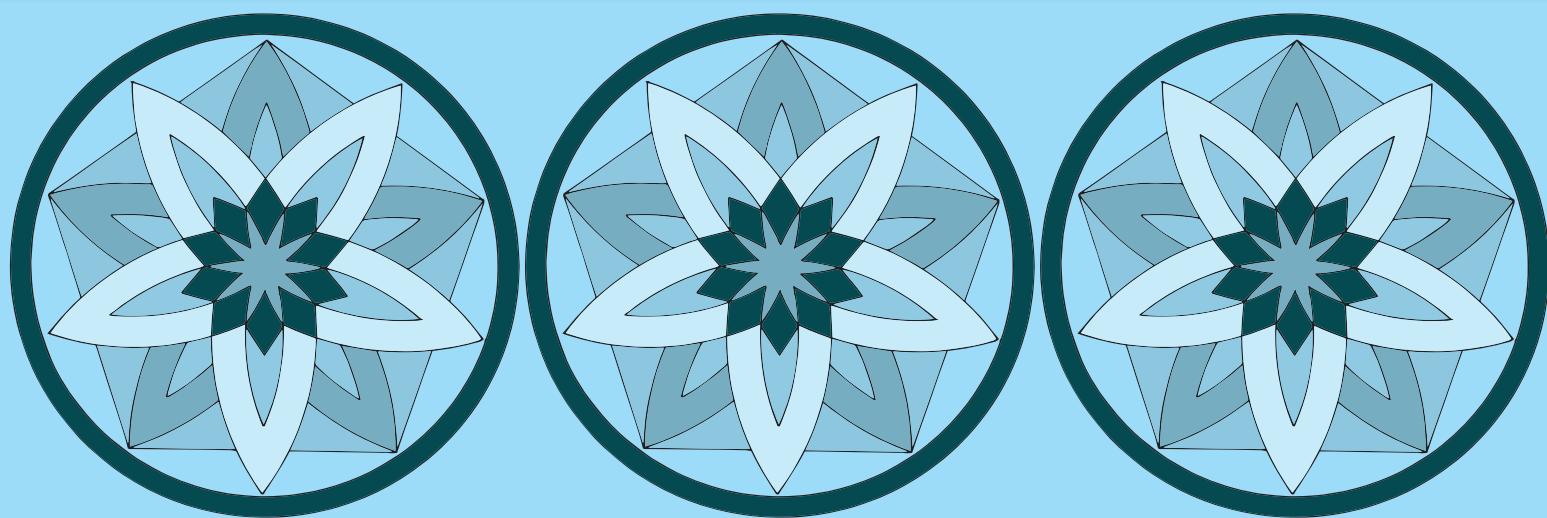


# Maternal Health Indicators in High-Priority Counties of Kenya

Levels and Inequities



DHS Further Analysis Reports No. 110





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Maternal Health Indicators in High-Priority Counties of Kenya: Levels and Inequities

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Additional information about the 2014 KDHS may be obtained from the Kenya National Bureau of Statistics (KNBS), P.O. Box 30266-00100 GPO, Nairobi, Kenya; telephone (Nairobi): 3317586/8, 3317612/22, 3317623, 3317651; fax: 3315977; e-mail: [directorgeneral@knbs.or.ke](mailto:directorgeneral@knbs.or.ke), [info@knbs.or.ke](mailto:info@knbs.or.ke); website: [www.knbs.or.ke](http://www.knbs.or.ke).

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## ABSTRACT

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The 2014 Kenya Demographic and Health Survey is the first national survey to provide data at the county level. This study uses these data to examine regional variation and socio-demographic inequities in maternal health indicators in 10 counties designated by USAID as high-priority areas for improvements in maternal health. Using data from 3,574 women with a birth in the past five years in high-priority counties, this study analyzes the prevalence and distributional patterns of fertility risk, distance to health facilities, antenatal care, delivery in a health facility, and postnatal care.

This study shows large variations in maternal health indicators across high-priority counties in Kenya. Nairobi exceeds the national average on all maternal health indicators in this study, while other high-priority counties consistently are disadvantaged compared with Kenya as a whole in most maternal health indicators. Kisumu exceeds the national average in use of antenatal care, delivery in a health facility, and postnatal care, but not other indicators. Nakuru has fewer women with fertility risk and fewer women who report that the distance they must travel to reach a health facility is a problem. Samburu and Baringo also have better than average use of antenatal care and postnatal care, respectively.

This study identifies a number of inequities in maternal health indicators across socio-demographic characteristics in the high-priority counties—most in the distribution of delivery care and least in antenatal care. Inequities are also observed in fertility risk and postnatal care. The most common disparities at the county level are by women’s education, wealth, and urban-rural residence. Turkana shows fewer disparities in maternal health indicators compared with Kilifi, Kisumu, and Kitui.



# 1 BACKGROUND

---

## 1.1 Introduction

In 2010 Kenya adopted a new constitution, which decentralized the governance structure and service provision, with the establishment of 47 new counties as semi-autonomous governance units. Health care service delivery devolved to the counties. With devolution it was expected that county governments would design innovative interventions in line with contextual realities and community health needs. The national government retained responsibility for health policy, provision of technical assistance to the counties, and the management of national referral health facilities (Republic of Kenya 2010).

The Kenya Health Policy 2012-2030 advocates for equitable provision of health care, and policy objective 4 provides for provision of health services in an equitable manner. County health services are arranged around three pillars, namely community, primary care, and referral services. The overall aim is to ensure equitable allocation of government resources to reduce disparities in health status across the country (Ministry of Health 2012a).

Adequate maternal health care is considered essential to reduce maternal and child mortality. Global maternal mortality is estimated at 289,000 deaths that occur during pregnancy and delivery. Providing proper maternal and delivery care at health facilities could prevent 1.3 million neonatal deaths, 531,000 still births, and 113,000 maternal deaths. The recently launched global Sustainable Development Goals (SDGs) aim to reduce maternal mortality worldwide to under 70 maternal deaths per 100,000 live births over the period 2016-2030 (UN General Assembly 2015). At the global level, maternal mortality has dropped by 44% since 1990 (UNICEF 2017). In sub-Saharan Africa, however, the burden of maternal mortality is more pronounced. More than half of the global maternal deaths are in sub-Saharan Africa. The African Union has also called for increased coverage in intervention programs to improve survival of women and children (African Union 2013).

Other notable global initiatives include the USAID maternal health vision for action, which aims to address the problems of inequity and poor coverage of maternal health programs. In Kenya, USAID has designated 10 counties or regional units as priority areas for action in maternal health: Baringo, Kakamega, Kilifi, Kisumu, Kitui, Migori, Nakuru, Samburu, Turkana, and the informal settlements of Nairobi. These counties are distributed across Kenya and vary significantly in their cultural norms, access to health care, coverage of health care programs, poverty levels, and education.

The USAID program has set key national level targets for select maternal and child health (MCH) indicators among partner countries; these targets aim to increase coverage by 2020, as follows: four or more antenatal care visits, 65%; use of skilled birth attendants, 60%; facility delivery, 60%; and postnatal care within two days of delivery, 55% (USAID 2014). According to the most recent Demographic and Health Survey (DHS) in Kenya, these key maternal health indicators are close to these goals at the national level (KNBS et al. 2015), though continued progress is needed in postnatal care and especially antenatal care. The national indicators, however, potentially mask regional disparities and variation by socioeconomic and demographic characteristics.

Kenya has a number of policies that support maternal health and provide strategic direction, including the Constitution of Kenya, Vision 2030, the poverty reduction strategy, the Kenya health policy (2012-2030) (Ministry of Health 2012a), the National Health Sector Strategic Plan, the Kenya Health Sector Strategic and Investment Plan 2012-2018 (Ministry of Health 2012b), and the Kenya Reproductive,

Maternal, Newborn, Child and Adolescent Health (RMNCAH) Investment Framework (Ministry of Health 2016), among others.

Good-quality data are essential to identify health care coverage and to focus efforts to improve coverage. Sub-Saharan Africa is the region with the poorest indicators compared with the rest of the world (Deaton and Tortora 2015). The 2014 Kenya Demographic and Health Survey (KDHS) is the sixth DHS survey in Kenya, and also the first national survey to provide data at the county level, in line with the country's devolution of health service delivery to the counties. This study exploits these data at the county level to explore regional patterns in maternal health indicators across counties and their equitable distribution within counties and across socio-demographic characteristics for 10 high-priority counties in Kenya.

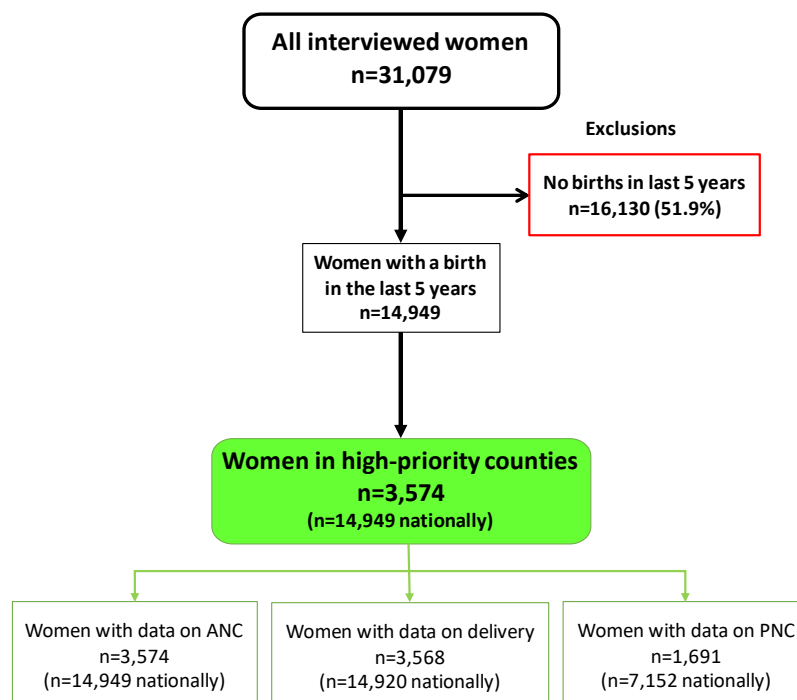
## 2 METHODS

### 2.1 Data

This study uses data from the KDHS survey conducted in 2014. The survey uses a standardized questionnaire, based on a multistage cluster sampling design to acquire data that are not only nationally representative but also representative of urban-rural areas, at the regional level, and, of particular relevance for this study, at the county level. More specific information on the sampling design is available in the 2014 KDHS final report (KNBS et al. 2015).

The respondents for this study were women age 15-49 with a live birth in the five years preceding the survey in the MCH high-priority counties (Figure 1). The 2014 KDHS consists of two subsamples. In one of every two households, eligible women were administered the full questionnaire. In the other half, eligible women were administered the short questionnaire—a subset of questions from the full questionnaire designed to produce indicators representative not only at the national, regional, and urban-rural levels but also at the county level (KNBS et al. 2015). While questions on antenatal and delivery care are included in both the full and short questionnaires, and therefore available for the full sample, questions on postnatal care and distance to a health facility are included only in the full questionnaire, and therefore available only for about half of all women interviewed. For most indicators, this results in a sample size of 3,574 women in the 10 high-priority counties (19,949 nationally).

Figure 1 Sample selection flow diagram



### 2.2 Variables

#### 2.2.1 Maternal health indicators

The main maternal health indicators describe antenatal, delivery, and postnatal care. We also examine fertility risk and whether distance to a health facility poses a problem to seeking care. We examine

fertility risk and distance to a health facility on their own and as they relate to antenatal, delivery, and postnatal care indicators.

Table 1 presents the definition of each maternal health indicator and the corresponding population base and the weighted sample size. Postnatal care is based on data from women with live births who had a child within the last three years, as opposed to the last five years for the other variables.

**Table 1. Definitions of maternal health indicators**

<b>Indicator</b>	<b>Definition</b>	<b>Population base</b>
Antenatal care (ANC)	Percentage of women with four or more ANC visits with the first ANC visit occurring within the first three months for their most recent pregnancy	Most recent birth among women age 15-49 with a live birth in the five years preceding the survey
Components of ANC services	Percentage of women who received eight ANC services (weight taken, given information on breastfeeding, given information on iron tablets/syrup/iron-folic, blood pressure taken, urine sample taken, blood sample taken, told about pregnancy complications, given or bought iron tablet/syrup)	Most recent birth among women age 15-49 with a live birth in the five years preceding the survey (subsample administered the long questionnaire)
Facility delivery	Percentage of women who delivered their most recent birth in a health facility	Most recent birth among women age 15-49 with a live birth in the five years preceding the survey
Assistance at birth	Percentage of women who were assisted by a skilled birth attendant (SBA) at their most recent birth	Most recent birth among women age 15-49 with a live birth in the five years preceding the survey
Postnatal care (PNC) for the mother	Percentage of women who received PNC check-up within 48 hours of delivering their most recent birth	Most recent birth among women age 15-49 with a live birth in the five years preceding the survey (subsample administered the long questionnaire)
Fertility risk	Composite measure of births that meet any of the following criteria; birth to women under age 18, birth to women age 35 or older, birth interval less than 24 months, most recent birth was fourth or greater.	Most recent birth among women age 15-49 with a live birth in the five years preceding the survey
Distance to health facility	Percent of women who respond yes to the following question: “When you are sick and want to get medical advice or treatment, is the following a big problem or not: The distance to the health facility?”	Most recent birth among women age 15-49 with a live birth in the five years preceding the survey (subsample administered the long questionnaire)

### 2.2.2 Socio-demographic characteristics

We examine the maternal health indicators shown in Table 1 across a range of socio-demographic characteristics (maternal age at birth, parity, education, wealth, residence, and religion), and by 10 counties in Kenya.

Maternal age at birth is computed in complete years of age and then categorized as younger than age 20, age 20-29, and age 30-49. Parity is the number of births inclusive of the index pregnancy and is categorized as primiparous (one birth), two or three births, or four or more births. Women are categorized as having completed no education or only primary education versus secondary or higher education. Relative household wealth is based on a set of assets owned by the household (Rutstein 2008; Rutstein and Johnson 2004) and is categorized in terciles. Residence is defined as either rural or urban, according to the categorization of the enumeration area in the Fifth National Sample Survey and Evaluation Programme (NASSEP V), which is the master sampling frame used by the 2014 KDHS (KNBS et al. 2015). The religious categories are Catholic, Protestant, or other.



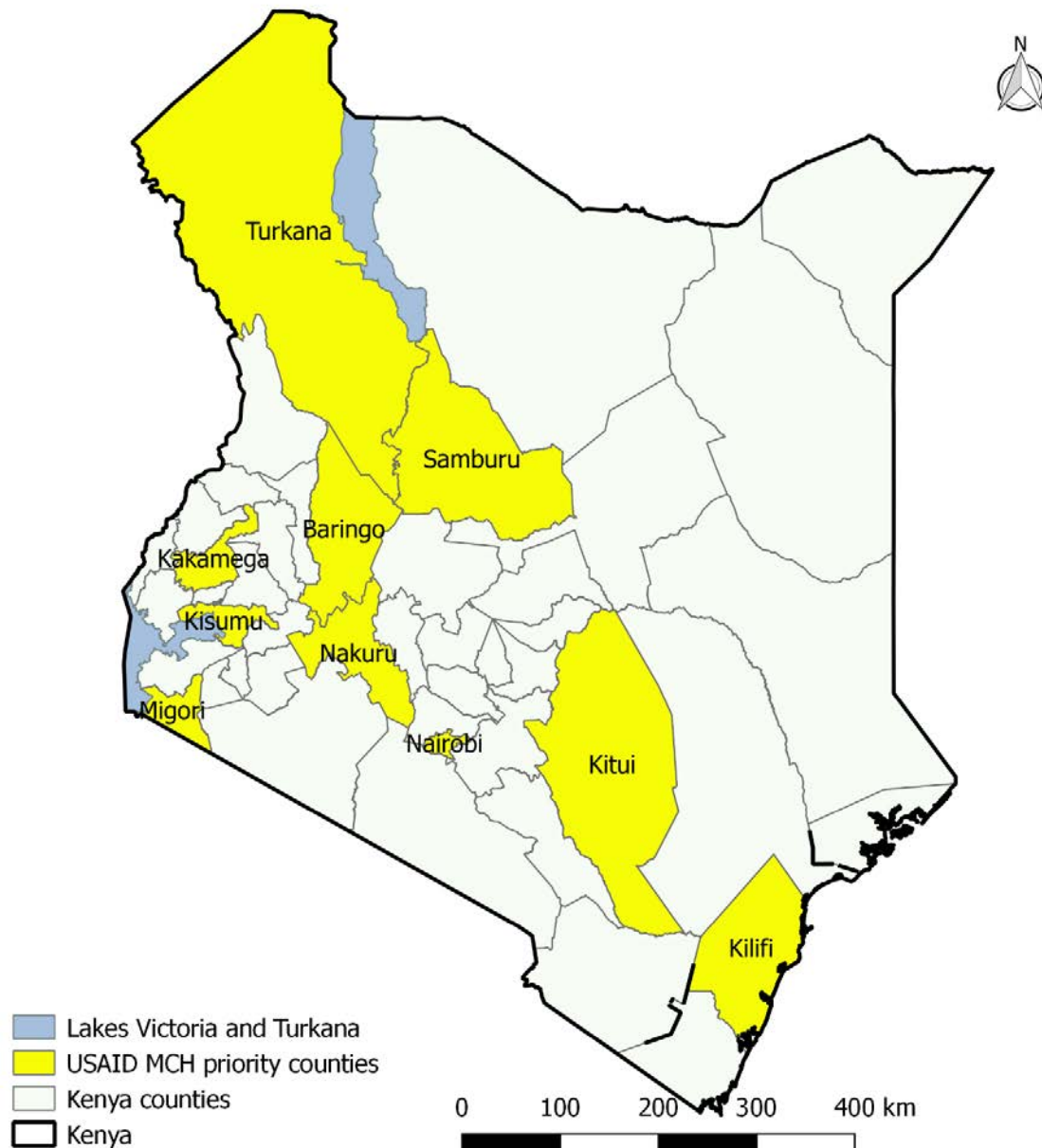
## 2.3 Analytical Strategy

The purpose of this study is to examine regional and socio-demographic disparities in maternal health indicators in counties designated as high-priority areas by USAID. The 10 USAID MCH high-priority counties examined in the analysis are Baringo, Kakamega, Kilifi, Kisumu, Kitui, Migori, Nairobi informal settlements, Nakuru, Samburu, and Turkana (Figure 2). Nairobi is an entirely urban county. Within its urban boundaries are a number of informal settlements marked by slum-like living conditions. All women in Nairobi are included in this analysis because the KDHS 2014 does not distinguish inhabitants of informal settlements versus other areas of Nairobi.

The analysis presented in this report facilitates comparison of maternal health indicators among these priority counties and between priority counties and the national average. Within each high-priority county, analysis allows comparison of maternal health indicators across socio-demographic characteristics. Chi-square tests of independence indicate whether statistically significant associations exist between county or socio-demographic characteristics and maternal health indicators.

We use the weights provided in the women's standard recode datafile to account for sampling probability and non-response. We use the `svy set` command in Stata to adjust for the complex sampling design used in the 2014 KDHS (KNBS et al. 2015). All statistical testing is performed at the 95% significance level.

Figure 2 USAID MCH priority counties



## 2.4 Study Limitations

This study has several limitations. First, the full questionnaire was administered to women in half of the surveyed households, while the short questionnaire was administered in the other half of households. The full questionnaire was designed to produce indicators representative at the national, regional, and urban-rural levels. The short questionnaire—a subset of questions from the full questionnaire—was designed to produce indicators representative not only at these levels but also at the county level (KNBS et al. 2015). Questions on components of ANC services, postnatal care, and distance to a health facility were included only in the full questionnaire. The reduced sample size for these indicators may not be sufficiently large in some counties, particularly when disaggregated by socio-demographic characteristics, to produce reliable estimates that are fully representative of the county. We group certain

characteristics into coarser categories to mitigate this limitation, for example, using only two categories of education and using wealth terciles rather than quintiles.

Second, our variable for Nairobi does not align well with USAID's target population for this area, which is Nairobi informal settlements. The KDHS could not distinguish between residents of informal settlements areas versus other areas. That our Nairobi sample is predominantly women in middle and richer terciles emphasizes that the sample is not well representative of the target population. Our results are likely to overestimate positive maternal health indicators (such as service use) and underestimate negative ones (such as fertility risk) for this selective population, reducing the usefulness of our findings for this purpose (see, e.g., APHRC 2014).

Third, because Nairobi is entirely urban and disproportionately non-poor, this restricts our ability to assess inequities by residence and, to a lesser extent, wealth in Nairobi. This limitation does not affect any other county.

Finally, this study makes use of unique county-level data. Although the survey design intended to produce representative county-level estimates, it is possible that the sample size may not be large enough in some counties to yield reliable estimates when we further disaggregate data in some socio-demographic characteristics. While we can be confident that inequities exist in counties where statistical tests so indicate, this limits our ability to definitively declare that inequalities do not exist where statistical tests are not significant. That is to say, we likely underestimate the true number of inequalities in certain counties.



## 3 RESULTS

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### 3.1 Sample Characteristics

#### 3.1.1 Socio-demographic characteristics

Table 2 presents select socio-demographic characteristics among women age 15-49 in the 10 high-priority counties and compared with national averages. To best understand any inequities within and across the 10 select counties, we present the 10 counties pooled as all high-priority counties (N=3,574), and as all high-priority counties excluding Nairobi (N=3,146<sup>1</sup>). Details of the distribution of socio-demographic characteristics within these counties are presented in Appendix Table 1.

The findings indicate that the high-priority counties are similar to the national averages with regard to the distribution of age and religion. The majority of women are Protestant, followed by Catholic and other. Women were mostly age 20-29 at recent birth. When excluding Nairobi, the distribution of residence is also similar: nearly 7 in every 10 women live in rural areas.

With Nairobi excluded, the level of inequality in priority counties is more evident compared with the national average. Women in high-priority counties are generally of higher parity, less educated, and poorer than their counterparts nationally.

The sample size of the high-priority counties varies. Nairobi accounts for about one-third of our sample. Nakuru, Kakamega, and Kilifi also contribute substantially to the study sample, while Samburu and Baringo contribute disproportionately fewer cases.

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<sup>1</sup> While USAID prioritizes informal settlement areas, in this study, Nairobi includes both slum dwellers and non-slum dwellers.

**Table 2 Sample profile: Socio-demographic characteristics of women with a birth in the last 5 years, 10 high-priority counties in Kenya**

	High-priority counties (n=3,574)			High-priority counties, excluding Nairobi (n=3,146)			National Average (n=14,949)		
	%	95% CI	weighted n	%	95% CI	weighted n	%	95% CI	weighted n
<b>Age of respondent at birth</b>									
<20	19.1	(17.1-21.3)	692	19.4	(17.5-21.4)	611	18.2	(17.3-19.2)	2,664
20-29	53.3	(50.6-56.0)	1,805	48.9	(46.6-51.2)	1,546	51.9	(50.6-53.1)	7,573
30-49	27.6	(25.5-29.8)	1,077	31.7	(29.7-33.8)	989	29.9	(28.8-31.0)	4,712
<b>Parity</b>									
1 child	26.8	(24.0-29.8)	765	20.1	(18.4-22.0)	596	25.0	(23.8-26.2)	3,235
2-3 children	40.9	(38.2-43.7)	1,339	37.0	(34.8-39.3)	1,132	40.3	(39.1-41.5)	5,694
4+ children	32.3	(29.8-34.9)	1,470	42.9	(40.4-45.4)	1,418	34.7	(33.5-35.9)	6,020
<b>Education</b>									
None or primary	60.7	(57.0-64.2)	2,574	72.1	(69.4-74.6)	2,405	64.2	(62.7-65.8)	10,633
Secondary or higher	39.3	(35.8-43.0)	1,000	27.9	(25.4-30.6)	741	35.8	(34.2-37.3)	4,316
<b>Household wealth tercile</b>									
Poorer	27.5	(24.5-30.7)	1,572	41.6	(37.9-45.4)	1,571	29.9	(28.4-31.5)	6,062
Middle	22.7	(20.2-25.4)	880	29.8	(26.9-32.8)	839	30.7	(29.3-32.1)	4,469
Richer	49.8	(46.1-53.5)	1,122	28.7	(25.3-32.2)	736	39.4	(37.7-41.2)	4,418
<b>Residence</b>									
Urban	55.0	(51.9-58.1)	1,468	31.8	(29.3-34.5)	1,040	30.5	(29.1-32.0)	4,736
Rural	45.0	(41.9-48.1)	2,106	68.2	(65.5-70.7)	2,106	69.5	(68.0-70.9)	9,785
<b>Religion</b>									
Catholic	18.4	(16.4-20.5)	777	16.5	(14.3-19.0)	683	19.0	(17.9-20.1)	2,873
Protestant	73.6	(71.0-76.0)	2,450	73.5	(70.8-76.1)	2,139	71.3	(70.0-72.6)	9,474
Other	8.1	(6.5-10.0)	345	10.0	(8.2-12.1)	322	9.7	(8.8-10.7)	2,576
<b>County</b>									
Baringo	3.3	(2.6-4.1)	294	5.0	(4.0-6.1)	294			
Kakamega	10.9	(9.8-12.2)	360	16.6	(15.0-18.3)	360			
Kilifi	10.3	(8.5-12.5)	386	15.7	(13.0-18.7)	386			
Kisumu	7.8	(6.6-9.1)	329	11.7	(10.1-13.6)	329			
Kitui	6.4	(5.4-7.6)	305	9.7	(8.3-11.4)	305			
Migori	7.4	(6.5-8.5)	431	11.2	(9.8-12.8)	431			
Nairobi	34.0	(30.5-37.7)	428						
Nakuru	13.8	(12.2-15.6)	346	21.0	(18.7-23.5)	346			
Samburu	1.6	(1.3-2.0)	374	2.5	(2.0-3.0)	374			
Turkana	4.4	(2.8-6.8)	321	6.7	(4.3-10.1)	321			

### 3.1.2 Maternal health characteristics

We also analyze maternal health care seeking characteristics by pooled counties including and excluding Nairobi County. As Table 3 shows, results are roughly similar for all 10 high-priority counties compared with the national average. However, disparities emerge when Nairobi is excluded. Excluding Nairobi, high-priority counties have a higher proportion of women with high fertility risk (56% compared with 48%) and a higher proportion of women who say that distance to the health facility poses a big problem to seeking care when sick compared with the national average (33% versus 26%). Women in high-priority counties are as likely as women nationally to fail to receive the recommended number, timing, and services at ANC visits. Only about 18% have four ANC visits with one visit in the first three months and about 15% receive all eight components of ANC services. However, women in high-priority counties (excluding Nairobi) are less likely to deliver in a health facility and to receive postnatal care compared with the national average. The national average for facility delivery is 66%, but is 58% in the high-priority counties. Finally, the national average for check-up within 48 hours of delivery is 55% compared with 42% in high-priority counties. The subsequent sections of this study describe differentials in each of these maternal health indicators across high-priority counties and, within counties, across women's socio-demographic characteristics.

**Table 3 Sample profile: Maternal health indicators among women age 15-49 with a birth in the last 5 years, 10 high-priority counties in Kenya**

	High-priority counties (n=3,574)			High-priority counties, excluding Nairobi (n=3,146)			National average (n=14,949)		
	%	95% CI	weighted n	%	95% CI	weighted n	%	95% CI	weighted n
<b>Fertility risk [1]</b>									
No risk	54.7	(51.9-57.6)	1,640	43.6	(41.2-46.0)	1,317	52.4	(51.1-53.7)	7,056
High risk	45.3	(42.4-48.1)	1,934	56.4	(54.0-58.8)	1,829	47.6	(46.3-48.9)	7,893
<b>Reported distance to health facility to be problematic [2]</b>									
No	75	(71.6-78.0)	1,120	66.9	(63.0-70.6)	939	74.2	(72.5-75.8)	5,032
Yes	25	(22.0-28.4)	571	33.1	(29.4-37.0)	552	25.8	(24.2-27.5)	2,141
<b>All ANC: 4+ visits and visit within first 3 months</b>									
No	79	(76.9-81.0)	2,924	82.4	(80.4-84.3)	2,613	81.9	(80.9-82.8)	12,603
Yes	21	(19.0-23.1)	650	17.6	(15.7-19.6)	533	18.1	(17.2-19.1)	2,346
<b>Received 8 ANC services</b>									
No	82.7	(81.1-84.2)	3,054	84.8	(83.1-86.3)	2,720	84.4	(83.5-85.2)	12,865
Yes	17.3	(15.8-18.9)	520	15.2	(13.7-16.9)	426	15.6	(14.8-16.5)	2,084
<b>Place of delivery</b>									
Other	30.9	(28.4-33.4)	1,538	41.9	(39.0-44.8)	1,496	33.9	(32.6-35.3)	6,172
Health Facility	69.1	(66.6-71.6)	2,030	58.1	(55.2-61.0)	1,644	66.1	(64.7-67.4)	8,748
<b>Assistance at birth</b>									
Skilled	69.4	(66.8-71.9)	2,055	58.3	(55.3-61.2)	1,666	66.6	(65.2-67.9)	8,891
Other	30.6	(28.1-33.2)	1,519	41.7	(38.8-44.7)	1,480	33.4	(32.1-34.8)	6,058
<b>Respondent's checkup within 48 hours [2]</b>									
No	48.3	(44.6-52.0)	909	58.3	(54.8-61.7)	856	45.1	(43.3-46.9)	3,498
Yes	51.7	(48.0-55.4)	774	41.7	(38.3-45.2)	628	54.9	(53.1-56.7)	3,654

[1] Fertility risk is defined as meeting one of the following criteria: younger than age 18 at time of birth, age 35 or older at time of birth, birth interval <24 months, or four or more births.

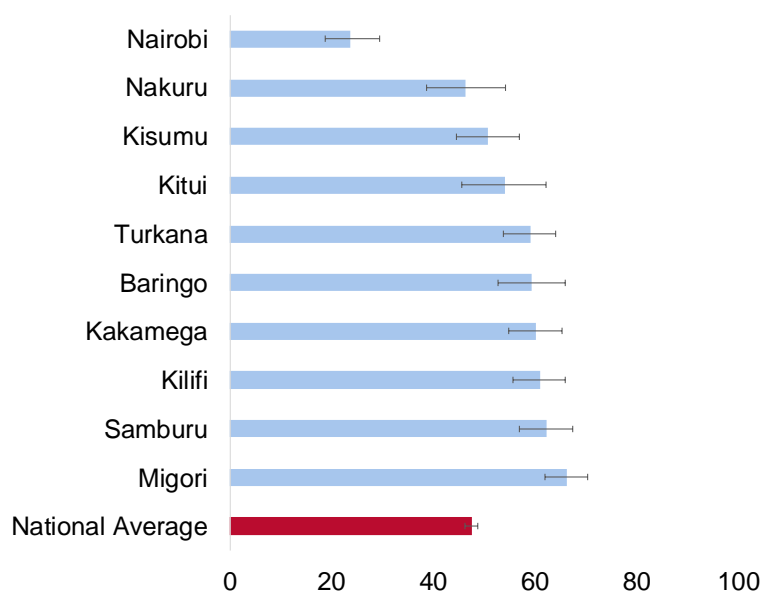
[2] Answered by a subsample who completed long questionnaire

## 3.2 Fertility Risk

### 3.2.1 Fertility risk by county

As Figure 3 shows, the magnitude of fertility risk varies substantially among counties, and the results of a chi-square test of independence shows this variation to be statistically significant ( $p \leq 0.001$ ). In only two counties, Nairobi and Nakuru, do a smaller proportion of women have high fertility risk than the national average of 48%. In the other eight study counties, the majority of women were designated as at high fertility risk for their most recent birth. The proportion of women with high fertility risk ranges from 24% in Nairobi to 66% in Migori.

**Figure 3 Fertility risk by county**



Note: Fertility risk is defined as meeting one of the following criteria: younger than age 18 at time of birth, age 35 or older at time of birth, birth interval <24 months, or four or more births.

### 3.2.2 Fertility risk within counties by socio-demographic characteristics

Figure 4 presents the within-county distribution of fertility risk across maternal age at birth, parity, education, household wealth tercile, and residence. Confidence intervals for all point estimates and the results of statistical tests of association can be found in Appendix Table 2. There was no significant variation in maternal health indicators, including fertility risk, by religious affiliation (Appendix Table 2).

Disparities in fertility risk based on maternal age at birth<sup>2</sup> and education are statistically significant in all 10 counties. The widest disparities are evident in Turkana and Samburu (about 60 percentage points). Even where disparities are narrowest, in Nairobi and Kakamega, there is a difference of about 40 percentage points among age groups. This is similar to the national average.

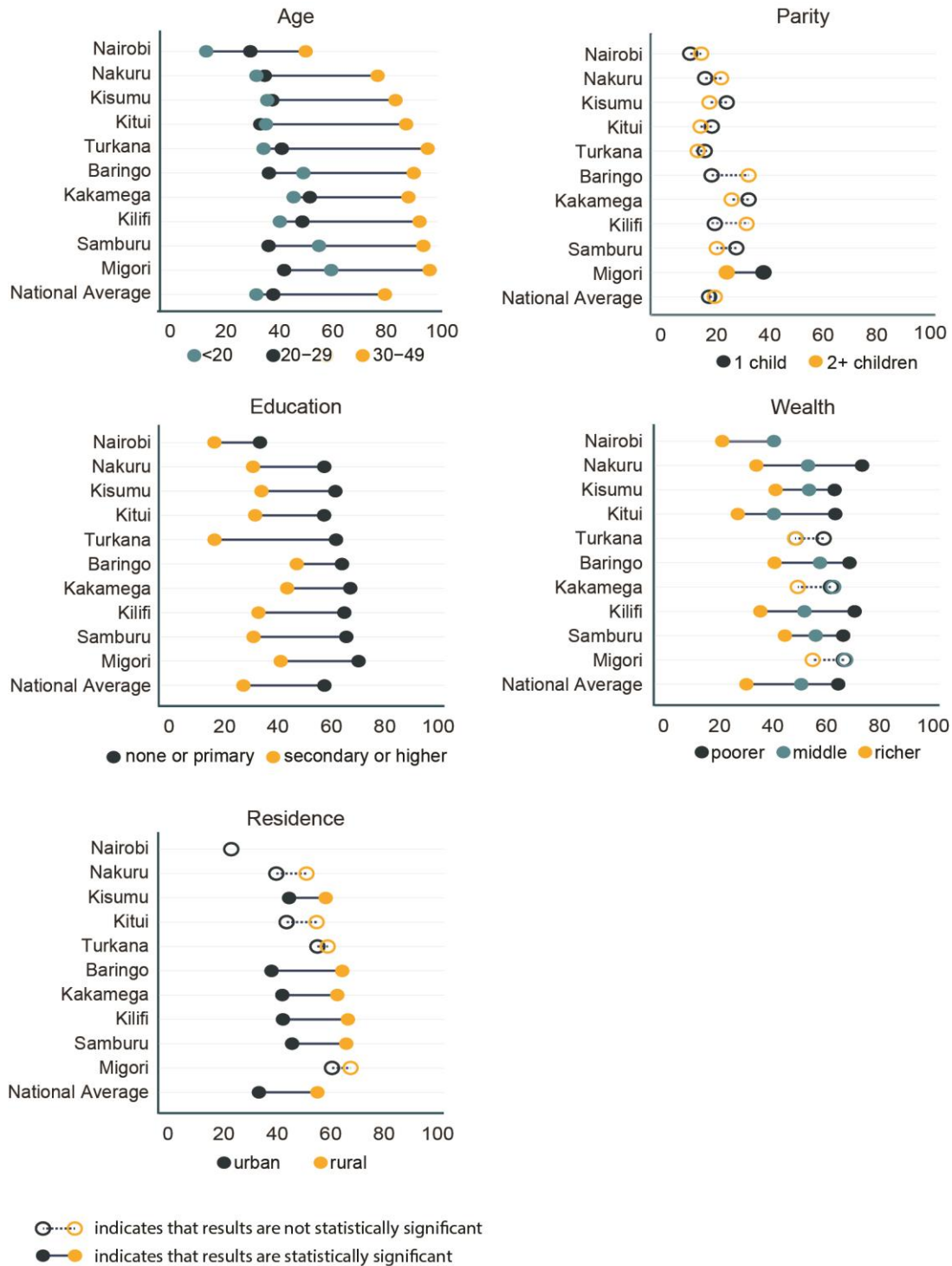
In general, fertility risk among the oldest age group markedly surpasses that among either the younger or middle age group. In Kilifi, Kitui, Kisumu, Turkana, Nakuru, and Kakamega the proportion of women with fertility risk is similar among women age 20-29 and women younger than age 20, while in Nairobi, Migori, Samburu, and Baringo fertility risk differs between these age groups.

<sup>2</sup> Although maternal age at birth is itself a fertility risk factor, the age categories (age <20, age 20-29, and age 30-49) differ from those that represent fertility risk, which are younger than age 18 or age 35 or older at time of birth.



**Figure 4 Fertility risk by socio-demographic characteristics**

Percentage of women age 15-49 with a birth in the last 5 years



With regard to education, women with no education or only primary education are consistently more likely to be designated as having higher fertility risk than are women with secondary or higher education. In Baringo and Nairobi only 17 percentage points separate educational groups in fertility risk. Nonetheless, in Nairobi this represents a doubling of fertility risk among less educated women compared with more educated women. Differentials are greatest in Turkana, where 63% of women with no education or only primary education have fertility risk compared with 17% of women with secondary or higher education.

Levels of fertility risk are similar for women pregnant with their first child compared with women with two or three children<sup>3</sup>, except in Migori, where fertility risk is 14 percentage points higher among women with one child, at 39% ( $p \leq 0.05$ ).

Fertility risk varies with household wealth in 7 of the 10 study counties, as it does nationally. The exceptions are Migori, Turkana, and Kakamega. The level of fertility risk increases nearly monotonically with decreasing wealth tercile. Fertility risk is also concentrated among women in rural areas, in six of nine study counties<sup>4</sup>.

In summary, fertility risk varies by age and educational level in all 10 high-priority counties, followed by wealth tercile (seven counties) and residence (five counties). Fertility risk is highest among older, less educated, poorer, and rural women. In four counties—Kilifi, Kisumu, Samburu, and Baringo—inequities in fertility risk exist across all four of these characteristics. There are fewer inequities in Turkana, where fertility risk varies by age and education but no other factors.

### **3.3 Distance to a Health Facility**

#### **3.3.1 Distance to a health facility by county**

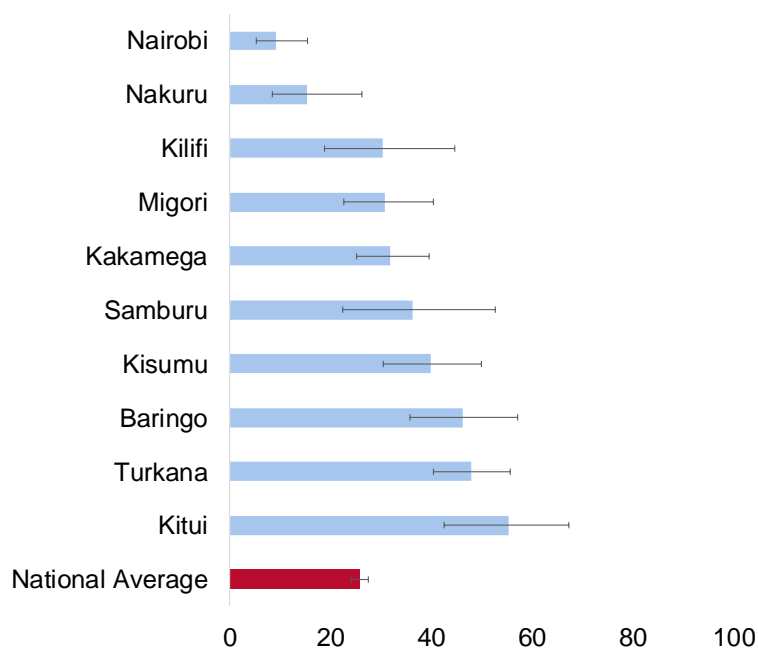
Figure 5 suggests that health facility access is inequitably distributed across counties. The proportion of women reporting that distance to a health facility is a problem for seeking care varies significantly ( $p=0.000$ ), from 9% in Nairobi to 15% in Nakuru and to 55% in Kitui, with a national average of 26%. Eight of the 10 study counties report levels above the national average.

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<sup>3</sup> The analysis of fertility risk by parity excludes women with four or more children since these women, by definition, are at higher fertility risk.

<sup>4</sup> Nairobi is 100% urban and so no statistical test of independence could be performed for this county.

**Figure 5 Distance to health facility by county**



Note: Answered by a subsample who completed the long questionnaire

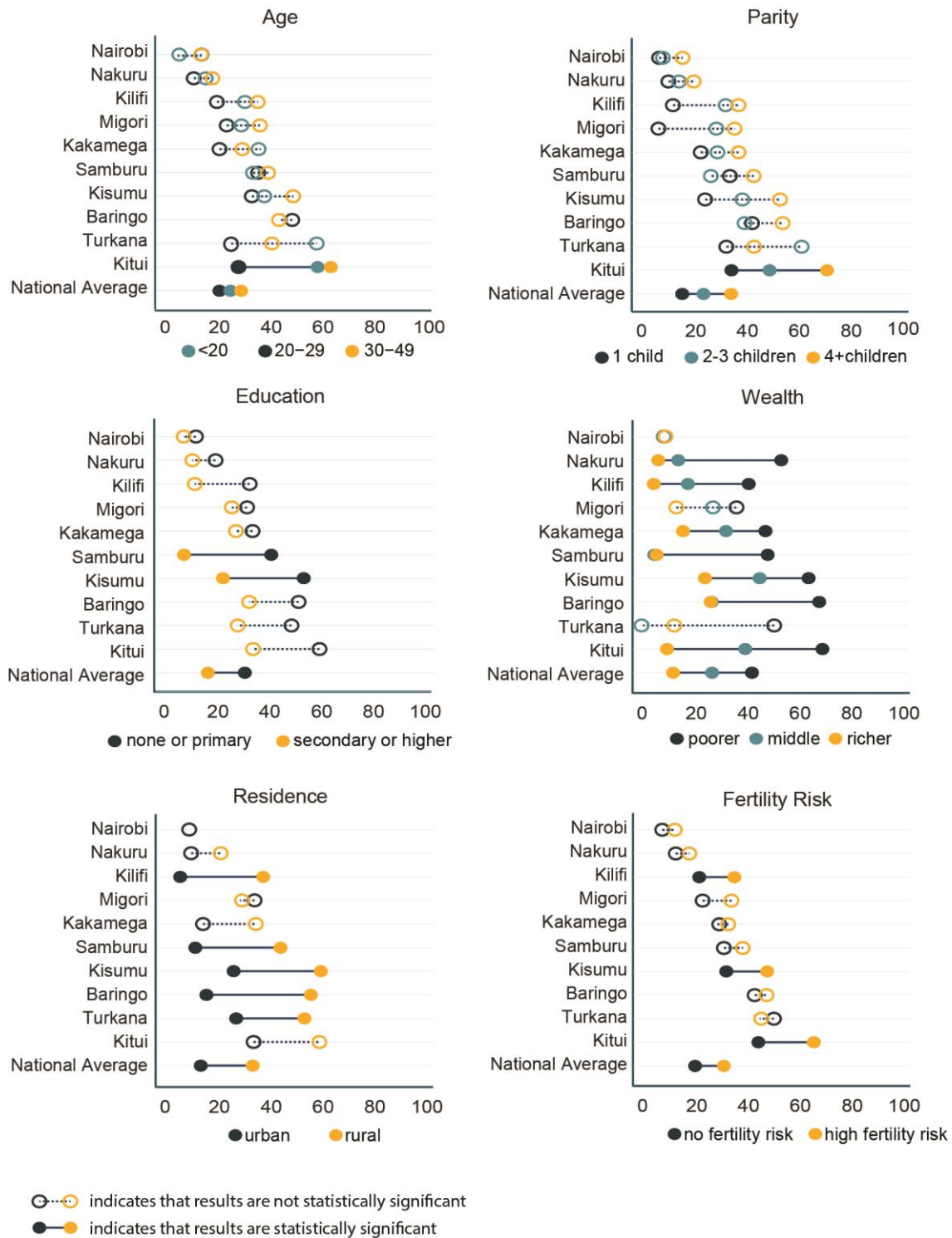
### 3.3.2 Distance to a health facility within counties by socio-demographic characteristics

Figure 6 shows the proportion of women for whom distance to a health facility is a problem by women’s socio-demographic characteristics. Details of confidence intervals and statistical tests can be found in Appendix Table 3. Although there is variation at the national level ( $p \leq 0.001$ ), there are no statistically significant differences in distance to health facilities as a problem for women of different ages except in Kitui. In Kitui county women younger than age 20 are much less likely to report that distance to a health facility is a problem for seeking treatment compared with older women ( $p \leq 0.05$ ).

Distance to health facilities is inequitably distributed across women of different parities nationally ( $p \leq 0.001$ ) and in two study counties, Kilifi and Kitui ( $p \leq 0.05$ ). In each case, women with more children are more likely to report that distance is a problem. In Kitui the increase is monotonic with increasing parity, while in Kilifi women with two or three children and women with four or more children are similar in their increased likelihood to find distance to be a problem when seeking care.

**Figure 6 Distance to health facility by socio-demographic characteristics**

Percentage of women age 15-49 with a birth in the last 5 years



In all study counties, women with no education or only primary education appear more likely than women with more education to report distance to a health facility to be a problem, but these differences are statistically significant in just two counties, Kisumu ( $p \leq 0.001$ ) and Samburu ( $p \leq 0.01$ ). In both counties the difference between educational groups exceeds 30 percentage points.

Variation by wealth and residence is more common. In 7 of 10 counties, distance to a health facility is a greater problem for women in the poorer tercile than for women in the middle or richer terciles. In Kilifi, Kitui, Kisumu, and Kakamega, the pattern resembles the national pattern—distance as a problem in seeking care increases linearly with women’s decreasing wealth. In Samburu, Baringo, and Nakuru, however, distance as a problem in seeking care is predominantly concentrated among women in the poorer tercile; there is little distinction among women in the other two terciles. Disparities are greatest in Kitui (60 points) and narrowest in Kakamega (30 points).

In half of the study counties—Kilifi, Kisumu, Turkana, Samburu, and Baringo—rural women are significantly more likely to report that distance to a health facility is a problem. Disparities are smallest in Turkana, at 26 points ( $p \leq 0.05$ ), and largest in Baringo, where 50 percentage points separate urban and rural women ( $p = 0.000$ ).

Women with fertility risk may have greater need to use health services than women without fertility risk. Women with higher fertility risk are significantly more likely to report that distance to a health facility is a problem getting treatment in three counties, Kilifi ( $p \leq 0.05$ ), Kitui ( $p \leq 0.01$ ), and Kisumu ( $p \leq 0.05$ ). This pattern is also observed nationally ( $p = 0.000$ ).

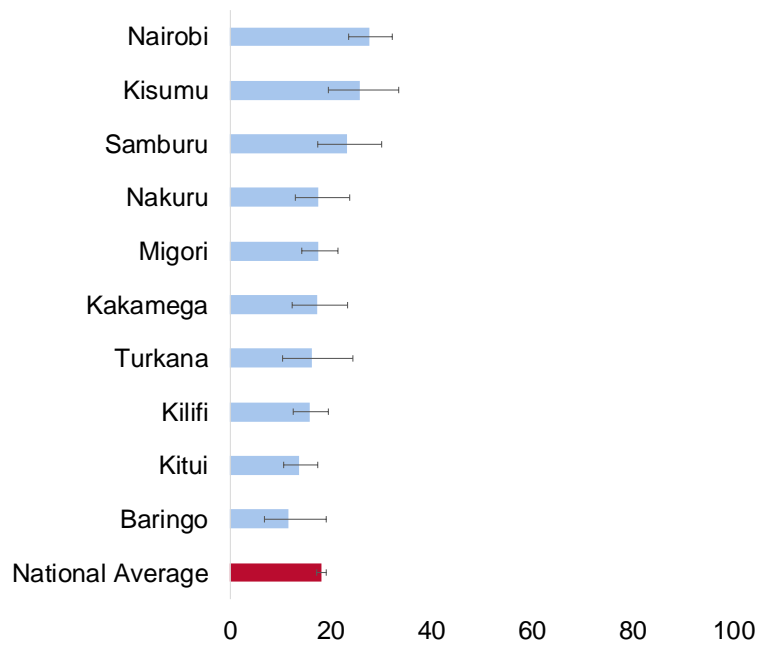
In summary, there are few differences in distance to a health facility being a problem by maternal age at birth, parity, or education. However, inequities in distance to a health facility are commonly seen with regard to wealth tercile (seven counties) and residence (five counties). Migori and Nairobi show the most equitable access to health facilities by this measure: there are no significant differences across any of the factors examined. In contrast, Kilifi, Kitui, and Kisumu show disparities by four of six factors studied.

### **3.4 ANC Use**

#### **3.4.1 ANC use by county**

Figure 7 presents a composite measure of adequate ANC use combining the number and timing of ANC visits, by county. This figure shows the proportion of women who attended four or more ANC visits, with the first visit occurring in the first three months of pregnancy. Figure 8 disaggregates this measure into its two constituent parts: (1) number and (2) timing.

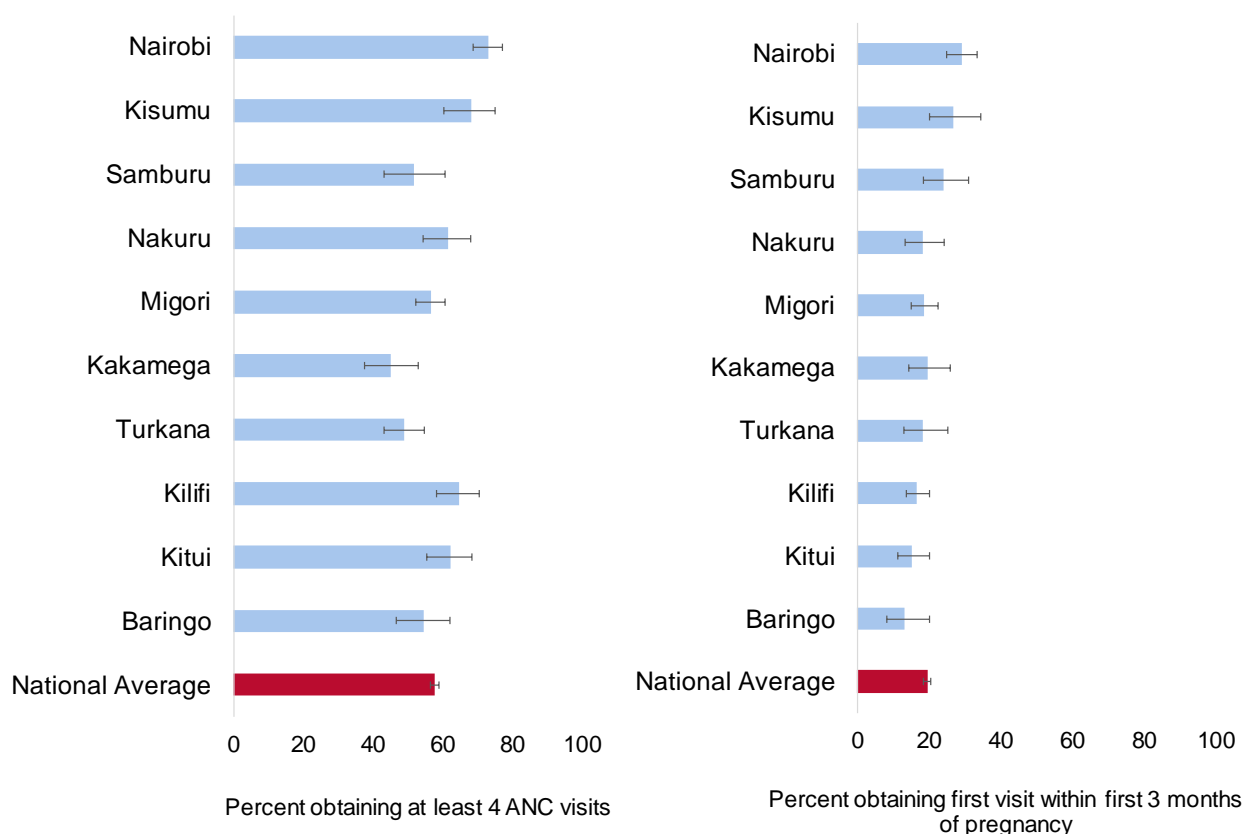
**Figure 7 ANC use by county**



Note: ANC use is defined as four or more ANC visits, with the first visit occurring in the first three months of pregnancy.

As Figure 7 shows, there is significant variation in ANC use across counties. The proportion of women obtaining adequate ANC ranges from 12% in Baringo to more than double that figure, 28%, in Nairobi. Figure 8 indicates that in most counties the majority of women attend the recommended four or more ANC visits. Kakamega (45%) and Turkana (49%) are the only exceptions. However, a much smaller proportion of women make their first ANC visit within the first three months of pregnancy. The timing of ANC contributes more to inadequate ANC use than does the number of visits. This pattern is consistent across all study counties.

**Figure 8 Number and timing of ANC visits by county**



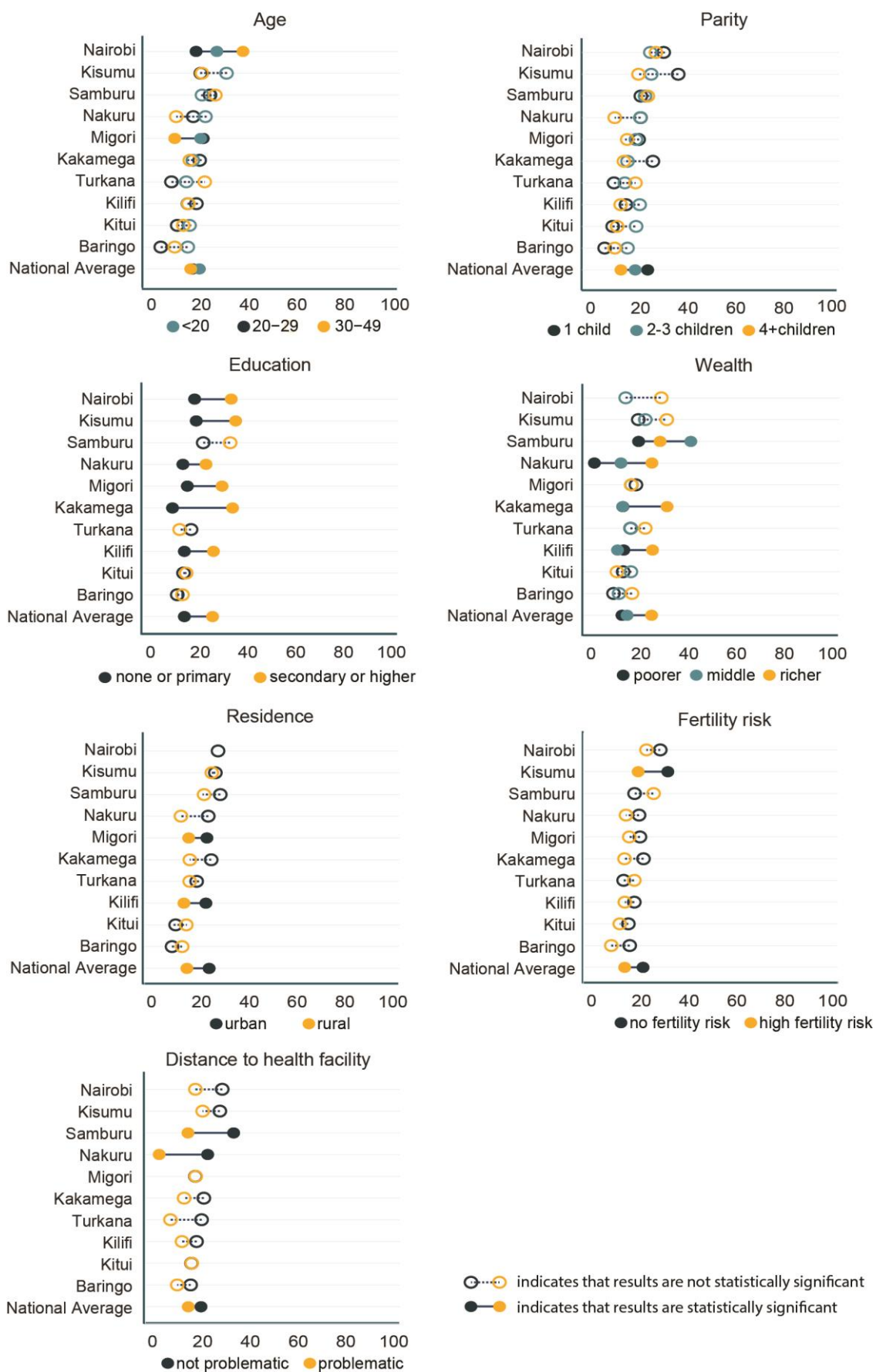
### 3.4.2 ANC use within counties by socio-demographic characteristics

Figure 9 presents the composite measure of ANC use by socio-demographic characteristics, fertility risk, and whether distance to a health facility poses a problem. Details can be found in Appendix Table 4. This figure indicates that ANC use seldom varies by maternal age, and where it does vary, the differences are small. In Nairobi adequate ANC use increases with women’s age ( $p \leq 0.05$ ). In contrast, in Migori women age 20-29 are more likely than either younger or older women to obtain adequate ANC.

Significant inequities in ANC use by education are found in 6 of the 10 study counties and nationally. In each of these counties, women with secondary or higher education are more likely to obtain adequate ANC compared with women with no education or primary education only. The inequities are relatively small in Nakuru (10 points,  $p \leq 0.05$ ) and Kilifi (12 points,  $p < 0.05$ ), but widen to 25 percentage points in Kakamega ( $p = 0.000$ ).

**Figure 9 ANC use by socio-demographic characteristics**

Percentage of women age 15-49 with a birth in the last 5 years





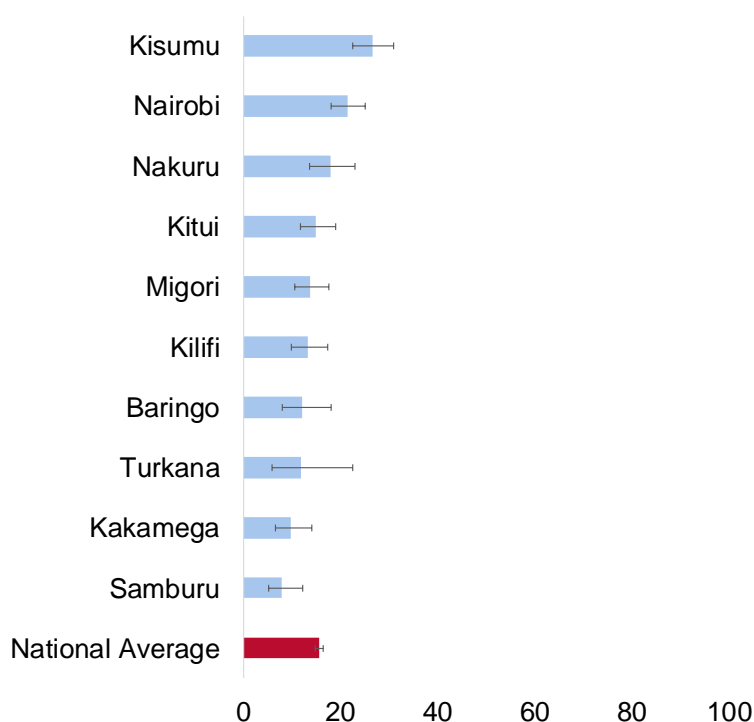
Disparities in ANC use by the other characteristics are less common among study counties. In three counties (and nationally), women in the richer wealth tercile are more likely to use ANC. These are Kilifi ( $p \leq 0.05$ ), Nakuru ( $p = 0.000$ ), and Kakamega ( $p \leq 0.001$ ). In a fourth county, Samburu, ANC use among women in the middle tercile exceeds that among richer or poorer women ( $p < 0.05$ ). ANC use is higher among urban women than rural women only in Kilifi and Migori ( $p < 0.05$ ), though this pattern is observed nationally ( $p = 0.000$ ). Apparent differences by residence in other counties are not statistically significant. ANC use does not vary by fertility risk except in Kisumu, where 32% of women with no fertility risk obtain adequate number and timing of ANC visits compared with 20% of women with high fertility risk ( $p \leq 0.05$ ). ANC use is significantly higher among women who do not report that distance to a health facility is a big problem; only in Samburu ( $p \leq 0.05$ ) and Nakuru ( $p < 0.01$ ) are such differences observed.

Compared with the other maternal health indicators in this study, antenatal care is relatively equitably distributed across socio-demographic characteristics in high-priority counties. Variation in adequate number and timing of ANC visits is seen by women's education (six counties) and to a lesser extent by wealth tercile (four counties), but other disparities are less common. Three counties—Kitui, Turkana, and Baringo—show no variation across any of the seven factors studied. No county shows disparities in ANC use by more than three of these seven factors. Kilifi shows disparities by education, wealth, and residence; Migori by education, residence, and maternal age; and Nakuru by education, wealth, and whether distance to a health facility is a problem.

### **3.4.3 Components of ANC services**

Figure 10 shows the proportion of women receiving eight named services during ANC visits. Nationally and in the 10 priority counties, this figure is relatively low but is variable ( $p = 0.000$ ). Seven of the 10 counties show fewer than 16% of women (the national average) receiving all eight services. Only in Nairobi (21%), Kisumu (27%), and Nakuru (18%) do more than 16% of women receive all components of ANC. Details on the components of ANC within counties by socio-demographic characteristics can be found in Appendix Table 5.

**Figure 10 Components of ANC by county**



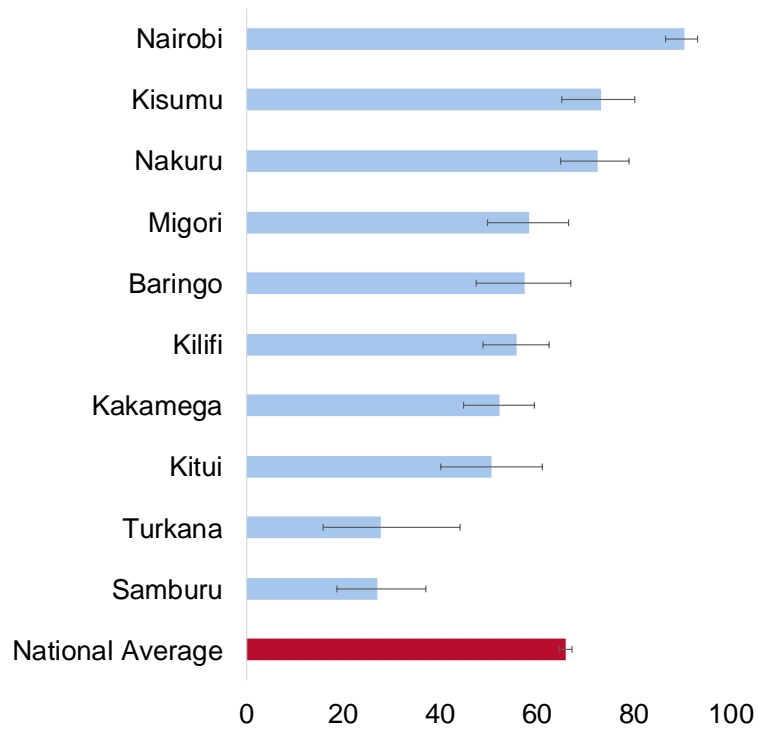
### 3.5 Delivery Care

This study assessed two measures of delivery care: delivery in a health facility and skilled assistance at birth. These two measures are highly correlated and demonstrate the same patterns across counties and across socio-demographic characteristics within study counties. Therefore, we present here only data on health facility delivery. Data on skilled assistance at birth can be found in Appendix Table 7.

#### 3.5.1 Delivery in a health facility by county

The proportion of women who deliver in a health facility varies significantly by county ( $p=0.000$ ). Nationally, two-thirds of women deliver in a health facility (Figure 11). Among the 10 high-priority counties in this study, this figure ranges from 27% in Samburu to 91% in Nairobi. In seven counties—Kilifi, Kitui, Migori, Turkana, Samburu, Baringo, and Kakamega—a smaller percentage of women than the national average deliver in a health facility.

**Figure 11 Health facility delivery by county**

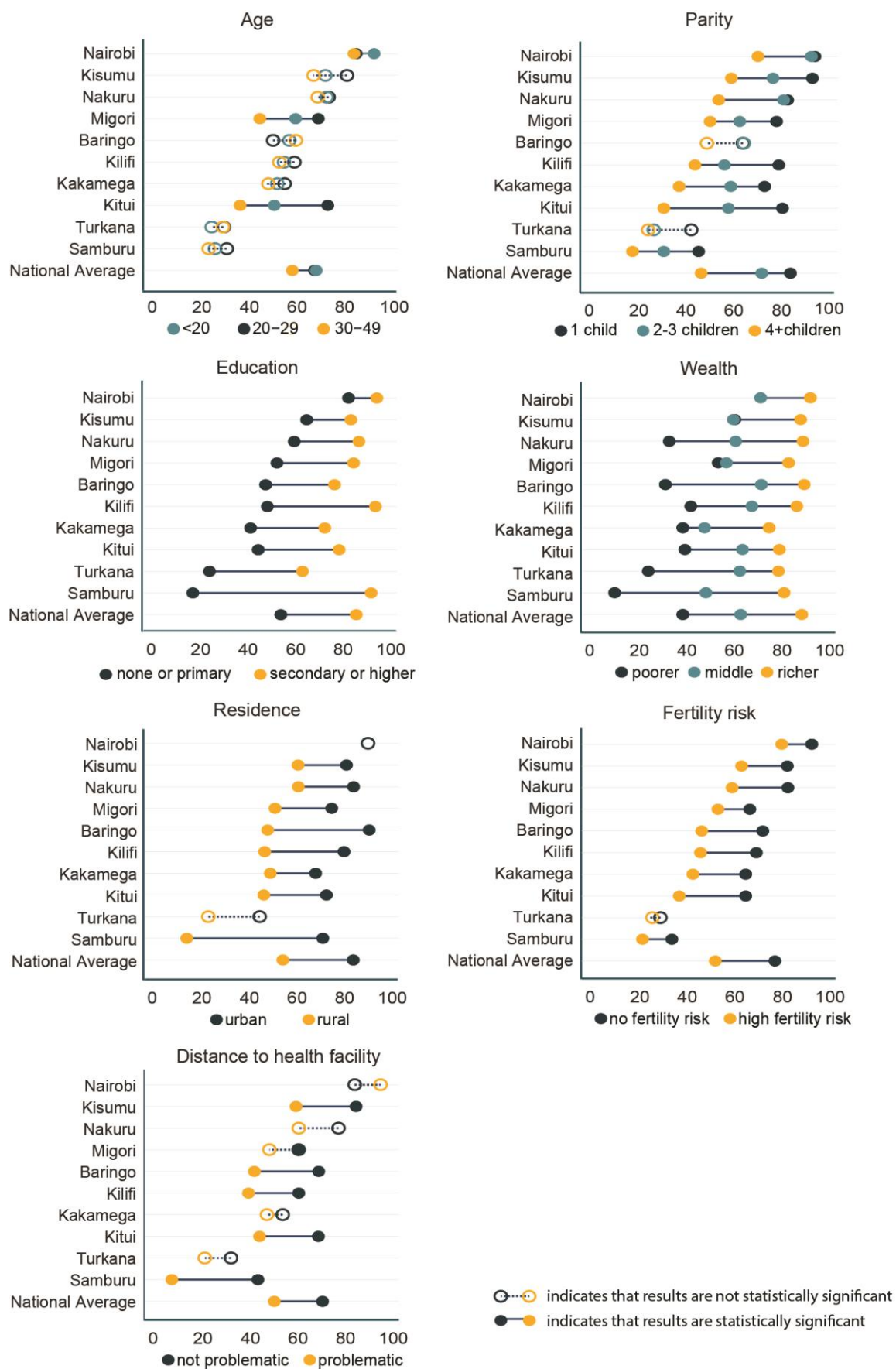


### **3.5.2 Delivery in a health facility within counties by socio-demographic characteristics**

As Figure 12 shows, there are few inequities in health facility delivery by maternal age at birth. Details of statistical tests can be found in Appendix Table 6. Only Nairobi ( $p \leq 0.05$ ), Kitui ( $p = 0.000$ ), and Migori ( $p < 0.01$ ) show disparities by women's characteristics. In these three counties, health facility delivery decreases with women's increasing age.

**Figure 12 Health facility delivery by socio-demographic characteristics**

Percentage of women age 15-49 with a birth in the last 5 years



In contrast, inequities are more commonly observed with regard to most other socio-demographic characteristics examined in this study. Facility delivery decreases with increasing parity in all study counties but Turkana and Baringo. In Nakuru and Nairobi, only women of highest parity differ in their use of health facilities; women with one child and women with two or three children deliver in a health facility at about the same rates. Disparities by parity are largest in Kitui ( $p=0.000$ ), where 37 percentage points separate primiparous women from women with four or more children, and smallest in Migori, with a difference of 14 percentage points ( $p=0.000$ ).

Disparities in delivery care by education are observed in all study counties and are generally sizable. These disparities are smallest in Nairobi, where 83% of women with no education or only primary education deliver in a health facility compared with 95% of women with secondary or higher education ( $p=0.000$ ). In contrast, in Samburu only 18% of women with no education or only primary education deliver in a health facility compared with 93% of women with more education ( $p=0.000$ ).

Disparities in delivery care by wealth are universal and wide in the study counties. Women in richer terciles are more likely than women in poorer terciles to deliver in a health facility, with a difference ranging from 26 percentage points in Kitui ( $p=0.000$ ) to 71 points in Samburu ( $p=0.000$ ). In most counties, women in the middle tercile deliver in a health facility at higher rates than poorer women but not as high as richer women. However, in Kisumu, Migori, and Kakamega, middle tercile women and poorer tercile women fall well below richer women in facility-based delivery.

Disparities in facility delivery by residence are statistically significant in all nine counties where they could be measured, except Turkana. Urban women are more likely to deliver in a health facility, ranging from a difference of 20 percentage points in Kakamega ( $p\leq 0.05$ ) to 57 points in Samburu ( $p=0.000$ ). Inequities by fertility risk are also widespread, except in Turkana, which shows no difference. Women with higher fertility risk are less likely than women with no fertility risk to deliver in a health facility, with a range from 12 percentage points in Samburu ( $p<0.05$ ) to 28 points in Kitui ( $p=0.000$ ).

The use of health facilities for childbirth also varies by whether women perceive distance to a facility to be a problem, though not as commonly as with other characteristics. In five counties women who report distance to a health facility being a big problem in seeking care are significantly less likely to deliver in a health facility. These counties are Kilifi, Kitui, Kisumu, Samburu, and Baringo. Disparities are largest in Samburu, with a difference of 36 percentage points ( $p=0.000$ ).

In summary, disparities in facility delivery are observed across numerous factors in high-priority counties. Maternal age at birth is the exception, with disparities observed in only three counties. Disparities by education and wealth are observed in all high-priority counties and by residence<sup>5</sup> and fertility risk in all counties but Turkana. Turkana exhibits the most equitable use of a health facility for delivery, showing disparities only by education and wealth. In contrast, in Kitui there are disparities in facility delivery related to all seven factors: maternal age at birth, parity, education, wealth, residence, fertility risk, and distance to a health facility as a problem in seeking care.

## **3.6 Postnatal Care**

### **3.6.1 Postnatal care by county**

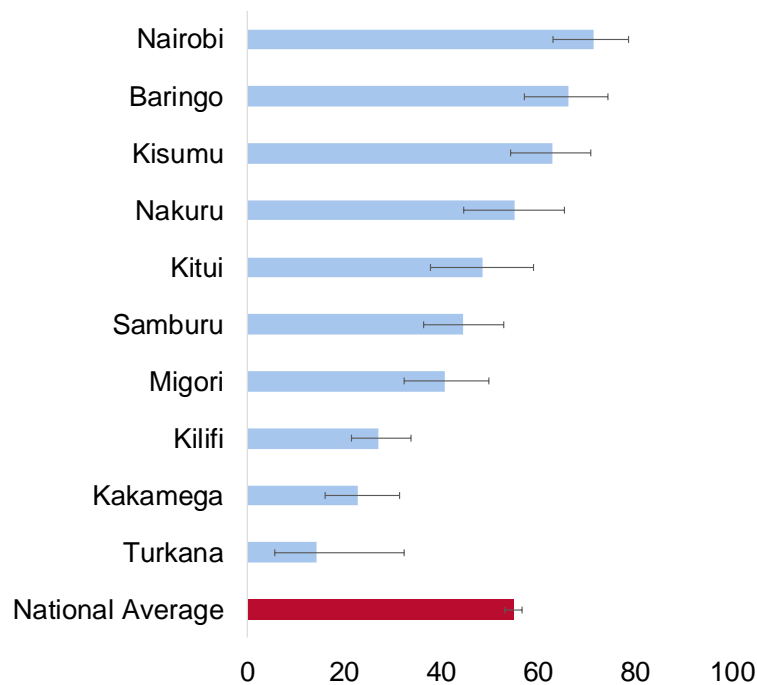
Figure 13 shows that there are significant differences by county in the proportion of women who had a postnatal exam within 48 hours of delivery ( $p=0.000$ ). Four counties—Nairobi, Kisumu, Baringo, and

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<sup>5</sup> No statistical test for variation by residence is possible in Nairobi because it is entirely urban.

Nakuru—show levels of postnatal care at or above the national average, while the remaining six high-priority counties have below-average levels of postnatal care. Turkana has the lowest proportion of women receiving postnatal care within 48 hours, at 14%, while this figure reaches 72% in Nairobi. The survey asked about half the total sample questions about postnatal care.

**Figure 13 PNC within 48 hours by county**



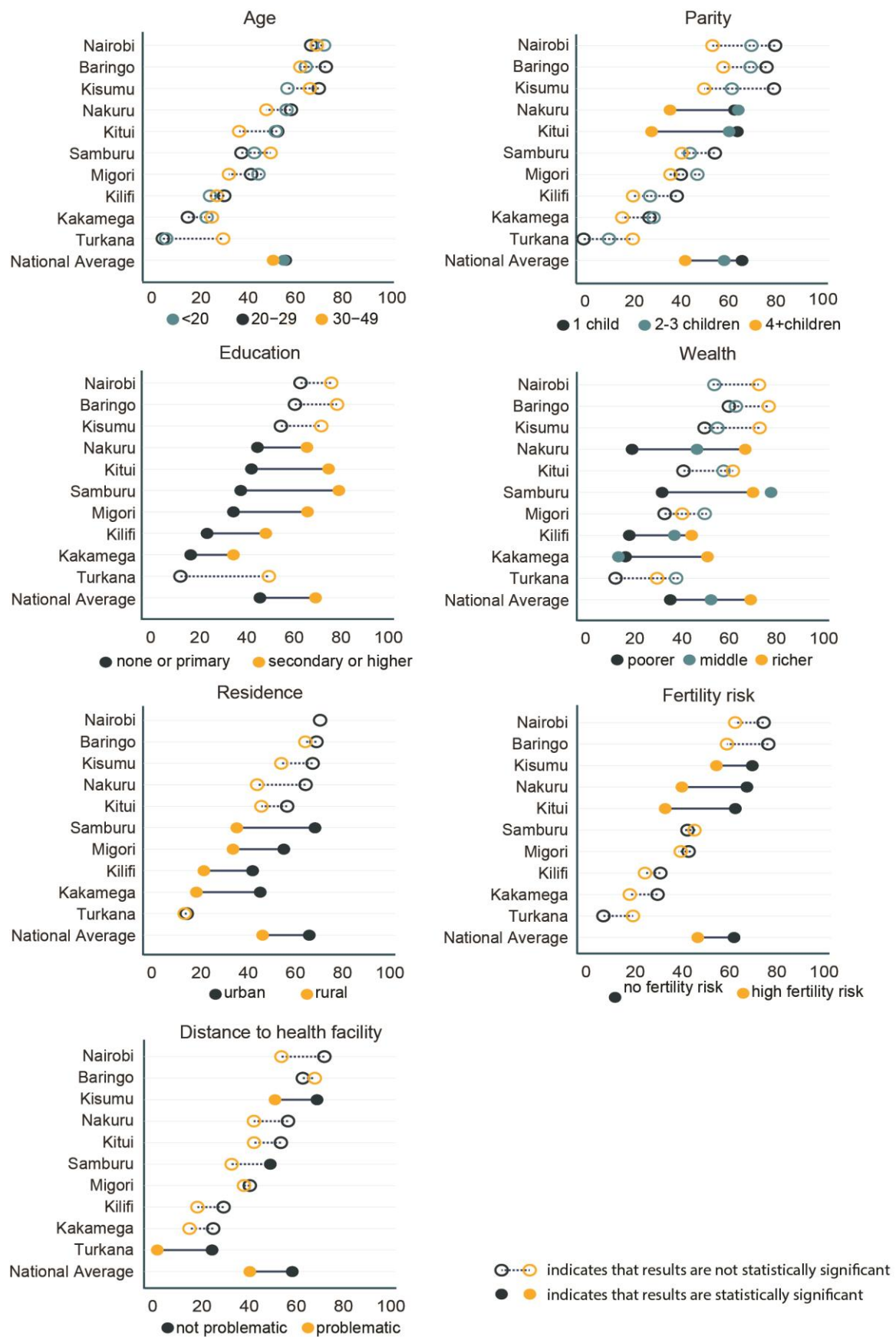
Note: Answered by a subsample who completed long questionnaire

### 3.6.2 Postnatal care within counties by socio-demographic characteristics

Nationally, there is significant variation in postnatal care by all socio-demographic characteristics examined, but these same associations are less frequently evident at the county level (Figure 14). Detailed data can be found in Appendix Table 8. Maternal age, for example, is not associated with postnatal care in any high-priority county. Only in Kitui ( $p \leq 0.01$ ) and Nakuru ( $p \leq 0.05$ ) are there disparities in postnatal care by parity. In these two counties women with either two or three children or with at least four children are more likely to receive postnatal care compared with primiparous women.

**Figure 14 PNC within 48 hours by socio-demographic characteristics**

Percentage of women age 15-49 with a birth in the last 5 years



Disparities in postnatal care by education are more common, found in 6 of the 10 high-priority counties. These disparities are equally evident in counties with low levels of postnatal care (e.g., Turkana and Kakamega) and high levels of postnatal care (e.g. Samburu). Disparities by wealth tercile are found in just four counties but are quite sizable where they exist. At least 35 percentage points separate the terciles with the lowest and the highest levels of postnatal care in Kakamega, Nakuru, and Samburu ( $p=0.000$ ). Likewise, postnatal care varies by residence in four counties, but these disparities are somewhat smaller, ranging from 21 percentage points in Kilifi ( $p\leq 0.05$ ) to 33 percentage points in Samburu ( $p\leq 0.01$ ).

Women with no fertility risk are more likely to receive postnatal care within 48 hours than are women with heightened fertility risk in Kitui ( $p\leq 0.01$ ), Kisumu ( $p\leq 0.05$ ), and Nakuru ( $p\leq 0.01$ ). The largest disparity—30 percentage points—is in Kitui. Only in Kisumu and Turkana ( $p\leq 0.05$ ), where timely postnatal care is 24-28 percentage points higher among women for whom distance is not a problem, does postnatal care vary significantly according to whether or not women report distance to a health facility to be a big problem. The apparent differences are not statistically significant elsewhere.

In high-priority counties there are fewer disparities in postnatal care than in health facility delivery but more than in antenatal care. Disparities in postnatal care are most common by women's education (six counties), followed by wealth and residence (four counties). Disparities are less common by fertility risk (three counties), parity (two counties), and distance to a health facility (two counties). There is no variation in postnatal care by maternal age. Postnatal care is most inequitably distributed in Nakuru, where it varies by four of the factors examined in the study and is concentrated among low parity, more educated, and wealthier women, and women with no fertility risk. In contrast, Baringo and Nairobi show no disparities in postnatal care by any of seven factors, and Turkana shows disparities only by distance to a health facility.



## 4 DISCUSSION AND CONCLUSIONS

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This study shows large variations in maternal health indicators among high-priority counties in Kenya. Nairobi exceeds the national average on all maternal health indicators in this study. When Nairobi is removed from pooled results, it is clear that high-priority counties are disadvantaged compared with Kenya as a whole in antenatal, delivery, and postnatal care, as well as fertility risk and access to health facilities.

Considered individually, high-priority counties consistently lag behind the country as a whole in most maternal health indicators (except Nairobi, as mentioned). However, Kisumu outperforms the national average in use of ANC, delivery in a health facility, and PNC. Nakuru has a smaller proportion of women with fertility risk, a smaller proportion reporting that distance to a health facility is a problem, and a higher proportion obtaining adequate ANC. Samburu has higher levels of ANC use, and Baringo has higher levels of PNC use compared with the country as a whole.

This study identified a number of inequities in maternal health indicators across socio-demographic characteristics in the high-priority counties—most in the distribution of delivery care and least in ANC. Inequities were also observed in fertility risk and PNC. The most common disparities at the county level are by women's education, wealth, and urban-rural residence. Turkana shows fewer disparities in maternal health indicators compared with Kilifi, Kisumu, and Kitui.

Fertility risk varies by maternal age at birth and women's educational level in all 10 high-priority counties. One reason may be that younger maternal age (<18) and older maternal age (>34) are themselves two of the four criteria for fertility risk (the other two are short birth interval and high parity). However, fertility risk is highest among older women (age 30-49), suggesting that older maternal age contributes more to fertility risk than does young maternal age. Older women are also more likely than younger or middle age women to have had multiple births—which may be closely spaced—and to have reached higher parity. In addition to age, fertility risk is also higher among less educated, poorer, and rural women in the majority of counties. This shows that women who are disadvantaged in their fertility risk are also disadvantaged in other ways.

Inequities in distance to a health facility cited as a problem for seeking care are common with regard to wealth tercile (seven counties) and urban-rural residence (five counties). Migori and Nairobi show the most equitable access to health facilities by this measure. There are few differences by maternal age at birth, parity, or education in the proportion of women reporting that distance to a health facility is a big problem. Distance to health facilities has been implicated in poor use of antenatal, delivery, and postnatal care services (Pell et al. 2013; LeGrand et al. 2013; Gitumu et al. 2015; Mason et al. 2015; Omollo 2016).

Although a majority of women report attending at least one ANC visit for a recent pregnancy, women are much less likely to attend the recommended four or more ANC visits and to make the first visit in the first trimester. While high-priority counties in this study perform about as well as the nation as a whole, the proportion of women who obtain both the recommended number and timing of ANC visits is relatively low and falls short of programmatic goals, as is the proportion who receive all eight components of ANC services.

Compared with the other maternal health indicators in this study, antenatal care is relatively equitably distributed across socio-demographic characteristics in the high-priority counties, but some disparities

exist in relation to education and wealth. Kitui, Turkana, and Baringo show no disparities in antenatal care. Kilifi shows disparities by women's education, wealth, and residence; Migori by education, residence, and maternal age; and Nakuru by education, wealth, and whether women consider distance to a health facility to be a problem. Antenatal care is an important entry point for the entire continuum of pregnancy care (Ikamari 2004; Gitumu et al. 2015; Mazalale et al. 2015; Belachew, Taye, and Belachew 2016; Dickson, Adde, and Amu 2016; Gitonga and Muiruri 2016; Owili et al. 2016; Mbugua and MacQuarrie 2018). A study in the informal settlements of Nairobi revealed that ANC attendance is associated with women's age, education level, and income (Mbai 2015). Similar socio-demographic associations are found in different parts of Kenya (Mungai 2015).

Disparities in facility delivery appear across numerous factors in the high-priority counties, particularly by education and wealth. Turkana has the most equitable use of a health facility for delivery, showing disparities only by education and wealth. In contrast, Kitui shows disparities in facility delivery by maternal age at birth, parity, education, wealth, residence, fertility risk, and distance to a health facility as a perceived problem.

Other studies have found some of the same demographic and socioeconomic associations, as well as cultural determinants of facility delivery. These include women's education, income, lack of male partner, knowledge of delivery complications, cultural beliefs, high fees, and uncooperative health workers (Nanjala and Wamalwa 2012). Several studies in Kenya have reviewed the factors associated with low levels of health facility delivery, including problems of access due to unpredictable timing of labor and transport, cost of facility-based delivery care, husband's preference, health facility staff attitudes, and women's previous experiences and habits (Mason et al. 2015). Omollo (2016) cites such barriers as distance, travel cost, medicine cost, poor roads, lack of nighttime travel services, verbal abuse and negative attitudes from some health workers, and long waiting hours. A study in western Kenya reported barriers associated with low levels of skilled birth attendance in the region: fear associated with HIV testing or disclosure of HIV status; gender inequalities; and negative attitudes toward facility-based care because it is associated with harsh treatment (Muckle et al. 2013). A study in eastern Kenya identified the following as factors affecting skilled birth attendance: education, ANC attendance, and living close to a health facility (1-5km) (Gitumu et al. 2015). The use of traditional birth attendants (TBAs) is also a common practice in most rural areas, especially among mothers under age 20, poor households, and women living more than 4 km from a health facility, and often reflects the influence of close family members (Magango 2013).

Having a postnatal check-up within the critical first two days after delivery is essential, as this period is one of the highest-risk times for maternal and child mortality. PNC has been reported as the neglected component in maternal health care programming (Ikamari 2004). In high-priority counties there are fewer disparities in postnatal care than in health facility delivery, but more than in antenatal care. Disparities in postnatal care are most common by women's education (six counties), followed by wealth and residence (four counties). Postnatal care is most unevenly distributed in Nakuru, where it is concentrated among low parity, more educated, and wealthier women, and women with no fertility risk. In contrast, Baringo and Nairobi show no disparities in postnatal care. Other studies in Kenya have cited factors similar to those found in this study, including education, parity, wealth, residence, fertility risk, and whether distance to a facility is a problem (Akunga et al. 2014; Mungai 2015; Ikamari 2004).

County-specific data are necessary as a first step for Kenya to achieve equitable provision of health care as promoted in the Kenya Health Policy 2012-2030 and in the SDG framework. This study reveals substantial and significant regional variation in all maternal health indicators across counties. The

comparison of high-priority counties with national figures suggests that USAID is appropriately focusing its efforts on areas most in need of better maternal health care.

As Kenya's county health authorities partner with the national government to improve service delivery under the devolved responsibility for health care, it is useful to be cognizant of the socio-demographic disparities that exist in maternal health in the respective counties. While the need to direct health interventions to disadvantaged population groups is evident, the disparities illustrated in this study also suggest a role for other agencies and sectors, including those pertaining to education and economic development, alongside or in conjunction with those in the health sector. Counties that face numerous inequities could achieve gains in antenatal, delivery, and postnatal care outcomes by focusing efforts on closing disparities. Meanwhile, counties with fewer disparities might want to be mindful that the gaps do not widen as they pursue improvements in maternal health indicators.



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## APPENDIX

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**Appendix Table 1 Sample profile: Socio-demographic characteristics of women who gave birth in the last 5 years from 10 high-priority counties in Kenya, by county**

	Baringo (n=294)		Kakamega (n=360)		Kilifi (n=386)		Kisumu (n=329)		Kitui (n=305)		Migori (n=431)		Nairobi (n=428)	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
<b>Maternal age at birth</b>														
<20	15.3	(10.5-21.6)	18.8	(14.3-24.3)	20.7	(15.7-26.8)	20.3	(16.3-24.9)	19.2	(13.3-27.0)	23.2	(19.3-27.6)	18.5	(14.1-23.8)
20-29	56.1	(48.9-63.1)	50.6	(44.0-57.2)	44.1	(39.7-48.6)	49.9	(45.6-54.2)	44.9	(39.4-50.5)	48.7	(43.5-54.0)	61.9	(55.5-67.9)
30-49	28.6	(22.8-35.2)	30.6	(25.3-36.4)	35.2	(29.8-41.0)	29.8	(25.4-34.7)	35.9	(30.0-42.2)	28.1	(24.0-32.5)	19.7	(15.4-24.7)
<b>Parity</b>														
1 child	18.7	(13.5-25.4)	20.2	(15.8-25.4)	23.3	(18.3-29.2)	21.2	(15.6-28.1)	21.1	(16.5-26.7)	15.1	(12.2-18.6)	39.7	(32.7-47.2)
2-3 children	37.9	(31.4-45.0)	35.9	(30.9-41.1)	30.3	(25.4-35.6)	40.8	(35.4-46.4)	34.1	(26.5-42.6)	32.5	(28.9-36.2)	48.5	(41.8-55.3)
4+ children	43.3	(35.6-51.4)	44.0	(38.1-50.0)	46.4	(41.0-52.0)	38.0	(32.5-43.9)	44.8	(34.7-55.3)	52.4	(48.3-56.4)	11.8	(8.2-16.6)
<b>Education</b>														
None or primary	68.0	(59.9-75.2)	67.0	(61.2-72.3)	85.2	(80.6-88.8)	57.9	(48.8-66.5)	84.0	(77.9-88.6)	83.3	(79.3-86.7)	38.5	(30.8-46.9)
Secondary or higher	32.0	(24.8-40.1)	33.0	(27.7-38.8)	14.8	(11.2-19.4)	42.1	(33.5-51.2)	16.0	(11.4-22.1)	16.7	(13.3-20.7)	61.5	(53.1-69.2)
<b>Household wealth tercile</b>														
Poorer	46.6	(34.4-59.2)	22.4	(17.4-28.2)	64.1	(55.1-72.2)	22.6	(15.1-32.5)	61.4	(49.3-72.2)	53.0	(44.2-61.6)	0.2	(0.0-1.5)
Middle	28.5	(20.1-38.6)	54.3	(48.5-60.0)	12.7	(9.3-17.0)	30.8	(24.2-38.2)	28.5	(20.1-38.8)	35.2	(28.8-42.1)	8.9	(5.4-14.5)
Richer	24.9	(18.0-33.5)	23.3	(17.9-29.9)	23.2	(16.9-31.1)	46.6	(35.7-57.8)	10.1	(5.8-17.1)	11.8	(8.3-16.5)	90.8	(85.0-94.6)
<b>Residence</b>														
Urban	21.8	(16.3-28.6)	15.4	(12.7-18.7)	26.2	(19.2-34.7)	60.3	(52.7-67.5)	14.9	(11.1-19.7)	29.6	(24.4-35.4)	100.0	
Rural	78.2	(71.4-83.7)	84.6	(81.3-87.3)	73.8	(65.3-80.8)	39.7	(32.5-47.3)	85.1	(80.3-88.9)	70.4	(64.6-75.6)	0.0	
<b>Religion</b>														
Catholic	9.6	(6.0-15.1)	11.8	(7.8-17.5)	9.0	(5.3-14.9)	10.9	(7.9-14.8)	19.3	(11.0-31.7)	8.8	(6.1-12.4)	21.9	(18.2-26.2)
Protestant	81.2	(71.5-88.1)	84.1	(77.2-89.2)	47.4	(41.0-53.8)	87.6	(83.2-90.9)	77.3	(65.3-86.0)	90.6	(86.6-93.4)	73.7	(68.2-78.5)
Other	9.2	(3.9-20.1)	4.1	(1.8-8.7)	43.6	(37.5-50.0)	1.5	(0.4-5.0)	3.4	(1.6-7.1)	0.7	(0.2-2.2)	4.4	(2.1-8.8)
<b>Fertility risk [1]</b>														
No risk	40.5	(34.0-47.3)	39.7	(34.7-45.0)	39.0	(33.9-44.3)	49.2	(43.0-55.3)	45.9	(37.7-54.4)	33.6	(29.5-38.0)	76.3	(70.6-81.2)
High risk	59.5	(52.7-66.0)	60.3	(55.0-65.3)	61.0	(55.7-66.1)	50.8	(44.7-57.0)	54.1	(45.6-62.3)	66.4	(62.0-70.5)	23.7	(18.8-29.4)
<b>Reported distance to health facility to be problematic [2]</b>														
No	53.7	(42.9-64.2)	68.1	(60.4-74.9)	69.7	(55.3-81.1)	60.2	(50.0-69.5)	44.7	(32.6-57.5)	69.2	(59.6-77.4)	90.9	(84.5-94.8)
Yes	46.3	(35.8-57.1)	31.9	(25.1-39.6)	30.3	(18.9-44.7)	39.8	(30.5-50.0)	55.3	(42.5-67.4)	30.8	(22.6-40.4)	9.1	(5.2-15.5)

(Continued...)

Appendix Table 1–Continued

	Nakuru (n=346)		Samburu (n=374)		Turkana (n=321)		National Average (n=14,949)	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI
<b>Maternal age at birth</b>								
<20	18.3	(13.7-24.2)	22.7	(19.4-26.4)	14.9	(10.9-20.0)	18.2	(17.3-19.2)
20-29	51.4	(44.3-58.3)	48.7	(44.7-52.7)	47.2	(43.1-51.3)	51.9	(50.6-53.1)
30-49	30.3	(24.8-36.5)	28.6	(24.9-32.5)	37.9	(34.1-41.9)	29.9	(28.8-31.0)
<b>Parity</b>								
1 child	22.1	(17.8-27.1)	17.1	(14.3-20.4)	13.6	(10.1-18.1)	25.0	(23.8-26.2)
2-3 children	45.6	(38.7-52.8)	32.2	(27.7-37.2)	34.4	(29.0-40.2)	40.3	(39.1-41.5)
4+ children	32.2	(25.2-40.2)	50.6	(45.2-56.0)	52.0	(46.7-57.2)	34.7	(33.5-35.9)
<b>Education</b>								
None or primary	55.4	(47.6-63.0)	87.7	(80.0-92.7)	92.0	(83.6-96.3)	64.2	(62.7-65.8)
Secondary or higher	44.6	(37.0-52.4)	12.3	(7.3-20.0)	8.0	(3.7-16.4)	35.8	(34.2-37.3)
<b>Household wealth tercile</b>								
Poorer	14.5	(8.4-23.8)	72.3	(57.7-83.3)	91.9	(83.4-96.2)	29.9	(28.4-31.5)
Middle	30.6	(22.3-40.4)	9.3	(5.2-16.2)	5.8	(2.3-13.7)	30.7	(29.3-32.1)
Richer	54.9	(44.2-65.3)	18.4	(9.3-33.0)	2.4	(0.8-6.8)	39.4	(37.7-41.2)
<b>Residence</b>								
Urban	49.1	(42.9-55.3)	22.0	(13.9-33.2)	20.5	(11.9-32.9)	38.5	(36.8-40.2)
Rural	50.9	(44.7-57.1)	78.0	(66.8-86.1)	79.5	(67.1-88.1)	61.5	(59.8-63.2)
<b>Religion</b>								
Catholic	19.2	(14.4-25.1)	60.4	(49.6-70.3)	45.3	(34.8-56.3)	19.0	(17.9-20.1)
Protestant	76.8	(70.9-81.8)	33.5	(24.1-44.5)	48.2	(37.1-59.5)	71.3	(70.0-72.6)
Other	4.0	(2.4-6.7)	6.1	(2.7-13.1)	6.4	(2.8-14.3)	9.7	(8.8-10.7)
<b>Fertility risk [1]</b>								
No risk	53.6	(45.7-61.3)	37.6	(32.6-42.9)	40.9	(35.9-46.1)	52.4	(51.1-53.7)
High risk	46.4	(38.7-54.3)	62.4	(57.1-67.4)	59.1	(53.9-64.1)	47.6	(46.3-48.9)
<b>Reported distance to health facility to be problematic [2]</b>								
No	84.6	(73.8-91.5)	63.8	(47.3-77.6)	52.0	(44.4-59.5)	74.2	(72.5-75.8)
Yes	15.4	(8.5-26.2)	36.2	(22.4-52.7)	48.0	(40.5-55.6)	25.8	(24.2-27.5)

[1] Fertility risk is defined as meeting one of the following criteria: younger than age 18 at time of birth, age 35 or older at time of birth, birth interval <24 months, or four or more births.

[2] Answered by a subsample who completed long questionnaire

**Appendix Table 2 Fertility risk in Kenya counties, by socio-demographic characteristics**

	Nairobi (n=428)			Kisumu (n=329)			Kitui (n=305)			Turkana (n=321)			Baringo (n=294)				
	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value		
<b>Total</b>	23.7	(18.8-29.4)		46.4	(38.7-54.3)		50.8	(44.7-57.0)		54.1	(45.6-62.3)		59.1	(53.9-64.1)		59.5	(52.7-66.0)
<b>Age of respondent at birth</b>			0.000			0.000			0.000			0.000			0.000		
<20	29.8	(19.3-43.0)		35.2	(24.1-48.3)		38.0	(26.0-51.7)		33.5	(22.5-46.6)		41.6	(25.3-60.0)		36.8	(22.5-53.9)
20-29	13.3	(9.7-18.1)		32.1	(22.4-43.5)		36.1	(27.6-45.7)		35.6	(25.5-47.1)		34.8	(25.2-45.8)		49.7	(41.4-58.0)
30-49	50.5	(39.1-61.8)		77.5	(65.6-86.1)		84.2	(71.3-91.9)		88.2	(79.1-93.7)		96.2	(90.7-98.5)		91.0	(82.8-95.5)
<b>Parity</b>			0.304			0.278			0.452			0.438			0.740		
1 child	11.3	(6.6-18.6)		16.9	(9.1-29.2)		25.0	(14.0-40.6)		19.4	(10.6-32.7)		16.7	(5.1-43.0)		19.3	(10.5-32.8)
2-3 children	15.4	(11.6-20.1)		22.8	(16.0-31.5)		18.5	(11.5-28.4)		15.2	(9.2-24.2)		14.1	(8.3-22.8)		33.2	(24.2-43.7)
<b>Education</b>			0.000			0.000			0.000			0.005			0.010		
None or primary	34.2	(27.7-41.4)		58.3	(47.4-68.4)		62.5	(54.6-69.8)		58.2	(49.0-66.8)		62.7	(56.8-68.3)		65.0	(57.5-71.8)
Secondary or higher	17.1	(12.2-23.5)		31.6	(23.4-41.2)		34.8	(28.4-41.8)		32.4	(20.0-47.8)		32.4	(3.7-52.8)		48.0	(37.7-58.4)
<b>Household wealth tercile</b>			0.038			0.000			0.016			0.000			0.347		
Poorer	41.4	(25.2-59.7)		74.4	(57.1-86.3)		64.1	(49.6-76.4)		64.3	(55.1-72.5)		60.0	(54.0-65.6)		69.7	(57.6-79.6)
Middle	22.0	(17.3-27.6)		54.1	(44.8-63.1)		54.5	(46.1-62.7)		41.4	(30.7-53.0)		49.6	(35.0-64.2)		58.6	(47.7-68.8)
Richer				34.8	(26.9-43.6)		42.0	(33.6-50.9)		27.8	(16.2-43.3)		27.8	(24.2-74.9)		41.6	(29.4-54.9)
<b>Residence</b>			0.161			0.036			0.166			0.253			0.473		
Urban	23.7	(18.8-29.4)		40.6	(30.9-51.2)		45.4	(36.9-54.2)		44.5	(28.7-61.4)		56.0	(47.0-64.6)		38.8	(27.8-51.0)
Rural				51.9	(39.9-63.7)		59.1	(49.8-67.8)		55.7	(45.8-65.2)		59.9	(53.2-66.3)		65.3	(56.7-73.1)
<b>Religion</b>			0.179			0.129			0.166			0.077			0.227		
Catholic	21.7	(14.0-32.1)		42.4	(29.9-55.9)		40.1	(24.0-58.6)		39.0	(26.6-52.9)		52.2	(38.8-65.2)		48.0	(29.8-66.7)
Protestant	23.1	(18.1-28.8)		45.9	(36.7-55.5)		52.6	(46.3-58.8)		57.3	(47.8-66.3)		63.5	(52.4-73.3)		58.9	(51.1-66.2)
Other	[*]	(17.8-74.3)		[*]	(46.6-90.6)		[*]	(6.9-64.9)		[*]	(29.5-90.4)		74.1	(57.0-86.0)		77.5	(57.8-89.6)

(Continued...)

**Appendix Table 2–Continued**

	Kakamega (n=360)			Kilifi (n=386)			Samburu (n=374)			Mogori (n=431)			National Average (n=14,949)		
	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value
<b>Total</b>	60.3	(55.0-65.3)		61.0	(55.7-66.1)		62.4	(57.1-67.4)		66.4	(62.0-70.5)		47.6	(46.3-48.9)	
<b>Age of respondent at birth</b>															
<20	52.1	(39.0-64.9)	0.000	49.3	(38.2-60.5)	0.000	36.6	(24.6-50.6)	0.000	42.5	(30.5-55.5)	0.000	38.4	(35.9-40.9)	0.000
20-29	46.0	(38.7-53.4)		40.9	(32.0-50.4)		55.5	(45.4-65.2)		60.1	(52.3-67.4)		32.0	(30.5-33.5)	
30-49	89.0	(79.3-94.5)		93.2	(87.3-96.4)		94.6	(87.5-97.7)		97.0	(91.0-99.1)		80.2	(78.4-81.9)	
<b>Parity</b>															
1 child	33.2	(21.4-47.6)	0.437	20.5	(13.1-30.7)	0.088	28.6	(17.5-43.0)	0.314	38.7	(27.2-51.5)	0.025	18.4	(16.5-20.4)	0.079
2-3 children	26.8	(19.8-35.2)		32.4	(24.1-42.0)		21.2	(14.0-30.7)		25.0	(19.3-31.7)		20.5	(19.2-21.9)	
<b>Education</b>															
None or primary	68.1	(61.9-73.7)	0.000	65.8	(59.8-71.3)	0.000	66.6	(60.9-71.9)	0.000	71.2	(66.3-75.7)	0.000	58.4	(57.1-59.8)	0.000
Secondary or higher	44.4	(35.5-53.7)		33.7	(22.1-47.7)		31.8	(19.4-47.6)		42.0	(30.1-54.9)		28.0	(26.1-30.0)	
<b>Household wealth tercile</b>															
Poorer	62.7	(51.2-72.9)	0.145	71.6	(66.8-76.0)	0.000	67.3	(60.8-73.2)	0.012	67.6	(60.7-73.7)	0.223	65.4	(63.9-66.9)	0.000
Middle	63.6	(55.4-71.0)		52.8	(41.5-63.9)		57.0	(37.5-74.6)		68.1	(61.4-74.0)		51.6	(49.7-53.4)	
Richer	50.3	(39.3-61.3)		36.3	(25.0-49.3)		45.5	(33.5-58.1)		55.9	(41.9-69.1)		31.0	(28.9-33.1)	
<b>Residence</b>															
Urban	42.8	(27.7-59.4)	0.020	43.1	(34.0-52.6)	0.000	46.5	(32.5-61.1)	0.012	61.5	(51.4-70.8)	0.204	34.1	(31.9-36.4)	0.000
Rural	63.5	(57.6-68.9)		67.4	(61.7-72.7)		66.8	(60.6-72.5)		68.4	(63.3-73.1)		56.0	(54.6-57.4)	
<b>Religion</b>															
Catholic	54.3	(39.5-68.4)	0.646	42.3	(28.0-58.0)	0.011	62.6	(56.5-68.2)	0.972	75.5	(60.5-86.1)	0.377	43.4	(40.9-46.1)	0.000
Protestant	61.2	(55.1-66.9)		55.0	(45.4-64.1)		61.4	(48.2-73.1)		65.6	(60.7-70.2)		46.2	(44.7-47.7)	
Other	[*]	(37.0-78.6)		71.5	(62.2-79.3)		64.1	(38.8-83.4)		[*]	(7.1-92.6)		66.3	(63.1-69.4)	

Note: Fertility risk is defined as meeting one of the following criteria: younger than age 18 at time of birth, age 35 or older at time of birth, birth interval <24 months, or four or more births.  
 [\*] An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

**Appendix Table 3 Distance to health facility is problematic in Kenya counties, by socio-demographic characteristics**

	Nairobi (n=200)				Nakuru (n=168)				Kilifi (n=179)				Migori (n=201)				Kakamega (n=177)				Samburu (n=186)			
	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value
<b>Total</b>	9.1	(5.2-15.5)	0.080	15.4	(8.5-26.2)	0.643	30.3	(18.9-44.7)	0.373	30.8	(22.6-40.4)	0.425	31.9	(25.1-39.6)	0.391	36.2	(22.4-52.7)	0.722	36.0	(17.5-59.9)	36.0	(17.5-59.9)	36.2	(22.4-52.7)
<b>Age of respondent at birth</b>																								
<20	14.2	(5.8-31.0)	0.080	11.2	(3.8-28.5)	0.643	20.1	(8.9-39.5)	0.373	23.9	(11.6-43.1)	0.425	21.1	(8.3-44.2)	0.391	36.0	(17.5-59.9)	0.722	36.0	(17.5-59.9)	36.0	(17.5-59.9)	36.2	(22.4-52.7)
20-29	5.6	(2.6-11.5)		15.8	(6.7-32.9)		30.9	(18.6-46.8)		29.6	(21.6-39.2)		36.2	(25.9-47.9)		34.0	(20.3-51.1)		34.0	(20.3-51.1)	34.0	(20.3-51.1)	39.9	(22.7-60.0)
30-49	14.0	(6.5-27.6)		18.4	(8.6-35.1)		35.9	(17.1-60.4)		36.7	(21.7-54.8)		29.9	(18.1-45.3)		39.9	(22.7-60.0)		39.9	(22.7-60.0)	39.9	(22.7-60.0)		
<b>Parity</b>																								
1 child	7.1	(2.9-16.6)	0.303	10.7	(3.7-27.2)	0.355	12.4	(5.3-26.6)	0.042	6.8	(1.1-31.8)	0.083	23.0	(12.4-38.7)	0.378	34.1	(12.2-66.0)	0.215	34.1	(12.2-66.0)	34.1	(12.2-66.0)	34.1	(12.2-66.0)
2-3 children	8.6	(4.1-17.3)		14.7	(7.0-28.1)		32.5	(19.7-48.5)		29.0	(18.8-41.9)		29.4	(16.6-46.5)		26.9	(14.5-44.3)		26.9	(14.5-44.3)	26.9	(14.5-44.3)	43.2	(26.2-61.9)
4+ children	16.1	(6.9-33.0)		20.3	(9.9-37.1)		37.4	(19.1-60.3)		35.9	(23.9-50.0)		37.4	(25.7-50.8)		43.2	(26.2-61.9)		43.2	(26.2-61.9)	43.2	(26.2-61.9)		
<b>Education</b>																								
None or primary	12.0	(5.6-23.8)	0.246	19.6	(9.5-36.2)	0.119	32.8	(19.7-49.2)	0.065	31.8	(22.9-42.3)	0.508	33.9	(25.2-44.0)	0.365	41.1	(25.2-59.1)	0.002	41.1	(25.2-59.1)	41.1	(25.2-59.1)	41.1	(25.2-59.1)
Secondary or higher	7.3	(3.8-13.6)		10.7	(5.3-20.5)		11.6	(3.3-33.9)		25.9	(12.6-45.7)		27.5	(18.1-39.4)		7.5	(1.8-26.2)		7.5	(1.8-26.2)	7.5	(1.8-26.2)		
<b>Household wealth tertile</b>																								
Poorer	8.6	(2.5-25.2)	0.919	53.9	(24.5-80.8)	0.000	41.4	(24.2-61.0)	0.000	36.6	(27.3-47.2)	0.182	47.8	(32.7-63.3)	0.013	48.7	(30.3-67.5)	0.000	48.7	(30.3-67.5)	48.7	(30.3-67.5)	48.7	(30.3-67.5)
Middle	9.2	(4.8-16.9)		14.2	(7.3-25.8)		17.9	(6.8-39.3)		27.6	(14.3-46.5)		32.6	(23.9-42.6)		4.9	(0.8-25.4)		4.9	(0.8-25.4)	4.9	(0.8-25.4)	5.8	(1.2-23.3)
Richer				6.5	(2.9-13.7)		4.7	(1.1-18.5)		13.4	(3.6-39.1)		16.0	(7.2-31.8)		5.8	(1.2-23.3)		5.8	(1.2-23.3)	5.8	(1.2-23.3)		
<b>Residence</b>																								
Urban	9.1	(5.2-15.5)	0.144	9.8	(5.0-18.2)	0.144	5.6	(1.9-15.4)	0.000	34.3	(21.2-50.5)	0.594	14.4	(4.9-35.5)	0.057	11.4	(4.6-25.2)	0.003	11.4	(4.6-25.2)	11.4	(4.6-25.2)	11.4	(4.6-25.2)
Rural				21.2	(8.7-43.2)		37.6	(21.6-56.9)		29.4	(19.2-42.0)		34.8	(26.9-43.7)		44.3	(26.0-64.4)		44.3	(26.0-64.4)	44.3	(26.0-64.4)		
<b>Religion</b>																								
Catholic	6.6	(2.1-18.5)	0.539	8.0	(1.7-30.2)	0.042	39.2	(15.9-68.8)	0.681	24.7	(7.6-56.7)	0.434	25.7	(9.1-54.4)	0.468	38.8	(20.8-60.4)	0.271	38.8	(20.8-60.4)	38.8	(20.8-60.4)	38.8	(20.8-60.4)
Protestant	10.4	(5.7-18.3)		15.1	(8.2-26.3)		27.5	(15.6-43.8)		31.0	(22.4-41.2)		33.3	(25.4-42.4)		28.3	(16.7-43.8)		28.3	(16.7-43.8)	28.3	(16.7-43.8)	28.3	(16.7-43.8)
Other	0.0			[*]	(15.1-72.4)		31.1	(16.1-51.5)		[*]	(12.4-98.1)		[*]	(3.5-48.6)		55.4	(23.9-83.2)		55.4	(23.9-83.2)	55.4	(23.9-83.2)		
<b>Fertility risk [1]</b>																								
No risk	7.8	(3.9-15.0)	0.208	13.0	(6.0-25.7)	0.310	22.1	(13.1-34.9)	0.023	23.4	(13.3-37.9)	0.153	29.8	(19.0-43.4)	0.661	31.6	(16.3-52.3)	0.340	31.6	(16.3-52.3)	31.6	(16.3-52.3)	31.6	(16.3-52.3)
High risk	12.7	(6.5-23.3)		18.3	(9.4-32.7)		35.6	(20.6-54.1)		34.5	(24.6-46.1)		33.3	(24.2-43.9)		38.9	(23.6-56.8)		38.9	(23.6-56.8)	38.9	(23.6-56.8)		

(Continued...)

**Appendix Table 3—Continued**

	Kisumu (n=154)				Baringo (n=138)				Turkana (n=148)				Kitui (n=140)				National Average (n=7,173)			
	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value		
<b>Total</b>	39.8	(30.5-50.0)		46.3	(35.8-57.1)		48	(40.5-55.6)		55.3	(42.5-67.4)		25.8	(24.2-27.5)						
<b>Age of respondent at birth</b>																				
<20	33.6	(18.9-52.5)	0.351	49.2	(37.3-61.3)	0.871	25.6	(9.2-53.9)	0.276	28.4	(13.6-49.9)	0.018	21.1	(18.3-24.2)	0.000					
20-29	38.4	(26.6-51.8)		46.4	(31.3-62.3)		58.6	(39.5-75.4)		59.0	(42.5-73.7)		25.3	(23.3-27.3)						
30-49	49.6	(33.3-66.0)		44.1	(30.0-59.2)		41.4	(18.9-68.1)		64.1	(46.2-78.8)		29.5	(26.9-32.2)						
<b>Parity</b>																				
1 child	24.7	(11.0-46.3)	0.063	42.6	(25.1-62.2)	0.332	32.8	(11.3-65.2)	0.184	34.7	(16.5-58.8)	0.011	15.9	(13.8-18.3)	0.000					
2-3 children	38.9	(25.7-54.0)		39.7	(26.1-55.0)		61.5	(43.7-76.6)		49.3	(35.0-63.7)		24.0	(21.8-26.4)						
4+ children	53.3	(38.4-67.6)		54.3	(36.4-71.2)		43.3	(33.8-53.4)		71.2	(53.3-84.3)		34.6	(32.1-37.2)						
<b>Education</b>																				
None or primary	53.6	(41.8-65.1)	0.001	51.7	(34.2-68.9)	0.228	48.9	(41.1-56.7)	0.278	59.7	(44.4-73.3)	0.110	30.9	(28.8-33.1)	0.000					
Secondary or higher	22.5	(12.3-37.7)		32.6	(18.2-51.2)		[*]	(6.5-68.9)		34.1	(15.1-60.1)		16.6	(14.6-18.8)						
<b>Household wealth tercile</b>																				
Poorer	64.5	(48.1-78.0)	0.004	68.6	(50.2-82.5)	0.002	51.2	(42.7-59.7)	0.082	69.8	(53.4-82.3)	0.000	42.6	(39.7-45.6)	0.000					
Middle	45.6	(33.1-58.6)		27.1	(12.7-48.6)		0.0			40.0	(29.1-52.0)		27.2	(24.8-29.9)						
Richer	24.5	(12.7-41.9)		26.7	(15.8-41.4)		[*]	(1.5-57.3)		9.8	(1.8-39.3)		12.2	(10.2-14.6)						
<b>Residence</b>																				
Urban	26.2	(16.0-39.8)	0.002	15.7	(10.9-22.1)	0.000	27.2	(13.2-47.8)	0.023	33.9	(11.4-67.2)	0.156	13.5	(11.5-15.8)	0.000					
Rural	59.9	(44.9-73.2)		56.0	(39.8-70.9)		53.5	(43.3-63.5)		59.3	(44.8-72.4)		33.6	(31.5-35.8)						
<b>Religion</b>																				
Catholic	49.5	(28.4-70.8)	0.333	24.4	(7.2-57.2)	0.075	63.2	(41.8-80.5)	0.253	46.1	(28.2-65.0)	0.209	25.2	(22.1-28.5)	0.000					
Protestant	39.3	(28.8-50.8)		46.5	(36.8-56.4)		35.8	(15.3-63.2)		56.8	(39.4-72.6)		24.6	(22.9-26.5)						
Other	0.0			71.6	(39.1-90.9)		38.8	(16.1-67.5)		[*]	(43.1-98.9)		35.8	(31.1-40.8)						
<b>Fertility risk [1]</b>																				
No risk	32.5	(20.5-47.4)	0.034	43.5	(31.8-56.0)	0.590	50.9	(42.9-58.8)	0.400	44.9	(31.9-58.5)	0.005	20.5	(18.6-22.4)	0.000					
High risk	48.3	(37.9-58.7)		48.1	(33.8-62.8)		46.0	(35.6-56.8)		66.3	(50.0-79.4)		31.6	(29.5-33.8)						

Note: Answered by a subsample who completed long questionnaire  
 [1] Fertility risk is defined as meeting one of the following criteria: younger than age 18 at time of birth, age 35 or older at time of birth, birth interval <24 months, or four or more births.  
 [\*] An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

**Appendix Table 4 ANC use in Kenyan counties, by socio-demographic characteristics**

	Nairobi (n=428)			Kisumu (n=329)			Samburu (n=374)			Nakuru (n=346)			Migori (n=431)			Kakamega (n=360)		
	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value
<b>Total</b>	27.6	(23.4-32.4)	0.045	25.8	(19.2-33.7)	0.180	23.2	(17.2-30.5)	0.649	17.6	(12.7-23.9)	0.117	17.5	(14.1-21.5)	0.049	17.2	(12.2-23.6)	0.832
<b>Age of respondent at birth</b>																		
<20	18.4	(10.3-30.7)	0.045	20.4	(12.5-31.6)	0.180	24.2	(15.9-35.0)	0.649	17.2	(8.2-32.6)	0.117	21.4	(13.8-31.7)	0.049	19.9	(10.8-33.8)	0.832
20-29	27.1	(21.3-33.9)		31.1	(21.5-42.7)		20.9	(13.6-30.6)		22.3	(15.0-31.7)		20.3	(15.1-26.9)		17.0	(10.5-26.4)	
30-49	38.0	(28.6-48.4)		20.8	(11.7-34.2)		26.4	(15.0-42.0)		10.1	(4.8-19.9)		9.4	(5.0-16.9)		15.8	(8.8-26.7)	
<b>Parity</b>																		
1 child	30.7	(25.0-37.1)	0.483	36.7	(23.8-51.8)	0.061	21.2	(11.4-36.1)	0.931	21.1	(12.2-33.9)	0.113	20.3	(11.7-32.9)	0.555	26.2	(15.4-41.1)	0.119
2-3 children	25.2	(18.9-32.6)		25.5	(18.5-34.0)		22.9	(12.9-37.5)		21.1	(13.6-31.1)		19.2	(13.4-26.8)		15.7	(10.3-23.4)	
4+ children	27.5	(16.8-41.6)		20.2	(12.6-30.7)		24.1	(16.0-34.7)		10.4	(5.4-19.0)		15.6	(11.5-20.9)		14.2	(8.1-23.8)	
<b>Education</b>																		
None or primary	18.2	(12.6-25.6)	0.002	18.9	(13.4-26.0)	0.009	21.8	(15.4-30.0)	0.137	13.3	(7.8-21.8)	0.049	15.1	(11.6-19.3)	0.009	8.9	(5.7-13.5)	0.000
Secondary or higher	33.5	(28.2-39.3)		35.4	(25.0-47.3)		33.1	(20.9-48.1)		23.0	(16.6-31.0)		29.7	(19.7-42.0)		34.1	(25.0-44.5)	
<b>Household wealth tertile</b>																		
Poorer	14.1	(5.4-32.0)	0.175	19.4	(8.9-37.3)	0.284	19.5	(13.3-27.8)	0.014	1.0	(0.1-8.5)	0.000	18.4	(13.1-25.2)	0.881	12.9	(6.8-23.2)	0.001
Middle	29.0	(24.3-34.3)		22.3	(14.9-32.0)		41.4	(23.6-61.8)		12.1	(6.2-22.1)		16.5	(11.7-22.8)		12.8	(7.5-21.2)	
Richer	29.0	(24.3-34.3)		31.3	(20.9-43.9)		28.5	(21.8-36.4)		25.1	(18.7-32.8)		16.4	(7.7-31.6)		31.4	(24.0-40.0)	
<b>Residence</b>																		
Urban	27.6	(23.4-32.4)	0.839	26.4	(17.3-38.1)	0.839	28.5	(21.8-36.2)	0.226	23.5	(17.2-31.2)	0.067	22.9	(17.4-29.4)	0.041	24.7	(15.4-37.1)	0.142
Rural				25.0	(17.0-35.1)		21.7	(14.7-31.0)		12.0	(5.8-23.2)		15.3	(11.4-20.2)		15.8	(10.4-23.3)	
<b>Religion</b>																		
Catholic	32.8	(24.0-42.9)	0.230	32.0	(16.3-53.3)	0.588	21.9	(15.4-30.0)	0.122	19.5	(10.3-33.7)	0.928	25.5	(13.8-42.4)	0.304	24.0	(12.6-40.8)	0.406
Protestant	25.1	(19.3-32.0)		25.0	(18.7-32.7)		29.1	(18.6-42.5)		17.2	(11.9-24.3)		16.9	(13.3-21.1)		15.9	(11.0-22.5)	
Other	[*]	(19.7-72.4)		[*]	(6.9-64.9)		5.3	(0.6-33.7)		[*]	(3.7-50.5)		[*]			[*]	(6.4-59.8)	
<b>Fertility risk [1]</b>																		
No risk	29.0	(24.1-34.5)	0.218	32.2	(24.3-41.2)	0.012	18.3	(10.7-29.5)	0.192	20.1	(12.9-30.1)	0.317	20.5	(14.5-28.1)	0.205	22.0	(15.0-31.1)	0.064
High risk	23.2	(16.4-31.8)		19.7	(12.7-29.3)		26.2	(18.9-35.1)		14.7	(9.3-22.5)		16.0	(12.5-20.3)		14.0	(8.9-21.5)	
<b>Reported distance to facility as challenge [2]</b>																		
No	29.0	(23.7-35.0)	0.328	28.0	(18.4-40.1)	0.365	33.8	(23.6-45.7)	0.025	22.9	(14.3-34.5)	0.006	17.8	(12.2-25.2)	0.976	21.3	(12.9-33.1)	0.274
Yes	[*]	(5.9-42.6)		20.8	(11.0-35.6)		14.7	(7.2-27.8)		2.6	(0.3-17.0)		17.9	(10.0-30.1)		13.0	(5.0-29.8)	

(Continued...)



**Appendix Table 4—Continued**

	Turkana (n=321)			Kilifi (n=386)			Kitui (n=305)			Baringo (n=294)			National Average (n=14,949)		
	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value
<b>Total</b>	16.3	(10.3-24.8)		15.7	(12.4-19.7)	13.7	(10.5-17.6)	11.6	(6.7-19.4)	18.1	(17.2-19.1)				
<b>Age of respondent at birth</b>															
<20	8.1	(2.8-20.8)	0.172	18.5	(8.9-34.5)	10.5	(5.1-20.7)	3.6	(0.8-15.6)	0.111		16.9	(14.9-19.2)		0.003
20-29	14.3	(8.5-23.1)		14.9	(10.0-21.5)	15.6	(9.2-25.2)	14.9	(8.5-24.8)			19.7	(18.3-21.2)		
30-49	22.0	(10.7-39.8)		15.2	(9.7-23.1)	13.0	(8.7-18.9)	9.4	(3.8-21.3)			16.1	(14.5-17.8)		
<b>Parity</b>															
1 child	10.1	(4.0-23.6)	0.312	15.1	(7.9-26.9)	9.5	(4.1-20.3)	6.2	(2.1-17.0)	0.143		24.0	(22.0-26.2)		0.000
2-3 children	14.6	(7.4-26.7)		20.7	(14.5-28.7)	19.3	(12.4-28.7)	15.7	(7.6-29.6)			18.9	(17.3-20.5)		
4+ children	19.0	(11.5-29.8)		12.9	(7.9-20.2)	11.4	(7.3-17.3)	10.4	(6.1-17.0)			13.0	(11.8-14.3)		
<b>Education</b>															
None or primary	16.7	(9.4-27.7)	0.702	13.9	(11.0-17.5)	13.5	(9.6-18.6)	10.9	(5.5-20.3)	0.593		13.9	(12.9-14.8)		0.000
Secondary or higher	[*]	(2.9-38.6)		26.1	(16.4-38.8)	14.7	(7.0-28.4)	13.1	(6.9-23.5)			25.7	(23.9-27.7)		
<b>Household wealth tercile</b>															
Poorer	16.1	(9.9-25.2)	0.833	13.3	(9.8-17.7)	13.0	(8.0-20.3)	9.0	(3.5-21.2)	0.494		12.5	(11.3-13.8)		0.000
Middle	16.3	(4.1-46.9)		10.7	(5.0-21.4)	16.3	(10.6-24.2)	11.3	(5.7-21.4)			14.7	(13.5-16.1)		
Richer	[*]	(9.5-43.8)		25.3	(16.6-36.5)	10.4	(3.7-25.8)	16.8	(5.7-40.2)			25.0	(23.2-26.9)		
<b>Residence</b>															
Urban	18.6	(8.4-36.3)	0.715	22.5	(14.3-33.5)	9.8	(5.1-18.2)	8.3	(3.3-19.4)	0.437		23.8	(22.1-25.7)		0.000
Rural	15.7	(8.8-26.3)		13.3	(10.2-17.3)	14.3	(10.8-18.8)	12.5	(6.7-22.2)			14.5	(13.6-15.5)		
<b>Religion</b>															
Catholic	13.8	(10.5-17.9)	0.531	28.5	(13.3-50.9)	15.5	(8.2-27.3)	13.1	(2.8-44.0)	0.681		19.6	(17.6-21.7)		0.003
Protestant	17.2	(7.8-33.7)		15.3	(10.8-21.1)	13.2	(9.7-17.7)	12.0	(7.1-19.4)			18.4	(17.2-19.6)		
Other	25.7	(7.2-60.7)		13.6	(8.3-21.5)	[*]	(2.5-52.5)	6.9	(2.3-18.8)			13.5	(11.0-16.4)		
<b>Fertility risk [1]</b>															
No risk	13.7	(8.7-20.9)	0.189	18.1	(13.2-24.4)	15.6	(10.6-22.4)	16.2	(7.4-31.7)	0.066		21.8	(20.3-23.3)		0.000
High risk	18.1	(10.6-29.1)		14.2	(10.2-19.5)	12.0	(8.3-17.1)	8.5	(5.3-13.4)			14.1	(13.1-15.2)		
<b>Reported distance to facility as challenge [2]</b>															
No	20.4	(10.7-35.4)	0.073	18.3	(11.5-27.9)	16.1	(7.8-30.3)	15.8	(6.4-34.1)	0.220		20.1	(18.5-21.8)		0.000
Yes	7.3	(3.0-16.8)		12.2	(5.2-26.2)	16.3	(8.0-30.3)	10.2	(3.2-28.2)			14.8	(12.7-17.1)		

Note: ANC use is defined as four or more ANC visits, with the first visit occurring in the first three months of pregnancy.

[1] Fertility risk is defined as meeting one of the following criteria: younger than age 18 at time of birth, age 35 or older at time of birth, birth interval <24 months, or four or more births

[2] Answered by a subsample who completed long questionnaire

[\*] An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

**Appendix Table 5 Eight components of ANC in Kenyan counties, by socio-demographic characteristics**

	Kisumu (n=329)			Nairobi (n=428)			Nakuru (n=346)			Kitui (n=305)			Mgori (n=431)			Kilifi (n=386)			
	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	
<b>Total</b>	26.6	(22.5-31.2)		21.4	(18.0-25.2)	0.297	17.9	(13.6-23.2)	0.230	15.0	(11.7-19.2)	13.8	(10.6-17.7)	13.3	(9.9-17.7)				
<b>Age of respondent at birth</b>			0.297			0.125			0.230			0.122			0.278			0.891	
<20	23.2	(14.6-34.9)		18.2	(11.1-28.3)		23.9	(14.7-36.3)		7.8	(2.6-21.4)		14.3	(8.6-23.1)		14.3	(7.2-26.6)		
20-29	30.2	(23.4-38.1)		19.4	(14.7-25.2)		18.0	(13.2-24.1)		20.4	(13.9-28.8)		16.3	(11.0-23.5)		13.7	(9.3-19.7)		
30-49	22.8	(16.7-30.3)		30.6	(20.8-42.5)		14.0	(8.1-23.2)		12.3	(7.0-20.5)		9.0	(4.6-17.1)		12.2	(7.1-20.1)		
<b>Parity</b>			0.120			0.146			0.030			0.165			0.495			0.757	
1 child	33.1	(24.0-43.6)		21.0	(15.9-27.3)		17.9	(11.5-26.9)		15.0	(6.5-30.8)		13.3	(7.0-23.9)		12.2	(6.4-21.9)		
2-3 children	28.6	(22.0-36.2)		19.4	(14.6-25.2)		22.9	(16.1-31.6)		21.4	(14.5-30.5)		16.4	(11.9-22.2)		15.4	(9.8-23.3)		
4+ children	20.8	(14.4-29.1)		30.9	(21.2-42.7)		10.7	(6.3-17.4)		10.2	(5.7-17.6)		12.3	(8.2-18.2)		12.5	(7.4-20.5)		
<b>Education</b>			0.082			0.052			0.372			0.089			0.048			0.363	
None or primary	23.5	(18.0-30.1)		16.6	(12.2-22.3)		16.0	(11.7-21.5)		13.5	(9.7-18.6)		12.4	(9.2-16.5)		12.4	(9.1-16.6)		
Secondary or higher	30.8	(25.7-36.3)		24.4	(19.4-30.2)		20.2	(12.9-30.1)		22.9	(14.4-34.5)		20.9	(13.2-31.4)		18.5	(7.7-38.0)		
<b>Household wealth tertile</b>			0.260			0.078			0.078			0.202			0.868			0.263	
Poorer	20.1	(11.9-32.0)		30.7	(20.3-43.7)		10.2	(3.7-25.1)		13.2	(9.2-18.6)		12.9	(8.1-20.0)		11.3	(7.2-17.3)		
Middle	26.3	(21.3-32.1)		20.5	(16.9-24.7)		12.8	(7.1-22.0)		16.3	(10.4-24.5)		14.5	(9.7-21.2)		20.7	(10.1-37.6)		
Richer	29.9	(22.9-38.0)		20.5	(16.9-24.7)		22.7	(16.3-30.8)		22.9	(14.3-34.6)		15.6	(8.1-28.0)		14.8	(9.1-23.1)		
<b>Residence</b>			0.433			0.050			0.050			0.117			0.054			0.294	
Urban	27.8	(21.8-34.9)		21.4	(18.0-25.2)		23.3	(18.3-29.2)		19.2	(15.3-23.9)		19.4	(12.2-29.4)		16.9	(9.5-28.4)		
Rural	24.7	(20.1-29.9)		21.4	(18.0-25.2)		12.6	(6.8-22.3)		14.3	(10.5-19.2)		11.5	(8.7-15.0)		12.0	(8.5-16.7)		
<b>Religion</b>			0.129			0.138			0.479			0.077			0.685			0.216	
Catholic	35.8	(22.2-52.2)		26.6	(18.3-37.0)		21.0	(12.4-33.3)		23.8	(14.2-37.0)		17.2	(7.1-36.1)		12.2	(4.4-29.8)		
Protestant	25.0	(20.3-30.4)		20.4	(16.7-24.6)		17.7	(12.4-24.7)		13.2	(9.9-17.4)		13.6	(10.3-17.7)		17.1	(11.7-24.3)		
Other	[*]	(22.7-80.7)		[*]	(5.7-22.8)		[*]	(0.8-37.4)		[*]	(1.0-37.5)		0.0			9.4	(4.8-17.5)		
<b>Fertility risk [1]</b>			0.106			0.210			0.038			0.005			0.163			0.849	
No risk	31.3	(23.4-40.4)		19.9	(15.9-24.6)		22.7	(16.0-31.0)		21.9	(16.1-29.0)		16.6	(12.4-21.7)		12.6	(7.3-20.9)		
High risk	22.1	(17.2-27.9)		26.2	(18.5-35.7)		12.3	(7.8-18.9)		9.2	(5.5-15.2)		12.4	(8.6-17.5)		13.8	(7.9-22.9)		
<b>Reported distance to facility as challenge [2]</b>			0.777			0.158			0.751			0.617			0.164			0.329	
No	57.2	(43.3-70.0)		47.5	(41.8-53.2)		37.3	(27.0-48.9)		30.2	(22.7-39.0)		32.5	(26.7-38.8)		26.5	(18.6-36.1)		
Yes	54.8	(44.1-65.0)		[*]	(14.2-54.4)		40.7	(24.7-58.9)		34.4	(21.4-50.3)		22.2	(11.1-39.3)		32.9	(23.6-43.7)		

(Continued...)

**Appendix Table 5–Continued**

	Baringo (n=294)			Turkana (n=321)			Kakamega (n=360)			Samburu (n=374)			National Average (n=14,949)		
	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value
<b>Total</b>	12.2	(7.9-18.4)		12.0	(5.9-23.1)	9.8	(6.7-14.2)	8.0	(5.1-12.4)	15.6	(14.8-16.5)				
<b>Age of respondent at birth</b>															
<20	14.7	(6.5-29.9)	0.554	20.1	(6.6-47.4)	0.125	(2.4-17.1)	1.9	(0.3-10.7)	0.060	(11.9-15.5)	0.048	13.6	(11.9-15.5)	
20-29	13.4	(7.9-21.8)		10.0	(5.1-18.7)		(7.9-19.9)	10.1	(6.4-15.6)		(15.3-17.6)		16.4	(15.3-17.6)	
30-49	8.6	(3.3-20.5)		11.4	(5.6-22.0)		(3.7-12.5)	9.3	(4.7-17.5)		(14.2-17.2)		15.6	(14.2-17.2)	
<b>Parity</b>															
1 child	11.7	(5.2-24.2)	0.610	20.4	(6.5-48.5)	0.143	(7.3-27.1)	9.3	(3.3-23.9)	0.847	(16.3-19.9)	0.000	18.0	(16.3-19.9)	
2-3 children	14.7	(8.6-24.0)		5.6	(2.2-13.3)		(5.4-19.5)	8.6	(4.7-15.2)		(15.5-18.2)		16.8	(15.5-18.2)	
4+ children	10.3	(4.9-20.4)		14.1	(6.2-28.9)		(3.8-12.7)	7.2	(3.8-13.3)		(11.5-13.8)		12.6	(11.5-13.8)	
<b>Education</b>															
None or primary	12.1	(7.1-20.0)	0.950	12.4	(5.4-26.2)	0.606	(4.4-13.6)	4.9	(2.5-9.4)	0.000	(11.7-13.5)	0.000	12.6	(11.7-13.5)	
Secondary or higher	12.4	(7.0-20.9)		[*]	(1.5-28.9)		(9.0-20.7)	30.0	(18.4-45.0)		(19.5-22.9)		21.2	(19.5-22.9)	
<b>Household wealth tertile</b>															
Poorer	13.8	(6.7-26.4)	0.097	12.1	(5.6-24.3)	0.929	(3.7-18.3)	4.4	(1.8-10.3)	0.464	(9.4-11.6)	0.000	10.5	(9.4-11.6)	
Middle	4.3	(1.3-13.6)		10.6	(4.9-21.4)		(4.8-15.3)	11.3	(4.5-25.8)		(12.6-15.0)		13.7	(12.6-15.0)	
Richer	18.2	(10.7-29.3)		[*]	(2.4-41.9)		(7.6-23.6)	20.4	(12.2-32.3)		(19.4-22.8)		21.0	(19.4-22.8)	
<b>Residence</b>															
Urban	15.3	(10.1-22.6)	0.371	12.3	(6.8-21.3)	0.953	(4.1-18.0)	17.1	(10.8-25.8)	0.781	(19.4-22.5)	0.000	20.9	(19.4-22.5)	
Rural	11.3	(6.4-19.3)		12.0	(4.8-26.6)		(6.5-15.1)	5.4	(2.6-11.0)		(11.5-13.3)		12.3	(11.5-13.3)	
<b>Religion</b>															
Catholic	23.4	(10.3-44.8)	0.184	10.2	(5.8-17.1)	0.500	(2.7-22.1)	7.5	(4.1-13.5)	0.929	(16.1-20.2)	0.000	18.1	(16.1-20.2)	
Protestant	11.8	(6.7-20.0)		12.7	(4.0-34.1)		(6.7-14.9)	8.4	(4.7-14.5)		(14.8-16.7)		15.7	(14.8-16.7)	
Other	3.9	(0.4-27.0)		20.3	(8.9-39.8)		(1.0-48.1)	6.2	(0.7-37.7)		(8.7-12.6)		10.5	(8.7-12.6)	
<b>Fertility risk [1]</b>															
No risk	14.0	(9.3-20.6)	0.442	9.4	(4.4-19.2)	0.066	(9.2-24.6)	7.8	(4.0-14.9)	0.898	(16.8-19.3)	0.000	18.0	(16.8-19.3)	
High risk	11.0	(5.8-19.8)		13.8	(6.6-26.8)		(3.4-10.9)	8.1	(5.3-12.3)		(12.0-14.1)		13.0	(12.0-14.1)	
<b>Reported distance to facility as challenge [2]</b>															
No	28.5	(18.7-40.9)	0.447	30.1	(12.9-55.8)	0.208	(13.6-30.9)	20.5	(14.3-28.4)	0.592	(33.0-36.6)	0.000	34.8	(33.0-36.6)	
Yes	22.7	(12.0-38.6)		21.8	(10.5-39.8)		(8.6-31.5)	8.0	(2.6-21.6)		(25.0-30.0)		27.4	(25.0-30.0)	

[1] Fertility risk is defined as meeting one of the following criteria: younger than age 18 at time of birth, age 35 or older at time of birth, birth interval <24 months, or four or more births

[2] Answered by a subsample who completed long questionnaire

[\*] An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

**Appendix Table 6 Health facility delivery in Kenyan counties, by socio-demographic characteristics**

	Nairobi (n=428)			Kisumu (n=329)			Nakuru (n=346)			Migori (n=431)			Baringo (n=294)			Kilifi (n=386)		
	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value
<b>Total</b>	90.5	(86.5-93.4)	0.050	73.4	(64.9-80.5)	0.124	72.6	(64.7-79.3)	0.781	58.5	(49.6-66.9)	0.003	57.6	(47.1-67.5)	0.543	55.9	(48.6-62.9)	0.712
<b>Age of respondent at birth</b>																		
<20	86.0	(75.6-92.4)	0.050	82.1	(70.1-90.0)	0.124	74.4	(61.4-84.1)	0.781	70.0	(59.7-78.5)	0.003	51.0	(35.8-66.0)	0.543	60.0	(47.0-71.8)	0.712
20-29	93.5	(89.5-96.1)		73.0	(62.1-81.7)		73.5	(61.7-82.7)		60.5	(49.0-70.9)		57.9	(46.9-68.1)		55.6	(45.9-64.9)	
30-49	85.1	(72.7-92.5)		68.1	(56.3-78.0)		69.8	(59.4-78.5)		45.5	(33.5-58.0)		60.6	(44.9-74.4)		53.7	(41.8-65.2)	
<b>Parity</b>																		
1 child	93.9	(88.9-96.8)	0.000	92.9	(83.9-97.0)	0.000	82.6	(71.8-89.8)	0.000	78.0	(67.5-85.8)	0.001	64.0	(48.7-77.0)	0.080	78.9	(68.0-86.9)	0.005
2-3 children	92.5	(88.4-95.3)		76.5	(64.7-85.3)		80.9	(71.7-87.6)		62.6	(48.6-74.7)		64.3	(51.5-75.4)		56.3	(43.3-68.6)	
4+ children	70.2	(55.5-81.7)		59.2	(48.8-68.9)		53.9	(43.9-63.6)		50.3	(40.4-60.2)		49.0	(34.3-63.7)		44.0	(30.5-58.3)	
<b>Education</b>																		
None or primary	83.2	(76.6-88.2)	0.000	65.6	(55.6-74.4)	0.003	60.4	(49.7-70.2)	0.000	53.1	(43.5-62.5)	0.000	48.3	(36.1-60.8)	0.001	49.1	(40.8-57.4)	0.000
Secondary or higher	95.1	(91.7-97.1)		84.2	(74.3-90.7)		87.6	(81.4-91.9)		85.3	(74.4-92.1)		77.3	(67.1-85.0)		94.5	(83.3-98.4)	
<b>Household wealth tertile</b>																		
Poorer	71.6	(53.2-84.8)	0.0001	60.7	(43.2-75.9)	0.000	33.2	(24.1-43.7)	0.000	53.8	(43.1-64.1)	0.011	31.5	(21.2-44.1)	0.000	42.2	(32.6-52.4)	0.000
Middle	92.5	(88.9-95.4)		88.4	(80.3-93.5)		89.4	(83.0-93.5)		83.4	(67.1-92.5)		89.9	(78.8-95.6)		86.8	(78.2-92.4)	
Richer																		
<b>Residence</b>																		
Urban	90.5	(86.5-93.4)	0.014	81.5	(68.2-90.1)	0.014	84.4	(75.4-90.6)	0.002	75.3	(64.5-83.6)	0.003	91.0	(82.6-95.5)	0.000	80.4	(71.2-87.2)	0.000
Rural				61.1	(51.4-70.0)		61.2	(49.1-72.0)		51.4	(40.1-62.6)		48.3	(35.9-60.9)		47.1	(37.8-56.6)	
<b>Religion</b>																		
Catholic	93.3	(86.1-96.9)	0.222	76.0	(59.8-87.1)	0.417	75.9	(63.6-85.0)	0.119	69.2	(54.0-81.1)	0.207	63.7	(47.5-77.3)	0.000	87.6	(69.2-95.7)	0.000
Protestant	89.3	(84.7-92.6)		72.6	(64.2-79.7)		72.9	(64.5-80.0)		57.7	(48.6-66.2)		61.9	(51.0-71.8)		63.1	(54.7-70.8)	
Other	[*]	(81.1-99.3)		100.0			[*]	(24.0-75.4)		[*]	(3.6-86.1)		13.1	(5.3-29.2)		41.4	(31.0-52.7)	
<b>Fertility risk [1]</b>																		
No risk	93.5	(90.1-95.8)	0.001	83.2	(74.8-89.2)	0.000	83.5	(74.7-89.7)	0.001	67.4	(54.3-78.2)	0.033	72.9	(61.9-81.7)	0.002	70.2	(61.4-77.7)	0.002
High risk	80.8	(70.1-88.3)		64.0	(54.2-72.8)		60.0	(49.5-69.6)		54.0	(44.6-63.2)		47.2	(33.8-61.0)		46.7	(36.5-57.2)	
<b>Reported distance to facility as challenge [2]</b>																		
No	84.9	(77.1-90.4)	0.171	85.5	(77.1-91.2)	0.000	78.1	(66.2-86.7)	0.059	61.3	(50.5-71.1)	0.189	69.8	(57.7-79.6)	0.008	61.4	(50.6-71.1)	0.002
Yes	[*]	(73.2-99.5)		60.2	(47.9-71.3)		61.4	(46.0-74.8)		49.1	(30.7-67.8)		42.7	(28.0-58.7)		40.2	(30.7-50.5)	

(Continued...)

Appendix Table 6–Continued

	Kakamega (n=360)			Kitui (n=305)			Turkana (n=321)			Samburu (n=374)			National Average (n=14,949)		
	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value
<b>Total</b>	52.3	(44.7-59.8)		50.6	(39.7-61.5)		27.8	(15.4-44.9)		27.0	(18.5-37.6)		66.1	(64.7-67.4)	
<b>Age of respondent at birth</b>															
<20	55.9	(38.8-71.8)	0.719	74.0	(61.4-83.5)	0.000	30.3	(13.6-54.6)	0.818	31.5	(20.1-45.7)	0.448	68.5	(66.0-71.0)	0.000
20-29	52.8	(44.4-61.1)		51.5	(39.2-63.6)		25.2	(16.0-37.4)		26.6	(17.1-39.0)		69.2	(67.4-70.9)	
30-49	49.1	(37.6-60.7)		37.1	(25.1-50.9)		30.0	(7.6-69.2)		23.9	(14.8-36.1)		59.1	(56.9-61.3)	
<b>Parity</b>															
1 child	73.0	(60.6-82.7)	0.000	80.4	(67.1-89.2)	0.000	42.5	(29.3-56.8)	0.312	45.5	(32.5-59.1)	0.000	83.8	(82.0-85.4)	0.000
2-3 children	58.9	(47.7-69.2)		58.0	(46.6-68.7)		26.9	(18.4-37.6)		31.0	(20.6-43.8)		71.8	(70.1-73.5)	
4+ children	37.4	(29.1-46.6)		31.0	(19.9-44.8)		24.5	(8.5-52.9)		18.0	(10.7-28.8)		46.6	(44.5-48.7)	
<b>Education</b>															
None or primary	42.0	(33.5-51.0)	0.000	45.2	(33.9-57.1)	0.000	24.7	(12.8-42.3)	0.020	17.7	(11.4-26.4)	0.000	54.7	(53.0-56.4)	0.000
Secondary or higher	73.2	(62.8-81.5)		79.2	(66.2-88.1)		[*]	(42.2-80.9)		92.7	(75.9-98.1)		86.4	(85.1-87.7)	
<b>Household wealth tertile</b>															
Poorer	38.9	(28.6-50.3)	0.000	39.7	(28.5-52.0)	0.000	24.3	(11.1-45.2)	0.001	10.2	(5.3-18.8)	0.000	38.9	(36.8-41.1)	0.000
Middle	48.0	(39.4-56.8)		64.0	(52.6-74.0)		62.8	(42.5-79.4)		48.6	(35.5-61.9)		63.2	(61.2-65.2)	
Richer	75.2	(61.0-85.5)		79.5	(62.3-90.2)		[*]	(48.8-93.7)		81.5	(68.9-89.7)		88.9	(87.5-90.1)	
<b>Residence</b>															
Urban	68.5	(52.9-80.8)	0.033	73.0	(54.3-86.1)	0.019	45.0	(25.8-65.9)	0.157	71.5	(51.0-85.8)	0.000	84.3	(82.6-85.8)	0.000
Rural	49.4	(40.8-58.0)		46.7	(34.7-59.1)		23.3	(8.9-48.6)		14.3	(7.8-24.7)		54.7	(52.8-56.5)	
<b>Religion</b>															
Catholic	53.7	(41.5-65.5)	0.970	56.5	(41.2-70.6)	0.675	23.5	(10.6-44.1)	0.278	25.9	(17.1-37.3)	0.332	69.7	(67.3-72.0)	0.000
Protestant	52.1	(43.8-60.3)		49.3	(37.0-61.7)		29.9	(15.2-50.4)		31.4	(18.6-47.9)		67.6	(66.1-69.2)	
Other	[*]	(31.2-72.7)		[*]	(15.9-81.4)		42.7	(22.0-66.3)		13.8	(3.9-39.0)		47.1	(42.9-51.4)	
<b>Fertility risk [1]</b>															
No risk	65.7	(54.9-75.0)	0.000	65.7	(56.0-74.3)	0.000	29.8	(19.9-42.1)	0.667	34.6	(22.7-48.8)	0.012	78.0	(76.6-79.4)	0.000
High risk	43.5	(34.8-52.6)		37.8	(25.5-52.0)		26.4	(11.4-49.9)		22.3	(14.7-32.3)		52.9	(51.0-54.7)	
<b>Reported distance to facility as challenge [2]</b>															
No	54.6	(43.6-65.2)	0.387	69.7	(58.2-79.2)	0.008	32.9	(15.4-56.8)	0.127	44.2	(30.5-58.8)	0.000	71.4	(69.6-73.2)	0.000
Yes	48.0	(33.3-63.1)		44.9	(29.9-60.8)		21.9	(10.5-40.2)		8.0	(4.0-15.3)		51.1	(47.8-54.5)	

[1] Fertility risk is defined as meeting one of the following criteria: younger than age 18 at time of birth, age 35 or older at time of birth, birth interval <24 months, or four or more births

[2] Answered by a subsample who completed long questionnaire

[\*] An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

**Appendix Table 7 Birth attended by skilled attendant in Kenyan counties, by socio-demographic characteristics**

	Nairobi (n=428)				Kisumu (n=329)				Nakuru (n=346)				Migori (n=431)				Baringo (n=294)				Kilifi (n=386)					
	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI
<b>Total</b>	91.0	(87.3-93.7)		73.4	(64.8-80.6)	0.089	72.4	(64.7-79.0)	0.793	58.1	(49.1-66.5)	0.001	57.8	(47.4-67.6)	0.532	55.3	(48.0-62.3)	0.000	55.3	(48.0-62.3)	0.000	55.3	(48.0-62.3)	0.000	55.3	(48.0-62.3)
<b>Age of respondent at birth</b>			0.070			0.089			0.793		0.001			0.532		0.637		0.637		0.637		0.637		0.637		0.637
<20	88.1	(77.8-94.0)		82.1	(70.1-90.0)		74.4	(61.4-84.1)		70.4	(60.2-78.8)		51.0	(35.8-66.0)		60.2	(47.1-72.0)		60.2	(47.1-72.0)		60.2	(47.1-72.0)		60.2	(47.1-72.0)
20-29	93.7	(89.9-96.2)		73.5	(62.6-82.1)		73.3	(61.8-82.3)		60.4	(48.9-70.8)		58.3	(47.5-68.3)		54.7	(45.2-63.9)		54.7	(45.2-63.9)		54.7	(45.2-63.9)		54.7	(45.2-63.9)
30-49	85.1	(72.7-92.5)		67.5	(55.8-77.3)		69.8	(59.4-78.5)		43.9	(31.9-56.6)		60.6	(44.9-74.4)		53.1	(41.1-64.6)		53.1	(41.1-64.6)		53.1	(41.1-64.6)		53.1	(41.1-64.6)
<b>Parity</b>			0.000			0.000			0.000		0.001			0.093		0.007		0.007		0.007		0.007		0.007		0.007
1 child	95.4	(90.4-97.8)		92.9	(83.9-97.0)		83.7	(73.2-90.6)		83.7	(73.2-90.6)		78.0	(67.5-85.8)		77.1	(66.3-85.2)		77.1	(66.3-85.2)		77.1	(66.3-85.2)		77.1	(66.3-85.2)
2-3 children	92.1	(88.1-94.8)		77.6	(65.8-86.3)		80.0	(70.7-87.0)		62.8	(48.8-74.9)		64.3	(51.5-75.4)		55.8	(42.9-68.0)		55.8	(42.9-68.0)		55.8	(42.9-68.0)		55.8	(42.9-68.0)
4+ children	71.7	(56.0-83.5)		58.1	(47.4-68.1)		53.9	(43.9-63.6)		49.5	(39.6-59.3)		49.5	(35.0-64.1)		44.0	(30.5-58.3)		44.0	(30.5-58.3)		44.0	(30.5-58.3)		44.0	(30.5-58.3)
<b>Education</b>			0.000			0.001			0.000		0.000			0.000		0.000		0.000		0.000		0.000		0.000		0.000
None or primary	83.7	(77.6-88.4)		65.1	(54.9-74.1)		60.1	(49.4-70.0)		60.1	(49.4-70.0)		53.0	(43.4-62.4)		48.7	(36.6-60.9)		48.7	(36.6-60.9)		48.7	(36.6-60.9)		48.7	(36.6-60.9)
Secondary or higher	95.6	(92.3-97.5)		85.0	(75.3-91.3)		87.7	(82.1-91.8)		87.7	(82.1-91.8)		83.6	(71.0-91.4)		77.3	(67.1-85.0)		77.3	(67.1-85.0)		77.3	(67.1-85.0)		77.3	(67.1-85.0)
<b>Household wealth tercile</b>			0.001			0.000			0.000		0.000			0.008		0.000		0.000		0.000		0.000		0.000		0.000
Poorer	74.0	(56.0-86.4)		60.7	(43.2-75.9)		33.2	(24.1-43.7)		33.2	(24.1-43.7)		53.4	(42.7-63.8)		32.0	(21.8-44.3)		32.0	(21.8-44.3)		32.0	(21.8-44.3)		32.0	(21.8-44.3)
Middle	92.9	(89.4-95.3)		88.4	(80.3-93.5)		88.6	(82.0-93.0)		88.6	(82.0-93.0)		83.4	(67.1-92.5)		89.9	(78.8-95.6)		89.9	(78.8-95.6)		89.9	(78.8-95.6)		89.9	(78.8-95.6)
Richer	91.0	(87.3-93.7)		82.1	(68.6-90.6)		61.7	(49.9-72.2)		61.7	(49.9-72.2)		74.6	(63.8-83.1)		91.0	(82.6-95.5)		91.0	(82.6-95.5)		91.0	(82.6-95.5)		91.0	(82.6-95.5)
<b>Residence</b>			0.231			0.419			0.125		0.191			0.004		0.000		0.000		0.000		0.000		0.000		0.000
Urban	94.3	(88.4-97.3)		76.0	(59.8-87.1)		74.9	(62.8-84.0)		74.9	(62.8-84.0)		69.2	(54.0-81.1)		63.7	(47.5-77.3)		63.7	(47.5-77.3)		63.7	(47.5-77.3)		63.7	(47.5-77.3)
Rural	89.5	(84.9-92.8)		72.7	(64.1-79.9)		73.0	(64.8-79.9)		73.0	(64.8-79.9)		57.2	(48.2-65.8)		61.9	(51.0-71.8)		61.9	(51.0-71.8)		61.9	(51.0-71.8)		61.9	(51.0-71.8)
<b>Religion</b>	100.0			100.0			[*]	(24.0-75.4)		[*]	(24.0-75.4)		[*]	(3.6-86.1)		15.6	(6.9-31.5)		15.6	(6.9-31.5)		15.6	(6.9-31.5)		15.6	(6.9-31.5)
Catholic	93.9	(90.9-96.0)		84.1	(75.8-89.9)		83.2	(74.4-89.4)		83.2	(74.4-89.4)		67.5	(54.5-78.3)		72.9	(61.9-81.7)		72.9	(61.9-81.7)		72.9	(61.9-81.7)		72.9	(61.9-81.7)
Protestant	81.6	(70.4-89.1)		63.2	(53.2-72.1)		60.0	(49.5-69.6)		60.0	(49.5-69.6)		53.3	(43.8-62.6)		47.6	(34.2-61.3)		47.6	(34.2-61.3)		47.6	(34.2-61.3)		47.6	(34.2-61.3)
Other			0.174			0.000			0.001		0.024			0.002		0.003		0.002		0.002		0.002		0.002		0.003
<b>Fertility risk [1]</b>			0.174			0.000			0.001		0.024			0.002		0.003		0.002		0.002		0.002		0.002		0.003
No risk	84.8	(77.1-90.3)		85.5	(77.1-91.2)		78.1	(66.2-86.7)		78.1	(66.2-86.7)		60.0	(48.9-70.1)		69.8	(57.7-79.6)		69.8	(57.7-79.6)		69.8	(57.7-79.6)		69.8	(57.7-79.6)
High risk	100.0			60.2	(47.9-71.3)		58.8	(45.3-71.0)		58.8	(45.3-71.0)		49.1	(30.7-67.8)		40.2	(28.0-58.7)		40.2	(28.0-58.7)		40.2	(28.0-58.7)		40.2	(28.0-58.7)
<b>Reported distance to facility as challenge [2]</b>			0.174			0.000			0.020		0.243			0.008		0.006		0.008		0.008		0.008		0.008		0.006
No	84.8	(77.1-90.3)		85.5	(77.1-91.2)		78.1	(66.2-86.7)		78.1	(66.2-86.7)		60.0	(48.9-70.1)		69.8	(57.7-79.6)		69.8	(57.7-79.6)		69.8	(57.7-79.6)		69.8	(57.7-79.6)
Yes	100.0			60.2	(47.9-71.3)		58.8	(45.3-71.0)		58.8	(45.3-71.0)		49.1	(30.7-67.8)		40.2	(28.0-58.7)		40.2	(28.0-58.7)		40.2	(28.0-58.7)		40.2	(28.0-58.7)

(Continued...)

**Appendix Table 7–Continued**

	Kakamega (n=360)			Kilifi (n=305)			Turkana (n=321)			Samburu (n=374)			National Average (n=14,949)		
	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value
<b>Total</b>	53.6	(46.3-60.8)		51.4	(40.2-62.5)		26.3	(16.3-39.6)		30.8	(21.6-41.9)		66.6	(65.2-67.9)	
<b>Age of respondent at birth</b>			0.793			0.000			0.876			0.346			0.000
<20	56.8	(39.3-72.7)		74.0	(61.4-83.5)		29.5	(13.0-53.8)		37.4	(22.9-54.6)		69.0	(66.4-71.4)	
20-29	54.0	(45.6-62.2)		51.5	(39.2-63.6)		25.1	(15.6-37.7)		29.9	(19.8-42.3)		69.6	(67.9-71.2)	
30-49	51.0	(39.6-62.4)		39.3	(27.1-53.0)		26.7	(9.3-56.3)		27.2	(17.4-39.8)		59.9	(57.8-62.1)	
<b>Parity</b>			0.000			0.000			0.132			0.000			0.000
1 child	76.0	(62.6-85.6)		80.4	(67.1-89.2)		41.6	(28.4-56.1)		52.3	(36.7-67.6)		84.6	(82.8-86.2)	
2-3 children	59.5	(48.3-69.7)		59.2	(47.1-70.3)		27.5	(18.7-38.4)		32.3	(21.8-44.9)		71.8	(70.1-73.5)	
4+ children	38.6	(31.0-46.8)		31.9	(20.5-45.9)		21.5	(9.4-42.1)		22.6	(14.2-34.0)		47.6	(45.5-49.7)	
<b>Education</b>			0.000			0.001			0.006			0.000			0.000
None or primary	43.2	(35.0-51.8)		46.1	(34.4-58.3)		23.2	(13.9-36.2)		21.6	(14.6-30.7)		55.3	(53.6-56.9)	
Secondary or higher	74.8	(64.7-82.7)		79.2	(66.2-88.1)		[*]	(41.8-79.1)		96.4	(75.6-99.6)		86.9	(85.6-88.1)	
<b>Household wealth tertile</b>			0.000			0.000			0.000			0.000			0.000
Poorer	41.5	(30.9-52.8)		39.7	(28.5-52.0)		22.5	(11.7-38.8)		14.1	(7.9-23.8)		39.8	(37.7-41.9)	
Middle	49.0	(40.3-57.7)		65.4	(53.3-75.8)		65.9	(52.4-77.3)		52.3	(37.2-66.9)		63.8	(61.8-65.8)	
Richer	76.1	(63.4-85.4)		83.4	(66.4-92.8)		[*]	(48.8-93.7)		85.8	(76.2-92.0)		89.1	(87.7-90.3)	
<b>Residence</b>			0.031			0.024			0.066			0.000			0.000
Urban	68.8	(54.6-80.2)		73.0	(54.3-86.1)		46.8	(26.4-68.3)		74.4	(54.5-87.6)		84.5	(83.0-86.0)	
Rural	50.9	(42.6-59.1)		47.6	(35.3-60.3)		21.0	(9.2-41.2)		18.5	(11.0-29.5)		55.3	(53.5-57.1)	
<b>Religion</b>			0.930			0.576			0.143			0.165			0.000
Catholic	55.7	(43.8-67.1)		58.5	(42.8-72.6)		20.3	(12.6-31.1)		29.0	(19.4-40.9)		70.1	(67.7-72.5)	
Protestant	53.4	(45.3-61.3)		49.8	(37.4-62.3)		29.4	(14.4-50.7)		37.5	(23.0-54.6)		68.0	(66.4-69.5)	
Other	[*]	(31.2-72.7)		[*]	(15.9-81.4)		45.9	(19.7-74.6)		13.8	(3.9-39.0)		49.0	(44.6-53.5)	
<b>Fertility risk [1]</b>			0.000			0.000			0.344			0.085			0.000
No risk	67.3	(56.4-76.5)		66.6	(56.4-75.4)		29.9	(20.0-42.3)		36.9	(24.7-51.0)		78.3	(76.9-79.7)	
High risk	44.7	(36.5-53.1)		38.6	(26.0-52.8)		23.8	(12.4-40.8)		27.1	(18.1-38.6)		53.7	(51.8-55.5)	
<b>Reported distance to facility as challenge [2]</b>			0.670			0.005			0.114			0.000			0.000
No	55.9	(45.0-66.3)		71.6	(59.3-81.4)		34.7	(17.1-57.8)		47.7	(34.5-61.3)		71.6	(69.8-73.4)	
Yes	52.7	(38.6-66.4)		44.9	(29.9-60.8)		22.8	(11.6-40.1)		9.4	(4.9-17.2)		52.6	(49.3-55.9)	

[1] Fertility risk is defined as meeting one of the following criteria: younger than age 18 at time of birth, age 35 or older at time of birth, birth interval <24 months, or four or more births

[2] Answered by a subsample who completed long questionnaire

[\*] An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.

**Appendix Table 8 PNC within 48 hours within Kenyan counties by socio-demographic characteristics**

	Nairobi (n=199)				Baringo (n=138)				Kisumu (n=154)				Nakuru (n=169)				Kitui (n=140)				Samburu (n=185)			
	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	
<b>Total</b>	71.6	(63.0-78.8)		66.4	(56.9-74.8)	0.630	63.0	(54.0-71.2)	0.296	55.3	(44.3-65.8)	0.534	48.5	(37.5-59.6)	0.267	44.5	(36.0-53.3)							
<b>Age of respondent at birth</b>																								
<20	67.8	(52.3-80.2)	0.821	74.0	(53.1-87.8)	0.630	71.0	(54.0-83.7)	0.296	59.2	(41.8-74.5)	0.534	[*]	(34.1-71.7)	0.267	38.2	(23.2-55.9)							
20-29	73.3	(62.9-81.7)		65.5	(52.6-76.5)		57.7	(44.5-69.8)		57.4	(44.2-69.6)		52.8	(38.0-67.2)		43.7	(32.1-56.0)							
30-49	70.2	(48.7-85.4)		63.2	(46.5-77.2)		67.3	(52.3-79.4)		48.8	(32.0-65.8)		37.3	(22.6-54.8)		50.6	(37.0-64.1)							
<b>Parity</b>																								
1 child	80.3	(69.2-88.1)	0.076	76.7	(55.5-89.7)	0.361	79.8	(59.6-91.3)	0.057	63.3	(45.3-78.3)	0.011	64.5	(44.6-80.4)	0.006	55.0	(28.6-78.9)							
2-3 children	70.4	(58.3-80.2)		70.0	(54.2-82.1)		62.2	(46.8-75.5)		64.8	(52.0-75.8)		61.0	(46.0-74.2)		44.6	(29.7-60.6)							
4+ children	54.0	(30.7-75.8)		58.6	(39.5-75.4)		50.6	(37.0-64.0)		36.2	(21.8-53.6)		28.5	(15.5-46.4)		41.1	(31.5-51.4)							
<b>Education</b>																								
None or primary	63.7	(50.9-74.8)	0.087	61.3	(49.2-72.2)	0.091	55.4	(46.6-63.8)	0.107	45.5	(32.2-59.4)	0.012	42.9	(31.2-55.4)	0.005	38.4	(31.1-46.1)							
Secondary or higher	76.8	(66.1-84.9)		79.2	(61.8-90.0)		72.5	(53.8-85.7)		66.4	(54.8-76.4)		75.6	(58.4-87.2)		[*]	(59.1-91.7)							
<b>Household wealth tertile</b>																								
Poorer	[*]	(28.2-78.9)	0.145	60.9	(43.3-76.1)	0.294	50.5	(31.6-69.3)	0.095	19.8	(10.7-33.7)	0.000	41.6	(28.6-55.9)	0.124	32.5	(24.2-42.0)							
Middle	73.6	(65.4-80.5)		63.8	(49.5-76.0)		56.0	(43.2-68.1)		47.3	(30.1-65.2)		58.6	(42.3-73.2)		[*]	(62.0-89.3)							
Richer				77.7	(58.7-89.5)		73.9	(56.7-86.0)		67.8	(56.6-77.3)		[*]	(38.6-81.7)		71.1	(52.1-84.7)							
<b>Residence</b>																								
Urban	71.6	(63.0-78.8)	0.587	70.0	(55.4-81.4)	0.587	68.4	(55.1-79.2)	0.138	65.4	(53.8-75.4)	0.064	57.6	(40.4-73.2)	0.308	69.4	(51.9-82.7)							
Rural				65.3	(53.7-75.4)		55.1	(42.5-67.1)		44.9	(27.6-63.6)		46.7	(34.4-59.5)		36.3	(27.6-46.0)							
<b>Religion</b>																								
Catholic	75.1	(57.7-86.9)	0.512	[*]	(43.6-78.0)	0.678	[*]	(38.6-87.5)	0.460	[*]	(34.5-79.3)	0.233	55.0	(35.2-73.3)	0.740	45.2	(33.4-57.5)							
Protestant	69.7	(58.6-78.9)		68.2	(57.6-77.2)		61.7	(52.4-70.1)		56.4	(45.6-66.7)		46.0	(33.1-59.3)		48.5	(37.4-59.7)							
Other	[*]	(52.3-98.1)		[*]	(30.4-82.6)		100.0			[*]	(9.3-59.9)		[*]	(7.5-89.2)		[*]	(4.7-54.9)							
<b>Fertility risk [1]</b>																								
No risk	74.9	(66.5-81.7)	0.117	76.9	(62.3-87.0)	0.122	70.1	(58.3-79.7)	0.035	67.8	(57.2-76.8)	0.004	62.9	(52.7-72.1)	0.005	42.6	(26.9-59.8)							
High risk	62.8	(45.9-77.0)		59.4	(43.5-73.6)		54.9	(44.2-65.2)		40.2	(26.2-56.1)		33.2	(19.3-50.9)		45.6	(36.0-55.6)							
<b>Reported distance to facility as challenge [2]</b>																								
No	73.2	(65.0-80.1)	0.082	64.1	(51.7-74.8)	0.575	70.1	(59.4-79.0)	0.020	57.8	(45.4-69.3)	0.213	54.8	(43.1-66.0)	0.281	50.3	(40.4-60.2)							
Yes	[*]	(32.1-76.1)		69.2	(53.8-81.2)		52.3	(39.2-65.2)		43.3	(25.1-63.4)		43.4	(27.8-60.3)		33.9	(21.2-49.6)							

(Continued...)



**Appendix Table 8–Continued**

	Migori (n=199)			Kilifi (n=176)			Kakamega (n=175)			Turkana (n=148)			National Average (n=7,152)		
	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value	%	CI	Chi square p-value
<b>Total</b>	40.8	(32.1-50.2)		27.1	(21.2-34.0)		22.9	(15.9-31.8)		14.4	(5.3-33.4)		54.9	(53.1-56.7)	
<b>Age of respondent at birth</b>			0.265			0.716			0.501			0.119			0.030
<20	42.3	(25.2-61.4)		30.9	(20.5-43.7)		15.5	(6.4-33.0)		[*]	(0.5-33.2)		57.0	(53.3-60.5)	
20-29	45.5	(36.5-54.8)		24.9	(15.6-37.3)		23.5	(14.8-35.3)		6.3	(2.2-17.1)		56.2	(53.6-58.7)	
30-49	32.9	(20.9-47.7)		27.8	(17.0-42.2)		25.7	(15.5-39.6)		30.5	(5.9-75.5)		51.7	(48.7-54.6)	
<b>Parity</b>			0.280			0.244			0.112			0.416			0.000
1 child	[*]	(20.7-64.6)		39.0	(22.5-58.5)		27.6	(16.4-42.6)		0.0			66.4	(63.0-69.6)	
2-3 children	47.7	(34.8-60.9)		27.9	(15.4-45.3)		29.3	(17.3-45.2)		10.6	(3.9-25.8)		58.9	(56.2-61.6)	
4+ children	36.4	(26.8-47.2)		20.7	(12.8-31.7)		16.2	(9.3-26.8)		20.6	(4.8-57.3)		42.6	(40.0-45.2)	
<b>Education</b>			0.004			0.020			0.016			0.064			0.000
None or primary	35.3	(25.1-46.9)		24.1	(17.9-31.6)		17.1	(10.3-27.2)		12.8	(3.9-35.0)		46.5	(44.5-48.6)	
Secondary or higher	66.7	(49.6-80.3)		[*]	(29.3-69.0)		35.3	(22.6-50.6)		[*]	(12.9-87.4)		70.1	(67.2-72.8)	
<b>Household wealth tertile</b>			0.086			0.004			0.000			0.173			0.000
Poorer	33.6	(22.3-47.3)		18.6	(12.9-26.0)		17.0	(7.3-34.8)		12.8	(3.7-35.7)		36.0	(33.7-38.5)	
Middle	50.6	(38.9-62.1)		37.8	(24.9-52.8)		14.0	(8.2-22.9)		[*]	(20.4-60.4)		53.3	(50.5-56.1)	
Richer	41.1	(23.4-61.4)		45.1	(27.1-64.5)		51.8	(36.9-66.5)		[*]	(3.6-83.5)		70.1	(67.3-72.9)	
<b>Residence</b>			0.005			0.015			0.004			0.940			0.000
Urban	56.2	(49.2-63.0)		43.0	(27.5-60.1)		46.2	(30.1-63.0)		15.0	(5.7-34.3)		67.0	(63.9-70.0)	
Rural	34.6	(23.6-47.4)		22.3	(16.5-29.4)		19.1	(11.8-29.5)		14.2	(4.1-39.4)		47.2	(45.2-49.3)	
<b>Religion</b>			0.558			0.034			0.111			0.005			0.000
Catholic	[*]	(20.4-65.4)		[*]	(26.4-75.7)		[*]	(14.3-64.4)		3.0	(0.9-9.6)		55.9	(51.9-59.8)	
Protestant	41.3	(31.9-51.4)		28.7	(21.3-37.5)		20.4	(13.8-29.2)		26.3	(8.5-57.8)		56.7	(54.7-58.8)	
Other	0.0			19.3	(11.0-31.5)		[*]	(18.0-77.4)		[*]	(0.7-20.5)		39.7	(35.3-44.3)	
<b>Fertility risk [1]</b>			0.638			0.296			0.108			0.302			0.000
No risk	43.1	(30.3-56.9)		31.1	(21.3-42.8)		29.9	(18.5-44.5)		7.0	(2.1-20.9)		62.3	(60.0-64.6)	
High risk	39.7	(30.1-50.2)		24.6	(18.0-32.7)		18.1	(10.7-28.8)		19.5	(4.9-53.3)		46.9	(44.5-49.2)	
<b>Reported distance to facility as challenge [2]</b>			0.773			0.124			0.184			0.021			0.000
No	41.6	(32.6-51.3)		30.5	(23.5-38.7)		26.1	(18.6-35.3)		25.6	(8.6-55.7)		59.6	(57.6-61.6)	
Yes	39.1	(23.9-56.6)		19.4	(10.8-32.5)		16.0	(7.0-32.6)		2.4	(0.3-15.8)		41.6	(38.7-44.6)	

[1] Fertility risk is defined as meeting one of the following criteria: younger than age 18 at time of birth, age 35 or older at time of birth, birth interval <24 months, or four or more births

[2] Answered by a subsample who completed long questionnaire

[\*] An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.