2014). Dismal statistics in pregnancy outcomes are compounded by poor access to reproductive health services and a consequently limited ability to plan pregnancies. A woman's ability to space and limit her pregnancies has a direct impact on her health and well-being as well as on the outcome of each pregnancy. FP is crucial in supporting child survival and reducing maternal mortality. Improved maternal and newborn health (MNH) is closely related to a community's social and economic empowerment, which in turn is promoted by enhanced access to quality FP services. The importance of FP in any strategy for safe motherhood and child survival is therefore not in question (Eltomy, Saboula, & Hussein, 2013).

Over the past five years, Kenya has been undergoing a change in governance of the public health sector, devolving most functions from the central Ministry of Health (MOH) to the control of the 47 counties newly created administrative units that are intended to disperse political governance. Guided by the Kenya Health Policy 2012–2030, county governments are now mandated to coordinate and manage the delivery of healthcare services at the county level; provision of FP services are one such responsibility. However, not much data exist to guide policy and implementation strategies within the counties. Data would facilitate an understanding of FP needs and guide supply, distribution, and awareness strategies. This is particularly important during the transition period, when data systems are being realigned and the level at which healthcare decisions are being made is changing.

Kenya adopted DHIS 2, which aggregates health data from registered health facilities all over the country to a national web-based portal. The DHIS 2 data go through a number of stages to reach the national level. FP clients typically have a card onto which the details of the visit, the contraceptive provided, and the date of the next visit are recorded. These source data are summarized in the MOH 512 FP register books, which are then summarized on a monthly basis in the MOH 711 Facility Integrated Form for transmission to the subcounty records officers and finally to the country and national levels. Indices are reported using differing methods. Many rely on mobile-based electronic platforms, and more recently, data aggregated at the subcounty level are fed directly into the national DHIS 2 portal. At the University of Nairobi data warehouse, where support for the system is provided, the data are filtered by type to reduce errors, and the filtering process excludes a large number of erroneous entries. A duty clinician, usually a nurse, oversees data collection. This clinician usually runs an FP clinic and provides other primary healthcare functions for which she or he is required not only to record primary data but also to aggregate and transmit it onward. This reporting constitutes a potentially important source of data errors and fabrication when clinicians are pressed to meet deadlines or access services tied to "timely reporting of data."

With the assumption that the data are mostly complete and accurate, the DHIS 2 provides a portal from which aggregate county data can be retrieved and synthesized. Using FP data from Kenya's DHIS 2, we investigated the implications of devolution on utilization of FP services across Kenya's counties.

## **METHODS**

#### **Objectives**

The main objectives of this study were:

- Estimate the general prevalence of FP use among women of childbearing age and the prevalence of FP use by county
- Analyze the trends in FP commodity utilization over the period of transition, 2012 to 2015
- Estimate the extent to which counties have integrated reporting of FP services in Kenya's national DHIS 2 system

#### Setting

As of the 2009 census, Kenya's population was 38.6 million, with approximately 9.3 million women of reproductive age (between the ages of 15 and 49 years) (KNBS, 2010). With a projected growth rate of 2.8 percent by 2014, the population was likely about 44.9 million, with 11 million women of reproductive age. The 2009 and 2014 KDHS estimate contraceptive use at 46 percent and 58 percent, respectively (KNBS & ICF Macro, 2014). Kenya has 47 counties. Each county is responsible for managing its population's health service, including provision of FP services, and each receives a proportion of the national budget to finance these services.

#### Population

We sought to investigate FP utilization by all women of reproductive age. We excluded data on condom utilization because of the difficulty in determining the number actually used of the quantity supplied, and the difficulty of determining complete compliance with the recommended method of use. We considered data on oral, injectable, barrier, and long-term and sterilization contraception methods.

#### **Study Duration**

We extracted DHIS 2 data for the period January 2012 to October 2015. This period includes the transition year of 2013, when a new government came into place with a structure that accommodated the devolved system of governance.

#### Data Analysis

Data for analysis were extracted from routine FP supply and utilization data reported to the DHIS 2 platform and hosted on <u>https://hiskenya.org</u>. The DHIS 2 platform hosts aggregated data on routine health statistics as reported from health facilities across the country. Data are normally aggregated in accordance with the county of origin. FP supply and utilization data were extracted from facility contraceptive request and consumption forms and the MOH 711 Facility Integrated Form

(http://fptoolkit.or.ke/download/public\_private\_partnership/M2%20-%20MOH%20711A%20Facility%20i ntegrated%20Form.pdf) respectively. Population data for women of reproductive age were extracted from the DHIS 2 population data. These data are extrapolated from the most recent Kenya Census National (2009) data, taking into account the national population growth rate. FP and population data were extracted by county of origin in a comma-separated variable format, cleaned, and merged into a single Stata<sup>TM</sup> data file for analysis.

In analyzing FP utilization, we made a number of assumptions. The number of return visits for oral contraceptive users over a one-year period was reduced by a factor of 12. This reflects individual use requiring a monthly supply of oral contraception, therefore making 12 return visits assuming complete compliance. The number of return visits for injectable contraception users was reduced by a factor of four to capture individual use requiring a quarterly supply of contraception. These clients would make four return visits in a year, assuming complete compliance.

We analyzed FP utilization for each county. FP use was expressed as a percentage of the number of women of reproductive age every year. In examining individual county coverage, we color-coded area plots of FP utilization with green, indicating observed gross improvement of FP utilization over time, and red, indicating no gross improvement. We compared the 2014 FP utilization determined by our analysis with 2014 FP utilization as reported in the 2014 KDHS report. We analyzed FP usage over the years for each county by applying a nonparametric test for trend based on the Kruskal Wallis Equality of Populations Test to determine differences in FP utilization rates across the years. We extracted STATA map files from Kenya County geospatial vector data shapefiles and created county choropleth maps of 2014 FP utilization data. We maintained the significance level at the standard five percent.

### RESULTS

We examined DHIS 2 data from registered facilities in the 47 counties of Kenya from January 2012 to October 2015. Data completeness from the counties remained the same over the years: 86 percent in 2012, 84 percent in 2013, 85 percent in 2014, and 84 percent in 2015. Data from the northern counties were the least complete, with Mandera County consistently registering the least complete FP data across the years (on average, 57 percent complete). Nairobi, the capital county, had the most complete data for each year that we examined (98 percent).

Only 22 counties registered significant improvements in FP utilization between 2012 and 2015; FP utilization for the rest either deteriorated or remained about the same (Figure 1). Overall, the proportion of women of reproductive age using FP in the country, as reported in the DHIS 2, improved from 13.8 percent in 2012 to 15 percent in 2015. Modern FP method utilization reported in KDHS 2014 was greater than that reported in the DHIS 2 by an average factor of 4.4 (Table 1). However, the two data sets showed the same trends in FP utilization for a number of counties, with counties in the north registering low utilization and those in the central part of the country showing better utilization (Figures 2 & 3).

Based on 2014 DHIS 2 data, 11 counties had FP utilization of less than 10 percent. All of these (Mandera, Wajir, Garissa, Marsabit, Turkana, West Pokot, Tana River, Samburu, Baringo, Kwale, and Isiolo), mostly northern counties, also had the lowest FP utilization as reported in the KDHS 2014 report. Nyamira, Kisumu, Taita Taveta, Nyeri, Siaya, and Nairobi counties had the best FP utilization according to the DHIS 2, the highest being Nyamira at 25 percent. None of these counties reported the best FP utilization in the KDHS 2014. Kirinyaga, Meru, Kiambu, Machakos, Tharak Nithi, and Embu were reported to have the best FP utilization in the KDHS, with Kirinyaga being the highest at 75.6 percent.

Most FP users considered injectable FP their method of choice: it accounted for 54 percent of FP utilization, as recorded in DHIS 2. About the same rate of utilization was observed in KDHS data, with injectables employed by 51 percent of FP users. Owing to their popularity, injectable FP methods had the best predicted overall FP utilization (Figure 4). Only 0.25 percent of the women took up female sterilization in 2014, as reported in DHIS 2 (2.8 percent on KDHS 2014). About 4.4 percent considered long-term methods of FP. The North Eastern counties were the least likely to take up female sterilization or any long-term FP method. Male sterilization was the least-utilized method of FP, with an average use of 0.01 percent, according to DHIS 2 data. Only one county reported on male sterilization in the KDHS 2014 report.



#### Figure 1. Trends in FP utilization across the counties

12 FP Utilization Trends across Counties in Kenya



FP Utilization Trends across Counties in Kenya 13



14 FP Utilization Trends across Counties in Kenya



FP Utilization Trends across Counties in Kenya 15





Figure 3. FP coverage, comparing DHIS 2 and KDHS county data



#### Figure 4. FP method utilization: 2014 DHIS 2 data

Figure 4A demonstrates overall FP utilization across the counties tracked alongside oral and injectable FP utilization. Figure 4B shows long-acting reversible contraceptives and sterilization methods across the counties.



#### A. 2014 DHIS data: FP utilization

#### B. 2014 DHIS data: long-term FP and sterilization



#### Table 1. County FP utilization data

County	2012	2013	2014	2015	KDHS 2014
Nyamira	18.55	21.57	24.69	27.02	64.20
Kisumu	20.57	16.89	23.42	21.69	59.30
Taita Taveta	26.36	26.15	22.53	22.54	61.30
Nyeri	18.14	10.03	20.81	17.50	67.10
Siaya	14.76	16.26	19.61	20.16	51.00
Nairobi	21.71	23.72	18.97	14.98	58.30
Mombasa	15.77	14.71	18.94	15.73	43.60
Tharaka Nithi	13.09	14.96	18.38	18.74	67.20
Nandi	11.08	10.33	18.22	18.06	59.20
Embu	27.31	26.00	17.86	16.63	67.20
Kakamega	12.47	13.85	17.66	18.93	60.30
Machakos	15.90	16.48	17.64	17.33	67.50
Makueni	50.47	37.42	17.46	24.54	65.00
Kilifi	18.36	18.85	17.40	18.45	32.80
Migori	11.69	12.35	16.80	21.26	43.90
Bungoma	12.18	12.34	16.61	17.31	53.90
Kirinyaga	14.32	12.72	16.27	16.00	75.60
Kericho	11.23	12.49	15.99	13.79	56.90
Murang'a	14.85	12.46	15.90	16.52	63.40
Nyandarua	30.57	14.75	15.85	17.42	60.40
Kisii	18.44	17.97	15.66	13.66	62.80
Kiambu	20.21	13.65	15.54	16.57	67.80
Kajiado	10.46	11.51	15.52	14.11	45.20
Laikipia	21.61	18.24	15.20	17.64	51.30
Lamu	16.47	16.67	14.99	16.17	39.50
Busia	14.26	11.59	14.93	16.07	56.50
Nakuru	11.55	12.78	14.91	16.72	53.50
Vihiga	9.17	9.78	14.85	18.11	56.60
Uasin Gishu	8.23	10.47	14.25	14.28	56.00
Meru	12.16	13.30	13.61	14.49	73.20
Homa Bay	13.98	12.12	13.61	14.42	45.50
Kitui	23.06	23.04	13.37	19.75	55.10
Elgeyo-					
Marakwet	8.07	10.06	12.66	15.03	43.60
Trans-Nzoia	12.78	10.34	11.04	11.58	56.40
Narok	5.72	6.40	10.65	6.99	38.10
Bomet	7.12	7.76	10.51	13.30	50.40
Isiolo	11.00	10.33	9.62	11.95	26.30
Kwale	10.44	10.79	8.84	15.43	38.20
Baringo	5.79	6.42	8.24	9.75	33.10
Samburu	8.34	5.28	6.62	8.06	20.00
Tana River	4.83	5.57	5.75	7.50	20.50
West Pokot	2.59	2.65	4.41	5.14	13.30
Turkana	2.38	2.82	2.77	2.23	10.10
Marsabit	2.92	3.63	2.74	4.16	11.70
Garissa	2.09	2.23	2.31	2.42	5.50
Wajir	1.73	1.32	0.95	0.89	2.30
Mandera	0.88	0.20	0.24	0.42	10.90
Average	13.80	13.13	14.63	15.00	47.27

## DISCUSSION

In reviewing Kenyan DHIS 2 data recorded between January 2012 and October 2015, we observed little change in FP utilization over time across most counties. We also observed significant disparities in FP utilization between counties in the Central and Western regions and those in the North Eastern and Coast regions. There were significant discrepancies between FP utilization data reported in the DHIS 2 and KDHS 2014 report.

Counties in the northern part of the country are inhabited mostly by conservative Muslim communities. The regions have remained economically marginalized, education levels are low, gender inequality is high, and FP uptake has been traditionally low. Recently, they have also experienced the greatest population growth, perhaps in congruence with limited FP use, but also because of immigration. MNH indicators in these counties are depressing, showcasing the inter-relationship between FP utilization and MNH. Indeed, Mandera, considered one of the worst places in the world for a mother to have a baby, also has the lowest FP uptake of all counties.

There is no particular pattern in geographic location for counties with the highest FP utilization. This could be a function of reporting rather than actual utilization. KDHS data suggest higher FP utilization in Central counties compared to other counties. This pattern is not apparent when analyzing the DHIS 2 data, which do not seem to show any significant pattern. There is a significant discrepancy in FP utilization between KDHS and DHIS 2 data among counties with the highest FP utilization. Counties with the highest FP utilization according to KDHS data are in the central part of the country and have relatively good MNH and FP indicators that rival those observed in developed countries. These observations are congruent with economic status, educational levels, and MNH indicators for these counties. However, the relationship between those factors and population growth is difficult to determine, because factors such as food security, cultural practices, and economic stability confuse expected trends.

The observed discrepancy between KDHS and DHIS 2 data may be partially accounted for by the fact that DHIS 2 represents data both from public and private registered medical facilities, and KDHS is derived from community data. A significant proportion of the country's population accesses healthcare from informal and nonregistered facilities, including drugstores and grocery shops, which are not required to report at all. Not all facilities that should be reporting to the HMIS do, and sometimes data that is reported is incomplete and even falsified. Thus, data on FP utilization derived from DHIS 2 are unreliable, and likely significant underestimations. Conversely, the KDHS takes into account a small population sample and may be subject to selection and recall bias. Furthermore, the two data sources apply different denominators; KDHS calculates FP utilization as a proportion of married women of reproductive age, and the DHIS 2 analysis includes all women of reproductive age regardless of their marital status—based on the assumption that all women of reproductive age are sexually active and have an equal need for contraception. Furthermore, population data are extrapolations of census data, which are affected by fertility and migration trends, particularly in urban settings.

## **CONCLUSION AND RECOMMENDATIONS**

We surmise that there is need to adjust the denominator used in estimating DHIS FP prevalence. We recommend adjusting the denominator downwards for long-term contraceptives, because women who receive these types of contraception will not represent a population in need. We also recommend adjusting for need, such as being sexually active without bias against those who are not married or not in long-term relationships.

If the working denominator is well-defined, the DHIS 2 should provide more accurate and representative data than the KDHS data, especially considering account access issues and that approximately half of the health services are supplied by the private sector. However, a quick sampling of data points shows that data are subject to many human errors, including obvious falsification. Often source documents are difficult to locate, raising questions about the authenticity of the data. Because data collection is a function primarily relegated to a health worker who has several other tasks and responsibilities, it lends itself to data errors and fabrication. Regular verification/validation of the data collection and aggregation process would be time-consuming, elaborate, and resource-intensive.

A number of county governments have implemented HMIS with a mix of functionality, but many fall short of covering the entire spectrum of health system data. In addition, the HMIS are not able to export data directly to the DHIS 2. Thus, data systems are still broken, and the data that are currently being collected are of questionable value. Facility-level HMIS that interface directly with the DHIS 2 would minimize the human factor and potential for error in entering data and enhancing data validity. These limitations notwithstanding, it is apparent that there are great intercounty disparities that call for an affirmative action in counties that are least-served.

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