Population and Health Dynamics in Nairobi's Informal Settlements

Report of the Nairobi Cross-sectional Slums Survey (NCSS) 2012

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Abbreviations

AIDS	Acquired Immunodeficiency Syndrome
ANC	Antenatal Care
APHRC	African Population and Health Research Center
ART	Antiretroviral Therapy
ASFRs	Age-Specific Fertility Rates
BCG	Bacillus Calmette–Guérin
CBD	Community-Based Distribution
CBR	Crude Birth Rate
CEB	Children Ever Born
CPR	Contraceptive Prevalence Rate
DPT	Diphtheria, Pertussis and Tetanus vaccine
EAs	Enumeration Areas
EDC	Electronic Data Collection
FP	Family Planning
FPAK	Family Planning Association of Kenya
FPE	Free Primary Education
FSE	Free Secondary Education
GoK	Government of Kenya
GRR	General Fertility Rate
HepB	Hepatitis B vaccine
HH	Household
Hib	Heamophilus influenza type b vaccine
HIV	Human Immunodeficiency Virus
IEA	Institute of Economic Affairs
IEC	Information, Education and Communication
IUD	Intrauterine Device
KDHS	Kenya Demographic and Health survey
KEPI	Kenya Expanded Program on Immunization
KNBS	Kenya National Bureau of Statistics
LAM	Lactational Amenorrhea Method
LMICs	Low and Middle Income Countries
MDGs	Millennium Development Goals

MMR	Maternal Mortality Ratio
MNH	Maternal and Newborn Health
NACC	National AIDS Control Council
NACHU	National Cooperative Housing Union
NASCOP	National AIDS/STDs Control Programme
NCSS	Nairobi Cross-sectional Slums Survey
NGOs	Non-Governmental Organizations
NNMR	Neonatal Mortality Rate
NUHDSS	Nairobi Urban Health and Demographic Surveillance System
OPV	Oral Polio Vaccine
ORS	Oral Rehydration Solution
ORT	Oral Rehydration Therapy
PNMR	Post-neonatal Mortality Rate
PPP	Probability Proportional to Population size
RH	Reproductive Health
RHFs	Recommended Home Fluids
SQL	Structured Query Language
SSA	sub-Saharan Africa
STIs	Sexually Transmitted Infections
Td	Tetanus, Diphtheria
TF	Total Fecundity
TFR	Total Fertility Rate
TT	Tetanus Toxoid
TV	Television
UN	United Nations
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNEP	United Nations Environment Programme
UNICEF	United Nations Children's Fund
VCT	Voluntary Counseling and Testing
WHO	World Health Organization
WSP-A	Water and Sanitation Programme – Africa

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Executive Summary

This report documents the living conditions and health risks of slum-dwellers across Nairobi's informal settlements a decade after the Nairobi Cross-sectional Slums Survey of 2000 (NCSS 2000). It aims to not only highlight the needs of slum-dwellers but also inform policymakers on the changes that have occurred in the living conditions of Nairobi's urban poor since 2000, considering development interventions by the Government of Kenya (GoK) and its development partners. The primary objective of the NCSS 2000 report was to document population and health problems among the residents of Nairobi's informal settlements and to compare these with indicators from national surveys for other sub-groups of the Kenyan population. The survey report, Population and Health Dynamics in Nairobi's Informal Settlements, for the first time brought to light the plight of slum residents in Kenya. Hitherto, this plight had remained hidden in national data systems and urban averages. In particular, the survey brought to focus the excess mortality and disease burden among the urban poor compared to any other subgroup in the country; their limited access to health care and family planning services; and the debilitating environment that characterizes their physical living conditions, including inadequate access to water and sanitation, poor housing conditions, poor livelihood opportunities and the near-absence of public sector services. A decade after the NCSS 2000, it became critical to revisit the slums of Nairobi to take stock of the changes that had taken place since 2000. The current report is guided by these key questions:

- Are the needs of the slum-dwellers still the same?
- What has really changed since the last report?
- What are the new areas of focus to improve the well-being of the slum-dwellers?

Background

Urbanization has increasingly become a challenging issue for the vast majority of African governments and planners. Although Africa remains the least urbanized continent, it has lately displayed the fastest rate of urbanization in the world. The continent is experiencing the highest urban growth at 3.5 percent per year and this rate is expected to hold until 2050. The corresponding rates for other regions are: Asia 2.03 percent, Europe 0.36 percent, Latin America and the Caribbean 1.23 percent and North America 1.04 percent. Moreover, the share of African urban population was about 28 percent in 1990 but it is projected to reach 52 percent by 2025. The urban population explosion has changed the landscape of African cities and also outstretched the meager financial resources at the disposal of city officials. Instead of bringing inclusive growth and major developments to African cities, urbanization has resulted in the proliferation of informal settlements, commonly known as slums, widening income inequalities and rising urban poverty. Despite the informal nature of such settlements, slums are increasingly becoming a major challenge for policymakers. For instance, according to the United Nations Population Fund's 2007 report on the State of the World, 72 percent of urban residents in sub-Saharan Africa live in slum-like conditions. The unintended consequences of rapid urbanization in the region have posed major intricate policy challenges in relation to scarce livelihood opportunities for the poor and exposure to pernicious heath conditions and low access to electricity and other social services.

From a population of 350,000 in the 1962 census to 3,375,000 in the 2009 census, Nairobi typifies the rapid urbanization and population explosion in sub-Saharan Africa. As the capital and largest city of Kenya, Nairobi has always been the major attraction of various segments of the Kenyan population—from rural and other urban areas—in search of better livelihood opportunities. The consequence of the rapid and uncontrolled population explosion is the proliferation of informal settlements in Nairobi, with between 60 and 70 percent of Nairobi residents estimated to be living in slums. For example, Kibera, a slum in Nairobi, has grown from a population of 3,000 in 1960 to 287,000 in 1999. Similarly, Korogocho went from a population of 2000 in 1970 to 44,000 in 1999. Meeting the increasing demand of this new population is a daunting challenge for policymakers and, specifically, for Nairobi authorities.

Slums are characterized by abject poverty, overcrowding, lack of access to water, as well as exposure to HIV/AIDS and sexually transmitted infections (STIs). Thus, addressing the needs of slum residents will be at the center of reducing poverty and improving overall living conditions in the city.

To understand and address the needs of slum residents calls for appropriate data systems that specifically focus on informal settlements, as national indicators based on national averages blur subgroup inequities within cities and across

sub-groups in the nation. In Kenya, for instance, the national census and the Kenya Demographic and Health Survey (KDHS) data cannot help answer a number of questions critical to the specific health and livelihoods of the urban poor. In response, the African Population and Health Research Center conducted the first cross-sectional slum survey in the city of Nairobi in 2000 and set up the Nairobi Urban Health and Demographic Surveillance System (NUHDSS), a premier urban demographic surveillance system in Africa in two of Nairobi slums, namely Korogocho and Viwandani, in 2002. The 2012 Nairobi Cross-sectional Slums Survey (NCSS 2012) builds on previous efforts in an attempt to generate policy relevant evidence on the changes that have occurred over the past decade in the living conditions of Nairobi urban poor in the context of investment interventions in the past decade.

General Summary

The NCSS 2012 results highlight marked improvements in environmental, health and educational indicators among slum dwellers. However, these improvements were not uniform, with subgroups of younger women and women without formal education being consistently disadvantaged. Additionally, slum residents remain generally disadvantaged in comparison to the rest of Nairobi and Kenya.

Relative to the NCSS 2000 (wherein lack of jobs, proper housing and affordable water supplies were mentioned as the most important needs), lack of drinking water and poor drainage were cited as the major needs for the slum residents in 2012. The findings show that water was a key concern for about one in five of slum dwellers – a substantial increase from 2000. Smaller proportions of slum dwellers reported concerns about housing and access to education. The proportion of slum dwellers concerned about unemployment almost halved between 2000 and 2012. Yet new concerns that were not there in 2000 around garbage/sewer disposal and security emerged in 2012.

There was an increase in the proportion of flush toilet users and a decrease in the usage of traditional and ventilated pit latrines. HIV/AIDS infection was less of a concern, especially among women aged 35-49. This may be related to the aggressive media campaigns, the low cost of purchase and high accessibility to condoms, which have significantly contributed to the decline in the rate of HIV/AIDS infections. Also, increased testing and counseling for HIV was identified as a major contributor to HIV prevention, treatment, care and support. Noticeably, fertility in the slums in 2012 was relatively higher than in Nairobi in 2008-09 (3.5 and 2.8 children per woman, respectively), but lower than the national level (4.6) and that of rural areas (5.2) in 2008-09.

Furthermore, marriage rates in 2012 remained the same relative to the rates observed in 2000. However, women living in the slums were more likely to be married than their non-slum counterparts. Yet, marital instability was noticed in the slums as well as other parts of Kenya, with high divorce and separation rates. Child mortality rates in the slums declined by almost half between 2000 and 2012, while the gap between slum and non-slum areas also gradually shrank. However, gender disparities in child survival remained, with female children being at greater disadvantage than males. There was a positive outcome regarding the decline in the overall number of women engaged with multiple sexual partners. Yet, relative to women resident elsewhere in Nairobi or Kenya, married women in the slums of Nairobi were more likely to have multiple sexual partnerships. Similarly, unmarried slum residents were more than twice as likely to have multiple sexual partners as their non-slum counterparts living in Nairobi; they were also about five times as likely to have multiple sexual partners as women living elsewhere in Kenya.

Progress on the education front was noticeable. There was a substantial increase in the proportion of young people living in slums with secondary or higher education between 2000 and 2012.The gap in the educational attainment between male and female school-age residents also narrowed. However, the existing educational disparity between slum residents and non-slum residents persisted, with slum residents being at a disadvantage relative to their non-slum Nairobi counterparts. In spite of the progress made, unemployment remained a major issue among this already vulnerable segment of the Kenyan population. Overall, unemployment rate worsened for slums residents of all age groups regardless of educational attainment. In addition, employment opportunities for slum residents shrank for both women and men. There was high unemployment rate among women aged 20-24. In the Kenyan context, this group of women has low labor force participation as a result of changes in their marital status. Low rates of completion of at least secondary school education and high illiteracy rates among women aged 44-49 attest to the high vulnerability of this age group. With high illiteracy rate, the burden of their upkeep may fall on their offspring or spouses. Government employment policies geared toward slum residents can significantly help alleviate the glaring poverty among the urban poor in slum areas.

Chapter-Specific Summaries

Characteristics of Households and Respondents

Chapter 2 presents the socio-economic background of slum-dwellers and also compares them to non-slum residents of Nairobi and the entire Kenyan population. Additionally, the chapter compares the characteristics of the current slum residents to the respondents in the NCSS 2000. Despite widespread poverty and precarious living conditions, the slum population continues to increase at an exponential rate. However, the distribution by sex (or gender) changed slightly: the proportion of men aged 15-49 declined—from 37.7 percent in 2000 to 33.3 percent in 2012 while that of women slightly increased from 26.3 percent in 2000 to 29.2 in 2012. Although illiteracy rate increased among women aged 44-49, there was an increase in educational attainment among those aged 15-24, which implies that better educated women are forming the next generation. That notwithstanding, the increase in educational attainment does not translate into more employment opportunities for various groups. In particular, employment opportunities for slum residents shrank for both women and men with high unemployment rate occurring among women aged 20-24 years, mainly due to changes in their marital status. By contrast, high unemployment among women aged 44-49 was mostly due to low levels of schooling.

The prevailing abject poverty in slum areas is typified by the increase in the proportion of households lacking drinking water and proper sanitation. Relative to the NCSS 2000, lack of drinking water and poor drainage were most commonly cited needs of slum-dwellers in 2012. Addressing the issue of water supply and poor drainage should lead to improved health conditions of the population in the slums. Obviously, lack of water exposes slum residents to major health risks that might have long and lasting effects on the population. A positive observation was the increase in the proportion of slum residents using flush toilets and a decrease in the use of traditional and ventilated pit latrines. Yet, lack of water to keep toilets clean, the sharing of toilets by many households, and the increasing concern relating to poor drainage may negate any potential health gains from the use of flush toilets. Noticeably, HIV/AIDS was one of the least reported problems of slum residents in 2012, especially among women aged 35-49. This may be attributed to the prevention campaigns undertaken by various non-governmental organizations (NGOs), availability of cheaper treatment, and government policies raising awareness about the consequences of the disease.

Fertility levels

Chapter 3 discusses fertility levels and trends in the slums and also compares them to levels in non-slum areas of Nairobi and the rest of the country. Fertility declined in Nairobi slums between 2000 and 2012, dropping from 4.0 children to 3.5 children per woman. The decline was, however, not uniform across divisions: Fertility increased in Westlands but stagnated in Dagoretti and Pumwani divisions. Although the fertility level observed in the Nairobi slums was higher than that in Nairobi as a whole in 2008-09, it was lower than the national average (4.6) and that of rural Kenya (5.2). Additionally, education attainment was negatively associated with fertility while married women had higher fertility than their unmarried counterparts, which is consistent with the claim that marriage remains closely associated with childbearing in African societies. Women from the Luo ethnic group had the highest fertility, which is consistent with findings from KDHS. Also, findings indicate that there were differences between the number of children ever born and the number of living children at the time of the survey, suggesting that child mortality remains a concern in Nairobi slums. Furthermore, in 2012, a substantial proportion (23 percent) of births occurred shortly after the preceding birth (less than 24 months), thereby putting the lives of many women at risk of complications and poor health outcomes in a very challenging environment. The proportion of births in the slums occurring within short intervals in 2012 was similar to that recorded in 2000, but higher than that of Nairobi as a whole. The median birth interval marginally increased between 2000 and 2012 (from 34.1 to 36.3 months). Older women had longer birth intervals. Contrary to expectations, the median birth interval was longer following a female than a male birth. Consistent with previous evidence, the median birth interval was much shorter when the preceding birth was no longer alive (28.6 vs. 36.7 months). Median birth interval increased with education level. Age at first birth did not change much between 2000 and 2012 but was positively associated with educational attainment. Like in 2000, women from the Kikuyu ethnic group entered into motherhood later while their Luo counterparts did so at an earlier age. Muslim women and those from Pumwani and Kasarani Divisions had the lowest age at first birth.

Fertility regulation

Chapter 4 sheds light on the levels of knowledge, attitudes and use of contraceptive methods among women of reproductive age (15-49 years). It also compares the results from 2012 with those in the NCSS 2000. Relative to 2000, findings indicate that knowledge of contraceptive methods remained high (95 percent), while there was substantial improvement in the use of modern contraceptive methods (from 32.3 percent to 40.1 percent) among all women in the slums. The increase could be due to media coverage, higher accessibility and lower cost of male condoms. However, there were differences in knowledge, attitude, and use of contraceptives among women of different socio-economic and demographic groups. Specifically, young women between the ages of 15-19 years, those with no formal education, and sexually active unmarried women performed poorly on most of the indicators compared with other groups. Furthermore, there was a general increase in any contraceptive usage among married women in the slums (from 45.7 percent in 2000 to 57.3 percent to 2012). The 2012 contraceptive prevalence rate (CPR) of any method among currently married women living in slums was substantially higher than the national rates in KDHS 2008-09 (57.3 vs. 45.4 percent). By contrast, the CPR for sexually active unmarried women remained lower than that of married women. This finding indicates that sexually active unmarried women, majority of who are below age 25 years, should be targeted with information and services as they remain exposed to adverse reproductive health outcomes, such as unintended pregnancy.

Other proximate determinants of fertility

Chapter 5 presents findings on the proximate determinants of fertility among slum women. More specifically, the chapter focuses on the trends in age at first marriage and age at first sexual intercourse, as well as patterns in current sexual activity and post-partum insusceptibility. Findings indicate that relative to 2000, marriage rates remained the same in the slums (on average 60 percent). Nevertheless, women in the slums were more likely to be married than women in the whole of Nairobi (60 percent versus 50 percent). Moreover, higher marital instability was observed in the slums compared with other parts of Nairobi in 2008-09 (8.1 percent and 6.5 percent, respectively). In addition, marital instability in the slums was higher than both national and rural levels. Although there was an increase in the age at first marriage between 2000 and 2012 among women living in the slums (20.2 years to 22.0 years), they got married two years earlier than their non-slum counterparts (24.2 years). Women in the slums also reported higher levels of sexual activity compared to women in other parts of Kenya although the proportion of women abstaining for non-post-partum reasons increased between 2000 and 2012. Noticeably, there was a delay in the first sexual encounter among women in general between 2000 and 2012 (16.9 years to 18.0 years among women aged 15-24, and 16.7 to 19.0 among women aged 25-49). Notwithstanding, women in slum areas initiated sexual intercourse earlier than their non-slum counterparts (19.0 years among women aged 15-24, and 20.0 years among women aged 25-49) in Nairobi.

Fertility preferences

Chapter 6 deals with questions related to the desirability of additional children, demand for family planning, ideal family size and planning status of births among women in Nairobi slums 2012. It also compares the findings with those of NCSS 2000 and KDHS 2008-09. Findings indicate that the proportion of women in the slums who desired more children declined in 2012 relative to 2000 (from 57 percent to 53 percent). The desire for children was, however, higher in the slums than the entire Kenya. This finding is indicative of the pro-natalist values prevalent among women living in the slums. Moreover, the ideal family size in Nairobi slums slightly decreased between 2000 and 2012 (from 3.2 to 3.0 children). The level was, however, marginally higher than that of Nairobi as a whole (2.8 children) but lower than the national level (3.8 children) and that of rural areas (4.0 children).

The total demand for family planning services among women in the slums substantially increased from 67 percent in 2000 to 79 percent in 2012. The 2012 level of demand among married women in the slums was higher than the demand among Kenyan women overall (72 percent), those in rural areas (71 percent), other urban areas (76 percent) and women in Nairobi as a whole (71 percent) in 2008-09. In addition, the level of satisfied demand was lower in the slums (60 percent) than at the national level (63 percent) and in Nairobi as a whole (78 percent). However, the gap between slum and non-slum women reduced between 2000 and 2012. In addition, the level of satisfied demand among married women increased from 65 percent in 2000 to 70 percent in 2012, a greater percentage than what was observed among women at the national level (63 percent) and in urban areas (61 percent) but a lower percentage than among women in Nairobi as a whole (78 percent). The level of unmet need for family planning was higher among women in the slums than among those in Nairobi as a whole while about 1 in 4 of the women in the slums experienced unwanted fertility. The findings

call for increased focus by family planning programs on women living in slum settlements that should entail targeting of specific segments of the population such as those who are uneducated and those from certain religious groups.

Infant and childhood mortality

Chapter 7 discusses the levels and trends in infant and childhood mortality in the slums, Nairobi and the whole of Kenya. Overall, childhood mortality in the slums declined substantially between 2000 and 2012 (Infant Mortality Rate: from 88.2 to 39.2 per 1000 and Under-five Mortality Rate: from 136.4 to 79.8 per 1000). Moreover, the gap in the mortality rates between slum and Nairobi non-slum areas narrowed (Infant Mortality: 60.0 per 1000, Under-five Mortality Rate: 63.4 per 1000). Although the decline in mortality rates in the slums is encouraging, distinct disparities were observed by division of residence, child gender and mother's ethnicity. The trends in childhood mortality in the slums can be attributed to a number of factors, such as the increase in health facility deliveries, improved immunization coverage, improved household access to sanitation and increased access to treatment for childhood fever.

Maternal and child health

Chapter 8 discusses maternal and child health in the slums, Nairobi and Kenya. Findings indicate that nearly all (96 percent) mothers in slums obtained antenatal care services from a health professional. This is indicative of the importance attached to the health of the child in the informal settlements. However, there was a small but negligible proportion (2 percent) of the slum mothers who obtained antenatal care services from traditional birth attendants. Traditional birth attendants may not be well-equipped or trained to detect any complications that could threaten the lives of both the mother and child. Thus, there is a need to understand and address the rationale behind preference for traditional birth attendants over a health professional. There was also high rate of delivery in health facilities (81 percent) and deliveries assisted by a trained professional (82 percent) among slum women of Nairobi.

Children born in slums had lower birth weights relative to their counterparts at the national level and in Nairobi as a whole. Moreover, immunization coverage in slums for all recommended vaccines is low. Only 45 percent of children were fully immunized at the time they were 12 months old, which falls short of the recommended 85 percent coverage. Immunization rates at 12 months for indicator vaccines used to assess community coverage as well as dropout rate such as DPT1 and measles indicate that more children in the slums received the first compared to subsequent rounds of immunization with the rates falling from 91 percent for BCG to 66 percent for measles. Polio immunization rates are lower than those for DPT yet they are administered at the same time, indicating missed opportunities. Given the crowding of slum communities and the associated risk in case of an isolated polio case, there is need for the KEPI program to consider rigorous community mobilization to educate parents and guardians on the benefits of full and on-schedule immunization of children. Further, the program needs to devise ways to maximize coverage by introducing mobile units to bring the services to the communities as this would reduce drop-out of children from BCG to measles immunization. Overall, immunization coverage for all vaccines in the slums was higher than the national average, other areas of the country, and Nairobi as a whole when immunization at any time as opposed to on-schedule immunization is considered. This can be attributed to the outreach campaigns that are conducted during national immunization days for specific vaccines as they target areas not well reached during routine immunization, such as slums and other remote areas.

Other childhood morbidities in the slums include cough and diarrhea. Although the prevalence of cough decreased in the inter-survey period, infants aged below six months (32.3 percent compared with 65.0 percent for those aged 24-35 months) and children of higher-order births (42.4 percent compared with 67.9 percent for first-order births) were the least likely to be taken to a health facility for treatment. This is an issue of concern that might lead to higher infant mortality in these communities. Prevalence of diarrhea with blood was higher in the slums in 2012 (8.0 percent) than in Nairobi (0.6 percent) and the country as a whole (3.3 percent) in 2008-09. For infants below six months high prevalence of bloody diarrhea may be related to early introduction of complimentary foods, which could lead to exposure to pathogens.

HIV/AIDS and other sexually transmitted infections

Chapter 9 discusses knowledge of HIV/AIDS and other sexually-transmitted infections in the slums. Among the urban poor, HIV/AIDS was the most widely reported and known STI relative to the other STIs, such as gonorrhea, syphilis and genital warts. Findings indicate that there was a positive relationship between the educational level of a person and knowledge of STIs. Women with no formal educational were the least knowledgeable. Although radio remained the main source of information on HIV/AIDS in communities in 2012 as in 2000, the role of community meetings increased over time.

There was improvement in the sexual behavior of married and unmarried women in the Nairobi slums between 2000 and 2012: the proportion of women with multiple sexual partners substantially declined during the period. Also, primary abstinence among unmarried women increased from 29 percent in 2000 to 58 percent in 2012. Despite the improvements, the proportion of married and unmarried women with multiple sexual partners in slums remained high, relative to other parts of Nairobi and Kenya as a whole. Moreover, married women in Nairobi slums were 69 percent and 31 percent more likely to have multiple sexual partnerships compared to those residing elsewhere in Nairobi and Kenya as a whole, respectively. The outcome is similar for unmarried women, with slum dwellers being more than twice and about five times as likely to have multiple sexual partners as their counterparts living elsewhere in Nairobi and Kenya, respectively. Multiple sexual partnerships are one of the major drivers of HIV/AIDS epidemic in Kenya. Thus, discouraging multiple sexual partners can significantly help reduce HIV/AIDS prevalence in the country. It is, however, worth noting that slum residents were less likely to use condom relative to other Nairobi residents. Responses to the question on behavior change to prevent getting AIDS show that the majority of women had changed their sexual behavior in a variety of ways, including staying with one partner, asking their spouse to be faithful, remaining virgins, reducing the number of sexual partners, stopping all sexual relations, and using condoms.

Young people in Nairobi's informal settlements

Chapter 10 discusses the changes in socio-economic, sexual and reproductive behaviors among young people aged 12-24 years between 2000 and 2012. Findings indicate an increase in the proportion of young slum residents with secondary or higher levels of education (27.8 percent to 48.8 percent for females and 34.4 percent to 52.0 percent for males). Although salutary, it is important to mention the existing disparity in educational achievement between young slum residents and their non-slum counterparts, which highlights the relative disadvantage faced by the former. Also, there was a decline in the proportion of young people reporting alcohol and drug use between the two surveys particularly among males (20.3 percent to 15.6 percent for alcohol use, and 18.8 percent to 13.3 percent for drug use). However, there was high level of alcohol and drug use among orphaned young males, which indicates the vulnerability of this specific group. Programs aimed at assisting this vulnerable group cope with the loss of their beloved ones can be part of future interventions among the young slum residents. Moreover, the study highlights the vulnerability of young slum dwellers aged 15-24 to various risky sexual behaviors. For example, young slum males were about 3 times as likely to have had 2-3 sexual partners in the 12 months preceding the survey compared with their male counterparts in Kenya as a whole in 2008-09; young females were about twice as likely. Although schools could be used as an avenue for reaching out to these vulnerable and high-risk groups, they are likely not to attend school due to various reasons. Findings further show that there was a decline in the proportion of unintended pregnancies among young people living in the slums between 2000 and 2012 (from 51.4 percent to 42.9 percent). These improvements are mostly attributed to increased investments in sexual and reproductive health programs in slums as well as increased levels of contraceptive use. However, the study also revealed some challenges with respect to reaching out to vulnerable groups of youth, such as those of the Muslim faith who were the least likely to use contraceptive methods. The involvement of leaders of these communities in educating the young people about the consequences of their actions would therefore be salutary.

CHAPTER 1: INTRODUCTION

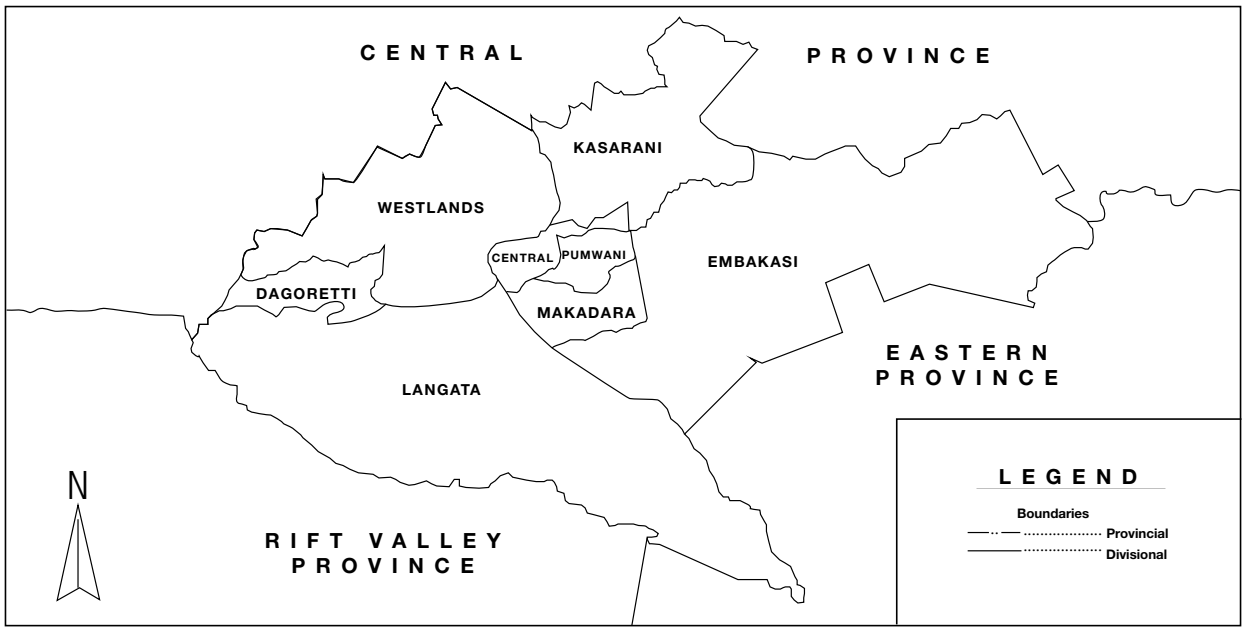
Blessing Mberu, Patricia Elung'ata and Kanyiva Muindi

1.1 Background

Cities are the future of our world. Today, more than half of the world's population lives in urban centers—and this proportion will continue to grow. By 2050, nearly seven in ten persons in the world will be living in cities and for sub-Saharan Africa (SSA), currently the least urbanized region of the world, the share of its urban population will increase from the current 37 percent to more than 60 percent[1, 2]. With a 3.53 percent average annual rate of change of the urban population between 2015 and 2020, SSA region is projected to have the highest urban growth rate in the world by 2050 [3]. Comparative rates for other regions are: Asia 2.03 percent, Europe 0.36 percent, Latin America and the Caribbean 1.23 percent, and North America 1.04 percent [4]. Indeed, by 2030, 95 percent of the world's population growth and 97 percent of the growth in the developing world will occur in cities in low and middle income countries [2, 5].

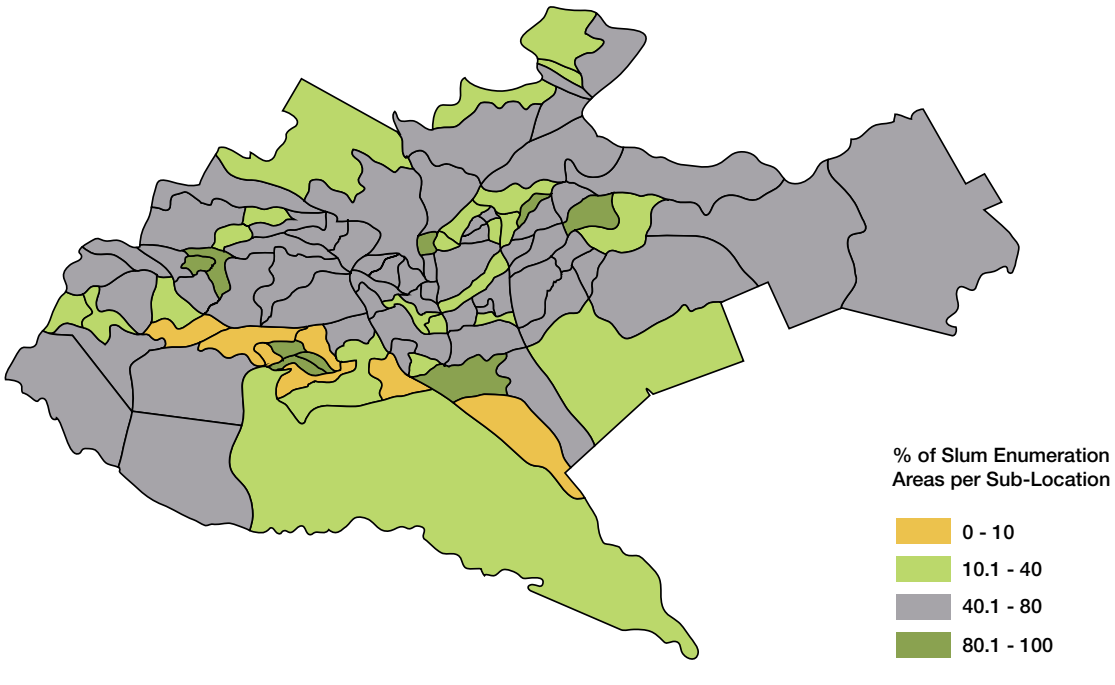
People are attracted to cities because they generally offer more choices (such as good quality housing), opportunities (such as employment) and services (such as education and health care) to the residents. However, cities also concentrate health risks and hazards and the impact of adverse developments such as water contamination and air or noise pollution. The impact of natural disasters is also amplified in densely populated urban settings[6]. Further, a mismatch between rapid population growth of cities and the ability of governments to provide infrastructure and opportunities essential for leading fulfilling lives enhances these risks and hazards. Today, nearly one billion people—one third of urban dwellers in the world—live in informal settlements or slums, characterized by overcrowding, social and economic marginalization, poor environmental conditions, insecurity and near absence of basic social services [7-10]. As a result, poverty, which in previous centuries was greatest in dispersed rural areas, is now heavily concentrated in cities [11]. Nairobi, Kenya's capital city, is a typical example of an African city that is growing at a rapid rate. This is despite poor urban governance, limited employment and a dearth of other life-enhancing opportunities for existing and incoming dwellers. Between 1969 and 1999 the city grew at a rate of about 5 percent per annum and had an additional 1.1 million in a decade [12]. According to the 2009 census, Nairobi is the most populous city in East Africa, with an estimated population of 3 million. The city covers an area of 684 square km, comprising eight administrative divisions: Westlands, Dagoretti, Kasarani, Lang'ata, Starehe, Central, Embakasi, and Makadara (see Figure 1.1). It is a politically and economically prominent city in Africa and home to thousands of locally-owned businesses and more than 100 major international companies and organizations, including the headquarters of the United Nations Environment Programme (UNEP) and UN-HABITAT.

Figure 1.1: A Map of Nairobi showing the Administrative Divisions



Despite being an established hub for business and culture, with one of the largest stock markets in Africa, Nairobi has some of the most dense, unsanitary and insecure slums, with over 100 slums and squatter settlements within the city[8] (see Figure 1.2). The poor standard of living in many cities in low and middle income countries (LMICs) has led researchers to question the long-held view of the so-called urban advantage, which assumes that urban dwellers fare better than their rural counterparts in economic and health conditions. Current studies show that in some poorly-governed urban centers in LMICs, life expectancy at birth is as low as 35 years, which is lower than in many rural settings[13]. The grim situation associated with urban slum living has attracted global attention and led to a call for concerted efforts and actions to address the economic and health challenges of slum dwellers (or the urban poor), prominent among which is the adoption in 2000 of the Millennium Development Goals (MDGs) 4, 5 and 7 [1, 8, 14-16].

Figure 1.2: A Map of Nairobi showing the Number of Slums per Sub-location



Source: www.kibera.org.uk

It is against this background that the African Population and Health Research Center (APHRC) designed and implemented the first Nairobi Cross-sectional Slums Survey (NCSS 2000). The primary objective of the survey was to document population and health indicators among the residents of Nairobi's informal settlements and to compare these with indicators from national surveys for other sub-groups of the Kenyan population. The survey report brought to light the plight of slum residents in Kenya for the first time[1]. Hitherto, this disadvantage had been hidden in national data systems and urban averages. In particular, the survey brought to focus the excess mortality and disease burden among the urban poor compared to any other subgroup in the country: their limited access to health care and family planning services; and the debilitating environment that characterizes their physical living conditions, including inadequate access to water and sanitation, poor housing conditions, poor livelihood opportunities and the near absence of public sector services[1].

A decade after the NCSS 2000 survey, it became critical to revisit the slums of Nairobi to take stock of the changes since 2000. Importantly, following the global push for the achievement of MDGs and enhanced accountability on the part of the Government of Kenya (GoK), substantial attention and resources have been invested in the past decade by the Government itself, development partners, and non-governmental organizations to improve health and economic outcomes in the country. For instance, in the last decade, the Ministry of Health in Kenya introduced a budget line for contraceptive commodities and made a policy shift on health service access whereby children under 5 years of age received free treatment at public health facilities (2002). There have been several slum-specific projects such as slum upgrading (initiated in 2001), cash transfers to older persons (pilot launch, 2006; official launch, 2009), Output Based Approach Voucher scheme to enable poor women deliver in hospitals (2005), policies to provide non-formal schools in slums with government support under the free primary education program (2010), and allocation of funding for hand-washing in schools to improve health outcomes. Other notable interventions in the past decade include the World Bank Water and Sanitation Programme-Africa (WSP-A) in Kenya, the Pamoja Trust and the National Cooperative Housing Union (NACHU),

both of which are active in housing for the urban poor and activities around HIV/AIDS treatment and prevention by such agencies as the National AIDS Control Council and UNAIDS and UNICEF.

Results from the most recent Kenya Demographic and Health Survey (KDHS) in 2008-09 show general improvements in key social, economic and health indicators at the national level[17]. However, due to the limited coverage of slum residents in the sample, the KDHS report is unable to answer a number of questions that are critical to the health and livelihood of the urban poor. In particular, the KDHS data do not enable an investigation of the following questions: Have the urban poor benefited as much as other groups from the progress registered at the national level? Are slum residents better off today than they were 10 years ago and in what areas? Have inequities in reproductive health and demographic indicators between slum residents and other sub-groups in Kenya narrowed or widened?

To provide answers to these questions, the African Population and Health Research Center, supported by the Bill and Melinda Gates Foundation, conducted the second Nairobi Cross-sectional Slums Survey (NCSS 2012). This is a critical part of the search for pathways to reduce health inequities and improve health outcomes including family planning and reproductive health (FP/RH) among populations in resource-poor urban settings in Kenya and other parts of SSA. The NCSS 2012 will not only help assess the progress towards meeting the MDG 4, 5 and 7 in Kenya, but also provide an updated demographic and health profile of the residents of Nairobi's informal settlements and identify current challenges faced by the urban poor in access to, and use of, health, education and other social services since 2000[9].

1.2 Objectives of the NCSS 2012

The overarching goal of NCSS 2012 was to strengthen the evidence base to guide policies and programs aimed at improving the wellbeing of the urban poor. Specifically, the survey pursued three main objectives:

1. To document current population and health challenges among the residents of Nairobi's informal settlements.
2. To take stock of the changes (or the lack thereof) in health outcomes, livelihood conditions and demographic behavior among slum dwellers in Nairobi, ten years after the NCSS 2000.
3. To compare indicators among slum dwellers in Nairobi to other urban population sub-groups and rural dwellers in Kenya.

1.3 The NCSS 2012 Sample Size and Selection

The sample for the NCSS 2012 was designed to allow estimation of key indicators in the slums of Nairobi with a margin of error of 2-5 points (95% level of confidence). The following indicators were considered in the sample size calculation: under-5 mortality rate, percentage of under-5 children who had diarrhea in the 2 weeks preceding the survey, percentage of children aged 12-23 months who had been vaccinated against measles, and percentage of children aged 12-23 months who had been fully immunized. The following sampling formula was used to calculate the number of children required to estimate each indicator:

Equation 1.1: Sampling Formula, NCSS 2012

$$n = \frac{z^2_{1-\frac{\alpha}{2}} \times p \times (1\text{-}p) \times deff}{e^2}$$

Where:

n = required sample size of the individuals of target population;

p = expected rate or prevalence of the key indicator to be estimated;

$deff$ = design effect;

e = margin of error to be tolerated at 95% level of confidence, set at different sizes for different indicators

$z_{1-\alpha/2}$ = critical value for the standard normal distribution corresponding to a Type I error rate of α for a two-tailed test. For α = 0.05, $z_{1-\alpha/2}$ is equal to 1.96.

The number of households required to estimate each indicator was then obtained by adjusting the resulting sample size according to the proportion of the target population to the entire population, non-response rate and average household

size. The required number of households is summarized in Table 1.1 below. As shown in Table 1.1, the number of households required to estimate the percentage of children 12-23 months who are fully immunized is large enough to allow estimation of the other indicators with the specified precision. We therefore used the proportion of fully immunized children in the poorest wealth quintile as an estimate of the proportion of full immunization coverage in Nairobi slums. Findings from the KDHS 2008-09 show this proportion to be 65.9 percent. Using the above formula, we estimated that a minimum of 518 children was required to estimate full immunization coverage in the slums. By adding to the above formula a 3.52 percent estimate of the proportion of children aged 12-23 months living in the slum (a proportion obtained from NUHDSS data collected between 2006-2010 in Korogocho and Viwandani slums), it was estimated that 14,714 individuals (=518/0.0352) would need to be interviewed to be able to reach 518 children aged 12-23 months. Given an estimated average household size of 2.5 in the NUHDSS slums, 5,886 (=14,714/2.5) households would need to be visited to reach 14,714 individuals. Assuming a 10 percent household non-response rate, an initial 6,540 households (5,886 / (1-0.10)) were sampled.

Table 1.1: Sample Size Calculation, NCSS 2012

	% of children aged 12-23 months fully immunized	% of children aged 12-23 months vaccinated against measles	% of under-5 children who had diarrhea	Under-5 mortality rate
Estimate of the indicator for the poorest wealth quintile in Nairobi Province (p)^	0.66	0.76	0.20	0.09
Design effect (deff)	1.50	1.50	1.50	1.50
Margin of error (e)	0.05	0.05	0.03	0.02
$z_{1-\alpha/2}$ (95% level of confidence)	1.96	1.96	1.96	1.96
Sample size of children required based on formula	517.95	425.17	1016.68	1192.78
Proportion of population targeted	0.04	0.04	0.13	0.13
Number of people needed given the proportion of children in total slum population ^^	14714.47	12078.59	7850.82	9210.69
Average Household (HHD) size^^	2.50	2.50	2.50	2.50
Number of households required	5885.77	4831.44	3140.33	3684.28
Response rate	0.90	0.90	0.90	0.90
Number of households required adjusted for response rate	6539.76	5368.26	3489.25	4093.64

^Kenya Demographic Health Survey, 2008-09

^^Nairobi Urban Health and Demographic Surveillance System, 2006-2010

The distribution of the sample by clusters or Enumeration Areas (EAs) was estimated according to the relative size of each administrative location. The list of administrative locations containing at least one EA categorized as an informal settlement or slum was obtained from the 2009 Kenya Population and Housing Census. A total of 42 administrative locations comprising 3,939 slum EAs were identified. To reduce intra-cluster correlation only 35percent of households in each sampled EA were visited; thus 220 (6540/ (100/0.3) EAs were sampled. Using the probability proportional to population size (PPP) sampling methodology, the 220 sampled EAs were distributed across the 42 administrative locations. Table 1.2 provides the summary of the distribution by Division.

Table 1.2: Distribution of sampled EAs per Division, NCSS 2012

	Slum EAs	Selected EAs (30% sampling fraction)
Embakasi	1,049	59
Makadara	367	20
Central	293	16
Kasarani	352	20
Pumwani	241	13
Dagoretti	615	34
Kibera	706	39
Westlands	316	18
Total	**3,939**	**220**

1.4 Sample Design and Coverage

A two-stage sampling methodology was used to select the 6,540 households. At the first stage, 30 percent of the sampled EAs were selected with PPP, yielding 220 EAs. A household listing carried out within each cluster found that a total of 188 EAs still existed, four years after the 2009 census. Thirty-two EAs were no longer in existence due to demolitions and flooding. At the second stage, a random sample of 35 percent of the households in each cluster was drawn based on the household listing and this produced 6,583 households. A total of 314 vacant structures were dropped from the initial number of sampled households, which reduced the sample size to 6,269 households. Of these, 5,490 households were successfully interviewed yielding a household response rate of 88 percent. Sample weights were calculated and applied to all reported estimates.

A total of 4,912 women were eligible to be interviewed and 4,240 women were successfully interviewed, yielding an 86 percent response rate. Half the households were randomly selected for a male interview. Therefore, 3,137 men were eligible to be interviewed, out of which 2,377 (76 percent) were successfully interviewed. The sample coverage and response rate is summarized in Table 1.3.

Table 1.3: Response Rates for Household and Individual Interviews, NCSS 2012

Category	Sampled	Eligible	Completed	Response Rate^ (%)
Households	6,583	6,269	5,490	88
Women (12-49)	4,912	4,912	4,240	86
Men (12-54)	3,137	3,137	2,377	76
Adolescent Girls (12-24)	1,964	1,964	1,963	100
Adolescent Boys (12-24)	937	937	807	86
^The household response rate is computed as the number of completed household interviews divided by the number of eligible households. For the NCSS 2012, there were 6,269 eligible households (i.e. sampled households minus households that were vacant, destroyed and where all members were absent.)				

1.5 The NCSS 2012 Survey Questionnaires

The NCSS 2012 questionnaires were adaptations of the KDHS 2008-09 and the NCSS 2000 survey instruments. This was to enable comparison of the NCSS 2012 findings with those of the two surveys. Sections in the first NCSS questionnaires were retained unchanged to provide the necessary data for comparison. Three questionnaires were administered: a household questionnaire and separate questionnaires for women and men.

The household questionnaire collected data on the socio-demographic characteristics of household members and visitors who slept in the house the previous night. The questionnaire included modules on household characteristics, household poverty and wellbeing including food security, transfers and remittances, and under-5 children anthropometric measurements. The questionnaire was administered to the head of the household or any other adult or credible household member. A list of household members was used to identify persons eligible for the individual interviews.

The women's questionnaire was administered to females aged 12 to 49 years in the sampled households. This questionnaire had several modules including socio-demographic characteristics, migration history, reproduction, contraception, pregnancy, ante-natal and post-natal care, child immunization and child health, marriage, fertility preferences, husband's background and the woman's work/livelihood activities, HIV/AIDS and other sexually transmitted infections, general health issues and maternal mortality. Women aged 12-24 years completed an additional module that addressed issues relevant to young people's health and wellbeing, including unintended pregnancy and abortion and drug and alcohol use.

The men's questionnaire was administered to eligible males aged 12 to 54 years in the sampled households. The questionnaire had several modules, including socio-demographic characteristics, reproduction, contraception, marriage, fertility preferences, work/livelihood activities and gender roles, HIV/AIDS and other sexually transmitted infections and general health issues. Males aged 12-24 years completed an additional module on issues relevant to young people's health and wellbeing. The questionnaires were pretested in Kariobangi estate, a neighboring community to the Korogocho slum. The pretest was used to assess the flow of questions and to estimate the time required to administer each questionnaire. The results of the pretest informed the revision of the survey instruments and the planning of field logistics. All questionnaires were translated and administered in Kiswahili.

1.6 Procedures

1.6.1 Fieldworker Training

Training for the fieldwork was organized in two parts: A two-day session for mapping and listing teams and a 16-day session for the main survey teams. The training sessions were facilitated by experts and staff from both the Kenya National Bureau of Statistics (KNBS) and APHRC. Training sessions covered interviewing techniques, the contents of the questionnaires, and mock interviews among trainees to gain practical interviewing experience. Training for the main survey included an extra eight-day session on the use of netbooks for data collection. Towards the end of the first training period, trainees spent one day in the field listing households in a cluster in Westlands that was not sampled for the main study. At the end of the second session, trainees spent two days interviewing households in non-sampled areas of Dandora and Mukuru Kwa Reuben slums.

1.6.2 Fieldwork

Community sensitization was undertaken before the listing exercise and the main survey. This was a collaborative effort of APHRC's Field Coordination and Community Relations and the KNBS' Nairobi Provincial Statistical Offices. It involved meetings with senior members of the provincial administration (District Commissioners and Divisional Officers), and Village Elders, to inform and seek their support for the listing and mapping exercise. With support secured, the listing exercise was undertaken in collaboration with cartographers and statisticians from the KNBS. Similar meetings were held with local authorities whose communities were sampled. The meetings aimed to explain the objectives of the survey and seek the support and participation of the local communities, not just as respondents but as partners in the survey process.

The main survey data collection exercise was carried out by eight teams comprising a field supervisor and between five and seven interviewers. Field supervisors were in charge of the general administration of their teams and served as the link between the project management and the field teams. They also ensured that their teams had all the necessary survey materials and organized for community guides and security when required. Field supervisors also supported in the collection of anthropometric data of under 5 children and were in charge of quality control.

Fieldwork for the main survey ran for 19 weeks between June and November 2012. Quality control was ensured through back-checks on 10 percent of completed questionnaires, spot-checks, sit-ins during interviews and editing of all completed questionnaires. Project management staff also carried out field-visits, conducted spot-checks, verified interviews and discussed areas of concern with field teams. Data were collected using both netbooks and paper questionnaires, where it was not possible to use the netbooks.

1.7 Data Processing

Data were captured using in-house software developed with a Visual Basic.Net front-end and a Microsoft Structured Query Language (SQL) Server back-end. The data entry staff underwent a two-day training session followed by a five-day data entry pre-test exercise for paper-based questionnaires. Ten data-entry clerks and one supervisor were engaged during the data entry exercise. Data entry, cleaning and editing occurred between October 2012 and January 2013. A research assistant edited all paper questionnaires coming from the field before their submission for data entry with return of incorrectly filled questionnaires to the field for error-resolution. Internal consistency checks were also performed for all questionnaires. In order to ensure optimal performance by the data entry team, daily performance reports were generated to allow the supervisor to carry out a daily evaluation of the work done. Data cleaning and analysis was carried out using STATA Version 12.1 software.

1.8 Sample Coverage: NCSS 2012, NCSS 2000 and KDHS 2008-09

To compare indicators among slum dwellers in Nairobi to other urban population sub-groups and rural dwellers in Kenya, data from NCSS 2000 and KDHS 2008-09 were used. The method employed for calculating each indicator, and the sub-groups considered for the indicator were the same across all three surveys. The methodology for the calculation of indicators followed the DHS and was tested on the NCSS 2000 and the KDHS 2008-09 datasets to replicate the published results from the two surveys. It is important to note that both the survey methodology and questionnaire content and design for NCSS 2000 and NCSS 2012 were patterned after the KDHS 2008-09. Table 1.4 below compares sample sizes across the three surveys.

Table 1.4: Completed Interviews (unweighted), NCSS 2012, NCSS 2000, KDHS 2008-09

Category	NCSS 2012	NCSS 2000	KDHS 2008-09
Households	5,490	4,564	9,057
Women (15-49)	3,892	3,256	8,444
Men (15-54)	2,229	na	3,465
Adolescent Girls (12-24)	1,963	1,934	3,511^
Adolescent Boys (12-24)	807	1,683	1,383^
^ The sample of adolescents from KDHS 2008-09 was extracted by limiting the male and female samples to those aged 15-24 years (the lower age limit in KDHS is 15 years)			
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09			

1.9 Ethical Considerations

Written informed consent was obtained for all interviews. For participants aged less than 18 years, additional consent was sought from parents or guardians after respondent assent. To maintain confidentiality all interviews were conducted in private rooms and household and individual identifier variables were anonymized in the final datasets. Ethical approval for the study was obtained from the Kenya Medical Research Institute's Ethics Review Committee.

References

1. African Population and Health Research Center, *Population and Health Dynamics in Nairobi's Informal Settlements*, 2002, APHRC: Nairobi.
2. United Nations, *World Population Prospects: The 2008 Revision Population Database*, 2009.
3. Mthuli, N. *Urbanization in Africa*. 2012[cited 2014 20 March].
4. United Nations. *World Population Prospects: The 2010 Revision and World Urbanization Prospects: The 2011 Revision*. 2011[cited 2014 20 March].
5. Bremner J, et al., *World Population Highlights: Key Findings Population Bulletin*, 2009. 3.
6. World Health Organization and UN-HABITAT, *Hidden Cities: Unmasking and Overcoming Health Inequities in Urban Settings, 2010,* the WHO Centre for Health Development, Kobe, and United Nations Human Settlements Programme (UN-HABITAT).
7. UN-HABITAT, *Cities in a Globalizing World: Global Report on Human Settlements 2001*, 2001: London.
8. UN-HABITAT, *The Challenge of Slums: Global Report on Human Settlements* 2003.
9. UN-HABITAT, *The State of the World's Cities Report 2006/2007: 30 Years of Shaping the Habitat Agenda*, 2006, UN-HABITAT,: Nairobi, Kenya.
10. The World Bank, *World Development Report 2000/2001: Attacking Poverty*, 2000: London.
11. Chan M. *Urban Health Threatened by Inequities.* 2010 [cited 2014 20 March]; Available from: http://www.who.int/dg/speeches/2010/urban_health_20100407/en/.
12. Agwanda, A. O. and P. Bocquier, *An Event History Analysis of Factors Influencing Entry into Parenthood in Nairobi*. African Population Studies, 2004. 19(2): p. 43-62.
13. Kantharia S. L. *Urban Health Issues in India - Need of the Day*. N J Community Med., 2010. 1(1).
14. UN-HABITAT, The State of African Cities 2008 - *A framework for Addressing Urban Challenges in Africa*. 2008, Nairobi: UN-HABITAT.
15. UN-HABITAT. *An Urbanizing World: Global Report on Human Settlements 1996*. 1996, Oxford: Oxford University Press.
16. Zulu, E.M., F.N.-A. Dodoo, and A.C. Ezeh. *Sexual Risk-taking in the Slums of Nairobi, Kenya, 1993-98.* Population Studies, 2002. 56(3): p. 311-323.
17. Kenya National Bureau of Statistics (KNBS) and ICF Macro. *Kenya Demographic and Health Survey 2008-09,* 2010, KNBS and ICF Macro: Calverton, Maryland.

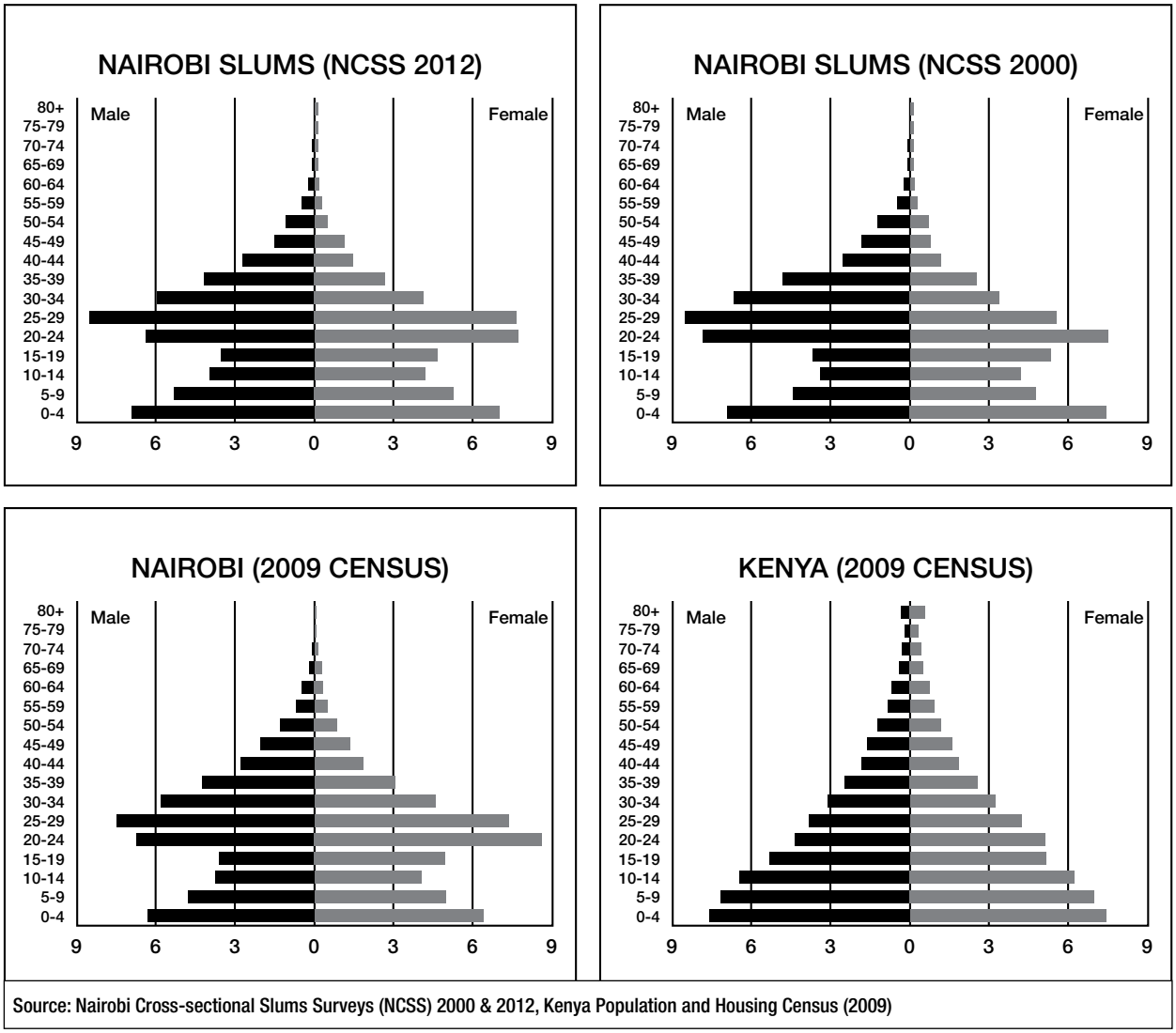
CHAPTER 2: CHARACTERISTICS OF HOUSEHOLDS AND RESPONDENTS

Maharouf Oyolola

This chapter compares the socio-demographic characteristics of NCSS 2000 and 2012 households and respondents. The comparisons highlight the changes observed among slum populations over the inter-survey period and identify similarities and differences between slum and non-slum Nairobi, other urban and rural populations in Kenya. The information contained in this chapter is important for the interpretation of results in subsequent chapters.

2.1 Age-Sex Composition

Figure 2.1: Population Pyramid for Nairobi Slums (NCSS 2000 & 2012), Nairobi and Kenya (2009 Census)



Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Population and Housing Census (2009)

Figure 2.1 presents the age-sex structure in Nairobi slums in 2000 and 2012 as well Kenya's and Nairobi's age-sex structures, based on the most recent census (2009). The population pyramid of slum population in 2012 was similar to the pyramid in 2000 with the exceptions of females aged 25-29 years and males aged 20-24 years. The proportion of females aged 25-29 years increased from 5.6 percent in 2000 to 7.6 percent in 2012, whereas the proportion of males aged 20-24 years decreased from 8.1 percent in 2000 to 6.5 percent in 2012. Overall, the proportion of men aged 15-49 in the slums in 2012, decreased relative to 2000, while the proportion of females increased.

Existing studies demonstrate an increase in the proportion of female rural-urban migrants [1, 2]. The proportion of those aged 0-14 years (32.9 percent) increased slightly by 1.1 percent. This proportion is higher than that for Nairobi (30.3 percent) but lower than the national proportion (42.9 percent).

2.2 Household Characteristics

Table 2.1 presents the distribution of households by selected demographic characteristics.

Table 2.1: Percent distribution of households by selected demographic characteristics, NCSS 2012, NCSS 2000 and KDHS 2008-09

Characteristics of households	KDHS				NCSS 2000	NCSS 2012
	National	Rural	Other Urban	Nairobi		
Sex of household head						
Male	66.1	64.2	69.1	75.9	83.1	79.4
Female	33.9	35.8	30.9	24.1	16.2	20.6
Sex of household members						
Male	48.7	48.7	48.0	49.9	56.0	63.2
Female	51.3	51.3	52.0	50.1	44.0	36.8
Mean No. of people per household	4.3	4.6	3.3	3.0	2.9	3.1
Mean No. of rooms per household	1.8	1.9	1.5	1.7	1.2	1.1
Number of usual members						
1	14.9	11.7	21.9	27.8	32.3	24.4
2	12.6	10.7	17.6	19.5	23.1	22.2
3	15.6	13.9	20.8	19.3	15.7	19.1
4	16.8	16.5	18.8	15.7	11.5	16.0
5	13.5	15.0	9.4	8.8	8.2	9.0
6+	26.6	32.2	11.5	9.0	9.1	9.2
Mean Size	4.2	4.6	3.2	2.9	2.8	3.0
Persons per sleeping room						
1-2	51.4	47.9	59.6	64.8	61.6	53.4
3-4	33.1	34.1	31.9	27.0	27.2	31.7
5-6	10.4	11.9	6.4	5.5	8.7	9.7
7+	4.0	4.9	1.3	1.0	1.9	2.7
Missing/DK	1.1	1.1	0.8	1.7	0.7	2.5
Mean	2.7	2.8	2.4	2.2	2.4	1.6
Percent of children under 15 not of household head	22.6	23.6	18.1	13.0	14.9	10.4
Number of Cases	38,515	28,845	6,412	3,258	13,238	16,885

Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09

In the inter-survey period, the proportion of male-headed households in the slums decreased from 83.1 percent to 79.4 percent. However, the proportion of male-headed households was higher in the slums than in the rest of the country. In addition, compared with the national, rural and urban trends wherein households comprise more females than males, the slums saw an increase in the proportion of male household members (56.0 percent in 2000 to 63.2 percent in 2012). Although the average number of rooms in the slums slightly decreased in 2012, the average number of persons per household increased. Furthermore, the proportion of three or more people sharing a sleeping room increased from 37.8 to 44.1 percent. This trend suggests that more people are sharing smaller spaces with implications for overcrowding and health.

Table 2.1 also shows 5 percentage points decrease in the proportion of children under the age of 15 who were not the biological offspring of the head of the household between 2000 and 2012. However, the proportion of such children remains lower in slums compared with the national figure of 22.6 percent and that for the rest of Nairobi at 13.0 percent. This finding implies that slum-dwellers are less likely to foster non-biological children relative to the rest of the country, including rural areas.

2.3 Background Characteristics of Female Respondents

Table 2.2 presents the background characteristics of female respondents aged 15-49 years. Similar to the NCSS 2000, at least three out of four women were aged 15-34 years. The proportion of women aged 25-29 years increased from 20.8

percent in 2000 to 26.7 percent in 2012. Women in the slums were more likely to be married (60.6 percent) compared with women in the rest of Nairobi (49.9 percent) and Kenya as a whole (58.4 percent). The majority of the female respondents were Christians. Whereas the proportion of Protestants increased, the proportion of Catholics decreased by 5 percentage points. The most dominant ethnic groups among women living in the slums were Luhya (24.5 percent), Kikuyu (22.5 percent), Kamba (21.5 percent), and Luo (15.5 percent). The least dominant ethnic group was the Maasai in 2000 and 2012 (0.1 and 0.2 percent, respectively).

Table 2.2: Comparison of female respondents aged 15-49 years in KDHS 2008-09, NCSS 2000 and NCSS 2012 by background characteristics

Background Characteristics	KDHS				NCSS 2000	NCSS 2012
	National	Rural	Other Urban	Nairobi		
Age						
15-19	20.8	22.7	15.8	14.4	20.8	15.0
20-24	20.3	18.7	25.3	24.8	28.9	26.4
25-29	17.2	15.2	21.0	27.7	20.8	26.7
30-34	14.3	14.4	14.7	12.7	12.7	14.1
35-39	10.4	10.5	9.8	10.5	9.4	8.9
40-44	9.1	9.5	9.1	5.6	4.5	5.1
45-49	7.8	9.0	4.3	4.4	2.3	3.8
Marital Status						
Never married	31.2	29.9	31.3	41.7	28.6	28.0
Married/Living together	58.4	59.9	55.7	49.9	59.3	60.6
Formerly married	10.4	10.1	13.0	8.3	12.1	10.0
Religion						
Catholic	21.9	23.1	17.2	20.6	30.7	25.8
Protestant/other Christians	68.1	68.6	64.5	70.8	63.6	69.3
Muslim	7.4	5.4	17.1	5.9	5.0	3.2
No religion	2.2	2.8	0.6	0.4	0.6	0.5
Other religion	0.4	0.1	0.6	2.2	0.2	0.8
Ethnic Group						
Kalenjin	13.2	16.9	1.7	3.4	0.9	1.2
Kamba	10.9	11.8	7.0	11.2	16.3	21.5
Kikuyu	19.4	15.5	27.3	38.3	25.1	22.5
Kisii	6.9	7.3	6.4	4.0	2.9	7.3
Luhya	16.3	16.0	18.0	14.7	24.7	24.5
Luo	13.0	12.6	14.1	14.1	22.3	15.5
Maasai	1.3	1.8	0.0	0.1	0.1	0.2
Meru/Embu	6.3	7.2	4.2	2.9	2.7	2.8
Mijikenda/Swahili	5.1	3.8	13.4	0.1	0.4	0.5
Somali	2.8	2.5	3.5	4.1	1.5	0.5
Taita Taveta	0.9	0.6	2.4	1.4	0.5	0.2
Other	3.7	3.9	2.1	5.5	2.7	2.6
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
*** Table displays columns and/or rows containing 'non-missing' values (some percentages may not add up to 100%)**						
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09						

2.3.1 Respondents' Educational Attainment

Table 2.3 presents the educational attainment of female respondents aged 15-49 by age, length of stay in current location and division. Education is fundamental for both labor market achievement and the fight against poverty. The data show that educational attainment is lowest among women aged 45-49 years. A greater proportion of women aged 15-24 years (57.5 percent) had completed secondary school compared with other age groups. It is important to note that educational attainment decreased with increasing age, with the oldest women being the most disadvantaged. Remarkably, a greater proportion of women born in the slums had completed secondary school (67.1 percent) compared with migrant women

especially long stayers who had lived in the current location for eight or more years (42.9 percent). Although the proportion of women in the slums with secondary or higher education substantially increased in the inter-survey period, they remain disadvantaged relative to the rest of Nairobi (68.1 percent).

Table 2.3: Percent distribution of women aged 15-49 years by level of educational attainment and background characteristics, NCSS 2012, NCSS 2000

Background Characteristics	Highest Education Level					
	No education	Primary incomplete	Primary complete	Secondary+	Missing	Total
Age						
15-19	0.0	18.5	24.0	57.1	0.4	590
20-24	1.1	10.5	30.5	57.9	0.1	1,027
25-29	1.6	12.9	36.9	48.4	0.2	1,043
30-34	2.6	16.0	33.2	47.8	0.4	543
35-39	1.9	16.8	38.1	42.9	0.2	351
40-44	6.7	34.4	18.3	40.6	0.0	198
45-49	12.2	43.3	15.2	29.3	0.0	140
Length of Stay						
< 2 years	1.0	15.0	32.8	51.1	0.2	1,444
2-4 years	1.4	14.1	32.3	52.1	0.1	955
5-7 years	2.7	16.3	32.7	48.4	0.0	534
8+ years	4.6	22.3	29.5	42.9	0.6	709
Since birth	1.7	13.2	18.0	67.1	0.0	250
Division^						
Central	3.6	20.5	37.1	38.5	0.3	303
Makadara	1.5	11.9	30.0	56.5	0.2	404
Kasarani	2.7	21.5	30.4	44.9	0.4	404
Embakasi	1.2	13.2	32.3	53.0	0.2	1,129
Pumwani	0.9	14.7	32.5	51.9	0.0	182
Westlands	2.6	13.7	27.2	56.5	0.0	332
Dagoretti	2.0	17.3	27.1	53.3	0.2	579
Kibera	2.9	19.9	32.8	44.2	0.2	559
NCSS 2012 Total	**2.0**	**16.2**	**31.1**	**50.5**	**0.2**	**3,892**
NCSS 2000 Total	**5.1**	**21.7**	**41.2**	**32.0**	**0.0**	**3,516**
KDHS 2008-09						
National	8.9	29.9	26.9	34.3	-	3,547
Rural	10.4	35.3	28.0	26.3	-	2,879
Other urban	5.8	17.2	24.8	52.2	-	668
Nairobi	2.5	7.9	21.5	68.1	-	206

^Aggregating by all slums within the specified urban Division

Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000& 2012; Kenya Demographic and Health Survey 2008-09

2.3.2 Respondents' Background Characteristics by Divisions

Table 2.4 presents background characteristics of respondents across Nairobi's eight divisions. The table reveals the high level of segregation of Nairobi slums along ethnic lines. For instance the Kamba were the dominant ethnic group in Makadara and Embakasi Divisions in both 2000 and 2012. The same situation remains true of the Luhyas in Dagoretti and Kibera Divisions. However, key changes in the ethnic composition of slums were observed between 2000 and 2012. For instance, the proportion of Luos in Central (53.2 percent) and Kasarani (50.1 percent) Divisions in 2000 declined substantially to 11.1 percent and 36.7 percent, respectively in 2012. The proportion of the Kambas in Central Division increased from 13.6 percent in 2000 to 36.2 percent in 2012. The proportion of the Kikuyus in Westlands declined from 42.2 percent in 2002 to 20.6 percent in 2012. It is important to take note of these shifts in ethnic compositions of slums across the city, particularly in light of several shocks that have affected slum residents in the past ten years, including the 2007/2008 post-election violence that had ethnic undercurrents. Looking at the marital status of the respondents, the table shows a higher proportion of married couples in all the eight divisions. The highest proportion of married couples is in Westlands Division (65.9 percent) and the lowest is in Pumwani Division (53 percent).

Table 2.4: Background characteristics of female respondents aged 15-49 years by division, NCSS 2012

Background Characteristics	Division							
	Central	Makadara	Kasarani	Embakasi	Pumwani	Westlands	Dagoretti	Kibera
Age								
15-19	14.7	11.1	20.7	13.9	13.5	12.2	15.4	17.6
20-24	28.8	28.3	25.0	26.5	33.3	24.5	22.4	27.5
25-29	26.0	25.1	25.8	29.7	25.3	27.9	27.1	21.8
30-34	12.2	19.0	12.8	14.4	12.3	12.9	15.1	12.8
35-39	9.9	8.3	6.9	8.2	8.8	11.3	10.3	9.1
40-44	5.0	4.9	5.0	4.3	4.0	7.2	6.2	4.7
45-49	3.5	3.4	3.9	2.9	2.8	3.9	3.5	6.5
Religion								
Catholic	26.3	32.5	26.0	28.0	16.1	21.9	23.1	23.9
Protestant	66.3	63.1	69.2	67.5	73.9	74.9	73.8	69.4
Muslims	6.4	2.0	3.9	2.1	8.0	2.0	1.6	5.1
No religion	0.6	0.9	0.5	0.7	0.9	1.1	0.0	0.0
Other religion	0.3	1.1	0.4	0.8	1.1	0.0	1.3	0.9
Ethnicity								
Kamba	36.2	31.6	8.4	33.5	26.1	9.5	7.1	13.4
Kikuyu	17.5	25.3	26.5	25.1	28.9	20.6	30.7	6.4
Luhya	22.3	13.4	18.8	14.7	16.5	40.6	36.9	38.3
Luo	11.1	8.7	36.7	9.4	16.6	7.1	11.2	27.5
Other	12.6	20.8	9.6	16.1	11.9	21.9	14.1	13.7
Marital Status								
Never married	24.1	30.5	28.8	28.2	30.2	21.3	29.2	29.5
Currently married	65.1	55.6	59.8	61.5	53.0	65.9	58.9	60.9
Formerly married	9.6	13.0	10.8	7.6	13.6	11.9	11.2	8.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
No. of cases	303	404	404	1,129	182	332	579	559
* Table displays columns and/or rows containing 'non-missing' values (some percentages may not add up to 100%)								
Source: Nairobi Cross-sectional Slums Survey (NCSS) 2012								

2.4 Household Amenities and Durable Goods

Table 2.5 presents the distribution of basic amenities among slum-dwellers relative to the overall population of Kenya and Nairobi. Overall, there is a general improvement in access to water, electricity and sanitary facilities among households living in the Nairobi slums. However, disparities with non-slum areas in Nairobi remained. Although the proportion of households with electricity in the slum improved slightly from 17.8 percent in 2000 to 19.5 percent in 2012, it is lower than 23 percent for the whole of Kenya and much lower than 88.6 percent for the rest of Nairobi in 2008-09. The proportion of households with piped water also increased from 21.7 percent to 27.6 percent in the inter-survey period. The proportion remained lower than that of Nairobi in 2008-09 at 78.2 percent. The proportion of households buying water declined markedly by 63.4 percentage points, while the proportion of households using public tap increased by 55.6 percentage points. Households using flush toilets increased from 7.3 percent in 2000 to 46.2 percent in 2012; that notwithstanding, this is far below 82.0 percent of households in the rest of Nairobi who use flush toilets.

The use of traditional pit latrines decreased from 78.8 percent to 44.0 percent between the two surveys. Furthermore, the quality of housing construction material improved between 2000 and 2012, with a decrease in household structures with mud floors from 30.6 percent to 15.1 percent, and an increase in household structures with cemented floors from 69.0 percent to 79.2 percent.

Table 2.5: Percent distribution of households by amenities, NCSS 2012, NCSS 2000 and KDHS 2008-09

Characteristics of Households	KDHS				NCSS 2000	NCSS 2012
	National	Rural	Other Urban	Nairobi		
Electricity	23.0	8.1	53.8	88.6	17.8	19.5
Source of drinking water						
Buying	1.8	1.1	4.1	2.9	74.8	11.4
Piped into residence	24.6	13.7	44.5	78.2	21.7	27.6
Public taps	9.7	6.1	23.0	13.4	2.7	59.3
Other	63.9	79.1	28.4	5.4	0.8	0.3
Sanitation facility						
Flush toilet	14.9	1.7	37.5	82.0	7.3	46.2
Traditional pit latrine	55.9	65.3	38.3	12.0	78.8	44.0
Ventilated pit latrine	16.7	16.6	22.7	5.8	5.4	3.3
Total with some facility	***87.5***	***83.5***	***98.5***	***99.7***	***91.4***	***93.9***
No facility/bush	12.5	16.5	1.5	0.3	8.6	4.7
Main floor material						
Mud/sand/dung	55.1	70.8	13.3	4.7	30.6	15.1
Wood planks/wood/vinyl/tiles	2.3	0.7	3.6	13.5	0.3	2.3
Cement	40.8	27.9	76.9	79.4	69.0	79.2
Other	1.7	0.6	6.2	2.2	0.1	1.3
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number of Households	9,057	6,707	1,549	801	4,564	5,489
* Table displays columns and/or rows containing 'non-missing' values (some percentages may not add up to 100%)						
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09						

Table 2.6 compares the distribution of households by possession of durable goods in Nairobi slums in 2012 to households in national, rural and urban Kenya in 2008-09. The most common durable goods are mobile phones, radio receivers and television sets, in order of magnitude. Specifically, the use of mobile phones increased from 1.5 percent in 2000 to 91.7 percent in 2012, while the use of radio remained the same over the period (66.0 percent). The increased use of telephones may be a reflection of the liberalization of the telephone industry in Kenya in the past decade. The proportion of households in slum areas with a television set more than tripled from 14.5 percent in 2000 to 49.2 percent in 2012. However, this is below the proportion of households with a television set in non-slum Nairobi in 2008-09 (74.3 percent), but higher than the rest of Kenya. Although the proportion of households with a refrigerator moderately increased to 4.1 percent in 2012, striking disparities remained when compared with households in non-slum Nairobi in 2008-09 at 31.5 percent.

Table 2.6: Percent distribution of households by possession of durable goods, NCSS 2012, NCSS 2000 and KDHS 2008-09

Durable Goods	KDHS				NCSS 2000	NCSS 2012
	National	Rural	Other Urban	Nairobi		
Radio receiver	73.6	70.6	78.7	88.3	66.1	66.0
Television set	28.1	17.9	48.2	74.3	14.5	49.2
Telephone	61.6	53.1	82.1	92.6	1.5	91.7
Refrigerator	6.4	1.2	15.8	31.5	1.5	4.1
Bicycle	30.1	34.4	20.4	12.6	6.7	9.5
Motorcycle	2.1	1.9	3.3	1.9	0.1	2.1
Private car	5.6	2.9	11.0	18.0	1.1	1.9
None of the above	16.0	19.2	9.1	3.3	31.0	4.7
Number of households	9,057	6,707	1,549	801	4,564	5,489
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09						

2.5 Duration of Stay in Slum Households

Table 2.7 presents the duration of stay in Nairobi slums by specific background characteristics. The median duration of stay in the slum decreased by half from 4.0 years in 2000 to 2.0 years in 2012, indicating a highly migratory and unstable population. The duration of stay increased with age, with those aged 45-49 having the highest median duration (3.5 years). The proportion of those aged 15-19 who have lived in the slum since birth increased from 4.3 percent in 2000 to 17.4 percent in 2012, suggesting that more individuals are staying longer in the slums from birth than previously observed. Among the various ethnic groups, Kikuyus and Luos had the highest median duration of stay and a higher proportion of individuals born and living in the slums (about 10 percent). Muslims had a longer median duration of stay (3.3 years) and the highest proportion of respondents who have stayed since birth (22.7 percent). This pattern is consistent with findings among Muslims in 2000, albeit with a lower median duration of stay (5.5 years). Households in Kibera had the longest median duration of stay (3.0 years) and the highest proportion of individuals who have stayed since birth (13.3 percent), relative to other divisions.

Table 2.7: Percent distribution of women aged 15-49 years by duration of stay in current household and background characteristics, NCSS 2012, NCSS 2000

Background Characteristics	% lived in household since birth	Mean No. of years	Median No. of years	No. of cases
Age				
15-19	17.4	2.3	1.8	590
20-24	5.9	1.9	1.6	1,027
25-29	3.9	2.2	2.0	1,043
30-34	3.1	2.5	2.4	543
35-39	5.4	3.0	3.2	351
40-44	2.9	3.0	3.2	198
45-49	4.6	3.3	3.5	140
Marital Status				
Never married	15.9	2.4	1.9	1,102
Currently married	2.1	2.3	2.0	2,345
Formerly married	6.1	2.5	2.4	388
Ethnic Group				
Kamba	2.9	2.1	1.8	862
Kikuyu	10.1	2.6	2.4	867
Luhya	4.7	2.3	1.9	938
Luo	9.7	2.5	2.3	614
Other	5.6	2.2	1.9	589
Religion				
Catholic	6.7	2.3	2.0	1,001
Protestant/other Christians	5.6	2.3	2.0	2,706
Muslims	22.7	3.1	3.3	118
Other	6.8	2.4	2.1	49
Division				
Central	6.9	2.4	2.2	303
Makadara	4.6	2.3	2.0	404
Kasarani	10.3	2.6	2.4	404
Embakasi	2.3	2.0	1.7	1,129
Pumwani	4.8	2.1	1.9	182
Westlands	3.6	2.2	1.9	332
Dagoretti	8.4	2.3	2.0	579
Kibera	13.3	2.9	3.0	559
NCSS 2012 Total	6.4	2.3	2.0	3,892
NCSS 2000 Total	1.6	5.8	4.0	3,252
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012				

2.6 Employment and Source of Earning

Table 2.8 presents the current employment status of women respondents by background characteristics. Overall, levels of unemployment among women increased from 40.6 percent to 50.7 percent in the inter-survey period. The proportion of those unemployed was highest among the youngest women (83.9 percent) and generally declined with age. It may be important to take note of the fact that 35.7 percent of women aged 12-24 years are currently attending school, according to Table 10.1. An important dimension of the results is the increase in unemployment rate among individuals with secondary school and higher from 36.6 percent in 2000 to 50.4 percent in 2012. Additionally, more than half of individuals with no primary education or completed primary education were unemployed in 2012. Makadara Division had the lowest proportion of unemployed females (39.1 percent), while Kasarani Division had the highest (63.7 percent). Worth noting is that Makadara Division encompasses the industrial area which is a major source of employment in the city of Nairobi.

Table 2.8: Percent distribution of women aged 15-49 years by type of employment and form of earning according to background characteristics, NCSS 2012, NCSS 2000

Background Characteristics	Not Currently Working	Currently Working							No. of cases
		Self employed		Employed by a non-relative		Employed by a relative		Total	
		Earns cash	Does not earn cash	Earns cash	Does not earn cash	Earns cash	Does not earn cash		
Age									
15-19	83.9	21.6	2.5	66.0	4.4	3.5	1.9	100.0	590
20-24	61.6	24.0	4.2	64.8	4.9	1.5	0.6	100.0	1,027
25-29	46.6	37.1	4.9	51.3	5.3	1.3	0.0	100.0	1,043
30-34	38.7	35.2	3.9	54.7	5.9	0.3	0.0	100.0	543
35-39	29.5	43.1	6.2	47.3	3.4	0.0	0.0	100.0	351
40-44	23.1	47.4	5.2	42.2	4.7	0.6	0.0	100.0	198
45-49	31.2	59.4	0.8	35.4	2.9	1.4	0.0	100.0	140
Education									
None	53.2	50.0	7.7	39.5	2.8	0.0	0.0	100.0	73
Primary incomplete	55.9	42.1	4.2	46.4	6.7	0.6	0.0	100.0	620
Primary complete	51.4	38.4	5.5	49.9	4.2	1.5	0.6	100.0	1,203
Secondary+	50.4	32.4	3.8	58.0	4.8	1.0	0.1	100.0	1,988
Missing	80.6	47.7	0.0	52.3	0.0	0.0	0.0	100.0	8
Length of stay									
< 2 years	59.0	28.5	3.6	59.3	5.5	2.3	0.7	100.0	1,444
2-4 years	49.3	34.5	4.1	55.7	5.1	0.5	0.0	100.0	955
5-7 years	42.4	36.7	5.2	53.5	4.1	0.6	0.0	100.0	534
8+ years	40.9	49.5	4.8	41.2	4.1	0.4	0.0	100.0	709
Since birth	69.6	27.0	7.8	60.2	5.0	0.0	0.0	100.0	250
Division									
Central	52.7	33.2	7.0	50.6	7.0	1.6	0.7	100.0	303
Makadara	39.1	27.9	5.9	59.2	6.3	0.4	0.3	100.0	404
Kasarani	63.7	47.4	6.0	44.8	1.9	0.0	0.0	100.0	404
Embakasi	51.9	41.0	5.4	45.0	6.6	1.5	0.5	100.0	1,129
Pumwani	48.7	48.0	9.4	36.9	4.7	1.1	0.0	100.0	182
Westlands	46.6	32.2	0.9	62.4	3.1	1.4	0.0	100.0	332
Dagoretti	52.6	34.1	2.4	60.1	3.0	0.4	0.0	100.0	579
Kibera	54.1	28.4	1.9	64.6	3.8	1.4	0.0	100.0	559
NCSS 2012 Total	51.7	36.1	4.4	53.4	4.9	1.1	0.2	100.0	3,892
NCSS 2000 Total	40.6	42.7	0.9	49.2	1.5	4.4	1.4	100.0	3,256

Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012

There are three major employment categories among the currently employed: self-employed, employed by a non-relative and employed by a relative. Self-employment that earns cash is highest among those aged 45-49 (59.4 percent), women

with no education (50.0 percent), women living in Kasarani and Pumwani Divisions (47.4 and 48.0 percent, respectively), and women who have lived eight or more years in the slums (49.5 percent).

These findings are consistent with the importance of the informal sector, where self-employment and working with relatives are important aspects of the Kenyan labor market. According to a 2012 report by the *Institute of Economic Affairs (IEA)*, the informal sector represents 34.3 percent of Kenya's labor market and provides about 77 percent of employment.

2.7 Respondents' Important Needs

2.7.1 General Needs/Concerns of Slum Residents

Table 2.9 presents female respondents' ranking of the most important needs/concerns by background characteristics. Generally, lack of water (22.3 percent), absence of garbage and sewer disposal (13.7 percent) and unemployment (12.9 percent) were ranked as the most important needs/concerns. In contrast, in 2000, the highest ranked need/concerns were unemployment (23.8 percent), better housing (18.4 percent) and toilets (16.9 percent). Differences in ranking of needs/concerns were observed by educational attainment where those with no education were most concerned about unemployment. By division, those living in Pumwani were most concerned about lack of toilets (36.3 percent), those in Kasarani about security (20.6 percent), while those in Central Division were most concerned about garbage and sewer disposal (29.5 percent).

Table 2.9: Percent distribution of respondents by their most important general needs/concerns and by background characteristics, NCSS 2012, NCSS 2000

Background Characteristics	Most important general needs/concerns												Total
	Housing	Unemployment	Lack of access to education	Lack of Water	Lack of Health Services	Lack of Toilets	Lack of Food	Poor Roads	Security	Garbage/ Sewer Disposal	Other	Don't know	
Age													
15-19	9.3	12.9	3.4	20.7	2.6	13.6	4.2	3.2	13.2	14.8	1.5	0.6	100.0
25-34	11.4	11.8	1.8	24.2	4.5	11.3	3.4	2.7	11.9	14.4	2.6	0.1	100.0
35-49	12.7	15.1	3.7	21.8	3.8	12.2	3.0	3.6	12.5	9.6	2.0	0.0	100.0
Education													
No Education	14.4	18.5	3.6	14.8	5.3	14.1	5.4	1.5	7.6	14.6	0.0	0.0	100.0
Primary Incomplete	10.7	12.0	2.1	22.0	3.7	16.3	5.6	3.3	11.2	11.9	1.0	0.3	100.0
Primary Complete	12.6	11.1	2.7	22.3	4.5	13.1	3.0	2.3	13.3	11.9	2.7	0.4	100.0
Secondary+	9.6	14.0	3.1	22.7	3.0	10.6	3.4	3.5	12.6	15.3	2.0	0.3	100.0
Marital Status													
Never married	9.8	15.0	4.1	19.4	2.8	10.2	3.5	3.8	14.1	14.9	1.6	0.9	100.0
Currently married	11.1	11.4	2.2	24.3	4.1	13.0	4.0	2.5	12.1	12.9	2.2	0.1	100.0
Formerly married	11.7	15.4	3.0	19.8	2.1	14.4	2.1	4.5	10.6	14.0	2.4	0.0	100.0
Length of stay													
< 2 years	9.8	12.3	2.8	21.6	3.4	14.6	3.4	2.6	11.9	15.2	1.7	0.6	100.0
2-4 years	11.6	12.4	1.9	22.3	4.0	12.0	3.8	3.1	12.5	13.9	2.3	0.1	100.0
5-7 years	10.5	16.0	3.0	22.2	3.5	10.7	3.4	2.9	12.6	13.2	1.7	0.3	100.0
8+ years	11.7	11.8	3.0	25.1	3.4	11.0	3.9	3.3	11.9	12.2	2.6	0.0	100.0
Since birth	11.4	13.9	5.6	18.5	3.9	8.9	4.0	4.4	17.8	9.3	2.3	0.0	100.0
Division													
Central	1.7	3.4	0.8	20.4	3.1	17.8	1.8	3.1	18.0	29.5	0.4	0.0	100.0
Makadara	15.6	15.9	3.4	30.5	2.9	12.9	3.2	0.0	4.5	6.3	4.9	0.0	100.0
Kasarani	7.2	11.1	0.7	19.4	2.7	9.0	7.9	2.7	20.6	16.2	2.6	0.0	100.0
Embakasi	7.1	13.3	5.0	20.0	7.2	5.6	3.8	5.1	12.6	18.5	0.9	0.9	100.0
Pumwani	4.2	14.2	0.6	3.6	0.0	36.3	2.0	1.8	17.9	18.2	0.6	0.6	100.0
Westlands	10.8	19.3	2.7	23.0	2.2	10.7	5.7	2.0	8.0	8.7	6.9	0.0	100.0
Dagoretti	5.7	14.0	0.9	34.0	2.5	18.7	2.6	1.3	12.8	6.0	1.4	0.0	100.0
Kibera	27.6	10.0	2.9	18.6	0.7	14.1	1.5	3.9	10.6	9.4	0.6	0.0	100.0
NCSS 2012 Total	10.8	12.9	2.8	22.3	3.6	12.4	3.7	3.0	12.5	13.7	2.0	0.3	100.0
NCSS 2000 Total	18.4	23.8	7.7	15.2	4.0	16.9	4.2	0.7	7.2	7.2	7.2	1.9	100.0

Source: Nairobi Cross-Sectional Slums Surveys (NCSS) 2000& 2012

2.7.2 Major Health Needs and Problems

Table 2.10 focuses on the most important health needs/problems of the female respondents by background characteristics.

Table 2.10: Percent distribution of women aged 15-49 years by their most important health needs/problems and by background characteristics, NCSS 2012, NCSS 2000

Background Characteristics	Most important health needs/problems							Total
	Toilet	Drainage	Health Services	Water	HIV/ AIDS	Other	Don't know	
Age								
15-24	26.4	35.6	12.0	21.3	3.3	0.7	0.7	100.0
25-34	26.3	32.7	13.4	20.5	5.8	1.0	0.2	100.0
35-49	27.9	31.6	14.8	17.9	7.1	0.7	0.0	100.0
Education								
No Education	30.7	36.5	16.8	13.9	2.1	0.0	0.0	100.0
Primary Incomplete	30.1	32.0	9.6	21.3	5.8	0.8	0.3	100.0
Primary Complete	29.4	35.4	11.3	17.8	4.8	0.8	0.4	100.0
Secondary+	23.7	33.0	15.0	21.9	5.0	0.9	0.4	100.0
Marital Status								
Never married	23.6	34.9	13.5	21.4	5.1	0.7	0.8	100.0
Currently married	28.3	32.8	12.9	20.3	4.5	1.1	0.2	100.0
Formerly married	26.4	34.6	12.4	17.8	8.3	0.0	0.5	100.0
Length of stay								
Since birth	26.0	31.8	14.9	21.2	6.2	0.0	0.0	100.0
<2 years	25.1	35.6	12.6	21.2	4.2	0.6	0.8	100.0
2-4 years	26.4	34.2	13.0	19.9	5.0	1.3	0.2	100.0
5+ years	28.7	31.5	13.3	19.6	5.8	1.0	0.1	100.0
Division								
Central	22.3	55.0	10.3	9.7	0.7	1.9	0.0	100.0
Makadara	31.7	24.8	12.9	20.9	9.4	0.2	0.0	100.0
Kasarani	29.1	33.4	7.6	21.5	6.2	1.9	0.2	100.0
Embakasi	13.6	36.3	24.4	20.2	3.6	0.9	1.1	100.0
Pumwani	18.8	66.1	5.9	8.1	0.5	0.0	0.6	100.0
Westlands	20.0	31.3	8.8	23.6	15.1	1.1	0.0	100.0
Dagoretti	37.3	13.8	12.0	30.6	5.8	0.6	0.0	100.0
Kibera	45.9	35.2	1.6	16.6	0.4	0.3	0.0	100.0
NCSS 2012 Total	26.7	33.7	13.1	20.3	5.0	0.8	0.4	100.0
NCSS 2000 Total	31.7	19.9	13.4	19.9	3.0	7.8	4.2	100.0
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012								

In 2012, poor drainage (33.7 percent), toilets (26.7 percent) and water (20.3 percent) were ranked as the most areas of concern. This is in contrast to the findings from 2000 where toilets were ranked first (31.7 percent), followed by drainage and water (both at 19.9 percent). Differences in ranking of most important health concerns were observed by division of residence.

Respondents of Makadara, Dagoretti and Kibera Divisions ranked toilets as the highest concern while those in the other divisions identified drainage as the most important concern. Lack of water was a major concern in Dagoretti compared to other divisions, while HIV/AIDS was of major concern to residents of Westlands Division, where the proportion of respondents reporting the disease as a major concern increased from 3.9 percent in 2000 to 15.1 percent in 2012. In contrast, HIV/AIDS reduced as a health concern in Pumwani Division, a known prostitution hub, from 11.2 percent in 2000 to 0.5 percent in 2012. There were no substantial differences in the proportions of respondents that reported HIV/AIDS as a major concern by the other background characteristics.

2.7.3 Highest Ranked Reproductive Health Needs and Problems

Table 2.11 presents female respondents' most important reproductive health needs/problems by background characteristics.

Table 2.11: Percent distribution of women aged 15-49 years by their most important reproductive health needs/problems and by background characteristics, NCSS 2012, NCSS 2000

Background Characteristics	Most important reproductive health needs/problems								Total
	HIV/AIDS	STIs	Unwanted Pregnancy	Abortion	Family Planning	Antenatal Care	Other	Don't know	
Age									
15-24	24.7	3.7	28.8	14.4	8.6	10.4	6.1	3.3	100.0
25-34	29.5	3.9	20.4	16.6	11.6	11.6	4.3	2.1	100.0
35-49	32.3	3.4	24.3	13.6	11.5	8.7	5.4	0.7	100.0
Education									
No Education	35.8	0.0	19.5	7.9	12.1	13.2	10.5	1.1	100.0
Primary Incomplete	34.8	2.7	25.1	12.2	11.3	6.9	4.6	2.3	100.0
Primary Complete	30.1	4.8	21.8	14.8	10.6	12.3	4.4	1.1	100.0
Secondary+	24.6	3.6	26.0	16.6	9.9	10.5	5.7	3.1	100.0
Missing	36.8	0.0	21.0	0.0	0.0	42.3	0.0	0.0	100.0
Marital Status									
Never married	24.2	4.5	31.0	17.3	7.1	7.2	5.2	3.4	100.0
Currently married	28.7	3.1	21.8	14.6	12.7	12.4	5.1	1.7	100.0
Formerly married	34.3	5.4	22.5	13.3	5.7	9.7	6.5	2.5	100.0
Missing	47.9	6.9	11.6	9.0	12.4	8.5	0.0	3.8	100.0
Length of stay									
< 2 years	25.9	4.1	23.0	16.6	8.1	12.2	5.9	4.2	100.0
2-4 years	29.3	2.9	22.3	15.7	10.1	12.4	5.6	1.7	100.0
5+ years	29.4	4.1	25.2	13.6	13.4	8.5	4.5	1.2	100.0
Since birth	29.5	3.1	36.1	13.7	7.8	5.5	3.8	0.4	100.0
Division									
Central	44.3	11.8	7.3	5.9	4.8	15.1	8.4	2.4	100.0
Makadara	10.9	1.8	18.5	42.1	10.5	10.9	5.3	0.0	100.0
Kasarani	32.9	4.0	27.2	14.2	2.6	4.6	14.0	0.5	100.0
Embakasi	23.6	3.0	20.1	15.1	12.7	16.5	3.3	5.8	100.0
Pumwani	80.9	2.3	6.1	1.5	1.8	3.5	2.2	1.7	100.0
Westlands	29.6	0.5	26.6	15.7	8.5	11.1	8.0	0.0	100.0
Dagoretti	24.5	2.6	36.9	17.6	9.5	6.4	2.4	0.2	100.0
Kibera	23.9	6.7	40.7	2.5	18.8	3.3	4.1	0.0	100.0
NCSS 2012 Total	28.2	3.8	24.4	15.2	10.4	10.6	5.2	2.3	100.0
NCSS 2000 Total	15.3	8.6	18.0	16.7	10.7	9.6	0.4	20.8	100.0

Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012

Generally, respondents ranked HIV/AIDS (28.2 percent), unwanted pregnancy (24.4 percent) and abortion (15.2 percent) as the three most important reproductive health (RH) problems. These results are consistent with those from the 2000 survey, except that unwanted pregnancies were of the highest concern, followed by abortion and HIV/AIDS. Women aged 25-49 years were most concerned about HIV/AIDS while women aged 15-19 years were most concerned about unwanted pregnancies. Women with secondary or higher education were more concerned about unwanted pregnancies and abortion but least concerned about HIV/AIDS. Unwanted pregnancies were a major concern among women who were never married whereas HIV/AIDS was of highest concern to currently married and formerly married women. In contrast, formerly married women in 2000 were most concerned about abortions. Disparities were observed by division: In Pumwani Division, 80.9 percent of respondents cited HIV/AIDS as the most important RH concern, 40.7 percent of residents in Kibera mentioned unwanted pregnancies, and 42.1 percent of women in Makadara ranked abortions as the most important RH concern.

2.8 Summary

This chapter described the background, health and socio-economic characteristics of Nairobi slum residents and compared them with the rest of Nairobi and other parts of Kenya. The study also compared the characteristics of slum residents in 2012 with those observed in 2000.

Despite widespread poverty and precarious living conditions, the slum population continues to increase. However, little change was observed in the distribution by sex between 2000 and 2012; the proportion of men aged 15-49 declined, but the proportion of similarly aged women increased. Relative to older women, educational attainment of women aged 15-24 substantially increased implying that better educated women are forming the next generation of slum residents. Notwithstanding, the gains in educational attainment did not translate into more employment opportunities for various groups, especially for women aged 20-24. In the Kenyan context, where the median age at first marriage was 20.3 years in 2008-09 (see Table 5.5), low labor force participation among this group of women may be related to changes in their marital status. Overall, unemployment rate worsened for slum residents of all age groups regardless of educational attainment. Government employment policies geared toward slum residents can help alleviate the glaring poverty in slum areas.

The chapter also highlights the perceptions of changes and continuities in living conditions among slum dwellers between 2000 and 2012. Unlike 2000 when the major concerns were unemployment and housing, lack of water and garbage/ sewer disposal were the key concerns in 2012. It is, however, important to note that smaller proportions of slum dwellers reported concerns about housing and access to education, which may be related to increased access to educational opportunities following the government investments in free education programs over the period. An emerging concern that did not exist in 2000 on security may be driven by high unemployment, especially among young people.

In relation to health needs, there was a shift in concerns from access to toilet facilities in 2000 to poor drainage in 2012, with an observed increase in the proportion of flush toilet users and a decline in the use of traditional and ventilated pit latrines. Overall, HIV/AIDS remained one of the least reported problems among slum residents in 2012. This may be attributed to prevention campaigns undertaken by the Government and its development partners, availability of cheaper treatment, as well as government policies aimed at raising awareness about the consequences of the disease.

References

1. Batten, L., A. Baschieri, and E. M. Zulu, "Female and male migration patterns into the urban slums of Nairobi, 1996-2006: Evidence of feminisation of migration?" in *International Union for the Scientific Study of Population* 2009: Marrakech.

2. Beguy, D., P. Bocquier, and E. Zulu, "Circular migration patterns and determinants in Nairobi slum settlements." *Demographic Research, 2010.* 23.

CHAPTER 3: FERTILITY LEVELS

Donatien Beguy and Cheikh Mbacké Faye

Kenya was among the first countries in sub-Saharan Africa (SSA) to experience a significant fertility decline. However, recent evidence shows that fertility decline in the country has stalled at the national level, mainly due to a stall in contraceptive prevalence, an increase in unmet need for family planning, a stall or reversal in reproductive intentions, increases in adolescent fertility, and declines in national and international commitments to family planning programs [1, 2]. Overall, the Total Fertility Rate (TFR) steadily declined from 8.1 in 1978 to 4.6 in 2008-09[3, 4]. In this chapter, data on women's reproductive histories are used to examine fertility levels, trends and differentials, as well as fertility changes between 2000 and 2012 among women in the Nairobi slums. It also compares fertility patterns between Nairobi as a whole and the urban poor who constitute an increasing share of the Nairobi population [5].

3.1 Current Fertility

Table 3.1 presents data on Total Fertility Rates (TFRs) and Age-Specific Fertility Rates (ASFRs) over the three-year period preceding the survey for the eight slum divisions in 2000 and 2012. TFR is defined as the number of children who would be born to a woman (or to 1,000 women) during her/their reproductive life if she/they gave birth according to a current schedule of age-specific fertility rates. ASFR is a measure of the age pattern of fertility, and is defined as the number of births occurring during a given year or reference period per 1,000 women of reproductive age of a given age category (single-or five-year age groups). TFR declined in the slums by 0.5 points, from 4.0 in 2000 to 3.5 in 2012. The declining fertility in the slums was consistent with a similar trend in Kenya as a whole between 2003 and 2008-09. There were, however, some differences in fertility trends across the eight divisions of Nairobi during the inter-survey period. Whereas TFR declined in Makadara (from 3.9 in 2000 to 2.5 in 2012) and Kasarani Divisions (from 4.9 in 2000 to 4.7 in 2012), it increased in Westlands (from 3.2 in 2000 to 4.0 in 2012), and remained stagnant in Dagoretti and Pumwani Divisions (at 3.7 and 3.6, respectively). Data further show that in 2012, ASFR was highest among women aged 20-24 years except in Central Division, where it was highest among those aged 25-29.

Table 3.1: Current Fertility

Age-specific and cumulative fertility rates and crude birth rate, NCSS 2012, NCSS 2000									
	Division								Total
	Central	Makadara	Kasarani	Embakasi	Pumwani	Westlands	Dagoretti	Kibera	
NCSS 2012 (2009-2012)									
Age Group									
15-19	126	101	133	94	120	137	131	118	116
20-24	188	160	261	202	248	279	213	186	210
25-29	208	111	205	148	129	203	182	163	165
30-34	75	66	248	109	139	103	126	132	118
35-39	95	52	69	65	77	31	51	53	59
40-44	15	16	29	22	0	49	36	36	29
45-49	0	0	0	0	0	0	0	0	0
TFR^, GRR^^, CBR^^^									
TFR (15-49)	3.5	2.5	4.7	3.2	3.6	4.0	3.7	3.4	3.5
GRR	131.8	87.1	180.9	117.2	147.5	144.8	128.3	123.1	127.0
CBR	34.4	26.5	39.5	31.0	41.8	38.8	31.0	31.3	32.9
NCSS 2000 (1997-2000)									
Age Group									
15-19	189	199	154	117	146	71	106	148	134
20-24	223	172	260	178	136	155	202	239	204
25-29	199	248	190	184	223	137	157	194	180
30-34	154	169	164	110	107	153	109	115	136
35-39	85	0	105	54	38	69	56	104	78
40-44	60	0	100	24	75	18	36	23	40
45-49	43	-	0	0	0	44	79	0	23
TFR, GRR, CBR									
TFR (15-49)	4.8	3.9	3.3	3.6	3.7	4.1	4.9	3.2	4.0
GRR	178	177	182	145	136	118	139	166	155
CBR	41.7	43.7	43.8	39.2	32.0	36.1	38.5	42.7	40.3

^ Total fertility rates (TFR) are expressed per woman

^^ General fertility rate (GRR) is the total number of births divided by the number of women aged 15-49, expressed per 1,000 women

^^^ Crude birth rate (CBR) is expressed per 1,000 people

Source: Nairobi Cross-sectional Slums Survey (NCSS) 2000 & 2012

Table 3.2 compares the fertility rates among women living in Nairobi slums in 2012 with estimates from NCSS 2000 and KDHS 2008-09 for rural Kenya, Nairobi, other urban areas, and Kenya as a whole. TFR was lower in the slums in 2012 (3.5 children per woman) than at the national level (4.6) and rural Kenya (5.2) in 2008-09. However, it was higher than the fertility rate in Nairobi as a whole (2.8) and in other urban areas of Kenya (3.0). The age-specific fertility rates follow different patterns when comparing NCSS 2012 and 2000, and KDHS 2008-09. Fertility declined between 2000 and 2012 across all age groups except among those aged 20-24 who witnessed an increase. In addition, among the youngest group (15-19), ASFR was higher than all the estimates from the KDHS 2008-09. Among those aged 20-24, ASFR in 2012 was higher than KDHS estimates for Nairobi and other urban areas in 2008-09, but much lower than the rate at the national level and in rural areas. For the 25-29 age group, ASFR in 2012 was lower than the rate at the national level, other urban areas and rural Kenya in 2008-09. It was, however, higher than the rate in Nairobi as a whole. Among women aged 30-34, ASFR in 2012 was lower than the rate at the national level and in rural Kenya, but higher than the rate in Nairobi as a whole in 2008-09. In 2012, ASFR for the age groups 35-39 and 40-44 was lower than all the KDHS 2008-09 estimates, except for the estimates in other urban areas.

Table 3.2: Comparative fertility

Age-specific fertility rates (per 1,000) and total fertility rates, NCSS 2012, NCSS 2000 and KDHS 2008-09						
	KDHS				NCSS 2000	NCSS 2012
	National	Rural	Other Urban	Nairobi		
Age Group						
15-19	103	107	100	71	134	116
20-24	239	281	161	122	204	210
25-29	216	248	167	120	180	165
30-34	176	198	103	109	136	118
35-39	118	135	44	92	78	59
40-44	51	57	24	43	40	29
45-49 ^	12	13	5	9	23	-
Total fertility rate (TFR) (15-49)	4.6	5.2	3.0	2.8	4.0	3.5
General fertility rate (GRR) (15-49)	152	168	114	99	155	127
Crude birth rate (CBR)	36.8	37.8	34.8	31.1	40.3	32.9
^ The ASFR for NCSS 2012 is suppressed because the cases are too few						
Note: Rates refer to the three-year period preceding the survey						
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09						

Table 3.3 shows fertility rates among women in Nairobi slums by selected background characteristics.

Table 3.3: Fertility by background characteristics

Total fertility rate for the three years preceding the survey, percentage currently pregnant and the mean number of children ever born to women aged 40-49, by selected background characteristics, NCSS 2012, NCSS 2000 and KDHS 2008-09			
Background Characteristics	**Total fertility rate**	**% Currently pregnant**	**Mean number of children ever born to women aged 40-49**
Education			
No education	4.5	3.8	3.3
Primary incomplete	4.4	6.1	4.1
Primary complete	3.7	5.8	3.3
Secondary +	3.1	7.0	3.6
Marital Status			
Never married	1.3	1.4	2.3
Married/Living together	4.9	9.4	3.9
Widowed/Divorced/Separated	2.7	2.3	3.7
Ethnic group			
Kamba	3.2	5.2	3.1
Kikuyu	3.3	6.5	3.6
Luhya	3.7	7.5	4.1
Luo	4.2	5.8	3.6
Other	2.2	6.9	3.4
Religion			
Catholic	3.4	5.7	3.7
Protestant/other Christians	3.6	6.5	3.8
Muslims	2.9	9.0	2.4
Other	2.6	7.4	-
Division^			
Central	3.5	9.2	4.1
Makadara	2.5	8.4	3.0
Kasarani	4.7	8.9	3.8
Embakasi	3.2	5.3	3.8
Pumwani	3.6	5.2	3.5
Westlands	4.0	6.0	5.0
Dagoretti	3.7	5.9	3.5
Kibera	3.4	5.0	3.4
NCSS 2012 Total	**3.5**	**6.4**	**3.7**
NCSS 2000 Total	**4.0**	**8.3**	**5.1**
KDHS 2008-09			
National	4.6	7.0	5.6
Rural	5.2	7.1	6.1
Other urban	3.0	7.4	3.6
Nairobi	2.8	5.5	3.4
^ Division: All those slums that are found within each Division			
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09			

Fertility rates in the slums declined with increasing level of education, with women with no education having the highest rate of 4.5, while those with at least secondary level of education having the lowest rate of 3.1. The results are consistent with the general view in the literature that the level of education is negatively correlated with fertility levels. With respect to marital status, women in union had, as expected, the highest fertility rate of 3.9 children.

There was variation across ethnic groups, with Luo women having the highest fertility rate of 4.2 compared to their Luhya (3.7), Kikuyu (3.3) and Kamba counterparts (3.2). Distribution by religious groups shows that Protestants and other Christians had higher fertility (3.6) than Catholics and Muslims (3.4 and 2.9, respectively). Further, Kasarani Division had the highest TFR of 4.7 while Makadara had the lowest (2.5 children) in 2012. Fertility levels in Makadara may be related to the preponderance of unaccompanied males working in the industrial area linked to split migration [6].

The percentage distribution of women who were pregnant at the time of the NCSS 2012 survey by educational attainment shows that 7.0 percent of women with secondary level education reported being pregnant at the time of survey compared to only 3.8 percent of their counterparts with no education. Married women were likely to be pregnant at the time of survey, with more than 9.0 percent being pregnant compared to only 1.4 percent of never married and 2.3 percent of formerly married women. The variations by ethnic group were marginal with the percentage of pregnant women at the time of the survey ranging between 5.2 percent among the Kamba and 7.5 percent among the Luhya. With respect to religious affiliation, 9.0 percent of Muslim women were pregnant at the time of the survey, which was the highest percentage compared to Catholics, Protestants and other Christians. Central Division had the highest percentage of currently pregnant women (9.2 percent) while Kibera had the lowest (5.0 percent).

A comparison of the current TFR estimated in 2012 and 2000 with the average number of children ever born to women aged 40-49 gives a rough estimation of completed fertility. The comparison can also help capture changes in fertility over the past few decades among women in Nairobi slums. Data show that in 2012, the mean number of lifetime births was 3.7 among women aged 40-49 years, 0.2 children more than the TFR, which indicates a negligible decline in fertility during the past few decades. In 2000, the magnitude of the decline was about 1.1 children per woman. Estimates from KDHS 2008-09 indicate that the decline was greater at the national level (1 child per woman) than in Nairobi as a whole (0.6), rural areas (0.9) and other urban areas (0.6).

3.2 Fertility Trends by Marital Duration

Childbearing is closely associated with marriage/union in African societies. This section presents fertility rates of women living in the slums of Nairobi by marital duration, which involved calculating fertility rates by years since first marriage. Results show that there was no clear pattern of fertility decline or increase during any of the five-year periods preceding the survey (Table 3.4). For example, for 0-4 years preceding the 2012 survey, TFR increased from 123 per 1,000 for women who had spent up to 4 years in marriage to 182 per 1,000 for women who had spent between 5 and 9 years of marriage, before steadily declining to 26 per 1,000 for those with 25 to 29 years of marriage. For the 5-9 year period preceding the survey, TFR first declined from 250 per 1,000 for women who had spent up to 4 years in marriage to 213 per 1,000 for women who had spent between 5 and 9 years of marriage, before increasing to 261 per 1,000 at 10-14 years of marriage and steadily declining to 164 per 1,000 for those with 25-29 years of marriage.

Table 3.4: Fertility by marital duration

Fertility rates (per 1000 women) for ever-married/in union women by number of years since first marriage, for 5-year periods preceding the survey, NCSS 2012, NCSS 2000				
	Number of years preceding the survey			
	0-4	5-9	10-14	15-19
NCSS 2012				
Years since first marriage				
0-4	123	250	265	213
5-9	182	213	261	242
10-14	161	261	236	265
15-19	124	221	258	187
20-24	80	178	234	200
25-29	26	164	138	97
NCSS 2000				
Years since first marriage				
0-4	316	294	341	350
5-9	203	251	238	250
10-14	146	172	208	248
15-19	114	131	153	224
20-24	59	126	112	0
25-29	37	28	375	-
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012				

3.3 Children Ever Born

Table 3.5 presents the distribution of number of children ever born, mean number of children ever born, and the mean number of living children by age group. Findings indicate that the average number of children ever born per woman slightly declined from 2.0 in 2000 to 1.6 in 2012 for all women living in Nairobi slums. These figures remained below the national and rural levels reported in KDHS 2008-09 (2.7 and 3.0, respectively). However, the levels in Nairobi (1.4) and other urban areas of Kenya (1.8) were comparable to estimates from the NCSS 2012. As would be expected, women aged 45-49 years had given birth to more children (3.7) compared with those from other age groups.

Table 3.5: Children ever born and living

Percent distribution of all women and of currently married women by number of children ever born, mean number of children ever born (CEB) and mean number of living children, according to five-year age groups, NCSS 2012, NCSS 2000 and KDHS 2008-09

	Number of children ever born												Number of women	Mean number of children ever born	Mean number of living children
	0	1	2	3	4	5	6	7	8	9	10+	Total			
ALL WOMEN															
Age Group															
15-19	78.0	19.1	2.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	590	0.3	0.2
20-24	39.3	37.2	18.5	4.5	0.5	0.0	0.0	0.0	0.1	0.0	0.0	100.0	1,027	0.9	0.8
25-29	17.0	30.4	30.8	15.5	5.2	0.8	0.2	0.0	0.1	0.0	0.0	100.0	1,043	1.7	1.6
30-34	11.9	17.1	28.8	24.4	10.9	5.4	0.7	0.8	0.0	0.0	0.0	100.0	543	2.3	2.1
35-39	6.6	11.7	20.3	26.1	17.0	10.9	3.7	2.1	1.6	0.0	0.0	100.0	351	3.0	2.8
40-44	5.8	9.6	15.7	21.3	23.1	12.5	6.2	3.3	1.0	1.3	0.2	100.0	198	3.4	3.1
45-49	11.0	6.8	12.4	15.8	22.7	13.6	6.2	4.6	4.4	1.3	1.1	100.0	140	3.7	3.3
NCSS 2012 Total	29.6	25.0	20.6	12.8	6.6	3.1	1.0	0.6	0.4	0.1	0.1	100.0	3,892	1.6	1.5
NCSS 2000 Total	29.8	23.1	16.7	10.8	7.6	4.6	3.4	1.6	1.0	0.6	0.7	100.0	3,257	2.0	1.7
KDHS 2008-09															
National	27.5	13.8	14.5	12.5	9.6	6.7	5.7	3.5	2.8	1.7	1.8	100.0	8,444	2.7	2.4
Rural	25.8	11.1	12.4	13.0	10.4	7.7	6.9	4.3	3.7	2.2	2.3	100.0	6,296	3.0	2.7
Other urban	28.9	20.4	21.1	12.8	8.4	4.1	2.2	1.1	0.5	0.2	0.2	100.0	1,420	1.8	1.7
Nairobi	39.3	23.7	19.3	7.9	4.2	3.1	1.6	0.6	0.0	0.0	0.2	100.0	728	1.4	1.3
CURRENTLY MARRIED WOMEN															
Age Group															
15-19	38.7	49.8	9.9	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	139	0.7	0.7
20-24	22.4	44.7	26.1	6.1	0.7	0.0	0.0	0.0	0.0	0.0	0.0	100.0	624	1.2	1.1
25-29	10.2	29.0	34.7	18.4	6.5	0.8	0.3	0.0	0.1	0.0	0.0	100.0	760	1.9	1.7
30-34	6.7	14.2	30.0	28.1	13.5	6.0	0.7	0.9	0.0	0.0	0.0	100.0	391	2.5	2.3
35-39	5.7	9.1	19.2	24.5	19.7	13.0	4.7	2.8	1.3	0.0	0.0	100.0	235	3.2	3.0
40-44	4.1	7.0	12.3	19.8	24.5	16.5	8.8	3.4	1.6	1.6	0.4	100.0	116	3.8	3.5
45-49	6.8	6.6	10.7	17.4	21.2	16.6	8.8	3.4	6.6	0.0	1.9	100.0	80	4.0	3.7
NCSS 2012 Total	13.7	28.0	26.6	16.4	8.5	4.0	1.4	0.7	0.5	0.1	0.1	100.0	2,345	2.0	1.9
NCSS 2000 Total	12.8	25.3	22.3	14.4	9.6	6.0	4.1	2.1	1.3	1.0	0.9	100.0	1,931	2.5	2.2
KDHS 2008-09															
National	5.0	13.8	18.6	17.8	13.6	9.4	8.0	5.1	3.8	2.2	2.6	100.0	4,928	3.7	3.4
Rural	3.7	10.6	15.8	18.0	14.5	10.6	9.5	6.3	4.8	2.8	3.2	100.0	3,774	4.1	3.7
Other urban	8.0	22.0	28.2	18.0	12.8	5.2	3.1	1.4	0.6	0.4	0.3	100.0	791	2.5	2.3
Nairobi	12.0	28.5	27.9	15.2	6.7	5.4	2.7	1.2	0.0	0.0	0.5	100.0	363	2.1	2.0

Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09

In general, the older the woman the higher the average number of children ever born. The number of children ever born was slightly higher for all age groups among slum women who were in union at the time of survey than among all women regardless of their marital status. This suggests that childbearing remains closely associated with marriage in Kenya. Also, the trend whereby the number of children ever born rises with increasing age was the same for all women regardless of their marital status. It should also be noted that differences between the number of children ever born and the number of living children at the time of the survey suggest that child mortality is still prevalent in Nairobi slums.

3.4 Birth Intervals

Evidence shows that the length of the interval between births not only affects fertility levels but is also significantly associated with women and children's health [7, 8]. Children born less than 24 months after their previous sibling are more likely to die, with their mothers being at greater risk of poor health. Also, short birth intervals increase the risk of pregnancy and delivery complications, mainly due to the fact that they reduce the physiological capacity of the mother. In contrast, long birth intervals allow mothers to breastfeed longer, to take better care of their child, and reduce competition for food and breast milk between children [8, 9].

Table 3.6 shows the percent distribution of births that occurred in the five years preceding the survey, by number of months since previous birth and median length of birth interval, according to selected demographic and socio-economic characteristics. Findings indicate that in 2012, about a quarter (23 percent) of births to women living in Nairobi slums occurred less than 24 months after the preceding birth. The proportion was similar to that observed in 2000 (24 percent), but higher than what was observed in Nairobi as a whole in 2008-09 (20 percent). This suggests that a substantial proportion of women in the slums continue to put their lives at risk by having short birth intervals.

The median birth interval among women living in Nairobi slums slightly increased from 34.1 months in 2000 to 36.3 in 2012. Estimates from the KDHS 2008-09 show greater median birth interval for Nairobi as a whole (40.0). The median number of months since birth increased with age, from 25.4 months among 15-19 year-old women to 38 months among those aged 30-39 years although the median interval for the latter group was greater than that of women aged 40-49. The median birth interval at lowest (2-3) and highest birth orders (seven and above) was similar to that of the overall sample – 36.5 and 36.4 months, respectively. At birth orders 4-6, the interval was 0.8 months shorter than the interval for the overall sample. Apparently, the preference for a boy that would lead women to get another birth immediately after a girl does not hold in Nairobi slums, as the median interval following a female birth (36.8 months) was 0.9 months longer than that following a male birth (35.9 months). Data corroborate the replacement effect, with the median birth interval being 8.1 months shorter after the death of the preceding birth (28.6 months) than when the preceding birth was still alive (36.7 months).

Table 3.6: Birth Intervals

Percent distribution of births in the five years preceding the survey by number of months since previous birth and median length of birth interval, according to selected demographic and socio-economic characteristics, NCSS 2012, NCSS 2000 and KDHS 2008-09								
Background Characteristics	**Number of months since previous birth**					**Total**	**Number of non-first births**	**Median number of months since previous birth**
	7-17	**18-23**	**24-35**	**36-47**	**48+**			
Age of mother								
15-19	28.9	21.0	36.4	6.9	6.9	100.0	18	25.4
20-29	10.8	14.9	25.4	18.5	30.3	100.0	1,086	34.4
30-39	8.4	12.4	23.5	18.5	37.1	100.0	1,454	38.0
40+	9.5	13.2	26.5	13.3	37.4	100.0	858	35.9
Birth order								
2-3	9.2	13.5	24.9	17.3	35.0	100.0	2,632	36.5
4-6	10.7	12.7	26.0	17.0	33.6	100.0	710	35.5
7+	10.9	16.9	17.9	13.8	40.4	100.0	74	36.4
Sex of prior birth								
Male	10.3	13.7	24.7	18.4	32.9	100.0	1,738	35.9
Female	8.8	13.2	25.3	15.9	36.9	100.0	1,678	36.8
Survival of prior birth								
Dead	17.6	18.6	27.3	14.7	21.9	100.0	202	28.6
Living	9.1	13.1	24.8	17.3	35.7	100.0	3,214	36.7
Education								
No education	11.4	12.1	24.9	17.1	34.5	100.0	158	36.3
Primary incomplete	10.0	16.0	25.3	17.9	30.9	100.0	894	34.6
Primary complete	8.9	12.7	27.6	18.0	32.7	100.0	1,165	35.7
Secondary +	9.7	12.5	22.1	15.8	40.0	100.0	1,195	38.8
NCSS 2012 Total	9.6	13.4	25.0	17.2	34.9	100.0	3,416	36.3
NCSS 2000 Total	9.3	14.3	30.0	17.4	29.1	100.0	1,410	34.1
KDHS 2008-09								
National	9.1	13.5	34.2	17.9	25.2	100.0	4,531	33.0
Rural	9.2	13.9	35.8	18.0	23.1	100.0	3,835	32.0
Other urban	8.3	11.5	26.6	18.5	35.1	100.0	496	37.0
Nairobi	8.8	11.1	22.6	16.0	41.4	100.0	199	40.0
Note: First order births are excluded								
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09								

Data further show that the median birth interval was longest among women with at least secondary level education (38.8 months) and shortest for those with incomplete primary education (34.6 months). Among those with at least some education, the higher the education level, the longer the birth interval. Noteworthy, the median interval was longer among women with no education than among those with primary education.

3.5 Age at First Birth

Despite the recent stall in fertility decline in Kenya, it is expected that the age at which women enter into motherhood should increase over time, mainly due to the previous decline that the country experienced. Table 3.7 shows the percent distribution of women of reproductive age (15-49 years old) living in Nairobi slums by the age at first birth. The percentage of women who had not yet given birth in 2012 decreased with age, from about three-quarters of women aged 15-19 to 6 percent among those aged 40-44 and 11 percent among those aged 45-49. In addition, between 2.5 percent and 8.5 percent of women had their first birth before age 15, with the proportion increasing by age, until age 45.

Table 3.7: Age at first birth

Percent distribution of women 15-49 by age at first birth, according to current age, NCSS 2012, NCSS 2000										
	Women with no births	Age at first birth							Number of Women	Median age at first birth
		<15	15-17	18-19	20-21	22-24	25+	Total		
NCSS 2012										
Current Age										
15-19	78.0	2.5	12.6	6.8	na	na	na	100.0	590	-
20-24	39.4	2.8	15.2	19.7	16.8	6.1	na	100.0	1,027	21.0
25-29	17.1	4.4	16.2	16.5	19.0	19.4	7.3	100.0	1,043	21.0
30-34	11.9	4.9	14.9	19.1	18.3	16.0	14.7	100.0	543	20.0
35-39	7.4	8.5	13.7	19.5	17.7	18.8	14.5	100.0	351	20.0
40-44	5.8	8.5	14.4	20.3	13.7	21.7	15.5	100.0	198	20.0
45-49	11.0	4.1	14.2	21.8	15.6	19.1	14.3	100.0	140	20.0
NCSS 2000										
Current Age										
15-19	76.5	2.8	16.1	4.6	na	na	na	100.0	671	-
20-24	36.0	2.0	18.4	25.4	12.7	5.5	na	100.0	945	20.5
25-29	9.9	4.3	20.4	19.6	18.5	21.3	6.0	100.0	680	20.5
30-34	4.1	6.8	22.3	25.0	18.0	13.1	10.7	100.0	412	19.7
35-39	4.9	4.9	24.9	25.2	18.8	12.9	8.4	100.0	309	19.5
40-44	7.6	8.9	28.0	23.6	11.5	11.5	8.9	100.0	157	18.9
45-49	7.2	10.8	27.7	26.5	13.3	8.4	6.0	100.0	83	18.8
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012										

Table 3.8 shows the median age at first birth by selected background characteristics. There was not much variation between the median age at first birth observed in 2012 and 2000 (20 years vs. 19.9 years). As expected, age at first birth increased with level of education in 2012, from 15.4 years among women with no education to 20.9 years among those with at least secondary education. With respect to marital status, never married women—who are also likely to be the youngest—had their first births at later ages (20.6 years) while those formerly married and thus likely to be generally older had their first births at earlier ages (19.8 years).

Table 3.8: Median age at first birth by background characteristics

Median age at first birth among women aged 25-49, by current age and selected background characteristics, NCSS 2012, NCSS 2000 and KDHS 2008-09						
Background Characteristics	**Current Age**					**All women aged 25-49**
	25-29	**30-34**	**35-39**	**40-44**	**45-49**	
Education						
No education	17.7	18.2	14.5	15.4	18.7	15.4
Primary incomplete	18.4	18.2	18.6	19.2	19.0	18.4
Primary complete	19.4	19.3	19.7	20.5	21.8	19.4
Secondary+	20.9	21.1	21.0	20.6	20.7	20.9
Marital Status						
Never married	20.6	20.2	20.7	20.3	22.2	20.6
Currently married	20.0	19.9	20.3	19.9	19.8	20.0
Formerly married	18.3	19.8	19.1	20.0	19.8	19.8
Ethnic Group						
Kamba	20.4	20.2	19.4	18.9	19.9	20.4
Kikuyu	20.5	20.3	20.5	19.2	20.3	20.5
Luhya	19.7	20.7	20.5	20.8	19.9	19.7
Luo	18.6	18.4	19.0	19.8	19.4	18.6
Other	20.3	19.3	20.6	22.4	18.3	20.3
Religion						
Catholic	20.5	19.9	20.0	19.9	19.6	20.5
Protestant/other Christians	19.8	20.0	19.9	19.9	20.3	19.8
Muslims	18.5	18.2	20.9	21.3	17.2	18.5
Other	20.2	19.6	21.1	19.6	-	19.6
Division						
Central	19.9	20.1	17.9	19.5	17.6	19.9
Makadara	19.8	20.3	19.9	20.4	19.5	19.8
Kasarani	19.2	19.6	21.3	21.2	21.2	19.2
Embakasi	20.2	19.9	20.3	19.7	21.3	20.2
Pumwani	20.6	19.4	19.2	16.6	19.9	19.2
Westlands	19.3	19.6	20.0	19.9	19.3	20.0
Dagoretti	20.7	19.9	20.7	20.6	17.9	19.9
Kibera	19.6	20.1	19.6	21.6	20.8	19.6
NCSS 2012 Total	**20.0**	**19.9**	**20.0**	**19.9**	**19.9**	**20.0**
NCSS 2000 Total	**20.5**	**19.7**	**19.5**	**18.9**	**18.8**	**19.9**
KDHS 2008-09						
National	19.8	19.7	20.0	20.0	19.4	19.8
Rural	19.3	19.3	19.3	19.5	19.1	19.3
Other urban	20.1	20.0	21.9	21.8	21.8	20.7
Nairobi	23.4	21.5	24.8	22.2	20.6	22.6
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09						

The results further show that Kikuyu women had their first births at later ages (20.5 years) while Luo women started their reproductive life at the youngest age (18.6 years). Distribution by religious groups shows that Christian women entered into motherhood at later ages (20.5 years for Catholics and 19.8 for Protestant/Other Christians) than their Muslim counterparts (18.5 years). In addition, women from Pumwani and Kasarani Divisions began childbearing at the youngest ages (19.2 years) while those from Embakasi Division did so at latest ages (20.2 years).

It is worth noting that age at first birth did not change much over time in Nairobi slums (20 years for 25-29 years old and 19.9 years for 45-49 years old). The comparison of age distributions of age at first birth between the 2012 NCSS and KDHS 2008-09 is illustrative of the fertility changes despite the fact that the two surveys were conducted about three years apart. Findings indicate that for all age groups, women living in Nairobi slums entered into motherhood earlier than their counterparts from Nairobi as a whole. Age at first birth at the national level was lower than that of Nairobi slums at ages 25-29, 30-34 and 45-49 but similar at age 35-39 and slightly higher at age 40-44.

3.6 Summary

Fertility declined in Nairobi slums between 2000 and 2012 from 4.0 children to 3.5 children per woman. There were, however, variations in fertility trends across divisions: fertility increased in Westlands but stalled in Dagoretti and Pumwani Divisions. The fertility level observed in the Nairobi slums was higher than that of Nairobi as a whole in 2008-09. However, it was lower than at the national level (4.6) and rural Kenya (5.2). Data show that even in such impoverished areas, educational attainment was negatively associated with fertility. Also, married women had higher fertility than their unmarried counterparts, which is consistent with the view that marriage remains closely associated with childbearing in African societies. Women from the Luo ethnic group had the highest fertility, which is consistent with findings from KDHS. There were also differences between the number of children ever born and the number of living children at the time of the survey, suggesting that child mortality remains a concern in Nairobi slums.

Findings show that in 2012, a substantial proportion (23 percent) of births in the slums occurred shortly after the preceding birth (less than 24 months), thereby putting women's lives at risk in a very challenging environment. The level of short birth intervals was similar to that observed in 2000 in the same slums, but higher than in Nairobi as a whole. The median birth interval marginally increased between 2000 and 2012 (from 34.1 to 36.3 months). Older women had longer birth intervals. Contrary to expectations, the median birth interval was longer following a female than a male birth. Consistent with previous evidence, the median birth interval was shorter when the preceding birth was no longer alive (28.6 vs. 36.7 months). Data also show that the median birth interval increased with higher levels of education.

Age at first birth did not change much between 2000 and 2012 but was positively associated with educational attainment. Like in 2000, Kikuyu women entered into motherhood at the latest ages whereas their Luo counterparts did so at the earliest ages. Muslim women and those living in Pumwani and Kasarani Divisions had the lowest age at firth birth. The age at first birth in Nairobi slums in 2012 was two and one-half years earlier than that of similar women in non-slum Nairobi in 2008-09 (20.0 vs. 22.6 years) and similar to the national and rural estimates according to KDHS 2008-09.

References

1. Ezeh, A. C., B. U. Mberu, and J.O. Emina, "Stall in fertility decline in Eastern African countries: Regional analysis of patterns, determinants and implications." *Philosophical Transactions of The Royal Society B*, 2009. 364(1532): p. 2991-3007

2. Westoff, C.F. and A.R. Cross, "The stall in the fertility transition in Kenya," in *DHS Analytical Studies* 2006, ORC Macro: Calverton, MD.

3. Central Bureau of Statistics (CBS) [Kenya], Ministry of Health (MOH) [Kenya], and ORC Marco, *Kenya Demographic and Health Survey 2003*. 2004, Calverton, Maryland: CBS, MOH, and ORC Marco.

4. Kenya National Bureau of Statistics (KNBS) and ICF Macro, *Kenya Demographic and Health Survey 2008-09*, 2010, KNBS and ICF Macro: Calverton, Maryland.

5. UN HABITAT, *Slums of the World: The face of urban poverty in the new millennium*, 2003, United Nations Human Settlements Program.

6. de Laat, J., *Moral Hazard and Costly Monitoring; The Case of Split Migrants in Kenya*, 2005.

7. Rutstein, S., "Effects of preceding birth intervals on neonatal, infant and under-five years mortality and nutritional status in developing countries: evidence from the demographic and health surveys." *International Journal of Gynecology & Obstetrics*, 2005. 89 (Supplement 1): p. S7-S24.

8. Whitworth, A. and R. Stephenson, "Birth spacing, sibling rivalry and child mortality in India." Social *Science & Medicine, 2002*. 55(12): p. 2107-2119.

9. Becher, H., et al., "Risk factors of infant and child mortality in rural Burkina Faso." *Bulletin of the World Health Organization*, 2004. 82(4).

CHAPTER 4: FERTILITY REGULATION

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Fertility regulation is the use of information and different contraceptive technologies to control fertility. Factors affecting fertility regulation determine the pace of fertility decline in many societies [1]. Existing literature posits that family planning has direct impacts on the number of maternal and child deaths because contraceptive use reduces the probability of pregnancy and its associated complications. In Kenya, it is estimated that about 43 percent of pregnancies are unintended at the time of conception [2]. Considering that 15 percent of all pregnancies end in complications, a substantial proportion of maternal deaths - which is significantly higher in Kenyan urban slums [3] - could be averted with effective fertility regulation [4].

This chapter examines knowledge, attitudes, and use of contraceptive methods among women of reproductive age. It also highlights the sources of modern contraceptive methods and information, intention and barriers to use of contraception. It further assesses spousal communication on attitudes and use of contraception. Results from NCSS 2012 are compared to those from NCSS 2000 and the KDHS 2008-09. The main focus is on married women and sexually active unmarried women, who face the greatest risk of pregnancy and hence have greater need for fertility regulation.

4.1 Knowledge of Contraceptive Methods

Adequate knowledge of contraceptive methods is imperative in making family planning decisions and a pre-requisite to informed choice and decision. In NCSS 2012, respondents were asked to specify the contraceptive methods (defined as methods a couple can use to delay or avoid a pregnancy) they know or have heard of. As with the NCSS 2000, the survey recorded responses that were given without any probing for knowledge of specific methods.

Table 4.1 shows the percentage of all women, currently married women, sexually active unmarried women and sexually inactive unmarried women who reported knowledge of various methods. The findings showed that spontaneous knowledge of contraceptive knowledge was quite high with about 94.8 percent of all women reporting knowledge of various contraceptive methods. Notably, women who were sexually inactive and therefore not exposed to the risk of pregnancy had levels of contraceptive knowledge similar to the rest of the group (94.8 percent). For all categories (currently married women, sexually active unmarried women and sexually inactive unmarried women), the male condom was the most commonly mentioned method, followed by injectables, pills, Norplant and the intra-uterine device (IUD). Knowledge of male and female sterilization remains low, compared to other methods. Similarly, knowledge of Lactational Amenorrhea Method (LAM) was quite low across all categories, with sexually inactive women displaying even lower knowledge levels (27.2 percent).

Table 4.1: Knowledge of contraceptive methods

Percentage of all women, currently married women, and sexually active and inactive unmarried women aged 15-49 years who spontaneously know specific contraceptive methods, NCSS 2012, NCSS 2000 and KDHS 2008-09				
Contraceptive Method	**All Women**	**Currently Married Women**	**Sexually Active Unmarried Women**	**Sexually Inactive Unmarried Women**
Any method	94.8	96.2	94.5	94.8
Any modern method	94.7	96.1	94.5	94.7
Pill	90.9	93.1	91.4	88.6
IUD	77.2	82.6	77.6	66.9
Injectables	91.1	94.7	91.0	86.3
Norplant	81.1	86.9	80.4	71.1
Diaphragm/Foam/Jelly	-	-	-	-
Male Condom	91.2	92.0	90.8	92.6
Female Condom	70.7	72.2	69.4	70.3
Female Sterilization	66.4	71.2	67.5	56.9
Male Sterilization	50.3	53.8	48.0	44.5
LAM	35.3	40.5	29.2	27.2
Emergency Contraception	54.4	54.3	60.6	53.4
Any traditional method	75.3	77.3	78.7	71.8
Periodic abstinence	71.7	73.3	76.6	68.6
Withdrawal	51.8	54.3	58.4	44.5
Other	2.9	3.3	3.5	1.3
Number of Cases	3,892	2,345	518	972
NCSS 2000				
Any method	95.6	98.2	97.9	76.0
Any modern method	95.2	97.9	97.7	74.7
Any traditional method	24.5	24.2	28.4	16.5
KDHS 2008-09				
National				
Any method	94.6	96.4	97.5	85.0
Any modern method	94.5	96.2	97.5	85.0
Any traditional method	67.2	73.0	71.4	43.8
Rural				
Any method	93.7	95.8	96.5	83.4
Any modern method	93.6	95.6	96.5	83.4
Any traditional method	64.4	70.6	69.7	38.9
Other urban				
Any method	97.1	98.9	97.6	87.7
Any modern method	97.1	98.9	97.6	87.7
Any traditional method	74.8	81.2	64.5	60.7
Nairobi				
Any method	97.5	97.0	100.0	95.0
Any modern method	97.5	97.0	100.0	95.0
Any traditional method	76.8	80.7	82.8	57.3
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09				

Knowledge of traditional methods was lower than that of modern methods, and sexually active unmarried women had higher knowledge of these methods. Periodic abstinence was the most commonly known traditional method by all categories of women. The overall levels of spontaneous knowledge of contraceptive methods reported in NCSS 2012 were not substantially different from levels recorded in the NCSS 2000. Similarly, national levels observed in the KDHS 2008-09 (94.6 percent) were close to levels recorded in NCSS 2012.

Among sexually inactive unmarried women, spontaneous knowledge of one or more contraceptive methods increased significantly from 76.0 percent in 2000 to 94.8 percent in 2012. KDHS 2008-09 indicates lower levels in Kenya as a whole (85.0 percent), rural Kenya (83.4 percent), and other urban areas (87.7 percent), but similar levels for Nairobi

(95.0 percent). There was also a substantial increase in the proportion of women who reported knowledge of at least one traditional method, from 24.5 percent in 2000 to 75.3 percent in 2012. Notably, knowledge of traditional methods was higher among slum women than among all women in Kenya (67.2 percent) in 2008-09.

Overall, there were substantial improvements in family planning knowledge among sexually inactive unmarried women, who were mostly young people below age 25 (70.0 percent) as shown in Table 5.8. The high levels of knowledge among young women living in Nairobi slums present opportunities for the prevention of unintended pregnancies and STIs including HIV/AIDS.

Knowledge of Contraceptive Methods by Background Characteristics

Table 4.2 shows that irrespective of background characteristics, a high proportion of married women reported spontaneous knowledge of at least one contraceptive method. However, the level reported in NCSS 2012 (96.2 percent) was a slight decline from that reported in NCSS 2000 (98.2 percent). Knowledge of modern methods varied between 94.9 and 98.3 percent across all age groups, between 89.5 and 98.2 percent across education levels, between 93.2 and 97.7 percent across religious groups, between 93.6 and 98.1 percent across ethnic groups, and between 91.0 and 100.0 percent across all divisions. Residents of Central Division had lower levels of knowledge for all methods. Similarly women with no formal education, women aged 15-19 years and women from the Kamba ethnic group had lower levels of knowledge of all contraceptive methods.

Of interest, however, is the increase in knowledge about condoms and traditional methods among married women. Knowledge of condoms increased from 56.5 percent in 2000 to 92.0 percent in 2012, while knowledge of traditional methods increased from 24.2 percent in 2000 to 77.3 percent in 2012. Irrespective of background characteristics, there was a slight increase in knowledge of injectables between the two surveys (from 88.8 percent in 2000 to 94.7 percent in 2012). By contrast, there were slight decreases in the proportion of currently married women who reported general knowledge of any contraceptive method, or any modern method, especially the pill.

Table 4.2: Knowledge of contraceptive methods by selected background characteristics, among currently married women, 15-49 years

Percentage of currently married women reporting knowledge of method according to selected background characteristics, NCSS 2012, NCSS 2000							
Background Characteristics	**Any method**	**Any modern method**	**Pill**	**Injectables**	**Condom**	**Any traditional method**	**Number of Cases**
Age Group							
15-19	95.7	95.7	87.3	87.9	86.6	60.5	139
20-24	95.8	95.8	92.7	94.5	92.5	76.2	624
25-29	95.9	95.6	93.4	94.8	91.9	77.2	760
30-34	98.3	98.3	95.7	97.3	92.9	83.1	391
35-39	95.9	95.5	92.1	94.1	92.0	79.2	235
40-44	94.9	94.9	92.9	92.9	90.7	82.6	116
45-49	96.9	96.9	94.6	96.9	95.1	75.3	80
Education							
No education	89.5	89.5	81.8	85.2	81.8	61.5	41
Primary incomplete	98.2	98.2	93.7	95.9	91.5	67.9	378
Primary complete	95.5	95.2	92.0	93.8	91.7	74.1	819
Secondary+	96.4	96.3	94.2	95.2	92.7	83.7	1,105
Religion							
Catholic	95.6	95.3	92.3	93.5	91.5	75.9	601
Protestant/other Christians	96.6	96.5	93.6	95.3	92.5	78.5	1,641
Muslims	93.2	93.2	88.9	89.4	84.5	66.3	72
No religion/Other	97.7	97.7	95.4	94.8	92.8	75.7	29
Ethnic Group							
Kamba	94.2	93.6	90.2	92.1	88.2	69.5	532
Kikuyu	96.0	96.0	92.4	93.5	90.7	79.8	481
Luhya	98.1	98.1	95.5	97.5	96.0	81.3	575
Luo	96.6	96.6	94.2	96.0	94.3	80.8	385
Other	96.1	96.1	93.4	94.0	90.6	75.8	368
Division							
Central	91.6	91.0	84.6	87.7	80.9	52.7	195
Makadara	97.6	97.6	97.3	97.6	95.0	88.5	221
Kasarani	96.4	96.4	95.5	95.2	94.8	76.1	245
Embakasi	94.0	93.7	88.7	91.3	86.3	67.0	693
Pumwani	93.1	93.1	87.6	88.6	87.2	57.9	100
Westlands	100.0	100.0	98.9	100.0	98.7	85.5	214
Dagoretti	97.7	97.7	95.3	96.5	95.7	89.2	341
Kibera	99.0	99.0	97.3	98.8	98.3	93.5	336
NCSS 2012 Total	96.2	96.1	93.1	94.7	92.0	77.3	2,345
NCSS 2000 Total	98.2	97.9	95.8	88.8	56.5	24.2	1,931
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012							

4.2 Use of Contraception and Source of Supplies

4.2.1 Ever Use of Contraception

Respondents were asked if they had ever used any contraceptive method in their lifetime and if so, which specific method(s) they had used. Table 4.3 presents the percentage distribution of women who had ever used a contraceptive method, by type of method and age.

Table 4.3: Ever use of Contraception

Percentage distribution of all women, of currently married women and of sexually active unmarried women who have ever used a contraceptive method, by method and age, NCSS 2012, NCSS 2000 and KDHS 2008-09																		
Age Group	Ever used any method	Modern Methods											Traditional Methods				Never used	Number of cases
		Any modern method	Pill	IUD	Injectables	Implant	Male Condom	Female Condom	Female Sterilisation	Male Sterilisation	LAM	Emergency Contraception	Any traditional method	Periodic abstinence	Withdrawal	Other		
ALL WOMEN (15-49)																		
15-19	25.0	24.0	5.1	0.3	11.0	2.2	12.2	0.5	0.2	0.0	0.2	1.9	1.9	1.9	0.7	0.0	75.0	590
20-24	64.5	62.9	13.0	1.9	42.0	5.2	20.3	1.1	0.6	0.4	1.4	4.5	8.5	6.3	2.5	0.4	35.5	1,027
25-29	77.0	74.6	25.3	4.4	56.4	10.2	12.5	1.0	0.9	0.4	1.0	2.5	8.3	7.1	0.9	0.8	23.0	1,043
30-34	82.9	80.2	34.7	5.0	58.4	11.0	15.0	1.1	1.9	0.7	1.7	2.2	10.9	9.5	2.1	0.1	17.1	543
35-39	80.1	77.8	33.1	5.5	57.5	12.5	10.5	1.8	5.3	2.7	1.7	2.3	11.9	10.5	1.1	1.1	19.9	351
40-44	73.1	71.9	36.1	7.9	48.0	10.4	11.0	0.0	6.3	2.5	1.0	0.5	7.7	5.5	1.6	1.8	26.9	198
45-49	62.7	59.8	24.2	11.9	37.6	6.4	4.8	0.0	5.1	2.6	2.4	0.0	6.8	4.7	0.0	2.1	37.3	140
NCSS 2012 Total	66.3	64.3	21.6	3.8	45.0	7.8	14.3	1.0	1.7	0.8	1.2	2.7	8.0	6.6	1.5	0.6	33.7	3,892
NCSS 2000 Total	59.0	52.2	32.3	5.3	28.4	1.2	10.0	0.0	2.0	0.1	0.0	0.0	12.7	11.8	0.4	0.9	41.0	3,572
CURRENTLY MARRIED WOMEN																		
15-19	57.5	54.1	16.3	0.7	33.0	6.0	19.4	0.0	0.0	0.0	0.9	2.8	5.6	5.6	1.6	0.0	42.5	139
20-24	74.0	72.1	16.7	2.3	55.3	6.5	16.2	1.0	0.6	0.2	1.7	2.9	9.8	7.9	2.3	0.4	26.0	624
25-29	82.2	79.7	28.0	5.2	64.5	10.8	8.5	0.5	0.9	0.5	1.2	2.1	7.7	6.3	0.6	1.0	17.8	760
30-34	87.2	84.1	35.7	5.9	62.6	11.4	10.3	0.9	2.0	0.8	2.3	0.5	10.3	9.2	1.4	0.2	12.8	391
35-39	85.2	82.8	33.2	6.6	61.9	12.2	8.7	1.8	6.9	3.5	2.3	1.6	11.9	10.3	0.8	1.2	14.8	235
40-44	76.9	75.3	41.7	9.2	46.4	12.6	10.2	0.0	8.8	3.6	0.6	0.9	11.3	7.5	2.8	3.0	23.1	116
45-49	67.9	64.3	29.9	14.7	44.2	4.7	4.6	0.0	8.6	4.4	2.6	0.0	8.5	5.6	0.0	2.9	32.1	80
NCSS 2012 Total	78.9	76.4	26.9	5.0	58.0	9.5	11.4	0.8	2.2	1.1	1.6	1.9	9.2	7.6	1.4	0.8	21.1	2,345
NCSS 2000 Total	66.9	59.7	38.4	6.4	34.2	1.5	8.1	0.0	2.5	0.1	0.0	0.0	12.9	11.9	0.5	0.9	33.1	1,931
KDHS 2008-09																		
National	72.9	67.9	32.7	6.0	48.3	3.9	14.3	0.0	4.8	0.2	0.0	0.0	19.5	16.0	7.4	-	27.1	4,928
Rural	70.0	64.4	29.8	4.4	47.5	3.6	12.2	0.0	5.4	0.2	0.0	0.0	19.0	15.7	6.8	-	30.0	3,774
Other urban	82.7	79.5	43.3	11.1	56.8	3.9	17.3	0.0	3.2	0.3	0.0	0.0	19.1	15.2	8.1	-	17.3	791
Nairobi	81.8	78.3	39.6	11.3	38.1	7.9	29.1	0.0	2.7	0.1	0.0	0.0	25.6	21.6	12.1	-	18.2	363
SEXUALLY ACTIVE UNMARRIED WOMEN																		
15-19	49.3	48.1	6.4	0.0	11.5	1.4	36.4	1.5	0.0	0.0	-	5.4	4.7	4.7	2.2	0.0	50.7	82
20-24	65.3	63.0	10.6	2.2	28.0	2.7	38.7	0.9	0.8	0.6	-	10.6	10.4	6.5	4.4	0.8	34.7	176
25-29	71.2	68.5	21.2	2.2	36.2	6.2	30.7	3.9	1.4	0.0	-	6.1	8.6	7.3	1.2	0.0	28.8	122
30-34	80.9	79.6	40.8	1.9	56.1	14.3	40.8	1.2	2.9	1.5	-	4.2	18.1	15.3	6.7	0.0	19.1	64
35-39	85.2	82.4	34.8	3.5	63.0	15.9	27.4	4.5	0.0	1.4	-	8.9	22.3	22.3	4.5	0.0	14.8	43
40-44	87.9	85.5	27.1	12.0	63.8	9.0	19.7	0.0	3.7	0.0	-	0.0	2.4	2.4	0.0	0.0	12.1	20
45-49	59.9	48.0	23.4	0.0	23.1	15.2	16.6	0.0	0.0	0.0	-	0.0	11.9	11.9	0.0	0.0	40.1	11
NCSS 2012 Total	68.9	66.5	19.5	2.3	35.5	6.5	34.6	2.0	1.1	0.5	-	7.2	10.9	8.9	3.4	0.3	31.1	518
NCSS 2000 Total	65.9	57.5	32.8	5.2	27.9	1.2	17.8	0.0	1.7	0.1	0.0	0.0	17.3	16.3	0.2	1.0	34.1	965
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09																		

Two-thirds (66.3 percent) of all women reported ever use of a contraceptive method, while 64.3 percent reported ever use of a modern method. More than three-quarters (78.9 percent) of currently married women reported ever use of a method compared to 68.9 percent of sexually active unmarried women. Among married women, the proportion reporting ever use of a contraceptive method represents a 12.0 percentage point increase from 2000 while for sexually active unmarried women, only a 3.0 percent increase was observed. A similar trend was observed regarding the proportion of women reporting ever use of modern contraception: about three-quarters of married women (76.4 percent) reported ever use of modern contraception, representing a 16.7 percentage point increase from 2000; for sexually active unmarried women, there was a 9 percentage point increase from 57.5 percent in 2000 to 66.5 percent in 2012.

Patterns for reported use of traditional methods in 2012 were similar for all groups of women. Overall, 8.0 percent of all women reported use of traditional methods compared to 9.2 percent of currently married women and 10.9 percent of sexually active unmarried women. These proportions were lower than those reported in 2000 among all women (12.7 percent), currently married women (12.9 percent) and sexually active unmarried women (17.3 percent).

The most common methods ever used by currently married women were injectables (58.0 percent), pills (26.9 percent), male condoms (11.4 percent), and implants (9.5 percent). Among sexually active unmarried women, the most common methods ever used were injectables (35.5 percent), male condoms (34.6 percent), and pills (19.5 percent). There was a marked increase in ever use of injectables among currently married women and ever use of condoms among sexually active unmarried women over the inter-survey period. Overall, ever use of condoms was low with just 14.3 percent of all women of reproductive age reporting use. For currently married women, ever use of contraception increased with age from 57.5 percent among those aged 15-19 years, to a peak of 87.2 percent among women aged 30-34 years, before declining to 67.9 percent among women aged 45-49 years.

Ever use of modern contraceptive methods among currently married women (76.4 percent) was higher in 2012 compared to 2000 (59.7 percent). Similar patterns were observed for every use of any method. The proportion of currently married women reporting ever use of modern method was higher in the slums in 2012 than in the whole of Kenya (67.9 percent) and rural Kenya (64.4 percent) but lower than Nairobi (78.3 percent) and other urban areas of Kenya (79.5 percent) according to the KDHS 2008/09. On the other hand, currently married women in Nairobi in 2008-09 were likely to report higher levels of ever use of condoms (29.1 percent) compared to married slum residents in 2012 (11.4 percent), a pattern that was consistent with that of NCSS 2000. Currently married slum residents reported remarkably lower levels of ever use of traditional methods in 2012 (9.2 percent) compared to their counterparts in Kenya (19.5 percent), Nairobi (25.6 percent), other urban areas of Kenya (19.1 percent) and rural Kenya (19.0 percent) in KDHS 2008/09.

It is worth nothing that the proportion of women who had never used a contraceptive method declined overall, but mostly among currently married women from 33.1 percent in 2000 to 21.1 percent in 2012.

4.2.2 Current Use of Contraception

Fertility of a population is related to the level of contraceptive prevalence. A decline of about one child in the total fertility rate of a population corresponds to an estimated 15 percentage point increase in contraceptive uptake [5]. In this regard, information on contraceptive prevalence rate (CPR) gives insight into the fertility of women and is an important measure of the success of family planning programs. CPR refers to the proportion of women using contraceptive methods at the time of the survey. Table 4.4 presents the CPR among all women, currently married women, and sexually active unmarried women.

Overall, the CPR was 42.8 percent for any method, 40.1 percent for modern methods and 3.2 percent for traditional methods. Among currently married women, 57.3 percent were currently using any method (53.5 percent for modern method and 4.3 percent for traditional method). The CPR for any method was substantially lower for sexually active unmarried women (40.0 percent) compared to their married counterparts. CPR among sexually active unmarried women changed marginally between 2000 and 2012 (a decrease of 1 percentage point); while it substantially increased from 45.8 percent in 2000 to 57.3 percent in 2012 among currently married women. For all women, CPR was lowest among those aged 15-19 years (14.6 percent) and highest in the age group 30-34 years (56.8 percent).

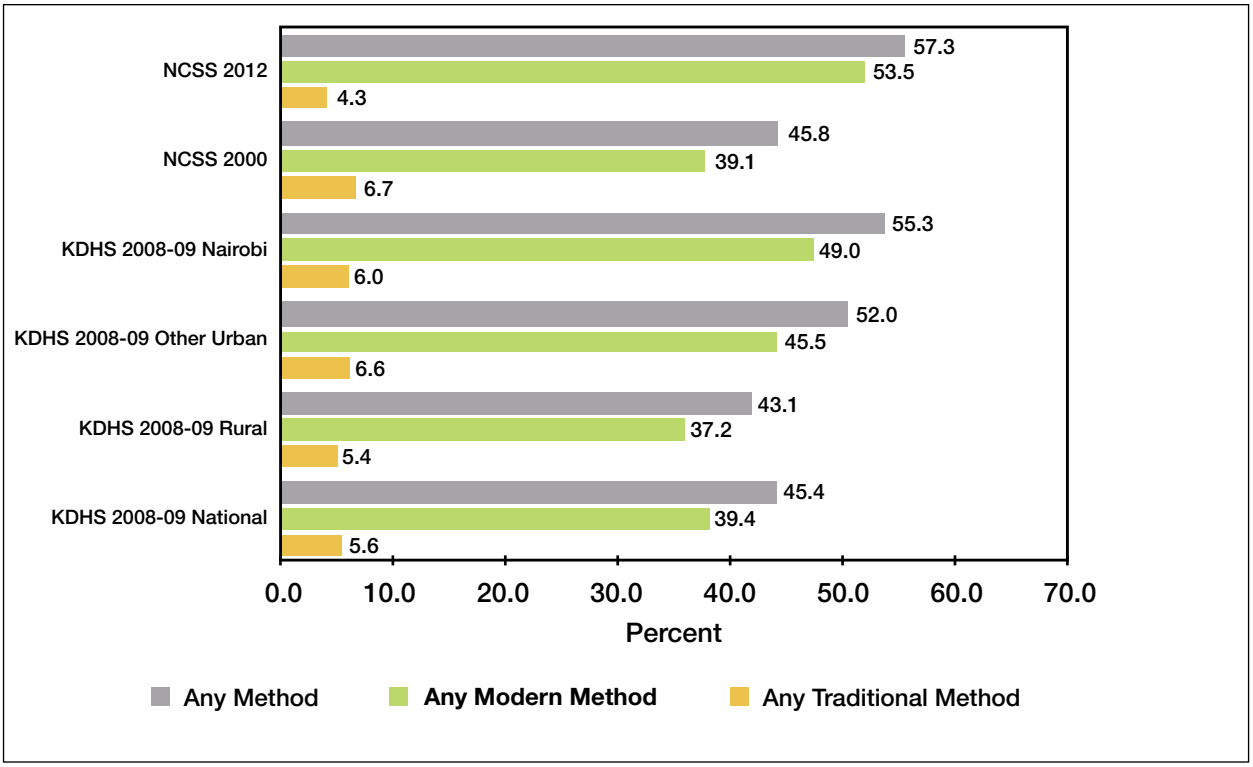
In terms of specific methods, injectables were the most common method being used by currently married women (34.5 percent) at the time of the survey, followed by pills (8.5 percent) and implants (6.6 percent) in that order. Injectables were also the most commonly used methods by sexually active unmarried women (17.0 percent), followed by male condoms (10.5 percent) and implants (5.5 percent) in that order. In addition, for sexually active unmarried women, usage of methods such as the pill, IUD and sterilization declined from the levels observed in 2000.

Table 4.4: Current use of contraception

Percentage distribution of all women, of currently married women and of sexually active unmarried women who are currently using a contraceptive method, by method and age, NCSS 2012, NCSS 2000																		
Age Group	Currently using any method	Modern Methods											Traditional Methods				Never used	Number of cases
		Any modern method	Pill	IUD	Injectables	Implant	Male Condom	Female Condom	Female Sterilisation	Male Sterilisation	LAM	Emergency Contraception	Any traditional method	Periodic abstinence	Withdrawal	Other		
ALL WOMEN (15-49)																		
15-19	14.6	13.7	1.8	0.2	7.3	1.5	3.4	0.0	0.2	0.0	0.0	0.0	1.0	1.0	0.1	0.0	85.4	590
20-24	39.6	37.8	5.0	0.7	25.8	4.2	4.0	0.2	0.6	0.0	0.0	0.0	2.5	2.0	0.2	0.3	60.4	1,027
25-29	53.2	50.4	7.6	2.2	32.4	7.6	2.2	0.2	0.9	0.1	0.1	0.1	3.3	2.4	0.3	0.7	46.8	1,043
30-34	56.8	53.0	9.2	2.9	33.1	7.2	2.6	0.0	1.9	0.0	0.0	0.2	4.1	4.0	0.0	0.1	43.2	543
35-39	55.7	51.2	8.8	1.6	27.4	8.1	2.4	0.4	5.3	0.0	0.3	0.3	5.1	3.9	0.0	1.1	44.3	351
40-44	46.2	39.7	11.2	1.2	16.6	4.2	3.9	0.0	6.3	0.0	0.0	0.0	6.6	4.3	1.0	1.8	53.8	198
45-49	17.0	14.3	0.5	0.6	5.9	0.6	0.5	0.0	5.1	0.0	1.1	0.0	3.8	1.7	0.0	2.1	83.0	140
NCSS 2012 Total	42.8	40.1	6.3	1.4	24.7	5.3	2.9	0.1	1.7	0.0	0.1	0.1	3.2	2.5	0.2	0.5	57.2	3,892
NCSS 2000 Total	38.9	32.3	10.1	1.6	15.8	0.8	2.0	0.0	2.0	0.0	0.0	0.0	6.6	6.0	0.1	0.5	61.1	3,132
CURRENTLY MARRIED WOMEN																		
15-19	39.3	37.4	6.3	0.7	21.9	2.9	6.3	0.0	0.0	0.0	0.0	-	2.5	2.5	0.0	0.0	60.7	139
20-24	51.9	48.9	6.8	0.8	35.1	5.1	3.2	0.1	0.6	0.0	0.0	-	3.7	2.8	0.4	0.4	48.1	624
25-29	61.2	58.1	8.1	2.8	39.5	8.5	1.0	0.0	0.9	0.2	0.1	-	3.6	2.6	0.2	0.8	38.8	760
30-34	65.9	61.4	11.6	3.8	39.7	7.5	1.9	0.0	2.0	0.0	0.0	-	4.4	4.2	0.0	0.2	34.1	391
35-39	66.3	61.5	11.2	2.2	32.5	8.7	2.0	0.6	6.9	0.0	0.4	-	4.9	3.7	0.0	1.2	33.7	235
40-44	59.1	48.5	13.4	1.2	18.7	4.7	5.3	0.0	8.8	0.0	0.0	-	10.6	6.8	1.6	3.0	40.9	116
45-49	25.3	21.4	0.0	1.0	9.9	0.0	0.0	0.0	8.6	0.0	1.8	-	5.8	2.9	0.0	2.9	74.7	80
NCSS 2012 Total	57.3	53.5	8.5	2.1	34.5	6.6	2.3	0.1	2.2	0.0	0.1	-	4.3	3.3	0.3	0.8	42.7	2,345
NCSS 2000 Total	45.8	39.1	12.9	2.0	19.9	0.8	0.9	0.0	2.6	0.0	0.0	0.0	6.7	6.0	0.2	0.5	54.3	1,828
SEXUALLY ACTIVE UNMARRIED WOMEN																		
15-19	27.9	24.3	2.3	0.0	6.7	1.4	15.1	0.0	0.0	-	-	0.0	3.6	3.6	1.2		72.1	82
20-24	32.6	32.1	2.3	0.9	17.0	2.7	11.1	0.5	0.8	-	-	0.0	1.8	1.8	0.0		67.4	176
25-29	44.1	41.6	7.6	0.0	13.8	6.2	11.3	1.4	1.4	-	-	0.0	4.1	4.1	0.0		55.9	122
30-34	54.9	49.9	3.1	0.9	23.8	13.4	8.9	0.0	2.9	-	-	0.0	6.7	6.7	0.0		45.1	64
35-39	57.9	50.4	3.6	1.4	31.3	11.2	6.8	0.0	0.0	-	-	0.9	9.7	9.7	0.0		42.1	43
40-44	49.0	46.5	18.9	0.0	27.8	5.2	0.0	0.0	3.7	-	-	1.8	2.4	2.4	0.0		51.0	20
45-49	13.7	13.7	6.8	0.0	0.0	0.0	6.9	0.0	0.0	-	-	2.2	0.0	0.0	0.0		86.3	11
NCSS 2012 Total	40.0	37.3	4.5	0.5	17.0	5.5	10.5	0.5	1.1	-	-	0.0	3.9	3.9	0.2		60.0	518
NCSS 2000 Total	41.0	32.0	8.6	1.6	14.2	1.0	4.8	0.0	1.7	0.0	0.0	0.0	9.0	8.6	0.0	0.4	59.9	945
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012																		

Figure 4.1 illustrates the CPR among currently married women in the NCSS 2000, NCSS 2012, and KDHS 2008-09. CPR for any method was higher for women in slum areas in 2012 (57.3 percent) compared with Nairobi (55.3 percent), Kenya as a whole (45.4 percent), rural Kenya (43.1 percent) and other urban areas of Kenya (52.0 percent). Similarly, women living in slum areas reported higher use of modern contraceptive methods (53.5 percent) compared to married women in other areas including Nairobi (49.0 percent) and the whole of Kenya (39.1 percent).

Figure 4.1: Percentage of currently married women who are using contraception, NCSS 2012, NCSS 2000 and KDHS 2008-09



Current Use of Contraception by Background Characteristics

Table 4.5 shows the percentage of women who were currently using contraception by selected background characteristics. CPR for modern methods was highest among currently married women with completed primary education (56.1 percent) and lowest among those with no formal education (32.6 percent). CPR for traditional methods was highest among currently married women with secondary or higher education (5.3 percent), and lowest among women with no formal education (2.6 percent).

Table 4.5: Current use of contraception by selected background characteristics

Percentage distribution of all women, currently married women, and of sexually active unmarried women aged 15-49 years by type of contraceptive method currently using, according to selected background characteristics, NCSS 2012, NCSS 2000

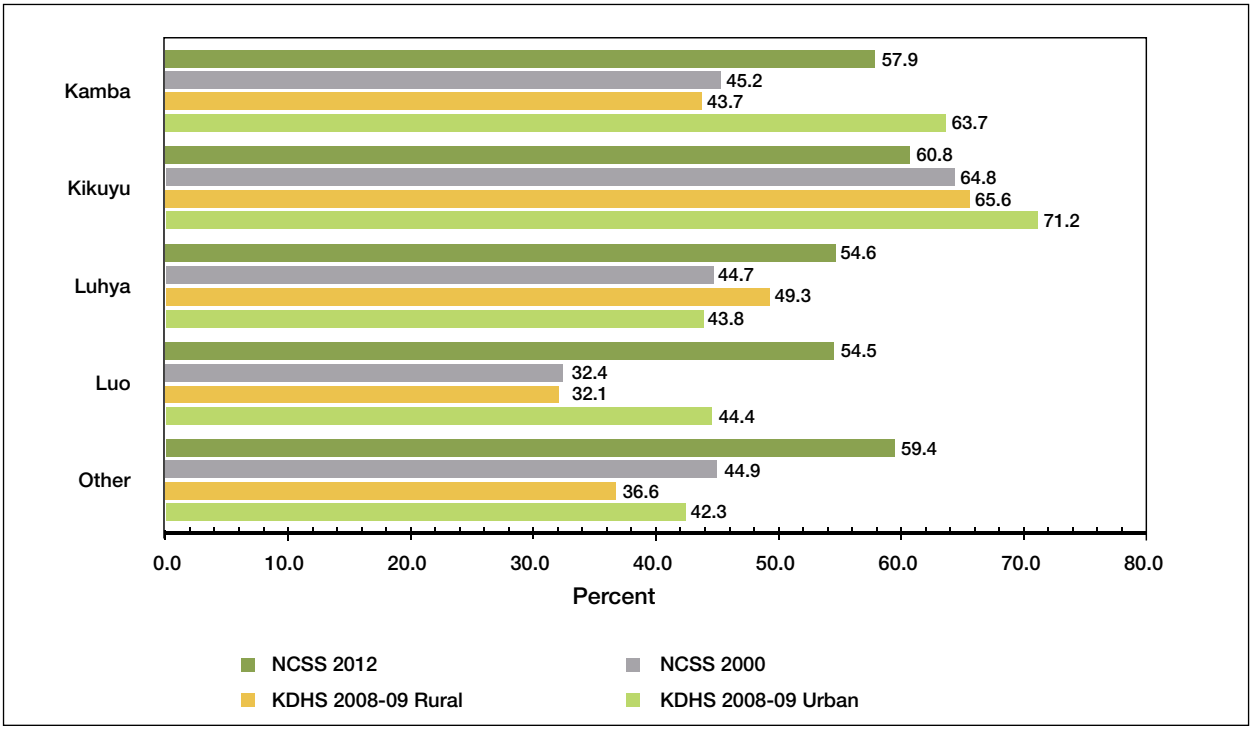
Background Characteristics	All Women					Currently Married Women					Sexually Active Unmarried Women				
	Any method	Any modern method	Any traditional method	Not using	Number of cases	Any method	Any modern method	Any traditional method	Not using	Number of cases	Any method	Any modern method	Any traditional method	Not using	Number of cases
Education															
No education	26.0	22.4	2.5	74.0	73	35.3	32.6	2.6	64.7	41	40.2	30.1	10.1	59.8	8
Primary incomplete	41.0	38.5	3.2	59.0	620	52.0	48.7	4.2	48.0	378	36.8	35.5	2.8	63.2	71
Primary complete	47.7	46.2	2.5	52.3	1,203	58.9	56.1	3.0	41.1	819	49.1	46.2	3.7	50.9	127
Secondary+	40.2	37.5	3.7	59.8	1,988	58.7	53.9	5.3	41.3	1,105	37.5	34.7	4.1	62.5	311
Religion															
Catholic	44.9	41.4	4.1	55.1	1,001	60.6	55.5	5.4	39.4	601	38.7	35.2	5.1	61.3	134
Protestant/other Christians	42.5	40.1	2.9	57.5	2,706	56.7	53.4	3.8	43.3	1,641	40.0	37.6	3.1	60.0	361
Muslims	36.7	34.0	4.5	63.3	118	45.1	42.1	4.3	54.9	72	56.3	49.3	18.1	43.7	12
Other	43.8	40.6	3.1	56.2	49	54.7	52.4	2.3	45.3	29	48.8	48.8	0.0	51.2	8
Ethnic Group															
Kamba	43.8	40.8	3.3	56.2	862	57.9	53.6	4.6	42.1	532	36.4	33.3	3.1	63.6	124
Kikuyu	44.8	42.3	3.0	55.2	867	60.8	57.3	3.9	39.2	481	42.7	40.4	4.6	57.3	119
Luhya	41.4	39.3	2.8	58.6	938	54.6	51.5	3.9	45.4	575	41.1	39.6	3.2	58.9	122
Luo	39.1	35.3	3.8	60.9	614	54.5	49.2	5.3	45.5	385	31.2	28.4	2.9	68.8	73
Other	45.2	42.7	3.2	54.8	589	59.4	56.3	3.8	40.6	368	45.5	41.0	6.3	54.5	77
Division															
Central	43.6	40.8	3.5	56.4	303	54.0	51.0	3.6	46.0	195	41.3	35.8	5.5	58.7	48
Makadara	45.4	43.0	2.8	54.6	404	60.5	57.6	2.9	39.5	221	46.6	43.0	5.4	53.4	85
Kasarani	38.0	36.6	1.7	62.0	404	50.5	48.8	2.0	49.5	245	51.2	47.9	3.3	48.8	28
Embakasi	43.7	39.8	4.7	56.3	1,129	58.2	52.6	6.4	41.8	693	44.7	41.4	5.2	55.3	119
Pumwani	52.4	51.1	2.1	47.6	182	61.2	59.7	1.5	38.8	100	63.4	63.4	4.1	36.6	33
Westlands	45.0	43.1	2.3	55.0	332	59.1	56.6	2.7	40.9	214	36.0	33.0	5.6	64.0	35
Dagoretti	42.1	38.2	4.4	57.9	579	60.2	54.3	6.7	39.8	341	29.9	26.7	3.3	70.1	84
Kibera	38.9	37.5	1.4	61.1	559	55.1	52.8	2.3	44.9	336	24.7	24.7	0.0	75.3	86
Number of living children															
0	10.9	10.0	1.3	89.1	1,217	19.0	17.3	1.9	81.0	354	22.8	20.6	3.9	77.2	254
1-2	54.8	51.6	3.6	45.2	1,814	61.6	57.8	4.2	38.4	1,321	56.1	53.6	3.0	43.9	206
3-4	63.8	59.2	5.4	36.2	686	70.9	65.7	5.8	29.1	532	54.9	49.1	7.6	45.1	53
5+	51.7	48.2	3.4	48.3	175	59.3	54.9	4.4	40.7	138	36.9	36.9	0.0	63.1	5
NCSS 2012 Total	42.8	40.1	3.2	57.2	3,892	57.3	53.5	4.3	42.7	2,345	40.0	37.3	3.9	60.0	518
NCSS 2000 Total	38.9	32.3	6.6	61.1	3,132	45.7	39.0	6.7	54.3	1,827	41.1	32.0	9.0	58.9	930

Source: Nairobi Cross-Sectional Slums Surveys (NCSS) 2000 & 2012

Variations were also observed in modern CPR by religious affiliation: Currently married Catholic women had the highest CPR (55.5 percent), while Muslims had the lowest CPR (42.1 percent). Figure 4.2 shows substantial increase in modern CPR among currently married women between 2000 and 2012 across all ethnic groups except the Kikuyu. Variations in CPR by ethnic group in 2012 showed that currently married Kikuyu women had the highest CPR for modern methods (57.3 percent) while the Luo had the lowest (49.2 percent) in 2012 (Table 4.5). A similar pattern was observed in NCSS 2000 as well as rural and other urban areas of Kenya, according to the KDHS 2008-09. Across all ethnic groups, slum residents had higher CPR compared to their rural counterparts. The highest modern CPR for currently married women was in Pumwani Division (59.7 percent) and the lowest in Kasarani Division (48.8 percent). Modern CPR among currently married women increased with increasing number of living children, peaking at 3-4 children (65.7 percent), compared with 17.3 percent among similar women with no living children.

Differentials in contraceptive use for sexually active unmarried women were similar to those of married women. Among sexually active unmarried women, the highest modern CPR was among women with complete primary education (46.2 percent), Muslims (49.3 percent), Kikuyu and Luhya women (40.4 and 39.6 percent, respectively), those living in Pumwani Division (63.4 percent) and women with 1-2 children (53.6 percent).

Figure 4.2: Current use of any family planning methods among currently married women aged 15-49 years by ethnicity, NCSS 2012, NCSS 2000 and KDHS 2008-09



4.2.3 Source of Contraceptive Method for Current Users

Women who reported using a modern contraceptive at the time of the survey were asked about their most recent source of contraceptives. Table 4.6 shows the distribution of women who were currently using a contraceptive method, by their most recent source.

Table 4.6: Source of contraceptive methods

Percentage distribution of current users of modern method of contraceptive aged 15-49 years by most recent source of method, according to specific methods, NCSS 2012, NCSS 2000									
Source of method	**Any modern methods**	**Type of modern method**							**Number of cases**
		Pill	**IUD**	**Injectables**	**Implant**	**Male Condom**	**Female Condom**	**Female Sterilization**	
Public Sector	**34.7**	**26.2**	**37.1**	**37.0**	**46.2**	**11.1**	**31.2**	**45.8**	**548**
Government hospital	10.0	6.3	13.3	9.5	10.8	5.0	0.0	35.4	155
Government health center	20.8	16.9	19.4	23.4	29.8	4.4	31.2	4.0	330
Government dispensary	3.9	3.0	4.4	4.1	5.6	1.7	0.0	6.4	63
Medical Private Sector	**40.5**	**53.4**	**35.3**	**42.8**	**28.1**	**25.1**	**33.4**	**28.7**	**635**
Mission/church hospital/clinic	2.4	0.5	3.7	2.4	4.2	0.7	0.0	8.3	37
FPAK health clinic	0.6	0.4	0.0	0.4	2.4	0.0	0.0	0.0	10
Other NGO service	1.1	1.1	1.7	1.3	0.8	0.0	0.0	0.0	16
Private hospital/clinic	22.1	9.6	24.3	28.0	18.6	3.8	0.0	20.4	347
Pharmacy	14.3	41.8	5.6	10.7	2.1	20.6	33.4	0.0	225
Mobile Clinic	**1.0**	**0.7**	**2.7**	**0.2**	**6.1**	**0.0**	**0.0**	**0.0**	**14**
CBD worker	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Other Private Sector	**2.8**	**0.4**	**0.0**	**0.3**	**0.0**	**32.4**	**19.0**	**0.0**	**86**
Shop	1.9	0.4	0.0	0.1	0.0	23.6	19.0	0.0	32
Friends/relatives	0.9	0.0	0.0	0.2	0.0	8.8	0.0	0.0	54
Other	**0.8**	**1.0**	**0.0**	**0.1**	**0.0**	**7.9**	**0.0**	**0.0**	**35**
Missing	20.0	18.2	25.1	19.5	19.1	23.0	16.4	25.6	358
Not Applicable	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	2,214
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	3,892
Number of cases	1,541	238	57	959	201	118	5	62	3,892
NCSS 2000									
Public sector	52.3	52.7	54.8	57.6	30.4	13.1	13.1	53.2	527
Medical private sector	41.8	41.9	45.2	42.3	69.5	16.3	16.3	46.9	420
Mobile clinic	0.2	0.0	0.0	0.0	0.0	3.3	3.3	0.0	2
CBD worker	1.0	2.9	0.0	0.0	0.0	1.6	1.6	0.0	10
Other private	4.1	1.3	0.0	0.0	0.0	59.0	59.0	0.0	41
Other	0.8	1.3	0.0	0.0	0.0	6.6	6.6	0.0	8
* Table displays columns and/or rows containing 'non-missing' values (some percentages may not add up to 100%)									
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012									

Results show that 40.5 percent of all modern users obtained contraceptives from the medical private sector, mostly from private hospitals and clinics. Among slum women using modern contraceptives, 34.7 percent obtained the methods from the public sector including government health centers and hospitals, 1.0 percent obtained the methods from mobile clinics, and 2.8 percent obtained the methods from other private sector, mostly shops.

There were variations in sources of contraceptive method by type of method. For users of the pill, more than half obtained the methods from the medical private sector (53.4 percent), in particular pharmacies (41.8 percent). Users of injectables and condoms primarily obtained the methods from the medical private sector. Public sector sources, especially government health centers and hospitals, were the preferred source for users of IUD (37.1 percent), implants (46.2 percent) and female sterilization (45.8 percent). The observed patterns may be a reflection of the availability of more technical procedures at lower costs in public facilities. It is worth noting that the medical private sector (especially private clinics) was a substantial provider for IUD, implants and sterilization services; however 6.1 percent of women using implants and 2.7 percent of IUD users obtained them from mobile clinics. Considerable differences in sources of contraceptives were observed in the inter-survey period. In the 2000 survey, 52.3 percent of women in the slums obtained modern contraceptive methods (especially pills, injectables, and implants) from the public sector, compared to 34.7 percent in 2012.

Table 4.7 presents information on the sources of modern contraceptives from NCSS 2000, NCSS 2012 and KDHS 2008-09. The proportion of women in rural areas that obtained contraceptives from the public sector (63 percent) was higher than that in the slums in 2012 (34.7 percent) and in Nairobi (33.4 percent).

Table 4.7: Source of modern contraceptive methods

Percentage distribution of current users of modern contraceptives aged 15-49 by most recent source of method, NCSS 2012, NCSS 2000 and KDHS 2008-09						
Source of method	**KDHS**				**NCSS 2000**	**NCSS 2012**
	National	**Rural**	**Other Urban**	**Nairobi**		
Public Sector	**57.2**	**62.7**	**50.2**	**33.4**	**52.3**	**34.7**
Government hospital	23.4	21.6	33.1	16.7	12.0	10.0
Government health center	14.5	16.5	8.2	12.0	10.8	20.8
Government dispensary	19.4	24.5	8.9	4.6	2.7	3.9
City council clinic	-	-	-	-	26.8	-
Medical Private Sector	**35.9**	**31.7**	**42.6**	**51.7**	**41.7**	**40.5**
Private hospital/clinic	19.4	17.1	25.7	22.7	5.2	22.1
Mission/church hospital/clinic	4.9	5.0	4.8	4.7	2.3	2.4
FPAK health clinic^	1.2	0.9	2.5	1.1	4.1	0.6
Other NGO service	-	-	-	-	24.7	1.1
Pharmacy	10.2	8.4	9.6	22.8	3.9	14.3
Private doctor	-	-	-	-	1.5	-
Mobile Clinic	**0.2**	**0.2**	**0.3**	**0.0**	**0.2**	**1.0**
CBD worker	**0.4**	**0.5**	**0.1**	**0.0**	**1.0**	**-**
Other Private Sector	**5.2**	**4.1**	**4.9**	**13.6**	**4.0**	**2.8**
Shop	3.7	3.1	4.3	6.7	3.2	1.9
Friends/relatives	1.6	1.0	0.9	6.9	0.8	0.9
Other	**0.5**	**0.4**	**0.9**	**0.8**	**0.8**	**0.8**
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number of cases	2,329	1,635	455	239	1,007	1,541
^FPAK: Family Health Options Kenya						
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09						

4.2.4 Current Use of Periodic Abstinence and Knowledge of the Fertile Period

Table 4.8: Knowledge of the fertile period and use of periodic abstinence

Percentage distribution of all women and women who have ever used or are currently using periodic abstinence aged 15-49 years by knowledge of the fertile period during the ovulatory cycle, NCSS 2012, NCSS 2000 and KDHS 2008-09													
Knowledge of fertile period	**KDHS**								**NCSS 2000**		**NCSS 2012**		
	National		**Rural**		**Other Urban**		**Nairobi**						
	All women	**Current users**	**All women**	**Current users**	**All women**	**Current users**	**All women**	**Current users**	**All women**	**Current users**	**All women**	**Current users**	**Ever users**
Ovulation time													
During period	2.5	4.3	2.7	5.2	1.8	-	1.9	6.2	1.0	0.5	3.3	1.1	4.0
Right after period ends	29.9	39.4	30.4	40.4	29.8	41.5	25.0	25.9	20.2	25.9	27.5	37.5	30.3
Middle of the cycle	24.3	38.0	21.8	37.1	28.8	38.1	36.8	45.7	32.2	52.9	23.9	35.2	29.9
Just before period begins	14.2	11.3	14.4	12.6	12.5	4.1	15.5	17.0	8.2	7.9	18.0	15.9	19.9
Other	11.3	1.9	11.5	1.6	13.0	3.5	6.8	-	0.4	0.0	1.1	0.0	0.8
Do not know time	17.7	5.1	19.0	3.1	13.9	12.8	14.1	5.2	38.1	12.7	26.3	10.2	15.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number of cases	8,444	288	6,296	209	1,420	55	728	23	3,254	189	3,892	88	251.0
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09													

Table 4.4 shows that 3.2 percent of all women reported use of traditional methods (including periodic abstinence and withdrawal). The efficacy of periodic abstinence depends on correct knowledge of the ovulatory cycle. Women were asked whether the specific time a woman is likely to get pregnant was just before her period begins, during her period, right after her period has ended, or halfway between two periods. Table 4.8 presents the percentage distribution of all women using periodic abstinence by their responses to this question. Only one in four of all women (23.9 percent) in 2012 accurately stated that pregnancy was most likely to occur halfway between periods.

Among current users of periodic abstinence in 2012, 35.2 percent correctly identified the middle of the menstrual cycle as time when conception is most likely to occur. In 2012, women in slums exhibited lower knowledge of the fertile period compared with 2000. Moreover, women in slums had lower knowledge than women in all other areas except rural Kenya. The low level of knowledge of fertile period among current users of traditional methods exposes them to the risk of unintended pregnancy.

Table 4.9 presents the percentage of women who correctly identified the middle of the menstrual cycle as the time when conception is most likely to occur, by selected background characteristics. Overall, correct knowledge was higher among single women (24.9 percent) compared to their married counterparts (22.8 percent). Married women aged 15-19 years had the lowest knowledge (16.0 percent), while married women aged 25-29 had the highest knowledge (25.9 percent). Single women aged 40-44 years had the lowest knowledge about their fertile period (12.9 percent) while those aged 25-29 had the highest knowledge (30.7 percent).

Women with secondary or higher education were more likely to correctly identify the fertile period. Among married women, Catholics and Protestants had higher levels of knowledge (23.6 percent and 23.0 percent, respectively) compared to Muslims (16.0 percent). In contrast, among single women, 29.4 percent of Muslim women correctly identified the fertile period compared to 25.4 percent of Catholics and 24.6 percent of Protestants. With respect to the major ethnic groups, Luos had the lowest correct knowledge of the fertile period, while Kambas had the highest level, irrespective of marital status. Married and single women living in Pumwani and Central Divisions had the highest levels of correct knowledge, while the lowest knowledge levels were observed among women living in Kasarani Division.

Table 4.9: Knowledge of the fertile period by selected background characteristics

Percentage of married and single women aged 15-49 years who correctly identified the middle of the menstrual cycle as the fertile period, by selected background characteristics, NCSS 2012, NCSS 2000			
Background Characteristics	**Married Women**	**Single Women**	**All Women**
Age Group			
15-19	16.0	20.5	19.4
20-24	20.0	27.8	22.7
25-29	25.9	30.7	26.5
30-34	25.4	27.5	26.0
35-39	18.1	25.8	19.7
40-44	25.0	12.9	25.3
45-49	23.5	13.3	24.0
Education			
No education	10.7	19.5	15.8
Primary incomplete	15.7	12.5	16.3
Primary complete	19.4	15.8	19.0
Secondary+	28.3	30.2	29.0
Religion			
Catholic	23.6	25.4	23.6
Protestant/other Christians	23.0	24.6	23.8
Muslims	16.0	29.4	23.8
Other	15.1	18.1	15.8
Ethnic Group			
Kamba	26.9	34.4	29.3
Kikuyu	25.3	23.7	24.3
Luhya	19.6	21.6	20.2
Luo	17.5	15.8	17.8
Other	24.0	28.4	26.1
Missing	35.1	20.5	17.8
Division			
Central	41.1	45.1	42.6
Makadara	21.3	26.9	21.4
Kasarani	11.3	7.1	10.1
Embakasi	24.6	27.3	25.3
Pumwani	51.9	64.2	58.6
Westlands	20.5	27.3	21.3
Dagoretti	25.2	18.8	23.1
Kibera	11.5	17.1	14.7
NCSS 2012 Total	22.8	24.9	23.6
NCSS 2000 Total	32.4	31.7	32.2
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012			

4.3 Attitudes about Contraception among Non-Users

4.3.1 Intention to Use Contraception in the Future among Non-Users

Future use of contraception by non-users is often an indicator of changing demand for family planning. In the NCSS 2012, women were asked if they intended to use contraception in the future. Table 4.10 presents the percentage distribution of women who were not using a method at the time of the survey but who reported that they intended to use contraception in the future, by number of living children.

Table 4.10: Intention to use contraception among non-users

Percent of currently married women, sexually unmarried women and all women aged 15-49 years old who were not using a contraceptive method at the time of the survey but who reported that they intended to use it in the future by number of living children, NCSS 2012, NCSS 2000

Future use of contraception	Number of living children																			
	Currently Married Women							Sexually Active Unmarried Women							All Women						
	0	1	2	3	4+	NCSS 2012 Total	NCSS 2000 Total	0	1	2	3	4+	NCSS 2012 Total	NCSS 2000 Total	0	1	2	3	4+	NCSS 2012 Total	NCSS 2000 Total
Intend to use	51.4	58.6	41.7	49.1	26.8	48.4	74.2	56.5	56.6	45.9	30.7	18.2	52.5	68.3	50.9	57.6	38.6	35.9	21.3	47.1	71.5
Don't intend to use	38.7	36.4	49.9	43.3	66.0	43.9	3.0	32.7	32.3	51.6	62.0	81.8	38.2	3.5	32.2	35.1	52.9	53.0	73.5	40.8	5.0
Do not know	9.9	5.0	8.3	7.7	7.1	7.6	22.9	10.8	11.1	2.5	7.2	0.0	9.4	28.3	16.8	7.3	8.5	11.1	5.2	12.2	23.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number of women	288	288	218	104	110	1,008	1,094	197	63	28	13	13	314	566	1,082	489	330	158	177	2,236	2,033

Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012

Overall, the proportion of women who reported intention to use contraception substantially dropped from 71.5 percent in 2000 to 47.1 percent in 2012. Similarly, levels among married and single women declined. Among married women, 74.2 percent reported future intention to use in 2000 compared with 48.4 percent in 2012. Among single women, future intention to use dropped from 68.3 percent in 2000 to 52.5 percent in 2012. Women's future intention to use varied by number of living children. Intention to use was highest among women with one child and lowest among women with 4 or more children regardless of marital status. Women with 4 or more children were older (Table 3.5) and may be less likely to use contraception in the future due to perceived declining fecundity.

Intention to Use Contraception in the Future by Background Characteristics

Table 4.11 presents the percentage of currently married and single women who were not using a method at the time of the survey, but intended to use contraception in the future, by selected background characteristics. Among married women, intention to use contraception declined with age, with women 15-19 years being most likely to report future intention to use. Among single women, future intention to use was highest among 20-24 year olds.

Future intention to use contraception was highest among women with secondary or higher level of education (54.8 percent of married women and 57.4 percent of single women). By contrast, among women with no formal education, only 8.0 percent of married women and 8.8 percent of single women reported future intention to use contraception. Variation by religious affiliation was also observed: Muslim women were less likely to report future intention to use contraception, while Protestants and other Christians were more likely to report such intentions. The proportion of married women reporting future intention to use contraception was lowest among Kamba and highest among Luo women. Majority of women from Dagoretti, Kasarani and Westlands Divisions expressed future intention to use contraception. Similarly, women with 0–2 living children were more likely to report future intention to use contraception compared with women with 3 or more living children.

In general, single women were more likely to express future intention to use contraception compared with their married counterparts. Future intention to use contraception substantially declined among slum women between 2000 and 2012. Overall, intention to use contraception was lowest among women in the slums in 2012 compared to all other sub groups, including their counterparts in rural areas (54 percent), other urban areas (62 percent) and Nairobi (53 percent).

Table 4.11: Intention to use contraception in future among non-users

Percentage of married and single women aged 15-49 years who intended to use contraception in future, by background characteristics, NCSS 2012, NCSS 2000 and KDHS 2008-09			
Background Characteristics	**Married Women**	**Single Women**	**All Women**
Age Group			
15-19	69.0	50.8	53.2
20-24	59.4	59.4	58.8
25-29	57.4	57.5	55.9
30-34	44.6	43.4	41.6
35-39	19.2	23.5	19.8
40-44	7.8	8.6	10.5
45-49	4.1	0.0	4.1
Education			
No education	8.0	8.8	13.6
Primary incomplete	46.5	38.0	40.3
Primary complete	44.4	44.0	41.7
Secondary+	54.8	57.4	53.9
Religion			
Catholic	45.3	49.4	45.1
Protestant/other Christians	50.8	54.4	49.3
Muslims	29.5	24.5	27.8
Other	41.1	21.0	30.4
Ethnic Group			
Kamba	41.7	48.3	41.6
Kikuyu	43.5	54.4	46.8
Luhya	53.1	58.7	52.2
Luo	57.6	52.0	51.8
Other	46.3	41.5	42.6
Missing	27.4	100.0	25.3
Division			
Central	29.5	59.7	39.4
Makadara	49.8	44.3	44.5
Kasarani	61.1	61.6	59.8
Embakasi	37.8	48.2	39.5
Pumwani	48.0	36.2	40.6
Westlands	67.3	54.5	55.6
Dagoretti	62.4	63.9	59.8
Kibera	43.6	44.5	41.5
Children surviving			
None	51.4	53.3	50.9
1-2	51.3	52.2	49.9
3-4	43.3	5.1	31.5
5+	21.9	0.0	18.7
NCSS 2012 Total	48.4	52.0	47.1
NCSS 2000 Total	74.0	68.7	71.6
KDHS 2008-09			
National	55.0	54.3	54.6
Rural	54.0	52.5	53.2
Other urban	61.6	58.3	59.7
Nairobi	52.6	60.9	58.0
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09			

4.3.2 Reasons for Non-Use of Contraception

Non-users of contraception who reported no future intention to use were asked why they did not intend to use a method. Table 4.12 shows that the most common reasons were method related (33.8 percent for married women and 33.0 percent for unmarried women), such as health concerns and fear of side effects. Method-related concerns were most notable among currently married women aged 25-34 years (42.0 percent).

The second most important set of reasons for future non-use of contraception were fertility-related (23 percent for married women and 15 percent for unmarried women), which included infrequent/no sex and/or the desire to have more children. Fertility-related reasons were mostly reported by women aged 35-49 years. Opposition to use by both respondents and their husbands accounted for another substantial proportion (11.3 percent) of reasons why women did not intend to use contraception in the future. Opposition to use was mostly reported by currently married women aged 15-24 years (31.8 percent) and sexually active unmarried women aged 25-34 years (27.5 percent).

There was a notable shift in the major reasons for lack of intention to use contraception in the future between 2000 and 2012. Unlike in 2012 where method-related reasons were most commonly reported, in 2000, fertility-related reasons were dominant (63.1 percent of married women and 56.1 percent of unmarried women). The 2012 findings are consistent with those from the KDHS 2008-09 which showed that method related dissatisfaction were the major reasons for contraceptive discontinuation among Kenyan women.

Table 4.12: Main reason for non-use of contraception

Percent of currently married women, sexually active unmarried women and all women who were not currently using a method by main reason for not using, NCSS 2012, NCSS 2000															
Reason for not using contraception	**Currently married women**					**Sexually active unmarried women**					**All women**				
	15-24	**25-34**	**35-49**	**NCSS 2012 Total**	**NCSS 2000 Total**	**15-24**	**25-34**	**35-49**	**NCSS 2012 Total**	**NCSS 2000 Total**	**15-24**	**25-34**	**35-49**	**NCSS 2012 Total**	**NCSS 2000 Total**
Marital status related reasons	**3.2**	**0.0**	**1.8**	**1.4**	**0.0**	**19.7**	**5.4**	**5.6**	**11.3**	**12.2**	**15.3**	**3.5**	**5.6**	**7.8**	**7.4**
Not married	3.2	0.0	1.8	1.4	0.0	19.7	5.4	5.6	11.3	12.0	15.3	3.5	5.6	7.8	7.1
Intend to marry	-	-	-	-	0.1	-	-	-	-	0.0	-	-	-	-	0.1
Not intend to marry	-	-	-	-	0.0	-	-	-	-	0.2	-	-	-	-	0.2
Fertility related reasons	**7.7**	**14.1**	**36.8**	**23.3**	**63.1**	**14.0**	**4.3**	**26.1**	**14.5**	**56.1**	**23.7**	**21.7**	**38.0**	**29.2**	**60.8**
Not having sex/Infrequent Sex	2.1	2.4	7.3	4.5	3.2	8.7	4.3	7.9	7.1	37.3	21.4	14.1	15.1	16.6	23.3
Menopausal/Hysterectomy	0.0	0.0	21.4	9.7	1.6	0.0	0.0	18.2	5.2	2.3	0.0	0.5	17.9	7.7	1.5
Subfecund/Infecund	0.0	1.7	3.4	2.2	8.5	-	-	-	-	6.7	0.0	1.1	2.7	1.4	6.4
Postpartum breastfeeding	-	-	-	-	11.9	-	-	-	-	1.9	-	-	-	-	6.9
Wants (more) children	5.6	10.0	4.8	6.9	23.7	5.2	0.0	0.0	2.1	3.7	2.3	6.1	2.4	3.4	13.9
Pregnancy	-	-	-	-	14.2	-	-	-	-	4.2	-	-	-	-	8.9
Opposition to use	**31.8**	**15.3**	**8.0**	**14.9**	**13.9**	**13.5**	**27.5**	**5.4**	**15.4**	**7.2**	**13.6**	**14.1**	**7.8**	**11.3**	**10.8**
Respondent opposed	6.6	5.0	4.1	4.9	5.4	13.5	22.3	0.0	12.3	4.6	5.2	5.9	3.2	4.6	4.9
Husband opposed	11.5	5.7	0.0	4.1	4.9	-	-	-	-	0.3	3.2	3.5	0.0	1.9	2.8
Others opposed	2.3	0.0	0.0	0.4	0.6	-	-	-	-	1.1	0.6	0.0	0.0	0.2	0.7
Religious prohibition	11.4	4.6	3.9	5.4	3.0	0.0	5.3	5.4	3.2	1.2	4.5	4.8	4.5	4.6	2.4
Lack of knowledge	**-**	**-**	**-**	**-**	**2.3**	**-**	**-**	**-**	**-**	**3.6**	**-**	**-**	**-**	**-**	**3.7**
Knows no method	-	-	-	-	1.6	-	-	-	-	1.8	-	-	-	-	2.7
Knows no source	-	-	-	-	0.7	-	-	-	-	1.8	-	-	-	-	1.1
Method related reasons	**31.4**	**42.0**	**28.1**	**33.8**	**17.4**	**33.8**	**27.5**	**37.7**	**33.0**	**18.7**	**20.3**	**32.1**	**22.2**	**24.5**	**15.0**
Health concerns	12.1	18.5	18.8	17.5	3.7	0.0	5.4	27.3	9.5	3.9	4.5	12.5	13.7	10.7	3.1
Fear of side effects	19.3	23.5	7.5	15.5	11.2	33.8	22.0	10.4	23.4	11.3	14.8	19.6	7.6	13.1	9.5
Lack of access/Too far	-	-	-	-	0.5	-	-	-	-	0.0	-	-	-	-	0.3
Cost too much	-	-	-	-	0.1	-	-	-	-	0.0	-	-	-	-	0.1
Inconvenience to use	-	-	-	-	0.5	-	-	-	-	0.9	-	-	-	-	0.5
Interferes with body's normal process	0.0	0.0	1.8	0.8	1.3	-	-	-	-	2.1	1.0	0.0	0.9	0.7	1.3
Method failure	-	-	-	-	1.0	-	-	-	-	0.5	-	-	-	-	0.2
Other	**2.5**	**2.0**	**2.8**	**2.5**	**2.7**	**0.0**	**0.0**	**0.0**	**0.0**	**1.9**	**1.7**	**1.2**	**1.4**	**1.4**	**2.0**
Do not know	**2.4**	**3.0**	**1.0**	**2.0**	**0.5**	**0.0**	**6.8**	**0.0**	**2.1**	**0.2**	**3.7**	**3.1**	**0.8**	**2.3**	**0.3**
Missing	**21.1**	**23.6**	**21.4**	**22.2**	**0.5**	**19.1**	**28.5**	**25.3**	**23.7**	**0.2**	**20.4**	**24.3**	**24.2**	**23.1**	**0.3**
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Number of cases	48	98	110	256	1,095	23	17	16	56	567	155	157	228	540	2,034

* Table displays columns and/or rows containing 'non-missing' values (some percentages may not add up to 100%)

Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012

4.4 Exposure to Family Planning Messages from Clinics

Respondents were asked whether they had visited a health facility over the past year, and if so, whether they were given any information on family planning during one of the visits. Table 4.13 shows the percentage of women who received family planning information from health facilities, by selected background characteristics.

Data indicate that 44.2 percent of women had not visited a clinic in the previous year, an increase from the 33.4 percent reported in 2000. Among respondents who visited a clinic in the past 12 months, only 1 in 4 women (24.8 percent) reported receiving any information on family planning, while 31.0 percent were not given any family planning information. The percentage of women who visited a clinic and received family planning information increased with age, following curvilinear pattern, with the youngest and the oldest age groups being less likely to receive family planning information.

Respondents with no formal education were the least likely to have visited a health facility and to have obtained family planning information. Muslims were less likely to visit a clinic and less likely to receive family planning information when they did. Respondents from the Luo ethnic group compared to other ethnic groups were more likely to have visited and received information about family planning. The proportion of respondents who received family planning information in clinics ranged from 9 percent in Pumwani to 38 percent in Kasarani, a twofold increase from levels recorded in 2000 for the Division. This could be indicative of improvement in SRH services in Kasarani Division as fertility regulation indicators throughout this chapter showed improvement in the area.

A comparison with KDHS 2008-09 shows that women living in slums in 2012 were more likely to have visited clinics in the past year (55.8 percent) and significantly more likely to have received family planning information from these clinics, compared with those in Nairobi as a whole, Kenya, other urban, and rural areas. Compared with other groups, women in Nairobi as a whole were less likely to have visited a clinic in the previous year (41.4 percent) and also substantially less likely (7.9 percent) to have received family planning information from the clinics they visited. Data suggest that clinic-based information on family planning is lacking in most facilities in Kenya, indicating an area for intervention.

Table 4.13: Source of family planning information

Percent of women who acquired family planning information from health facilities, by background characteristics, NCSS 2012, NCSS 2000 and KDHS 2008-09					
Background Characteristics	**Family planning information at clinic**				
	Not visited	**Visited & given FP info**	**Visited but no FP info given**	**Total**	**Number of cases**
Age Group					
15-19	60.1	15.2	24.7	100.0	590
20-24	43.3	26.2	30.5	100.0	1,027
25-29	36.8	29.9	33.3	100.0	1,043
30-34	40.9	30.5	28.6	100.0	543
35-39	44.2	21.6	34.2	100.0	351
40-44	49.1	15.0	35.9	100.0	198
45-49	44.9	15.7	39.5	100.0	140
Marital Status					
Never married	61.1	10.8	28.1	100.0	1,102
Currently married	34.9	32.8	32.3	100.0	2,345
Formerly married	46.8	18.3	34.9	100.0	388
Education					
No education	57.8	9.6	32.6	100.0	73
Primary incomplete	44.2	22.2	33.6	100.0	620
Primary complete	41.0	29.3	29.7	100.0	1,203
Secondary+	45.7	23.3	31.0	100.0	1,988
Religion					
Catholic	45.8	26.0	28.2	100.0	1,001
Protestant/other Christians	43.2	24.6	32.1	100.0	2,706
Muslims	42.9	20.9	36.1	100.0	118
Other	48.3	26.8	24.9	100.0	49
Ethnic Group					
Kamba	48.7	24.5	26.7	100.0	862
Kikuyu	41.6	22.1	36.3	100.0	867
Luhya	44.0	22.4	33.7	100.0	938
Luo	42.1	32.5	25.4	100.0	614
Other	42.4	25.7	31.9	100.0	589
Division					
Central	57.0	16.2	26.8	100.0	303
Makadara	42.7	31.4	25.9	100.0	404
Kasarani	24.8	38.1	37.1	100.0	404
Embakasi	55.2	21.4	23.4	100.0	1,129
Pumwani	43.5	8.8	47.7	100.0	182
Westlands	37.4	15.6	47.0	100.0	332
Dagoretti	35.0	24.6	40.4	100.0	579
Kibera	45.0	31.7	23.3	100.0	559
NCSS 2012 Total	44.2	24.8	31.0	100.0	3,892
NCSS 2000 Total	33.4	23.1	43.5	100.0	3,254
KDHS 2008-09					
National	48.6	12.3	39.1	100.0	8,444
Rural	48.4	12.4	39.2	100.0	6,296
Other urban	44.5	14.1	41.3	100.0	1,420
Nairobi	58.6	7.9	33.5	100.0	728
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09					

4.5 Spousal Communication about Family Planning

Insights into the dynamics of spousal communication about family planning offer an opportunity to assess the use of contraception among couples. In Kenya, effective communication about family planning between couples was associated not only with increased contraceptive uptake, but also achieving the desired and ideal family size [6].

In NCSS 2012, respondents were asked how often they talked to their husbands and partners about family planning in the previous year. Table 4.14 shows the percentage distribution of the frequency of spousal communication about family planning, by selected background characteristics.

Table 4.14: Communication about family planning with husband

Percent distribution of currently married women aged 15-49 years by frequency of communication about family planning with the husband, by background characteristics, NCSS 2012, NCSS 2000

Background Characteristics	Number of times discussed family planning with the husband				Number of cases
	Never	Once or twice	More often	Total	
Age Group					
15-19	18.5	53.1	28.4	100.0	42
20-24	21.4	55.5	23.0	100.0	265
25-29	16.5	56.1	27.4	100.0	403
30-34	26.8	45.9	27.4	100.0	223
35-39	22.7	55.7	21.6	100.0	130
40-44	26.6	58.5	15.0	100.0	52
45-49	33.8	50.3	15.9	100.0	20
Education					
No education	33.0	52.5	14.5	100.0	12
Primary incomplete	22.7	56.9	20.4	100.0	161
Primary complete	20.2	58.1	21.7	100.0	423
Secondary+	21.6	49.0	29.4	100.0	537
Missing	0.0	100.0	0.0	100.0	2
Religion					
Catholic	16.0	55.8	28.3	100.0	303
Protestant/other Christians	22.8	52.8	24.4	100.0	795
Muslims	35.1	54.8	10.0	100.0	26
Other	21.6	65.5	12.9	100.0	11
Ethnic Group					
Kamba	18.5	60.0	21.5	100.0	264
Kikuyu	21.6	55.6	22.8	100.0	251
Luhya	20.2	54.7	25.1	100.0	273
Luo	22.5	52.0	25.5	100.0	173
Other	25.4	42.5	32.1	100.0	174
Division					
Central	17.6	77.2	5.2	100.0	97
Makadara	25.2	47.4	27.4	100.0	113
Kasarani	14.8	61.2	24.0	100.0	98
Embakasi	13.1	53.8	33.1	100.0	301
Pumwani	23.0	64.2	12.9	100.0	58
Westlands	44.7	38.9	16.4	100.0	115
Dagoretti	21.7	51.4	27.0	100.0	184
Kibera	20.5	52.3	27.2	100.0	169
NCSS 2012 Total	21.3	53.8	24.9	100.0	1,135
NCSS 2000 Total	23.4	45.0	31.6	100.0	1,931

Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012

Results indicate that 21.3 percent of respondents reported they had never talked to their spouses about family planning, 53.8 percent had talked to their husbands once or twice, and 24.9 percent had talked more often. Spousal communication varied by age, with the proportion of women who had ever spoken to their spouses being lowest among those aged

45-49 years (66.2 percent) and highest among those aged 25-29 years (83.5 percent). The frequency of spousal communication varied with the level of educational attainment and religion. There were marginal variations in spousal communication across ethnic groups. Geographically, Embakasi and Kasarani Divisions reported the highest levels of spousal communication (87.9 percent and 85.2 percent, respectively), while Westlands Division reported the lowest levels (55.3 percent).

The proportion of women who had ever talked to their spouses about family planning remained largely unchanged between 2000 and 2012. However, among those who had talked about family planning, the frequency of the communication decreased between the two surveys.

4.6 Summary

This chapter examined knowledge, attitudes, and use of contraceptive methods among women aged 15-49 years living in Nairobi slums in 2012. The indicators were compared with results from the NCSS 2000 survey. Overall, there was marked improvement in the knowledge and use of contraception among slum women between 2000 and 2012. Findings show that spontaneous knowledge of contraceptive methods was high, with male condoms and injectables being the most mentioned methods. The widespread knowledge of male condoms could be attributed to constant media campaigns, high accessibility, and comparatively low cost. This may be related to the fight against HIV/AIDS through social marketing of FP products.

There were differences in knowledge, attitude, and use of contraception by socio-economic and demographic characteristics. Specifically, young women aged 15-19 years, women with no formal education, and sexually active unmarried women performed poorly on most of the indicators compared with women in other socio-economic groups. It is important to note that slum women mostly obtained contraceptive supplies from the medical private sector, although more technical commodities and procedures (female sterilization and injectables) were most commonly obtained from public facilities.

An important finding over the inter-survey period was the increased level of current contraceptive use (modern methods) among married women in slums, which was higher than the levels in the whole of Kenya and Nairobi. However, contraceptive use among sexually active unmarried women declined between 2000 and 2012. The finding suggests that these women, majority of who were under 25 years and at risk of adverse reproductive health outcomes, should be targeted with family planning information and services.

The low intention to use contraception in the future, especially among slum women with low education, needs to be investigated further. The main reasons for lack of intention to use contraception in the future were method-related, linked to perceived health concerns and side effects, which may fuel attitudinal resistance to contraception. It is therefore imperative to expand the range of methods available to widen choice and that family planning clients receive adequate counseling to minimize the risk of contraceptive discontinuation.

References

1. Campbell, M., N. N. Sahin Hodoglugil, and M. Potts,"Barriers to fertility regulation: a review of the literature." *Studies in family planning, 2006*. 37(2): p. 87-98.

2. Kenya National Bureau of Statistics (KNBS), *Kenya Demographic and Health Survey 2008-09.*, 2010, Calverton, Maryland: KNBS and ICF Macro.

3. Ziraba, A., et al., "Maternal mortality in the informal settlements of Nairobi city: What do we know?" *Reprod Health, 2009*. 6(6).

4. Ahmed, S., et al., "Maternal deaths averted by contraceptive use: an analysis of 172 countries". *The Lancet*, 2012.

5. Ross, J. A. and E. Frankenberg, *Findings from two Decades of Family Planning Research*, 1993, The Population Council.

6. Lasee, A. and S. Becker, "Husband-Wife Communication about Family Planning and Contraceptive Use in Kenya." *International Family Planning Perspective, 1997*. 23(1): p. 15-20.

CHAPTER 5: OTHER PROXIMATE DETERMINANTS OF FERTILITY

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Fertility levels and changes in most populations can be explained using Bongaarts' model of the proximate determinants of fertility. These determinants are marriage, contraceptive use, post-partum infecundability, induced abortion, and sterility [1].This chapter focuses on proximate determinants of fertility, other than contraception, that define a woman's exposure to the risk of pregnancy.

The onset of first marriage still marks the start of approved childbearing in most African societies. The younger a woman is at first marriage, the more likely that childbearing will begin earlier and last longer, thereby increasing the number of children she will have by the end of her reproductive life [2]. However, with pre-marital sexual experience on the rise, sexual activity also determines a woman's exposure to the risk of pregnancy [3]. Therefore, this chapter examines not only the trends in age at first marriage but also trends in age at first sexual intercourse, as well as patterns in current sexual activity. The duration of post-partum amenorrhea (the period from childbirth to ovulation) and post-partum abstinence also influence the interval between births as they determine a woman's frequency of childbirth during her reproductive years [4]. The fertility-inhibiting effects of marriage, contraceptive use, post-partum infecundability and sterility are also presented in this chapter in order to understand the contribution of each of these determinants to the prevailing fertility levels in Nairobi slums.

5.1 Marriage and Sexual Activity

5.1.1 Current Marital Status

The distribution of women by marital status is shown in Table 5.1. The proportion of currently married women increased marginally from 59.3 percent in 2000 to 60.6 percent in 2012 whereas the proportion of never married women decreased slightly from 28.6 percent to 27.9 percent between the surveys. However, the overall distribution of marital status remained the same across the survey years [5].

The proportion of never married women aged 15-44 years decreased with age while the proportion of similarly aged widowed, divorced or separated women increased with age. Among never married women, the decrease was from 73.6 percent in the 15-19 age group to 7.6 percent in the 40-44 age group. For currently married women, the proportion peaked among those aged 25-29 (73.4 percent). From age 30 onwards, as the proportion of the currently married women gradually declined, the proportion of those formerly married increased substantially mostly as a result of divorce or separation rather than widowhood.

Women with no formal education were more likely to experience marital disruption but least likely to be never married. By contrast, women with secondary or higher levels of education were least likely to experience marital disruption. The proportion of the widowed, divorced or separated decreased with increasing levels of education, from 30.7 percent among women with no formal education to 7.5 percent among those with secondary or higher levels of education.

Table 5.1: Current marital status

Percent distribution of women by current marital status and by background characteristics, NCSS 2012, NCSS 2000							
Background Characteristics	**Current marital status**						**Number of Cases**
	Never married	**Currently married**	**Widowed**	**Divorced/ Separated**	**Missing**	**Total**	
Age Group							
15-19	73.6	23.6	0.6	0.6	1.6	100.0	590
20-24	33.8	60.9	1.0	3.7	0.6	100.0	1,027
25-29	17.2	73.4	0.9	7.1	1.4	100.0	1,043
30-34	11.7	71.6	2.1	13.4	1.2	100.0	543
35-39	10.3	66.4	6.1	16.1	1.1	100.0	351
40-44	7.6	59.8	11.7	20.3	0.5	100.0	198
45-49	10.4	59.7	9.7	19.5	0.6	100.0	140
Education							
No education	11.1	54.9	8.7	22.0	3.3	100.0	73
Primary incomplete	19.1	61.5	3.9	14.2	1.2	100.0	620
Primary complete	20.2	68.9	2.4	7.4	1.1	100.0	1,203
Secondary+	36.2	55.5	1.6	5.9	0.8	100.0	1,988
Religion							
Catholic	28.9	60.5	2.2	7.6	0.7	100.0	1,001
Protestant/other Christians	27.8	60.8	2.5	8.2	0.8	100.0	2,706
Muslims	21.6	63.7	4.3	9.7	0.7	100.0	118
Other	30.8	57.6	0.0	6.9	4.7	100.0	49
Ethnic Group							
Kamba	27.9	61.5	1.3	8.6	0.7	100.0	862
Kikuyu	30.8	56.5	2.7	8.7	1.3	100.0	867
Luhya	25.3	61.6	2.5	9.9	0.7	100.0	938
Luo	29.1	61.9	4.2	4.1	0.7	100.0	614
Other	26.8	63.5	1.6	7.4	0.7	100.0	589
Division							
Central	24.1	65.1	2.5	7.6	0.6	100.0	303
Makadara	30.5	55.6	1.9	11.3	0.6	100.0	404
Kasarani	28.8	59.8	4.5	6.5	0.4	100.0	404
Embakasi	28.1	61.5	1.7	6.3	2.5	100.0	1,129
Pumwani	30.2	53.0	3.7	12.2	0.9	100.0	182
Westlands	20.8	65.9	1.5	11.5	0.3	100.0	332
Dagoretti	29.2	58.9	2.8	8.5	0.6	100.0	579
Kibera	29.5	60.9	2.3	6.9	0.4	100.0	559
NCSS 2012 Total	27.9	60.6	2.4	8.1	1.1	100.0	3,892
NCSS 2000 Total	28.6	59.3	3.0	9.1	-	100.0	3,256
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012							

There was little variation in marital patterns by religion but large differences by ethnic group. In 2012, the proportion of never-married women was similar among the various ethnic groups, except among the Luhya where it was substantially lower (25.3 percent).

The proportion of Kikuyu women currently married (56.5 percent) was lower than the proportion among Kamba, Luhya, and Luo women (62 percent in each of the three ethnic groups). Luhya women, on the other hand, were most likely to be divorced or separated (9.9 percent), while Luo women were least likely to experience marital disruption (4.1 percent). It is important to note that while Kamba women were least likely to be widowed (1.3 percent), widowhood was highest among Luo women (4.2 percent). This may be related to high HIV/AIDS prevalence in Nyanza Province, home of the Luo ethnic community [6, 7].

There were wide variations in women's marital status across the divisions of Nairobi. The proportion of never married women varied from 20.8 percent in Westlands Division to 30.5 percent in Makadara Division. The proportion formerly married varied widely from 8.0 percent in Embakasi Division to 15.9 percent in Pumwani Division. The pattern was consistent with results from the 2000 survey.

Table 5.2 compares the marital patterns for women in Nairobi slums in 2012 and 2000 with those of different samples of women in the KDHS 2008-09. The proportion of never married women in the slums in 2012 (27.9 percent) was similar to the estimates in 2000 (28.6 percent) but much lower than that of the whole of Nairobi according to KDHS 2008-09 (41.7 percent). For currently married women, the proportion remained largely unchanged between 2000 and 2012 and similar to KDHS 2008-09 estimates for Kenya as a whole, rural Kenya and other urban areas in Kenya except for Nairobi. Although the rate of divorce/separation decreased in the slums in the inter-survey period, it was still higher than the national, rural and Nairobi estimates from KDHS 2008-09 [6].

Table 5.2: Comparison of current marital status

Percent distribution of women by current marital status, NCSS 2012, NCSS 2000 and KDHS 2008-09							
Survey	**Current marital status**						**Number of Cases**
	Never married	**Currently married**	**Widowed**	**Divorced/ Separated**	**Missing**	**Total**	
NCSS 2012 Total	27.9	60.6	2.4	8.1	1.1	100.0	3,892
NCSS 2000 Total	28.6	59.3	3.0	9.1	-	100.0	3,256
KDHS 2008-09							
National	31.2	58.4	4.4	6.1	0.0	100.0	8,444
Rural	29.9	59.9	5.0	5.1	0.0	100.0	6,296
Other urban	31.3	55.7	3.0	10.0	0.0	100.0	1,420
Nairobi	41.7	49.9	1.8	6.5	0.0	100.0	728
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09							

5.1.2 Age at First Marriage

In most African societies, childbearing is sanctioned after the onset of marriage [2]. Consequently, the earlier a woman marries, the longer her exposure to the risk of pregnancy. Table 5.3 displays the proportion of women by their age at marriage and current age. The data on age at first marriage were obtained for all women who reported ever having been married.

The median age at first marriage was earlier among women aged 40-49 than that of those aged 25-39 (21.0 and 22.0 years, respectively). This indicates a delay in first marriage in the slums of Nairobi in 2012. The same was observed in 2000 with a two-year increase in median age at first marriage between women aged 40-49 (18.4 years) and women aged 25-39 (20.5 years). There was postponement of first marriage between 2000 and 2012 among women in all age groups, with the longest delay being among women aged 40-44, whose median age at first marriage was 18.7 years in 2000 and 22.0 years in 2012.

The proportion of women who were married for the first time by age 16 declined from 14.6 percent among women aged 40-49 to 11.6 percent among those aged 25-39. A decrease was also observed among women of the same age groups in 2000 but the margin was wider at 11 percentage points. However, the proportion of women aged 40-49 who got married by age 16 decreased from 23.3 percent in 2000 to 14.6 percent in 2012. There was no variation in the proportion of women who were married by age 16 among those aged 15-24 and those aged 25-39 between the two surveys.

The proportion of women first married by age 28 declined between 2000 and 2012, with the greatest decline being among women aged 35-39 and 40-44 years. The proportion of never married women increased between 2000 and 2012 for each age group. The largest increase was observed among women aged 35-39, from 4.2 percent in 2000 to 10.3 percent in 2012.

Table 5.3: Age at first marriage

Percentage of women aged 15-49 years who were married for the first time by exact ages and median age at first marriage, according to current age, NCSS 2012, NCSS 2000											
Current Age	Percent who were married for the first time by exact age								Never married	Number of women	Median age at first marriage
	14	16	18	20	22	24	26	28			
NCSS 2012											
Age Group											
15-19	1.2	8.1	20.9	na	na	na	na	na	73.0	590	-
20-24	2.0	8.2	21.8	43.6	53.2	na	na	na	33.8	1,027	21.0
25-29	4.0	11.4	24.4	39.6	53.6	65.0	71.0	72.8	17.1	1,043	22.0
30-34	4.0	11.9	24.4	39.4	54.4	61.9	69.3	73.6	11.5	543	22.0
35-39	3.1	11.8	25.2	36.7	52.8	61.4	67.7	72.2	10.3	351	22.0
40-44	6.5	17.6	30.5	44.2	55.3	64.5	72.4	73.4	7.1	198	22.0
45-49	2.2	10.7	30.7	49.2	59.8	70.8	74.2	75.9	10.4	140	21.0
Women 15-24	1.7	8.2	21.5	35.9	42.0	-	na	na	48.0	1,617	21.0
Women 25-39	3.8	11.6	24.5	39.0	53.7	63.5	69.9	72.9	14.3	1,937	22.0
Women 40-49	4.7	14.6	30.6	46.4	57.2	67.2	73.2	74.5	8.5	338	21.0
NCSS 2000											
Age Group											
15-19	0.9	-	-	na	na	na	na	na	70.5	671	-
20-24	1.3	6.6	20.5	42.9	na	na	na	na	32.5	945	-
25-29	2.6	9.6	23.2	40.6	58.2	71.9	80.7	85.0	14.1	680	21.1
30-34	4.4	14.1	30.1	47.6	63.1	74.5	81.8	87.1	8.0	412	20.3
35-39	4.2	15.5	37.2	57.0	69.6	79.0	85.4	90.6	4.2	309	19.1
40-44	7.6	23.6	44.6	63.1	80.9	87.9	89.2	91.7	3.2	157	18.7
45-49	10.8	22.9	48.2	65.1	75.9	80.7	86.7	88.0	7.2	83	18.1
Women 15-24	1.1	7.2	21.5	-	-	-	na	na	48.3	1,616	-
Women 25-39	3.5	12.2	28.3	46.3	62.2	74.2	82.1	86.9	10.1	1,401	20.5
Women 40-49	8.8	23.3	45.8	63.8	79.2	85.4	88.3	90.4	4.6	240	18.4
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012											

Table 5.4 shows the median age at first marriage by current age and background characteristics. Women with secondary or higher education entered into their first union about two years later than those with no formal education.

Table 5.4: Median age at first marriage

Median age at first marriage by current age and selected background characteristics, NCSS 2012, NCSS 2000							
Background Characteristics	**Current Age**						**Number of women (15-49)**
	25-29	**30-34**	**35-39**	**40-44**	**45-49**	**All ages (15-49)**	
Education							
No education	-	21	20	16	28	21	73
Primary incomplete	20	20	20	21	19	19	620
Primary complete	21	21	21	22	23	21	1,203
Secondary+	23	24	23	22	21	23	1,988
Ethnic Group							
Kamba	22	22	23	21	21	22	862
Kikuyu	23	24	22	21	21	23	867
Luhya	21	21	23	20	20	21	938
Luo	20	20	19	22	21	20	614
Other	22	22	23	23	-	22	589
Religion							
Catholic	22	22	22	21	21	22	1,001
Protestant/other Christians	22	22	22	21	20	22	2,706
Muslims	21	19	21	23	24	21	118
Other	22	18	24	15	-	24	49
Marital Status							
Currently married	21	21	21	21	20	20	2,345
Formerly married	19	21	21	19	21	20	388
Division							
Central	22	22	22	20	20	21	303
Makadara	21	23	24	22	20	22	404
Kasarani	20	21	22	20	-	21	404
Embakasi	23	22	22	22	22	22	1,129
Pumwani	21	22	23	18	19	22	182
Westlands	21	21	21	20	20	20	332
Dagoretti	21	22	24	20	21	21	579
Kibera	22	21	20	23	20	21	559
NCSS 2012 Total	22	22	22	21	21	22	3,892
NCSS 2000 Total	21.1	20.3	19.1	18.7	18.1	20.2	3,257
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012							

As in 2000, age at first marriage did not vary much by ethnicity, except that Luo women married 1-3 years earlier than women from other ethnic groups. Kamba, Kikuyu, and Luhya women experienced an increase of one to two years in median ages at first marriage between the oldest age group (45-49) and the age group 30-34, followed by a very slight decline or stagnation among women aged 25-29. However, among Luo women, the median age decreased by about one year between the oldest and youngest age groups.

Variations by religious affiliation showed that Muslim women first married about one year earlier than Christians, and their median age at first marriage varied across the age groups. It was highest among women aged 45-49 (24 years), and decreased steadily to its lowest among those in the 30-34 age group (19 years). The median age was 21 years among Muslim women aged 25-29, which was one year earlier than for women of other religious groups. The median age at first marriage for Christian women was higher among younger age groups than older women by about one year.

Currently married women were first married at the same age as formerly married women (20 years). Among women aged 25-29, the median age for currently married women was 21 as compared to 19 among those formerly married. These figures were similar to those in 2000 where the median age for currently married women was 20.6 and 18.3 among formerly married women. Lower age at first marriage for formerly married women aged 25-29 suggests that early first marriage may be linked to increased marital disruption, particularly because marital disruption for these younger women was mostly due to divorce or separation rather than widowhood (see Table 5.1). For women aged 40-44, the median age at

first marriage was 21 and 19 years among currently and formerly married women, respectively. There was no difference in median age at first marriage by current marital status among women aged 30-39. Among women aged 45-49, the pattern changed, with currently married women entering their first union 1 year earlier than formerly married women. Westlands Division had the lowest median age at first marriage (20 years) and Makadara, Embakasi, and Pumwani Divisions had the highest (22 years) in 2012. The median age at first marriage in most divisions increased between 2000 and 2012.

Table 5.5 compares the median age at first marriage among women in the Nairobi slums in 2012 and 2000 with women in different areas of the country based on the KDHS 2008-09. First, women in Nairobi slums in 2012 married about two years later than their counterparts in the slums in 2000. Second, women in Nairobi slums in 2012 married about two years later than women in Kenya as a whole and rural Kenya, and about half a year later than women in other urban areas of Kenya (median age at first marriage is 22 years in Nairobi slums in 2012, 20.3 years in Kenya, 19.8 years among rural women, and 21.4 years among women in other urban areas of Kenya). Third, women in Nairobi slums in 2012 married about two years earlier than women in Nairobi in 2008-09 (24.2 years).

Table 5.5: Comparison of median age at first marriage

Distribution of median age at first marriage by current age, NCSS 2012, NCSS 2000 and KDHS 2008-09							
Survey	Current Age						Number of women (15-49)
	25-29	30-34	35-39	40-44	45-49	All ages (15-49)	
NCSS 2012 Total	22.0	22.0	22.0	21.0	21.0	22.0	3,892
NCSS 2000 Total	21.1	20.3	19.1	18.7	18.1	20.2	3,257
KDHS 2008-09							
National	20.3	19.8	20.2	20.0	18.9	20.3	8,444
Rural	19.3	19.3	19.6	19.7	18.7	19.8	6,296
Other urban	21.3	20.9	21.8	22.2	21.8	21.4	1,420
Nairobi	24.4	24.7	24.8	22.2	22.2	24.2	728
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09							

5.2 Sexual Activity

5.2.1 Age at First Sexual Intercourse

Age at first marriage does not correctly reflect the onset of exposure to the risk of pregnancy among women for whom sexual activity precedes first marriage [4, 8]. In these cases, the age at first sexual intercourse is a better indicator. Table 5.6 shows the proportion of women who initiated sexual activity by selected ages and by their current age.

The proportion of women who had initiated sexual activity by age 16 decreased from 33.3 percent of women who are now aged 40-44 to 24.9 percent of those aged 20-24 and 25-29 years. This is similar to what was observed in 2000, where the proportion initiating sexual activity by age 16 declined over time from 47.8 percent among women aged 40-44 to 33 percent among those aged 20-24 and 25-29 years. There was delayed initiation of sex between the two surveys across all the age groups. The largest decrease was among women aged 40-49 where the proportion of those who had initiated sex by age 16 dropped from 48.3 percent in 2000 to 28.5 percent in 2012. The delay was also evident in the proportions of women who had first sexual intercourse by age 28.

Table 5.6: Age at first intercourse

Percent of women who had first sexual intercourse by exact ages, and median age at first intercourse, according to current age, NCSS 2012, NCSS 2000											
Current Age	Percent who had first intercourse at exact age								Never had sex	Number of women	Median age at first intercourse
	14	16	18	20	22	24	26	28			
NCSS 2012											
Age Group											
15-19	10.1	28.3	42.7	na	na	na	na	na	50.3	590	18.0
20-24	6.0	24.9	54.4	73.6	81.2	82.5	na	na	9.1	1,027	18.0
25-29	6.7	24.9	47.1	68.7	78.4	84.8	88.1	88.8	1.5	1,043	19.0
30-34	8.1	26.6	49.9	68.5	79.2	82.8	86.3	88.4	0.7	543	19.0
35-39	8.9	28.0	48.8	68.2	78.9	84.0	87.3	89.4	0.6	351	19.0
40-44	12.3	33.3	52.5	71.5	78.2	83.1	86.6	88.0	0.0	198	18.0
45-49	5.7	22.2	42.9	63.3	76.6	83.9	84.9	86.5	1.8	140	19.0
Women 15-24	7.5	26.1	50.2	63.1	67.9	-	na	na	24.0	1,617	18.0
Women 25-39	7.5	25.9	48.2	68.6	78.7	84.1	87.5	88.8	1.1	1,937	19.0
Women 40-49	9.5	28.5	48.4	68.0	77.5	83.4	85.9	87.4	0.8	338	19.0
NCSS 2000											
Age Group											
15-19	10.9	-	-	na	na	na	na	na	41.3	671	-
20-24	6.6	32.9	58.9	81.5	-	-	na	na	9.6	945	17.3
25-29	10.9	33.2	59.3	80.9	91.3	95.3	96.9	97.5	0.6	680	17.1
30-34	13.6	42.7	66.7	84.5	93.2	94.4	97.1	97.3	0.5	412	16.6
35-39	14.2	46.3	71.5	86.1	93.5	96.1	96.8	97.1	0.3	309	16.3
40-44	12.7	47.8	69.4	87.3	92.4	93.6	94.9	94.9	0.0	157	16.2
45-49	21.7	49.4	72.3	86.7	94.0	95.2	96.4	96.4	1.2	83	16.1
Women 15-24	8.4	35.0	57.4	-	-	-	na	na	22.8	1,616	-
Women 25-39	12.4	38.9	64.2	83.2	92.4	95.2	96.9	97.4	0.5	1,401	16.8
Women 40-49	15.8	48.3	70.4	87.1	92.9	94.2	95.4	95.4	0.4	240	16.2
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012											

The median age at first intercourse was 19 years among women aged 45-49 and decreased to 18 years among those aged 20-24. This was contrary to what was observed in 2000 where the median age at first intercourse gradually increased from 16.1 years for women aged 45-49 to 17.3 years for those aged 20-24. Fewer women had initiated sexual intercourse by the age of 20 in 2012 as compared to 2000 (in 2000, over 80 percent of women aged 25-29 had initiated intercourse by the age of 20 compared to 69 percent in 2012). The largest increase in median age at first intercourse was observed among the cohort of women aged 45-49 years (16.1 years in 2000 and 19.0 years in 2012). The results show that fewer women are initiating sexual activity early. Compared to findings in 2000, there was a 9 percentage point increase in the proportion of 15-19 year olds who had never had sexual intercourse in 2012. Table 5.7 shows the median age at first intercourse by current age and by background characteristics.

Table 5.7: Median age at first intercourse

Median age at first sexual intercourse among women aged 20-49 years by current age and selected background characteristics, NCSS 2012, NCSS 2000 and KDHS 2008-09								
Background Characteristics	**Current Age**							
	20-24	**25-29**	**30-34**	**35-39**	**40-44**	**45-49**	**Women 15-24 years**	**Women 25-49 years**
Education								
No education	16	17	19	18	15	23	16	15
Primary incomplete	17	17	18	18	18	19	17	17
Primary complete	18	18	18	19	18	20	18	18
Secondary+	19	20	20	20	20	19	19	20
Marital Status								
Never married	19	20	20	19	20	21	19	20
Currently married	18	19	18	19	18	19	18	19
Formerly married	16	17	18	18	18	19	16	18
Ethnic Group								
Kamba	19	19	19	18	18	19	18	19
Kikuyu	19	19	20	19	18	19	19	19
Luhya	18	18	18	19	18	19	18	18
Luo	18	18	18	17	17	17	18	18
Other	18	19	19	20	21	-	18	19
Religion								
Catholic	18	19	18	19	18	19	18	19
Protestant/other Christians	18	19	19	18	18	19	18	19
Muslims	19	18	17	21	23	19	19	18
Other	17	17	16	20	15	-	17	16
Division								
Central	18	18	16	19	20	16	18	18
Makadara	19	19	19	20	18	19	19	19
Kasarani	18	18	19	18	18	20	18	18
Embakasi	19	19	19	18	18	20	19	19
Pumwani	18	20	18	18	19	19	18	18
Westlands	18	19	18	19	19	18	18	19
Dagoretti	18	19	20	19	18	18	18	20
Kibera	18	19	19	19	18	20	18	19
NCSS 2012 Total	**18**	**19**	**19**	**19**	**18**	**19**	**18**	**19**
NCSS 2000 Total	**17.3**	**17.1**	**16.6**	**16.3**	**16.2**	**16.1**	**16.9**	**16.7**
KDHS 2008-09								
National	18	18	17	18	18	17	18	18
Rural	17	17	17	17	17	17	18	17
Other urban	18	18	18	19	20	20	18	19
Nairobi	19	20	19	22	21	19	19	20
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09								

The median age at first sex among women aged 25-49 years was 19 years compared to 18 years for younger women aged 24 years or lower. Women with secondary or higher education were more likely to delay sexual intercourse compared with women with no formal, or incomplete primary, education. The protective effect of education was more pronounced among the older cohort (25-49), where women with secondary or higher education initiated sex five years later than women with no formal education. Formerly married women initiated sex earlier than their currently married, and never married, counterparts. Younger women (15-24) initiated sex earlier than the older cohort (25-49), with the biggest gap in median age at first sex occurring among formerly married women. The 2000 survey found that median age at first sex did differ by age or marital status.

Among older women aged 25-49 years, Luo and Luhya women initiated sex 1 year earlier than their counterparts from other ethnic groups. Christian women aged 25-34 years typically initiated sex about one year later than Muslim women. Muslim women aged 20-24 years and 35-44 years initiated sex later than their Christian counterparts. Little variation in median age at first sex was observed by division while women in Nairobi slums initiated sex about one year earlier than women in Nairobi as a whole, according to KDHS 2008-09.

5.2.2 Sexual Relationships among Unmarried Women

Table 5.8 shows that in 2012, 36.1 percent of never married women were sexually active. This was a marked increase from levels observed in 2000 when only 22.2 percent of never married women were sexually active. Among formerly married women, the proportion of those sexually active decreased from 34.9 percent in 2000 to 30.2 percent in 2012. Irrespective of marital status, about two thirds of sexually active women (69.3 percent for those never married and 70.6 percent for those formerly married) reported no sexual partner in the four weeks preceding the survey, while about one tenth reported having had a regular sexual partner during the reference period. This corroborates the increasing dissociation between sexual experience and marriage, emphasizing the importance of age at first coitus as a more accurate marker of the beginning of a woman's exposure to the risk of pregnancy.

Table 5.8: Sexual relations of non-married women

Percent distribution of non-married women by sexual activity in the four weeks preceding the survey and partner type among those sexually active, according to selected background characteristics, NCSS 2012, NCSS 2000 and KDHS 2008-09										
Background Characteristics	Never married women					Formerly married women				
	Sexually active	Partner Type			Number of cases	Sexually active	Partner Type			Number of cases
		None	Regular	Occasional			None	Regular	Occasional	
Age										
15-24	30.2	74.0	11.0	15.0	810	40.5	65.0	11.9	23.1	74
25-34	49.2	55.6	19.4	25.0	311	35.2	65.9	12.1	22.0	336
35+	41.1	71.8	10.6	17.6	136	25.8	74.2	12.3	13.5	588
Education										
No education	16.0	84.0	0.0	16.0	15	23.7	76.3	17.1	6.6	69
Primary incomplete	35.4	68.4	8.5	23.1	151	32.2	67.8	16.0	16.1	330
Primary complete	35.7	68.3	14.3	17.5	307	25.0	77.3	7.1	15.6	279
Secondary+	36.7	69.6	13.7	16.7	783	35.1	65.4	11.7	22.9	313
Number of living children										
None	29.3	74.8	10.5	14.7	791	31.3	68.7	12.0	19.3	34
1-2	45.0	57.9	18.4	23.7	343	37.9	63.3	11.1	25.6	357
3+	52.1	68.3	12.8	19.0	123	25.6	75.1	12.8	12.2	607
Religion										
Catholic	34.7	67.7	12.2	20.1	333	28.3	73.3	8.8	17.9	247
Protestant/other Christians	36.4	70.2	13.1	16.6	873	30.6	70.0	12.6	17.5	700
Muslims	26.3	77.6	5.8	16.6	28	35.4	64.6	24.0	11.4	41
Other	56.6	43.4	29.4	27.2	18	18.3	81.7	18.3	0.0	10
Ethnic Group										
Kamba	39.6	64.1	14.4	21.5	265	26.4	74.4	13.7	11.9	178
Kikuyu	37.4	71.2	14.5	14.3	338	27.4	74.4	9.8	15.8	261
Luhya	34.0	70.6	9.2	20.2	276	35.2	65.5	13.6	20.9	285
Luo	30.9	73.8	10.2	16.0	203	30.9	69.1	17.5	13.4	147
Other	38.0	65.7	17.6	16.7	170	28.7	71.3	5.6	23.1	118
Division										
Central	55.5	47.7	15.9	36.4	86	27.2	75.3	10.0	14.6	92
Makadara	55.6	46.8	27.8	25.4	140	32.9	67.1	20.2	12.7	102
Kasarani	16.8	91.7	6.9	1.4	163	29.1	70.9	17.5	11.6	114
Embakasi	28.8	75.2	10.3	14.5	343	18.4	83.9	1.3	14.8	211
Pumwani	47.5	67.2	7.5	25.3	65	47.1	54.5	7.9	37.6	49
Westlands	26.9	75.6	5.2	19.2	80	31.9	68.1	13.4	18.5	123
Dagoretti	37.7	66.8	17.8	15.3	196	41.6	58.4	19.5	22.1	173
Kibera	46.0	60.9	13.0	26.1	184	29.2	70.8	12.2	16.9	134
NCSS 2012 Total	**36.1**	**69.3**	**13.0**	**17.7**	**1,257**	**30.2**	**70.6**	**12.2**	**17.2**	**998**
NCSS 2000 Total	**22.2**	**58.8**	**34.7**	**6.4**	**933**	**34.9**	**45.6**	**45.6**	**8.9**	**393**
KDHS 2008-09^										
National	7.1	-	-	-	2,634	12.6	-	-	-	881
Rural	5.5	-	-	-	1,885	11.1	-	-	-	636
Other urban	7.5	-	-	-	445	14.6	-	-	-	184
Nairobi	16.4	-	-	-	304	22.2	-	-	-	61
^ The data contained in the variable regarding sexual partner type (v534) have not been collected since KDHS 1998										
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09										

There were no substantial differences in sexual activity in the four weeks preceding the survey by background characteristics, except among never married women aged 25-34 who were more likely to have had a sexual partner during the reference period compared with their younger and older counterparts. The proportion of sexually active never married women with a regular partner increased with educational attainment from less than 1 percent among those with no formal education to 13.7 percent among those with secondary or higher education.

The proportion of never married women who were sexually active was higher among Christian women (34.7 and 36.4 percent for Catholics and Protestants, respectively) than among their Muslim counterparts (26.3 percent). By contrast, one fifth of Christian women in the 2000 survey were sexually active compared with 6.5 percent of Muslim women. Also, never married Christian women were twice as likely as Muslim women to have had a regular sexual partner in the four weeks preceding the survey. However, formerly married Muslim women were more likely to have had a regular sexual partner compared to their Christian counterparts.

The lowest propensity to pre-marital sexual activity was observed among never married Luo women (30.9 percent) who had the earliest age at first intercourse (18 years in Table 5.7) and also the earliest age at first marriage (20 years in Table 5.4). Similar to findings in 2000, the proportion of sexually active non-married women was substantially higher in Nairobi slums compared to all other areas of Kenya, particularly rural areas.

5.2.3 Recent Sexual Activity

Given that sexual activity among never-married women increased between 2000 and 2012 in the Nairobi slums, sexual behavior is a crucial factor in understanding fertility among the urban poor. Recent sexual activity was measured by asking women about the last time they had sexual intercourse.

Table 5.9 shows the distribution of women by sexual activity in the four weeks preceding the survey by selected background characteristics. Over half of the women had had sex in the four weeks preceding the survey although the proportion (57.3 percent) was lower than that observed in 2000 (62.1 percent). As in 2000, about 12 percent of the women had never engaged in sexual intercourse.

Over 80 percent of women who had sex in the four weeks preceding the survey were currently using modern methods (see table 5.9). The proportion of sexually active women that were not using any method decreased from 50.1 percent in 2000 to 39.8 percent in 2012. The proportion of women who were abstaining for non-post-partum reasons was estimated at 25.3 percent, a significant increase from 2000 where it was 10.2 percent. On the other hand, the proportion of women in post-partum abstinence decreased from 16.0 percent to 1.4 percent between 2000 and 2012.

There were no major variations in the proportion of women abstaining for less than two years for post-partum reasons by age in 2012. By contrast, younger women in 2000 were less likely than their older counterparts to practice prolonged abstinence following childbirth. The proportion of women in non-post-partum abstinence for less than 2 years increased steadily from 17.2 percent among women aged 15-19 to 38.5 percent among those aged 45-49 years. Short-term non-post-partum abstinence (less than two years) decreased with increased educational attainment; the proportion decreased from 39.9 percent among women with no formal education to 24.2 percent for women with secondary or higher education. About one third of women in short term non-post-partum abstinence were not using any method of contraception, representing an increase from the levels observed in 2000 (10.7 percent).

Table 5.9: Recent sexual activity

Percent distribution of women by sexual activity in the four weeks preceding the survey, and those not sexually active, the length of time they have been abstaining, according to selected background characteristics and contraceptive method currently used, NCSS 2012, NCSS 2000								
Background Characteristics	**Sexually active in the last 4 weeks**	**Not sexually active in the last 4 weeks**					**Never had sex**	**Number of Cases**
		Post-partum abstinence		**Non-post-partum abstinence**		**Missing**		
		0-1 year	**2+ years**	**0-1 year**	**2+ years**			
Age Group								
15-19	23.8	0.6	0.0	17.2	0.0	3.3	55.0	590
20-24	59.9	2.3	0.0	23.3	0.0	3.8	10.7	1,027
25-29	67.4	1.4	0.0	24.4	0.1	4.3	2.4	1,043
30-34	69.5	1.3	0.0	24.1	0.0	4.5	0.7	543
35-39	60.8	0.6	0.0	31.7	1.9	4.3	0.6	351
40-44	53.9	1.1	0.0	36.6	2.7	5.3	0.4	198
45-49	51.1	0.0	0.3	38.5	4.4	3.8	1.8	140
Education								
No education	41.6	0.0	0.0	39.9	1.4	11.9	5.1	73
Primary incomplete	56.3	2.0	0.0	28.0	1.2	2.5	9.8	620
Primary complete	63.8	1.5	0.0	23.0	0.3	4.3	7.1	1,203
Secondary+	54.2	1.2	0.0	24.2	0.4	4.0	15.9	1,988
Contraceptive Method								
No method	39.8	2.4	0.0	29.5	0.8	7.2	20.3	2,236
Pill	84.3	0.0	0.0	15.7	0.0	0.0	0.0	202
IUD	86.5	0.0	0.0	13.5	0.0	0.0	0.0	57
Injection	81.1	0.0	0.0	18.0	0.2	0.0	0.7	942
Sterilization	83.2	0.0	0.0	15.3	0.0	0.0	1.5	62
Periodic abstinence	79.3	0.0	0.0	18.4	0.0	0.0	2.4	88
Other	74.4	0.0	0.0	24.2	0.0	0.0	1.4	305
Duration since first union (years)								
Never married	20.3	0.5	0.0	35.2	0.5	3.5	40.0	1,102
0-4	82.9	2.7	0.0	13.4	0.0	0.5	0.6	888
5-9	79.9	2.0	0.0	16.9	0.1	0.5	0.5	627
10-14	78.0	1.3	0.0	20.3	0.2	0.3	0.0	438
15-19	72.5	1.3	0.2	22.8	1.2	1.7	0.3	238
20-24	66.2	0.0	0.0	30.9	1.7	0.0	1.1	150
25-29	59.4	0.0	0.0	37.0	2.2	1.3	0.0	100
30+	55.8	0.0	0.0	34.6	9.7	0.0	0.0	33
Marital Status								
Never married	20.3	0.5	0.0	35.2	0.5	3.5	40.0	1,102
Married	80.8	1.8	0.0	13.4	0.0	3.1	0.9	2,345
Formerly married	26.8	1.4	0.1	64.6	3.7	2.2	1.3	388
Religion								
Catholic	57.3	1.4	0.0	24.8	0.2	4.5	11.8	1,001
Protestant/other Christians	57.5	1.4	0.0	25.0	0.7	3.5	11.9	2,706
Muslims	53.3	1.5	0.0	25.2	0.0	5.2	14.8	118
Other	62.3	0.0	0.0	19.7	0.0	6.0	12.0	49
Number of children								
None	32.6	0.2	0.0	21.5	0.2	8.3	37.3	1,217
1	66.7	1.8	0.0	27.5	0.3	2.4	1.3	1,013
2	70.0	1.9	0.1	24.4	0.7	2.6	0.3	801
3	69.9	1.9	0.0	25.0	0.7	2.1	0.3	459
4+	65.9	2.4	0.0	28.5	1.4	1.3	0.6	402
NCSS 2012 Total	57.3	1.4	0.0	24.8	0.5	4.1	11.9	3,892
NCSS 2000 Total	62.1	9.8	6.2	8.1	2.1	0.2	11.5	3,257
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012								

Short-term post-partum abstinence decreased with marital duration, which was contrary to findings from the 2000 survey. On the other hand, short-term non-post-partum abstinence increased with marital duration as the proportion of sexually active women decreased. Over 80 percent of women married less than 5 years were sexually active in the last four weeks preceding the survey, compared with only half of women who had been married for at least 30 years. The proportion of women in short-term non-post-partum abstinence was lowest among currently married women (13.4 percent) and highest among formerly married women (64.6 percent). The same pattern was observed among women in long term non-post-partum abstinence (2 or more years). There were no significant variations in post-partum and non-post-partum abstinence by religion or parity.

Table 5.10 compares the recent sexual behavior of women in Nairobi slums in 2012 and 2000 with women in other areas of Kenya. There were much lower levels of post-partum abstinence in the slums in 2012 (1.4 percent) compared with 2000 (16.0 percent) and for Kenya as a whole (7.3 percent) according to KDHS 2008-09. However, 25.3 percent of slum women in 2012 were in non-post-partum abstinence (either short or long term). This was similar to the proportion of women nationally (26.2 percent), rural women (25.4 percent) and women in other urban areas of Kenya (27.4 percent). The proportion of women who were sexually active in the four weeks preceding the survey was higher in 2012 than nationally while the proportion of women who had never had sex was lower in the slums compared to the national average.

Table 5.10: Comparison of recent sexual activity

Percent distribution of women by sexual activity in the four weeks preceding the survey, and those not sexually active, the length of time they have been abstaining, NCSS 2012, NCSS 2000 and KDHS 2008-09

Survey	Sexually active in the last 4 weeks	Not sexually active in the last 4 weeks					Never had sex	Number of cases
		Post-partum abstinence		Non-post-partum abstinence		Missing		
		0-1 year	2+ years	0-1 year	2+ years			
NCSS 2012 Total	57.3	1.4	0.0	24.8	0.5	4.1	11.9	3,892
NCSS 2000 Total	62.1	9.8	6.2	8.1	2.1	0.2	11.5	3,257
KDHS 2008-09								
National	48.6	6.0	1.3	20.8	5.4	1.2	16.7	8,444
Rural	48.3	6.8	1.4	19.8	5.6	1.0	17.0	6,296
Other urban	50.4	3.7	1.0	22.1	5.3	1.8	15.6	1,420
Nairobi	47.0	3.3	1.1	26.8	4.3	1.5	16.0	728

Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09

5.3 Post-partum Amenorrhea, Abstinence, and Insusceptibility

Post-partum amenorrhea is defined as the period between childbirth and the resumption of menstruation. The duration of amenorrhea is affected by the extent and intensity of breastfeeding and its termination is marked by the return of menstruation [9]. Post-partum insusceptibility defines the period during which a woman is amenorrheic and/or abstaining from coitus after childbirth and is therefore unlikely to conceive [10]. The length of post-partum insusceptibility is obtained by taking the longer duration of either amenorrhea or abstinence. Women who had given birth in the three years preceding the survey were asked about the duration of amenorrhea and sexual abstinence since the birth of their last child. The results are presented in Table 5.11.

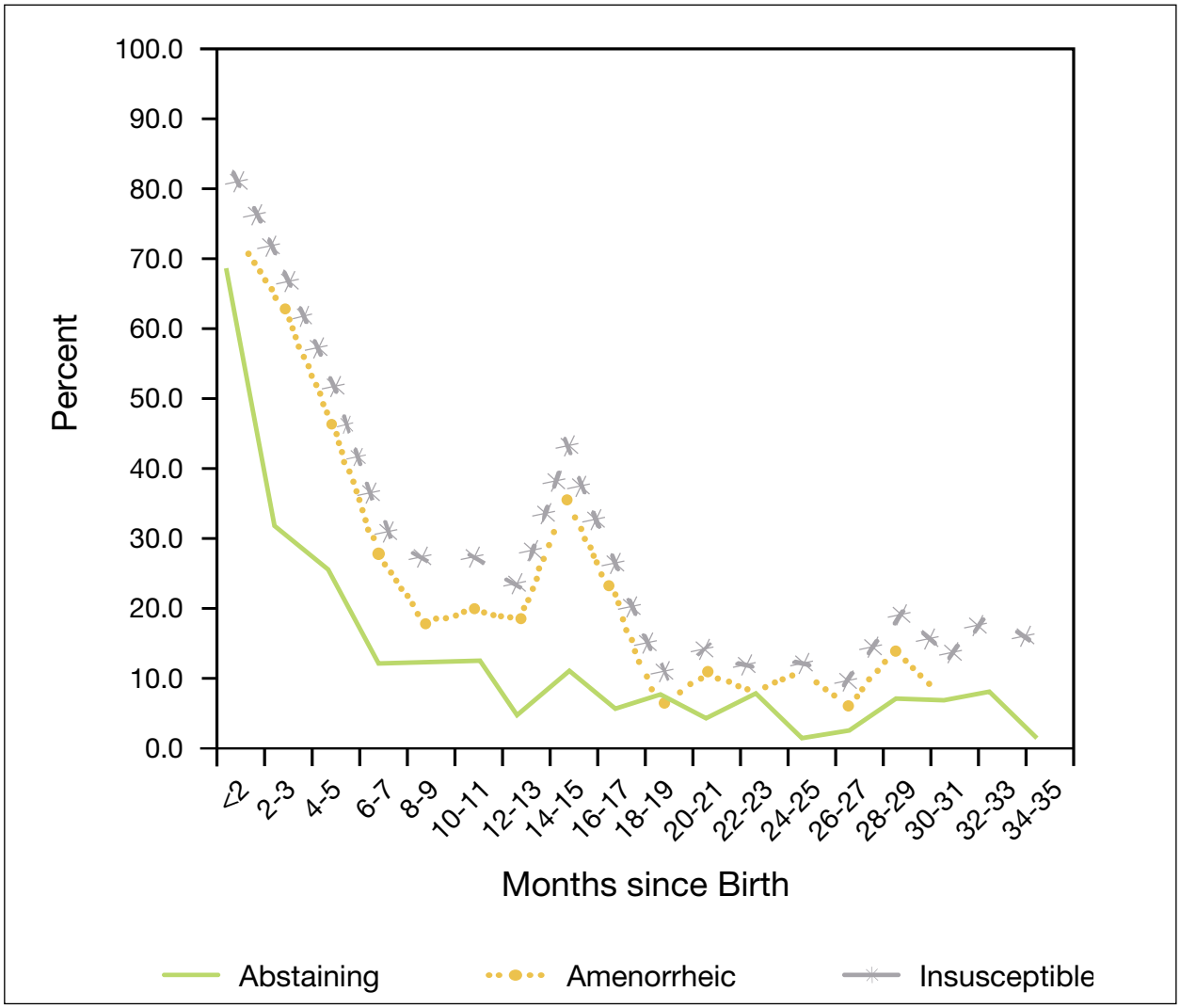
There was little variation in the median duration of amenorrhea and the median duration of abstinence as both contributed equally to the length of post-partum insusceptibility. The median duration of amenorrhea decreased from 7 months in 2000 to 3 months in 2012, while the median duration of insusceptibility decreased from 9 to 4 months between 2000 and 2012. However, the median duration of abstinence remained the same at about 3 months in both surveys.

Table 5.11: Post-partum amenorrhea, abstinence and insusceptibility

Percentage of births in the three years preceding the survey for which mothers are post-partum amenorrheic, abstaining and insusceptible, by number of months since birth, and median and mean durations, NCSS 2012, NCSS 2000				
	Amenorrheic	**Abstaining**	**Insusceptible**	**Number of births**
Months since birth				
<2	73.2	69.9	82.1	108
2-3	62.9	32.8	67.7	31
4-5	46.5	26.6	52.6	61
6-7	27.9	13.3	32.6	62
8-9	18.2	13.4	27.8	72
10-11	19.8	12.0	27.8	62
12-13	18.6	5.5	23.1	96
14-15	35.5	11.6	43.5	61
16-17	22.3	5.5	26.1	59
18-19	5.6	8.5	11.4	58
20-21	10.9	4.9	15.8	50
22-23	8.2	7.8	11.5	66
24-25	11.1	1.6	12.7	63
26-27	6.3	3.3	9.5	57
28-29	13.9	7.5	20.0	59
30-31	7.3	6.9	14.3	64
32-33	10.0	9.0	19.1	51
34-35	13.4	1.7	15.1	43
NCSS 2012				
Total	24.4	15.5	30.2	1,123
Median	3.0	2.7	3.6	-
Mean	4.2	3.5	4.8	-
NCSS 2000				
Total	26.3	15.1	31.1	1,374
Median	7.2	2.6	8.5	-
Mean	9.3	5.7	11.0	-
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012				

At less than two months post-partum, about 80 percent of women were protected from the risk of pregnancy, a decline from levels observed in 2000 where 95 percent of women were protected over the same period. From 2 to 19 months post-partum, the declining proportion of women abstaining and those amenorrheic continued, as more women resumed sexual intercourse (Figure 5.1). The same declining pattern was evident in 2000 but it only lasted from 2 to 9 months post-partum. Relative to 2000, a higher proportion of women were insusceptible in 2012 from twenty four months' post-partum.

Figure 5.1: Percentage distribution of children whose mothers are amenorrheic, abstaining, and insusceptible to pregnancy following birth, NCSS 2012



5.3.1 Median Duration of Post-partum Insusceptibility by Background Characteristics

Table 5.12 shows the median duration of post-partum amenorrhea, abstinence, and insusceptibility by background characteristics. Median duration of amenorrhea increased slightly from 3 months among younger women aged 15-24 years to 4 months among women aged 35 and older. However, there was no variation in median duration of abstinence and insusceptible by age. By contrast, results from 2000 showed that women aged 25-34 years were more likely to be amenorrheic than their younger and older counterparts and had a higher median duration of insusceptibility. Moreover, there was no substantial variation in median duration of postpartum insusceptibility by education, with the exception of women with no formal education, who were insusceptible for about 5 months, compared with 4 months for women with at least a primary education.

As in 2000, currently married women in 2012 were less likely than their never-married and formerly married counterparts to practice post-partum abstinence, although the median duration of amenorrhea was about 3 months regardless of marital status. Among never-married women, the risk of pregnancy was largely determined by abstinence rather than amenorrhea as they were insusceptible for only as long as they abstained (6 months).

Median duration of abstinence was similar across ethnic groups (3 months), although Luhya women were amenorrheic for slightly longer periods than women from other ethnic groups. All women were insusceptible for about 4 months after childbirth regardless of ethnicity.

The median durations of post-partum amenorrhea and insusceptibility in the slums of Nairobi were lower than the national, rural, urban and Nairobi estimates. Further, the median duration of post-partum abstinence in the slums of Nairobi was similar to that observed nationally, in rural areas, urban areas and Nairobi in KDHS 2008-09.

Table 5.12: Median duration of post-partum insusceptibility

Median number of months of post-partum insusceptibility by background characteristics for births in the three years preceding the survey, NCSS 2012, NCSS 2000 and KDHS 2008-09				
Background Characteristics	**Median duration of post-partum:**			**Number of births**
	Amenorrhea	**Abstaining**	**Insusceptible**	
Age				
15-24	3.1	2.8	3.7	532
25-34	2.9	2.6	3.5	590
35+	4.0	2.7	3.8	77
Education				
No education	4.5	3.2	4.6	19
Primary incomplete	3.3	2.7	3.5	202
Primary complete	2.9	2.5	3.4	423
Secondary+	3.0	2.8	3.7	553
Marital Status				
Never married	3.5	5.8	5.7	120
Currently married	2.9	2.6	3.4	1,014
Formerly married	3.4	3.2	4.2	64
Ethnic Group				
Kamba	2.7	2.6	3.5	258
Kikuyu	2.8	2.6	3.3	226
Luhya	3.4	2.8	3.8	306
Luo	3.0	2.6	3.4	226
Other	-	-	-	182
NCSS 2012 Total	3.0	2.7	3.6	1,199
NCSS 2000 Total	7.2	2.6	8.5	1,374
KDHS 2008-09				
National	8.9	3.1	10.3	3,547
Rural	9.7	3.2	11.2	2,879
Urban	4.5	3.0	8.4	668
Nairobi	4.3	2.5	5.2	206
Source: Nairobi Cross-Sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09				

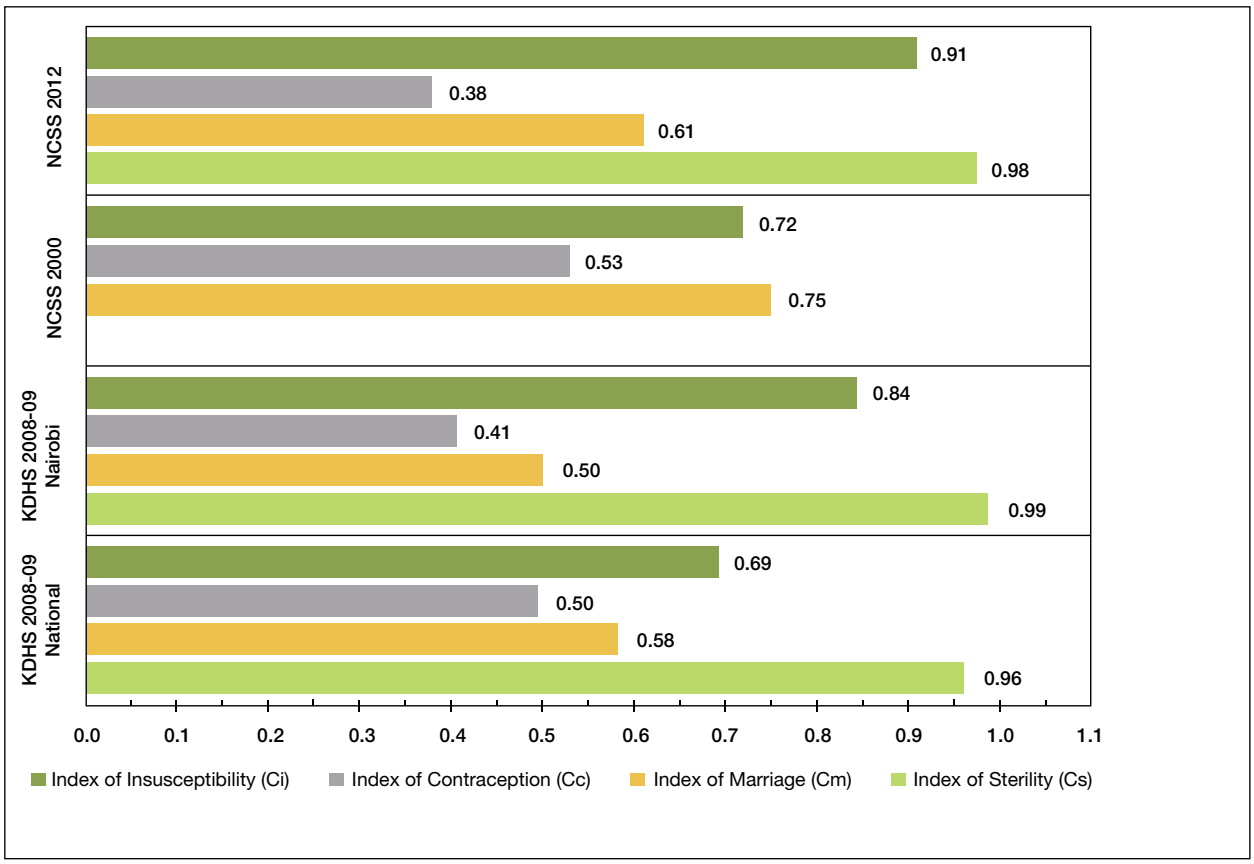
5.4 Fertility-inhibiting Impact of the Proximate Determinants

The proximate determinants of fertility framework [11] was used to estimate and compare the contribution of marriage, contraception, insusceptibility and sterility to the fertility levels in Nairobi slums in 2012 and 2000, and Nairobi and Kenya in 2008-09. In addition to the CPR of currently married women, that of sexually active unmarried and fecund women was also used, because sexual activity is a more important indicator of exposure to pregnancy than marriage.

For the same reason, the proportion of sexually active infecund women was used to determine the index of sterility instead of the percentage of women aged 45-49 years who had never had a live birth. This adequately captures the effects of primary and secondary sterility on fertility levels [12]. The index of abortion was not calculated because of lack of adequate data to measure its effect on fertility.

Figure 5.2 summarizes the indices of insusceptibility, contraception, marriage and sterility for Nairobi slums in 2012 and 2000 and for Kenya and Nairobi in 2008-09. The lower the index, the more important is the corresponding proximate determinant in reducing the total fecundity rate. Total fecundity (TF) cannot be calculated but can be estimated as the total fertility rate (TFR) in the absence of all the proximate determinants. Bongaarts (1983) estimated TF to be about 15 births per woman with a range of 13-17 births per woman in most populations [12].

Figure 5.2: Bongaarts Proximate Determinants of Fertility, NCSS 2012, NCSS 2000 and KDHS 2008-09



Ci=20/(18.5+PPI) where PPI=median duration of post-partum insusceptibility (in months)
Cc=1-(1.08*Prevalence*Effectiveness) where 1.08=is a sterility correction factor, Prevalence=Proportion of sexually active, fecund women using contraception (ranges from 0 to 1), Effectiveness=the weighted average of contraceptive use effectiveness using the proportions of current contraceptive users of each method as weights
Cm=Proportion of women of reproductive age in union (ranges from 0 to 1)
Cs=1-f where f is the proportion of sexually active women who are infecund due to any cause (ranges from 0 to 1)
TFR = TF*Cm*Ci*Ca*Cc*Cs where TF=total fecundity is approximately 15 births per woman

Table 5.13 shows that Bongaarts framework generates TFRs that are close to direct estimates except for the whole of Kenya in 2008-09 where the framework gives a TFR that is 1.7 children lower. In the three areas (slums, Kenya and Nairobi), sterility was the least powerful fertility-inhibiting proximate determinant, followed by postpartum insusceptibility. Sterility was most powerful nationally in 2008-09 (0.96) and least effective in Nairobi in 2008-09 (0.99). The index of sterility in Nairobi slums in 2012 was 0.98, suggesting that it was slightly more effective in reducing fertility in Nairobi slums in 2012 than in other parts of Nairobi in 2008-09.

Postpartum insusceptibility had the greatest effect in other parts of Kenya in 2008-09 (0.69) and was least effective in Nairobi slums in 2012 (0.91). Its contribution as a fertility inhibitor in Nairobi slums decreased between 2000 and 2012. Insusceptibility index was higher in the slums in 2012 than in Nairobi in 2008-09 (0.84), suggesting that the duration of post-partum abstinence and breastfeeding have gradually reduced over time in Nairobi slums than among those in Nairobi as a whole (See Table 5.12).

The most powerful fertility-inhibiting proximate determinant in all three areas was contraception. Contraception was more efficient at inhibiting fertility over time in the Nairobi slums between 2000 and 2012 where the index decreased substantially from 0.53 in 2000 to 0.38 in 2012.The Index for the slums in 2012 was also lower than that among Nairobi women in KDHS 2008-09 (0.41). Contraception had the highest effect on fertility levels in Nairobi slums in 2012 where the use of family planning reduced fertility by 5 births compared to a reduction of only 3.8 births in the slums in 2000. Contraception reduced fertility by 3.7 births in the whole of Nairobi and 2.9 births nationally in KDHS 2008-09, as shown in Table 5.13.

Marriage had the greatest effect on fertility in the whole of Nairobi in KDHS 2008-09 (0.50), compared to other parts of Kenya (0.58) and Nairobi slums in 2012 (0.61), where the index decreased from 0.75 in 2000. As in 2000, the prevalence of marriage was lowest in Nairobi than the whole of Kenya and the slums.

Table 5.13: Bongaarts Proximate Determinants of Fertility

Index of Insusceptibility, Index of Contraception, Index of Marriage, Index of Sterility, Total Fertility Rates using Bongaarts framework and effect of contraception on total fertility rate, NCSS 2012, NCSS 2000 and KDHS 2008-09									
Survey	Indices				Total fertility rate (TFR)			Effect of contraception on total fertility rate	
	Index of Insusceptibility (Ci)	Index of Contraception (Cc)	Index of Marriage (Cm)	Index of Sterility (Cs)	TFR (Using Bongaarts framework)	TFR (Direct estimate)	Difference	TFR (Using Bongaarts framework) (Without Cc)	Number of births by which fertility is reduced
NCSS 2012	0.91	0.38	0.61	0.98	3.1	3.5	-0.4	8.1	5.0
NCSS 2000	0.72	0.53	0.75	-	4.3	4.0	0.3	8.1	3.8
KDHS 2008-09									
Nairobi	0.84	0.41	0.50	0.99	2.5	2.8	-0.3	6.2	3.7
National	0.69	0.50	0.58	0.96	2.9	4.6	-1.7	5.8	2.9
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Surveys (KDHS) 2008-09									

5.5 Summary

This chapter presented findings on the proximate determinants of fertility among women in Nairobi slums: age at first marriage, age at first sexual intercourse, patterns in current sexual activity and post-partum insusceptibility.

Marriage rates in the slums in 2012 were remarkably similar to rates observed in the slums in 2000, as well as nationally and in rural Kenya. However, women living in the slums were more likely to be married than women in the whole of Nairobi. A higher proportion of women in the slums in 2000 and 2012 were divorced or separated relative to the rest of Kenya and the whole of Nairobi. There was an observed postponement in onset of marriage between 2000 and 2012, although women in Nairobi slums in 2012 still married about two years earlier than their counterparts in Nairobi as a whole. Also, despite delayed initiation of sex between the two surveys, women in the slums began sexual intercourse earlier than women in Nairobi as a whole. Compared with 2000, a greater proportion of women in 2012 had never been married but were sexually active. However, they were less likely to have a regular sexual partner and were more likely to have an occasional partner compared to women in the Nairobi slums in 2000.

Women in the slums had higher levels of sexual activity compared with women in other parts of Kenya although the proportion of slum women that were abstaining for non-post-partum reasons increased between 2000 and 2012. There were much lower levels of post-partum abstinence in the slums in 2012 compared to 2000 and other parts of Kenya in KDHS 2008-09. Also, durations of amenorrhea among women living in Nairobi slums were shorter in 2012 compared to 2000, and other parts of the country.

The most powerful fertility-inhibiting proximate determinant in the slums was contraceptive use, with its contribution increasing between 2000 and 2012. It is possible that women living in slums are also benefiting from the expansion of FP services and method choices. As indicated in Chapter 4, modern contraceptive use increased among women living in the slums between 2000 and 2012.

References

1. Bongaarts, J. and R. G. Potter, "Fertility, biology, and behavior: An analysis of the proximate determinants." *Studies in population*, ed. J. Bongaarts and R. G. Potter. 1983, New York: Academic Press.

2. National Research Council, *Demographic Change in Sub-Saharan Africa*. 1993, Washington, DC: The National Academies Press. 117-152.

3. Anastacia J. Gage and Dominique Meekers, "Sexual activity before marriage in sub-Saharan Africa." *Biodemography and Social Biology, 1994*. 41(1-2): p. 44-60.

4. John Bongaarts, Odile Frank, and Ron Lesthaeghe, "The proximate determinants of fertility in Sub-Saharan Africa." *Population and Development Review, 1984*. 10(3): p. 511-537.

5. African Population and Health Research Center (APHRC), *Population and Health Dynamics in Nairobi's Informal Settlements*, 2002, APHRC: Nairobi.

6. Kenya National Bureau of Statisitics (KNBS) and ICF Macro, *Kenya Demographic and Health Survey 2008-09*, 2010, KNBS and ICF Macro: Calverton, Maryland.

7. NACC and NASCOP, *Kenya AIDS Epidemic Update 2012*, 2012: Nairobi.

8. Audrey Harwood-Lejeune, "Rising age at marriage and fertility in Southern and Eastern Africa." *European Journal of Population, 2001*. 17(3): p. 261-280.

9. Roger V. Short, "Lactational infertility in family planning." *Annals of Medicine, 1993*. 25(2): p. 175-180.

10. Karl L. Dehne, "Knowledge of, attitudes towards, and practices relating to child-spacing methods in Northern Burkina Faso." *Journal of Health Population and Nutrition, 2003*. 21(1): p. 55-66.

11. John Bongaarts and R. G. Potter, "Fertility, biology, and behavior: An analysis of the proximate determinants." *Studies in Population*, ed. John Bongaarts and R.G. Potter. 1983, New York: Academic Press.

12. John Stover, "Revising the proximate determinants of fertility framework: What have we learned in the past 20 years?" in *Annual Meeting of the Population Association of America1997*: Washington, DC, USA.

CHAPTER 6: FERTILITY PREFERENCES

Donatien Beguy

In general, data on fertility preferences are used to not only gauge the prevalence of unwanted fertility in a country but also to determine the demand for children as well as predict future fertility levels[1]. The data are also used as inputs in estimating unmet need for family planning that helps in promoting or evaluating family planning services or programs[2, 3]. Kenya is among sub-Saharan African countries where fertility decline has stalled at the national level due to declines in contraceptive use, increases in unmet need for family planning, increasing preferences for larger families, increases in adolescent fertility and declines in national and international commitments to family planning programs[4, 5]. The KDHS 2008-09 indicates that fertility preferences changed between 2003 and 2008 in Kenya, with the proportions of married women who wanted an additional child (either within two years or later) having decreased while the desire to cease childbearing having increased during the same period[6]. Rural women are more likely than their urban counterparts to desire to stop childbearing but when the number of living children is taken into account, urban women are more likely to have such desire than their rural counterparts. The desire to stop child bearing increases with wealth status. In addition, the gap between wanted and observed fertility is greatest among poor women such as those living in urban slum settlements. Compared to other segments of the Kenyan population including those living in rural areas, Nairobi slum residents are more disadvantaged with respect to living conditions, morbidity [7, 8], access to health services including family planning services [7, 9-13], mortality [14-16], sexual violence and risky sexual practices[17-20]. Living in such environments may limit women's ability to control their fertility and implement their fertility preferences. It is against this background that the NCSS 2012 collected data to assess fertility preferences, including the desire to have another child, the timing of such desire, ideal family size and planning status of recent births. This chapter presents data on fertility preferences for women living in Nairobi's slum settlements in 2012 and compares them with estimates from the 2000 survey and KDHS 2008-09.

6.1 Desire for more Children

Information on desire for more children is often an indication of future reproductive behavior if women can access family planning services to help them realize their fertility preferences. Table 6.1 displays the percent distribution of married women by desire for children and the number of living children. The findings show that 52.9 percent of married women reported that they wanted another child, with 14.6 percent wanting the next birth within two years, 35.1 percent willing to wait at least two years to have the next child, and 3.2 percent being undecided about when they want the next child. In the 2000 survey, 58.3 percent of currently married women wanted another child, 37.9 percent wanted to wait at least two years to have the child, 19.3 percent wanted to have it sooner, and only 1.1 percent did not know when to have the next child. During the inter-survey period, the proportion of women who knew when they would like to have the next child decreased while the proportion of women undecided about when to have their next child increased.

Table 6.1: Fertility preference by number of living children

Percent distribution of currently married women by desire for more children, according to number of living children, NCSS 2012, NCSS 2000 and KDHS 2008-09													
Desire for children	**Number of living children^**							**NCSS 2012 Total**	**NCSS 2000 Total**	**KDHS 2008-09**			
	0	**1**	**2**	**3**	**4**	**5**	**6+**			**National**	**Other Urban**	**Rural**	**Nairobi**
Desire for children													
Have a/another child soon^^	54.6	19.0	7.4	2.9	2.2	2.0	3.4	14.6	19.3	13.7	16.3	12.6	19.7
Have a/another child later^^^	24.8	61.0	37.4	17.3	7.2	2.5	3.0	35.1	37.9	26.5	34.3	24.9	25.8
Have a/another child, undecided when	6.6	3.9	2.5	2.9	1.4	0.0	2.1	3.2	1.1	2.2	3.3	2.1	1.1
Undecided	3.8	4.9	6.6	5.3	2.8	0.0	2.2	4.9	2.5	2.9	3.6	2.6	4.7
Want no more children	7.6	10.4	44.6	67.7	80.8	83.2	75.5	39.3	35.5	48.8	38.7	51.2	45.5
Sterilized	1.4	0.0	1.4	3.3	5.7	12.3	10.4	2.2	2.5	4.8	3.1	5.3	2.7
Declared infecund	1.3	0.8	0.2	0.7	0.0	0.0	3.5	0.6	1.1	0.9	0.6	1.0	0.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number of cases	267	724	637	395	181	88	53	2,345	1,931	4,928	791	3774	363
^ Includes current pregnancy													
^^ Want next birth within two years													
^^^ Want to delay next birth for two or more years													
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000& 2012, Kenya Demographic and Health Survey (KDHS) 2008-09													

Findings from the KDHS 2008-09 show that at the national level, 42.4 percent of married women wanted another child, while it was 53.9 percent in other urban areas, 39.6 percent in rural areas and 46.6 percent in Nairobi. These figures indicate that the desire for additional children remained higher among married women in Nairobi's slums compared to women in the rest of Kenya. In addition, 39.3 percent of married women in Nairobi's slums in 2012 indicated that they did not want more children, a slight increase compared with NCSS 2000 (35.5percent). The KDHS 2008-09 indicates a much higher percentage in other parts of Kenya as almost half of married women (48.8 percent) at the national level, 51.2 percent in rural areas, and 45.5percent in Nairobi reported similar preference. The distribution of married women by desire for children according to number of living children shows the normal pattern of positive association between current parity and women's desire to stop childbearing. By contrast, the desire to have additional children declined with increasing number of children. These findings are consistent with previous studies in other settings in sub-Saharan Africa [21, 22].

Findings on women's desire for children by age are presented in Table 6.2. As in the case with parity, the percentage of married women who wanted to stop childbearing steadily increased with age. In particular, the proportion increased from 7.1 percent among women aged 15-19 to 18.0 percent among those aged 20-24, and 81.2 percent among those aged 45-49. On the other hand, the desire for additional children was inversely related to age. For example, only 3.3 percent of women aged 45-49 reported that they wanted to have another child later, compared to 57.4 percent of those aged 15-19.

Table 6.2: Fertility preference by age of woman

Percent distribution of currently married women by desire for more children, according to five-year age groups of the women, NCSS 2012, NCSS 2000									
Desire for children	**Age of Woman**							**NCSS 2012 Total**	**NCSS 2000 Total**
	15-19	**20-24**	**25-29**	**30-34**	**35-39**	**40-44**	**45-49**		
Desire for children									
Have another child soon^	26.0	15.5	15.1	15.0	11.8	8.3	0.0	14.6	19.3
Have another child later^^	57.4	56.7	37.6	19.6	10.1	2.3	3.3	35.1	37.9
Have another child, undecided when	3.5	3.7	4.3	2.2	2.7	0.0	0.0	3.2	1.1
Undecided	6.1	5.0	6.5	3.4	3.9	2.5	1.0	4.9	2.5
Want no more children	7.1	18.0	35.2	57.6	63.0	77.0	81.7	39.3	35.5
Sterilized	0.0	0.6	0.9	2.0	6.9	8.8	8.6	2.2	2.5
Declared infecund	0.0	0.4	0.3	0.2	1.6	1.2	5.4	0.6	1.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number of women	139	624	760	391	235	116	80	2,345	1,931
^ Want next birth within two years **^^ Want to delay next birth for two or more years**									
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012									

Table 6.3 shows the percentage of currently married women expressing a desire to cease childbearing by parity and other background characteristics. Overall, women in Nairobi's slums were less likely to report a desire to stop childbearing than women in other parts of Kenya.

The proportion of women who wanted no more children was highest among those with incomplete primary education and lowest among those with at least a secondary education. Among women who had ever been to school, the desire to cease childbearing decreased with level of education. At every parity, except parities 0 and 1, women with complete primary education and those with secondary education or higher were more likely to express a desire to stop child bearing.

The lower desire among women with complete primary or higher education is probably due to compositional effect whereby these women are over-represented in parities 0 and 1 (they already have fewer children than women with no formal education).

Table 6.3: Desire to limit child bearing by background characteristics

Percent of currently married women who want no more children, by number of living children and selected background characteristics, NCSS 2012, NCSS 2000 and KDHS 2008-09								
Background Characteristics	**Number of living children^**							
	0	**1**	**2**	**3**	**4**	**5**	**6+**	**Total**
Education								
No education	17.3	73.5	24.8	0.0	68.0	100.0	77.1	52.9
Primary incomplete	26.5	15.9	42.9	66.0	83.3	89.6	82.8	51.0
Primary complete	4.4	8.9	46.5	71.8	88.4	96.9	90.9	42.0
Secondary+	7.7	9.4	47.1	73.7	89.7	100.0	92.1	37.4
Religion								
Catholic	9.7	9.9	41.8	72.2	85.6	94.8	93.2	39.1
Protestant/other Christians	9.2	10.5	47.4	70.5	88.0	96.5	85.3	42.2
Muslims	0.0	17.8	52.9	68.4	80.4	59.7	63.4	47.5
Other	0.0	0.0	24.1	88.1	53.3	100.0	100.0	37.3
Ethnic Group								
Kamba	14.3	3.7	48.9	75.4	91.9	100.0	83.2	38.5
Kikuyu	12.1	13.9	53.9	80.6	89.6	100.0	89.0	45.2
Luhya	6.7	15.5	41.6	68.4	88.3	91.5	100.0	44.6
Luo	6.6	8.2	34.0	60.6	83.4	100.0	86.0	39.2
Other	2.3	10.9	50.8	68.8	76.2	75.4	64.1	38.3
Division								
Central	15.4	8.5	44.2	52.9	82.8	100.0	100.0	37.4
Makadara	14.4	8.4	53.3	67.6	76.0	100.0	0.0	38.3
Kasarani	7.5	9.0	38.3	62.2	79.9	91.1	100.0	38.9
Embakasi	8.4	8.3	41.6	74.3	88.5	100.0	58.4	38.6
Pumwani	10.0	4.9	61.4	77.8	100.0	100.0	100.0	39.7
Westlands	8.1	14.4	48.0	71.9	86.2	100.0	89.6	48.0
Dagoretti	1.9	16.1	48.8	73.8	89.6	69.6	100.0	43.7
Kibera	9.2	12.6	49.1	78.5	88.4	100.0	86.5	47.9
NCSS 2012 Total	9.0	10.4	45.9	71.0	86.5	95.5	85.9	41.5
NCSS 2000 Total	0.5	5.3	36.7	59.4	80.6	82.8	87.3	36.4
KDHS 2008-09								
National	2.5	8.4	36.4	58.0	73.6	84.0	85.3	53.6
Rural	3.1	6.6	31.9	55.9	72.5	83.5	85.5	56.6
Other urban	0.0	6.7	36.5	61.9	81.7	86.2	77.6	41.9
Nairobi	3.3	18.4	64.4	76.7	68.7	87.8	96.4	48.2
^Includes current pregnancy								
Note: Women who have been sterilized are considered to want no more children								
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09								

With respect to religious groups, 47.5 percent of Muslims wanted no more children, compared to 42.2 percent of Protestants/Other Christians and 39.1 percent of Catholics. For parities 1 and 2, the desire to stop child bearing was lowest among Catholics but highest among Muslims. However, the desire to stop child bearing was lowest among Muslims from parity 3. There were some variations in the desire to limit childbearing across ethnic groups. In particular, 44.6 percent of Luhya and 45.2 percent of Kikuyu women wanted no more children, while 39.2 percent of Luo and 38.5 percent of Kamba women expressed the same preference. There was also marked variation in the desire to limit child bearing across administrative divisions in Nairobi, with women in Central Division being the least likely to want to cease child bearing (37.4 percent) and those in Westlands and Kibera being the most likely to desire cessation of child bearing (48 percent).

6.2 Demand for Family Planning Services

This section presents the extent of need and the potential demand for family planning services. It distinguishes between married women who were currently using contraception and those who had an unmet need for family planning (Table 6.4). Women who are currently using family planning methods are considered to have a met need for family planning. Met

need for spacing includes women who are using contraceptive methods and who indicate a desire to have another child, are undecided about the timing of the next birth, or are undecided whether to have another child. Met need for limiting includes women who are using some method of family planning and who say they want to cease child bearing. Unmet need for family planning, on the other hand, includes pregnant women whose pregnancy was mistimed or unwanted, and postpartum amenorrheic women whose last birth was mistimed or unwanted. It also includes fecund women who are neither pregnant nor postpartum amenorrheic and are not using any contraceptive method despite their desire to postpone their next birth for at least two years or to cease childbearing. Further included in the definition of unmet need are fecund women who are not using any contraceptive method and who are undecided about the timing of their next birth, or if they should have another child. Women who want to wait at least two years to have children but are not using contraception are considered to have unmet need for spacing while those who want no more children have unmet need for limiting. The total demand for family planning is the sum of the met need and unmet need components.

Data in Table 6.4 indicate that unmet need among currently married women in the slums did not change between 2000 and 2012 (23.3 and 23.7 percent, respectively). The estimated level of unmet need among women in the slums in 2012 was lower than that among women at the national level and in rural areas according to KDHS 2008-09 (26.5 and 28.2 percent, respectively); it was, however, greater than among married women in the whole of Nairobi (15.6 percent). The need for spacing contributed more to the total unmet need than the need for limiting (15.4 vs. 8.2 percent). Unmet need among unmarried women did not change much, from 4.4 percent in 2000 to 6.1 percent in 2012.

Although there was no clear relationship between unmet need and educational attainment, unmet need for family planning was highest among married women with incomplete primary level of education and lowest among those with at least secondary education. Overall unmet need and unmet need for spacing were slightly lower among Protestants/Other Christians compared to Catholics but unmet need for spacing was similar among the three religious groups. Kamba women had the lowest levels of overall unmet need (17.9 percent), while the Luhya had the highest (34.0 percent). Unmet need for limiting follows the same pattern but unmet need for spacing was lowest among Luo women (12.3 percent) and highest among their Luhya counterparts (20.9 percent). Variations across divisions indicated that the lowest level of unmet need was observed in Pumwani (13.9 percent) while the highest was in Westlands (31.2 percent).

Table 6.4: Need for family planning services

Percentage of currently married women with unmet need for family planning, current use of family planning, and the demand for family planning services, by selected background characteristics, NCSS 2012, NCSS 2000 and KDHS 2008-09											
Background Characteristics	**Unmet need for family planning^**			**Current use^^**			**Total demand for family planning**			**Percent of satisfied demand**	**Number of women**
	For spacing	**For limiting**	**Total**	**For spacing**	**For limiting**	**Total**	**For spacing**	**For limiting**	**Total**		
Education											
No education	22.0	5.4	27.4	10.3	18.3	28.6	32.3	23.7	56.0	51.1	41
Primary incomplete	16.6	13.0	29.6	24.1	26.0	50.1	40.7	39.0	79.7	62.9	378
Primary complete	17.3	7.1	24.4	29.3	27.4	56.7	46.6	34.5	81.1	69.9	819
Secondary+	13.4	7.6	21.0	33.0	23.6	56.6	46.4	31.2	77.6	72.9	1,105
Religion											
Catholic	17.5	8.5	26.0	33.7	24.4	58.1	51.2	32.9	84.1	69.1	601
Protestant/other Christians	14.7	8.3	23.0	29.1	25.6	54.7	43.8	33.9	77.7	70.4	1,641
Muslims	18.7	8.6	27.3	17.1	27.0	44.1	35.8	35.6	71.4	61.8	72
Other	8.8	2.8	11.6	30.8	23.9	54.7	39.6	26.7	66.3	82.5	29
Ethnic Group											
Kamba	13.6	4.3	17.9	30.3	26.6	56.9	43.9	30.9	74.8	76.1	532
Kikuyu	13.8	6.3	20.1	29.3	28.1	57.4	43.1	34.4	77.5	74.1	481
Luhya	20.9	13.1	34.0	27.9	23.6	51.5	48.8	36.7	85.5	60.2	575
Luo	12.3	10.7	23.0	30.8	22.5	53.3	43.1	33.2	76.3	69.9	385
Other	15.1	6.4	21.5	32.5	25.3	57.8	47.6	31.7	79.3	72.9	368
Division											
Central	10.2	7.1	17.3	28.9	24.6	53.5	39.1	31.7	70.8	75.6	195
Makadara	18.9	8.2	27.1	34.5	24.9	59.4	53.4	33.1	86.5	68.7	221
Kasarani	15.4	13.1	28.5	29.4	19.2	48.6	44.8	32.3	77.1	63.0	245
Embakasi	16.2	6.1	22.3	30.9	26.1	57.0	47.1	32.2	79.3	71.9	693
Pumwani	10.3	3.6	13.9	33.7	25.8	59.5	44.0	29.4	73.4	81.1	100
Westlands	19.6	11.6	31.2	26.5	28.6	55.1	46.1	40.2	86.3	63.8	214
Dagoretti	14.8	8.4	23.2	30.4	24.8	55.2	45.2	33.2	78.4	70.4	341
Kibera	13.2	8.2	21.4	26.5	26.6	53.1	39.7	34.8	74.5	71.3	336
NCSS 2012 Total (Currently married)	15.4	8.3	23.7	29.9	25.2	55.1	45.3	33.5	78.8	69.9	2,345
NCSS 2012 Total (Single)	2.8	3.3	6.1	4.5	11.1	4.4	7.3	14.4	10.5	41.9	1,102
NCSS 2000 Total (Currently married)	15.8	7.5	23.3	23.1	20.1	43.2	38.9	27.6	66.5	65.0	1,931
NCSS 2000 Total (Single)	3.1	1.3	4.4	16.5	12.4	29.0	19.6	13.7	33.3	86.9	1,326
KDHS 2008-09 (Currently married)											
National	12.5	14.0	26.5	17.5	28.0	45.5	30.0	42.0	72.0	63.2	4,928
Rural	13.0	15.2	28.2	13.8	29.3	43.1	26.8	44.5	71.3	60.5	3,774
Other urban	12.6	10.8	23.4	30.7	21.4	52.1	43.3	32.1	75.5	69.0	791
Nairobi	6.5	9.1	15.6	27.1	28.2	55.3	33.6	37.3	70.9	78.0	363
KDHS 2008-09 (Single)											
National	2.1	1.0	3.2	6.8	6.4	13.2	8.9	7.5	16.4	80.7	3,516
Rural	1.6	1.1	2.6	5.5	6.0	11.5	7.1	7.0	14.1	81.4	2,522
Other urban	3.8	0.8	4.6	7.4	9.1	16.5	11.2	9.9	21.1	78.2	629
Nairobi	2.9	1.5	4.4	14.5	4.9	19.4	17.4	6.4	23.8	81.5	364

^ ***Unmet need for spacing*** includes pregnant women whose pregnancy was mistimed, postpartum amenorrheic women whose last birth was mistimed, and fecund women who are neither pregnant nor postpartum amenorrheic and who are not using any method of family planning and say they want to wait two or more years for their next birth, are undecided about the timing of the next birth, or are undecided whether to have another child. ***Unmet need for limiting*** includes pregnant women whose pregnancy was unwanted, postpartum amenorrheic women whose last birth was unwanted and fecund women who are neither pregnant nor postpartum amenorrheic and who are not using any method of family planning and who want no more children. Also excluded are menopausal women

^^ ***Using for spacing*** refers to women who are using some method of family planning and who say they want to wait two or more years for their next child, are undecided about the timing of the next birth, or are undecided whether to have another child. ***Using for limiting*** refers to women who are using some methods of family planning and who want no more children. Note that the specific methods used are taken into account

Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09

In addition, Table 6.4 indicates that 55.1 percent of married women in slums met their need for family planning (i.e. currently using contraception), which is quite high compared to what was estimated in 2000 (43.2 percent). The met need for spacing was higher than that for limiting (29.9 vs. 25.2 percent). In addition, the 2012 level of met need was higher than that among women at the national level (45.5 percent), in rural areas (43.1 percent), and other urban areas (52.1percent), but similar to the level of met need among women in the whole of Nairobi (55.3 percent) according to estimates from the KDHS 2008-09. Slum women had a similar level of met need for spacing compared to women in other urban areas, but a higher level than women in the whole of Kenya, rural areas, and Nairobi. The level of met need for limiting was higher than what was observed among women in other urban areas but lower than in Kenya as a whole, Nairobi, and rural areas. Overall met need increased with level of education. Further, it was lowest among Muslims, Luhya and women in Kasarani Division and highest among Kikuyu, women in Pumwani and Makadara Divisions. When disaggregated by type, met need for spacing was lowest among Muslims while met need for limiting was lowest among Catholics.

The total demand for family planning services among married women in the slums was estimated at 78.8 percent in 2012, a substantial increase from the 2000 level (66.5 percent). The 2012 level of demand was higher than that among Kenyan women nationally (72.0 percent), those in rural areas (71.3 percent), other urban areas (75.5 percent), and women in Nairobi as a whole (70.9 percent). The total demand for family planning was lowest among women with no formal education, Muslims, Kamba women and those from Central Division. In addition, the level of satisfied demand among married women was 69.9 percent in 2012, representing a 5 percentage point increase from the 2000 level. It was higher than what was observed among women at the national level (63.2 percent) and in rural areas (60.5 percent) but lower than among women in Nairobi as a whole (78.0 percent) in the KDHS 2008-09. The percentage of demand satisfied increased with level of education; it was lowest among Muslim and Luhya women, and those living in Kasarani Division.

6.3 Ideal Family Size

In the NCSS 2012, women were asked about their ideal family size, i.e. their desired number of children if they had to start their reproductive life afresh. Data presented in Table 6.5 shows that the ideal family size was 3.0 children among women in Nairobi slums in 2012, a slight decrease from the 2000 level (3.2 children). Ideal family size in 2012 was slightly greater than that of women in Nairobi as a whole in the KDHS 2008-09 (2.8 children) but lower than what was observed among women at the national level (3.8 children) or in the rural areas (4.0).

For most levels of parity, ideal number of children in the slums was lower than what was observed in 2000. The exceptions were parity 1 where ideal numbers in the two surveys were similar, and parity 6 and above where ideal family size was higher in 2012 than in 2000. In general, the preferred ideal family size was lower in Nairobi slums in 2012 compared with Kenya, rural areas, and other urban areas in the KDHS 2008-09. Before parity 3, ideal family sizes were relatively comparable between Nairobi slums and Nairobi as a whole but for parities 3 to 5, the Nairobi slums had lower mean ideal number of children compared to Nairobi as a whole.

Table 6.5 also slows the percentage distribution of women according to their ideal family size across parities. Before parity 4, the distribution of respondents by ideal number of children and parity has an inverted “U” shape, increasing from a low of zero to a maximum of two or three children before steadily decreasing thereafter. In addition, although only about a third of the women reported ideal family size of up to 3 children, for those at parity 3 or lower, the proportion ranged from 63.5 to 82.6 percent. Only 1.3 percent of women gave non-numeric responses to the question about ideal family size, which is similar to what was obtained in 2000. The KDHS 2008-09 findings indicate that 3.6 percent of women at the national level gave non-numeric responses to this question.

Table 6.5: Ideal and actual number of children

Percent distribution of all women by ideal number of children for all women, according to number of living children, NCSS 2012, NCSS 2000 and KDHS 2008-09										
Ideal number of children	Number of living children^							NCSS 2012 Total	NCSS 2000 Total	KDHS 2008-09 National
	0	1	2	3	4	5	6+			
Ideal number of children										
0	0.3	0.6	0.5	1.1	0.8	1.0	0.8	0.6	1.1	1.0
1	4.2	6.3	3.7	2.2	1.4	1.6	0.0	4.1	4.1	2.4
2	45.6	41.0	37.0	20.4	17.3	21.6	9.7	36.0	30.9	21.2
3	31.1	34.7	27.1	39.8	10.6	15.0	3.4	30.1	26.5	21.5
4	14.3	13.9	26.7	26.9	55.2	22.5	26.5	21.6	26.6	30.2
5	1.7	1.4	2.8	4.7	6.0	22.8	11.6	3.3	4.6	8.7
6+	1.1	1.0	1.5	4.2	7.8	11.1	43.2	3.1	5.6	11.5
Non-numeric	1.7	1.1	0.9	0.7	1.0	4.3	4.9	1.3	0.6	3.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number of cases	1,117	1,043	822	493	239	108	70	3,892	3,257	8,444
Mean ideal number-all women										
NCSS 2012										
Mean	2.7	2.7	2.9	3.2	3.7	3.9	4.9	3.0	-	-
Number	1,117	1,043	822	493	239	108	70	3,892	-	-
NCSS 2007										
Mean	2.9	2.7	3.1	3.5	3.8	4.2	4.7	-	3.2	-
Number	921	810	630	356	241	143	156	-	3,257	-
KDHS 2008-09										
National										
Mean	3.3	3.2	3.3	3.8	4.1	4.3	5.4	-	-	3.8
Number	2,178	1,248	1,312	1,068	840	529	963	-	-	8,139
Rural										
Mean	3.5	3.4	3.5	3.8	4.2	4.4	5.4	-	-	4.0
Number	1,526	757	851	840	700	456	911	-	-	6,042
Other urban										
Mean	3.0	3.0	3.1	3.6	3.7	4.2	5.7	-	-	3.3
Number	386	296	322	174	111	52	43	-	-	1,383
Nairobi										
Mean	2.6	2.5	2.9	3.6	4.2	4.1	4.5	-	-	2.8
Number	266	195	139	55	29	22	8	-	-	714
Note: The means exclude women who gave non-numeric responses ^ Includes current pregnancy										
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09										

Table 6.6 shows the mean ideal number of children by age and other selected background characteristics. Overall, the mean ideal number of children increased with age from age 20-24, and for each age group, the mean ideal family size was lower in 2012 than in 2000.

In 2012, ideal family size was inversely related to the level of education, decreasing from 4.1 children among women with no formal education to 2.7 children among those with at least secondary level education. Ideal family size was lower among never married women (2.6 children) than among those currently (3.1 children) or formerly married (3.0 children). Compared to Muslims, Christian women had lower mean ideal number of children (2.9 children and 3.3 children, respectively). With respect to ethnicity, Luhya women had the highest ideal number of children while their Kikuyu and Kamba counterparts had the lowest. Women from Makadara Division had the lowest ideal family size (2.7 children), while those from Kasarani had the highest (3.3 children).

Table 6.6: Mean ideal number of children by background characteristics

Mean ideal number of children by background characteristics, NCSS 2012, NCSS 2000								
Background Characteristics	**Age**							**Total**
	15-19	**20-24**	**25-29**	**30-34**	**35-39**	**40-44**	**45-49**	
Education								
No education	-	3.5	3.0	4.6	3.4	4.7	4.3	4.1
Primary incomplete	2.8	3.1	3.2	3.2	3.4	3.7	3.9	3.3
Primary complete	2.8	2.9	2.9	3.0	3.3	3.7	3.2	3.0
Secondary+	2.6	2.5	2.8	2.9	3.0	3.2	3.3	2.7
Marital Status								
Never married	2.6	2.5	2.4	2.6	2.9	2.4	3.1	2.6
Married	2.8	2.8	3.0	3.1	3.3	3.9	3.7	3.1
Formerly married	2.1	2.7	2.6	2.9	3.0	3.3	3.9	3.0
Religion								
Catholic	2.6	2.7	2.9	3.1	3.2	3.5	3.4	2.9
Protestant/other Christians	2.7	2.7	2.9	3.0	3.2	3.6	3.7	2.9
Muslims	3.5	2.9	3.2	3.2	4.6	2.9	4.2	3.3
Other	2.4	2.5	2.8	3.3	3.8	4.5	-	3.0
Ethnic Group								
Kamba	2.4	2.6	2.7	2.9	3.2	3.5	3.7	2.8
Kikuyu	2.5	2.6	2.7	2.6	3.0	3.5	3.8	2.8
Luhya	2.8	2.8	3.1	3.4	3.2	3.7	3.5	3.1
Luo	2.8	2.8	3.1	3.1	3.8	4.0	3.9	3.0
Other	2.8	2.7	2.8	3.1	3.1	3.1	3.5	2.9
Division								
Central	2.8	2.7	2.9	3.2	3.9	3.6	4.0	3.0
Makadara	2.5	2.5	2.8	2.6	2.7	3.0	3.7	2.7
Kasarani	3.1	3.1	3.1	3.4	3.7	4.3	4.7	3.3
Embakasi	2.4	2.6	2.8	2.9	3.2	3.5	3.4	2.8
Pumwani	2.3	2.6	2.7	3.3	3.2	3.5	3.5	2.8
Westlands	2.5	2.7	2.9	3.1	3.5	3.7	3.4	3.0
Dagoretti	2.8	2.7	2.9	2.9	3.0	3.2	3.7	2.9
Kibera	2.8	2.7	2.9	3.0	3.1	4.0	3.5	2.9
NCSS 2012 Total	2.7	2.7	2.9	3.0	3.2	3.6	3.7	2.9
NCSS 2000 Total	3.0	2.9	3.1	3.4	3.5	4.1	4.7	3.2
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012								

6.4 Wanted and Unwanted Fertility

It is important to determine the magnitude of wantedness or unwantedness of children born to women as fertility preferences have implications for fertility levels in a given country [23]. Estimates of wanted and unwanted fertility also help in assessing the effectiveness of programs aimed at preventing or reducing unwanted pregnancies [24, 25]

Estimates of levels of unwanted fertility were derived from data gathered about all pregnancies that occurred to women in the five years preceding the survey. The following question was asked to all women who had a live birth over the past five years: "At the time you became pregnant with [NAME], did you want to become pregnant then, did you want to wait until later or did you want no (more) children at all?" Based on the answers "then", "later" and "not at all", unwanted fertility is defined as a pregnancy for which a woman indicated that she did not want any more children at all or wanted to wait until later. The births for which women indicated to have wanted to wait until later are also considered as mistimed.

Table 6.7 presents the percentage distribution of births and current pregnancies in the three years preceding the survey according to their planning status at conception. The data indicate whether, at the time of conception, the birth (or pregnancy) was wanted then, later, or not wanted at all. It is important to note that the planning status was reported retrospectively at the time of conception and not at the time of the survey, suggesting that it might be affected by recall bias or "ex post-facto rationalization" by respondents.

Table 6.7: Fertility planning status

Percent distribution of births (and current pregnancies) in the three years preceding the survey by fertility status, according to birth order and mother's age at birth, NCSS 2012, NCSS 2000 and KDHS 2008-09					
Sample	**Planning status at conception**				**Number of births^**
	Wanted then	**Wanted later**	**Not wanted**	**Total**	
Birth order					
1	69.0	21.7	9.3	100.0	692
2	69.1	24.7	6.2	100.0	398
3	59.9	31.0	9.1	100.0	206
4+	53.9	20.6	25.5	100.0	145
Age at Birth					
<20	50.2	33.0	16.7	100.0	246
20-24	67.9	26.2	5.8	100.0	604
25-29	71.5	19.0	9.5	100.0	380
30-34	73.9	15.5	10.6	100.0	150
35-39	65.9	12.2	22.0	100.0	46
40-44	38.5	7.7	53.8	100.0	13
45-49	100.0	0.0	0.0	100.0	2
NCSS 2012 Total	66.2	23.8	10.1	100.0	1,441
NCSS 2000 Total	52.7	37.8	9.2	100.0	1,488
KDHS 2008-09					
National	53.1	27.9	18.9	100.0	3,880
Rural	50.5	29.3	20.2	100.0	3,160
Other urban	62.8	25.1	11.9	100.0	504
Nairobi	68.8	13.8	16.7	100.0	217
^ Includes current pregnancy					
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09					

In 2012, two-thirds (66.2 percent) of all births that occurred to women in Nairobi slums were reported to be wanted at the time of conception, which was a significant increase from the 52.7 percent level estimated in 2000. Almost a quarter of all the births (23.8 percent) were mistimed or wanted later as they occurred to women who, at the time of conception, did want to delay their next pregnancy until later. This was a sharp decrease from the level observed in 2000 in the same slum communities (37.8 percent). Only one in ten births were reported to be unwanted, which was similar to what was estimated in 2000 (9 percent). The level of unwanted pregnancy in the slums in 2012 was lower than the estimates from the KDHS in 2008-09 at the national level, in rural areas, and in Nairobi.

The percentage of births reported as wanted at the time of conception remained unchanged from birth order 1 to birth order 2 (69.0 to 69.1 percent) but sharply decreased for birth order 3 (from 69.1 to 59.9 percent and then to 53.9 percent for birth order 4 or higher). The percentage of mistimed births rose steadily from birth order 1 to birth order 3 (21.7 to 31.0 percent) and then fell considerably at birth order 4 or higher (20.6 percent). At the same time, unwanted fertility did not follow any clear pattern by birth order although it was highest at birth order 4 or higher (25.5 percent compared to less than 10 percent for the lower birth orders). The distribution by mother's age at birth indicates that the percentage of wanted births steadily increased from 50.2 percent among women aged less than 20 years at the time of delivery to 73.9 percent among those aged 30-34 years but then drastically fell to 65.9 percent among those aged 35-39 years. The level of mistimed births decreased by mother's age at birth, from 33.0 percent among women aged less than 20 years to 12.2 percent among those aged 35-39 years. The percentage of unwanted fertility fell from 16.7 percent among women aged less than 20 years to 5.8 percent among those aged 20-24 before drastically increasing to 22.0 percent among women aged 35-39 at the time of delivery.

6.5 Summary

In this chapter, questions relating to the desire for additional children, the demand for family planning, ideal family size, and planning status of births were used to examine reproductive preferences among women living in Nairobi slums in 2012. The estimates were also compared with those from NCSS 2000 and KDHS in 2008-09.

Findings indicate that the desire for additional children slightly decreased between 2000 and 2012 among slum women (from 58.3 to 52.9 percent). As was the case in 2000, the desire for more children was higher in the slums than in Kenya as a whole. Furthermore, the desire to stop child bearing was lower among slum residents than in Kenya as a whole. The fact that the desire to continue child bearing is higher in the slums is an indication of the relatively prevalent pro-natalist values among women living in the slums. Overall, women in Nairobi's slums were less likely to report a desire to stop child bearing than their counterparts from other parts of the country. In addition, the desire to stop child bearing among women in the slums increased with higher parity.

Ideal family size in Nairobi slums slightly decreased between 2000 and 2012 (from 3.2 to 3.0 children). However, the ideal family size in slums was marginally higher than that of Nairobi as a whole (2.8 children), and lower than the estimate for the national level (3.8 children), or rural areas (4.0 children).

With respect to the demand for family planning services, unmet need in the slums did not change much between 2000 and 2012 (23.3 to 23.7 percent, respectively). Unmet need in the slums was, however, lower than the national average (26.5percent) and the estimate for rural areas (28.2 percent) but greater than the estimate for the whole of Nairobi (15.6 percent). Among married women, the need for spacing contributed more to the total unmet need than the need for limiting. Also, unmet need among single women marginally changed, from 4.4 percent in 2000 to 6.1 percent in 2012. In addition, the met need for family planning substantially increased between 2000 and 2012, with the met need for spacing being higher than the met need for limiting (29.9 and 25.2 percent, respectively). The 2012 level of met need was also greater than that among women at the national level (45.5 percent), in rural areas (43.1 percent), and other urban areas (52.1 percent), but similar to the level of met need among women in the whole of Nairobi (55.3 percent) based on the estimates from the KDHS 2008-09.

The total demand for family planning services among women in the slums increased from 66.5 percent in 2000 to 78.8 percent in 2012. The 2012 level of demand among married women in the slums was higher than that among Kenyan women overall (72.0 percent), those in rural areas (71.3 percent), other urban areas (75.5 percent) and women in Nairobi as a whole (70.9 percent). In addition, the level of satisfied demand among married women increased from 65.0 percent in 2000 to 69.9 percent in 2012. The level of satisfied demand in 2012 was also greater than what was observed among women at the national level (63.2 percent) and in urban areas (60.5 percent) but lower than that among women in Nairobi as a whole (78.0 percent).

The level of mistimed fertility sharply decreased from 37.8 percent in 2000 to 23.8 percent in 2012, but the level of unwanted fertility remained unchanged. The level of unwanted fertility in the slums in 2012 was lower than the estimates from KDHS in 2008-09, at the national level, in rural areas, and for Nairobi as a whole. On the other hand, the level of wanted fertility increased considerably from 52.7 percent in 2000 to 66.2 percent in 2012.

Overall, there were noticeable changes in reproductive preferences between 2000 and 2012 although the pro-natalist values were still prevalent among women living in slums. The findings on unmet need for family planning and unwanted fertility call for increased focus by programs on women living in slum settlements with specific focus on segments of the population such as those with no formal education and those from certain religious groups.

References

1. Koenig M. A, et al., "Do current measurement approaches underestimate levels of unwanted childbearing? Evidence from rural India." *Population Studies 2006. 60 (3): p.* 243-256.

2. Westoff, C. and A. Bankole, "Unmet need: 1990-1994," in *DHS Comparative Studies* 1995, Macro International: Calverton.

3. Casterline, J. B. and S. W. Sinding, "Unmet need for family planning in developing countries and implications for population policy." *Population and Development Review, 2000. 26 (4): p. 691-723*.

4. Ezeh, A. C., B. U. Mberu, and J. O. Emina, "Stall in fertility decline in Eastern African countries: regional analysis of patterns, determinants and implications." *Philosophical Transactions of the Royal Society B, 2009. 364(1532): p. 2991-3007*

5. Westoff, C. F. and A. R. Cross, "The stall in the fertility transition in Kenya," in *DHS Analytical Studies* 2006, ORC Macro: Calverton, MD.

6. Kenya National Bureau of Statistics (KNBS) and ICF Macro, *Kenya Demographic and Health Survey 2008-09*, 2010, KNBS and ICF Macro: Calverton, Maryland.

7. Taffa, N., G. Chepngeno, and M. Amuyunzu-Nyamongo, "Child morbidity and healthcare utilization in the slums of Nairobi, Kenya." *Journal of Tropical Pediatrics, 2005. 51*(5): p. 279-84.

8. African Population and Health Research Center, *Population and Health Dynamics in Nairobi's Informal Settlements: Report of the Nairobi Cross-sectional Slums Survey (NCSS) 2000, 2002*, African Population and Health Research Center: Nairobi.

9. Taffa, N. and G. Chepngeno, "Determinants of health care seeking for childhood illnesses in Nairobi slums." *Trop Med Int Health*, 2005. 10 (3): p. 240-5.

10. Fotso, J. C., et al., "What does access to maternal care mean among the urban poor? Factors associated with use of appropriate maternal health services in the slum settlements of Nairobi, Kenya." *Matern Child Health J*, 2009. 13(1): p. 130-7.

11. Ziraba, A. K., et al., "The state of emergency obstetric care services in Nairobi informal settlements and environs: Results from a maternity health facility survey." *BMC Health Serv Res*, 2009. 9: p. 46.

12. Fotso, J. C., A. Ezeh, and R. Oronje, "Provision and use of maternal health services among urban poor women in Kenya: What do we know and what can we do?" *J Urban Health*, 2008. 85(3): p. 428-42.

13. Essendi, H., S. Mills, and J.-C. Fotso, "Barriers to formal emergency obstetric care services' utilization." Journal of Urban Health, 2011. 88(0): p. 356-369.

14. Kyobutungi, C., et al., "The burden of disease profile of residents of Nairobi's slums: Results from a Demographic Surveillance System." *Popul Health Metr*, 2008. 6: p. 1.

15. Ziraba, A. K., et al., "Maternal mortality in the informal settlements of Nairobi city: what do we know?" *Reprod Health*, 2009. 6: p. 6.

16. Ziraba, A., C. Kyobutungi, and E. Zulu, "Fatal Injuries in the Slums of Nairobi and their risk factors: Results from a matched case-control study." *Journal of Urban Health*, 2011. 88(0): p. 256-265.

17. Kabiru, C. W., et al., "Transition into first sex among adolescents in slum and non-slum communities in Nairobi, Kenya." *Journal of Youth Studies*, 2010. 13(4): p. 453-471.

18. Zulu, E. M., F. N.-A. Dodoo, and A. C. Ezeh, "Sexual risk-taking in the slums of Nairobi, Kenya, 1993-98." *Population Studies*, 2002. 56(3): p. 311-323.

19. Beguy, D., et al., "Inconsistencies in self-reporting of sexual activity among young people in Nairobi, Kenya."*J Adolesc Health,* 2009. 45(6): p. 595-601.

20. Fotso, J. C., "Urban-rural differentials in child malnutrition: trends and socioeconomic correlates in sub-Saharan Africa". *Health Place*, 2007. 13(1): p. 205-23.

21. Wolff, B., A. K. Blanc, and J. Ssekamatte-Ssebuliba, "The Role of Couple Negotiation in Unmet Need for Contraception and the Decision to Stop Childbearing in Uganda." *Studies in Family Planning*, 2000. 31(2): p. 124-137.

22. Short, S. E. and G.-E. Kiros, "Husbands, wives, sons, and daughters: fertility preferences and the demand for contraception in Ethiopia." *Population Research and Policy Review*, 2002. 21(5): p. 377-402.

23. Casterline, J. and L. O. El Zeini, "The estimation of unwanted fertility." *Demography*, 2007. 44(4): p. 729-745.

24. Bankole, A., "Desired fertility and fertility behavior among the Yoruba of Nigeria: A Study of couple preferences and subsequent fertility." *Population Studies*, 1995. 49(2): p. 317-328.

25. Bongaarts, J., "Do reproductive intentions matter?" *International Family Planning Perspectives, 1992*. 18(3): p. 102-108.

CHAPTER 7: INFANT AND CHILDHOOD MORTALITY

Patricia Elung'ata and Donatien Beguy

This chapter presents levels, trends and differentials in neonatal, post-neonatal, infant and under-five mortality. A time-based comparison in mortality is included to assess improvement in child survival over time [1, 2]. Within-urban, across-urban and urban-rural differentials are assessed by comparing findings from the slum with findings from non-slum areas of Nairobi, other urban areas of Kenya, and Kenya as a whole [3, 4]. Socio-economic and bio-demographic differentials in mortality are also assessed due to the documented non-uniform progress in child-survival [1, 2, 5].

Infant and childhood mortality rates are useful for planning and evaluation of health policies and programs [1, 5]. Child mortality rates have also been used to track progress in mortality reduction [6-8], to identify high risk groups for interventions [9, 10], and assess interventions that work [8]. Infant and under-five mortality rates have been used commonly as part of composite indices to assess the level of development in all countries and the progress of MDGs [1].

Compared with 18 other SSA countries, Kenya reported one of the highest improvements in child survival: a 7.6 percent annual decline in under-five mortality since 2005, more than the 4.4 percent needed to achieve MDG 4 [8]. Moreover, Kenya reported 35 percent and 32 percent declines in under-five and infant mortality rates, respectively, in the five years preceding the last KDHS (2008-09); the declines are higher than those observed at any time in the 20 years preceding the survey [3]. Of concern, however, is that a reversed pattern in Kenya's urban-rural differentials in mortality is being observed, with infant mortality and childhood mortality in rural areas dropping faster than those in urban areas [3]. In addition, significant intra-urban differences in child health outcomes have been reported within the country [4]. Evidence suggests that intra-urban differences in child health indicators are larger than rural-urban differences [4, 11], and improvement in overall mortality masks large sub-group inequities, especially among the urban poor living in informal settlements [6]. Other disparities in mortality are explained by differentials in access to maternal healthcare and obstetric services [12-14], as well as by access to preventive maternal and child health interventions [1, 15-18].

Infant and childhood mortality estimates presented in this chapter are derived from retrospective birth histories. However, retrospective birth histories suffer from a number of limitations that may affect the quality of mortality estimates. First, they are collected from surviving mothers at the time of the survey, suggesting that survival status of orphaned children is not captured. As a result, infant and child mortality may be underestimated if orphaned children are more likely to die than children whose mothers were alive at the time of the survey.

Second, the length of the retrospective period also affects infant and childhood mortality estimates. Indeed, the longer the retrospective period considered before the survey, the less represented are births from women aged 15-49 years that were surveyed. For example, it is only births to women aged less than 40 years that are used in the calculation of mortality indicators for the 10-14 year period prior to the survey because women aged 40-49 at the time of birth of their children are not eligible to be considered in the survey sample of women aged 15-49 years. Therefore, given that children's mortality varies by age of the mother, it is likely that mortality estimates from retrospective birth histories partly reflect differences in childhood mortality by mother's age.

Third, recall lapses also affect the quality of birth histories, especially for deaths that occur shortly after birth. In cases where the mother does not know her child's date of death, it is likely she systematically reports the death as having occurred further or closer to the time of survey, thereby influencing mortality estimates.

For instance, mortality may be underestimated for the most recent period preceding the survey or overestimated for the less recent period when deaths tend to be reported further from the date of the survey. In general, the above birth history data limitations do not result in substantial biases in infant and child mortality estimates. We present in Appendix B.1, additional details on the quality of the data used for the mortality estimations. In this chapter, to further check the quality of the data used, the estimates are compared to the most recent estimates from other international data sources.

7.1 Current Levels of Mortality

Table 7.1 presents infant and child mortality levels from ten years preceding the NCSS 2000, NCSS 2012 and KDHS 2008-09. There was a general decline in childhood mortality in informal settlements, with the rates decreasing by about half between 2000 and 2012. Urban poor children remain disadvantaged with under-five mortality rate in slums in 2012 (79.8 per 1000) being higher than that of Nairobi in 2008-09 (63.4 per 1000). However, the under-five mortality rate in 2012 was similar to the rate in other urban areas of Kenya (79.9 per 1000), and almost similar to the rate in rural areas of Kenya in 2008-09 (85.4 per 1000). These findings were generally consistent with findings from the NCSS 2000, in which both infant and under-5 mortality rates were higher in slums than in Kenya as a whole, rural Kenya, other urban areas of Kenya or Nairobi. Comparison with recent estimates developed by the UN Inter-agency Group for Child Mortality Estimation indicate that infant mortality rates in 2012 were lower in the slums of Nairobi than in Kenya as a whole during the same year (40.6 per 1000 and 49 per 1000, respectively). However, under-five mortality rate in the slums was higher than that for Kenya in 2012 (79.8 per 1000 and 73 per 1000, respectively). The neonatal mortality rate in the slums was much lower than the national average for 2012 (14.4 per 1000 and 27 per 1000, respectively) [2].

In Kenya, decreasing overall childhood mortality rates have been associated with several factors. First, there were substantial increases in immunization coverage at national and regional levels. Second, there was an increase in health facility deliveries and access to antenatal and postnatal care [1] and use of iron supplements during pregnancy [8], which is consistent with findings from NCSS 2012 (See Tables 8.2a, 8.4, 8.5 and 8.7). Third, there was improved household access to drinking water and improved sanitation [8], with a substantial increase in the proportion of households with access to water from a public tap, as well as increased access to flush toilets between 2000 and 2012 (see Table 2.5). Fourth, there were improvements in key malaria indicators, including ownership and use of treated mosquito nets, preventive treatment of malaria during pregnancy, and treatment of childhood fever [3, 8].

Table 7.1: Infant and childhood mortality rates

Mortality in infancy and childhood by residential area, ten years preceding the NCSS 2012, NCSS 2000 and KDHS 2008-09					
	Neonatal mortality (NNMR)	**Post-neonatal mortality (PNMR)^**	**Infant mortality (1q0)**	**Child mortality (4q1)**	**Under-five mortality (5q0)**
NCSS 2012 Total	14.4	24.9	39.2	40.6	79.8
NCSS 2000 Total	31.1	57.9	88.2	52.8	136.4
KDHS 2008-09					
National	33.0	26.1	59.2	26.0	83.6
Rural	33.3	25.0	58.3	28.7	85.4
Other urban	25.8	38.7	64.5	16.4	79.9
Nairobi	47.8	12.1	60.0	3.7	63.4
^ Post-neonatal mortality is the difference between the infant and neonatal mortality rates					
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09					

7.2 Mortality Trends

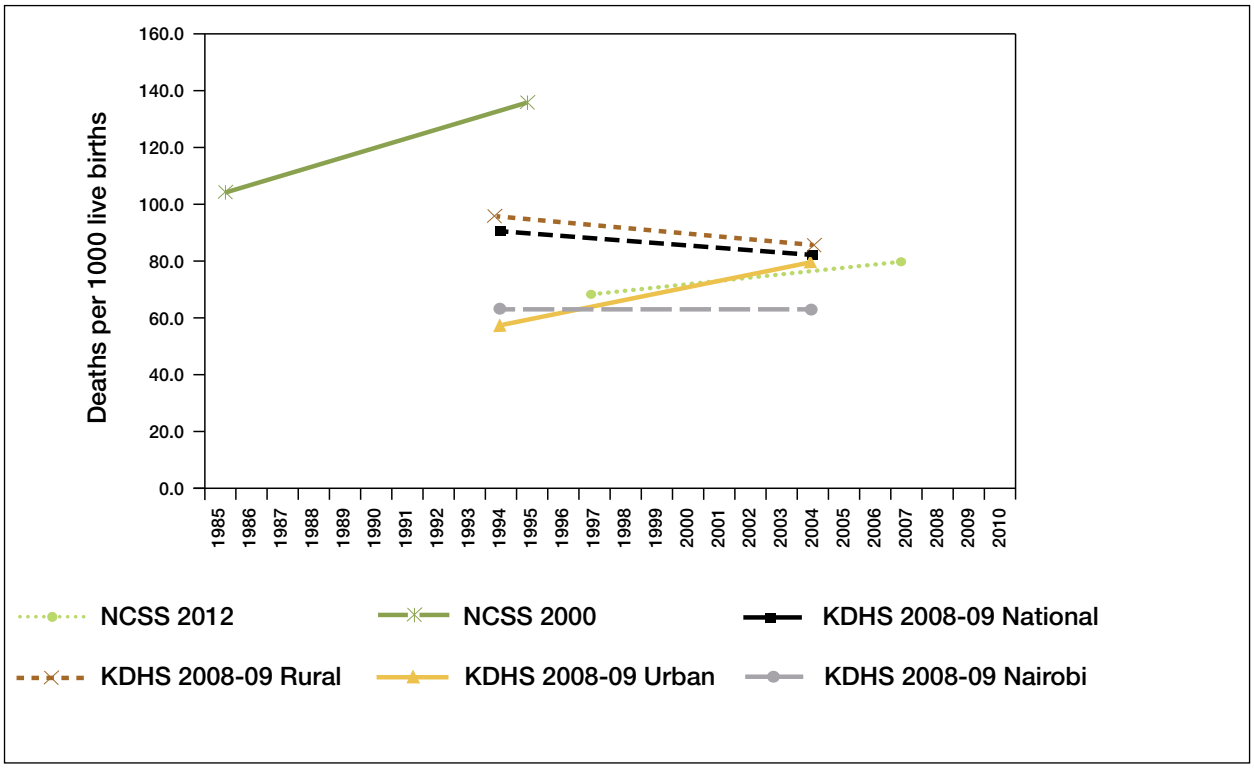
Time-based differentials in infant and child mortality are presented in Table 7.2 and Figure 7.1. The current (0-9 years preceding the 2012 survey) under-five mortality rate (79.8 per 1000) was higher than that reported 10 years preceding the survey (68.8 per 1000) suggesting that the chances of survival for children below the age of five years living in urban slums worsened over the past twenty years. This trend was similar to what was observed in other urban areas of Kenya, but differed markedly from the evidence of declining childhood mortality in rural Kenya, and in Kenya as a whole over the same period. Figure 7.1 shows a diagrammatic representation of the same results.

Table 7.2: Trends in mortality in infancy and childhood

Trends in mortality in infancy and childhood, NCSS 2012, NCSS 2000 and KDHS 2008-09						
Years preceding the survey	**Approximate calendar years (range)**	**Neonatal mortality (NNMR)**	**Post-neonatal mortality (PNMR)^**	**Infant mortality (1q0)**	**Child mortality (4q1)**	**Under-five mortality (5q0)**
NCSS 2012						
0-9	2003-2012	14.4	24.9	39.2	40.6	79.8
10-19	1993-2002	12.7	22.9	35.5	33.3	68.8
NCSS 2000						
0-9	1991-2000	31.1	57.9	88.2	52.8	136.4
10-19	1981-1990	25.1	44.0	68.4	38.1	103.9
KDHS 2008-09						
National						
0-9	2000-2009	33.0	26.1	59.2	26.0	83.6
10-19	1990-1999	26.2	30.6	56.8	35.7	90.5
Rural						
0-9	2000-2009	33.3	25.0	58.3	28.7	85.4
10-19	1990-1999	25.6	33.9	59.5	38.7	95.9
Urban						
0-9	2000-2009	25.8	38.7	64.5	16.4	79.9
10-19	1990-1999	30.8	10.6	41.5	17.3	58.0
Nairobi						
0-9	2000-2009	47.8	12.1	60.0	3.7	63.4
10-19	1990-1999	26.3	17.5	43.7	20.3	63.2
^ Post-neonatal mortality is the difference between the infant and neonatal mortality rates						
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09						

Figure 7.1 illustrates under-5 mortality trends in NCSS 2000 and 2012 and KDHS 2008-09. In recent years, there had been a reversal in the slums of Nairobi and in other urban areas; that is, mortality increased rather than decreased. The reversal was similar to results reported in the KDHS 2008-09 [3], which indicated a faster drop in infant mortality in rural than urban Kenya.

Figure 7.1: Trends in under-five mortality (per 1000 live births), NCSS 2012, NCSS 2000 and KDHS 2008-09



7.3 Mortality Differentials

7.3.1 Socio-Economic Differentials

Table 7.3 shows infant and child mortality in the ten years preceding the survey by mother's background characteristics. As in 2000, there were inter-division disparities in childhood mortality. The risk of a neonatal death in Westlands and Dagoretti Divisions was almost 7 times higher than the risk in Pumwani Division, the risk of an infant death in Westlands Division was 4 times higher than the risk in Pumwani Division, and the risk of an under-five death in Central Division was about 4 times higher than the risk in Kasarani Division.

These findings are consistent with previously reported intra- and inter-slum differences in child health outcomes and their underlying determinants as well as increasing area-differentials in child survival in slums over time. Area-differentials have been attributed to several possible reasons, notably service coverage gap leading to differences in availability, access and utilization of health and other public services [1, 19], together with differences in demographic and economic composition of slums [6, 18, 20]. Overall, area-differentials suggest the need for more targeted design, implementation and monitoring of interventions aimed at improving child survival in informal settlements, and the importance of disaggregating results by multiple dimensions of inequities.

Results from NCSS 2012 also show an inverted U-shaped relationship between child's risk of dying and mother's education. The probability of a child dying in the first 5 years of his/her life increased from 64.2 per 1000 for women with no formal education to 88.1 per 1000 for women with complete primary education, and then decreased to 75.7 per 1000 for women with secondary education or higher. It is notable that the lowest mortality rates were observed among children born to women with no formal education. These patterns were consistent with findings from the NCSS 2000.

Evidence from NCSS 2012 shows that women with no formal education had longer median durations of post-partum amenorrhea and abstinence (see Table 5.11), and therefore had longer insusceptibility to conception than their more educated counterparts all of which are linked to positive child health and survival outcomes. Further, the NCSS 2012 showed that employment by a non-relative increased with increasing formal education whereas self-employment is higher among women with no formal education (See Table 2.8). All of this may have implications for women's autonomy and ability to respond to child-care needs.

That notwithstanding, the NCSS 2012 results are consistent with existing evidence that higher mother's education (secondary or higher) is beneficial for child survival. In informal settlements, increased levels of mother's education have been associated with: increased access to immunization [17], improved breastfeeding patterns [18], increased access to obstetric care [13], improved nutrition in children [21] and increased access to food [20]. The NCSS 2012 results are also similar to the KDHS 2008-09, which showed the protective effect of mother's education on child survival [3].

Neonatal, infant and under-five deaths were about twice as likely to occur in a household with 2 or less people sleeping in a room compared to households with 5 or more people sleeping in a room. Since small households are likely to be adults living together with no children, and larger households may constitute a small part of the overall sample [22],a comparison using average-sized households that have 3 to 4 persons sleeping in a room showed that the disadvantage persists. Deaths were more likely to occur in a household with 3-4 people sleeping in a room compared with a household of 5-6 persons sleeping in a room. Results from NCSS 2000, on the other hand, showed that survival was highest in both the smallest and the largest households and lowest in average-sized households (3-4 persons).

In 2012, child survival improved with larger household size. These results were unexpected because overcrowding has been associated with increased risk of pneumonia in children and subsequently mortality [10, 23]. The presence of many children in the household has also been associated with competition for food and consequently increased risk of malnutrition and mortality [24]. Conversely, larger households have been associated with the availability of extra hands to take children to hospital [26, 27], and shown to be protective against stunting in children [25].

Survival in Nairobi slums in 2012 improved with mother's access to antenatal and delivery care by almost 50 percent when mothers accessed either or both forms of care. This was consistent with findings from NCSS 2000, which showed that receiving both forms of care was negatively associated with infant, neonatal and post-neonatal mortality. The findings further confirm the evidence which has shown that slum dwellers are increasingly delivering in health facilities despite many challenges regarding access to the services [12].The findings are also consistent with the evidence that associates increased access to antenatal and delivery care with improved breastfeeding practices [18] and advice on delivery care and other pregnancy-related issues [13], all of which contribute to improved child survival [28], which is consistent with other findings from NCSS 2012 (See Tables 8.2a, 8.4 and 8.5).

Table 7.3: Infant and child mortality (10 years before the survey)

Infant and child mortality (per 1,000 live births-10 years before the survey) by mother's background characteristics, NCSS 2012, NCSS 2000					
Background Characteristics	**Neonatal mortality (NNMR)**	**Post-neonatal mortality (PNMR)^**	**Infant mortality (1q0)**	**Child mortality (4q1)**	**Under-five mortality (5q0)**
Division of residence					
Central	16.1	32.4	48.6	98.0	146.5
Makadara	14.6	17.4	32.0	50.5	82.5
Kasarani	8.1	11.9	19.9	22.5	42.4
Embakasi	8.5	23.0	31.5	36.9	68.4
Pumwani	4.2	10.1	14.3	35.1	49.4
Westlands	27.2	31.3	58.5	42.0	100.5
Dagoretti	26.7	20.1	46.7	46.3	93.0
Kibera	9.3	23.9	33.2	45.3	78.5
Education					
No education	-	10.8	10.8	53.4	64.2
Primary incomplete	14.6	18.4	33.0	42.0	75.0
Primary complete	15.1	22.7	37.8	50.3	88.1
Secondary+	13.6	22.9	36.5	39.2	75.7
Number of people per room					
0-2	24.5	38.4	62.9	36.3	99.2
3-4	12.1	19.9	32.0	54.3	86.3
5-6	11.2	12.7	23.9	21.4	45.3
7+	11.5	14.7	26.2	42.8	69.0
Medical maternity care					
No antenatal or delivery care	-	72.9	72.9	-	-
Either antenatal or delivery care	16.4	24.3	40.7	34.3	75.0
Both antenatal and delivery care	11.4	17.7	29.0	-	-
Ethnic Group					
Kamba	12.7	20.3	33.0	29.5	62.5
Kikuyu	16.8	11.0	27.7	36.3	64.1
Luhya	17.3	24.6	41.9	40.8	82.7
Luo	5.1	40.6	45.7	67.8	113.5
Other	16.4	12.9	29.3	51.4	80.7
NCSS 2012 Total	**14.4**	**24.9**	**39.2**	**40.6**	**79.8**
NCSS 2000 Total	**31.1**	**57.9**	**88.2**	**52.8**	**136.4**
^Post-neonatal mortality is the difference between the infant and neonatal mortality rates					
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012					

Child survival varied by ethnic group. Both infant and under-five mortality rates were highest among the Luo and Luhya ethnic groups with the Luhya reporting the highest infant mortality and the Luo the highest under-five mortality rates. Children of Luhya ethnicity were most likely to die during the neonatal period while children of the Luo community were more likely to die between 1 and 5 years of age. The results were similar to those from NCSS 2000 where child mortality rates were highest among these two communities. However, the pattern of risk changed over time; in 2000, both Luhya and Luo children were most likely to die between 1 and 5 years of age.

The finding highlights ethnic differences in child survival [3, 9], access to immunization [29], and breastfeeding patterns [18]. Some of the existing evidence suggests that ethnic differentials in child survival in Kenya could be associated with regional differences in HIV-prevalence patterns, malaria-endemicity patterns [9], cultural differences in child feeding practices, and different cultural barriers to child immunization as well as other health care seeking behaviors and child care practices [18, 29]. To some extent, the ethnic differences in child survival in the slums mirror those at the national level [3]. This is likely to be related to the fact that cultural practices and other socio-economic factors that impact child survival may persist among rural-urban migrants. Migrants also tend to settle in close neighborhoods, effectively "replicating their own community" in a new location. Similar ethnic differentials even in adult health indicators such as HIV prevalence have been demonstrated among slum residents [3, 9]. Results are also similar with findings from KDHS 2008-09 which showed regional differentials in child survival.

7.3.2 Bio-Demographic Differentials

Results show a changing pattern in mortality rates by gender. Mortality rates in 2012 among male and female children in the slums were generally comparable; the average difference was minimal at 1.8 percent (Table 7.4). Neonatal deaths were, however, more likely to occur among female children, compared to post-neonatal and child deaths which were more likely among male children. These results are consistent with recent findings from the slums, which showed greater risk of mortality for females [20], but are contrary to findings from NCSS 2000 and the KDHS 2008-09, both of which showed that the risk of mortality was consistently higher among males than females. In addition, some existing evidence showed that male children in informal settlements were at greater risk of poor breastfeeding patterns, due to the early introduction of complementary foods [18]. Further evidence showed that stunting was consistently higher among male than female children [20, 21], suggesting longer-term exposure of male children to poor health and nutrition [28]. The high neonatal mortality among females could also be attributed to a related finding from the NCSS 2012 (See Tables 8.10, 8.11 and 8.12).

Mother's age at birth generally showed the expected U-shaped association with neonatal, infant and under-five mortality rates with the rates being higher among children of younger and older mothers and lower among children of mothers in the middle age-groups. High mortality risks for children born to young mothers is often linked to a lack of physical maturation and related complications during pregnancy and delivery, psychological immaturity, or poor seeking of prenatal care services [30, 31]. Children of older women tend to have a higher prevalence of congenital abnormalities such as Down's syndrome, which may explain the increased risk of poor outcomes associated with their pregnancies. That neonatal mortality was highest among mothers aged less than 20 is consistent with the evidence that associates higher risk of neonatal mortality among younger women with differences in socioeconomic factors mediated primarily through pre-term delivery, low birth weight babies and small-for-gestational age complications or some interaction of these factors [32]. Results are generally consistent with findings from the NCSS 2000 and the KDHS 2008-09 [33].

Results show increased risk of death for first births and higher-order births at neonatal, infant and under-five ages. An infant death, for example, was about twice as likely to occur among births in the seventh birth order compared to births in the second to sixth birth orders, while an under-five death was 1.5 times more likely to occur among first order births compared to births between the second and sixth orders. Part of the explanation could be that women of higher parity are less likely to deliver in health facilities [13] (Table 8.4), and less likely to be assisted by a skilled birth attendant during delivery [13] (Table 8.5). Home deliveries in informal settlements have also been associated with poor child health outcomes including poor handling of pregnancy-related complications [14], higher likelihood of incomplete immunization [17, 34], incorrect breastfeeding patterns [18] and higher infant and under-five mortality (Table 7.3). Physiologically, women of higher parity are also more prone to obstetric complications that affect child birth outcomes [35]. First order births are also associated with higher risk because most mothers are generally younger women who are prone to pregnancy-related complications and other socioeconomic disadvantages [32].

These results contrast with findings from NCSS 2000, which showed increased risk of mortality with higher birth orders, with the risk of a post-neonatal death being 3 times more likely to occur among births of order seven, compared with those of the first order. The pattern is, however, consistent with findings from the KDHS 2008-09.

The relationship between length of birth interval and the risk of dying takes a characteristic U-shaped pattern. Mortality rates were lowest among children born 2 to 3 years after a preceding birth. A neonatal death was, however, twice as likely to occur among children born 4 years or later after a preceding birth, while an infant death was about 2 times as likely to occur among children born 2 years or earlier after a preceding birth. Similar results were reported in a study of children living in urban informal settlements [36]. Children born within 18 months of an elder sibling were more than twice as likely to die as those born after an interval of 36 months or more. Further, an increase of one year in preceding birth interval was estimated to result in a reduction of 14.5 percent in early childhood mortality among second and higher order births. A report on the effects of preceding birth intervals on neonatal, infant, and under-five mortality and nutritional status in developing countries found large effects of preceding interval length on mortality between ages 12 and 23 months [37]. The results suggest that early occurrence of a succeeding birth may bring about a competition for resources at household level and also for parental care and attention, thereby contributing to deteriorating child health outcomes and thus mortality. Results are consistent with findings from both the NCSS 2000 and the KDHS 2008-09 [3].

To examine the possible effect of birth weight on infant and childhood mortality, the NCSS 2012 collected information on respondent's perception of the size of their new born. Results show that children who were small at birth had a higher risk

of death compared with those who were average-sized or larger. The highest relative difference was observed during the neonatal period, with smaller children being about 2 times more likely to die compared to average-sized or larger children. Low birth weight places children at high risk of dying during the early months of life particularly due to infections such as diarrhea and pneumonia [23, 38, 39]. Moreover, diarrhea and pneumonia have been shown to be some of the main causes of neonatal and infant mortality in informal settlements [10, 40]. The risk of low birth weight has also been associated with preterm delivery or restricted foetal growth, resulting largely from poor maternal health and nutrition [41] both of which independently increase the child's risk of early mortality. Low birth weight has also been associated with stunting in children living in informal settlements [21]; malnutrition increases the risk of mortality by weakening the child's overall immune system. Results are consistent with findings from the NCSS 2000, and the KDHS 2008-09.

Table 7.4: Infant and child mortality (10 years before the survey)

Infant and child mortality (10 years before the survey) by mother and child's bio-demographic characteristics, NCSS 2012, NCSS 2000					
Demographic Characteristics	**Neonatal mortality (NNMR)**	**Post-neonatal mortality (PNMR)^**	**Infant mortality (1q0)**	**Child mortality (4q1)**	**Under-five mortality (5q0)**
Sex of Child					
Male	11.4	25.4	36.8	40.3	77.1
Female	16.7	18.3	35.0	48.0	83.1
Mother's age at birth					
Less than 20	21.3	21.5	42.8	53.2	96.0
20-29	11.6	21.1	32.7	40.9	73.6
30-39	12.7	26.2	38.9	39.2	78.1
40-49	-	14.9	14.9	-	-
Birth order					
1	20.6	21.2	41.7	45.2	87.0
2-3	9.2	20.6	29.8	40.3	70.1
4-6	6.4	25.6	32.0	49.7	81.7
7+	28.8	51.3	80.1	73.5	153.5
Previous birth interval					
< 2 years	7.9	24.1	32.1	44.1	76.1
2-3 years	10.9	7.3	18.2	28.8	47.0
4+ years	39.5	-	39.5	26.5	66.0
Size at birth					
Small/Very small	22.2	11.0	33.2	-	-
Average/Larger	9.9	17.3	27.3	-	-
NCSS 2000 Sex of child					
Male	33.1	64.8	96.8	57.7	148.8
Female	29.2	51.2	79.8	48.0	124.0
^Post-neonatal mortality is the difference between the infant and neonatal mortality rates					
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012					

7.4 Summary

In light of substantial investments made by government and NGOs to improve health and wellbeing across the country, this chapter assessed changes and continuities in neonatal, post-neonatal, infant and under-five mortality over time in Nairobi's informal settlements [22].

Consistent with worldwide trends on improving child survival, all indicators of childhood mortality in the slums decreased by almost fifty percent in the 10 years preceding the 2012 survey. The gap between mortality rates in the slum and non-slum areas also narrowed over time, suggesting decreasing disadvantage for urban slum dwellers. The pattern of risk factors for child mortality also changed over time. There was a greater similarity between slum and non-slum risk factors.

Although mortality rates improved in the slums, further analysis showed that the improvements masked distinct underlying differentials in mortality where some socio-economic groups realized improved outcomes while others did not. There were, for instance, differences in mortality by divisions with as much as 4 times increased risk of mortality in one area compared to another. Female children in slums were also at greater disadvantage than their male counterparts, whereas at the national level, male children are reported to be at a greater risk of poor health outcomes. Distinct ethnic differences in mortality also persisted overtime, with children from some ethnic groups consistently being at greater risk of death. These variations and the evidence of increasing mortality in urban areas [3] suggest that the gains made in child survival may not be sustainable unless targeted interventions are designed to reach the most vulnerable groups. The disparity between Nairobi and the slums also highlight the need for continued focus on people living in slums as a vulnerable group.

These findings should, however, be interpreted in light of the study's limitations. Much of the discussion in this chapter is limited to under-five mortality rates due to evidence of some underreporting of infant and neonatal deaths (Appendix Table B5). Direct estimation of mortality using probability method was applied due to evidence of some transference of deaths and births outside of the reference year detected using calendar year ratios (Appendix Table B4). Such transference can lead to either under- or over-estimate of mortality rates. However, the use of probability method helped to overcome this limitation.

Responses were also based on women living in the informal settlements at the time of the survey. Mortality among children living without parents or children living with a male parent only, are therefore, not reflected in these estimates. The mortality estimates may therefore reflect a downward bias since orphanhood and separation from parents have been shown to increase children's risk of poor health outcomes and death. The use of information given by women to estimate mortality has, however, been used in many surveys [42] and found to be fairly reliable.

References

1. WHO, *Countdown to 2015: tracking progress in maternal, newborn and child survival*, 2013, World Health Organization.

2. UN-IGME, ***Levels & Trends in Child Mortality***, 2013, The UN Inter-agency Group for Child Mortality Estimation: New York.

3. Kenya National Bureau of Statistics (KNBS) and ICF Macro, *Kenya Demographic and Health Survey 2008-09*, 2010, KNBS and ICF Macro: Calverton, Maryland.

4. Fotso, J.C., "Child health inequities in developing countries: differences across urban and rural areas." *Int J Equity Health, 2006*. 5: p. 9.

5. Bhutta, Z.A., et al., "Countdown to 2015 decade report (2000-10): taking stock of maternal, newborn, and child survival." *Lancet, 2010*. 375(9730): p. 2032-44.

6. Emina, J., et al., "Monitoring of health and demographic outcomes in poor urban settlements: evidence from the Nairobi Urban Health and Demographic Surveillance System." *J Urban Health, 2011*. 88 Suppl 2: p. S200-18.

7. Bocquier, P., et al., "Do migrant children face greater health hazards in slum settlements? Evidence from Nairobi, Kenya." *J Urban Health, 2011*. 88 Suppl 2: p. S266-81.

8. Demombynes, G.T., Sofia-Karina, , "What Has Driven the Decline of Infant Mortality in Kenya?" *World Bank Policy Research Working Paper 2012*. No. 6057.

9. Wafula, S. W., L. D. Ikamari, and B. O. K'Oyugi, "In search for an explanation to the upsurge in infant mortality in Kenya during the 1988-2003 period." *BMC Public Health, 2012*. 12: p. 441.

10. Kyobutungi, C., et al., "The burden of disease profile of residents of Nairobi's slums: results from a demographic surveillance system." *Popul Health Metr,* 2008. 6: p. 1.

11. Smith, L. C., M. T. Ruel, and A. Ndiaye, "Why is child malnutrition lower in urban than in rural areas? Evidence from 36 developing countries." *World Development, 2005.* 33(8): p. 1285-1305.

12. Essendi, H., S. Mills, and J. C. Fotso, "Barriers to formal emergency obstetric care services' utilization." *J Urban Health, 2011.* 88 Suppl 2: p. S356-69.

13. Fotso, J. C., et al., "What does access to maternal care mean among the urban poor? Factors associated with use of appropriate maternal health services in the slum settlements of Nairobi, Kenya." *Matern Child Health J, 2009*. 13(1): p. 130-7.

14. Ziraba, A. K., et al., "Maternal mortality in the informal settlements of Nairobi city: What do we know?" *Reprod Health, 2009*. 6: p. 6.

15. Taffa, N. and G. Chepngeno, "Determinants of health care seeking for childhood illnesses in Nairobi slums." *Trop Med Int Health, 2005*. 10(3): p. 240-5.

16. Konseiga, A., "Family migration: A vehicle of child morbidity in the informal settlements of Nairobi city, Kenya?" in *Urban Population-Environment Dynamics in the Developing World: Case Studies and Lessons Learned*, A. de Sherbinin, A. Rahman, A. Barbieri, J.C. Fotso, and Y. Zhu (eds.). Editor. 2009, Committee for International Cooperation in National Research in Demography (CICRED): Paris. p. 316 pages.

17. Mutua, M. K., E. Kimani-Murage, and R. R. Ettarh, "Childhood vaccination in informal urban settlements in Nairobi, Kenya: who gets vaccinated?" BMC Public Health, 2011. 11(1): p. 6.

18. Kimani-Murage, E. W., et al., "Patterns and determinants of breastfeeding and complementary feeding practices in urban informal settlements, Nairobi Kenya." *BMC Public Health, 2011*. 11: p. 396.

19. Agarwal, S., A. Bhanot, and G. Goindi, "Understanding and addressing childhood immunization coverage in urban slums." *Indian Pediatr, 2005.* 42(7): p. 653-63.

20. Fotso, J. C., et al., "Child growth in urban deprived settings: does household poverty status matter? At which stage of child development?" *Health Place, 2012*. 18(2): p. 375-84.

21. Abuya, B. A., J. Ciera, and E. Kimani-Murage, "Effect of mother's education on child's nutritional status in the slums of Nairobi." *BMC Pediatr, 2012*. 12: p. 80.

22. APHRC, *Population and Health Dynamics in Nairobi's Informal settlements*, 2002, African Population and Health Research Center: Nairobi, Kenya.

23. Cardoso, M., et al., "Crowding: risk factor or protective factor for lower respiratory disease in young children?" *BMC Public Health, 2004.* 4(1): p. 19.

24. Hale, L., et al., "Which factors explain the decline in infant and child mortality in Matlab, Bangladesh?" *Journal of Population Research, 2009*. 26(1): p. 3-20.

25. Engebretsen, I. M., et al., "Determinants of infant growth in Eastern Uganda: A community-based cross-sectional study." *BMC Public Health, 2008*. 8: p. 418.

26. Bronte-Tinkew, J. and F. D. Gordon, "Do household structure and household economic resources predict childhood immunization? Evidence from Jamaica and Trinidad and Tobago." *Population Research and Policy Review, 2005*. 24(1): p. 27-57.

27. Schoeps, A., et al., "Socio-demographic determinants of timely adherence to BCG, Penta3, measles, and complete vaccination schedule in Burkina Faso." *Vaccine, 2013.* 32(1): p. 96-102.

28. WHO-Countdown to 2015, *Tracking progress in maternal, newborn and child survival, 2013*, World Health Organization.

29. Ettarh, R. R., M. K. Mutua, and C. Kyobutungi, "Ethnicity and delay in measles vaccination in a Nairobi slum." *Trop Med Health, 2012*. 40(2): p. 59-62.

30. Aitken, I., Walls, B., "Maternal height and cephalo-pelvic disproportion in Sierra Leone." Tropical Doctor, 1986. **16**(3): p. 132-134.

31. Geronimus, T. A., "Teenage childbearing and social disadvantage: unprotected discourse." *Family Relations, 1992*. 41(2): p. pp 244-248.

32. Sharma, V., et al., "Young maternal age and the risk of neonatal mortality in rural Nepal." *Arch Pediatr Adolesc Med, 2008.* 162(9): p. 828-35.

33. Govindasamy, P., Stewart, M. K. Rutstein, S. O.,Boerma, J. T. , Sommerfelt. A. E., "High-risk births and maternity care" *Demographic and Health Surveys Comparative Studies, 1993.* 8.

34. Nath, B., et al., "A study on determinants of immunization coverage among 12-23 months old children in urban slums of Lucknow District, India." *Indian J Med Sci, 2007*. 61(11): p. 598-606.

35. Chan, B. C.-P. and T. T.-H. Lao, "Effect of parity and advanced maternal age on obstetric outcome." *International journal of gynecology and obstetrics: The official organ of the International Federation of Gynecology and Obstetrics, 2008*. 102(3): p. 237-241.

36. Fotso, J. C., et al., "Birth spacing and child mortality: an analysis of prospective data from the Nairobi urban health and demographic surveillance system." *J Biosoc Sci, 2013.* 45(6): p. 779-98.

37. Rutstein, S. O., "Further evidence of the effects of preceding birth intervals on neonatal, infant, and under-five-years mortality and nutritional status in developing countries: evidence from the demographic and health surveys," *MEASURE DHS*, Editor 2008, Macro International, Inc.: Calverton, MD.

38. Ballard, T. J. and C. G. Neumann, "The effects of malnutrition, parental literacy and household crowding on acute lower respiratory infections in young Kenyan children." *J Trop Pediatr, 1995*. 41(1): p. 8-13.

39. Cairncross, S., et al., "Water, sanitation and hygiene for the prevention of diarrhea." *Int J Epidemiol, 2010.* 39 Suppl 1: p. i193-205.

40. Vaid, A., et al., "Infant mortality in an urban slum." *Indian J Pediatr, 2007*. 74(5): p. 449-53.

41. Dreyfuss, M. L., et al., "Determinants of low birth weight among HIV-infected pregnant women in Tanzania." *Am J Clin Nutr, 2001*. 74(6): p. 814-26.

42. Rutstein, S. O., Rojas, G., *Guide to DHS Statistics, 2006*, ORC Macro: Calverton, Maryland.

CHAPTER 8: MATERNAL AND CHILD HEALTH

Kanyiva Muindi

The Government of Kenya remains committed to the achievement of health for all as can be attested by different efforts aimed at addressing health care disparities apparent in the country. For example, the government introduced free maternity care at public health facilities in 2013, a move that was aimed at ensuring that all pregnant women have access to skilled assistance during delivery. Although the step might in the long run lead to a reduction in maternal and neonatal mortality, various reports indicate that the country is not on track to achieving a reduction in the maternal mortality, which has remained unacceptably high at 488 deaths per 100,000 live births [1, 2]. There are also huge disparities in maternal mortality indicators between different segments of the population. A study in the slums of Nairobi, for instance, estimated that the maternal mortality ratio was 706 per 100,000 live births between 2003 and 2005, which was attributable to lack of appropriate services in such settings [3]. The health care disparities in Kenya are largely linked to differences in socio-economic conditions, with poor urban communities reporting worse indicators of health compared to their wealthier neighbors and communities residing in rural areas. Most of the health facilities in slums do not have skilled personnel or the basic equipment needed to provide emergency obstetric care. Poverty has also been found to contribute to the high level of maternal mortality as many women cannot afford to be delivered of babies in well-equipped health facilities, which are more costly, compared to the facilities that exist in the slums [4-7]. The HIV epidemic also contributes to higher maternal mortality rates in the slums where the HIV prevalence was higher than the national average [8].

Maternal mortality in the slums [and nationally] is mainly due to preventable causes that can be addressed with timely and adequate antenatal care as well as efficient systems of referring cases that require advanced medical interventions. The main immediate causes of maternal mortality in Kenya include hemorrhage, sepsis, hypertensive disorders, unsafe abortions, and obstructed labor, while indirect causes include such conditions as malaria, anemia, tuberculosis, and HIV/AIDS [9]. Hemorrhage and sepsis are mainly a consequence of unsafe abortions as well as inadequate care during and after delivery. Kenya's restrictive abortion laws have acted as barriers to safe abortions, pushing many women to terminate pregnancies in unsafe usually clandestine 'facilities' using unsafe methods. Many women die while others suffer damage to their health while procuring unsafe abortions. In urban slums, lack of access to proper care during and immediately after delivery contributes to the observed high maternal mortality [5]. Qualitative accounts from women in the slums indicate that insecurity, usually higher in the slums, prevents women from getting to facilities especially if labor starts at night. Further, they report harsh treatment by service providers at public and private facilities as barriers to seeking delivery care from health facilities [5]. Affordability of services is also another factor that could be linked to the high maternal mortality in slums as most slums are served by for-profit private health facilities whose charges are beyond the reach of many.

Kenya's child mortality remains high, putting the country off track to achieving the fourth MDG. Neonatal causes account for a third of the child mortality rates in the country [9] and together with still births account for a similar proportion in slums [10].

Child mortality in Kenya is mainly due to conditions such as pneumonia, malaria, HIV/AIDS diarrhea and malnutrition [9, 11]. Most of these illnesses are preventable through routine immunization, and information on proper child feeding practices and hygienic handling of food and drinking water. Socio-economic status has been found to be the biggest driver of under 5 mortality in the country with children from poor households and those born to mothers with no formal education being more likely to die compared to their counterparts from wealthier families and those born to educated mothers. Household wealth improves access to child health services, which the poor are unlikely to afford [1, 9]. In addition, poor households face almost constant food insecurity which compromises the nutritional status of members, especially children, thereby increasing their vulnerability to infections.

For example, a study conducted in Nairobi's slums showed that 48.4 percent of households experience extreme food insecurity [12]. Diarrheal diseases are reported as the leading causes of death among children aged below five years. These are as a result of poor sanitation and lack of safe drinking water, conditions that are prevalent in slums. Pneumonia is the second leading cause of mortality among children aged below five years in Kenya, with the country ranking among the top 15 countries globally with high child mortality due to pneumonia. In the slums of Nairobi, pneumonia has been

found to be the leading cause of mortality among children below five years mainly because of the poor state of housing and crowding [10]. In addition, single rooms occupied by households in slums also serve as kitchens; usually, households use kerosene and charcoal stoves in poorly ventilated rooms. Indoor air quality in these households is poor and may be a major contributor to the high pneumonia burden observed in the slums.

This chapter examines maternal and child health care using information on births occurring in the three years preceding the survey. It addresses issues such as antenatal care, delivery care, child vaccination, and the prevalence and treatment of common infectious diseases manifesting in symptoms such as fever, cough and diarrhea in young children. Analyses of maternal health care and delivery characteristics are restricted to the last birth, while information on child immunization and the prevalence of common diseases among children was obtained for all children born in the three years preceding the survey.

8.1 Antenatal Care

Antenatal care (ANC) is an important component of maternal health as it provides medical personnel with the opportunity to detect possible obstetric complications. Seeking of antenatal care early is therefore important as it provides an opportunity for timely management of complications and also for flagging of high risk pregnancies. Lack of antenatal care has been identified as one of the risk factors for poor maternal and newborn outcomes including stillbirths, prematurity, low birth weight, maternal and neonatal mortality globally and in Kenya in particular [2, 13, 14]. Kenya is among countries that have adopted the WHO focused ANC package, which is aimed at reducing maternal morbidity and mortality. Villar et al state that, "...the basic component of the new model is the set of effective, goal-oriented activities implemented on a four-visit schedule…". The activities include screening for health conditions that might increase the risk of adverse outcomes; provision of proven beneficial interventions; and alerting women to emergencies and advising on the appropriate course of action [15]. In Kenya, in accordance with the focused ANC model, the minimum number of ANC visits is set at four for women whose pregnancies are assessed to be proceeding normally [9]. The visits are spread across the trimesters to allow for objective assessment of fetal development and to keep a tab on the mother's health. Many countries have defined the set of services that form the antenatal care package. In Kenya, this includes such services as iron/folic supplementation, immunization against maternal and neonatal tetanus, monitoring of blood pressure and protein in urine, as well as monitoring of maternal weight. Other services include tests for various infections including HIV and Syphilis. Attending antenatal care clinic alone is therefore not sufficient and providers must be able to offer the minimum package to ensure quality care while mothers must attend the clinics in a timely and consistent manner.

8.1.1 Antenatal Care Provider

The ANC service provider is an important determinant of the quality of services received by expectant mothers. Thus, the provision of ANC by trained medical professionals is a critical issue in the efforts to tackle adverse maternal and newborn outcomes. Table 8.1 presents the distribution of women attending ANC by type of provider for the most recent birth in the three-year period preceding the survey, by selected background characteristics. The table also compares the type of provider in the 2012 survey with that of NCSS 2000 conducted in 2000 and the KDHS 2008-09.

In the Nairobi slums, almost all births benefit from some form of antenatal care from medical personnel such as a doctor, nurse, or a trained midwife (96.2 percent). The distribution of the types of antenatal care provider in the Nairobi slums exhibits some slight variation by some of the selected background characteristics. The proportion of women obtaining antenatal care from traditional birth attendants was higher among those aged below 20 years; those with incomplete primary level of education; and women who were never married compared to those from other socio-economic groups. In addition, women from the Luo community had the highest proportion receiving antenatal care from traditional birth attendants compared to those from other communities.

Overall, doctors were the predominant providers of antenatal care accounting for 48.7 percent of all cases, while nurses or trained midwives together provided antenatal care in 47.5 percent of all cases. It is important to note that respondents may not distinguish nurses and midwives from doctors, since the general public often mistakes male midwives or nurses for doctors. Traditional birth attendants rarely provide antenatal care in this urban setting, accounting for only 1.7 percent of all cases. There were changes in the type of ANC provider between 2000 and 2012. The proportion receiving care from doctors drastically increased in 2012 while nurses or trained midwives were the dominant professional providers in 2000. In addition, the use of traditional birth attendants increased five-fold over the ten-year period. The pattern of antenatal care in the slums was different from that of the rest of Kenya, with the slums having the highest proportion of women receiving care from traditional birth attendants and doctors compared to other sub-populations in the country.

Table 8.1: Antenatal Care

Percent distribution of births in the three years preceding the survey by source of antenatal care during pregnancy, according to selected background characteristics, NCSS 2012, NCSS 2000 and KDHS 2008-09						
Background Characteristics	**Antenatal care provider**					**Number of births**
	Doctor	**Nurse/ Trained midwife**	**Traditional birth attendant**	**No one**	**Missing**	
Mother's age at birth						
<20	52.7	40.6	4.5	0.0	2.2	189
20-24	47.8	47.4	1.8	0.2	2.8	474
25-34	48.4	49.9	0.5	0.0	1.2	413
35+	44.3	55.7	0.0	0.0	0.0	47
Birth Order						
1	51.8	44.7	1.8	0.2	1.4	458
2-3	47.1	48.1	1.8	0.0	3.0	532
4-5	49.6	49.3	1.1	0.0	0.0	105
6+	21.1	78.9	0.0	0.0	0.0	23
Education Level						
No education	32.3	64.9	2.8	0.0	0.0	19
Primary incomplete	45.3	48.9	5.3	0.0	0.5	181
Primary complete	51.6	44.0	1.1	0.0	3.3	395
Secondary+	48.0	49.3	0.9	0.2	1.6	526
Marital Status						
Never married	49.3	45.9	3.3	0.0	1.5	118
Married/Living together	49.2	47.0	1.6	0.1	2.1	943
Widowed/Divorced/Separated	40.7	59.3	0.0	0.0	0.0	61
Division						
Central	49.8	36.9	2.0	0.0	11.3	87
Makadara	57.4	37.8	0.0	0.0	4.7	87
Kasarani	47.1	51.2	0.5	0.5	0.6	147
Embakasi	47.8	48.6	1.7	0.0	1.8	320
Pumwani	14.5	82.4	0.0	0.0	3.1	53
Westlands	48.5	48.9	2.6	0.0	0.0	102
Dagoretti	39.5	56.2	3.4	0.0	1.0	169
Kibera	66.0	32.2	1.8	0.0	0.0	158
Ethnic Group						
Kamba	47.0	49.4	1.1	0.0	2.4	244
Kikuyu	54.9	42.3	1.2	0.0	1.6	215
Luhya	46.8	48.5	2.3	0.0	2.3	280
Luo	49.5	44.4	3.1	0.4	2.7	210
Other	45.1	53.8	0.5	0.0	0.6	173
NCSS 2012 Total	48.7	47.5	1.7	0.1	2.0	1,123
NCSS 2000 Total	27.3	68.7	0.3	3.4	0.2	1,219
KDHS 2008-09						
National	27.4	64.3	0.9	7.2	0.1	3,101
Rural	24.6	65.6	0.9	8.6	0.1	2,492
Other urban	38.9	58.0	1.1	2.0	0.0	422
Nairobi	38.0	60.7	0.0	1.3	0.0	187
Source: Nairobi Cross-Sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09						

8.1.2 Frequency and Timing of Antenatal Care

The frequency and timing of antenatal care visits are important because they offer the service providers opportunities to identify and address potential pregnancy complications as early as possible. In Kenya, the government recommends that pregnant mothers make at least four antenatal care visits during pregnancy, with the first visit occurring early in the pregnancy. For mothers making more than the minimum visits, monthly visits are recommended with the frequency increasing during the last two months of pregnancy to fortnightly and weekly visits. Table 8.2a shows the distribution of the frequency of ANC visits during pregnancy while Table 8.2b presents the timing of the first visit, by selected background characteristics.

There was no clear pattern between the frequency of antenatal care visits and demographic characteristics such as maternal age, parity, and marital status. However, women with no formal education and those with incomplete primary education formed the highest proportion of those making less than the four recommended ANC visits. The proportion of women making four or more ANC visits was highest among those with at least secondary level education and complete primary level (68.7 percent and 65.5 percent respectively).

Some regional variation was noted which could be due to differential availability of ANC services at existing health facilities or the lack of health facilities. Kasarani Division had the highest proportion of women making 1-3 antenatal care visits while in Pumwani Division had the lowest proportion. Pumwani Division is home to one of the largest maternity hospitals in Kenya, which facilitates access to services. Further, the highest proportion of women who made at least seven antenatal care visits during pregnancy was observed in Dagoretti Division. In terms of ethnicity, the Kamba made more frequent antenatal care visits (4+), while the Luhya and Luo had the highest proportion making 1-3 visits compared with other ethnic groups. Over half the women attended antenatal care clinics 4-6 times during their pregnancy across all socio-demographic groups.

Overall, 65.9 percent of the women made four or more antenatal care visits during pregnancy. The median number of antenatal care visits in the slums (4.0) was comparable to the average for Nairobi (4.4), while it was slightly higher than the national median of 3.5 visits and that of other communities in Kenya. The median number of antenatal care visits in 2012 was, however, similar to that observed in 2000 (3.9).

Table 8.2a: Number of antenatal care visits during pregnancy

Percent distribution of live births in the three years preceding the survey by number of antenatal care visits, according to selected background characteristics, NCSS 2012, NCSS 2000 and KDHS 2008-09							
Background Characteristics	**Median number of visits during pregnancy**	**Number of Visits**					**Number of cases**
		None	**1-3**	**4-6**	**7+**	**Don't know/ Missing**	
Mother's age at birth							
<20		0.0	37.2	57.4	5.0	0.4	189
20-24		0.2	33.0	58.7	7.3	0.9	474
25-34		0.0	32.0	59.3	8.2	0.5	413
35+		0.0	35.0	63.5	1.6	0.0	47
Birth Order							
1		0.2	28.2	63.1	7.8	0.8	458
2-3		0.0	34.6	57.5	7.5	0.4	532
4-5		0.0	45.5	50.5	3.0	1.0	105
6+		0.0	46.9	53.1	0.0	0.0	23
Education Level							
No education		0.0	44.0	50.2	5.8	0.0	19
Primary incomplete		0.0	39.5	54.3	4.8	1.4	181
Primary complete		0.0	34.0	60.8	4.7	0.5	395
Secondary+		0.2	30.6	59.2	9.5	0.5	526
Marital Status							
Never married		0.0	34.9	55.3	9.8	0.0	118
Married/Living together		0.1	33.0	59.9	6.4	0.6	943
Widowed/Divorced/Separated		0.0	38.8	50.0	9.8	1.4	61
Division							
Central		0.0	31.5	64.6	3.9	0.0	87
Makadara		0.0	32.0	62.4	5.6	0.0	87
Kasarani		0.5	39.4	53.3	5.4	1.4	147
Embakasi		0.0	37.9	53.6	7.6	0.9	320
Pumwani		0.0	26.1	64.8	7.4	1.7	53
Westlands		0.0	30.7	62.1	7.2	0.0	102
Dagoretti		0.0	29.6	56.6	13.1	0.6	169
Kibera		0.0	28.5	68.1	3.4	0.0	158
Ethnic Group							
Kamba		0.0	31.0	60.1	8.1	0.8	244
Kikuyu		0.0	33.3	60.1	5.2	1.4	215
Luhya		0.0	35.1	59.1	5.7	0.0	280
Luo		0.4	35.1	54.2	9.8	0.5	210
Other		0.0	32.0	61.0	6.5	0.4	173
NCSS 2012 Total	4.0	0.1	33.4	58.9	7.0	0.6	1,123
NCSS 2000 Total	3.9	3.5	10.8	39.9	18.9	0.8	1,219
KDHS 2008-09							
National	3.5	7.2	15.3	50.7	6.0	1.4	3,101
Rural	3.3	8.6	16.1	51.9	5.0	0.7	2,492
Other urban	3.8	2.0	11.9	49.9	7.8	4.2	422
Nairobi	4.4	1.3	12.8	36.8	16.2	3.7	187
Source: Nairobi Cross-Sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09							

Comparing the reported frequency of ANC visits between 2000 and 2012 indicates that the proportion reporting attending antenatal care clinics 4-6 times increased substantially from 39.9 percent to 58.9 percent, while that reporting 7 or more times decreased over the period. There was a three-fold increase in the proportion of women making 1-3 visits in 2012 compared to the 2000 survey. The proportion making 4-6 visits in the slums was higher than that for Nairobi, other areas of Kenya and the national average.

Regarding the timing of the first ANC visit (Table 8.2b), there was no clear pattern between first trimester visit and the mothers' age and education, but the proportion of women making the first ANC visit in the first trimester decreased with increasing birth order. In addition, there was variation with marital status with the highest proportion of women initiating ANC visit during the first trimester being among the never married and the lowest being among those who were widowed, separated or divorced. A high proportion of women with no formal education (87.6 percent) and those with complete primary education (85.4 percent) made their first ANC visit in the second or third trimester. The highest proportion of women initiating ANC early was among those with secondary education or higher (20.8 percent). The proportion of women initiating antenatal care in the last trimester was higher among those with complete primary education (13.8 percent) than among those with at least secondary education (12.2 percent). There was a reduction of 1.1 months in the median number of months at first ANC visit between 2000 and 2012. In addition, there was a 7.5 percentage point increase in the proportion of mothers who initiated antenatal care in the first trimester and a reduction by 7.0 percentage points in the proportion of mothers who made the first ANC visit in the third trimester between the two surveys.

Table 8.2b: Timing of first antenatal visit

Percent distribution of live births in the three years preceding the survey by number of months pregnant at time of first visit, according to selected background characteristics, NCSS 2012, NCSS 2000 and KDHS 2008-09							
Background Characteristics	**Median number of months pregnant at 1st antenatal visit**	**Duration of pregnancy at time of first antenatal visit**					**Number of cases**
		No antenatal visit	**1-3**	**4-6**	**7-9**	**Don't know/ Missing**	
Mother's age at birth							
<20		0.0	19.5	69.8	10.7	0.0	189
20-24		0.2	20.4	66.6	12.4	0.5	474
25-34		0.0	14.9	70.5	13.9	0.7	413
35+		0.0	9.7	72.1	18.3	0.0	47
Birth Order							
1		0.2	20.8	69.5	9.1	0.4	458
2-3		0.0	17.5	67.4	14.4	0.7	532
4-5		0.0	9.2	72.1	18.8	0.0	105
6+		0.0	8.3	68.6	23.1	0.0	23
Education Level							
No education		0.0	12.4	74.3	13.3	0.0	19
Primary incomplete		0.0	17.4	69.6	13.0	0.0	181
Primary complete		0.0	14.4	71.6	13.8	0.2	395
Secondary+		0.2	20.8	66.1	12.2	0.8	526
Marital Status							
Never married		0.0	19.2	67.1	13.7	0.0	118
Married/Living together		0.1	17.8	69.3	12.3	0.5	943
Widowed/Divorced/Separated		0.0	14.5	64.0	20.2	1.4	61
Division							
Central		0.0	15.5	70.3	14.2	0.0	87
Makadara		0.0	21.2	64.2	14.5	0.0	87
Kasarani		0.5	12.9	72.9	13.2	0.5	147
Embakasi		0.0	17.8	69.2	11.9	1.1	320
Pumwani		0.0	14.5	62.7	21.0	1.7	53
Westlands		0.0	17.4	66.3	16.3	0.0	102
Dagoretti		0.0	17.2	69.9	12.9	0.0	169
Kibera		0.0	23.6	68.6	7.9	0.0	158
Ethnic Group							
Kamba		0.0	16.6	71.6	11.4	0.4	244
Kikuyu		0.0	17.2	65.4	16.6	0.7	215
Luhya		0.0	17.2	67.9	14.9	0.0	280
Luo		0.4	23.0	65.2	11.0	0.4	210
Other		0.0	14.8	75.4	8.8	1.1	173
NCSS 2012 Total	4.8	0.1	17.8	68.8	12.9	0.5	1,123
NCSS 2000 Total	5.9	3.5	10.3	65.6	19.9	0.8	1,219
KDHS 2008-09							
National	5.3	7.2	13.5	63.1	15.9	0.3	3,101
Rural	5.3	8.6	11.7	62.9	16.7	0.2	2,492
Other urban	5.2	2.0	20.8	64.6	12.6	0.0	422
Nairobi	4.8	1.3	21.5	63.8	12.6	0.8	187
Source: Nairobi Cross-Sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09							

Variations by Division show that antenatal care started latest in Kasarani Division and earliest in Kibera. The proportion of first trimester visits was also highest among the Luo, while the proportion initiating care very late (during the third trimester) was highest among the Kikuyu.

For the majority of women in Nairobi slums, ANC began during the second trimester (68.8 percent), but for 12.9 percent, it started in the last trimester. This pattern is consistent with national statistics, though a higher proportion of women in the slums initiated antenatal care earlier compared with those from rural Kenya while other urban areas of Kenya and Nairobi had higher proportions initiating ANC visits in the first trimester compared with women in the slums. The median gestational age at first ANC visit in the slums of Nairobi was very similar to that reported for Nairobi (both at 4.8 months) but lower than that of the whole country (5.3 months) and rural and other urban Kenya (5.3 and 5.2 months respectively).

8.1.3 Tetanus Toxoid Vaccination

Maternal and neonatal tetanus is one of the most lethal infections associated with unhygienic delivery and cord care. To prevent mothers and their newborns from getting tetanus infection, tetanus vaccination is recommended during pregnancy and this forms an important component of ANC in Kenya. Two doses of the tetanus toxoid are usually administered during pregnancy, but fewer doses may be required, depending on the number of doses received during previous pregnancies or during the woman's lifetime. A three-dose course of Tetanus Toxoid (TT) or Tetanus and Diphtheria (Td) provides protection against maternal and neonatal tetanus for at least five years while a maximum of five doses protects women throughout their childbearing years [16]. Table 8.3 presents the number of tetanus toxoid doses received by women who delivered a baby in the three years preceding the survey according to selected background characteristics. The proportion of women who received at least one dose of tetanus toxoid vaccination was lower than that of pregnant women who received ANC from a medical provider. This suggests that though this is a basic component of antenatal care, some health care providers do not offer the service to eligible women visiting their facilities.

The proportion of women receiving only one dose of tetanus injection increased with maternal age. In addition, women with no formal education, those with incomplete primary education as well as those who were never married had relatively high proportions not receiving tetanus injection. The proportion that did not receive any dose of tetanus vaccination exceeded the proportion that did not receive ANC by a notable margin (by at least 10 percentage points) among women with no formal education, those with complete primary education, the never married, higher order births (4 -5), and those in Embakasi Division.

Higher order births or births to older women may have been protected by previous vaccinations, while births to never married mothers (who were more likely younger mothers) might have missed out on tetanus injection due to non-attendance of ANC or unavailability of the service at the facility where antenatal care was sought. The observed pattern by Division suggests that some births in specific areas were not protected from tetanus, despite the fact that the mothers received ANC. The findings of missed opportunity for vaccination against tetanus highlights poor quality of care women in the slums receive and should be an area for intervention and further research.

Overall, 90 percent of women in the slums, with the most recent birth occurring in the three years preceding the 2012 survey reported receiving at least one tetanus injection in the five years preceding the interview. This vaccination rate compares favorably with that of Nairobi and is slightly higher than the rate for Kenya and other communities.

Between 2000 and 2012, there was a slight increase in the proportion of births not protected from tetanus. There was, also a slight increase in the proportion of women receiving two or more doses (from 61 percent to 62.3 percent) and a decrease in the proportion of women receiving only a single dose of the tetanus injection over the period.

Table 8.3: Tetanus toxoid vaccination

Percent distribution of births in the three years preceding the survey by the number of toxoid injection that mothers received during pregnancy, according to selected background characteristics, NCSS 2012, NCSS 2000 and KDHS 2008-09					
Background Characteristics	**Number of tetanus toxoid injections**				**Number of births**
	No injection	**1 Dose**	**2+ Doses**	**Don't know/ Missing**	
Mother's age at birth					
<20	7.5	18.1	73.1	1.3	189
20-24	7.5	27.3	62.6	2.6	474
25-34	6.1	32.0	58.2	3.8	413
35+	8.8	32.5	50.9	7.7	47
Birth Order					
1	6.5	17.1	75.0	1.5	458
2-3	6.5	35.3	53.6	4.6	532
4-5	10.6	30.7	57.6	1.0	105
6+	15.1	37.0	45.2	2.8	23
Education Level					
No education	17.2	22.8	54.2	5.8	19
Primary incomplete	10.2	29.2	59.5	1.1	181
Primary complete	5.8	29.4	60.6	4.1	395
Secondary+	6.5	26.1	64.7	2.8	526
Marital Status					
Never married	8.0	22.3	68.1	1.6	118
Married/Living together	7.0	28.7	61.4	3.0	943
Widowed/Divorced/Separated	6.0	23.1	64.1	6.7	61
Division					
Central	6.2	13.3	76.7	3.8	87
Makadara	4.8	30.3	62.9	2.0	87
Kasarani	3.7	32.6	58.7	5.0	147
Embakasi	13.0	20.6	63.9	2.5	320
Pumwani	1.4	12.7	85.9	0.0	53
Westlands	6.3	33.8	55.5	4.4	102
Dagoretti	3.2	35.6	60.0	1.2	169
Kibera	6.2	34.3	55.8	3.8	158
Ethnic Group					
Kamba	8.2	20.5	68.8	2.5	244
Kikuyu	5.7	29.9	59.8	4.7	215
Luhya	7.6	29.8	59.1	3.6	280
Luo	6.8	32.2	59.6	1.5	210
Other	6.8	25.5	65.2	2.5	173
NCSS 2012 Total	7.0	27.7	62.3	3.0	1,123
NCSS 2000 Total	5.1	33.8	61.0	0.1	1,219
KDHS 2008-09					
National	11.5	33.3	54.1	1.1	3,101
Rural	12.5	33.3	53.4	0.7	2,492
Other urban	7.2	34.1	55.2	3.5	422
Nairobi	7.6	30.8	60.2	1.5	187
Source: Nairobi Cross-Sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09					

8.2 Delivery Care

Access to high quality services from skilled birth attendants during delivery is an important factor in the survival of both the mother and her newborn. Global attention has recently focused on increasing women's access to high quality midwifery services. A study conducted to assess the state of midwifery in the world has brought to the fore the wide inequalities between and within countries with respect to maternal and child mortality [2]. Poor women in both rural and urban

communities of developing countries bear the greatest burden due to lack of access to appropriate health facilities and professional care during pregnancy and delivery. Estimates indicate that 15 percent of pregnancies will have complications [2], hence the need for skilled birth attendants in a functioning health facility.

Kenya's high maternal mortality ratio (MMR) is a result of various factors that place women at risk during pregnancy and delivery. First, national statistics indicate that despite near universal antenatal care utilization, 43 percent of deliveries took place in a health facility while 45 percent of were assisted by a skilled birth attendant [1]. Second, Kenya has inequitable distribution of midwives who are also not adequate to attend to all pregnancies and deliveries. Estimates indicate that Kenya is below the 6 midwives per 1000 births per year benchmark used for midwifery workforce planning [1]. Kenyan women continue to rely on traditional birth attendants as well as other unskilled persons during delivery. In slum communities, access to functioning health facilities and skilled attendants is perhaps the single most important factor pushing up maternal and child mortality rates.

Studies have documented the informal nature of health facilities prevalent in the slums of Nairobi, most of which have no properly trained medical staff or the essential supplies needed in case of obstetric emergencies [4, 17, 18]. Another factor is poverty that limits allocation of the meager household resources and makes services from the mostly private-for-profit health facilities in these communities unaffordable [4, 7].

The government has recognized the need to reduce the high maternal and child mortality and several measures have been put in place, including the Maternal and Newborn Health (MNH) Road Map, which was aimed at providing "opportunities for partnerships for increased investments in maternal and newborn health" [19]. In addition, the government has pledged to increase the health care workforce by hiring 20,000 new primary care professionals in order to address the shortage of health care workers in the country. User fees for maternity care have also been abolished in all public health facilities in a bid to increase access to skilled care during delivery.

Table 8.4 shows the distribution of health facility deliveries by background characteristics. Overall, 83.0 percent of births were delivered in a health facility. There were some notable variations by Divisions which could reflect the differential availability of health facilities. The highest percentage of health facility deliveries was reported in Makadara and Kibera (88.7 percent and 88.5 percent respectively), while the lowest percentage was reported in Central Division (71.9 percent). There were ethnic variations in health facility delivery, with the Kikuyu having the highest percentage of health facility deliveries (91.1 percent), while the Luhya had the lowest percentage (70.7 percent). Maternal education was positively associated with delivery at a health facility. The proportion of health facility deliveries increased with higher levels of maternal education; with the highest percentage of health facility deliveries (91.6 percent) being among women with secondary level education or higher and the lowest being among those with no formal education (48.3 percent).

Table 8.4: Place of Delivery

Percent distribution of births in the three years preceding the survey occurring in health facility, according to selected background characteristics, NCSS 2012, NCSS 2000 and KDHS 2008-09		
Background Characteristics	**Percent of births occurring at a health facility**	**Number of births**
Mother's age at birth		
<20	81.2	189
20-24	84.2	474
25-34	83.5	413
35+	75.0	47
Birth Order		
1	89.6	458
2-3	81.0	532
4-5	72.5	105
6+	56.3	23
Education Level		
No education	48.3	19
Primary incomplete	67.5	181
Primary complete	80.8	395
Secondary+	91.6	526
Marital Status		
Never married	80.5	118
Married/Living together	83.6	943
Widowed/Divorced/Separated	79.0	61
Division		
Central	71.9	87
Makadara	88.7	87
Kasarani	86.0	147
Embakasi	85.2	320
Pumwani	84.3	53
Westlands	79.5	102
Dagoretti	74.6	169
Kibera	88.5	158
Ethnic Group		
Kamba	85.8	244
Kikuyu	91.1	215
Luhya	70.7	280
Luo	82.4	210
Other	89.7	173
NCSS 2012 Total	83.0	1,123
NCSS 2000 Total	52.3	1,219
KDHS 2008-09		
National	43.4	3,591
Rural	36.0	2,914
Other urban	68.4	468
Nairobi	90.3	209
Source: Nairobi Cross-Sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09		

Maternal age, especially being older (35 years and above) was negatively associated with health facility delivery. This age group had the lowest percentage of health facility deliveries compared with the other age groups. Births of order of four and above had lower chances of occurring in a health facility (between 56.3 and 72.5 percent), while first order births had the highest chance (89.6 percent).

The proportion of slum births that took place in a health facility (83 percent) was higher than that in other areas of Kenya except for Nairobi which had a higher proportion of institutional deliveries (90.3 percent). Although the high proportion of deliveries in health facilities in the slums is encouraging, previous research found the quality of care received in some of the facilities in the communities to be poor. Some of the facilities were staffed with unqualified personnel and others were not equipped to handle obstetric and neonatal emergencies [17, 18]. The gains made in the interceding decade are clear: there was a 31 percentage point increase in the proportion of deliveries in a health facility; however, the improvement needs to be interpreted against the backdrop of poor quality services highlighted above.

Regarding assistance during delivery (see table 8.5 below), 82.6 percent of births in the slums were assisted by medical personnel, while 7.6 percent were assisted by traditional birth attendants, 4.1 percent by relatives or other unskilled persons and 5.3 percent were unassisted. There were some variations by mothers' background characteristics.

The proportion of deliveries assisted by a doctor decreased as mothers' age increased, while a similar trend was noted among mothers reporting being assisted by traditional birth attendants. Higher order births (6 and above) were the least likely to receive assistance from doctors but most likely to receive assistance from traditional birth attendants compared with lower order births. Makadara and Kibera Divisions had the highest proportion of deliveries assisted by medical personnel, while Central, Kasarani and Dagoretti Divisions had considerable proportions of deliveries assisted by traditional birth attendants (above 10 percent). Previous studies have identified maternal education as a determinant of delivery assistance by medical personnel [20, 21]. The NCSS 2012 results indicate that women with no formal education were the least likely to be assisted by medical personnel and the most likely to use traditional birth attendants.

Table 8.5: Assistance during delivery

Percent distribution of births in the three years preceding the survey by type of assistance during delivery, according to selected background characteristics, NCSS 2012, NCSS 2000 and KDHS 2008-09							
Background characteristics	**Delivery attendant**						**Number of births**
	Doctor	**Nurse/ Trained midwife**	**Traditional birth attendant**	**Relative/ Other individual**	**No one**	**Don't know/ Missing**	
Mother's age at birth							
<20	51.5	29.9	8.3	5.3	4.3	0.8	189
20-24	49.1	35.8	7.8	2.5	4.7	0.0	474
25-34	48.9	32.5	7.1	4.2	6.5	0.8	413
35+	40.3	33.1	7.0	13.8	5.7	0.0	47
Birth Order							
1	53.2	36.0	5.1	1.5	3.7	0.6	458
2-3	47.2	32.9	8.1	5.4	6.1	0.3	532
4-5	46.9	26.3	14.5	6.1	6.3	0.0	105
6+	18.3	39.2	15.3	13.4	13.9	0.0	23
Division							
Central	33.9	39.8	15.3	6.4	4.6	0.0	87
Makadara	66.1	24.1	4.5	5.3	0.0	0.0	87
Kasarani	37.1	46.1	12.6	0.9	2.4	0.9	147
Embakasi	48.2	37.6	4.0	3.6	6.3	0.3	320
Pumwani	15.4	67.4	3.3	5.5	8.4	0.0	53
Westlands	48.6	29.2	4.8	9.1	8.3	0.0	102
Dagoretti	46.5	27.1	12.6	5.8	7.5	0.6	169
Kibera	73.9	13.8	6.6	0.5	4.4	0.8	158
Education Level							
No education	33.3	24.8	17.6	18.3	6.0	0.0	19
Primary incomplete	38.6	29.8	12.8	5.1	13.0	0.7	181
Primary complete	48.6	32.1	8.8	4.9	4.9	0.8	395
Secondary+	53.9	36.1	4.4	2.6	3.0	0.0	526
Missing	0.0	63.1	36.9	0.0	0.0	0.0	2
Antenatal Visits							
None	0.0	100.0	0.0	0.0	0.0	0.0	1
1-3 visits	43.9	35.1	9.3	3.9	7.5	0.2	367
4+ visits	52.0	32.3	6.8	4.2	4.2	0.5	748
Ethnic Group							
Kamba	48.6	37.9	5.0	3.9	4.1	0.4	244
Kikuyu	55.2	34.5	1.5	3.7	4.3	0.6	215
Luhya	39.5	29.6	14.6	5.1	10.4	0.7	280
Luo	49.4	32.3	11.8	2.7	3.8	0.0	210
Other	57.0	33.8	2.6	4.7	1.9	0.0	173
NCSS 2012 Total	49.1	33.5	7.6	4.1	5.3	0.4	1,123
NCSS 2000 Total	20.0	34.3	24.7	14.8	5.2	1.0	1,219
KDHS 2008-09							
National	15.9	29.3	27.1	21.1	6.5	0.1	3,591
Rural	13.4	24.8	30.2	24.0	7.6	0.0	2,914
Other urban	24.8	43.8	17.5	11.1	2.5	0.2	468
Nairobi	31.5	59.1	5.7	2.7	0.3	0.7	209
Source: Nairobi Cross-Sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09							

There were ethnic variations in the type of assistance received during delivery with the Kikuyu having the highest proportion of women who received delivery care from medical personnel (89.7 percent) while the Luhya had the lowest (69.1 percent). Further, the Luhya and Luo had the highest percentage of deliveries assisted by traditional birth attendants. The proportion of deliveries assisted by medical personnel was substantially higher in the slums (82.6 percent) than the

national average (45.2 percent) and for all other areas of the country. It was, however, much lower than that of Nairobi as a whole (90.6 percent). Unassisted deliveries were notably more common in the slums compared to Nairobi as a whole. In the interceding decade, the following changes were noted: the percentage of deliveries assisted by skilled personnel increased from 54.3 percent in 2000 to 82.6 percent in 2012. The changes were accompanied by declines in the proportion of deliveries assisted by traditional birth attendants, relatives and other unskilled persons.

8.3 Delivery Characteristics

The mode of delivery (i.e. whether through Cesarean section, normal vaginal delivery or assisted vaginal delivery) as well as the birth weight of the newborn have a bearing on the survival of the infant. This is especially important in resource poor settings, where health facilities might be ill-equipped to handle some outcomes, such as the very low birth weight babies. Low birth weight is a strong determinant of neonatal mortality in the developing world; and has been shown to predict adult health [22]. Low birth weight is also an important measure of the general public health situation in the community, pointing to long-term poor maternal nutritional status, inadequate health care and morbidity. Low birth weight results from a range of factors such as maternal age and nutrition, maternal smoking and alcohol consumption and genetics. These factors lead to intrauterine growth retardation and prematurity resulting in low birth weight.

The rate of Cesarean section can be taken to represent the share of pregnancies that had complications that would otherwise result in mortality for the mother and fetus if delivered normally. It also indicates the quality of maternal health care in the community. Cesarean sections are not a favored mode of delivery owing to the risk that surgery carries with it such as death or disability owing to a range of factors including adverse reactions to anesthesia, sepsis or other complications.

The World Health Organization had previously set the optimal Cesarean section rate at 15 percent. However, this has been retracted because there was no empirical evidence for an optimal rate considering that Cesarean sections are driven by unstable factors [23]. Table 8.6 gives the distributions of Cesarean section deliveries, birth weight, and birth size according to selected background characteristics.

Cesarean section deliveries were highest among women aged 35 years or older and among first order births. Older women especially those experiencing their first pregnancy face a relatively higher risk of complications, which would necessitate Cesarean delivery. The results show that women with higher education (at least secondary education) were more likely to deliver by Cesarean section, with similar patterns being observed among those who reported at least four antenatal care visits. The high rate of Cesarean deliveries among women reporting the highest frequency of antenatal care could be a reflection of good quality care and the ability to detect possible complications. For the more educated women, however, it might signal an increase in elective Cesarean deliveries. There were some divisional variations with the highest proportion of Cesarean section deliveries being reported in Makadara Division (12.7 percent) while the lowest in Westlands Division (5.5 percent).

Table 8.6: Delivery Characteristics

Percent distribution of births in the three years preceding the survey by delivery characteristics (Cesarean section, premature births, birth weight, size), according to selected background characteristics, NCSS 2012, NCSS 2000 and KDHS 2008-09							
Background Characteristics	**Delivery by C-section**	**Birth weight**			**Size of child at birth**		**Number of births**
		<2.5 kg	**2.5+ kg**	**No birth weight recorded**	**Smaller than average**	**Average Size/ Larger**	
Mother's age at birth							
<20	7.2	4.8	83.3	11.9	15.6	84.4	189
20-24	9.7	3.4	83.4	13.2	13.1	86.9	474
25-34	10.1	4.1	83.0	12.9	10.7	89.3	413
35+	10.7	9.6	78.6	11.8	12.8	87.2	47
Birth Order							
1	11.3	4.7	86.5	8.8	16.0	84.0	458
2-3	9.5	3.2	82.3	14.4	9.8	90.2	532
4-5	3.2	6.8	73.3	19.9	13.7	86.3	105
6+	2.8	2.8	75.9	21.4	11.6	88.4	23
Division							
Central	10.8	2.2	76.7	21.1	4.7	95.3	87
Makadara	12.7	4.5	90.2	5.2	10.9	89.1	87
Kasarani	11.6	4.1	88.6	7.3	14.0	86.0	147
Embakasi	9.7	4.9	81.9	13.1	13.3	86.7	320
Pumwani	9.1	3.2	91.6	5.2	5.3	94.7	53
Westlands	5.5	4.3	79.2	16.4	11.5	88.5	102
Dagoretti	9.3	1.5	75.0	23.5	10.4	89.6	169
Kibera	7.9	6.3	87.0	6.7	20.1	79.9	158
Education Level							
No education	0.0	8.8	66.9	24.3	12.3	87.7	19
Primary incomplete	7.0	3.4	72.2	24.3	12.5	87.5	181
Primary complete	6.7	4.6	81.3	14.2	12.3	87.7	395
Secondary+	12.9	3.8	88.9	7.3	13.0	87.0	526
Antenatal Visits							
None	0.0	0.0	100.0	0.0	0.0	100.0	1
1-3 visits	7.3	4.3	80.4	15.2	11.6	88.4	367
4+ visits	10.5	4.0	84.3	11.7	13.3	86.7	748
Ethnic Group							
Kamba	10.5	5.3	81.6	13.1	17.3	82.7	244
Kikuyu	11.8	4.4	90.0	5.6	9.0	91.0	215
Luhya	8.4	4.7	74.2	21.2	12.3	87.7	280
Luo	7.8	3.9	82.1	14.0	13.2	86.8	210
Other	8.8	1.9	91.4	6.7	11.0	89.0	173
NCSS 2012 Total	9.5	4.2	83.0	12.8	12.6	87.4	1,123
NCSS 2000 Total	6.5	2.9	50.2	46.9	17.2	82.8	1,219
KDHS 2008-09							
National	6.7	2.5	44.7	52.8	13.3	82.9	3,591
Rural	5.4	2.2	37.9	59.8	13.4	83.0	2,914
Other urban	11.1	2.9	68.5	28.6	12.4	82.6	468
Nairobi	14.9	5.9	85.7	8.5	13.2	83.2	209
Source: Nairobi Cross-Sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09							

Overall, the proportion of births delivered by Cesarean section in the slums in 2012 (9.5 percent) was higher than in 2000 (6.5 percent) but lower than that of Nairobi (14.9 percent) and other urban areas of Kenya (11.1 percent). It was, however, higher than the proportions reported for rural areas (5.4 percent) and the national average (6.7 percent).

Regarding low birth weight, having an education and more frequent ANC were associated with low proportions of babies of low birth weight (below 2.5kg). The highest percentage of low birth weight babies was among mothers aged 35 years and above, and among births of order 4-5 (9.6 percent and 6.8 percent respectively). Kibera Division had the highest proportion of low birth weight babies (6 percent) while the lowest was reported in Dagoretti Division. As with the other maternal care indicators, the interpretation for Divisional variations needs to be done with caution due to small numbers reported in some areas.

Overall, the proportion of low birth weight babies was lower in the slums compared with that of Nairobi but higher than the rate for other areas in Kenya (2.2 percent in rural and 2.9 for other urban) and for the country as a whole (2.5 percent). In addition, it should be noted that 12.8 percent of all the births did not have any record for birth weight and this was highest among women from Central and Dagoretti Divisions (over 20.0 percent), those with no formal education or incomplete primary education (24.3 percent each) and among births of order 6 or higher (21.4 percent). It is important to note that not all of these births took place in a health facility and therefore birth weight records would be missing for those births occurring outside of a health facility.

In the inter-survey period, the proportion of Cesarean section deliveries substantially increased as did the rate of low birth weight babies. The proportion of babies with normal birth weight increased, while births with no birth weight information significantly reduced. However, birth weight reporting issues, including precision of measurement and rounding, may affect the classification of low and normal birth weight. The findings call for concerted effort by all stakeholders to realize complete coverage of the collection of accurate birth weight data in all health facilities in the country.

8.4 Child Vaccination

The Kenya Expanded Program on Immunization (KEPI) remains the government's key vehicle for controlling vaccine-preventable diseases among children. The program aims to reduce morbidity and mortality caused by illnesses such as tuberculosis, polio, measles, tetanus, diphtheria and pertussis. The government's immunization program is in line with the WHO guidelines requiring full immunization of children by the age of 12 months. In Kenya, the last immunization under the KEPI schedule is given when the child is nine months old. The KEPI schedule includes one dose of BCG (Bacillus Calmette–Guérin) vaccine given at birth or at the first visit to a clinic and four doses of polio with the initial oral polio vaccine (Polio0) administered at birth or at first contact with the child. At six weeks, the child is given the first pentavalent dose, which comprises combined diphtheria, pertussis and tetanus vaccine (DPT), hepatitis B vaccine (HepB), Heamophilus influenza type b vaccine (Hib) and the polio 1 vaccine. Four weeks after the first pentavalent vaccine, the second dose of the DPT/HepB/Hib and polio 2 vaccines are administered at 10 weeks. The third doses of the above vaccines are given four weeks after the second dose at 14 weeks, while measles vaccine is administered when the child is aged nine months [24]. If followed correctly, the schedule ensures full immunization before the child is 12 months old.

Vaccination cards were seen for 43.2 percent of the children surveyed, while immunization status information for 48.2 percent of the children was obtained from mothers' reports/recall. Full coverage for the vaccines given during the first six weeks after birth was nearly achieved for all children (at least 91 percent of the children had received BCG, DPT1 and polio 1). For vaccines administered after the first six weeks, coverage varied with measles and polio 3 having lower coverage rates compared to DPT3 regardless of the source of immunization information. It is worth noting that some of the vaccinations administered concurrently (DPT and polio) had differing rates of coverage; for example, polio 3 had a coverage rate that was slightly lower than that for DPT3. This might have been occasioned by stock-outs of the vaccine at facilities and failure by mothers/guardians to follow through on appointments.

Table 8.7: Vaccination by source of information

Percentage of children aged 12-23 months who had received specific vaccines at any time before the survey, by source of information about the vaccination, and the percentage vaccinated by 12 months of age, NCSS 2012, NCSS 2000											
Vaccinated at any time before the survey	**BCG**	**DPT**			**Polio**			**Measles**	**All^**	**None**	**Number of children**
		DPT1	**DPT2**	**DPT3**	**Polio1**	**Polio2**	**Polio3**				
NCSS 2012											
Vaccinated at any time before the survey											
Vaccination card	43.2	43.2	43.0	42.6	42.9	42.0	41.1	39.6	38.3	1.0	167
Mother's report	48.2	41.8	41.8	36.0	41.5	40.4	34.8	47.1	30.2	14.4	215
Either source	91.4	85.0	84.7	78.6	84.4	82.4	75.9	86.7	68.5	8.2	382
Vaccinated by 12 months of age^^	91.4	78.1	78.9	71.1	75.5	74.7	66.9	66.1	45.2	15.4	382
NCSS 2000											
Vaccinated at any time before the survey											
Vaccination card	52.4	52.0	51.1	49.1	52.6	51.2	48.9	43.9	42.5	0.0	233
Mother's report	43.1	42.6	39.4	33.1	42.9	21.8	0.2	36.0	0.0	2.0	192
Either source	95.5	94.6	90.5	82.2	95.5	73.0	49.1	79.9	42.5	2.0	445
Vaccinated by 12 months of age^^	88.4	76.9	64.4	51.9	79.4	58.5	42.2	15.2	41.3	3.6	481

^ Children who are fully vaccinated, that is, those who have received BCG, measles, and three doses of DPT and polio (excluding Polio)

^^ For children whose information was based on the mother's report, the proportion of vaccinations given during the first year of life was assumed to be the same as for children with a written record of vaccination

Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012

Overall, 68.5 percent of the children aged 12-23 months had received all immunizations. However, immunizations were not received according to the recommended schedule as only 45.2 percent of children had received all immunizations by the time they were 12 months old. In addition, there were pockets of unimmunized children with 8.2 percent for all children aged 12-23 months not immunized, a rate that was almost double (at 15.4 percent) for immunization status by the time the children were 12 months.

The coverage rates for full immunization by the age of 12 months slightly increased from 41.3 percent in 2000 to 45.2 percent in 2012. There were more gains in coverage for most of the individual vaccines. There was, however, an almost four-fold increase in the proportion of children reported to have received no immunization at all (from 3.6 percent in 2000 to 15.4 percent in 2012). Reasons for non-immunization require further investigation to inform efforts aimed at eliminating cases of unimmunized children in these communities.

Table 8.8 shows the percentage of children aged 12-23 months who received specific vaccinations by select background characteristics. There was a significant difference in full immunization by sex with male children having a higher rate of immunization compared with their female counterparts. The immunization rates increased with higher birth order. There were also variations by division, with Central Division having the lowest rates (48.3 percent) while Kibera had the highest immunization rates at 83.1 percent. With respect to individual vaccines, Kasarani and Embakasi Divisions had consistently lower coverage than all the other areas for all vaccines except for DPT 3 and polio 3, for which Central Division reported the lowest coverage.

Overall, the immunization rates in the slums in 2012 for almost all vaccines were lower than those reported in 2000, as well as nationally, in rural and other urban areas of Kenya, according to KDHS 2008-09. However, there was an improvement in coverage for polio 2, polio 3 and measles; full immunization also improved between 2000 and 2012. The coverage for full immunization in the slums in 2012 remained comparable to the national average, rural communities and other urban areas in Kenya, but was higher than that of Nairobi as a whole in 2008-09. The positive outcome regarding immunization coverage in the slums may be related to concerted efforts to reach the urban poor in Nairobi by governmental and non-governmental agencies.

Table 8.8: Vaccination by background characteristics

Percentage of children aged 12-23 months who had received specific vaccines at any time before the survey, (according to the vaccination card or the mother's report), by selected background characteristics, NCSS 2012, NCSS 2000 and KDHS 2008-09											
Background Characteristics	Percentage of children who received:										Number of children
	BCG	DPT			Polio			Measles	All^	None	
		DPT1	DPT2	DPT3	Polio1	Polio2	Polio3				
Child's Sex											
Male	92.5	87.2	86.8	80.1	88.9	87.2	81.0	87.1	73.7	7.5	198
Female	90.1	82.6	82.6	76.9	79.5	77.1	70.2	86.2	62.8	8.9	184
Birth Order											
1	87.8	81.5	81.5	74.9	80.6	77.9	72.2	85.7	67.0	11.4	163
2-3	93.1	87.2	86.8	79.5	88.2	87.1	78.4	86.2	68.7	6.6	180
4-5	97.0	86.1	86.1	86.1	88.2	83.2	83.2	90.5	76.7	3.0	31
6+	100.0	100.0	100.0	100.0	58.8	58.8	58.8	100.0	58.8	0.0	7
Division											
Central	93.7	87.3	87.3	58.7	86.8	86.8	60.2	86.9	48.3	6.3	31
Makadara	90.5	82.5	82.5	76.4	79.6	79.6	72.6	85.6	66.4	7.9	33
Kasarani	86.0	74.8	74.8	64.3	77.1	73.4	66.8	79.8	59.3	14.0	50
Embakasi	85.8	80.5	80.5	75.1	83.1	78.9	74.2	84.3	66.8	13.0	102
Pumwani	92.8	80.5	80.5	74.4	87.2	87.2	87.2	92.8	74.4	7.2	15
Westlands	94.8	89.2	89.2	89.2	75.0	75.0	69.4	92.4	67.1	5.2	36
Dagoretti	98.2	94.4	93.0	93.0	91.2	89.7	89.7	88.4	78.1	1.8	63
Kibera	97.0	93.1	93.1	89.4	97.0	95.6	86.9	91.3	83.1	3.0	52
Education Level											
No education	100.0	85.8	85.8	85.8	100.0	100.0	100.0	100.0	85.8	0.0	6
Primary incomplete	95.2	90.8	90.8	85.4	82.7	81.5	78.6	83.1	69.3	4.8	65
Primary complete	93.0	87.7	87.0	74.8	86.7	85.0	73.3	88.5	62.5	6.5	120
Secondary+	88.8	81.3	81.3	78.3	83.1	80.4	75.7	86.3	71.2	10.6	190
Ethnic Group											
Kamba	91.6	87.1	87.1	78.5	85.8	85.8	77.5	86.0	72.0	8.4	80
Kikuyu	90.9	82.6	82.6	75.1	81.9	80.7	74.5	92.1	67.2	6.8	76
Luhya	94.5	87.5	86.7	79.6	88.7	86.4	77.2	85.9	66.4	5.5	104
Luo	92.3	89.3	89.3	84.9	85.9	79.8	74.6	85.0	68.5	7.7	64
Other	85.3	76.6	76.6	74.5	76.9	75.7	74.5	83.9	69.1	14.7	58
NCSS 2012 Total	91.4	85.0	84.8	78.6	84.4	82.4	75.9	86.7	68.5	8.2	382
NCSS 2000 Total	95.5	94.6	90.5	82.2	95.3	73.0	49.2	79.9	44.0	3.6	445
KDHS 2008-09											
National	95.6	95.6	93.1	86.6	95.7	92.4	77.2	85.0	68.3	3.2	1,096
Rural	95.4	95.3	92.6	86.2	95.4	92.0	80.1	83.4	69.9	3.5	844
Other urban	96.9	97.5	96.5	89.3	97.4	95.3	67.7	91.3	64.6	1.9	196
Nairobi	93.8	94.3	88.5	82.9	94.6	88.1	66.9	87.6	57.0	3.9	56
^ Children who are fully vaccinated, that is, those who had received BCG, measles, and three doses of DPT and polio (excluding Polio)											
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09											

8.5 Prevalence and Treatment of Cough, Fever and Diarrhea

The common symptoms of pneumonia, diarrhea and malaria are cough and fever. For example, acute respiratory tract infections might present as a cough while malaria will usually present with a fever as do other infections. Most of the conditions associated with these symptoms can be fatal if left untreated, hence the need for the mothers/caregivers to recognize the symptoms and seek timely and appropriate treatment. Mothers of children born in the three years preceding the survey were asked if their children had suffered from a cough, fever, or diarrhea in the two weeks preceding interview date. The results are presented in Tables 8.9, 8.10 and 8.11. Table 8.9 presents the prevalence and treatment of cough by selected background characteristics.

Table 8.9: Prevalence and treatment of cough

Percentage of children under three years of age who were ill with a cough in the two weeks preceding the survey and percentage taken for treatment, according to selected background characteristics, NCSS 2012, NCSS 2000			
Background Characteristics	**Percentage of children with a cough**	**Percentage of children taken to a health facility or provider^**	**Number of children**
Child's Age			
<6 months	19.8	32.3	194
6-11 months	26.7	61.3	191
12-23 months	28.0	75.4	369
24-35 months	22.3	64.2	321
Child's Sex			
Male	22.4	66.6	549
Female	26.9	66.6	526
Birth Order			
1	23.8	65.8	439
2-3	24.9	72.1	514
4-5	25.8	67.5	95
6+	20.0	42.4	22
Division			
Central	16.7	100.0	85
Makadara	20.1	69.4	84
Kasarani	27.6	44.6	141
Embakasi	17.3	63.7	301
Pumwani	25.4	80.7	50
Westlands	47.8	78.2	100
Dagoretti	33.0	51.9	162
Kibera	14.9	69.2	152
Education Level			
No education	7.0	-	18
Primary incomplete	27.7	70.1	170
Primary complete	25.8	71.0	381
Secondary+	23.3	61.6	505
Ethnic Group			
Kamba	22.5	68.9	232
Kikuyu	20.2	84.6	204
Luhya	26.1	67.9	264
Luo	23.7	47.9	207
Other	31.6	66.3	166
NCSS 2012 Total	24.6	66.6	1,075
NCSS 2000 Total	43.8	66.3	1,181
^ Includes health center, hospital, clinic and private doctor			
Source: Nairobi Cross-Sectional Slums Surveys (NCSS) 2000 & 2012			

A quarter of the children were reported to have had a cough in the two weeks before the survey. There was variation in the prevalence of cough by age, which was especially high among infants below one year, who accounted for 46.5 percent of all cases of cough. The lowest prevalence rate of cough was among infants below six months (19.8 percent) while the highest rate was among children aged 12-23 months (28.0 percent). The prevalence of cough varied slightly by child's sex, with female children having a higher proportion with cough compared with male children. There was marked variation in the prevalence of cough across Divisions with the lowest being in Kibera Division (14.9 percent) and the highest in Westlands Division (47.8 percent). There were no consistent variations in prevalence of cough by birth order and maternal education. Health seeking varied by age of the child, with 61.3 percent of the 6-11 month old infants being taken to a health facility, while only 32.3 percent of the infants below 6 months were taken for similar care while there was no variation in health seeking for male and female children. Further, there was variation in health-seeking by Division with Kasarani Division having the lowest proportion of children with a cough taken to a health facility for medical care (44.6 percent), while all children with a cough in Central Division were taken for treatment. The proportion of children with cough whose mothers sought medical care was lowest for the highest order births and also among mothers with no formal education. Overall, there was a marked reduction in the prevalence of cough from 43.8 percent in 2000 to 24.6 percent in 2012 and no change in seeking medical care for cough over the years.

The prevalence of fever in the slums by selected background characteristics is shown in Table 8.10. The prevalence of fever among children in 2012 was remarkably low compared to the level reported in 2000, and also compared to that for Kenya as a whole, rural Kenya and other urban areas of in 2008-09. However, the prevalence of fever in 2012 was almost similar to that reported for Nairobi as a whole in 2008-09.

Prevalence of fever also varied by children's age, with 9.6 percent of infants below six months reported to have had fever in the two weeks before the survey while those aged 6-11 months and 12-23 months had the highest prevalence (about 21 percent). There was variation in prevalence of fever by sex with females being more likely to have had fever compared with males. There were also Divisional variations in the prevalence of fever, with Westlands Division leading at 35.3 percent while Kibera Division had the lowest prevalence of 8.5 percent. The prevalence of fever further varied by maternal ethnic group. Children born to mothers from the Luhya community had the highest prevalence of fever (21.6 percent) while those from the Kamba community had the lowest (14.1 percent). However, the lowest prevalence of fever was among children born to mothers with at least secondary education while the highest was among children born to mothers with incomplete primary education.

Concerning treatment-seeking for fever, 65.0 percent of children with fever were taken to a health facility or provider. This proportion was substantially higher than that of Nairobi (47.5 percent), other urban areas of Kenya (49.2), rural Kenya (51.7 percent) as well as Kenya as a whole (51.2 percent) in 2008-09.

Table 8.10: Prevalence and treatment of fever

Percentage of children under three years of age who were ill with fever in the two weeks preceding the survey and percentage taken for treatment, according to selected background characteristics, NCSS 2012, NCSS 2000 and KDHS 2008-09				
Background Characteristics	**Percentage of children with a fever**	**Number of children**	**Percentage of children with fever taken to a health facility or provider^**	**Number of children with fever**
Child's Age				
<6 months	9.6	194	55.2	17
6-11 months	20.5	191	63.2	37
12-23 months	21.0	369	65.4	77
24-35 months	15.2	321	69.6	43
Child's Sex				
Male	13.9	549	68.1	74
Female	20.6	526	62.8	100
Birth Order				
1	15.8	439	65.9	62
2-3	17.0	514	67.6	85
4-5	22.6	95	65.1	21
6+	18.5	22	42.4	5
Division				
Central	10.1	85	100.0	8
Makadara	13.7	84	69.4	11
Kasarani	23.4	141	57.4	32
Embakasi	11.0	301	64.6	33
Pumwani	11.4	50	80.7	5
Westlands	35.3	100	62.9	35
Dagoretti	23.9	162	58.6	37
Kibera	8.5	152	72.1	13
Education Level				
No education	0.0	18	-	-
Primary incomplete	20.5	189	69.8	34
Primary complete	18.6	405	66.2	65
Secondary+	15.5	526	62.1	75
Ethnic Group				
Kamba	14.1	232	60.0	29
Kikuyu	14.7	204	89.7	28
Luhya	21.6	264	57.9	54
Luo	16.6	207	55.3	34
Other	17.7	166	63.0	29
NCSS 2012 Total	17.2	1,075	65.0	174
NCSS 2000 Total	67.9	1,086	63.5	737
KDHS 2008-09				
National	25.4	3,370	51.2	855
Rural	25.7	2,736	51.7	702
Other urban	26.7	444	49.2	118
Nairobi	17.8	189	47.5	34
^ Includes health center, hospital, clinic and private doctor				
Source: Nairobi Cross-Sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09				

There were variations in seeking treatment for fever, with the youngest infants having the lowest likelihood to be taken to a health facility. Notably, female children had the highest prevalence of fever and yet were the least likely to get medical care compared with males. The same pattern was observed among children born to Luhya mothers, who were among the least likely to be taken to a health facility, yet had the highest prevalence of fever. Children of birth order six and above and those born to mothers with secondary education or higher were least likely to be taken for medical care. There were Divisional variations in seeking medical care for fever, with about 57.4 percent of children with fever in Kasarani Division receiving

medical care while all children with fever in Central Division were taken for medical treatment. Overall, the proportion seeking medical care in 2012 was slightly higher than that reported in 2000. In addition, there was a 51 percentage point decrease in the prevalence of fever between 2000 and 2012 (67.9 percent and 17.2 percent, respectively). This could be as a result of increased vaccination coverage (see Table 8.7) and improved sanitation and access to water (see Table 2.5).

Table 8.11 presents the prevalence of diarrhea (all forms of diarrhea and diarrhea with blood) among children during the two-weeks preceding the survey, by selected background characteristics. Twenty percent of the children below three years of age were reported to have had an episode of diarrhea in the two weeks preceding the survey. This rate represents a decrease in the prevalence of diarrhea from that reported in 2000 (30.8 percent). Further, the prevalence of diarrhea in 2012 was slightly lower than the national average (21.9 percent), rural (21.7 percent) and other urban areas (26.4 percent) in the country, but higher than the rate reported for Nairobi (14.8 percent) in 2008-09. In addition, 7.0 percent of the children were reported to have had an episode of diarrhea with blood over the same time period. This rate was more than double the national average and for Nairobi but was lower than that in 2000.

All forms of diarrhea were most prevalent among children aged 12-23 months followed by those aged 6-11 months. The lowest prevalence was observed among the youngest infants, while there was no variation in the prevalence by the sex of the child. Kasarani Division had the highest prevalence of all forms of diarrhea with 33.5 percent while Pumwani Division had the lowest at 0 percent. There was no clear pattern in the prevalence of all forms of diarrhea by birth order; however, births of order 2-5 had the highest prevalence of any form of diarrhea, while the lowest prevalence was found among the highest order births (6 or higher). On the other hand, the proportion with diarrhea with blood was highest among the youngest infants at 13.5 percent. There was variation in the prevalence of diarrhea with blood by the sex of the child with males being more likely to have experienced the condition compared with females. Divisional variations were also noted with the highest prevalence of diarrhea with blood being reported in Westlands Division (16.3 percent) and the lowest in Pumwani and Dagoretti Divisions (0 percent).

As with the prevalence of fever (Table 8.10), all forms of diarrhea were most prevalent among children born to Luhya mothers, while diarrhea with blood was mostly among children born to Kamba mothers. There was no variation in prevalence of all forms of diarrhea and that of diarrhea with blood by mother's education.

With respect to treatment of diarrhea (Table 8.12), 42.7 percent of all children with any form of diarrhea were taken to a health facility or provider for treatment. Children, who received Oral Rehydration Therapy (ORT), which consists of a solution prepared from Oral Rehydration Salts (ORS), were just below the half way mark (48.2 percent). In addition, 25.7 percent of children with diarrhea received recommended home fluids (RHF) while 26.1 percent of the children were treated by increasing their fluid intake. More than one-fifth of the children with diarrhea did not receive any treatment at all while one-third was given home remedies.

Table 8.11: Prevalence of diarrhea

Percentage of children under three years of age with watery diarrhea and diarrhea with blood in the two weeks preceding the survey and percentage taken for treatment, according to selected background characteristics, NCSS 2012, NCSS 2000 and KDHS 2008-09			
Background Characteristics	**Diarrhea in the preceding two weeks**		**Number of children**
	All diarrhea	**Diarrhea with blood**	
Child's Age			
<6 months	8.9	13.5	194
6-11 months	22.6	0.0	191
12-23 months	28.0	9.3	369
24-35 months	16.5	6.2	321
Child's Sex			
Male	20.2	9.5	549
Female	20.2	4.3	526
Birth Order			
1	19.6	9.2	439
2-3	20.3	3.9	514
4-5	22.4	11.8	95
6+	17.2	0.0	22
Division			
Central	18.4	11.4	85
Makadara	19.7	11.4	84
Kasarani	33.5	0.0	141
Embakasi	16.0	5.6	301
Pumwani	0.0	7.3	50
Westlands	23.3	16.3	100
Dagoretti	23.8	0.0	162
Kibera	15.9	9.9	152
Education Level			
No education	14.5	0.0	18
Primary incomplete	24.0	5.5	170
Primary complete	19.1	9.8	381
Secondary+	19.9	5.7	505
Ethnic Group			
Kamba	15.3	10.8	232
Kikuyu	17.5	2.9	204
Luhya	26.8	8.6	264
Luo	21.8	5.8	207
Other	17.3	5.5	166
NCSS 2012 Total	20.2	7.0	1,075
NCSS 2000 Total	30.8	11.3	1,182
KDHS 2008-09			
National	21.9	3.3	3,370
Rural	21.7	3.7	2,736
Other urban	26.4	1.9	444
Nairobi	14.8	0.6	189
Source: Nairobi Cross-Sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09			

Table 8.12 presents diarrhea treatment by select background characteristics. The highest proportion of children receiving treatment from a health facility or provider was among those aged 12-23 months (52.9 percent). The proportion of children with diarrhea taken to a health facility or provider declined with higher birth order.

Table 8.12: Treatment of diarrhea

Treatment of diarrhea among children under three years of age who had diarrhea in the two weeks preceding the survey, the percentage taken for treatment to a health facility or provider, the percentage who received oral rehydration therapy (either solution prepared from ORS packets, recommended home fluid (RHF), or increased fluids), the percentage who received no ORT and the percentage given other treatments, according to selected background characteristics, NCSS 2012, NCSS 2000

Background Characteristics	Percentage taken to a health facility or provider	ORS packet	RHF at home	Either ORS or RHF	Increased fluids	Did not receive ORT	Home remedy/ Other	No treatment	Number of children
Child's Age									
<6 months	43.8	43.8	37.5	75.0	18.8	18.8	18.8	12.5	16
6-11 months	38.1	40.5	21.4	57.1	26.2	33.3	28.6	16.7	42
12-23 months	52.9	57.8	23.5	63.7	29.4	27.5	37.3	17.6	102
24-35 months	27.6	37.9	29.3	53.4	22.4	37.9	31.0	34.5	58
Child's Sex									
Male	41.8	45.5	28.2	59.1	28.2	30.0	29.1	22.7	110
Female	43.5	50.9	23.1	62.0	24.1	31.5	36.1	20.4	108
Birth Order									
1	50.6	51.8	17.6	57.6	23.5	29.4	44.7	18.8	85
2-3	39.6	48.1	29.2	64.2	31.1	28.3	27.4	18.9	106
4-5	31.8	45.5	40.9	63.6	18.2	36.4	9.1	36.4	22
6+	0.0	0.0	33.3	33.3	0.0	66.7	33.3	66.7	3
Division									
Central	53.3	40.0	6.7	40.0	6.7	53.3	73.3	6.7	15
Makadara	47.1	35.3	17.6	52.9	41.2	23.5	35.3	17.6	17
Kasarani	43.1	45.1	31.4	56.9	9.8	39.2	37.3	25.5	51
Embakasi	35.4	56.3	33.3	75.0	33.3	20.8	29.2	18.8	48
Pumwani									
Westlands	43.5	43.5	13.0	47.8	26.1	30.4	21.7	26.1	23.0
Dagoretti	35.9	51.3	25.6	59.0	41.0	30.8	17.9	25.6	39
Kibera	56.0	52.0	28.0	72.0	24.0	24.0	36.0	20.0	25
Education Level									
No education	0.0	0.0	0.0	0.0	0.0	100.0	0.0	100.0	2
Primary incomplete	34.1	47.7	22.7	61.4	15.9	34.1	22.7	27.3	44
Primary complete	46.5	50.7	38.0	71.8	23.9	21.1	29.6	15.5	71
Secondary+	44.6	47.5	18.8	53.5	32.7	34.7	39.6	21.8	101
Ethnic Group									
Kamba	29.4	32.4	38.2	58.8	26.5	29.4	23.5	26.5	34
Kikuyu	44.1	58.8	14.7	64.7	38.2	20.6	23.5	17.6	34
Luhya	47.2	50.0	22.2	62.5	22.2	31.9	33.3	20.8	72
Luo	50.0	47.9	29.2	58.3	18.8	35.4	45.8	20.8	48
Other	34.5	48.3	27.6	55.2	34.5	34.5	27.6	24.1	29
NCSS 2012 Total	42.7	48.2	25.7	60.6	26.1	30.7	32.6	21.6	218
NCSS 2000 Total	57.8	43.4	53.7	74.1	35.0	25.9	53.7	3.6	364

Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012

There was wide variation in seeking treatment for diarrhea across the Divisions, with Kibera Division having the highest proportion of children taken to a health facility (56.0 percent) while Embakasi Division had the lowest (35.4 percent). Children born to Luo mothers were more likely to be taken to a health facility or provider (50.0 percent) while those from the Kamba community were most likely not to receive any treatment (26.5 percent). The noted variations across the different ethnic groups could be suggestive of tendencies among mothers from certain communities to use folk medicine to treat childhood illnesses such as diarrhea.

Children born to mothers with complete primary education were most likely to seek treatment (46.5 percent) while those born to mothers with incomplete primary education and secondary or higher education were less likely to receive treatment (34.1 percent and 44.6 percent, respectively). However, mothers with higher education were more likely to use home remedies and increased fluid intake to treat diarrhea.

Between 2000 and 2012, there was a decrease in the proportion of children taken to a health facility or provider for treatment of diarrhea, an overall decline in the proportion receiving RHF and a 5 percentage point increase in the proportion

receiving ORT. There was also a decrease in the proportion of children receiving increased fluid intake and the proportion that did not receive ORS. A notable change was the almost six-fold increase in the proportion receiving no treatment, which might be an indication of the existence of barriers to medical care seeking among mothers in Nairobi slums, with potential negative consequences.

The recommended child feeding practice when there is a diarrhea episode is to provide adequate solid foods and increase fluid intake to avoid dehydration. Table 8.13 shows the variation in the recommended practice by select background characteristics.

Table 8.13: Feeding practices during diarrhea

Percentage distribution of children under three years of age who had diarrhea in the past two weeks by amount of fluids and solid foods given compared with normal practice, NCSS 2012, NCSS 2000		
Amount of Fluid/Solids given	**NCSS 2012 Total**	**NCSS 2000 Total**
Amount of fluids given		
Same	30.5	47.2
Increased	6.4	34.9
Decreased	52.8	17.6
Nothing to Drink	7.4	-
Don't know/Missing	2.9	0.3
Amount of solids given		
Same	20.3	54.7
Increased	2.3	5.8
Decreased	60.3	39.0
Nothing to eat	15.1	-
Don't know/Missing	2.0	0.5
Total	100.0	100.0
Number of cases	218	364
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012		

The findings indicate that in 2012, 52.8 percent of the children with diarrhea had less fluid intake while 7.4 percent got nothing to drink at all. Only 6.4 percent of the children had their fluid intake increased. With respect to solid foods, 60.3 percent of the children received reduced solid food intake, while 15.1 percent were given nothing to eat.

A comparison of the 2012 and 2000 findings shows that there was a drastic decline in the proportion of mothers following the recommended feeding practices when a child had diarrhea. For example, the proportion of children with diarrhea who received increased fluid intake dropped from 34.9 percent in 2000 to 6.4 percent in 2012, while those who received decreased fluid intake went up from 17.6 percent to 52.8 percent in the inter-survey period. This might point to lack of information on diarrhea management and could be an opportunity for information, education and communication programming to provide mothers in these communities with correct information on the management of diarrhea.

8.6 Summary

The maternal and child health indicators in the slums of Nairobi paint a mixed picture with gains in some aspects and losses in others. As far as antenatal care is concerned, there was near universal utilization of the services by mothers in the slums of Nairobi who mostly obtained care from a health professional. There was, however, a small fraction (1.7 percent) of women who reported that they received antenatal care from traditional birth attendants. Traditional birth attendants are usually not equipped with the skills and equipment needed to detect any complications that could threaten the life of the mother and fetus, putting to question the quality of care these women receive.

It is therefore important to address the factors pushing some mothers to seek ANC from TBAs. It is important to highlight positive developments in the inter-survey period in relation to improved prevention of neonatal tetanus, with children born in Nairobi slums in 2012 receiving comparable protection as children born in Nairobi as a whole in 2008-09. Moreover, tetanus toxoid vaccination was higher in the slums than in other urban and rural areas of the country in 2008-09. In general, there is need to ensure complete ANC package in all health facilities and to educate mothers in slums on the importance of timely and comprehensive ANC as majority reported starting ANC visits in the second trimester, resulting in fewer visits and therefore reduced opportunity for adequate monitoring.

Delivery at a health facility and assistance by a trained professional were more prevalent in the slums of Nairobi in 2012 than in other areas of Kenya in 2008-09, but lower than that for Nairobi as a whole. However, caution is warranted because the quality of care in most of the health facilities in the slums has been found wanting [18]. Despite the increased use of ANC from health professionals, there was a considerable proportion of women who delivered with the assistance of traditional birth attendants and other unskilled care givers. This was most notable among mothers with no formal education and women of high parity; there is therefore a need to determine the drivers of this trend. Further, the health system in the country and in the slums can take advantage of the near universal utilization of ANC services to encourage delivery at health facilities.

Child health outcomes in Nairobi slums were mixed. Whereas low birth weight was more prevalent in the slums in 2012 compared with the national average in 2008-09, it was lower than that for Nairobi in 2008-09. Moreover, immunization coverage for all recommended vaccines was low with only 44 percent of children fully immunized by the age of 12 months, falling short of the recommended 85 percent coverage. Immunization rates at 12 months for indicator vaccines (DPT1 and measles) used to assess community coverage and dropout rate indicates that in the slums, more children received the first round of immunization (DPT1 and Polio1) with the rates falling to 66 percent by the last round when the measles vaccine is administered. Immunization rates for polio were lower than those for DPT yet they are administered at the same time, indicating missed opportunities. Given the crowded conditions of slum communities and the potential risk in case of an isolated polio case, there is need for the KEPI program to consider rigorous community mobilization to educate parents/guardians on the benefits of full and on-schedule immunization of children. Further, the program needs to devise ways to maximize coverage by introducing mobile units to bring the services to the communities as this would reduce the drop-out of children from immunization.

Overall, slum communities in 2012 fared better in coverage of all vaccines compared with the national average and that of other areas of the country including Nairobi as a whole in 2008-09 when immunization at any time as opposed to on-schedule immunization is considered. This could be attributed to the outreach campaigns that occur during national immunization days for specific vaccines as they target areas not well covered during routine immunization, such as slums and other remote areas.

Other indicators of child health such as the prevalence and treatment of common illnesses indicate that 25 percent of the children had a cough in the two weeks preceding the survey. That infants aged below six months were the least likely to be taken to a health facility for treatment is an issue of concern that might lead to higher infant mortality in these communities. The highest order births and those that occurred in Kasarani Division were the least likely to be taken to a health facility for treatment, which warrants attention in order to address the barriers to health care seeking among these groups. Diarrheal diseases are among the leading causes of mortality among children aged below five years in Kenya. Prevalence of diarrhea with blood was higher in the slums in 2012 than that in Nairobi and the country as a whole in 2008-09. The high prevalence of diarrhea with blood among infants below six months is indicative of early introduction to solid foods and liquids, which could be pathways for the causal pathogens. Programs encouraging exclusive breastfeeding in these settings would be timely, while the entire community would benefit from education on the sanitary handling of food and water/liquids for babies. Following evidence of poor management of diarrhea, there is need for strong information, education and communication strategy on the management of the disease in these communities.

References

1. Kenya National Bureau of Statistics (KNBS) and ICF Macro, *Kenya Demographic and Health Survey 2008-09*, 2010, KNBS and ICF Macro: Calverton, Maryland.

2. United Nations Population Fund (UNFPA), *The State of the World's Midwifery 2011, 2011*, UNFPA.

3. Ziraba, A., et al., *Maternal mortality in the informal settlements of Nairobi city: what do we know? Reprod Health, 2009.* 6(6).

4. Essendi, H., S. Mills, and J.-C. Fotso, *Barriers to Formal Emergency Obstetric Care Services' Utilization. Journal of Urban Health*, 2010.

5. Izugbara, C., A. Ezeh, and J.-C. Fotso, *The persistence and challenges of homebirths: perspectives of traditional birth attendants in urban Kenya. Health Policy and Planning, 2009*. 24: p. 36–45.

6. Izugbara, C. O., C. W. Kabiru, and E. M. Zulu, *Urban poor Kenyan women and hospital-based delivery. Public Health Reports, 2009*. 124: p. 585-589.

7. Izugbara, C. and D. Ngilangwa *Women, poverty and adverse maternal outcomes in Nairobi, Kenya. BMC Women's Health, 2010*. 10(1): p. 33.

8. Nyovani J. Madise, et al., *Are slum dwellers at heightened risk of HIV infection than other urban residents? Evidence from population-based HIV prevalence surveys in Kenya*. Health Place, 2012. 18(5): p. 1144-1152.

9. Inter-parliamentary Union, "The Partnership for maternal newborn and child health, and Parliament of Kenya," *Maternal and Child Health: Kenya*, 2012, World Health Organization. http://www.who.int/pmnch/media/membernews/2011/20121216_kenyaparliament.pdf

10. Kyobutungi, C., et al., "The burden of disease profile of residents of Nairobi's slums: Results from a demographic surveillance system." *Population Health Metrics, 2008.*

11. UNICEF, *Pneumonia and diarrhea: Tackling the deadliest diseases for the world's poorest children,* 2012, UNICEF: New York.

12. Ousmane Faye, et al., "Hunger and Food Insecurity in Nairobi's Slums: An Assessment Using IRT Models." *Journal of Urban Health*, 2011.

13. Sarah Patridge, et al., "Inadequate Prenatal Care Utilization and Risks of Infant Mortality and Poor Birth Outcome: A Retrospective Analysis of 28,729,765 U.S. Deliveries over 8 Years." *American Journal of Perinatology*, 2012. 29(10): p. 787-794.

14. Magadi, M., I. Diamond, and N. Madise, "Analysis of factors associated with maternal mortality in Kenyan hospitals." *Journal of Biosocial Science,* 2001. 33: p. 375-389.

15. Villar, J., et al., "WHO antenatal care randomized trial for the evaluation of a new model of routine antenatal care." *The Lancet*, 2001. 357(9268): p. 1551-1564.

16. World Health Organization, *Maternal Immunization against Tetanus, in Standards for Maternal and Neonatal Care* 2006, World Health Organization: Geneva.

17. Fotso, J. ., A. Ezeh, and R. Oronje, "Provision and Use of Maternal Health Services among Urban Poor Women in Kenya: What Do We Know and What Can We Do *Journal of Urban Health*, 2008. 85(3): p. 428-442 ?" .

18. Fotso, J. C., et al., "What does access to maternal care mean among the urban poor? Factors associated with use of appropriate maternal health services in the slum settlements of Nairobi, Kenya" *Maternal & Child Health Journal*, 2008: p. 10.

19. UNDP. *Improve Maternal Mortality: Where we are?* Millennium Development Goals 2013 [cited 2013 15/10];

    Available from: http://www.undp.org/content/kenya/en/home/mdgoverview/overview/mdg5/.

20. Irma T. Elo, *Utilization of maternal health-care services in Peru: The role of women's education. Health Transition Review*, 1992. 2(1).

21. Zelalem B. M., et al., "Determinants of skilled attendance for delivery in Northwest Ethiopia: A community based nested case control study." BMC *Public Health* 2013. 13(130).

22. S˘Rám, R. J., Binková, B., Dejmek, J. & Bobak, M. 2005. "Ambient Air Pollution and Pregnancy Outcomes: A Review of the Literature." *Environmental Health Perspectives,* 113, 375–382.

23. WHO, UNFPA, UNICEF and AMDD 2009. *Monitoring emergency obstetric care: A handbook.*

24. The World Health Organization (WHO), *Immunization, in clinical guidelines for diagnosis and treatment of common conditions in Kenya* 2002, WHO. p. 344.

CHAPTER 9: HIV/AIDS AND OTHER SEXUALLY TRANSMITTED INFECTIONS

Blessing Uchenna Mberu

Since 1984 when it was first diagnosed, HIV/AIDS has remained a major public health challenge in Kenya. At the launch of the NCSS 2000 Kenya was in the midst of a mounting HIV/AIDS crisis. The HIV prevalence rate, as measured by the proportion of adults between ages 15-49 who were infected with HIV, increased from 4 percent in 1990 to 14 percent in 1998. The prevalence in urban areas, estimated at between 17 and 18 percent, was far higher than that in rural areas [1].

However, evidence also demonstrates the extraordinary impact of programs and policies put in place to address the epidemic [2]. The first-ever comprehensive update of the HIV and AIDS epidemic in Kenya over the last decade, for example, indicates that the rate of new HIV infections has fallen by 40 percent. The report also highlights improvements in treatment with 69 percent of HIV-positive pregnant women having received drug prophylaxis to prevent transmission to their infants in 2011; and 83 percent of all adults who were medically eligible receiving antiretroviral therapy (ART) [2]. In terms of behavior change due to HIV/AIDS, Kenya is currently at the forefront of global efforts to implement voluntary medical male circumcision for HIV prevention, with more than 60 percent of adult males in Nyanza province having been circumcised as of December 2010, where male circumcision was not traditionally practiced prior to the epidemic. Kenya has also embraced the goal of ensuring universal access to HIV prevention, treatment, care and support and shown commitment to the vision of a world with zero new HIV infections, zero AIDS deaths, and zero AIDS discrimination [2]. Notwithstanding the progress reported in the past decade, HIV/AIDS remains a major public health challenge in the country with increase in the absolute number of people living with HIV and worldwide decline in HIV funding [2].

This chapter presents data from the NCSS 2012 on awareness of sexually transmitted infections (STIs), sources of information on HIV/AIDS and other STIs, and preventing HIV transmission; perception of risk of getting AIDS; as well as HIV/AIDS-related behavior, including multiple sexual partnerships and HIV testing among slum dwellers. It also examines changes between 2000 and 2012 and compares the findings with those of KDHS 2008-09.

9.1 Awareness of Sexually Transmitted Infections

Data on knowledge about STIs have been identified as an important input into the planning of awareness campaigns for the prevention and management of the diseases[3]. In the NCSS 2012, female respondents were asked whether they had heard about infections that can be transmitted through sexual relations, and if so, to mention the ones they had heard of. The infections most often mentioned spontaneously are shown in Table 9.1.

Table 9.1: Knowledge of sexually transmitted infections

Percentage distribution of female respondents aged 15-49 years by knowledge of specific sexually transmitted infections and background characteristics, NCSS 2012, NCSS 2000							
Background Characteristics	**Syphilis**	**Gonorrhea**	**HIV/AIDS**	**Genital warts**	**Other**	**Don't know**	**Number of cases**
Age							
15-19	71.6	75.4	91.6	16.5	9.8	2.9	590
20-24	70.1	72.0	87.3	10.8	5.2	4.1	1,027
25-29	72.7	78.6	91.1	11.3	2.5	2.9	1,043
30-39	69.6	77.2	91.4	11.9	3.3	1.5	894
40-49	61.5	67.4	92.0	9.8	2.4	1.6	338
Marital Status							
Never married	78.7	80.6	92.3	17.0	9.5	2.7	1,102
Currently married	67.2	73.6	90.1	10.1	2.4	2.8	2,345
Formerly married	68.3	74.0	93.1	9.7	3.6	3.2	388
Missing	39.8	37.7	42.8	7.9	2.2	1.8	57
Division							
Central	68.9	66.5	88.4	16.6	1.1	1.6	303
Makadara	65.1	74.4	94.4	6.7	6.8	0.8	404
Kasarani	57.1	66.1	93.1	5.4	5.5	0.9	404
Embakasi	73.2	77.3	86.7	16.1	4.3	5.2	1,129
Pumwani	81.6	79.3	93.2	17.3	4.2	0.0	182
Westlands	81.6	79.3	93.2	17.3	4.2	0.0	332
Dagoretti	65.0	78.3	87.7	3.0	7.3	6.1	579
Kibera	80.2	83.1	92.0	20.0	4.2	1.4	559
Ethnic Group							
Kamba	69.1	75.9	89.1	13.1	4.7	4.0	862
Kikuyu	74.7	80.1	93.0	10.8	4.8	1.0	867
Luhya	70.2	73.7	89.1	12.0	3.3	3.2	938
Luo	63.8	68.5	91.4	11.2	5.2	2.0	614
Other	71.2	75.7	89.4	13.1	5.1	4.0	589
Education Level							
No education	31.9	41.3	67.3	2.5	0.0	13.2	73
Primary incomplete	54.6	62.0	88.3	8.1	1.7	4.1	620
Primary complete	63.0	69.2	89.6	7.7	1.4	3.4	1,203
Secondary+	81.1	84.3	92.4	16.2	7.5	1.6	1,988
NCSS 2012 Total	70.1	75.1	90.3	12.0	4.5	2.8	3,892
NCSS 2000 Total	64.0	71.5	93.4	1.5	10.6	0.1	3,257
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012							

As in the 2000 survey, HIV/AIDS was the most widely known STI (90.3 percent), followed by gonorrhea (75.1 percent) and syphilis (70.1 percent). Although genital warts remained the least reported STI as in 2000, the proportion of women who reported knowledge of genital warts increased from 1.5 percent in 2000 to 12.0 percent in 2012. Table 9.1 also shows the distribution of spontaneous knowledge of STIs by background characteristics. There was a 3 percentage point overall decline in knowledge of HIV/AIDS between 2000 and 2012 from 93.4 percent in 2000 to 90.4 percent in 2012. Although there was no substantive variation in knowledge of HIV/AIDS by background characteristics, women with no formal education were the least knowledgeable with the proportion that knew of HIV/AIDS declining from 86.3 percent in 2000 to 67.3 percent in 2012. The disadvantage in knowledge among women with no formal education cuts across all STIs. It is important to note, however, that the absolute number of women with no education was very small relative to other education sub-categories across the two surveys, 5.2 percent in 2000 and 2 percent in 2012.

Knowledge of syphilis and gonorrhea increased marginally between 2000 and 2012. However, the pattern of knowledge of both STIs by background characteristics was the same across both surveys. Both increase with education and have

an inverted-U relationship with age, peaking among women aged 25-29. Despite the general increase in knowledge of syphilis and gonorrhea, members of the Luo ethnic community, as in 2000, were the least knowledgeable about both STIs, while the Kikuyu were the most knowledgeable across both surveys, compared to other ethnic groups in Kenya.

9.2 Sources of Information

Understanding where people get their information about HIV/AIDS is central to the design of effective campaigns and highlights appropriate channels to reach target populations. The main sources of information about HIV/AIDS in the slums by background characteristics are summarized in Table 9.2.

The top six sources of information were radio (58.7 percent), health workers (51.1 percent), friends/relatives (49.7 percent), television (39.0 percent), school/teachers (30.3 percent), and church/mosque (23.6 percent). It is noteworthy that the proportion of women reporting radio as a source of information on STIs declined substantially between 2000 and 2012, while a greater proportion of women reported that they obtained information from television (TV) in 2012 relative to 2000. Non-traditional sources such as drama, workplace and community meetings assumed increased relevance as sources of information for women. There was a substantial increase in the proportion of respondents identifying health workers, television and school/teachers as sources of information between 2000 and 2012.

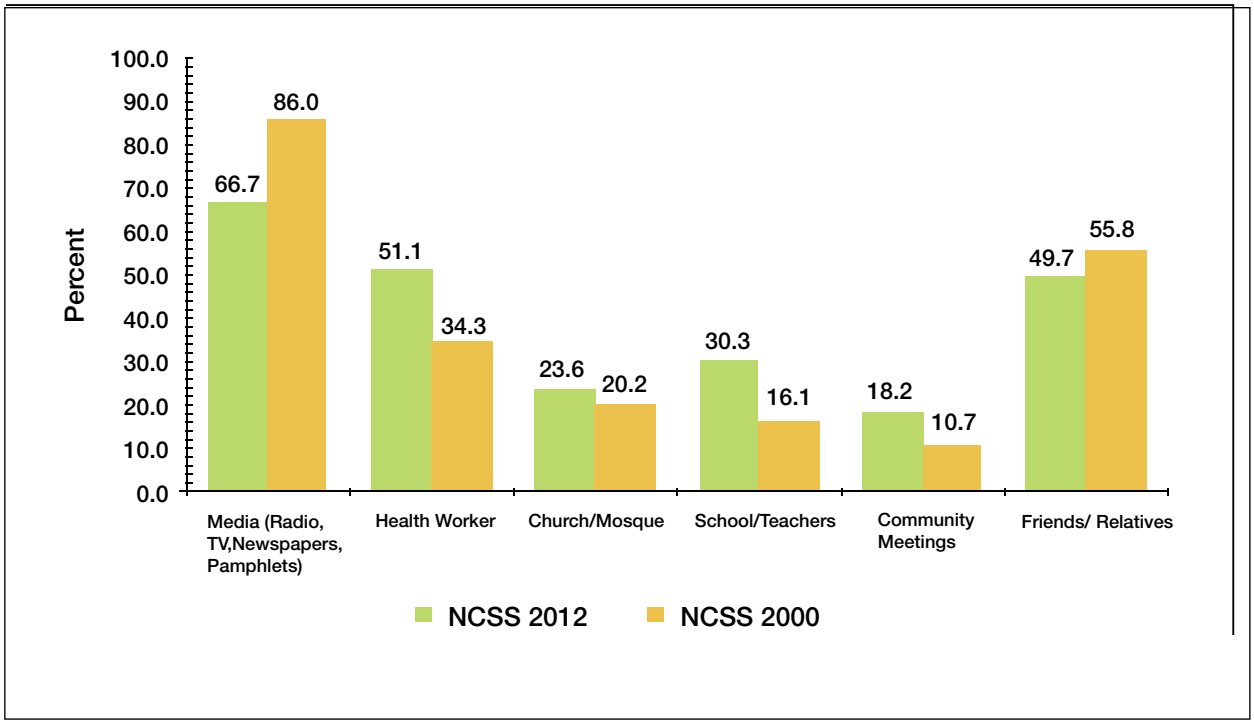
Women with higher levels of education were more likely to obtain their information from formal sources (radio, TV, newspaper, pamphlets, schools and health workers), but less likely to use informal channels such as community meetings, friends and relatives. Younger women (15-19) mostly received information from radio and schools/teachers; women aged 20-24 mentioned radio and friends/relatives; and women aged 25-29 from friends and health workers. Television and radio stood out among women aged 30-39, while the oldest age group (40-49) mostly received information from community meetings and radio. Never married women were more likely to mention radio and schools/teachers as sources of HIV/AIDS information, while currently and formerly married women mostly obtained information from health workers and radio.

Table 9.2: Source of HIV/AIDS knowledge

Percent distribution of female respondents aged 15-49 years by source of HIV/AIDS knowledge, according to selected background characteristics, NCSS 2012, NCSS 2000													
Background Characteristics	**Media**				**Health worker**	**Church/ Mosque**	**School/ Teachers**	**Community Meetings**	**Friends/ Relatives**	**Work place**	**Drama**	**Other sources**	**Number of cases**
	Radio	**TV**	**Newspapers**	**Pamphlets**									
Age													
15-19	49.9	33.2	9.2	18.5	18.2	30.4	48.2	4.1	37.0	0.0	0.0	4.1	590
20-24	68.8	37.9	19.4	7.5	48.3	20.7	34.0	18.1	52.0	7.9	3.8	0.0	1,027
25-29	38.5	35.5	22.1	11.8	63.7	16.6	21.1	17.8	69.6	9.5	10.4	0.0	1,043
30-39	81.0	61.0	30.5	46.7	75.0	44.0	26.4	20.7	34.7	5.5	3.8	0.0	894
40-49	60.7	23.9	0.0	0.0	51.8	0.0	0.0	63.6	12.5	23.9	0.0	0.0	338
Marital Status													
Never married	60.4	49.0	23.2	21.7	25.9	30.9	59.1	10.2	43.3	2.2	0.0	0.0	1,102
Currently married	61.8	37.2	19.8	15.0	56.2	22.3	16.7	15.9	55.7	11.6	8.1	1.2	2,345
Formerly married	44.1	27.8	6.8	6.8	81.1	14.5	24.2	48.1	39.3	0.0	0.0	0.0	388
Marital Duration (years)													
Never married	60.4	49.0	23.2	21.7	25.9	30.9	59.1	10.2	43.3	2.2	0.0	0.0	1,102
0-4	57.5	26.3	9.6	9.7	53.7	13.3	12.6	20.3	62.5	5.4	5.4	2.8	888
5-9	60.9	30.2	28.9	13.6	72.3	31.6	19.0	17.5	67.9	13.6	9.4	0.0	627
10-14	52.9	45.8	14.1	16.3	50.0	27.1	27.5	23.1	54.6	8.7	12.8	0.0	438
15+	64.7	40.9	21.2	21.2	68.8	18.8	9.8	45.5	10.4	13.4	0.0	0.0	521
Division													
Central	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	303
Makadara	55.9	38.9	38.9	0.0	43.4	37.1	83.0	19.4	61.1	0.0	0.0	0.0	404
Kasarani	90.0	35.1	30.8	30.8	90.9	0.0	26.6	16.6	20.9	0.0	0.0	0.0	404
Embakasi	79.2	56.5	28.2	28.4	49.6	56.7	42.6	24.2	70.8	15.1	13.4	0.0	1,129
Westlands	7.2	8.2	4.3	0.0	56.3	0.0	9.6	13.4	64.3	0.0	0.0	0.0	332
Kibera	80.4	52.7	22.4	17.7	27.9	7.9	37.9	19.8	12.8	10.3	0.0	3.6	559
Duration of stay in HH													
<2	53.6	34.1	12.4	13.8	52.8	30.1	32.3	22.0	54.4	5.2	5.5	0.0	1,444
2-4	66.0	45.9	35.9	29.8	53.9	24.7	23.3	19.0	58.0	8.2	8.2	2.9	955
5-7	62.2	41.8	8.7	16.2	78.6	13.6	14.4	15.1	47.4	7.6	0.0	0.0	534
8+	73.9	41.1	25.9	0.0	13.0	0.0	34.1	9.7	27.4	16.8	0.0	0.0	709
Since birth	19.3	44.4	0.0	0.0	60.3	35.0	79.6	0.0	14.6	0.0	0.0	0.0	250
Education Level													
No education	51.9	13.7	0.0	0.0	44.7	0.0	0.0	50.4	13.7	13.7	0.0	0.0	73
Primary incomplete	68.6	33.5	8.8	9.8	51.3	17.1	25.8	6.4	50.3	3.0	3.0	2.8	620
Primary complete	41.9	35.7	19.8	18.8	56.6	32.0	28.9	18.3	56.8	5.1	6.8	0.0	1,203
Secondary+	72.9	55.8	32.7	22.0	45.8	25.8	45.1	19.2	50.8	12.4	5.1	0.0	1,988
NCSS 2012 Total	58.7	39.0	18.9	15.8	51.1	23.6	30.3	18.2	49.7	7.4	4.7	0.7	3,892
NCSS 2000 Total	81.1	26.5	22.1	12.2	34.3	20.2	16.1	10.7	55.8	4.4	2.0	3.9	3,257
Note: Data on specific sources of HIV/AIDS knowledge was not captured after KDHS 1998													
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012													

Consistent with previous studies in Nairobi and Mombasa [4, 5], the prominence of radio as a source of information about HIV/AIDS remained substantial across the slums of Nairobi in 2012. However, there were variations by different locations. Health workers were identified as the main source of information about HIV/AIDS for residents in the slums of Kasarani (90.9 percent) and Dagoretti (72.4 percent). Residents of Makadara identified schools/teachers (83.0 percent) and friends/relatives (61.1 percent) as their main sources of information, whereas friends/relatives were the main source of information for slum residents of Embakasi (70.8 percent) and Westlands (64.3 percent).

Figure 9.1: Sources of HIV/AIDS information, NCSS 2012, NCSS 2000



The sources of information were similar across the slums of Nairobi in 2000 and 2012 for most of the channels. There was, however, a decline in the role of traditional mass media as a source of information for HIV/AIDS for the urban poor. In particular, the mass media (radio, television, newspapers and pamphlets) declined substantially as sources of information from 86.0 percent in 2000 to 66.7 percent in 2012 (Figure 9.1). This outcome may be explained by the cut in investments in public institutions to promote reproductive health messages in the last decade. What is also clear, however, was the increasing importance of non-traditional sources of information, especially the relative importance of health workers, schools/teachers and community meetings as sources of HIV/AIDs information in the slums of Nairobi. For example, the proportion of respondents identifying health workers and schools/teachers as sources of HIV/AIDS information increased from 34.3 percent to 51.1 percent and from 16.1 percent to 30.3 percent, respectively, over the inter-survey period (Figure 9.1). This notwithstanding, it is important to note the 13 percentage point increase in the proportion of women identifying television as a source of information over the period (Table 9.2). This may be related to a three-fold increase in TV ownership between 2000 and 2012 among slum dwellers (see Table 2.5).

9.3 Preventing HIV Transmission

Building on evidence that most HIV infections across SSA are linked to heterosexual relations, experts have suggested that behavior change interventions relating to sexual relations offer the greatest promise for protection against HIV/AIDS infection [6]. Abstinence, faithfulness and consistent condom use (the ABC model) have been identified as key to HIV/AIDS infection risk reduction strategy. To determine the level of women's knowledge about HIV/AIDS prevention, respondents were asked about ways in which a person could avoid getting infected. The results are summarized in Table 9.3.

The most commonly cited ways of avoiding HIV infection were the use of condoms (71.7 percent), being faithful to one's partner (55.7 percent) and sexual abstinence (47.6 percent). Slightly more than one-fifth (21.2 percent) of the respondents mentioned avoiding multiple sexual partners. Currently married women (61.4 percent), women living in Kibera Division (71.3 percent), and older women aged 30 and above were most likely to mention being faithful to one's partner. Women living in Kasarani and Westlands Divisions were the least likely to identify being faithful to one's partner

and were among the least likely to identify avoiding sex with prostitutes as a protection strategy. Condom use was mentioned more frequently by women aged 15 to 39 years (over 70 percent), formerly and never married women (over 75 percent), women living in Kibera (84.2 percent), and women with complete primary or higher education (72.4 and 74.1 percent, respectively).

In 2012, a small proportion of women responded that there was no way to avoid HIV/AIDS (2.2 percent), a decline from the proportion observed in 2000 (4.5 percent). Additionally, 2.0 percent of women were ignorant of any method that can be used to prevent HIV infection, a decrease from the 3.6 percent reported in 2000. The lack of knowledge of ways of preventing HIV infection was more pronounced among women with no formal education (8.3 percent) and women living in Makadara Division (4.1 percent).

Table 9.3: Knowledge of ways to avoid HIV/AIDS among women

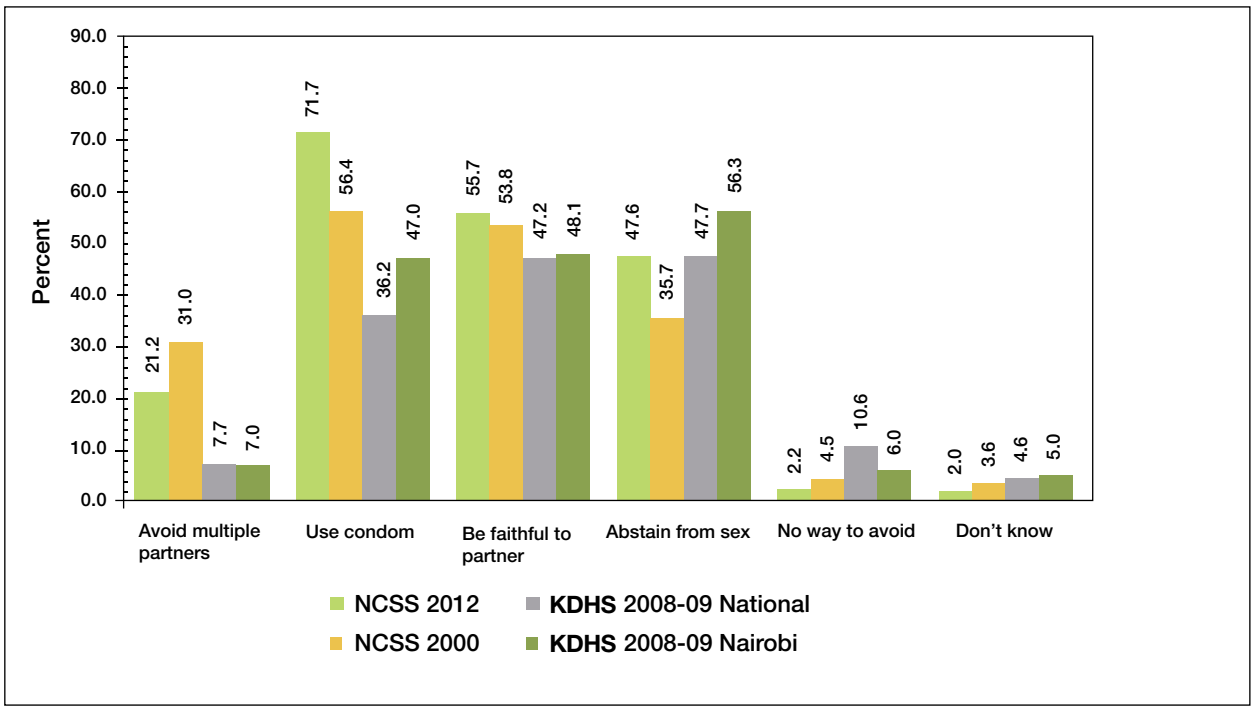
Percent distribution of women aged 15-49 years by knowledge of ways to avoid HIV/AIDS infection, according to selected background characteristics, NCSS 2012, NCSS 2000

	No way to avoid	Abstain from sex	Use condom	Avoid multiple partners	Be faithful to partner	Avoid sex with prostitutes	Avoid blood transfusion	Avoid injection	Other	Don't know	Number of women
Age											
15-19	2.5	68.3	70.2	15.3	42.2	5.0	14.8	15.5	46.7	2.0	590
20-24	2.1	47.5	73.0	20.1	51.2	5.6	10.8	12.0	37.2	3.0	1,027
25-29	1.7	42.4	74.5	22.2	60.4	6.2	11.5	12.7	39.8	1.5	1,043
30-39	2.9	42.4	71.5	23.8	61.5	5.8	12.7	11.5	38.2	1.5	894
40-49	2.0	41.8	62.0	24.3	62.9	7.4	12.6	15.6	36.5	1.4	338
Marital Status											
Never married	2.5	67.8	75.3	18.2	45.8	5.4	13.1	14.4	44.6	2.2	1,102
Currently married	2.0	38.7	70.5	22.2	61.4	6.4	11.4	12.3	37.5	2.1	2,345
Formerly married	2.3	47.3	75.4	22.8	52.4	4.2	15.4	14.1	39.4	0.6	388
Division											
Central	0.3	48.9	65.9	33.8	67.1	13.8	27.0	20.1	51.9	1.0	303
Makadara	4.4	35.9	73.1	26.4	46.9	3.2	4.7	5.9	29.1	4.1	404
Kasarani	0.6	33.6	71.0	17.7	37.6	1.5	4.9	10.1	32.2	0.2	404
Embakasi	3.6	48.9	65.3	30.3	58.7	13.6	23.9	23.9	49.6	3.6	1,129
Pumwani	0.0	72.4	68.8	27.6	67.1	2.0	17.6	9.0	55.9	0.5	182
Westlands	1.0	29.2	67.5	13.5	40.6	1.0	3.4	15.9	34.7	1.5	332
Dagoretti	2.8	50.9	78.3	9.2	55.4	0.9	2.8	3.2	28.1	1.2	579
Kibera	1.1	64.9	84.2	9.8	71.3	0.6	5.1	2.7	34.9	0.5	559
Education Level											
No education	2.3	32.6	47.9	18.7	47.3	4.8	11.9	11.8	25.4	8.3	73
Primary incomplete	3.7	37.9	65.9	20.8	49.1	7.6	12.0	10.6	35.9	2.6	620
Primary complete	2.2	41.2	72.4	22.1	56.7	6.6	9.6	10.8	36.5	2.3	1,203
Secondary+	1.8	55.3	74.1	20.9	57.6	4.9	13.8	15.1	43.2	1.3	1,988
NCSS 2012 Total	2.2	47.6	71.7	21.2	55.7	5.8	12.2	12.9	39.5	2.0	3,892
NCSS 2000 Total	4.5	35.7	56.4	31.0	53.8	5.2	7.8	10.5	6.9	3.6	3,247

Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012

Figure 9.2 compares knowledge of ways to prevent HIV/AIDS between women living in the slums of Nairobi in 2000 and 2012 with the KDHS 2008-09 estimates for Nairobi Province and Kenya as a whole. The percentage distribution of four dominant methods is displayed, namely use of condom, avoiding multiple sexual partners, being faithful to one sexual partner and abstaining from sex. The results suggest higher knowledge of ways to prevent HIV/AIDS among women living in the slums compared to the rest of Nairobi and Kenya as a whole. Findings also showed an increase in knowledge of condom as a prevention strategy from 56.4 percent in 2000 to 71.7 percent in 2012 in the slums. Similarly, the proportion of women living in slums that identified abstinence as an HIV/AIDS prevention strategy increased from 35.7 percent in 2000 to 47.6 percent in 2012. It is important to note that knowledge of HIV/AIDS prevention strategies substantially improved in the slums over the inter-survey period relative to other parts of Nairobi and the entire Kenya.

Figure 9.2: Knowledge of ways to prevent HIV/AIDS, NCSS 2012, NCSS 2000 and KDHS 2008-09



9.4 Perception of Risk of Getting AIDS

Subjective perception of one's own risk of contracting STIs is correlated with adoption of risk-reduction strategies [1, 3, 7]. In SSA, researchers have demonstrated significant association between individuals' correct assessment of risk and the prevalence of protective behaviors such as condom use [8] and seeking of Voluntary Counseling and Testing services (VCT) [9]. Assessing the depth of knowledge is critical to understanding the extent to which individuals' perceptions of HIV provide a basis for behavioral change. This section presents results of analysis of questions about HIV/AIDS-related issues and self-evaluation of the risk of getting HIV among women. The questions relate to whether an apparently healthy-looking person is likely to have the HIV virus and whether AIDS could be transmitted from mother to child. For self-evaluation, respondents were asked whether their chances of getting HIV/AIDS were nonexistent, small, moderate, or great. The responses to these questions are summarized in Table 9.4.

The majority of the women correctly responded that a healthy-looking person could have the HIV virus (92.2 percent). Women who believed that a person's HIV status could be assessed from physical appearance were likely to be younger, aged 15-24 years (7-8 percent), or older, 45-49 years (7.1 percent), never married women (6.4 percent), women in their first four years of marriage (6.8 percent), and those living in Kasarani Division (9.4 percent).

About 6 percent of women in the slums of Nairobi in 2012 had incorrect perceptions regarding whether a healthy-looking person could be HIV positive, compared to 7.5 percent in the slums in 2000, 3.5 percent in Nairobi and 6.9 percent in Kenya as a whole in 2008. Concerted and targeted efforts remain necessary throughout Kenya to provide correct information, but mostly in rural areas where over 8 percent of women of reproductive age believe that a healthy-looking person cannot be infected with HIV.

There was a very high level of knowledge of mother to child transmission of AIDS across most categories of women living in the slums. However, there were exceptions to this near universal knowledge, especially among women living in Central Division (76.0 percent), and those with no formal education (76.4 percent). There is therefore need to move away from the assumption that knowledge of HIV/AIDS has become universal and seek for ways to address the knowledge gap with targeted and tailored information, education and communication interventions.

The majority of women thought they were either at small or no risk of HIV/AIDS infection (44.7 and 37.8 percent, respectively). The youngest women aged 15-19 (34.7 and 56.7 percent) and the never married (40.2 and 48.3 percent) were most likely to perceive themselves to be at small or no risk of HIV/AIDS infection, respectively. The respective proportions for young (15-19 years) and never married women in KDHS 2008-09 were 43.1 and 7.2 percent in Kenya,

44.3 and 7.6 percent in rural Kenya, and 36.0 and 4.6 percent in Nairobi. On the other hand, a relatively small proportion of women considered their risk to be moderate or great (about 10.8 and 6.7 percent, respectively). For Kenya, these figures were 34.4 and 14.0 percent, for rural Kenya it was 32.5 and 14.0 percent and for Nairobi, corresponding proportions were 49.1 and 8.9 percent, respectively.

Table 9.4: Perception of risk of HIV/AIDS among women

Percent distribution of women aged 15-49 years by their perception to one's HIV/AIDS status, vertical transmission, according to selected background characteristics, NCSS 2012, NCSS 2000 and KDHS 2008-09									
Background Characteristics	**Can a healthy looking person have the HIV virus that causes AIDS?**			**AIDS can be transmitted from mother to child**	**Personal chance of getting HIV/AIDS**				**Number of cases**
	Yes	**No**	**Don't know**	**Yes**	**No risk at all**	**Small risk**	**Moderate risk**	**Great risk**	
Age									
15-19	89.1	8.1	2.8	88.1	56.7	34.7	5.2	3.3	590
20-24	89.9	7.4	2.7	87.5	37.4	47.6	9.3	5.6	1,027
25-29	93.9	4.6	1.6	90.6	30.2	47.8	13.9	8.1	1,043
30-34	94.9	3.3	1.9	89.3	31.5	44.1	16.0	8.4	543
35-39	95.2	3.8	1.0	89.8	35.8	46.5	10.7	7.1	351
40-44	93.0	3.6	3.4	85.6	42.6	37.7	10.9	8.9	198
45-49	91.4	7.1	1.5	86.9	36.4	51.6	4.6	7.5	140
Marital duration (years)									
Never married	91.9	6.4	1.8	91.0	48.3	40.3	6.9	4.4	1,102
0-4	90.4	6.8	2.8	92.7	36.0	46.0	12.1	5.9	888
5-9	93.5	5.1	1.4	92.1	28.1	46.8	16.0	9.2	627
10-14	93.9	3.9	2.1	92.4	33.5	45.0	11.9	9.6	438
15+	95.4	3.6	1.0	91.2	36.9	44.6	10.4	8.2	521
Division									
Central	90.9	3.1	6.0	76.0	5.8	70.8	15.9	7.5	303
Makadara	94.2	4.0	1.8	91.7	41.6	34.3	19.7	4.4	404
Kasarani	88.3	9.4	2.3	93.6	38.3	46.4	10.7	4.7	404
Embakasi	90.9	6.8	2.3	83.6	37.4	46.5	8.8	7.4	1,129
Pumwani	95.1	2.5	2.4	84.3	9.4	65.5	18.5	6.7	182
Westlands	90.4	5.5	4.0	91.6	53.6	24.2	14.4	7.9	332
Dagoretti	94.3	5.1	0.5	90.7	43.2	41.5	8.9	6.3	579
Kibera	95.3	4.2	0.5	97.0	42.5	46.4	3.4	7.7	559
Duration of stay in the slum (years)									
<2	89.8	7.1	3.1	88.0	38.8	44.4	11.4	5.4	1,444
2-4	92.9	5.6	1.5	86.6	37.2	43.4	11.8	7.7	955
5-7	93.0	4.7	2.3	90.5	32.1	49.0	11.8	7.1	534
8+	94.7	3.9	1.5	90.5	37.0	45.3	9.4	8.3	709
Since birth	94.7	4.4	0.9	93.3	47.6	41.2	6.3	4.8	250
Education Level									
No education	85.1	1.5	13.4	76.4	45.0	39.9	0.0	15.1	73
Primary incomplete	88.6	9.2	2.2	85.7	39.3	41.9	11.5	7.3	620
Primary complete	89.6	7.2	3.2	88.0	36.4	45.9	10.7	6.9	1,203
Secondary+	95.3	3.7	1.1	90.8	38.0	44.9	11.1	6.0	1,988
NCSS 2012 Total	92.2	5.6	2.1	88.8	37.8	44.7	10.8	6.7	3,892
NCSS 2000 Total	89.7	7.5	2.8	91.8	25.2	49.9	20.7	4.2	3,247
KDHS 2008-09									
National	90.0	6.9	2.2	91.6	7.2	43.1	34.4	14.0	8,444
Rural	88.4	8.3	2.3	90.9	7.6	44.3	32.5	14.0	6,296
Other urban	95.2	2.7	1.8	93.3	6.7	41.0	35.3	16.3	1,420
Nairobi	93.7	3.5	1.8	93.9	4.6	36.0	49.1	8.9	728
Table displays columns and/or rows containing 'non-missing' values (some percentages may not add up to 100%)									
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09									

9.5 Multiple Sexual Partners and STIs

Multiple sexual partnerships represent a key risk factor for HIV/AIDS and STIs. To assess the prevalence of this behavior, respondents were asked about the number of sexual partners they had in the 12 months preceding the survey. The results are summarized in Table 9.5.

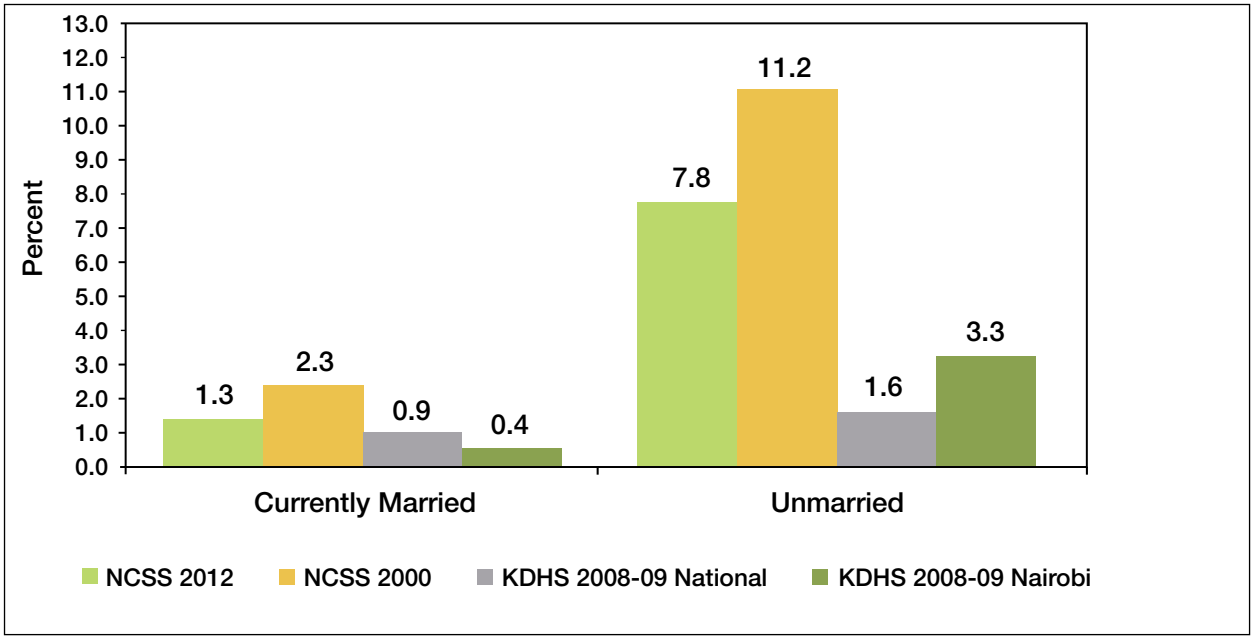
Table 9.5: Multiple sexual partners

Percent distribution of currently married and unmarried women aged 15-49 years by number of persons with whom they had sexual intercourse in the last 12 months, according to selected background characteristics, NCSS 2012, NCSS 2000								
Background Characteristics	**Currently married^**				**Unmarried**			
	0	**1**	**2+**	**Number of Cases**	**0**	**1**	**2+**	**Number of Cases**
Age								
15-19	6.0	93.2	0.8	139	80.4	15.3	4.3	435
20-24	1.8	96.6	1.6	624	43.6	47.0	9.4	348
25-29	1.5	96.6	1.9	760	35.0	55.5	9.5	188
30-39	1.8	97.7	0.5	626	38.5	45.5	16.0	102
40-49	8.4	90.5	1.0	196	64.7	30.3	5.1	29
Division								
Central	4.4	94.4	1.2	195	47.4	48.4	4.2	73
Makadara	1.6	97.9	0.5	221	37.5	44.6	17.9	129
Kasarani	3.2	93.6	3.2	245	84.9	9.1	6.0	115
Embakasi	2.6	95.7	1.7	693	56.7	34.9	8.3	322
Pumwani	4.0	94.3	1.7	100	53.6	39.6	6.8	53
Westlands	0.8	99.2	0.0	214	51.2	43.0	5.7	74
Dagoretti	1.8	97.1	1.1	341	61.2	32.9	5.9	168
Kibera	3.4	96.0	0.6	336	56.6	38.1	5.2	168
Duration of stay in the slums (years)								
<2	1.7	95.7	2.6	837	52.9	38.9	8.2	472
2-4	2.8	96.7	0.6	629	56.2	36.6	7.2	221
5-7	1.5	98.2	0.3	364	55.8	30.1	14.2	109
8+	3.9	95.6	0.5	465	61.2	29.4	9.5	127
Since birth	7.8	89.1	3.1	50	69.1	28.4	2.5	173
Education Level								
No education	12.1	87.9	0.0	41	47.3	52.7	0.0	9
Primary incomplete	3.8	94.3	1.9	378	68.8	22.9	8.3	120
Primary complete	2.5	96.1	1.4	819	48.2	42.3	9.5	251
Secondary+	1.8	97.1	1.0	1,105	58.9	34.1	7.0	721
Missing	0.0	100.0	0.0	2	0.0	0.0	100.0	1
NCSS 2012 Total	2.6	96.2	1.3	2,345	57.5	34.7	7.8	1,102
NCSS 2000 Total	0.0	97.5	2.3	1,931	28.8	38.3	11.2	1,325
^ Number of partners includes the current spouse								
*** Table displays columns and/or rows containing 'non-missing' values (some percentages may not add up to 100%)**								
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012								

Nearly all currently married women reported one sexual partner (96.2 percent) during the reference period. Among the never married women, 57.5 percent reported no sexual partners, while 7.8 percent reported two or more sexual partners. The proportion of married women with multiple sexual partners decreased from 2.3 percent in 2000 to only 1.3 percent in 2012, while unmarried women with multiple partners over the same period declined from 11.2 percent to 7.8 percent. Further, never married women with two or more sexual partners in the year preceding the survey were more likely to be migrants than those born in the slums; they were also more likely to be living in Makadara than in other slums in Nairobi.

It is worth noting that there was a substantial increase in the proportion of never married women who reported no sexual partner, from 28.8 percent in 2000 to 57.5 percent in 2012. The lower proportion of multiple sexual partnerships may be related to the reported decline among men, with the proportion of men reporting multiple sexual partners falling from 24 percent in 1998 to 9 percent in 2008–2009 [2]. However, women usually consider themselves at low risk of getting AIDS when they have only one sexual partner, ignoring the fact that their risk is likely to be higher if the partner has other sexual partners [4]. Such a belief presents a challenge to strategies on HIV/AIDS education and prevention, more so in the context of high risk sexual behavior in slum settlements.

Figure 9.3: Multiple sexual partners in the last 12 months by marital status, NCSS 2012, NCSS 2000 and KDHS 2008-09



Despite improvements over the inter-survey period, sexual risk taking in terms of multiple sexual partnerships among married and never married women is more prevalent in the slums relative to other parts of Nairobi and Kenya (Figure 9.3). The proportion of currently married women living in the slums of Nairobi that reported multiple sexual partners (1.3 percent) was higher than that among their counterparts in Nairobi and Kenya (0.4 percent and 0.9 percent, respectively). Further, never married women resident in Nairobi slums were more than twice and about five times as likely to have multiple sexual partners as their counterparts living elsewhere in Nairobi and Kenya, respectively.

Following evidence that multiple sexual partnerships increase the risk of STIs, these findings bring to the fore the work that needs to be done in addressing behavior changes in order to achieve full control of the spread of HIV and other STIs among vulnerable populations in Kenya. In recent years, researchers have shown particular interest in the potential role of concurrent sexual partnerships in accelerating the spread of HIV within sexual networks [10, 11]. According to Gelmon and et al [12], the social acceptance of concurrent and/or multiple partnerships in Kenya is a major driver of the country's HIV/AIDS epidemic. Despite the persuasiveness of the sexual concurrency perspective [2], the definitive linkage between HIV prevalence and rates of sexual concurrency remains unclear [13].

9.6 Knowledge, Source and Use of Condom

Condoms are highly effective in preventing pregnancy and STIs when used correctly and consistently [14, 15]. Table 9.6 shows that 91.2 percent of all respondents knew that condoms prevent HIV/AIDS and STIs, and all respondents knew where to obtain them.

However, knowledge of public sources of condom declined more than two-fold between 2000 and 2012, while knowledge of private sources of condom over the same period increased from 16.8 percent to 29.5 percent. This may be related to the growing importance of private sources of condom over the period. The overwhelming majority of women had not used a condom during their last sexual intercourse (90.7 percent). Only 9 percent of the women used condoms, and most of them were unmarried (18.6 percent), living in Makadara (14.7 percent) and Westlands (12.7 percent), and with secondary education or higher (11.1 percent). Over the inter-survey period, condom use in the last sexual intercourse increased by about 3 percentage points only from 6.7 percent to 9.3 percent.

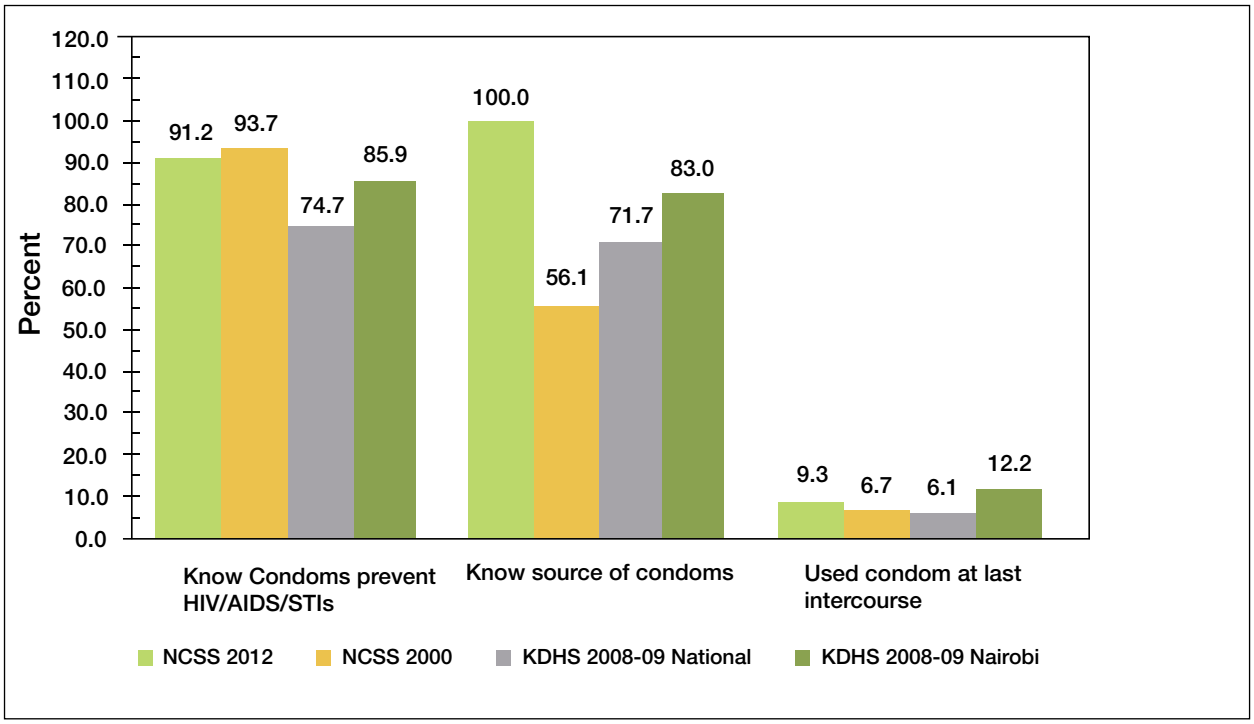
Table 9.6: Knowledge of condom sources and condom use

Percent distribution of female respondents aged 15-49 years by knowledge of sources of condoms and condom use during the last sexual intercourse, according to selected background characteristics, NCSS 2012, NCSS 2000								
Background Characteristics	Know condoms prevent HIV/AIDS/ STIs	Know source of condoms				Used condom at last intercourse		Number of Cases
		Don't know source	Public source	Private source	Other sources	Yes	No	
Age								
15-19	87.7	-	10.3	24.7	65.0	9.3	90.7	590
20-24	92.1	-	7.2	31.1	61.7	12.1	87.9	1,027
25-29	91.4	-	13.2	30.4	56.4	7.9	92.1	1,043
30-34	91.8	-	0.0	0.0	100.0	8.5	91.5	543
35-39	91.8	-	20.4	44.0	35.5	9.8	90.2	351
40-44	90.5	-	0.0	61.9	38.1	7.9	92.1	198
45-49	93.9	-	0.0	0.0	100.0	4.1	95.9	140
Marital Status								
Never married	90.8	-	7.6	30.7	61.7	18.6	81.4	1,102
Currently married	92.0	-	14.4	32.1	53.5	4.3	95.7	2,345
Formerly married	95.4	-	0.0	15.2	84.8	15.2	84.8	388
Division								
Central	82.2	-	47.7	0.0	52.3	5.3	94.7	303
Makadara	96.2	-	0.0	17.3	82.7	14.7	85.3	404
Kasarani	94.0	-	12.6	30.0	57.3	10.8	89.2	404
Embakasi	86.0	-	7.1	11.8	81.1	6.1	93.9	1,129
Pumwani	81.1	-	0.0	53.2	46.8	6.8	93.2	182
Westlands	97.0	-	24.4	0.0	75.6	12.7	87.3	332
Dagoretti	93.8	-	16.4	54.1	29.5	11.4	88.6	579
Kibera	96.9	-	6.1	65.1	28.7	9.6	90.4	559
Education Level								
No education	79.9	-	-	-	-	6.4	93.6	73
Primary incomplete	90.8	-	17.9	39.6	42.6	7.6	92.4	620
Primary complete	90.5	-	12.0	49.3	38.7	7.7	92.3	1,203
Secondary+	92.3	-	6.9	20.2	72.9	11.1	88.9	1,988
NCSS 2012 Total	91.2	-	9.9	29.5	60.6	9.3	90.7	3,892
NCSS 2000 Total	93.7	43.9	21.8	16.8	17.5	6.7	93.3	3,256
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012								

Figure 9.4 compares knowledge of condoms, sources, and use during the last sexual intercourse between the slums of Nairobi, Nairobi as a whole, and Kenya. Women in the slums were comparable to or better off than women in other parts of Nairobi and across Kenya in knowledge of condom and knowledge of a source of condom. In terms of condom use during the last sexual intercourse, women in the slums in 2012 did better than women in the 2000 survey and women across Kenya surveyed in the KDHS 2008-09. However, women in slums were less likely to use a condom during the last sexual intercourse relative to women in other parts of Nairobi.

What is profound is the apparent disconnect between knowledge of condom, knowledge of a source of condom and condom use, not only in the slums but across the country. Despite evidence of increases in the last decade and half, condom use in Kenya, including among people with two or more partners, remains sub-optimal [2]. According to the 2012 Kenya AIDS Epidemic Update Report by the National AIDS Control Council (NACC) and the National AIDS/STDs Control Programme (NASCOP), 72 percent of adults surveyed in 2007reported having had unprotected sex with a partner of unknown or discordant HIV status in the previous 12 months [2]. Further, among adults with multiple partners, only 34.9 percent reported using a condom during the last sexual intercourse – a modest increase over the 32.8 percent reported in 2003 but still lower than needed to slow the spread of HIV [2]. The deficit in condom use in the context of persistence of risky sexual behavior remains a window of opportunity for research, policy and program interventions.

Figure 9.4: Knowledge of condoms, source and use during last sexual intercourse, NCSS 2012, NCSS 2000 and KDHS 2008-09



9.7 Behavior Change

Respondents were asked whether they had changed their behavior to lower the risk of HIV infection, and if so, what they had done. The results by selected background characteristics for the 2012 and 2000 surveys are shown in Table 9.7. The majority of women had changed their sexual behavior in a variety of ways: staying with one partner (46.4 percent), asking their spouse to be faithful (22.0 percent), remaining virgins (10.0 percent), reducing the number of their sexual partners (5.2 percent), stopping all sexual relations (6.9 percent), and using condoms (9.0 percent).

Young and unmarried women who had not initiated sexual relations were more likely to remain virgins. For example, in an attempt to avoid AIDS, a large proportion of younger women, 15-19 and never married women planned to keep their virginity (39.2 percent and 28.9 percent, respectively). On the other hand, there were those who opted for secondary abstinence by stopping sexual relations altogether. These were women formerly in union (21.4 percent), and older women, 45-49 (17.3 percent), women with no formal education (14.6 percent), and never married women (13.6 percent). Restricting sex to one partner (58.9 percent) and asking a partner to be faithful (31.5 percent) were key behavioral changes among currently married women, especially those who married in the four years prior to the survey (92.4 percent).

Table 9.7 also compares changes and continuities in terms of how women modified their behavior in response to the HIV/AIDS epidemic between 2000 and 2012 across Nairobi informal settlements. The overall change in behavior was typified by a reduction in the proportion of women who did not change their behavior at all from 14 percent in 2000 to 0.2 percent in 2012. However, the proportion of women who kept their virginity remained unchanged over the inter-survey period at 10.0 percent. Those who stopped all sex increased from 5.4 to 6.9 percent. Condom use more than doubled but the increase was at very low levels from 4.1 percent in 2000 to 9.0 percent in 2012. The high risk potential of the less than optimal levels of condom use is a matter of concern, following persistence of various elements of risky sexual behaviors over the inter-survey period, including multiple sexual partnerships. These outcomes suggest that community education on HIV/STI and outreach interventions around behavior modification may be most needed activities among the urban poor now than was previously the case in 2000.

Table 9.7: Change in sexual behavior to avoid HIV/AIDS

Percent distribution of women aged 15-49 years by type of change in behavior in order to avoid HIV/AIDS, according to selected background characteristics, NCSS 2012, NCSS 2000								
Background Characteristics	**Kept virginity**	**Stopped all sex**	**Started using condoms**	**Restricted sex to one partner**	**Reduced number of partners**	**Asked spouse to be faithful**	**No behavior change**	**Number of cases**
Age								
15-19	39.2	8.8	7.4	22.9	3.0	9.3	0.0	590
20-24	8.9	4.8	11.4	46.2	5.1	20.4	0.3	1,027
25-29	2.8	5.0	8.4	55.3	6.7	27.3	0.2	1,043
30-34	3.7	6.0	8.0	54.8	5.7	27.7	0.4	543
35-39	2.7	10.0	10.3	50.5	5.4	23.9	0.0	351
40-44	1.5	11.2	6.6	41.7	3.9	17.0	0.8	198
45-49	5.7	17.3	5.9	44.5	3.0	27.8	0.0	140
Marital Status								
Never married	28.9	13.6	15.4	24.5	4.5	6.7	0.0	1,102
Currently married	2.9	1.5	5.1	58.9	5.3	31.5	0.3	2,345
Formerly married	1.3	21.4	15.6	35.7	4.4	7.5	0.4	388
Marital duration (years)								
Never married	28.9	13.6	15.4	24.5	4.5	6.7	0.0	1,102
0-4	-	1.7	6.4	62.1	4.9	30.3	0.3	888
5-9	-	3.4	7.1	57.6	4.4	29.1	0.4	627
10-14	-	4.0	7.5	57.9	5.5	28.8	0.2	438
15+	-	9.2	5.6	48.8	4.2	25.3	0.3	521
Duration of stay in slum (years)								
<2	10.5	6.6	10.2	44.3	5.3	18.4	0.1	1,444
2-4	7.4	5.3	8.7	49.0	5.3	22.8	0.1	955
5-7	6.7	7.3	8.3	52.1	6.1	25.6	0.1	534
8+	6.2	8.7	5.9	48.0	4.2	29.3	0.6	709
Since birth	35.6	8.6	13.6	32.3	4.9	11.9	0.6	250
Division								
Central	5.9	4.6	6.4	48.6	3.8	23.4	0.0	303
Makadara	3.3	3.6	12.1	51.7	5.7	16.0	0.0	404
Kasarani	24.0	11.3	8.6	48.5	1.6	23.0	0.3	404
Embakasi	8.3	4.9	7.3	39.4	9.5	21.0	0.5	1,129
Pumwani	12.5	10.1	7.0	55.6	1.0	39.0	0.0	182
Westlands	5.2	9.9	9.4	50.4	4.1	5.5	0.2	332
Dagoretti	11.5	8.2	10.5	55.2	3.4	16.0	0.0	579
Kibera	10.5	6.9	10.7	40.9	3.3	38.4	0.2	559
Education Level								
No education	5.3	14.6	7.0	29.0	2.5	13.7	0.0	73
Primary incomplete	9.3	7.5	7.1	43.6	5.0	22.2	0.3	620
Primary complete	7.1	6.8	7.3	49.9	5.9	24.8	0.3	1,203
Secondary+	12.3	6.5	10.6	45.9	4.9	20.7	0.2	1,988
NCSS 2012 Total	10.0	6.9	9.0	46.4	5.2	22.0	0.2	3,892
NCSS 2000 Total	10.0	5.4	4.1	57.1	7.4	19.9	14.0	3,247
Note: Data on change in sexual behavior to avoid HIV/AIDS was not captured after KDHS 1998								
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012								

Testing and counseling for HIV has been identified as a primary entry point to HIV prevention, treatment, care and support. Evidence suggests that from only three VCT centers in Kenya in 1999, there were more than 1,000 VCT centers and 4,438 health facilities offering HIV testing and counseling services across the country by the end of 2010 [2].

In 2011, 65 percent of all health facilities, including more than 78 percent of public sector facilities, offered HIV counseling and testing services free of charge. In seeking to understand whether the urban poor benefited as much as other groups

from the progress registered at the national level, women in the survey were asked whether they had been tested for HIV, the circumstances of the last test and place where last test was taken. The outcomes by women's background characteristics summarized in Table 9.8 showed that 93.5 percent of the women had ever been tested, a massive improvement from 27.1 percent ever tested in the 2000 survey. Among the tested women, about half of the women (50.9 percent) were tested in public hospitals, 16.6 percent were tested in private facilities, 22.3 percent were tested in mobile clinics and research studies, while only 8.9 percent were tested in VCT centers.

In terms of their backgrounds, despite high levels of testing recorded in the data, the lowest proportion of those ever tested were the youngest women aged 15-19 (75.9 percent) and the never married (82.7 percent). Further, the youngest women and the never married were the least likely to be tested in public facilities and most likely to have been tested through mobile clinics/research studies. These findings point to the complementary role of unconventional initiatives in addressing vulnerable groups, who are not always served by traditional and official channels. This is supported by the comparison of data from the 2012 survey and the 2008-2009 KDHS. The results show better indicators for HIV testing in the slums relative to Nairobi as a whole, other urban areas, and Kenya. This may be related to the advantage recorded for slums through the activities of mobile clinics and research studies, which were very active in informal settlements than any other part of Nairobi, and Kenya. The data show that while mobile clinics and research studies offered tests to 22.3 percent of residents of Nairobi slums, these were a source of testing for only 3.1 percent for the rest of Nairobi, 4.8 percent for other urban areas and 6.7 percent for the rest of the country.

Table 9.8: HIV/AIDS testing

Percent distribution of women aged 15-49 years by HIV/AIDS testing status, whether they received the results of the last test, circumstances of the last test and place where last AIDS test was taken, according to selected background characteristics, NCSS 2012, NCSS 2000 and KDHS 2008-09

Background Characteristics	Testing status & whether received results			Ever tested	Last test was on your own, offered or required			Place where last AIDS test was taken					Number of cases
	Tested, received results	Tested, did not receive results	Never tested^		Asked for test	Offered and accepted	Required	Public	Private	Mobile Clinic/ Research Study	VCT Center	Other	
Age													
15-19	74.5	1.4	24.1	75.9	40.0	36.2	23.8	38.6	13.8	35.5	9.3	2.9	590
20-24	94.1	1.1	4.8	95.2	42.0	25.4	32.6	53.0	15.0	19.8	10.9	1.4	1,027
25-29	97.3	1.3	1.4	98.6	41.9	22.9	35.2	54.2	17.8	18.1	8.8	1.0	1,043
30-34	96.6	0.8	2.6	97.4	37.3	25.7	37.1	53.2	19.5	18.9	8.0	0.4	543
35-39	93.8	2.5	3.7	96.3	45.4	29.4	25.2	51.3	13.2	25.2	9.7	0.6	351
40-44	93.9	2.0	4.1	95.9	56.2	26.6	17.2	51.5	15.0	24.6	7.8	1.2	198
45-49	91.3	2.0	6.8	93.3	49.2	39.3	11.5	37.2	19.8	34.7	7.4	0.8	140
Marital Status													
Never married	81.8	0.9	17.3	82.7	49.4	34.5	16.2	37.0	13.2	32.1	15.0	2.7	1,102
Currently married	96.4	1.5	2.1	97.9	37.4	24.9	37.7	56.6	18.0	18.3	6.1	0.9	2,345
Formerly married	96.7	1.5	1.8	98.2	50.7	26.4	22.9	50.2	16.4	22.3	10.6	0.4	388
Duration of stay in household (years)													
<2	91.9	1.3	6.8	93.2	44.0	24.3	31.7	55.8	13.4	19.2	10.6	1.0	1,444
2-4	93.7	1.4	4.9	95.1	41.8	26.8	31.4	49.4	20.1	20.7	8.1	1.7	955
5-7	93.6	1.3	5.1	94.9	40.8	26.1	33.1	49.7	19.0	22.0	7.7	1.6	534
8+	92.2	1.8	6.0	94.0	41.0	31.1	27.9	48.1	16.1	26.6	8.1	1.0	709
Since birth	84.7	0.6	14.7	85.3	35.2	40.8	24.0	38.9	17.7	34.5	7.5	1.4	250
Education Level													
No education	98.6	0.0	1.4	98.6	45.9	28.8	25.3	59.6	19.0	12.4	6.1	2.9	73
Primary incomplete	87.8	3.3	8.9	91.1	44.9	24.8	30.3	52.3	15.3	24.5	7.6	0.3	620
Primary complete	93.0	1.3	5.6	94.3	39.7	26.1	34.2	54.8	15.5	21.7	7.0	0.9	1,203
Secondary+	92.7	0.8	6.5	93.5	42.4	29.1	28.5	47.7	17.6	22.3	10.7	1.7	1,988
NCSS 2012 Total	92.1	1.4	6.5	93.5	42.0	27.4	30.6	50.9	16.6	22.3	8.9	1.3	3,892
NCSS 2000 Total	-	-	72.9	27.1	-	-	-	-	-	-	-	-	3,256
KDHS 2008-09													
National	56.5	1.9	41.6	58.4	-	-	-	66.5	16.3	6.7	9.1	1.0	8,444
Rural	52.0	2.2	45.8	54.2	-	-	-	71.8	13.0	7.8	6.1	0.8	6,296
Other urban	67.9	0.7	31.4	68.6	-	-	-	61.8	20.8	4.8	12.0	0.5	1,420
Nairobi	73.8	1.9	24.4	75.6	-	-	-	41.9	28.7	3.1	22.7	3.2	728

^ Includes 'don't know/missing'

* Table displays columns and/or rows containing 'non-missing' values (some percentages may not add up to 100%

9.8 Summary

The review of the most recent data underscores the continuing threat of HIV/AIDS epidemic in Kenya, but also demonstrates the substantive impact of programs and policies put in place to address the epidemic. In particular, Kenya is currently at the forefront of global efforts to implement voluntary medical male circumcision for HIV prevention, continues to serve as a pivotal host for some of the most important HIV-related research in the world and has embraced the goal of ensuring universal access to HIV prevention, treatment, care and support.

This chapter presented the HIV/AIDS update as it concerns the urban poor in slums and shows HIV/AIDS as the most widely known STI relative to gonorrhea, syphilis and genital warts. Although there were no substantive variation in knowledge of HIV/AIDS by background characteristics, women with no formal education continued to report the least knowledge of all STIs between 2000 and 2012. Despite the general increase in knowledge of syphilis and gonorrhea, members of the Luo ethnic community, as in 2000, were the least knowledgeable about both STIs, while the Kikuyu were the most knowledgeable across both surveys. Taken together, these findings underscore the need for sub-group specific focus by information, education and communication interventions.

The top six sources of information in descending order were radio, health workers, friends/relatives, school/teachers and church/mosque. Although the radio remained relevant as a source of information on HIV/AIDS in 2012, its influence had substantially waned with non-traditional sources such as drama, workplace and community meetings assuming increased relevance. Similarly, the mass media (radio, television, newspapers and pamphlets) also declined as sources of information over the survey period. The cut in investments in public institutions to promote reproductive health messages in the past decade led to the increasing role of television and non-traditional sources of information, particularly health workers, schools/teachers and community meeting among residents in the slums of Nairobi. This underscores the need for new information, education and communication (IEC) interventions in order to get the message to the people beyond investments in traditional media.

Since heterosexual intercourse is the predominant mode of HIV transmission among the adult population in Kenya and other parts of Africa, sexual behavior change has continued to offer great promise for protection against HIV/AIDS infection. Abstaining from sexual relations, faithfulness to one sexual partner and consistent use of condoms have been identified as possible means of reducing the risk of infection. The most commonly cited ways of avoiding HIV infection were use of condoms, being faithful to one's partner and sexual abstinence. A small proportion of women (4 percent) responded that there was no way to avoid HIV/AIDS and were ignorant of any method that can be used to prevent HIV infection.

Despite the overall improvements in sexual risk taking, multiple sexual partnerships among married and unmarried women remained more prevalent in the slums relative to other parts of Nairobi and Kenya. This outcome may be linked to the social acceptance of concurrent and/or multiple partnerships in Kenya, which is identified as a major driver of the country's HIV/AIDS epidemic [12].

This notwithstanding, the situation presents both the current risks of contracting new HIV virus and other STIs and accelerating their spread within sexual networks, both of which require renewed efforts and behavior change interventions consistent with achieving full control of the spread of HIV and other STIs among the urban poor in Kenya.

Knowledge of condoms and sources was widespread and women in the slums were comparable to or even better off than women in Nairobi as a whole and across Kenya. However, there was an apparent disconnect between knowledge of condom, knowledge of a source of condom and condom use not only in the slums of Nairobi but across the country. The results show that slum residents were less likely to use condoms relative to other Nairobi residents and, despite evidence of increases in the past decade and half across the country, condom use in Kenya remains sub-optimal. In sum, the deficit in condom use in the context of persistence of risky sexual behavior remains a window of opportunity for research, policy and program interventions.

Despite low condom use, other changes in behavior to prevent contracting HIV/AIDS were observed: staying with one partner, asking the spouse to be faithful, remaining virgins, reducing the number of sexual partners, stopping all sexual relations, and using condoms. Young and unmarried women who had not started sexual relations were more likely to remain virgins, while others opted for secondary abstinence by stopping sexual relations altogether.

In relation to the urban poor in the slums of Nairobi, there was massive improvement in the proportion of women who had ever tested for HIV and an increase in use of non-traditional testing centers such as mobile clinics or research studies. These results point to the complementary roles of initiatives beyond public facilities and VCT centers in reaching vulnerable groups such as young people, who were least likely to be served by traditional and formal institutions.

References

1. Kohler, H.-P., J. R. Behram, and S.C. Watkins, "Social networks and HIV/AIDS risk perceptions." *Demography 2007.* 44(1): p. 1-33.

2. NACC and NASCOP, *Kenya AIDS Epidemic update 2012*, 2012: Nairobi.

3. UNAIDS, *Sexual behavioral change for HIV: Where have the theories taken us?* 1999, UNAIDS: Geneva.

4. APHRC, *Population and health dynamics in Nairobi informal settlements.*, 2002 African Population and Health Research Center (APHRC): Nairobi

5. Maina G., "Youth peer survey in Kenya." *Planned Parenthood Challenges,* 1995. 1: p. 24-5.

6. UNAIDS, AIDS *epidemic update,* 2009, Joint United Nations Programme on HIV/AIDS: Geneva.

7. Smith, D. J., Imagining HIV/AIDS: *Morality and perceptions of personal risk in Nigeria. Medical Anthropology 2003.* 22(4): p. 343-372.

8. Ndola, P., F. Vahidnia, and A. Fraser, "Gender and relationship differences in condom use among 15-24 years olds in Angola." *International Family Planning Perspectives 2005.* 31(4): p. 192-199.

9. Kibombo R., S. Neema, and F. Ahmed, "Perceptions of risk to HIV Infection among Adolescents in Uganda: Are they Related to Sexual Behavior?" *African Journal of Reproductive Health, 2007*. 11(3): p. 168-181.

10. Epstein H., *The invisible cure: Africa, the West, and the fight against AIDS.* 2007, New York: Farrar, Strauss and Giroux.

11. Halperin D. T. and H. Epstein, "Why is HIV prevalence so severe in southern Africa? The role of multiple concurrent partnerships and lack of male circumcision: Implications for AIDS prevention." *Southern African Journal of HIV Medicine 2007*. 8: p. 19-25.

12. Gelmon, L., et al., *Kenya HIV Prevention response and modes of transmission analysis*, 2009, Kenya National AIDS Control Council: Nairobi.

13. Mishra V and S. Bignami-Van Assche, *Concurrent sexual partnerships and HIV infection: evidence from national population-based surveys*, 2009, Macro International Inc.: Calverton, Maryland (USA).

14. Hatcher R. A., et al., "Contraceptive Technology." *18th revised edition 2004,* New York: Ardent Media.

15. Holmes K. K., Levine R., and Weaver M., *Effectiveness of condoms in preventing sexually transmitted infections.* Bulletin of the World Health Organization, 2004. 82: p. 454-461.

CHAPTER 10: YOUNG PEOPLE IN NAIROBI'S INFORMAL SETTLEMENTS

Caroline W. Kabiru

Young people aged 10-24 years comprised about a third (30.6 percent) of Nairobi urban slum residents in 2012 (Figure 2.1). Previous studies conducted in urban slums have shown that youth in these settings are at significantly greater risk of poor sexual and reproductive health, education, and other outcomes compared with similarly aged youth living in other urban or rural contexts [1-3]. Results from NCSS 2000 showed that 47 percent of female adolescents aged 15-24 years in Nairobi's slums had begun childbearing compared to 30.5 percent among their counterparts in Nairobi and 41 percent for the rest of Kenya [4]. Scholars have argued that abject poverty, limited livelihood opportunities, and high levels of violence and crime that characterize urban slums pose major challenges to youth development and heighten their risk taking [5]. This chapter examines the characteristics of young people aged 12-24 years in Nairobi's slums and investigates differences in educational outcomes, and behavioral and reproductive health indicators between young people interviewed during NCSS 2000, NCSS 2012, and the KDHS 2008-09.

10.1 Background Characteristics of Young Respondents

In total, 2,765 young people aged 12-24 years of whom 29 percent were male were interviewed in NCSS 2012. In comparison, 3,617 young people were interviewed in NCSS 2000 of whom 47 percent were male. Table 10.1 presents the background characteristics of young people who were interviewed in 2000 and 2012. There was little difference in the marital status of young people in the two surveys, with a substantially greater proportion of females than males currently married. In 2012, for example, 39.1 percent of females were currently married compared to 12.3 percent of males, while 40.6 percent of females and 15.5 percent of males were currently married in 2000. In both surveys, almost all young people had at least a primary level education; however, the proportions of young people with secondary or higher education substantially increased over the period. Among males, 34.4 percent in 2000 and 52.0 percent in 2012 had secondary or higher education. For females, these figures stood at 27.8 percent in 2000 and 48.8 percent in 2012. An increase in the proportion of young people currently in school was also observed between 2000 and 2012. In 2000, only 21.1 percent of young males and 20.1 percent of young females were attending school at the time of the survey, compared to 40.9 percent of males and 35.7 percent of females in 2012. Although the numbers suggest a narrowing gap in educational attainment between males and females, the gender gap in school attendance widened from 1 percentage point to 5 percentage points between the two surveys. The increase in school participation and educational attainment may be partly explained by the implementation of the Free Primary Education (FPE) policy in 2003 and the Free Secondary Education (FSE) policy in 2008. The policies led to increased access to primary and free secondary education in day schools, respectively.

Table 10.1: Percentage distribution of respondents (12-24 years) by background characteristics, NCSS 2012, NCSS 2000

Background Characteristics	NCSS 2012		NCSS 2000	
	Males	Females	Males	Females
Age				
12-14	18.2	17.9	13.4	16.3
15-17	15.0	14.0	14.1	20.5
18-20	22.6	27.0	23.0	27.1
21-24	44.2	41.1	49.5	36.1
Marital Status				
Never married	85.1	57.1	82.3	56.6
Currently married	12.3	39.1	15.5	40.6
Formerly married	2.1	2.7	2.2	2.8
Education Level				
No education	0.1	0.6	0.8	2.4
Primary incomplete	23.4	26.4	32.5	35.9
Primary complete	24.5	24.1	32.3	33.9
Secondary+	52.0	48.8	34.4	27.8
Currently attending school				
Yes	40.9	35.7	21.1	20.1
No	59.1	64.3	78.9	79.9
Ethnic Group				
Kamba	21.1	18.8	17.0	14.7
Kikuyu	21.8	18.9	22.2	24.0
Luhya	24.0	24.6	20.6	22.5
Luo	17.5	19.9	27.8	26.5
Other	15.6	17.4	12.4	12.3
Religion				
Catholic	27.0	26.4	32.8	32.9
Protestant/Other Christian	66.0	68.0	60.9	60.9
Muslim	4.5	4.1	4.9	5.5
Other (Other/No religion)	2.4	1.0	1.4	0.7
Division				
Central	6.4	7.0	12.1	9.6
Makadara	12.9	9.6	3.5	2.8
Kasarani	12.2	13.2	19.2	20.0
Embakasi	26.9	28.4	20.9	18.4
Pumwani	5.4	4.5	4.4	3.4
Westlands	9.2	8.6	9.3	13.9
Dagoretti	10.6	11.8	9.6	12.0
Kibera	16.4	16.9	21.0	19.9
Length of stay in current location				
Since birth	23.0	14.8	3.9	3.9
<2 years	37.0	44.1	46.1	53.6
2-4 years	20.6	22.8	34.6	30.5
5-7 years	8.0	9.5	7.0	5.3
8+ years	11.4	8.8	7.7	6.5
Other	0.0	0.0	0.7	0.2
Total	100.0	100.0	100.0	100.0
Number of cases	807	1,958	1,683	1,934
Table displays columns and/or rows containing 'non-missing' values (some percentages may not add up to 100%)				
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012				

As in 2000, the ethnic compositions of young people were similar for males and females. However, while the Luos were the dominant ethnic youth group in 2000, Luhya youth were the leading group in 2012. Over 90 percent of young people reported that they were Christians. However, a notable decrease in the proportion of Catholics was observed between 2000 and 2012. The largest proportion of male and female youth lived in Embakasi in 2012, while most lived in Kibera

in 2000. A substantial increase was observed in the proportion of young people living in Makadara Division in 2012 compared to 2000, while substantial decreases were observed in the proportions of young people living in Central and Kasarani Divisions. These shifts may be linked to differentials in employment opportunities for young people in some slums. For example, Makadara Division hosts most of the industries in Nairobi. The data also reveal a decreasing proportion of migrant youth as indicated by the increased proportion of young people living in the slums since birth in 2012. Specifically, while only 3.9 percent of young people interviewed in 2000 had lived in the current location since birth, the corresponding proportions for 2012 were 23.0 percent of males and 14.8 percent of females.

10.2 Educational Experiences of Young Males and Females

10.2.1 Educational Attainment

Table 10.2 shows the distribution of young people aged 15-24 by schooling status and education levels for the NCSS 2000 and 2012, and the KDHS 2008-09. As noted in section 10.1, a substantial increase in the proportions of young people with secondary or higher level of education was noted between 2000 and 2012. Considerable increases in the proportions of youth currently in school across all age categories were also recorded between the two surveys. Similar increases in educational attainment at national levels were also observed based on data from the KDHS 1998 and 2008-09 [6, 7].

Table 10.2: Percentage distribution of young people aged 15-24 years by schooling status and educational attainment, NCSS 2012, NCSS 2000 and KDHS 2008-09

Characteristic	NCSS 2012		NCSS 2000		KDHS 2008-09^					
					National		Rural		Nairobi	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Attending School										
15-17	84.2	69.2	40.2	22.2	na	na	na	na	na	na
18-20	24.8	21.1	9.8	5.4	na	na	na	na	na	na
21-24	11.3	7.3	3.1	2.9	na	na	na	na	na	na
Education Level										
No education	0.1	0.6	0.7	2.0	1.9	5.6	1.9	6.1	3.0	2.1
Primary incomplete	23.4	26.4	22.6	25.8	34.8	33.1	38.7	37.8	5.3	9.9
Primary complete	24.5	24.1	37.1	39.4	21.8	26.1	23.4	26.8	21.5	25.9
Secondary+	52.0	48.8	39.6	32.8	41.5	35.2	36.0	29.2	70.1	62.0
Number of cases	807	1,958	1,457	1,618	1,406	3,475	1,128	2,607	106	285
^ KDHS 2008-09 data do not contain information on current school attendance										
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09										

Although levels of educational attainment reflect a substantial urban advantage, the data also highlight the considerable intra-urban differences between slum and non-slum dwellers. For example, the proportion of young males with secondary or higher level of education was 70.1 percent in the larger Nairobi according to the KDHS 2008-09, compared to 52.0 percent in the slums in 2012. Within urban areas, previous studies have shown that slum settlements are underserved by public school facilities compared to non-slum areas [1], meaning that the urban poor are disadvantaged with respect to educational opportunities compared to their peers living in non-slum areas.

10.2.2 School Dropout/Non-Attendance

In both surveys, all young people who were not currently in school were asked why they were not attending school. Table 10.3 summarizes the reasons given by males and females in both surveys. For close to 60 percent of young people in 2012, inability to pay school fees was given as the reason for non-attendance. There was a gender shift in the inability to pay school fees as reason for dropout/non-attendance. The proportion of young people who could not pay school fees was slightly higher among males in 2000 (70.8 vs. 66.7 percent), but higher among females in 2012 (61.8 vs. 53.2 percent). Overall, there was a notable decline in the proportion of young people, particularly males, who dropped out of school because of lack of school fees between 2000 and 2012. This decline may stem from national policies implemented in the inter-survey period that subsidized basic school fees at both primary and secondary levels.

Table 10.3: Percentage distribution of respondents aged 12-24 years by reported reasons for dropping out of school or non-attendance, NCSS 2012, NCSS 2000

Reason	NCSS 2012			NCSS 2000		
	Males	Females	Total	Males	Females	Total
Could not pay fees	53.2	61.8	58.6	70.8	66.7	68.6
Complete/Had enough school	23.3	13.0	16.8	15.7	12.5	14.0
Pregnancy/Marriage	0.8	11.5	7.5	0.1	6.2	3.4
Did not like school	5.8	4.1	4.8	4.6	4.8	4.7
Other reasons	11.0	7.5	8.8	8.8	9.8	9.3
Number of cases	462	1,238	1,700	1,316	1,501	2,817
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012						

In both surveys, a substantially greater proportion of females than males reported non-enrollment because of pregnancy or marriage. However, a two-fold increase was observed in the proportions of females reporting that they were not in school because of pregnancy or marriage between 2000 (6.2 percent) and 2012 (11.5 percent). This suggests low rate of re-entry for girls after pregnancy-related dropout despite the introduction in 1994 of a policy that promotes school re-entry of teenage mothers after pregnancy. [8].

10.2.3 Financial Support for Education

Young people who were in school at the time of the surveys were asked to indicate the primary sources of funding for school expenses. The results are presented in Table 10.4. In 2000, about two-thirds and just over half of young people reported that their fathers and mothers, respectively, were the main source of funding for school expenses. In 2012, parents were reported as a major contributor to educational expenses by over half of the young people. Fathers were the major contributors to school expenses in 2000 (67.1 percent vs. 54.6 percent) while mothers became the major contributors in 2012 (59.6 percent vs. 57.3 percent). The most notable change was with respect to contributions by other relatives and NGOs, religious groups, and "others", including the government. In total, 4.9 percent of young people in 2000 and 8.0 percent in 2012 reported NGOs, religious groups or 'others' as a major contributor to their educational expenses. Among those stating other" sources of support, the proportion that reported that their school expenses were met by the government through the FPE program was almost negligible. Previous studies conducted in Nairobi's slums have shown that following the implementation of the FPE policy, there was a dramatic shift toward enrollment in public schools but that the trend reversed with more children in urban slums being enrolled in private schools, which are perceived to perform better [9]. These results suggest that the FPE policy may not be fully benefiting children from the poorest households in urban areas.

Table 10.4: Percentage distribution of respondents aged 12-24 years by source of main support for school expenses, NCSS 2012, NCSS 2000

Person Contributing	NCSS 2012			NCSS 2000		
	Males	Females	Total	Males	Females	Total
Father	59.2	55.9	57.3	71.6	62.9	67.1
Mother	54.3	63.4	59.6	51.4	57.6	54.6
Sibling(Brother/Sister)	4.6	7.8	6.5	6.3	5.3	5.7
Other relatives	8.4	16.7	13.2	4.6	7.1	5.9
NGO/Religious group/Other	5.4	9.8	8.0	3.7	6.0	4.9
No one/Self	3.7	1.6	2.5	0.3	0.5	0.4
Number of cases	337	686	1,023	352	380	732
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012						

10.3 Orphanhood and Living Arrangements

Young people's living arrangements have been shown to be associated with behavioral and schooling outcomes [10-12]. Kabiru and Ezeh [12], for example, examined differences in sexual behavior based on living arrangements among adolescents aged 15-19 years in Burkina Faso, Ghana, Malawi and Uganda. They observed that in all countries, females living with both parents were more likely to have never had sex compared to those living with no parent. In Ghana, living

with even one parent had a strong protective effect for girls. Living arrangements were not significantly associated with sexual experience for males. Studies have also shown that orphans and other vulnerable children are more likely to suffer poor health outcomes even when poverty status is accounted for [13]. In Uganda, female double orphans aged 15–18 were significantly less likely to be enrolled in secondary school compared to females living with both parents [10]. Given the potentially important role that living arrangements and family context may play in explaining young people's wellbeing, this sub-section presents data on orphanhood status and living arrangements.

10.3.1 Orphanhood

Table 10.5 presents the survival status of young people's parents by socio-demographic status.

Table 10.5: Percentage distribution of adolescents by survival status of parents and by selected background characteristics, NCSS 2012, NCSS 2000

Background Characteristics	Both parents deceased	Mother deceased	Father deceased	Both parents alive	Don't know	Number of cases
Age						
12-14	2.1	3.5	8.6	81.3	4.5	489
15-17	3.1	6.4	10.1	76.5	3.8	394
18-20	6.0	3.9	16.0	65.2	8.9	709
21-24	8.3	5.0	14.9	60.6	11.1	1,173
Sex						
Male	3.9	4.4	12.4	72.6	6.7	807
Female	7.1	4.8	14.0	64.7	9.3	1,958
Currently attending school						
Yes	3.5	4.7	10.1	76.3	5.5	1,023
No	7.4	4.6	15.4	62.6	10.0	1,742
Marital Status						
Never married	4.1	4.1	12.2	73.9	5.6	1,804
Currently married	9.6	5.9	16.0	55.1	13.3	863
Formerly married	14.9	3.3	19.4	56.3	6.0	69
Ethnic Group						
Kamba	4.8	4.2	10.2	71.3	9.6	554
Kikuyu	2.9	5.1	11.4	70.8	9.7	544
Luhya	6.0	4.5	13.8	67.4	8.3	675
Luo	12.1	5.8	18.7	55.8	7.5	536
Other	3.8	3.6	12.5	74.5	5.6	449
Division						
Central	7.7	3.5	9.7	66.0	13.1	216
Makadara	6.2	4.1	9.3	71.6	8.7	287
Kasarani	5.8	5.8	22.6	58.8	6.9	331
Embakasi	3.6	3.4	13.2	71.6	8.1	757
Pumwani	6.1	2.5	7.9	73.7	9.8	143
Westlands	6.5	5.5	13.0	69.4	5.6	213
Dagoretti	6.4	5.4	14.4	60.7	13.2	354
Kibera	8.0	6.3	11.8	68.7	5.2	464
NCSS 2012 Total	5.9	4.7	13.4	67.8	8.3	2,765
NCSS 2000 Total	4.5	4.8	16.2	72.5	2.0	3,614
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012						

In 2012, about two-thirds of young people reported that both parents were alive compared to 72.5 percent in 2000. The proportion of adolescents in the 2012 survey reporting that both parents were alive was highest among 12-14 year olds (81.3 percent) and lowest among those aged 21-24 years (60.6 percent). A greater proportion of males (72.6 percent) than females (64.7 percent) reported that both parents were alive. The percentage of young people reporting that both parents were alive was higher among those in school than those out of school at the time of the survey. The difference in current enrollment between orphans and non-orphans may stem from households with both parents alive having greater assets to cover educational expenses [10].

Among never married young people, 73.9 percent reported that both parents were alive compared to 55.1 percent of currently married and 56.3 percent of formerly married respondents. With respect to ethnicity, a greater proportion of young people belonging to the Luo ethnic group reported that one or both parents were deceased. A similar pattern was reported in 2000 [4]. Paternal survivorship was much lower than maternal survivorship across all socio-demographic groups.

10.3.2 Living Arrangements

Table 10.6 summarizes the living arrangements of young people. Overall, 25 percent of young people were living with both parents in 2012, a moderate increase from 19 percent in 2000. A greater proportion of males (8.0 percent) than females (3.2 percent) were living with their father only in 2012. However, younger males were considerably more likely to be living with their mother only than with their father only. Similar patterns were observed in 2000 [4]. Overall, the proportion of young people living with their mother only did not differ between males and females.

As expected, the proportion of young people living with both parents was highest among the youngest age group with about three out of every five persons aged 12-14 years in 2012 living with both parents compared to 6.9 percent among young people aged 21-24 years. Compared to 2000 [4], a greater proportion of young people were living with both parents across all age groups. In addition, more females than males were living with neither parent across all age groups, which may reflect the greater proportion of married young women and the fact that a greater proportion of females relative to males were orphaned. About 50 percent of young people who were currently in school were living with both parents.

A greater proportion of Kikuyu youth were living with both parents compared with other ethnic groups. Among the Kikuyu, 2 percent of males and females were living with their father only while about three out of every five males were living with neither parent among Kambas, Luhyas and other ethnic groups. More females than males were living with neither parent across all ethnic groups with the exception of Luhyas. The greater likelihood of young females being married may explain sex differences in living arrangements. A higher proportion of young people in Kibera compared to other Divisions were living with one or both parents. This represents a shift from the pattern in 2000, when young people living in Kasarani were more likely to be living with both parents. Across all divisions, with the exception of Kasarani, a considerably higher proportion of males than females were living with their father only.

Table 10.6: Percentage distribution of young people aged 12-24 years by living arrangements and by selected background characteristics classified by sex, NCSS 2012, NCSS 2000

Background Characteristics	Living with both parents		Living with father only		Living with mother only		Living with neither parent	
	Male	Female	Male	Female	Male	Female	Male	Female
Age								
12-14	61.1	60.2	12.6	5.0	20.4	19.0	6.0	15.8
15-17	43.7	46.1	9.5	3.1	19.0	17.4	27.8	33.4
18-20	17.7	13.1	8.3	3.5	10.2	9.4	63.8	74.0
21-24	6.9	6.8	5.4	2.2	3.8	4.4	83.8	86.7
Marital Status								
Never married	28.2	38.5	8.9	5.2	11.6	16.5	51.3	39.8
Currently married	0.0	1.6	3.1	0.0	1.5	0.5	95.5	97.8
Formerly married	22.6	18.7	0.0	2.0	18.5	9.8	59.0	69.5
Currently attending school								
No	8.4	8.5	6.9	1.8	5.7	5.1	79.0	84.6
Yes	48.5	50.6	9.5	5.4	17.7	19.1	24.3	24.8
Ethnic Group								
Kamba	22.0	18.9	13.2	3.5	4.1	6.5	60.7	71.1
Kikuyu	35.9	30.7	2.3	2.2	18.1	13.6	43.7	53.5
Luhya	16.9	25.8	10.6	4.8	8.9	11.7	63.6	57.8
Luo	27.3	25.0	8.7	2.2	12.6	13.4	51.4	59.4
Other	23.1	22.1	4.5	3.0	9.2	6.0	63.3	68.9
Division								
Central	27.9	18.8	5.8	3.0	14.5	7.3	51.7	71.0
Makadara	18.6	21.5	7.8	3.2	7.8	11.5	65.8	63.8
Kasarani	25.7	14.8	4.1	6.3	11.0	21.0	59.2	57.8
Embakasi	28.3	28.6	7.1	1.2	7.7	7.2	56.9	63.0
Pumwani	22.9	17.7	9.7	1.7	15.0	13.5	52.4	67.0
Westlands	21.0	23.4	5.6	4.9	5.0	6.2	68.3	65.5
Dagoretti	16.6	29.2	8.9	1.8	20.3	7.2	54.1	61.8
Kibera	31.1	28.7	13.6	4.5	11.1	12.0	44.2	54.8
NCSS 2012								
Total	24.9	24.6	8.0	3.2	10.6	10.5	56.5	61.7
Number of cases	185.0	426.0	59.0	55.0	85.0	186.0	421.0	1,100.0
NCSS 2000								
Total	18.5	19.2	7.2	4.3	7.0	9.2	67.3	67.3
Number of cases	1,251	1,368	1,251	1,368	1,251	1,368	1,251	1,368

Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012

10.4 Deviant Behavior

The module on young people included questions on deviant behavior as captured by drunkenness and illicit drug use. As illustrated in Figure 10.1, a substantially greater proportion of males than females reported drunkenness and illicit drug use in the month preceding the survey. For both males and females, however, the results suggest a slight decline in the proportions of young people reporting these behaviors between 2000 and 2012.

Figure 10.1: Percentage of young people aged 12-24 years who were inebriated or used illicit drugs in the past month by gender, NCSS 2012, NCSS 2000

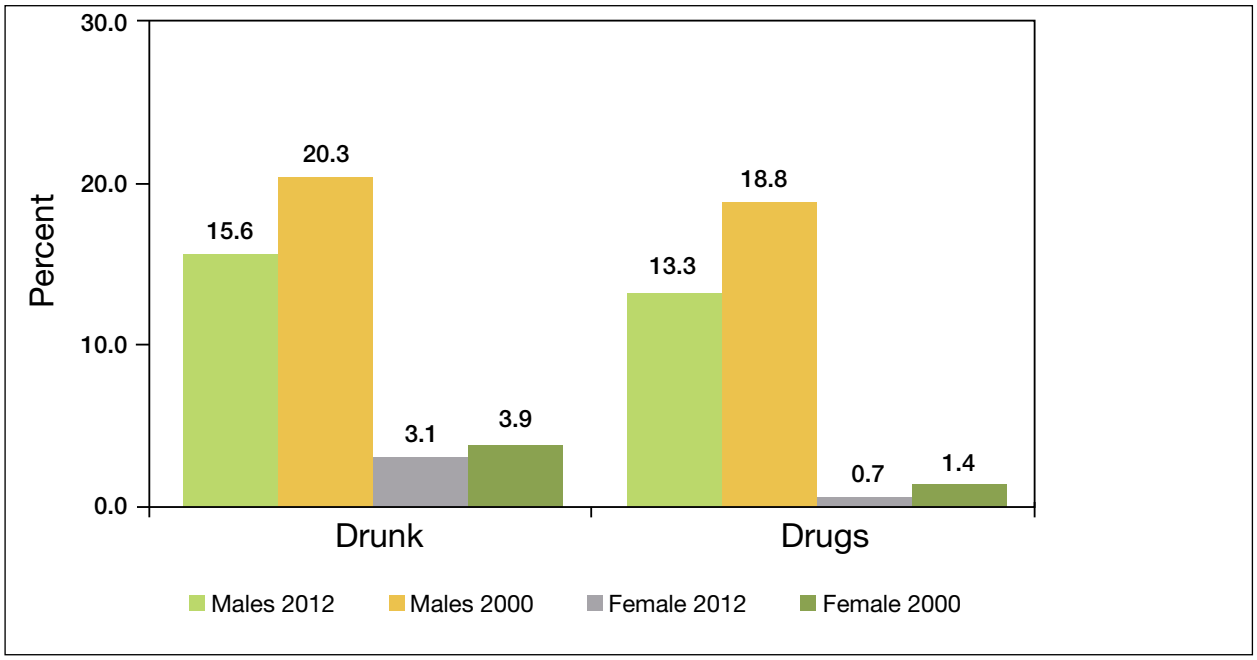


Table 10.7 summarizes the percentage of young people who were inebriated in the month preceding the survey and those who had ever used illicit drugs by background characteristics in 2012. The proportion of youth reporting substance use and drunkenness increased with age, particularly among males. For example, whereas no 12-14 year old males reported recent drunkenness, 26.3 percent of males aged 21-24 years reported that they had been drunk in the past month.

Currently or formerly married males were more likely to report recent drunkenness or illicit drug use compared to their unmarried counterparts. Among females, the pattern was less clear but data suggest that previously married females were more likely to report substance use than currently or never married females. As highlighted in NCSS 2000 where a similar pattern was observed, marital disruption may predispose females to risky behavior [4].

As expected, young people who were out of school were more likely to report recent drunkenness and ever use of illicit drugs. Lower substance use among in-school youth have been reported in other studies in SSA [14]. Among males, recent drunkenness and illicit drug use were particularly high among double orphans (35.2 percent and 29.5 percent, respectively). A similar pattern was observed among females. These findings underscore the need for substance use prevention efforts that target the most vulnerable groups of youth, particularly orphans who might lack social support.

Table 10.7: Percentage of young people aged 12-24 years who were inebriated in the past month or who had ever used illicit drugs by background characteristics, NCSS 2012, NCSS 2000

Background Characteristics	Drunk		Drugs	
	Male	Female	Male	Female
Age				
12-14	0.0	0.0	0.0	0.0
15-17	4.1	1.7	7.9	1.0
18-20	14.7	4.4	13.3	0.4
21-24	26.3	4.2	20.6	1.1
Marital Status				
Never married	13.8	3.5	12.1	0.7
Currently married	28.2	2.4	20.4	0.7
Formerly married	18.1	5.3	23.4	2.0
Currently attending school				
Yes	4.5	2.6	5.4	0.3
No	23.2	3.5	18.8	0.9
Survival status of parents				
Both deceased	35.2	5.7	29.5	1.4
Mother deceased	16.9	3.9	8.3	0.0
Father deceased	17.1	1.8	19.7	1.8
Both alive	15.2	3.2	12.2	0.5
Don't know	4.2	2.1	6.8	0.0
Ethnic Group				
Kamba	20.0	2.4	11.0	0.2
Kikuyu	13.5	3.6	13.6	1.7
Luhya	11.9	2.2	10.3	0.8
Luo	20.5	2.8	18.1	0.2
Other	12.7	4.7	15.2	0.6
Division				
Central	15.7	3.2	24.8	0.0
Makadara	16.6	4.2	4.3	3.7
Kasarani	18.1	2.1	24.8	0.0
Embakasi	14.7	2.7	8.8	0.2
Pumwani	5.0	0.8	23.2	0.0
Westlands	18.0	6.5	7.2	0.4
Dagoretti	19.2	3.7	10.5	1.1
Kibera	14.1	2.6	16.6	0.7
NCSS 2012				
NCSS 2012 Total	15.6	3.1	13.3	0.7
NCSS 2012 Number of cases	807	1,958	807	1,958
NCSS 2000				
NCSS 2000 Total	20.3	3.9	18.8	1.4
NCSS 2000 Number of cases	1,683	1,934	1,683	1,934
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012				

Although a decrease was observed in the proportion of young people reporting recent drunkenness and illicit drug use between 2000 and 2012, data show a trend toward early initiation of substance use among males (Table 10.8). For example, in 2000, 6.0 percent of males reported initiating alcohol use before 12 years of age, and 2.9 percent of males initiated drug use before age 12. In 2012, the corresponding proportions of males reporting that they initiated alcohol or drug use before age 12 years were 8.5 and 9.0 percent, respectively. For females, on the other hand, the data show a delay in initiation of drug use with only 6.4 percent of females reporting that they initiated drug use before attaining age 15 in 2012 compared with 25.9 percent in 2000. However, the proportion of females initiating alcohol use before the age of 15 did not differ much between the two surveys.

Table 10.8: Percentage distribution of young people aged 12-24 years by age of starting alcohol and drug use, NCSS 2012, NCSS 2000

Age	NCSS 2012				NCSS 2000			
	Alcohol use		Drug use		Alcohol use		Drug use	
	Males	Females	Males	Females	Males	Females	Males	Females
<12 years	8.5	8.6	9.0	0.0	6.0	5.7	2.9	11.1
12-14 years	12.4	6.5	15.1	6.4	10.7	10.4	14.6	14.8
15-17 years	31.4	35.3	47.2	61.0	35.8	33.8	40.5	22.2
18-20 years	40.7	39.5	26.9	13.3	39.3	40.5	34.2	40.7
21-24 years	7.0	10.1	1.8	19.3	8.2	9.6	11.1	7.9
Number of cases	246	172	91	13	882	385	27	316
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012								

10.5 Sexual Behavior among Young People

The transition to adulthood is characterized by greater vulnerability to sexual risk-taking, with early initiation of sexual activity being one of the primary indicators. Early sexual debut predisposes young people to poor sexual and reproductive health outcomes. For example, previous studies show a high level of unmet need for family planning among young people [15], which contributes substantially to the high levels of unintended pregnancies and abortions among women below 25 in SSA [16].

Although existing data show that, on average, rural females initiate sexual intercourse earlier, studies have shown that young people living in urban slums are at greater risk of poor sexual and reproductive health outcomes compared to other sub-populations of young people [2, 17]. Some scholars have argued that many young people in urban slums, particularly females, are forced to engage in transactional sex to meet basic needs [18].

10.5.1 Initiation of Sexual Activity among Young People and their Peers

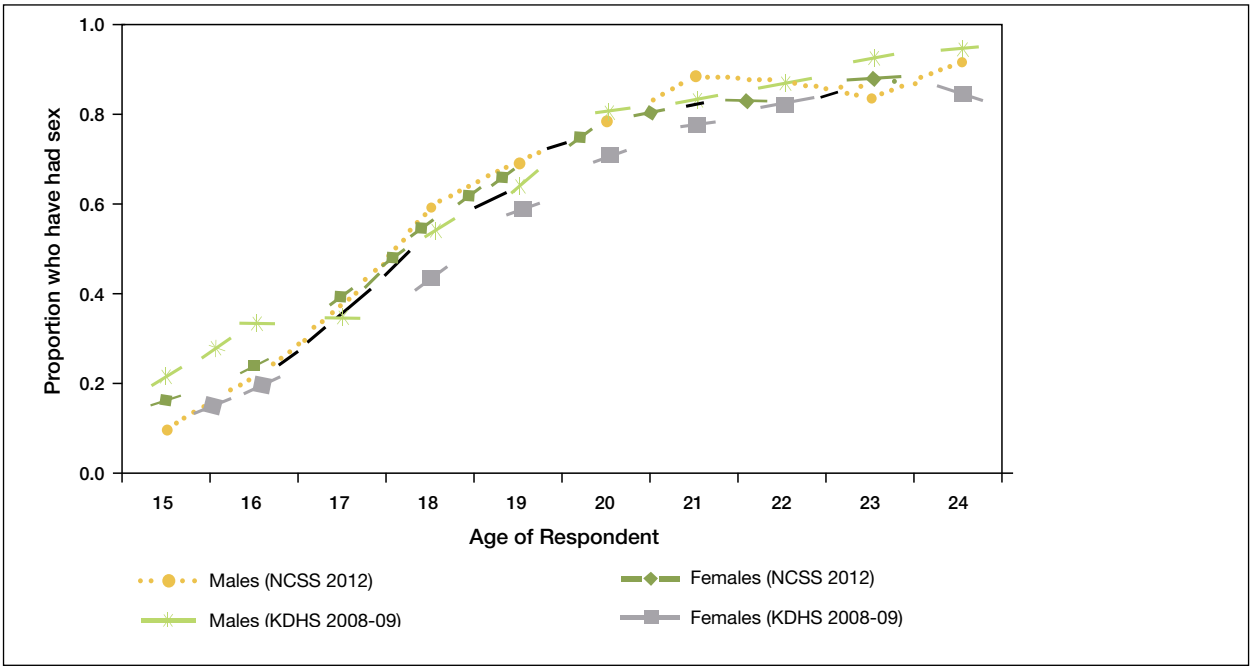
Previous studies suggest that young males may exaggerate their sexual engagement while females may underreport it because of societal proscription of sex prior to marriage for females and wider acceptance of sexual mobility among males [19, 20]. In 2000, young people were first asked whether their best friend of the same sex had ever had sex. It was anticipated that asking young people about their best friend first would elicit more accurate responses because young people would be less inclined to over-report (for males) or under-report (for females) their friends' sexual behavior. Interestingly, the results showed huge variations between young people's self-reported sexual behavior and that of their friends. For example, whereas only 5.1 percent of females aged 12-14 reported that they were sexually active, 38.6 percent indicated that their best friends had ever had sexual intercourse. The data did not suggest over-reporting among males compared to females [4].

Table 10.9: Percentage distribution of respondents aged 12-24 years by whether they and their best friends had ever had sex according to current age, NCSS 2012, NCSS 2000

Age	NCSS 2012				NCSS 2000			
	Males		Females		Males		Females	
	Self	Best friend	Self	Best friend	Self	Best friend	Self	Best friend
12-14	2.0	-	1.2	-	6.2	42.9	5.1	38.6
15-17	22.8	-	22.9	-	47.3	75.9	47.8	65.7
18-20	71.1	-	69.9	-	87.3	94.0	80.0	83.9
21-24	87.9	-	84.5	-	92.8	97.6	92.1	90.4
Total	58.5	-	57.5	-	73.5	86.4	65.5	75.1
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012								

Although recent evidence suggests that young females in SSA initiate sex earlier than males [21], Figure 10.2 indicates that young females in the slums initiated sex slightly later than males. However, for both males and females, sexual debut occurred earlier in the slums than in Kenya as a whole, with a similar pattern being observed in 2000 [4].

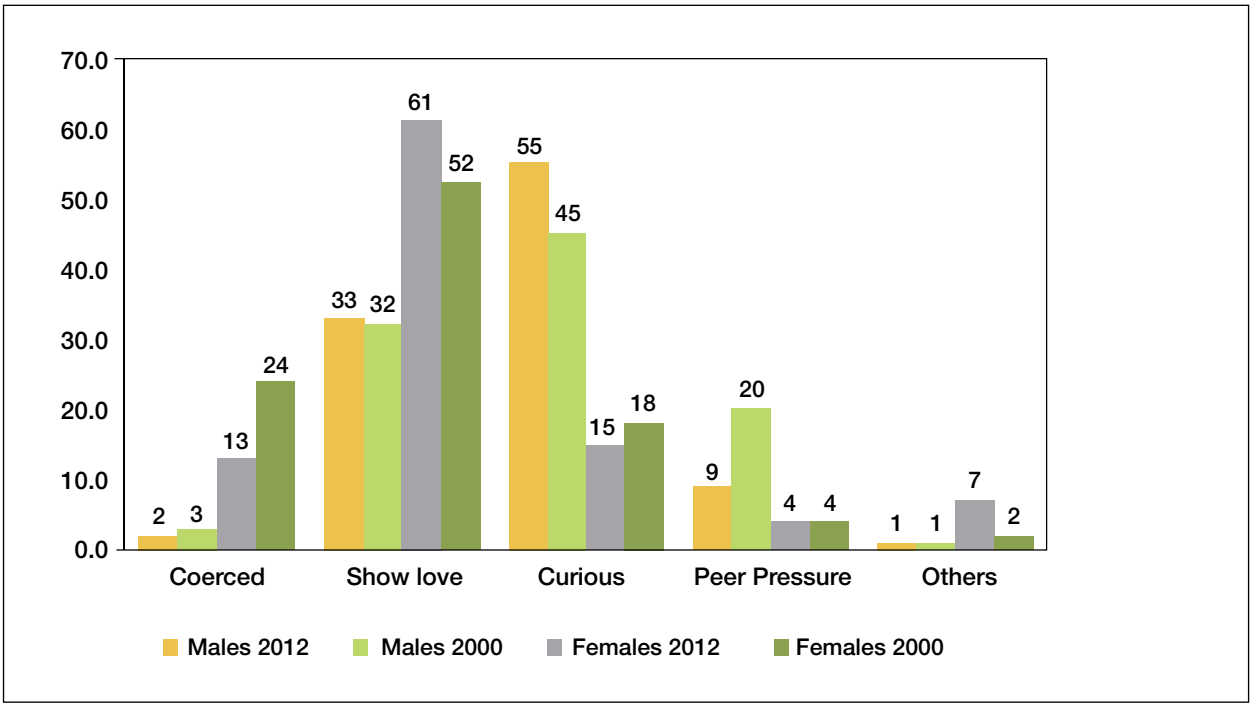
Figure 10.2: Proportion of young people aged 12-24 years that had initiated sex by age at sexual debut, NCSS 2012, KDHS 2008-09



10.5.2 Circumstances of First Sex

In the 2000 and 2012 surveys, young people who reported that they had engaged in sexual intercourse were asked about the circumstances of their first sexual encounter. Figure 10.3 illustrates the distribution of sexually active young people by circumstances of first sex.

Figure 10.3: Percentage distribution of sexually active young people aged 12-24 years by circumstances of first sex, NCSS 2012, NCSS 2000

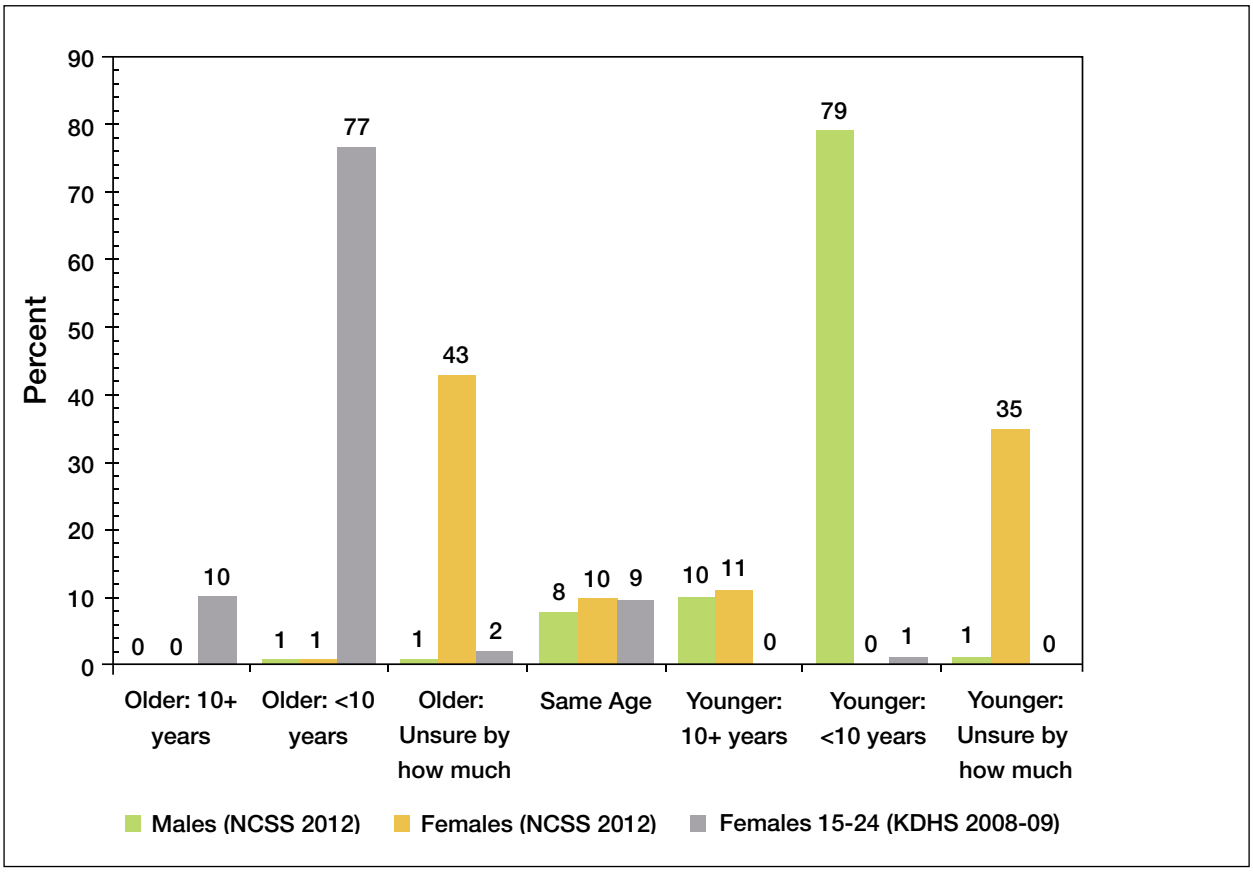


The results underscore substantial gender differences in motivation for the first sexual encounter. Over half of females in both surveys reported that 'showing love' was the primary motivation for having sex the first time. However, a substantially higher proportion of females in the 2012 survey (61.0 percent) reported love as a primary motivator compared with 2000 (52.0 percent). Among males, 'showing love' was a primary motivation for about a third in both surveys. Curiosity was

the key driver of the first sexual engagement among males in 2000 and 2012. Females were more likely to report that they were coerced into having their first sexual intercourse, with 24 percent of females in 2000 and 13 percent in 2012 reporting sexual coercion. The differences in reasons for having sex the first time may have implications for interventions to delay the onset of sexual activity among young people in the slums. In particular, given the importance that young women place on "showing love" as a motivator, interventions to delay sexual activity may require working with them to understand the role of sexual activity in the context of healthy relationships.

Young people were also asked about the age of their first sexual partner. As illustrated in Figure 10.4, most young males (79 percent) reported a younger sexual partner by less than 10 years. Forty-three percent of young females reported older sexual partners but were unsure of the age difference between them. Roughly 10 percent of young people had sex for the first time with someone about the same age.

Figure 10.4: Percentage distribution of young people who had ever had sexual intercourse by age of first sexual partner, NCSS 2012, KDHS 2008-09

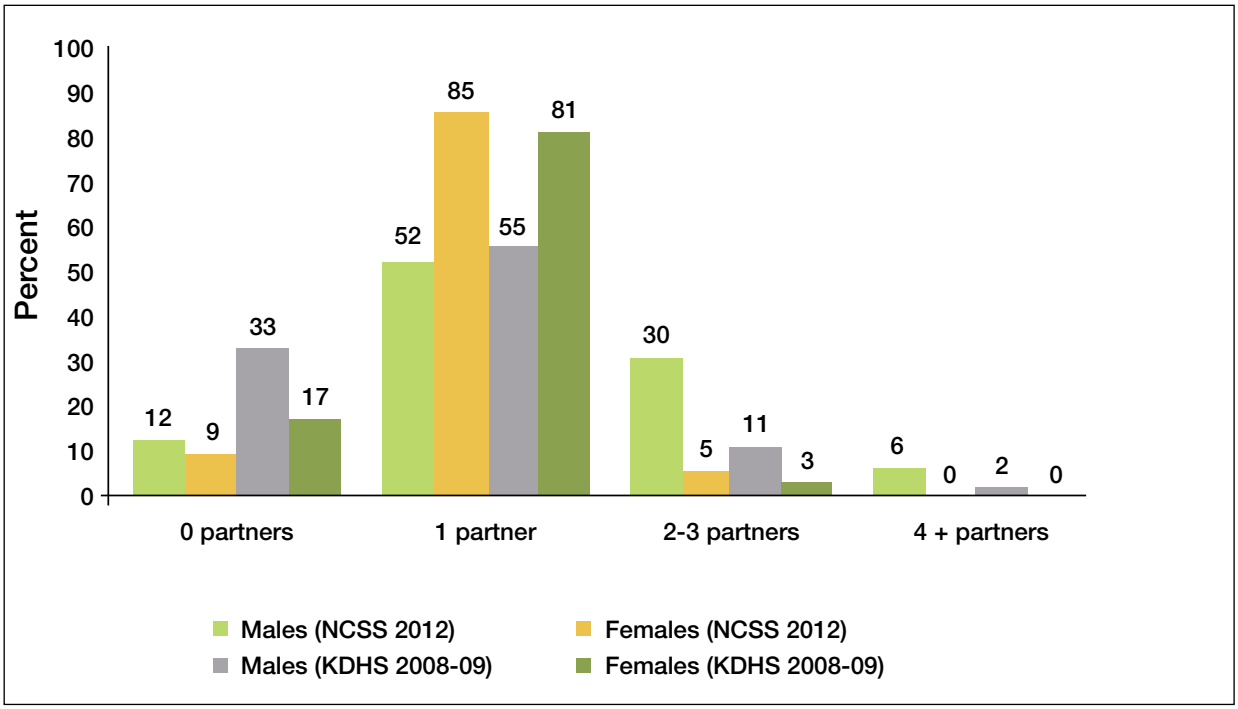


10.5.3 Multiple Sex Partners

The number of sexual partners is considered an indicator of risky sexual behavior. Young people reporting that they had ever had sex were asked the number of sexual partners they had in the 12 months preceding the survey. Results presented in Figure 10.5 show that majority of males and females reported none or one sexual partner in the 12 months preceding the survey.

However, males in the slums were more likely to report multiple sexual partners with 30 percent reporting two or three partners in the 12 months preceding the interview and 6 percent reporting four or more partners. In comparison, 13 percent of 15-24 year old males interviewed in the KDHS 2008-09 reported multiple partners. This is a shift from the 2000 survey where the proportion of males in slums reporting multiple sexual partners was lower than the proportion reporting multiple sexual partners nationally. Females aged 15-24 years in the slums were more likely to report recent sexual activity with one or more partners than their counterparts in the whole of Kenya.

Figure 10.5: Number of sex partners in the past 12 months among young people aged 15-24 who had ever had sex, NCSS 2012, KDHS 2008-09



10.6 Sexually Transmitted Infections, Including HIV/AIDS

As noted above, young people are particularly vulnerable to poor sexual and reproductive health outcomes. This section examines proximate determinants of sexual behavior. It summarizes young people's awareness of STIs, including HIV/AIDS; communication on reproductive health issues; sources of information on HIV/AIDS; HIV/AIDS-related knowledge and risk perceptions; and changes in behavior in response to the HIV/AIDS epidemic.

10.6.1 Awareness of Sexually Transmitted Infections (STIs)

Although being knowledgeable about STIs, including HIV/AIDS, may not necessarily lead to avoidance of risky sexual behavior, STI knowledge is a critical precursor to the adoption of preventive behavior and avoidance of risk behaviors. Young people were asked about their knowledge of various STIs. Table 10.10 presents the percentage distribution of young people by knowledge of STIs according to background characteristics based on the 2012 survey. Summary statistics from the 2000 survey are also presented for comparison.

Knowledge of HIV/AIDS was high across all age groups at over 80 percent for both males and females. A greater proportion of males than females reported that they were aware of syphilis, gonorrhea, HIV/AIDS, and other STIs. The results show a moderate increase in the proportion of young people who were aware of different STIs between 2000 and 2012.

Table 10.10: Percentage distribution of respondents aged 12-24 years by knowledge of sexually transmitted infections and background characteristics, NCSS 2012, NCSS 2000

Background Characteristics	Males				Females			
	Syphilis	Gonorrhea	HIV/ AIDS	Other	Syphilis	Gonorrhea	HIV/ AIDS	Other
Age								
12-14	45.1	55.8	86.5	10.4	48.2	53.6	86.7	12.4
15-17	80.4	82.1	87.1	21.7	75.8	78.8	92.3	23.2
18-20	83.2	83.1	91.4	21.6	69.2	75.8	89.4	21.0
21-24	86.2	89.5	93.0	23.1	69.8	69.6	87.3	14.1
Marital Status								
Never married	76.3	80.3	90.6	20.9	70.2	72.4	90.6	21.4
Currently married	88.7	88.8	92.2	18.5	62.0	66.6	86.9	10.7
Formerly married	63.4	71.8	96.4	8.6	77.6	76.9	91.3	15.2
Education Level								
No education	100.0	100.0	100.0	100.0	19.4	9.3	58.7	0.0
Primary incomplete	50.2	57.0	86.4	6.8	47.1	51.8	84.7	9.0
Primary complete	79.7	85.8	93.8	15.6	60.4	63.7	86.4	10.6
Secondary+	88.0	89.1	90.9	28.3	80.9	83.2	92.0	24.5
Ethnic Group								
Kamba	84.0	84.6	92.4	16.2	69.1	71.6	86.9	20.5
Kikuyu	76.1	79.2	92.0	14.5	71.5	74.2	92.8	15.8
Luhya	72.7	78.6	91.1	15.9	66.9	70.8	86.6	17.0
Luo	74.9	79.5	85.5	34.2	61.5	65.9	89.5	16.2
Other	78.5	82.7	90.8	24.5	64.5	66.1	87.2	15.6
Division								
Central	78.4	77.1	75.4	14.3	66.7	65.3	87.4	20.3
Makadara	78.9	76.5	98.2	7.7	61.4	67.5	89.7	13.7
Kasarani	76.5	79.5	93.3	57.5	52.7	57.0	92.9	12.1
Embakasi	78.5	83.3	89.7	15.1	71.1	74.4	84.5	19.3
Pumwani	78.1	80.1	98.3	10.1	74.5	71.7	90.5	22.3
Westlands	58.6	73.7	83.2	7.0	57.2	66.5	85.2	15.6
Dagoretti	75.7	84.8	94.2	21.7	73.9	76.5	89.9	21.6
Kibera	84.5	83.9	89.0	23.0	70.6	71.3	91.3	13.4
NCSS 2012								
Total	77.1	80.8	90.6	20.2	66.6	69.7	88.5	17.0
Number of cases	807				1,958			
NCSS 2000								
Total	64.0	79.3	82.4	3.1	53.0	61.1	91.3	9.3
Number of cases	1,683				1,934			

Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012

For both males and females, the younger age group (12-14 years) had the lowest awareness of various STIs, particularly syphilis and gonorrhea. The overall pattern shows that knowledge of STIs increased with educational attainment. Again, no definitive conclusions can be made from the fact that all young males reporting no formal education knew about all STIs because of the small number that had no education.

In 2012, a considerably lower proportion of Luo males were aware of HIV compared with males belonging to other ethnic groups, while in the 2000 survey, a lower proportion of Luo women reported that they were aware of HIV [4]. Males in Central Division reported lower knowledge of HIV than their counterparts in other divisions. However, a considerably lower proportion of males in Westlands than other Divisions were aware of syphilis, gonorrhea and HIV. Overall, the data suggest the need for intensified efforts to increase knowledge levels about other STIs besides HIV/AIDS.

10.6.2 Communication on Reproductive Health Issues

Access to correct sexual and reproductive health information is critical for behavior change. Young people need access to people they can talk to about sexual and reproductive health concerns. Table 10.11 presents information about who the young people talk to about their sexual concerns and STIs. For both males and females, friends are often important confidants about sexual matters. However, a substantial decrease between 2000 and 2012 was observed in the proportion of young people reporting that they would talk to friends regarding sexual concerns. Worthy of note was the substantial increase in the proportion of males and females reporting that they would talk to a medical practitioner about sexual concerns but a decline in the proportion who would talk to a medical practitioner about STIs. A higher proportion of males than females noted that they would talk to a medical practitioner about sexual matters. In addition, a higher proportion of males and females would talk to the parent of similar gender. These findings underscore the need to equip parents and practitioners with the necessary skills and knowledge to communicate with young people about sexual matters.

Table 10.11: Percentage distribution of young people aged 12-24 years by the persons they would talk to regarding sexual concerns or STIs, NCSS 2012, NCSS 2000

Person to talk to	NCSS 2012				NCSS 2000			
	Sexual Concerns		STIs		Sexual Concerns		STIs	
	Males	Females	Males	Females	Males	Females	Males	Females
Father	21.3	4.6	23.0	4.8	21.9	2.2	19.2	3.9
Mother	22.4	45.1	21.1	38.9	17.7	31.3	17.0	31.3
Brother/Sister	25.5	19.2	22.1	15.2	29.4	20.5	2.5	13.4
Other relative	12.5	28.5	12.2	21.3	22.8	18.5	13.4	11.0
Religious leader/Teacher/Counselor	16.0	7.5	15.9	6.3	7.6	6.4	3.9	3.0
Medical practitioner	33.9	17.0	61.5	44.9	9.3	9.4	66.2	52.7
Friend	44.6	18.6	29.6	10.1	63.6	43.7	46.7	27.9
No one	2.3	4.2	1.9	2.9	2.7	5.4	1.3	2.4
Others	0.9	0.6	0.5	0.2	4.1	11.4	3.7	14.1
Number of cases	807	1,958	807	1,958	1,683	1,934	1,683	1,934
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012								

10.6.3 Sources of Information on HIV/AIDS

Young people were asked about the sources of information on HIV/AIDS. Table 10.12 shows that in the 2000 survey, 85.1 percent of males and 75.9 percent of females reported obtaining information on HIV/AIDS from radio. In comparison, in 2012, just over 50 percent of young people reported radio as a source of information on HIV/AIDS. A notable increase was observed between 2000 and 2012 in the proportions of males and females reporting television, video shows, film, health workers and school/teachers as sources of information on HIV/AIDS.

The increasing role that schools and teachers play in imparting HIV/AIDS information may be explained by the incorporation of HIV/AIDS information in the school curriculum in the early 2000s [22]. Friends, relatives and the workplace were also noted to be an important source of information. The increasing importance of health workers and schools as sources of information on HIV/AIDS is notable; young people should therefore be encouraged to seek information from sources likely to impart accurate information on HIV/AIDS.

Table 10.12: Percentage distribution of young people aged 12-24 years by source of information on HIV/AIDS, NCSS 2012, NCSS 2000

Source	NCSS 2012		NCSS 2000	
	Males	Females	Males	Females
Radio	55.1	52.7	85.1	75.9
TV/Video shows/Films	45.3	32.7	28.0	26.2
Print media (Newspapers/Magazines/Pamphlets/Posters)	6.5	19.5	54.5	29.1
Health workers	30.8	28.9	15.4	24.3
Church/Mosque	15.1	23.9	17.7	18.4
School/Teacher	55.8	48.4	29.4	31.3
Community meetings/Drama performance	15.7	11.2	15.8	9.4
Friends/Relatives/Work place	63.6	40.4	61.4	57.5
Others	0.0	1.6	3.5	3.2
Number of cases	807	1,958	1,671	1,919
Note: Percentages do not add up to 100% due to multiple responses				
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012				

10.6.4 Perceptions of HIV/AIDS (Transmission, Prevention, Personal Risk)

Young people were asked about measures a person could take to avoid contracting or transmitting HIV/AIDS. Table 10.13 summarizes the spontaneous responses given by young people in the 2000 and 2012 surveys.

Table 10.13: Percentage distribution of young people aged 12-24 years by reported measures a person can take to avoid getting HIV/AIDS, NCSS 2012, NCSS 2000

What to do	NCSS 2012		NCSS 2000	
	Males	Females	Males	Females
Abstain from sex	52.8	56.2	39.4	36.3
Use condoms	79.3	66.5	60.2	46.8
Avoid high risk groups (Prostitutes/Homosexuals)	6.3	11.1	5.0	4.4
Avoid multiple partners/Be faithful to one partner	60.6	47.8	58.8	55.9
Avoid blood transfusions/injections/kissing	16.1	19.7	4.0	13.3
Avoid blood transfusions	7.7	7.8	-	-
Avoid injections	13.5	16.2	-	-
Avoid kissing	3.4	0.0	-	-
Other actions	30.9	39.6	2.8	6.0
Don't know	0.0	1.2	0.2	0.0
Number of cases	807	1,958	1,671	1,919
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012				

The data show an overall increase in the proportion of young people who were aware of various methods to prevent the transmission of HIV. For example, over half of respondents in 2012 reported sexual abstinence as a way to reduce the transmission of HIV compared to less than 40 percent in 2000. Likewise, there was a considerable increase in the proportion of young people reporting condom use as a preventive behavior. In both 2000 and 2012, males were more likely to report condom use as a preventive behavior. The gender differences in reported condom use have been observed in other studies [23, 24]. These differences may be driven by greater male control over condom use in relationships [24]. Community perceptions about acceptable sexual conduct for males and females may also mean that males may be at greater ease to report condom use. Among females, a lower proportion reported avoidance of multiple sexual partners and monogamy as a preventive behavior in 2012 than in 2000. Although relatively few people gave alternate responses such as avoiding kissing, blood transfusions, and injections compared to more widely advocated practices such as abstinence, monogamy and condom use, a considerable increase in the number of young people giving these alternate responses was observed over the period.

All young people who stated that they knew about HIV/AIDS were asked about their perceptions of risk of getting infected. Table 10.14 presents the percentage distribution of respondents by perceptions of risk of getting HIV/AIDS according to background characteristics in the 2000 and 2012 surveys. Overall, there was a decline in the proportion of young people who perceived that they were at moderate or great risk of contracting HIV/AIDS between the two surveys. This was accompanied by an increase in the proportion of young people who perceived that they were at no risk of getting HIV/AIDS.

It is important to note that in both 2000 and 2012, a greater percentage of females than males thought that they were at moderate or great risk of getting HIV/AIDS. This is consistent with the HIV prevalence data from Korogocho and Viwandani slums in Nairobi, which show that young females aged 15-24 years are significantly more likely to be HIV-infected than similarly aged males [25]. In 2012, the proportion of males and females that perceived that they were at no risk of getting HIV/AIDS was highest among the youngest age group (12-14 years). A similar pattern was observed in the 2000 survey [4]. Previous studies suggest that perceived risk of contracting HIV among young people living in urban slums is driven, in part, by sexual behavior [26]. Similarly, as shown in Table 10.14, risk perception also varied by the number of sex partners in the 12 months preceding the survey. Age differences in perceived risk of getting HIV/AIDS therefore likely stem from age disparities in sexual behavior. Formerly married males were six and five times as likely as those who were never and currently married, respectively, to perceive their risk of getting HIV/AIDS as great or moderate. Among females, those formerly married were four and two times as likely as never and currently married ones, respectively, to perceive their risk of getting HIV/AIDS as great or moderate. The proportion of young people that perceived that they were at no risk of contracting HIV/AIDS declined with increasing educational attainment. A similar pattern was observed in the 2000 survey [4]. Almost one in five females in Pumwani Division – more than in any other division – reported that they were at great or moderate risk of getting HIV/AIDS. The lowest proportion of males reporting no risk for HIV/AIDS was also in Pumwani Division.

Table 10.14: Percentage distribution of respondent aged 12-24 years by perceptions of the risk of getting HIV/AIDS according to background characteristics, NCSS 2012, NCSS 2000

Background Characteristics	Males			Females		
	No risk	Small risk	Moderate/ Great risk	No risk	Small risk	Moderate/ Great risk
Age						
12-14	70.5	28.6	0.8	76.8	22.8	0.4
15-17	48.6	41.8	9.6	62.6	31.4	6.0
18-20	26.5	64.6	8.9	48.6	40.9	10.5
21-24	25.9	64.3	9.8	35.3	48.3	16.4
Marital Status						
Never married	40.4	52.4	7.2	59.9	33.5	6.6
Currently married	18.4	73.3	8.3	36.2	49.0	14.8
Formerly married	41.7	18.0	40.3	43.6	27.4	28.9
Education Level						
No education	100.0	0.0	0.0	75.8	24.2	0.0
Primary incomplete	60.4	37.3	2.3	64.5	29.0	6.5
Primary complete	34.0	55.8	10.2	43.6	46.2	10.2
Secondary+	29.0	61.6	9.4	46.3	41.2	12.4
Number of sex partners in past 12 months						
Never had sex	58.4	38.1	3.6	70.0	27.6	2.4
0 partners	26.0	61.9	12.1	45.6	39.8	14.6
1 partner	24.5	66.7	8.8	36.4	48.7	14.9
2-3 partners	19.0	61.0	20.0	32.6	33.9	33.4
4+ partners	12.7	83.3	4.0	54.8	45.2	0.0
Ethnic Group						
Kamba	37.6	55.0	7.4	43.9	49.9	6.2
Kikuyu	42.5	54.5	3.0	54.6	35.1	10.3
Luhya	35.6	52.3	12.1	50.9	37.3	11.8
Luo	32.3	58.4	9.3	50.8	40.1	9.1
Other	39.8	52.3	7.9	52.1	35.1	12.9
Division						
Central	32.2	55.4	12.5	13.4	74.4	12.2
Makadara	36.9	55.8	7.3	55.0	29.0	16.0
Kasarani	52.4	33.1	14.5	51.8	38.3	9.8
Embakasi	35.5	57.3	7.1	51.8	38.9	9.3
Pumwani	25.3	73.0	1.7	16.6	64.0	19.4
Westlands	58.3	33.4	8.3	66.6	21.1	12.4
Dagoretti	36.2	60.5	3.4	49.4	41.8	8.7
Kibera	26.6	65.2	8.2	60.8	33.0	6.3
NCSS 2012						
Total	37.7	54.4	7.9	50.6	39.1	10.3
Number of cases	807			1,958		
NCSS 2000						
Total	35.2	53.0	11.8	37.6	46.4	16.0
Number of cases	1,617			1,917		

Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012

10.6.5 Behavior Change to Avoid Getting HIV/AIDS

Young people who reported that they knew about HIV/AIDS were asked whether they had changed their behavior to avoid HIV infection. Table 10.15 shows the distribution of respondents by behavior changes according to background characteristics.

Table 10.15: Percentage distribution of respondent aged 12-24 years by behavior change to avoid getting HIV/AIDS according to background characteristics, NCSS 2012, NCSS 2000

Background Characteristics	Males				Females			
	Condom use	One partner	Other	No change	Condom use	One partner	Other	No change
Age								
12-14	0.6	2.7	85.1	7.9	0.2	0.2	64.8	0.0
15-17	12.8	10.9	70.6	14.0	5.5	10.9	67.0	0.0
18-20	52.3	31.2	62.5	7.1	10.7	37.6	48.6	0.1
21-24	56.2	41.5	59.8	10.0	10.9	47.0	37.5	0.3
Marital Status								
Never married	37.5	22.6	68.7	9.0	9.4	13.7	59.1	0.0
Currently married	49.9	66.2	56.4	10.3	6.2	57.0	36.8	0.4
Formerly married	29.8	6.4	57.9	29.4	12.3	36.1	41.1	0.0
Education Level								
No education	100.0	100.0	100.0	0.0	13.7	37.0	31.7	0.0
Primary incomplete	8.6	9.9	76.2	9.9	2.7	14.5	54.4	0.0
Primary complete	42.2	30.7	61.0	15.4	7.4	40.6	46.1	0.3
Secondary+	50.4	33.8	64.9	6.6	11.6	35.0	48.8	0.2
Number of sex partners in past 12 months								
Never had sex	1.8	2.5	85.4	11.9	0.7	1.2	72.1	0.0
0 partners	55.9	39.7	68.3	6.8	13.8	22.5	58.0	0.0
1 partner	64.8	54.1	51.8	10.8	13.0	58.2	36.4	0.3
2-3 partners	71.5	33.9	62.7	7.9	26.2	28.2	22.7	0.0
4+ partners	73.8	12.0	72.2	0.0	40.8	34.3	47.3	0.0
Ethnic Group								
Kamba	44.1	32.1	60.3	8.0	9.0	31.1	42.4	0.0
Kikuyu	36.6	17.1	69.7	10.6	6.7	26.9	49.2	0.6
Luhya	35.3	29.6	67.9	9.5	7.5	30.2	54.3	0.1
Luo	38.5	28.4	66.6	9.5	8.7	29.9	56.6	0.0
Other	39.6	31.6	69.0	10.1	9.7	37.9	42.6	0.0
Division								
Central	17.1	13.6	33.5	34.1	8.4	32.8	41.8	0.0
Makadara	55.5	31.4	83.6	0.0	10.1	37.9	33.0	0.0
Kasarani	46.6	43.7	77.0	12.7	4.6	30.6	68.4	0.6
Embakasi	37.3	24.3	70.9	2.4	7.7	25.6	38.3	0.3
Pumwani	14.5	3.5	14.9	50.8	5.9	42.2	54.9	0.0
Westlands	39.2	18.6	50.0	21.0	8.7	37.2	51.1	0.0
Dagoretti	39.2	33.9	66.6	0.8	11.2	35.3	50.8	0.0
Kibera	37.7	31.9	77.8	2.5	9.1	26.7	63.0	0.0
NCSS 2012								
Total	38.7	27.5	66.6	9.5	8.2	31.0	49.5	0.2
Number of cases	807				1,958			
NCSS 2000								
Total	25.4	42.7	51.2	5.3	3.7	44.7	51.8	13.7
Number of cases	1,617				1,919			

Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012

Less than one percent of females stated that they had not changed their behavior in 2012 compared to 14 percent in 2000. However, a greater proportion of young males in 2012 (9.5 percent) than in 2000 (5.3 percent) reported that they had not changed their behavior to prevent HIV infection. There was an increase in the proportion of young people reporting condom use as a preventive behavior between the two surveys. Similar to the 2000 survey [4], the proportion of young people reporting condom use and restricting sexual activity to one partner as preventive strategies increased with age. For both males and females, those who were currently married were more likely to report restricting sexual activity to one

partner as a preventive strategy. A similar pattern was observed in 2000 [4]. Married males were the least likely to report condom use as a preventive strategy in 2000 [4], but the most likely to do so in 2012 with 50 percent mentioning the use of condoms. More educated young people were likely to report condom use as a preventive strategy and, among males, the proportion reporting monogamy increased with higher levels of education. Young people with multiple partners in the 12 months preceding the survey were more likely to report condom use as a preventive strategy than those with one partner. Overall, the findings show that young people are increasingly becoming aware about the need to adopt preventive behavior to avoid HIV infection.

10.6.6 Condom Use during the Last Sexual Encounter

Consistent use of condoms has been shown to result in 80 percent reduction in HIV incidence [27]. Table 10.16 shows young people's use of condoms in the most recent sexual intercourse by background characteristics. Overall the proportion of young people reporting condom use in the most recent sexual encounter was slightly lower among those living in the slums in 2012 compared with the national average. Among males, condom use during the most recent sexual encounter was higher among older age groups. Only one in ten males aged 15-17 years in the 2012 survey reported condom use during the most recent sexual intercourse compared to one in three in 2000. There was a decline in the proportion of females aged 15-17 years that reported condom use during most recent sexual intercourse between 2000 and 2012. For both males and females, condom use among 18-24 year olds increased between the two survey periods. Not surprising, condom use during the most recent sexual intercourse was lowest among currently married young people. However, there was an increase in the proportion of married young people reporting condom use during the most recent sexual intercourse between 2000 and 2012. In 2012, condom use during the most recent sexual intercourse was highest among young males with secondary or higher education. A similar pattern was observed among females. Given the low number of young people with no formal education, the proportions in this category should be interpreted with caution. As in 2000, Muslim males and females were the least likely to report condom use during the most recent sexual intercourse in 2012. Taken together, these findings underscore the need for efforts to increase condom use among sexually active youth (not just for prevention of STIs but also as a contraceptive method), particularly among those who are currently married and among Muslim youth.

Table 10.16: Percentage distribution of sexually-experienced respondents by use of condoms in the most recent sexual intercourse according to background characteristics, NCSS 2012, NCSS 2000 and KDHS 2008-09

Background Characteristics	Males			Females		
	NCSS 2012	NCSS 2000	KDHS 2008-09 National	NCSS 2012	NCSS 2000	KDHS 2008-09 National
Age						
12-14	0.0	6.7	not available	0.0	25.0	not available
15-17	10.0	34.8	26.9	5.6	10.1	23.0
18-20	44.8	31.1	34.9	13.4	6.7	12.1
21-24	46.0	31.1	43.4	11.4	7.8	11.0
Marital Status						
Never married	34.2	37.3	40.1	11.5	17.2	26.5
Currently married	18.5	10.0	21.0	5.6	2.0	3.5
Formerly married	30.3	35.3	35.1	13.1	18.5	11.5
Education Level						
No education	0.0	0.0	22.7	22.1	3.7	2.8
Primary incomplete	6.0	26.7	30.6	2.8	8.3	10.8
Primary complete	33.8	30.4	40.4	8.2	5.1	9.2
Secondary+	42.8	34.9	42.0	12.8	11.1	20.9
Religion						
Catholic	33.6	31.3	33.3	11.5	8.2	12.4
Protestant/Other Christian	31.5	32.0	39.4	8.4	7.7	14.7
Muslim	26.0	28.6	41.3	6.1	3.9	3.4
Other (Other/No religion)	39.7	11.8	35.9	11.1	10.0	3.7
Ethnic Group						
Kamba	38.6	33.7	19.6	8.0	6.1	10.3
Kikuyu	31.3	33.2	34.3	6.4	12.0	15.6
Luhya	29.8	27.5	28.7	11.1	6.6	14.2
Luo	30.3	31.7	51.7	9.5	7.7	17.6
Other	29.2	30.8	42.2	10.1	5.0	10.4
Total	32.0	31.4	37.8	9.1	7.8	13.1
Number of cases	807	1,226	893	1,958	1,251	2,021

Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09

10.7 Contraceptive Knowledge, Attitudes and Practices among Young People

Young people's contraceptive-related knowledge, attitudes and practices are likely to drive the timing of childbearing and fertility levels. This section examines contraceptive knowledge, attitudes, and practices among young people.

10.7.1 Knowledge of Contraceptive Methods

Young people were asked about various contraceptive methods. Table 10.17 summarizes respondents' spontaneous responses in the 2000 and 2012 surveys, as well as in the 2008-09 KDHS. In all three surveys, over 90 percent of young people spontaneously mentioned at least one modern method, with substantial increases being observed in the proportion of young people who spontaneously mentioned the IUD over the inter-survey period.

Specifically, in 2012, 67.7 percent of females and 49.4 percent of males spontaneously mentioned the IUD compared to 32.0 percent of females and 7.1 percent of males in 2000. Considerable increases were also observed in the proportion of young people who spontaneously mentioned female and male sterilization as well as implants. Overall, the data suggest substantial increases in knowledge of contraception among young people living in urban slums.

Table 10.17: Percentage distribution of young people aged 15-24 years who spontaneously reported knowledge of specific contraceptive methods, NCSS 2012, NCSS 2000 and KDHS 2008-09

Contraceptive Method	Females			Males		
	NCSS 2012	NCSS 2000	KDHS 2008-09 National	NCSS 2012	NCSS 2000	KDHS 2008-09 National
Any modern method	**93.6**	**91.7**	**91.3**	**97.0**	**95.5**	**95.0**
Pill	87.5	88.1	79.8	85.4	74.8	71.5
IUD	67.7	32.0	40.2	49.4	7.1	26.0
Injection	86.9	72.2	79.8	80.5	35.8	61.6
Diaphragm/Foam/Jelly	-	3.1	-	-	3.8	-
Condom	90.5	54.7	86.6	97.0	88.4	94.6
Female Sterilization	56.2	10.6	52.9	54.4	13.3	47.3
Male Sterilization	40.8	3.5	28.6	51.0	9.6	35.5
Implant	70.5	16.9	48.4	46.5	2.8	24.0
Any traditional method	**70.8**	**22.4**	**56.9**	**72.7**	**28.1**	**58.4**
Periodic abstinence	67.3	20.5	51.4	68.1	27.3	52.3
Withdrawal	46.3	1.2	35.1	53.1	2.4	41.0
Other	76.4	2.1	4.1	82.7	0.5	2.5
Any method	**93.6**	**92.3**	**91.5**	**97.0**	**95.9**	**95.1**
Number of cases	1,958	1,618	3,475	807	1,457	1,406

Note: Percentages do not add up to 100 due to multiple responses

Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09

10.7.2 Attitudes towards Contraceptives

Young people were asked whether they approved the use of contraceptives and condoms among unmarried youth. Table 10.18 shows the percentage of young people who approved of contraceptive and condom use for unmarried youth by background characteristics. Overall, there was a slight increase in the proportion of males and a decline in the proportion of females that approved the use of contraceptives and condoms for unmarried youth between 2000 and 2012. In both surveys, males were more likely than females to approve the use of contraceptives and condoms among unmarried youth.

Approval of contraceptive and condom use by unmarried youth increased with age with 12-14 year olds being the least likely to approve use. For example, 83.2 percent of 21-24 year-old males approved the use of contraceptives by unmarried youth while 51.4 percent of those aged 12-14 did so. Among females, approval of contraceptive use by unmarried youth was higher among those who were currently or formerly married. Overall, approval of contraceptive use was higher among more educated young people. All males with no formal education approved of contraceptive and condoms use by unmarried youth. However, no definitive conclusions can be made because of the small number of males that had no formal education.

Table 10.18: Percentage distribution of young people aged 12-24 years who approved of contraceptive use by background characteristics, NCSS 2012, NCSS 2000

Background Characteristics	Approve contraceptive use for unmarried youth		Approve condom use for unmarried youth	
	Males	Females	Males	Females
Age				
12-14	51.4	29.4	69.4	42.9
15-17	61.4	45.6	78.9	58.6
18-20	77.0	52.7	88.2	69.6
21-24	83.2	49.7	88.6	66.5
Marital Status				
Never married	72.6	44.9	84.2	58.8
Currently married	75.7	49.1	83.4	67.9
Formerly married	73.5	53.8	73.4	69.6
Education Level				
No education	100.0	10.5	100.0	37.2
Primary incomplete	58.0	37.6	72.3	51.0
Primary complete	73.9	46.1	86.4	62.2
Secondary+	78.8	51.5	87.2	68.1
Religion				
Catholic	75.8	49.3	85.7	62.6
Protestant/Other Christian	73.3	45.8	83.8	62.8
Muslim	54.3	32.6	74.4	44.5
Other (Other/No religion)	57.9	65.8	68.5	74.0
Ethnic Group				
Kamba	76.0	41.1	83.2	55.3
Kikuyu	69.4	49.9	80.3	63.3
Luhya	76.6	43.6	88.6	62.8
Luo	66.1	52.1	81.2	66.9
Other	74.5	45.1	83.4	61.0
Division				
Central	33.1	34.1	53.6	60.1
Makadara	67.9	50.9	79.6	68.3
Kasarani	73.2	54.2	81.3	64.4
Embakasi	80.9	42.9	87.5	55.7
Pumwani	75.6	17.4	89.9	35.9
Westlands	72.7	50.0	74.0	73.4
Dagoretti	83.8	56.5	94.4	71.9
Kibera	70.3	46.9	89.6	62.1
NCSS 2012				
Total	72.7	46.3	83.5	62.0
Number of cases	582	899	671	1,199
NCSS 2000				
Total	65.2	48.8	80.1	70.1
Number of cases	1,683	1,934	1,683	1,934
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012				

Young people who were affiliated to the Christian faith were more likely to approve of contraceptive and condom use. A very low proportion of young males living in the Central Division approved of contraceptive and condom use among unmarried youth compared with males living in other divisions. Less than one in five females in Pumwani Division approved of contraceptive use among unmarried youth and about one in three approved of condom use.

10.7.3 Contraceptive Use

Table 10.19 summarizes the proportion of young people aged 12-24 years who had ever used contraception by background characteristics. Overall, a higher proportion of young people in the slums reported ever use of any modern method than their counterparts in Kenya as a whole. For both males and females, there was an increase in the proportion of young people reporting ever use of any modern method between 2000 and 2012.

Table 10.19: Percentage of adolescents aged 12-24 years who had ever used contraceptive methods by background characteristics, NCSS 2012, NCSS 2000 and KDHS 2008-09

Background Characteristics	Any method						Any modern method					
	Males			Females			Males			Females		
	NCSS 2012	NCSS 2000	KDHS 2008-09 National	NCSS 2012	NCSS 2000	KDHS 2008-09 National	NCSS 2012	NCSS 2000	KDHS 2008-09 National	NCSS 2012	NCSS 2000	KDHS 2008-09 National
Age												
12-14	0.0	1.3	-	16.1	0.6	-	0.0	1.3	-	16.1	0.6	-
15-17	67.9	26.6	14.0	37.8	16.4	8.7	65.6	23.2	14.1	36.8	11.1	8.9
18-20	79.6	61.0	48.7	60.8	37.4	29.1	78.7	54.8	45.0	59.2	29.4	25.3
21-24	83.8	72.0	73.6	74.6	61.6	62.6	82.1	60.6	71.1	72.4	52.6	57.5
Marital Status												
Never married	78.7	58.0	43.7	55.2	29.4	19.2	77.6	50.8	41.9	53.6	21.8	17.6
Currently married	90.5	75.1	78.0	73.0	53.8	62.7	87.4	60.5	72.3	70.8	45.5	57.5
Formerly married	86.2	83.3	100.0	88.9	74.1	65.5	86.2	69.4	85.2	88.9	70.4	55.6
Education Level												
No education	0.0	10.0	41.8	24.0	33.3	19.0	0.0	10.0	40.3	24.0	27.3	10.7
Primary incomplete	64.8	45.3	32.5	71.3	33.6	30.0	61.0	41.0	31.0	70.6	26.9	28.9
Primary complete	77.0	65.6	53.3	65.1	44.9	42.9	73.0	56.2	50.1	64.1	36.4	38.7
Secondary+	85.6	68.3	55.1	69.2	47.8	37.6	85.6	57.5	52.9	66.4	39.9	34.4
Ethnic Group												
Kamba	82.0	69.6	30.8	59.2	42.5	30.9	49.8	57.1	28.6	56.3	32.1	29.8
Kikuyu	77.3	53.2	44.2	70.0	47.5	38.7	38.5	47.8	40.6	69.1	41.4	36.0
Luhya	78.3	64.2	46.4	70.7	47.1	33.0	53.4	51.9	44.9	69.1	40.9	32.1
Luo	85.0	65.6	56.9	68.5	37.8	43.5	49.4	60.0	57.2	67.3	27.5	39.9
Other	85.6	51.4	48.9	71.4	35.6	33.4	53.3	42.2	46.3	68.6	30.2	28.9
Religion												
Catholic	82.9	66.8	45.9	67.4	46.2	34.1	80.2	57.0	42.5	66.8	36.4	30.8
Protestant/Other Christian	80.5	62.1	48.1	68.8	42.4	37.4	79.7	53.8	46.2	66.5	35.2	34.6
Muslim	80.1	28.6	32.3	51.1	25.9	21.1	75.4	25.4	36.6	45.9	22.2	17.4
Other (Other/No religion)	85.7	33.3	45.9	71.1	30.8	40.2	85.7	14.3	39.7	65.6	30.8	33.7
Total	81.2	61.7	46.6	67.7	42.7	35.4	79.8	53.0	44.4	65.8	34.9	32.4
Number of cases	472	1,457	1,406	1,126	1,618	3,475	472	1,457	1,406	1,126	1,618	3,475

(-) data not available

Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09

As shown in Table 10.20, there was an increase in current use of contraception between 2000 and 2012 among both males and females. Current use of contraception was higher among older and ever married young people; it also was higher in urban slums than the rest of Kenya. Among males, current use of contraceptives increased with higher levels of education while for females, current use was highest among those with primary level education. For both males and females, Muslims were the least likely to be current users of contraception.

Table 10.20: Percentage of young people aged 12-24 years who were currently using contraceptive methods by background characteristics, NCSS 2012, NCSS 2000 and KDHS 2008-09

Background Characteristics	Any method						Any modern method					
	Males			Females			Males			Females		
	NCSS 2012	NCSS 2000	KDHS 2008-09 National	NCSS 2012	NCSS 2000	KDHS 2008-09 National	NCSS 2012	NCSS 2000	KDHS 2008-09 National	NCSS 2012	NCSS 2000	KDHS 2008-09 National
Age												
12-14	0.0	0.4	-	16.1	0.3	-	0.0	0.4	-	16.1	0.3	-
15-17	54.8	19.4	9.3	18.5	9.8	3.6	51.3	15.6	8.9	18.5	5.8	3.2
18-20	57.6	39.8	28.5	35.9	23.8	12.8	57.0	34.4	24.5	34.0	16.7	10.2
21-24	58.9	48.8	47.0	47.0	40.5	30.0	56.4	38.4	43.6	44.6	32.4	26.3
Marital Status												
Never married	55.6	41.4	28.0	21.9	18.7	7.3	53.9	34.7	25.5	21.0	11.3	6.1
Currently married	6	41.8	38.7	51.6	35.2	33.1	63.9	28.0	34.7	48.7	28.5	28.5
Formerly married	54.3	50.0	49.8	50.5	46.3	21.1	54.3	41.7	35.1	50.5	44.4	20.8
Education Level												
No education	0.0	0.0	20.7	8.8	18.2	8.0	0.0	0.0	20.7	8.8	12.1	5.8
Primary incomplete	29.8	28.3	20.4	46.7	20.6	13.2	29.8	24.0	18.7	46.0	15.8	11.8
Primary complete	48.9	43.3	33.6	43.8	31.2	21.1	48.3	36.8	29.5	42.4	23.2	17.3
Secondary+	66.0	48.5	34.0	39.6	29.4	17.3	63.1	36.7	31.0	36.7	23.2	15.3
Religion												
Catholic	59.9	47.9	26.3	43.7	29.7	15.8	57.9	36.8	24.7	42.5	20.9	13.8
Protestant/Other Christian	58.5	40.5	30.3	41.1	27.7	17.3	56.3	33.7	27.5	38.9	21.6	14.8
Muslim	40.5	20.6	21.5	32.6	17.3	10.4	40.5	19.1	20.3	27.6	13.6	9.3
Other (Other/No religion)	51.6	14.3	32.0	53.6	0.0	17.7	51.6	4.8	24.4	48.1	0.0	13.0
Ethnic Group												
Kamba	62.5	53.7	14.5	37.5	29.9	17.1	61.4	40.4	12.3	35.4	20.1	14.3
Kikuyu	56.9	36.0	30.3	40.6	33.7	18.2	56.9	30.3	26.1	40.0	28.1	16.6
Luhya	55.1	39.4	21.1	38.3	28.3	15.7	51.5	32.3	19.7	36.6	22.7	14.3
Luo	59.1	44.4	39.7	46.6	22.7	17.3	57.1	36.4	39.7	44.4	14.4	15.4
Other	56.0	31.2	32.5	46.6	21.8	15.6	53.5	25.4	28.6	42.8	16.8	12.5
Total	57.9	41.7	28.9	41.6	27.6	16.4	55.9	33.6	26.2	39.5	20.8	14.1
Number of cases	472	1,457	1,406	1,126	1,618	3,475	472	1,457	1,406	1,126	1,618	3,475
(-) data not available												
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09												

10.8 Childbearing and Unintended Pregnancies among Young People

Young people in SSA are more likely than those in other regions to report early childbearing [28], a phenomenon that occurs in the context of high unmet need for contraception in the region [15]. Early childbearing is associated with poor maternal health outcomes, with women and girls aged below 20 years being more likely to die during pregnancy or childbirth compared with older women [29]. This section examines childbearing experiences and unintended pregnancies among young people in the slums.

10.8.1 Childbearing

As shown in Table 10.21, young females in the slums were more likely to have given birth than those in Nairobi. A lower proportion of young people in the slums had given birth in 2012 than in 2000, suggesting that young people in slums are delaying childbearing. The later initiation of childbearing also means lower parity. For example, 17.3 percent of females aged 15-24 had given birth to 2 or more children in 2000 compared to 11.9 percent in 2012.

Table 10.21: Percentage of female adolescents aged 15-24 years by parity, NCSS 2012, NCSS 2000 and KDHS 2008-09

Parity	NCSS 2012	NCSS 2000	KDHS 2008-09	
			Nairobi	National
0	62.8	52.7	68.9	59.8
1	25.2	30.0	25.7	20.4
2	9.7	11.6	4.0	12.0
3+	2.2	5.7	1.3	7.8
Mean number	0.5	0.7	0.4	0.7
Number of cases	1,958	1,618	285	3,475
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09				

Table 10.22 shows the percentage of female youth aged 15-24 years who had begun childbearing by background characteristics.

Table 10.22: Percentage of females aged 15-24 years who had begun childbearing (ever given birth or pregnant with first child) by background characteristics, NCSS 2012, NCSS 2000 and KDHS 2008-09

Background Characteristics	NCSS 2012	NCSS 2000	KDHS 2008-09	
			Nairobi	National
Age				
15-17	8.5	19.4	0.4	9.4
18-20	44.4	51.5	33.9	40.2
21-24	68.4	72.9	46.0	74.1
Marital Status				
Never married	18.3	19.9	10.9	14.3
Married	81.4	82.9	85.8	92.6
Divorced/Separated/Widowed	88.0	92.6	92.5	94.9
Education Level				
No education	89.5	72.7	61.0	70.6
Primary incomplete	62.1	52.5	38.8	45.0
Primary complete	63.4	58.4	56.1	55.0
Secondary+	40.9	45.4	24.3	29.0
Religion				
Catholic	48.9	53.6	29.9	38.9
Protestant/Other Christian	50.7	52.1	35.6	43.5
Muslim	54.1	55.6	35.5	47.8
Other (Other/No religion)	53.1	69.2	80.6	81.1
Ethnic Group				
Kamba	46.5	51.9	29.1	40.0
Kikuyu	43.3	44.0	25.1	31.4
Luhya	53.5	55.9	45.8	40.0
Luo	52.8	61.0	41.9	53.6
Other	55.2	49.5	37.8	46.7
Total	50.3	52.9	34.7	43.4
Number of cases	800	1,618	285	3,475
Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09				

Overall, the data show that young people in urban slums are delaying childbearing. For example, while 19.4 percent of those aged 15-17 years had begun childbearing in 2000, only 8.5 percent of similarly aged females in 2012 had done so.

Although the data show a positive trend in the slums, they also depict substantial inequities between the rich and the poor, which indicate that specific groups are particularly vulnerable to early childbearing. The onset of childbearing among 15-17 year olds, for example, is much higher in the slums compared to the whole of Nairobi. Further, the proportion of young people who had begun childbearing was higher among those with either primary or no formal education compared with those with at least secondary level of education. The delay in childbearing observed is therefore likely linked to the substantial increase in the proportion of young females that were in school between 2000 and 2012 (Table 10.1). In 2012, a greater proportion of Muslim youth in the slums had begun childbearing compared to young people of Christian faith. A similar pattern was observed in Kenya as a whole.

10.8.2 Unintended Pregnancies among Young People

Table 10.23 presents the proportion of births to young females aged 15-24 years in the 3 years preceding the survey that were unintended by background characteristics. Overall, 42.9 percent of births in the 3 years preceding the 2012 survey were unintended compared with 51.4 percent in the 2000 survey. As in 2000, births to the younger females were more likely to be unintended. There was, however, a decline in the proportion of unintended births among females in the 15-17 year age group, from 69.2 percent in 2000 to 50.6 percent in 2012. Never married females were more likely to report unintended births than ever married ones, while currently married females were less likely to report unintended births than their formerly married counterparts. A greater proportion of young people with incomplete primary education reported unintended births compared with more educated youth. Kamba youth had notably lower proportions of unintended births relative to other ethnic groups. Among religious groups, Muslim youth, who had the lowest levels of contraceptive use (see Table 10.19), were also the most likely to report unintended births.

Table 10.23: Percentage of unintended births in the 3 years preceding the survey by maternal background characteristics, NCSS 2012, NCSS 2000 and KDHS 2008-09

Background Characteristics	NCSS 2012	NCSS 2000	KDHS 2008-09	
			Nairobi	National
Age				
15-17	50.6	69.2	36.9	66.2
18-20	56.1	54.4	34.4	52.1
21-24	36.1	47.1	35.2	46.4
Marital Status				
Never married	67.6	88.3	66.3	80.8
Currently married	37.8	43.8	22.3	41.9
Formerly married	45.8	57.9	74.9	56.2
Education Level				
No education	23.6	47.4	25.0	28.2
Primary incomplete	58.5	52.4	28.3	51.2
Primary complete	36.5	51.6	40.3	51.8
Secondary+	42.6	50.3	34.2	53.3
Religion				
Catholic	41.2	53.3	35.0	48.2
Protestant/Other Christian	43.2	49.5	34.9	52.3
Muslim	50.4	55.6	20.9	30.3
Other (Other/No religion)	37.1	71.4	100.0	42.1
Ethnic Group				
Kamba	29.0	40.4	11.6	49.7
Kikuyu	36.1	47.0	45.0	56.8
Luhya	52.1	55.8	41.5	54.5
Luo	49.9	56.1	44.8	58.0
Other	40.4	50.7	10.6	41.1
Total	42.9	51.4	35.2	49.3
Number of cases	204	625	79	1,507

Source: Nairobi Cross-sectional Slums Surveys (NCSS) 2000 & 2012, Kenya Demographic and Health Survey (KDHS) 2008-09

10.9 Summary

Current projections of population growth in SSA show that it will be concentrated in urban slums [30], which are home to a substantial proportion of young people [31]. Previous studies show that many youth in urban slums face extreme difficulties that inhibit their capacity to achieve life aspirations and to lead productive lives [32]. Thus, it is critical to understand the situation of young people in urban slums in order to inform policies and programs that promote youth health and general wellbeing. This chapter highlighted the changes in socio-economic and sexual and reproductive health indicators among young people living in urban slums of Nairobi between 2000 and 2012.

Results show a substantial increase in the proportions of young people in slums with secondary or higher levels of education between 2000 and 2012 and a narrowing of the gap in educational attainment between males and females. The positive outcomes notwithstanding, there was substantial disparity in educational attainment between youth in slums and their non-slum counterparts, which underscores the relative disadvantage of young urban slum dwellers.

Previous work shows that slum settlements are underserved by public school facilities [1], which has long-term implications for the ability of young urban slum dwellers to actively engage in an economy that increasingly depends on an educated workforce [33]. A review of youth education, training and employment in Nairobi's slum settlements identified expansion of secondary school opportunities as critical in ensuring that the full potential of youth to drive economic productivity is harnessed [1]. An important aspect of this process is the need to further narrow the gender gap in educational attainment. Although there was a slight decline in the proportions of young people reporting drunkenness and illicit drug use between 2000 and 2012, a considerable proportion (over 10 percent) of males reported these behaviors, with the proportions reporting substance use being considerably higher among orphaned youth. These findings are consistent with previous studies in terms of how restrictive opportunity structures, that are characteristic of Nairobi urban slums, engender deviant behavior [5, 34-38]. Consequently, efforts to improve the health and wellbeing of urban youth must aim at reducing levels of substance use particularly among the most vulnerable groups.

Similar to previous research [2, 17], the results demonstrate the unique vulnerability of young slum dwellers to poor sexual and reproductive health outcomes compared with young people living in other urban or rural settings. For example, males in the slums were more likely to report having multiple recent sexual partners than those in Kenya as a whole, while a higher proportion of females in the slums reported recent sexual activity with one or more partners than similarly-aged females nationally. Some scholars have argued that young people in urban slums are particularly vulnerable to poor sexual and reproductive health outcomes because they may resort to transactional sex to meet basic needs [18]. Schools are primary avenues for reaching youth with sexual and reproductive health information; thus, the large number of youth in urban slum settlements who are out of school also presents a challenge to efforts to improve sexual and reproductive health outcomes among them. The structural factors that drive poor sexual and reproductive health indicators for young people in slums, including limited educational opportunities and pervasive poverty, therefore, warrant multi-sectoral action that includes poverty alleviation approaches as well as investments to improve access to schooling.

Previous studies have shown high levels of unintended pregnancies among young people living in urban slums [18]. Overall, just over two in five recent births among young female slum dwellers were unintended in 2012 compared with about one in two in the 2000 survey. Higher levels of contraceptive use among youth in slum settings probably accounted for much of the reduction in unintended pregnancies. Increased investments in sexual and reproductive health programs in resource-poor urban settings may explain increased levels of contraceptive use among young people in these settings. However, the data also reveal some vulnerable groups of youth, particularly the very young and those of Muslim faith. Both groups of youth are less likely to use or approve of contraception. Targeted sexual and reproductive health interventions are needed to reach these groups who are at risk of unintended pregnancies. The finding also suggests the need to involve faith-based organizations – particularly Islamic leaders – in efforts to reach youth with sexual and reproductive health education.

In summary, the 7th Millennium Development Goal (MDG 7), Target 7D—*Achieve, by 2020, a significant improvement in the lives of at least 100 million slum dwellers*—has drawn attention to the needs of urban slum dwellers and prompted investments in urban slums by governmental and non-governmental agencies. The results reported in this chapter highlight marked improvements between the two surveys in education, behavioral, as well as sexual and reproductive health indicators among young people. As the absolute number of young slum dwellers grows, sustained efforts to improve the health and wellbeing of urban youth are needed to harness their full potential. In particular, governments must dedicate resources to support primary and secondary education, and improve access to health for the most vulnerable groups of youth. In addition, efforts to improve the wellbeing of young people in slums must take a multi-sectoral approach that brings together major stakeholders—key ministries such as education, youth, health, labor, finance and planning; researchers; and non-governmental agencies—to ensure that programming takes into account the multiple facets critical to positive youth development.

References

1. Oketch, M. O. and M. Mutisya, "Education, training and work among youth living in slums of Nairobi, Kenya," in *Urbanization and education in East Africa*, M. O. Oketch and M. W. Ngware, Editors. 2012, African Population and Health Research Center: Nairobi. p. 21-42.

2. Kabiru, C. W., et al., "Transition into first sex among adolescents in slum and non-slum communities in Nairobi, Kenya." *Journal of Youth Studies*, 2010. 13(4): p. 453-471.

3. Zulu, E. M., F. N.-A. Dodoo, and A. C. Ezeh, "Urban-rural differences in the socioeconomic deprivation-sexual behavior link in Kenya." *Social Science and Medicine*, 2007. 64(5): p. 1019-1031

4. African Population and Health Research Center (APHRC), Population and health dynamics in Nairobi's informal settlements: Report of the Nairobi Cross-sectional Slums Survey (NCSS) 2000. 2002, Nairobi: APHRC.

5. Kabiru, C. W., et al., "Growing up at the 'margins': Concerns, aspirations, and expectations of young people living in Nairobi's slums." *Journal of Research on Adolescence*, 2013. 23(1): p. 81–94.

6. Kenya National Bureau of Statistics (KNBS) and ICF Macro, Kenya demographic and health survey 2008-09. 2010, Calverton, Maryland: KNBS and ICF Macro.

7. National Council for Population and Development (NCPD), Central Bureau of Statistics (CBS) (Office of the Vice President and Ministry of Planning and National Development) [Kenya], and Macro International Inc. (MI), *Kenya Demographic and Health Survey 1998*. 1999, Calverton, Maryland: NCPD, CBS, and MI.

8. Omwancha, K. M., *The implementation of an educational re-entry policy for girls after teenage pregnancy: A case study of public secondary schools in the Kuria District, Kenya*. 2012, Victoria University of Wellington, Wellington, New Zealand.

9. Ngware, M. W., et al., *Case study of urban education in Kenya, in Urbanization and Education in East Africa*, M. O. Oketch and M. W. Ngware, Editors. 2012, African Population and Health Research Center: Nairobi. p. 9-20.

10. Yamano, T., Y. Shimamura, and D. Sserunkuuma, "Living arrangements and schooling of orphaned children and adolescents in Uganda." *Economic development and cultural change*, 2006. 54(4): p. 833-856.

11. Kabiru, C. W. and P. Orpinas, "Factors associated with sexual activity among high-school students in Nairobi, Kenya." *Journal of Adolescence*, 2009. 32(4): p. 1023-1039.

12. Kabiru, C. W. and A. Ezeh, "Factors associated with sexual abstinence among adolescents in four sub-Saharan African countries." *African Journal of Reproductive Health*, 2007. 11(3): p. 111-132.

13. Watts, H., et al., "Poorer health and nutritional outcomes in orphans and vulnerable young children not explained by greater exposure to extreme poverty in Zimbabwe." Tropical Medicine & International Health, 2007. 12(5): p. 584-593.

14. Kabiru, C. W., et al., "Self-reported drunkenness among adolescents in four sub-Saharan African countries: Associations with adverse childhood experiences." *Child and Adolescent Psychiatry and Mental Health*, 2010. 4: p. 17.

15. Prata, N., K. Weidert, and A. Sreenivas, "Meeting the need: Youth and family planning in sub-Saharan Africa." *Contraception*, 2013. 88(1): p. 83-90.

16. Grimes, D. A., et al., "Unsafe abortion: The preventable pandemic." *Lancet,* 2006. 368(9550): p. 1908-19.

17. Dodoo, F. N., E. M. Zulu, and A. C. Ezeh, "Urban-rural differences in the socioeconomic deprivation-sexual behavior link in Kenya." *Social Science & Medicine*, 2007. 64: p. 1019-1031.

18. Beguy, D., et al., *Status Report on the Sexual and Reproductive Health of Adolescents Living in Urban Slums in Kenya*. STEP UP Technical Working Paper. 2013, Nairobi: African Population and Health Research Center.

19. Akwara, P. A., N. J. Madise, and A. Hinde, "Perception of risk of HIV/AIDS and sexual behavior in Kenya." *Journal of Biosocial Science*, 2003. 35: p. 385-411.

20. C.Baylies, C and J Bujra J, (Editors) *Perspectives on gender and AIDS in Africa, in AIDS, Sexuality and gender in Africa: Collective strategies and struggles in Tanzania and Zambia*, 2000, Routledge: New York, NY. p. 1-24.

21. Doyle, A. M., et al., "The sexual behavior of adolescents in sub-Saharan Africa: patterns and trends from national surveys." *Tropical Medicine and International Health,* 2012. 17(7): p. 796–807.

22. Ndambuki, J., et al., *An analysis of HIV/AIDS policy formulation and implementation structures, mechanisms and processes in the education sector in Kenya.* A study commissioned by the Overseas Development Institute (ODI) and funded by the Merck Foundation. 2006, Nairobi: CfBT.

23. Clark, S., C. Kabiru, and E. Zulu, "Do men and women report their sexual partnerships differently? Evidence from Kisumu, Kenya." *International Perspectives on Sexual and Reproductive Health,* 2011. 37(4): p. 181-190.

24. Walusaga, H. A., R. Kyohangirwe, and G. J. Wagner, "Gender differences in determinants of condom use among HIV clients in Uganda." *AIDS Patient Care STDs, 2012.* 26(11): p. 694-9.

25. Madise, J. N., et al., "Are slum dwellers at heightened risk of HIV infection than other urban residents? Evidence from population-based HIV prevalence surveys in Kenya." *Health & Place, 2012*. 18(5): p. 1144-1152.

26. Kabiru, C. W., et al., "HIV/AIDS among youth in urban informal (slum) settlements in Kenya: What are the correlates of and motivations for HIV testing?" *BMC Public Health, 2011*. 11(1): p. 685.

27. Weller, S. C. and K. Davis-Beaty, "Condom effectiveness in reducing heterosexual HIV transmission." *Cochrane Database of Systematic Reviews, 2002* (1. Art. No.: CD003255).

28. United Nations, *World population prospects: The 2012 revision, CD-ROM edition.* 2013, New York: United Nations.

29. USAID. *Technical Areas: Adolescent Maternal Health.* 2005 [cited 2012 November 18]; Available from: http://transition.usaid.gov/our_work/global_health/mch/mh/techareas/adolescent.html.

30. United Nations Human Settlements Programme (UN-HABITAT), *State of the world's cities 2010/2011: Bridging the urban divide.* 2010, London: Earthscan.

31. Decent Rural Employment Team, ESW, and FAO. *Rural youth and internal migration*. 2013 [cited 2013 September 18]; Available from: http://www.fao-ilo.org/fileadmin/user_upload/fao_ilo/pdf/Internal_migration_Youth_FAO.pdf.

32. Kabiru, C. W., et al., "'Making it': Understanding adolescent resilience in two informal settlements (slums) in Nairobi, Kenya." Child & Youth Services, 2012. 33(1): p. 12-32.

33. Altman, M., V. Schöer, and N. Rama. "Education and youth employment in sub-Saharan countries: Linkages and policy responses." In *African Economic Research Consortium Workshop on Youth and Unemployment, March 21-22, 2013*. 2013. Kigali, Rwanda.

34. Furlong, A. and F. Cartmel, "Aspirations and opportunity structures: 13-year-olds in areas with restricted opportunities." *British Journal of Guidance & Counselling, 1995*. 23(3): p. 361-375.

35. Markus, H. and P. Nurius, "Possible selves." *American Psychologist, 1986*. 41(9): p. 954-969.

36. Merton, R. K. "Social structure and anomie." *American Sociological Review, 1938*. 3, 672-682.

37. Merton, R. K. "Social conformity, deviation, and opportunity structures: A comment on the contributions of Dubin and Cloward." *American Sociological Review, 1959*. 24, 177-189.

38. Agnew, R., "Foundation for a general strain theory of crime and delinquency." *Criminology, 1992.* 30(1): p. 47-88.

APPENDICES

Appendix A: Sample Implementation

Table A.1: Sample Implementation

Household and Eligible Females/Males Response Rate	NCSS 2012 Division									KDHS 2008-09 Region	
	Central	Makadara	Kasarani	Embakasi	Pumwani	Westlands	Dagoretti	Kibera	Total	National	Nairobi
Households											
Sampled	591	625	638	1,823	347	657	1,097	804	6,582	9,936	1,300
Vacant/destroyed/not available	51	28	12	72	2	28	92	29	314	696	299
Eligible	540	597	626	1,751	345	629	1,005	775	6,268	9,240	1,001
Completed	483	589	530	1,567	273	558	827	662	5,489	9,062	1,108
Household Response Rate (HRR)^	89.4	98.7	84.7	89.5	79.1	88.7	82.3	85.4	87.6	98.1	110.7
Eligible Women (12-49)											
Sampled	443	481	595	1,520	221	488	886	760	5,394	8,767	1,005
Completed	326	432	456	1,218	191	357	620	633	4,233	8,443	952
Not Completed	117	49	139	302	30	131	266	127	1,161	324	53
Eligible Women Response Rate (EWRR)^^	73.6	89.8	76.6	80.1	86.4	73.2	70.0	83.3	78.5	96.3	94.7
Eligible Men (12-54)											
Sampled	273	359	322	916	150	327	484	453	3,284	3,910	477
Completed	202	299	220	702	131	223	280	313	2,370	3,464	423
Not Completed	71	60	102	214	19	104	204	140	914	446	54
Eligible Men Response Rate (EMRR)^^	74.0	83.3	68.3	76.6	87.3	68.2	57.9	69.1	72.2	88.6	88.7

^ The household response rate is computed as the number of completed household interviews divided by the number of eligible households. For the NCSS 2012, 95% of the sampled households (6,583) were eligible (i.e. sampled households minus households that were vacant, destroyed, or where all members were absent from the household)

^^ Eligible Individuals were defined as men and women of eligible age living in households in which household interviews were completed

Source: Nairobi Cross-Sectional Slums Survey (NCSS) 2012 and Kenya Demographic and Health Survey (KDHS) 2008-09

Appendix A.1: Challenges with Electronic Data Collection (EDC)

Some interviewers indicated discomfort with the data collection using netbook while the majority were quite comfortable, especially after retraining when the program version had been changed. Frequent upgrades in the program versions, though intended to improve efficiency, came with other challenges such as change in format, thereby affecting the loading speeds of some sections of the software and saving of records.

In the course of fieldwork, the following challenges regarding electronic data collection (EDC) were reported and documented in the issues log:

1. Saving

Capturing data is a critical aspect of EDC; otherwise it is better to use paper questionnaires. Although the problem of saving records in the netbooks was rampant during the first week of fieldwork, it had been resolved by the second week. However, subsequent updates in the program affected the saving of some sections of the questionnaire based on what an interviewer entered in the netbook. Interviews were redone for lost records. In some cases, the same program could be installed in all the computers that were available for fieldwork but some of the records developed –or the interviewers made them develop— their own filters that made it appear like records were not being saved, hence prompting multiple entries for the particular question.

2. Speed

Speed is understood in two ways. The first is the time it takes to load the program, questionnaire, and/or sections of the questionnaire. The second is the time taken to save a questionnaire or sections of it. The field interviewers learned to work around some speed issues, for instance, by loading the program before entering any respondent's house. Appending some tables in the questionnaires had to be done painstakingly slowly. It was understood that the program development had to strike a balance between necessary skips, filters and speed. The more checks there are, the less the speed. The problem of speed is very cyclic because once skips are automated, interviewers can easily cruise through the questionnaire without looking over each skip. The netbooks also tended to get slower over time from one program change to another.

3. Inactive Sections

The height and weight sections of the household questionnaire were inactive in the netbooks for two weeks and the measurements that were taken had to be placed in the comments section. Maternal mortality and the contraceptive calendar depicted the same problem but were promptly fixed.

4. Synchronization and Backup

Capturing of data is followed by synchronization or backup to a central server. This is to avoid loss of any records saved on the local drive. Each team had 2 modems to be used for synchronization of data. Synchronization was done on a daily basis. However, after changes in the program, synchronization did not work and a system of backing up the data replaced synchronization. When netbooks were collected from the field, all records were re-backed up in the database.

Appendix B: Data Quality Tables

Table B.1: Household Age Distribution

Single-Year Age Distribution of the De Facto Household Population by Sex (Weighted), NCSS 2012									
Age in Single Years	Males		Females		Age in Single Years	Males		Females	
	Number of Cases	Percent	Number of Cases	Percent		Number of Cases	Percent	Number of Cases	Percent
0	733	3.0	716	3.3	**36**	370	1.5	281	1.3
1	641	2.7	600	2.8	**37**	338	1.4	238	1.1
2	652	2.7	682	3.2	**38**	403	1.7	246	1.1
3	624	2.6	628	2.9	**39**	233	1.0	152	0.7
4	538	2.2	587	2.7	**40**	525	2.2	208	1.0
5	476	2.0	473	2.2	**41**	157	0.6	119	0.6
6	603	2.5	568	2.6	**42**	281	1.2	157	0.7
7	530	2.2	463	2.2	**43**	138	0.6	95	0.4
8	470	1.9	460	2.1	**44**	170	0.7	76	0.4
9	368	1.5	433	2.0	**45**	230	1.0	100	0.5
10	397	1.6	379	1.8	**46**	98	0.4	89	0.4
11	359	1.5	273	1.3	**47**	135	0.6	135	0.6
12	455	1.9	517	2.4	**48**	152	0.6	143	0.7
13	387	1.6	392	1.8	**49**	116	0.5	51	0.2
14	267	1.1	344	1.6	**50**	181	0.7	84	0.4
15	273	1.1	336	1.6	**51**	68	0.3	24	0.1
16	257	1.1	333	1.5	**52**	127	0.5	35	0.2
17	330	1.4	325	1.5	**53**	54	0.2	35	0.2
18	376	1.6	516	2.4	**54**	100	0.4	22	0.1
19	411	1.7	601	2.8	**55**	105	0.4	27	0.1
20	562	2.3	730	3.4	**56**	59	0.2	24	0.1
21	443	1.8	611	2.8	**57**	38	0.2	13	0.1
22	619	2.6	762	3.5	**58**	30	0.1	19	0.1
23	622	2.6	687	3.2	**59**	32	0.1	11	0.1
24	708	2.9	731	3.4	**60**	70	0.3	27	0.1
25	908	3.8	938	4.4	**61**	13	0.1	8	0.0
26	806	3.3	747	3.5	**62**	19	0.1	11	0.1
27	826	3.4	592	2.8	**63**	16	0.1	11	0.1
28	884	3.7	682	3.2	**64**	27	0.1	13	0.1
29	505	2.1	514	2.4	**65**	11	0.0	19	0.1
30	889	3.7	533	2.5	**66**	13	0.1	5	0.0
31	351	1.5	279	1.3	**67**	19	0.1	8	0.0
32	690	2.9	489	2.3	**68**	16	0.1	8	0.0
33	355	1.5	284	1.3	**69**	3	0.0	5	0.0
34	443	1.8	279	1.3	**70**	60	0.2	68	0.3
35	601	2.5	279	1.3	**DK/Missing**	396	1.6	168	0.8
					Total	24,166	100.0	21,498	100.0
Source: Nairobi Cross-Sectional Slums Survey (NCSS) 2012									

Table B.2: Age distribution of eligible and interviewed women

Percent distribution of household population of women age 12-54 and of interviewed women aged 15-49, and percentage of eligible women who were interviewed by five year age groups, NCSS 2012					
Age Group	Household Population		Interviewed Women		Percentage of Eligible Women Interviewed (Response Rate)
	Number	Percent	Number	Percent	
12-14	463	8.5	na	na	na
15-19	780	14.3	590	15.2	131.7
20-24	1,302	23.8	1,027	26.4	80.1
25-29	1,284	23.5	1,043	26.8	42.3
30-34	689	12.6	543	14.0	50.9
35-39	442	8.1	351	9.0	44.8
40-44	242	4.4	198	5.1	57.9
45-49	192	3.5	140	3.6	0.0
50-54	74	1.4	na	na	na
Total (15-49)	4,931	na	3,892	na	78.9
Source: Nairobi Cross-Sectional Slums Survey (NCSS) 2012					

Table B.3: Completeness of Reporting

Percentage of Observations Missing Information for Selected Demographic and Health Questions, NCSS 2012		
Subject	% Missing Information	Number of Cases
Birth Date (among births in the last 15 years)		
Month Only	0.0	5,063.0
Month and year	0.7	5,063.0
Age at death (deaths among births in the last 15 years)	0.0	255.0
Age/date at first union (among ever-married women)	0.0	2,723.0
Respondent's education (among all women)	0.2	3,892.0
Child's size at birth (among births in the last 59 months)	8.3	2,250.0
Diarrhea in the last 2 weeks (among living children aged 1-59 months)	3.3	1,769.0
Source: Nairobi Cross-Sectional Slums Survey (NCSS) 2012		

Appendix B.1: Data Quality Tables for Mortality Estimates

Women aged between 15 and 49 years, and who had ever given birth, were asked to provide their birth history. For each birth, data were obtained on sex, month and year of birth, survivorship status and age at death if the child was not living [1].

Information on day of birth was not collected; respondents were only asked to provide the month and year of birth of each child. For mortality analysis, the day of birth was therefore estimated to be the fifteenth of the reference month. This estimation was applied to all births recorded in the birth history and is therefore unlikely to affect the observed mortality patterns [2].

The birth history method of data collection is subject to problems of recall of birth dates, misreporting and underestimation of ages [2], which need to be addressed when using these data for analysis. Displacement of birth dates can lead to errors in mortality estimates. To check for possible errors, calendar-year ratios were calculated (Appendix Table B.4). We compared birth ratios for 2007 and 2006, respectively, because January 2007 was the cut-off year for administering a module on pregnancy and postnatal care [2].

In a normal population, birth ratios for living and deceased children tend to remain fairly constant across the years. The birth ratios for living children (93.9) and deceased children (88.9) in 2007 were compared to birth ratios in 2006 (110.6 for living children and 73.6 for deceased children).

The almost 15 point difference in birth ratios suggests a misreporting of dates of birth for both living and deceased children. This may be due to respondents and interviewers transferring birth dates out of the 5-year reference period [1]. Birth transference can distort the time period in which child deaths occur, resulting in a shortfall of deaths in the five-year period prior to the survey. This could lead to a distortion in the time trend of mortality estimates.

A random imputing technique was used to assign ages at death to children with possible misreporting of ages and missing ages at death [3]. About 20 percent of births (58 out of 270 reported deaths) were found to have missing or implausible ages at death. Regression was used to check for differences in characteristics between deaths with missing age at death and those with a correct value for missing age at death. The pattern of missing values was not arbitrary; it varied significantly by slum of residence. Using the Stata 12.1 ICE command, which uses the pattern of missing values and iterative methods to assign random replacement values to missing values, we imputed missing ages at death based on birth order, date of birth and slum of residence [2, 3].

Selective omission of infants who died early and neonates was also checked through an evaluation of the proportion of neonatal deaths to infant deaths [2]. Appendix Tables B.5 and B.6 show reported deaths by age at death in days, and months (0 through 23 months), respectively. There is an observed underreporting of both infant and neonatal mortality in the 10-19 years preceding the survey. The proportion of infant deaths is (72.6) for the 10 years preceding the survey, lower than 81.5 reported in the NCSS 2000 [4] and 115.0 reported in KDHS 2008-09 [1]. The proportion of neonatal deaths occurring in the 1st week of life was quite low: 72 percent compared to 82 percent reported for Kenya in the most recent DHS [1]. It was also lower than 75 percent, the figure reported in NCSS study of 2000 [4] whereas current evidence shows that neonatal deaths are increasing [5]. This suggests a possible underreporting of infant and neonatal deaths which could compromise the quality of reported infant and neonatal mortality rates.

Direct methods of mortality estimation, using a synthetic cohort life table approach, was used to address the challenges discussed above [2]. These methods use data on the date of birth, survival status, and date of or age at death. Unlike indirect techniques, direct methods are not dependent on assumptions about the data to predict probabilities of death [2]. Two methods of direct estimation were applied and the results were then compared: a true-cohort life table approach and a synthetic-cohort life table approach [2]. The synthetic-cohort life table approach was selected because it allows full use of the most recent data and is also specific for time periods. In this approach, mortality probabilities are calculated for small age segments based on real cohort mortality experience and then combined into the more common age segments [2].

Infant and under-5 mortality rates are expressed per 1000 children surviving to the age of 11 months and 4 years, respectively. Neonatal mortality is reported per 1000 children surviving to 30 days, while child mortality is expressed per 1000 children surviving from 12 months of age to 4 years. Mortality estimates are calculated for the 10-year period preceding the survey (2002-2012). Tables 7.1, 7.3 and 7.4 use results from ten years preceding the survey. However, Table 7.2 uses some measures from 10-19 years preceding the survey and therefore needs to be interpreted with caution based on the discussion of the limitations above.

Table B.4: Births by Calendar Year and by Years Preceding the Survey

	Number of Births			Percent with Complete Birth Date^			Sex Ratio at Birth^^			Calendar Ratio^^^			Males			Females		
	Living	Dead	Total	Living	Dead	Total	Living	Dead	Total	Living	Dead	Total	Living	Dead	Total	Living	Dead	Total
CALENDAR YEAR																		
2012	274	13	287	100.0	100.0	100.0	62.6	99.2	101.6	na	na	na	138	5	143	136	8	144
2011	437	24	461	100.0	100.0	100.0	103.3	166.7	100.4	122.9	129.7	123.3	219	15	234	218	9	227
2010	437	28	465	100.0	100.0	100.0	106.2	55.5	102.0	100.0	107.7	100.4	225	10	235	212	18	230
2009	411	22	433	100.0	100.0	100.0	107.0	105.3	144.5	96.9	88.0	96.4	211	13	224	200	9	209
2008	372	25	397	100.0	100.0	100.0	82.8	78.6	83.2	95.0	106.4	95.7	169	11	180	203	14	217
2007	325	20	345	100.0	100.0	100.0	116.5	100.0	115.5	93.3	88.9	93.0	175	10	185	150	10	160
2006	402	12	414	100.0	100.0	100.0	110.1	112.8	49.9	110.6	75.0	109.1	213	4	217	189	8	197
2005	321	16	337	100.0	100.0	100.0	111.9	77.8	114.1	88.8	114.3	89.7	171	7	178	150	9	159
2004	295	9	304	100.0	100.0	100.0	200.3	95.3	97.2	95.8	72.0	94.9	144	6	150	151	3	154
2003	269	12	281	100.0	100.0	100.0	96.5	100.0	96.5	95.4	114.3	96.1	132	6	138	137	6	143
2002	241	15	256	100.0	100.0	100.0	102.4	104.9	150.0	94.5	111.1	95.3	122	9	131	119	6	125
YEARS PRECEDING THE SURVEY																		
0-4	1,931	112	2,043	100.0	100.0	100.0	99.2	98.8	93.1	na	na	na	962	54	1,016	969	58	1,027
5-9	1,612	69	1,681	100.0	100.0	100.0	107.5	91.6	106.6	na	na	na	835	33	868	777	36	813
10-14	1,087	54	1,141	100.0	100.0	100.0	107.9	105.3	104.9	na	na	na	557	28	585	530	26	556
15-19	602	37	639	100.0	100.0	100.0	131.5	96.5	94.9	na	na	na	293	21	314	309	16	325
20-36	625	42	667	100.0	100.0	100.0	116.0	110.1	116.5	na	na	na	336	22	358	289	20	309

na=not applicable

^ Both year and month given

^^ $(B_m/B_f) * 100$, where B_m and B_f are the numbers of male and female births respectively

^^^ $[2B_x/(B_x\text{-}1+B_x=1)] * 100$, where B_x is the number of births in calendar year x

Source: Nairobi Cross-Sectional Slums Survey (NCSS) 2012

Table B.5: Reporting of age at death in days

Distribution of reported deaths under one month of age by age at death in days and the percentage of neonatal deaths reported to occur at ages 0-6 days, for five-year periods preceding the survey, NCSS 2012					
Age at Death (in days)	**Number of years preceding the survey**				
	0-4	**5-9**	**10-14**	**15-19**	**Total (0-19)**
0	5	3	3	2	13
1	11	7	3	1	25
2	4	4	3	0	11
3	4	1	0	0	7
4	0	1	0	0	2
5	2	1	1	0	4
6	1	0	0	0	1
7	4	1	3	1	9
8	1	0	0	0	1
14	0	1	2	0	3
21	0	0	0	0	1
25	0	0	0	0	1
28	1	0	0	0	1
30	4	3	1	0	8
31+	0	1	1	0	2
Total 0-30 days^	37	23	17	4	89
% Early Neonatal^^	83.8	78.3	76.5	100.0	80.9
^ Includes cases for which age at death (in exact days) is not known.					
^^ % Early Neonatal=[(0-6 days)/(0-30 days)] * 100.					
Source: Nairobi Cross-Sectional Slums Survey (NCSS) 2012					

Table B.6: Reporting of age at death in months

Distribution of reported deaths under one month of age by age at death in months and the percentage of infant deaths reported to occur at ages on month, for five-year periods preceding the survey, NCSS 2012					
Age at Death (in months)	**Number of years preceding the survey**				
	0-4	**5-9**	**10-14**	**15-19**	**Total (0-19)**
<1 ^	37	22	16	4	87
1	2	2	2	0	6
2	6	3	3	0	13
3	5	1	1	3	11
4	0	1	1	0	2
5	5	2	4	1	15
6	1	1	3	1	7
7	1	1	1	0	3
8	3	2	2	1	8
9	2	0	0	0	3
10	1	1	1	1	4
11	9	6	4	2	26
13	0	1	0	0	1
14	0	0	1	1	2
18	0	1	1	0	2
19	1	0	0	0	1
20	0	0	1	0	1
21	0	0	0	1	1
23	1	2	4	3	13
24+	1	13	7	11	51
Total 0-11 months^^	96	71	73	45	72
% Neonatal^^^	49.3	37.3	30.8	13.8	33.9
^ Includes deaths under 1 month reported in days.					
^^ Includes cases for which age at death (in exact months) is not known.					
^^^ % Neonatal=[(under 1 month)/(under 1 year)] * 100.					
Source: Nairobi Cross-Sectional Slums Survey (NCSS) 2012.					

References

1. Kenya National Bureau of Statistics (KNBS) and ICF Macro, *Kenya Demographic and Health Survey 2008-09*, 2010, KNBS and ICF Macro: Calverton, Maryland.
2. Rutstein, S. O., Rojas, G., *Guide to DHS Statistics*, 2006, ORC Macro: Calverton, Maryland.
3. Croft, T., "DHS Data Editing and Imputation." *Demographic and Health Surveys, 1991*.
4. APHRC, *Population and Health Dynamics in Nairobi's Informal settlements*, 2002, African Population and Health Research Center: Nairobi, Kenya.
5. UN-IGME, *Levels & Trends in Child Mortality*, 2013, The UN Inter-agency Group for Child Mortality Estimation: New York.

Appendix C: Team Structure

Figure C.1: Structure of the Project Management Team

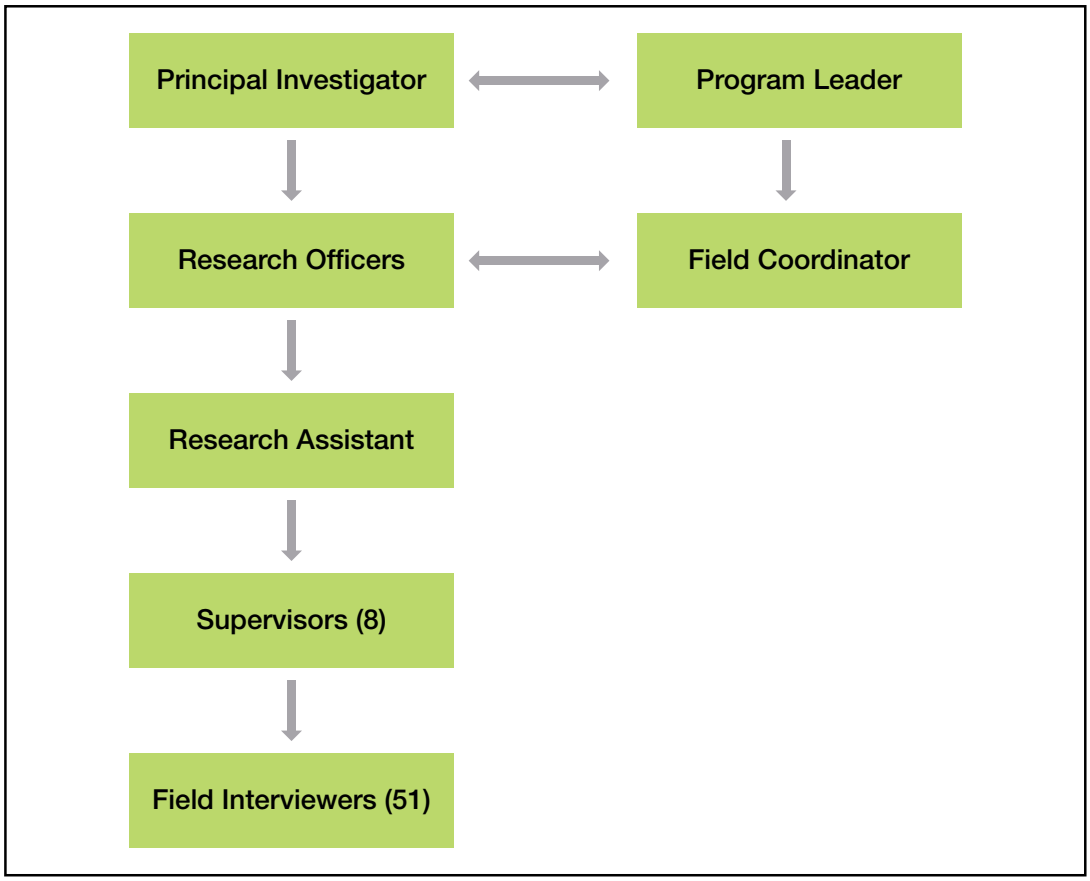


Table C.1: Field Teams

Nairobi South - Kibera	**Nairobi East - Mukuru Kwa Njenga**
Ann Njeri - Supervisor	David Juma - Supervisor
Esther Nyambura	Paul Kidew
Kennedy Otieno	Dorcas Wanza
Mary Scholastica Wawira	Peter Otendo
Noreen Wafula	Linet Nyongesa
Robert Kadiavayi	Joel Olewe
Rodgers Mukudi	Ann Wachira
Zena Mohammed	Jacqueline Oronge
Westlands - Kangemi	**Nairobi East - Viwandani**
Benard Sompoika - Supervisor	Jedidah Njeri - Supervisor
Samuel Kamau	Nancy Owande
Ann Ndungu	Scholar Wangari
Lydia Musitah	Edwins Odhiambo
Geofrey Sandi	Peter Waswa
Stanley Githu	Linet Ramani
Catherine Kimatu	Christopher Malela
	Ruth Waithera
Nairobi North - Kasarani	**Nairobi North - Mathare & Eastleigh**
Danstone Ogeno - Supervisor	Kirleen Adhiambo - Supervisor
Oscar Murithi	Benard Owino
Lydia Suter	Melchizedek Mokaya
Felly Esilaba	Ahmed Ali
Justus Kisilu	Sarah Ndinda
Phenus Okumu	Sylvia Butale
Freddinah Nzengo	Jane Njeri
	Loise Kalekye
Nairobi East - Kayole & Dandora	**Nairobi West - Kawangware**
Faith Nyaura - Supervisor	Shem Mambe - Supervisor
Mark Ouma	Eddy Migai
Nicolas Mugenya	Kelvin Juma
Naomi Jelimo	Dorothy Kwamboka
Lydia Nungari	Doreen Mbone
Beatrice Awino	Mildred Otiato
Florence Ayieko	Samuel Bwire
	Eunice Kwamboka

Appendix D: Questionnaires

The following questionnaires can be downloaded from:

1. Household Questionnaire - http://aphrc.org/publications/ncss2012-household-questionnaire/
2. Men's Questionnaire - http://aphrc.org/publications/ncss2012-men-questionnaire/
3. Women's Questionnaire - http://aphrc.org/publications/ncss2012-women-questionnaire/