Children's living arrangements in sub-Saharan Africa: Assessing trends and diversities Evidence from Health and Demographic Surveillance Systems

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Abstract

We use longitudinal prospective data from Health and Demographic Surveillance Systems from six sites (Nanoro and Ouagadougou, Burkina Faso; Niakhar, Senegal; Nairobi (Kenya); Nairobi, Kenya; Rufiji, Tanzania; and Africa Centre, South Africa) to describe the changes and diversities in living arrangements for children under 20 years. Findings revealed significant variations in children's living arrangements by gender and age, within site and across sites. We identify three major regimes referred to as a *very conservative regime* of children's living arrangements in Burkina Faso; a *conservative regime* in Kenya, Senegal and Tanzania, and a *transitional regime* in South Africa.

INTRODUCTION

Over the past three decades, sub-Saharan Africa (SSA) has been suffering a serious socio-economic hardship: increasing urbanization, changes in family structures, and highest AIDS rates than any other region in the world. Scholars who addressed the effects of urbanization on reproductive health outcomes posited that attitudes and social norms about sexuality had weakened over time in urban areas (*a.k.a.* social disorganization) (Meekers, 1994) and substantially changed the structure of African traditional societies and families (Kayongo-Male & Onyango, 1984; Omariba & Boyle, 2007). These changes thereafter led to new types of family formations and events including an increasing proportion of cohabiting couples and rates of divorce especially in urban areas. Additionally, the structural adjustment programs (SAP) put in place in many sub-Saharan Africa in the 1980s produced adverse social effects (Konadu-Agyemang, 2000; Robson, 2004), such as unemployment rates and low enrolment rates in elementary and secondary schools which were accentuated by the global economic down-turn, and also affected the agriculture and industry sectors in many SSA countries (Nwagbara, 2011). These economic changes pushed people, particularly men to cross national boundaries and look for better opportunities, leaving behind their families. Finally, SSA is bearing the highest burden of HIV/AIDS worldwide with a steady increase of adult mortality (The Joint United Nations Programme on HIV/AIDS [UNAIDS], 2013). Indeed, SSA is hosting the biggest share (1.1 million) out of the 1.5 million of deaths in 2013 (The Joint United Nations Programme on HIV/AIDS [UNAIDS], 2013). This overwhelming picture in SSA fed a tremendous literature on the relationship between orphanhood and child well-being (Case & Ardington, 2006; Case, Paxson, & Ableidinger, 2004; Gertler, Levine, & Ames, 2004; Thurman, Brown, Richter, Maharaj, & Magnani, 2006). Although findings are mixed, previous research indicated that orphans (one or double orphans) are disadvantaged compared with non-orphans (Thurman,

Brown, Richter, Maharaj, & Magnani, 2006). Taken together, these contextual factors drive major changes on children's living arrangements in SSA. Nowadays, many children in SSA are growing up or will grow up in non-traditional families.

Despite these concerns, SSA is today the most understudied part of the world; little is known concerning children's living arrangements. Yet children's living arrangements are of chief importance to understand child outcomes including school attendance and performance (Case & Ardington, 2006), premarital sexual intercourse (Thurman, Brown, Richter, Maharaj, & Magnani, 2006), risky sexual behavior (Kuate Defo & Tsala Dimbuene, 2012; Tsala Dimbuene & Kuate Defo, 2011b; Tsala Dimbuene & Kuate Defo, 2012), and other risky behaviours such as alcohol drinking (Kalichman, Simbayi, Kaufman, Demetria, & Jooste, 2007) and drug use (Buve, Bishikwaba-Nsahaza, & Mutangandalona, 2002). This research is obviously important to understand family influences on child well-being. However, one potential drawback from previous research relies from the nature of the data; most studies indeed utilized cross-sectional data (Beegle & De Weerdt, 2008; Beegle, Filmer, Stokes, & Tiererova, 2008). This body of research provides only a snapshot of children's living arrangements; however, it does not address the family changes and family transitions over time. Other studies used retrospective longitudinal data (Tsala Dimbuene & Kuate Defo, 2011a; Tsala Dimbuene & Kuate Defo, 2012). This is definitely an improvement to cross-sectional data but still have some limitations. For instance, it is difficult to reconstitute children's living arrangements during early childhood when the children are almost in the twenties. Also, the recall biases can limit the validity of the estimations drawn from retrospective data. Longitudinal studies examining children's living arrangements in SSA and how they have evolved over time still are very limited (Ardington, 2008; Beegle, De Weerdt, & Dercon, 2007; Beegle & Krutikova, 2008; Beegle, Filmer, Stokes, & Tiererova, 2008;

Case & Ardington, 2006; Evans & Miguel, 2007; Hammer, Kouyaté, Ramroth, & Becher, 2006). Furthermore, comparative studies based on different SSA settings are almost inexistent.

The current study fills this gap and uses prospective longitudinal data from (number of sites) Health and Demographic Surveillance Systems (HDSSs) to assess children's living arrangements in SSA over time. Additionally, the paper identifies and describes children's living arrangements regimes in SSA. Overall, findings indicated that, except the site of Agincourt (South Africa), most of children less than 20 years lived mostly with their two biological parents. Also, findings showed gender differences, especially on age-specific analyses. There were also cross-sites differences in terms of the most prevalent living arrangements. In Burkina Faso, neither parent category was almost inexistent either in Nanoro or in Ouagadougou. In Niakhar (Senegal), the proportion of children living with their two biological parents increased over time. For females, the number of children living with their parents for the 16-19 years increased significantly as of 2000. Economic hardship and education may likely explain these trends because taken together; they may have contributed to delaying age at first marriage. In Nairobi (Kenya), although the two biological parents were the most common, it was observed that mother-only, father-only, and neither-parent families were important compared to Burkina Faso. Data from Rufiji (Tanzania) revealed that the proportion of children living with two biological parents increased over time; hence the proportion of children in all other types of household decreased. Findings from Africa Centre (South Africa) showed that neither-parent and mother-only family structures were the most common. Three contextual factors may explain these findings in South Africa including high AIDS prevalence, males' migration for work, and high rates of out-of-wedlock births.

The three major findings are referred to as a *very conservative regime* of children's living arrangements in Burkina Faso; a *conservative regime* in Kenya and Senegal, and a *transitional regime* in South Africa.

METHOD

Data

This study used data from six Health and Demographic Surveillance Systems (HDSSs) in sub-Saharan Africa: Agincourt (South Africa), Nanoro and Ouagadougou (Burkina Faso), Niakhar (Senegal), Nairobi (Kenya), and Rufifi (Tanzania). The HDSS involves continuous monitoring of households and household members within a specific area in cycles or intervals. Overall, an HDSS prospectively collects information on demographic, household, socioeconomic and environmental characteristics of the population in the defined area. Information collected within the HDSS approach includes household assets, births and deaths, pregnancies, marriages, morbidity, verbal autopsies on malaria, and migrations. The current study utilized the household module and was especially interested in children's living arrangements in the six sites. Specifically, the study was interested on the information collected on parental survival status and parental co-residence to build living arrangements over time. Therefore, the sample size of HDSSs data is not fixed like in panel data because there are entries (births and in-migration) and exits (deaths and out-migration).

Unit of analysis

In the HDSS approach, each child is observed if he/she resides in the area as many times as there are follow ups in the setting. Because the children's living arrangements may change within the year or over time, the unit of analysis in this paper is the occasion the child is observed in the area. That means if the HDSS collects household information four times a year, a complete case will have four observations for that specific year. Also, it is important to keep in mind that

respondent's age is a time-varying variable. In practice, an individual may have contributed the a specific age (or age group) during year *t* but will be contributing in the older age (or age group) during the year *t+1*. Table 1 provides information about each site and the period covered for the available data.

---------- Table 1 about here ----------

Measures

Living arrangements. In this paper, children's living arrangement is defined as co-residence of the child with his/her biological parents. The classification varied from a site to another. For some sites, the categories retained were both parents, mother-only, father-only, neither parent, mother unknown and father coresident, mother unknown and father non-coresident, father unknown and mother co-resident, father unknown and mother non-coresident, mother and father unknown. Other sites retained the following categories: both parents, mother-only, father-only, neither parent, and unknown. Because some sites treated living arrangements as "*missing values*" when information about parental coresidence was unknown, the paper adopted this latter to be consistent across sites. Hence, cross-checking the existing information on parental co-residence and parental survival status, four categories of categories were built including *two biological parents*, *mother-only*, *father-only*, and *neither parent*. For the aforementioned reasons, this classification is western-oriented because it does not take into account the parental marital status which allows distinguishing between monogamous two-parent families and two-parent polygamous families.

Analytic strategy

This study aims to describe children's living arrangements over time using HDSS datasets. One of the specific objectives was to emphasize the gender and age-specific differences in the sites.

Therefore, respondent's age s treated as time-varying variable so that the sample size within each age group varies from year to year.

Within each year and age group, the study reported the proportion of the children falling in two-parent, mother-only, father-only, and neither-parent categories. It is then possible to track the changes over time for each type of living arrangement. For each year *t*, each age (or age group) *i*, and each gender s, the percentages falling in each age group *j* can be expressed mathematically as follows:

$$p_{ij} = \frac{n_{sijt}}{N_{sit}} * 10$$

where n_{sijt} is the number of children in age (or age group) i which are in the category j during the year t by gender s; and N_{sit} is the row total of children of age (or age group) *i*, gender s during the year *t*.

Age-specific analyses

Social scientists utilize numerous categorizations of age span depending of the subject of interest. This paper uses two relevant markers of African societies relying on schooling which can determines children's living arrangements. First, the transition from childhood (referred to in this paper as 0-5 years of age) to elementary schools (6-12 years) can be an important factor which can explain child's living arrangements. Due the unequal repartition of schools in many African settings and the long distance a child can walk a day to attend school, biological parents choose to send the child to other relatives to increase his/her chance to go to school. In the same vein, secondary/high schools are even less equally located within the country. Therefore, if a child had the chance to live with biological parents when attending elementary school, the chances to move and live with other relatives may increase. Hence, the segment 13-19 years was considered to take into account grade repetitions. However, this group (13-19 years) is splitted into two

categories: 13-15 years and 16-19 years to get insights of living arrangements not only for schooling but also for outcomes of interest in future research such sexual initiation, marriage, and fertility.

PRELIMINARY FINDINGS

First, gender differences in children's living arrangements are presented. Second, the paper presents and discusses findings about the age-specific and gender differences in children's living arrangements for each HDSS participating in this study.

Gender differences in children's living arrangements

Burkina Faso: Ouagadougou and Nanoro

In Burkina Faso, three years of observations were available for the two participating sites (Ougadougou and Nanoro). That is a short period compared with other HDSS sites to provide sustainable trends. That said however, it is observed that during the here years, most of children lived with two biological parents. Almost eight tenth of children aged 0 to 19 years lived with their two biological parents in Nanoro and Ouagadougou. Interestingly, mother only and father are marginal in those two sites; and neither parent was almost inexistent. These trends remained unchanged when data are analyzed by gender.

Senegal: Niakhar

The Niakhar HDSS collected prospectively data over the last three decades, long enough to provide sustainable trends about children's living arrangements. During this period (1983-2012), findings indicate that the proportions of children living with two biological parents steadily increased over time from 56% in 1983 to 72% in 2012. At the same time, the proportions of children living with mother only remained stable (roughly 14%) while living with father only or in neither parent significantly declined over time. Declines of 109% and 181% were observed for

father only and neither parent, respectively. Overall, they represent an annual decline of 3.6% and 6% for father only and neither parent, respectively.

Findings by gender show similar trends for both males and females with some slight differences. Although the proportion of children living with two biological increased over time as it was observed for the full sample, the decline of neither parent living arrangements for females was a bit steady compared with males. In fact, the proportion of children living neither parent household declined from 26% to 7.5% in 2012. This decline is partly explained by the increasing proportion of children living with two biological parents during this period as mentioned above. Finally, the mother only category increased a bit for both males and females while the father only category decreased over time.

Kenya: Nairobi

The HDSS in Nairobi has collected data since 2003. The current study included data from 2003 to 2011. Findings for the full sample showed that 9 out 10 children in this area lived with their two biological parents. This proportion slightly increased between 2003 and 2011 while the other types of living arrangements represented only marginal proportions. Taken together, the proportions of children living in neither-parent or one-parent households represented less than 12% in 2003 and they represented less than 10% in 2011.

When analyzing the gender differences in Nairobi, findings indicate similar trends for both males and females with most children aged 0 to 19 years living with two biological parents. Although the proportions living in neither- and one-parent households are marginal it is important to have a close look at these children to understand their characteristics.

Tanzania: Rufiji

The HDSS in Rufiji (Tanzania) has a long tradition of data collection. For the current study, data from 1998 to 2011 were used to describe the trends in children's living arrangements. Overall,

findings indicate that most children lived with two biological parents during this period. Also, the major changes in children's living arrangements were observed for two-parent households and neither-parent households. In contrast, mother-only and father-only households stagnated between 1998 and 2011. Indeed, an increase of the proportion of children living with two biological parents is observed between 1998 and 2009 before a decrease as of 2010. This proportion increases from 42% in 1998 to49% in 2011. Similarly, neither-parent households decrease from 198 to 2009 before a small increase takes place as of 2010. Although mother-only households are not the most common pattern of children's living arrangements, roughly one-fourth of children live with their mother only in this setting. Analyses by gender showed very similar patterns.

South Africa: Africa Centre

Available data covered the 2000-2011 period. Unlike all other sites, findings from Africa Centre (South Africa) showed a totally different landscape. Indeed, mother-only and neither-parent households were the most important features in the area. The proportion of children living with their mother only increased significantly from 39.5% to 42.6% from 2000 to 2011. Furthermore, the proportion of children increased slightly from 28% to 30% during the same period. Taken together, over two-thirds of children in this area live apart for two-parent households. These findings may have social and psychological implications for these children. During this period, there was only one out five children living with two biological parents. The analyses by gender show the same pattern, living with only mother being the most prevalent children's living arrangements for both males and females followed by neither-parent and two-parent households. Father-only households are the less important during the period.

Age-specific and gender differences in children's living arrangements

The previous section examined children's living arrangements using gender to detect differences between males and females for children aged 0-19 years in HDSS sites in sub-Saharan Africa. This section adds an additional dimension: age. Psychological and developments theorists posit that the effects of children's living vary by child's age. Findings are plotted in Figure 2 (Panels A-F).

Burkina Faso : Ouagadougou and Nanoro

Panels A and B of Figure 2 show that the trends observed for the full sample remained the same when the sample was splitted by age groups. Although the proportions of children living with two biological parents decreased by age group for the full sample and for both males and females, it remained the most important children's living arrangements in these areas. In fact, the proportion of children living in two-parent households are 86%, 78.7%, 71% and 67% for 0-5, 6-12, 13-15, and 16-19 year-old in Ouagadougou and for the overall period, respectively. That represents a decrease of 20% when moving from the youngest to the oldest children in the area. The corresponding figures in Nanoro are 84%, 79%, 73%, and 71%. Although the figures are comparable in magnitude, the decrease is lower in Nanoro (only 7%) compared with Ouagadougou.

When gender is included in the analyses, findings did not change the main conclusions that most children live in two-parent households irrespective of age groups and neither-parent households are very marginal even though the proportions slightly decreased with age.

Senegal: Niakhar

Disaggregated analyses by age groups showed similar trends with the full sample, except the 16-19 age group where two-parent and neither-parent households varied in the opposite direction during the 1983-2012 period. After a short decrease before 1990, two-parent households

increased from 46% in 1992 to 64% in 2012. Overall, 59% of children in this age group lived with two biological parents.

Analyses by gender showed different trends for males and females especially for the 13-15 and 16-19 age groups. The trends observed in disaggregated analyses are mainly driven by females. In fact, findings for males reveal similar trends with those observed for the full sample. For females, findings also indicate similar trends for the 0-5 and 6-12 age groups. Unlike, the trends for the 13-15 and 16-19 age groups are very different. In the 13-15 age group, the two-parent households monotonically increased after 1995 while the neither-parent ones decreased for that period. While in 1983 27% of females aged 13 to 15 years lived in neither-parent households, these figures decreased to reach roughly 7% in 2012, and an average of 16% during the entire period. The picture for the 16-19 year-olds is more impressing. Although the neither-parent households are decreasing, they still are the most important living arrangement until 1999-2000 where the two types of living arrangements almost tied. After 2000, neither-parent households continued its decrease but now became less important than two-parent households.

Kenya: Nairobi

Using data collected in Nairobi between 2003 and 2011, it is possible to track changes in children's living arrangements in Nairobi area. Findings show that two-parent households decrease with age while neither-parent households increase during the same period. In fact, the proportions of children living with two parents are 94%, 87%, 74%, and 61% for the 0-5, 6-12, 13-15, and 16-19 age groups, respectively. The decrease of the proportion of children living with two parents between early childhood and late adolescence is significant: a 27% decrease in eight years. During the same period, the proportion of neither-parent households increased significantly with age. Indeed, only 2% of children aged 0 to 5 years while this proportion reached 34% for the 16-19 year-old. Also one might see that the shape of the increase of the proportion of children

living in two-parent households vary with age. While the increase is less significant in 0-5 and 6-12 years, it becomes important for the 13-15 and 16-19 years.

Taking into account gender, findings showed that for both males and females, two-parent households remain the most significant family structures in Nairobi for the 0-5 and 6-12 age groups. It is also important to note that the proportion of children living in neither-parent households start to increase for 6-12 year-olds. Unlike the younger age groups, beside the two-parent households the proportions of children living in neither-parent households become significantly important even though they decreased over time for both males and females. Indeed, the proportion of children living in neither-parent households averaged 25% and 40% for males in 13-15 and 16-19 age groups. The corresponding figures for females in those age groups are 17% and 28%, respectively.

Tanzania: Rufiji

Between 1998 and 2011, the proportion of children living in two-parent households increased; hence the proportion of all other types of household structures decreased over time. For the entire sample, all types of children's living arrangements stagnated with small shift at the beginning and the end of the period for the 0-5 year-old. For this age group, two-parent and mother-only households represent the main types of children's living arrangements. They represent 60% and 27% for 0-5 age group in 1998. The corresponding figures at the end of the period in 2011 are 54% and 28%. The averages for these two types of living arrangements are 59% and 29%, respectively. Findings for the 6-12 and 13-15 age groups are a bit similar with trends observed for the entire sample: an increase of two-parent and a decrease of neither-parent households during the period. However, two-parent households remain the most important children's living arrangements. At the same time, the two other types of children's living arrangements (mother-only and father-only) stagnate. Unlikely, the 16-19 year-olds show a very different pattern.

Although neither-parent households decreased and two-parent increased, the former become the most important feature of children's living arrangement in Rufiji.

Gender analyses showed that the structure of living arrangements changed for males and females. For males within 0-5 and 6-12 age groups, mother-only and two-parent households are the most important living arrangement even though at some point neither-parent households crossed mother-only households for the 6-12 age group. For 13-15 and 16-19 age groups, neither- and two-parent households are definitely the most important pattern of living arrangements, with an increase of two-parent households and a decrease of neither-parent households.

For females, findings indicate that mother-only and two-parent households are the most important living arrangements over time. For the rest (6-12, 13-15, and 16-19 age groups) and with some differences, neither- and two-parent households are the most important living arrangements. For instance, neither-parent households are the most important living arrangement for females aged 16-19 years even though they decreased over time.

South Africa: Africa Centre

The striking findings in Africa Centre (South Africa) can be summarized as follows. First, two-parent households are not the most important living arrangements among children aged 0 to 19 years in this area. Mother-only is the most common feature for the 0-5 and 6-12 year-old. For 13-15 and 16-19 age groups, mother-only and neither-parent households are the most common features.

Analyses from the entire sample show that mother-only households are very common among the 0-5 year-old. Indeed, 47% of children lived with their mother in 2000. They are followed by two-parent (27%) and neither-parent households (21%) while father-only was the lowest category (5%). At the end of the period in 2011, the figures did not change significantly except for mother-only and two-parent households which shifted from 47% to 58% and from

27% to 16%, respectively. Similar trends are observed for 6-12 age group in which the figures remained on the same magnitude except neither-parent (38% to 47%) and two-parent (29% to 20%). For 13-15 and 16-19 year-old, neither-parent, mother-only, and two-parent households emergent as important features in those age groups. Neither-parent households are the most important living arrangement, especially for the 16-19 year-old.

When data are disaggregated by gender, findings indicate similar patterns for males and females. For the first three age groups (0-5; 6-12; 13-15 years), mother-only households remain the most important living arrangement. Neither- and two-parent households decreased a little bit between 2000 and 2012 whereas father-only households stagnated. In contrast, neither-parent households are the most common living arrangement among the 16-19 year-old followed by mother-only and father-only households.

DISCUSSION AND CONCLUSIONS

The paper examined the trends and diversities of children's living arrangements in sub-Saharan Africa using HDSS datasets in Burkina Faso (Ouagadougou and Nanoro), Senegal (Niakhar), Kenya (Nairobi), Tanzania (Rufiji), and South Africa (Africa Centre). Findings showed that children's living arrangements vary over time and that there are geographical variations. If living with two biological parents remained the main feature of children's living arrangements in Nanoro and Ouagadougou (Burkina Faso), Niakhar (Senegal), Nairobi (Kenya) and Rufiji (Tanzania), the situation was totally different for Africa Centre (South Africa). In South Africa, three contextual factors likely explain these findings, including illegitimate births, adult AIDS mortality and male migration for work. In this site, mother-only households were the most common feature of children's living arrangements.

Another key finding is that children's living arrangements varied with age and gender. Children's living arrangements were more similar for the younger age groups (i.e., 0-5 and 6-12

years). In contrast, the older age groups showed similar children's living arrangements with some variations within a site and across sites.

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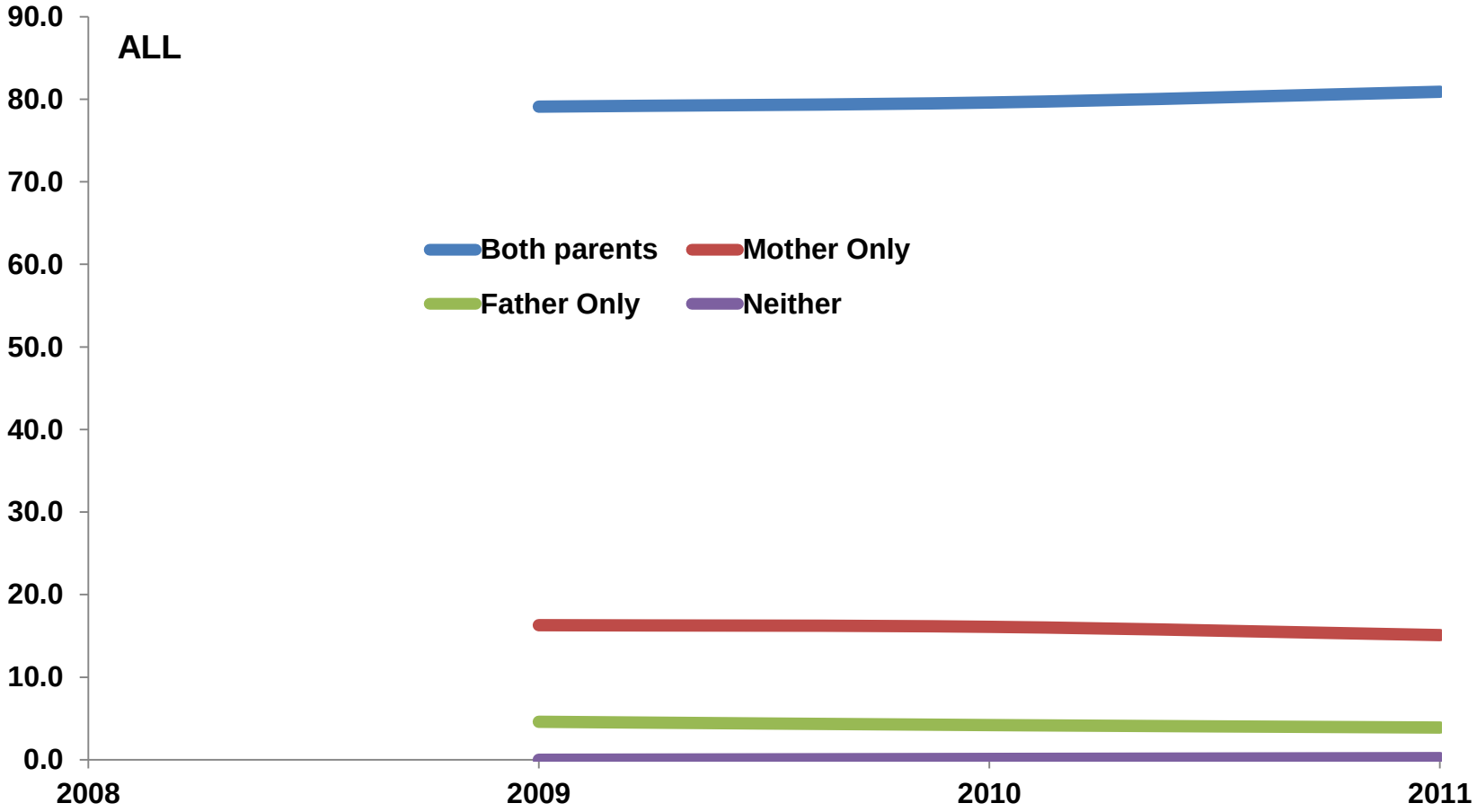
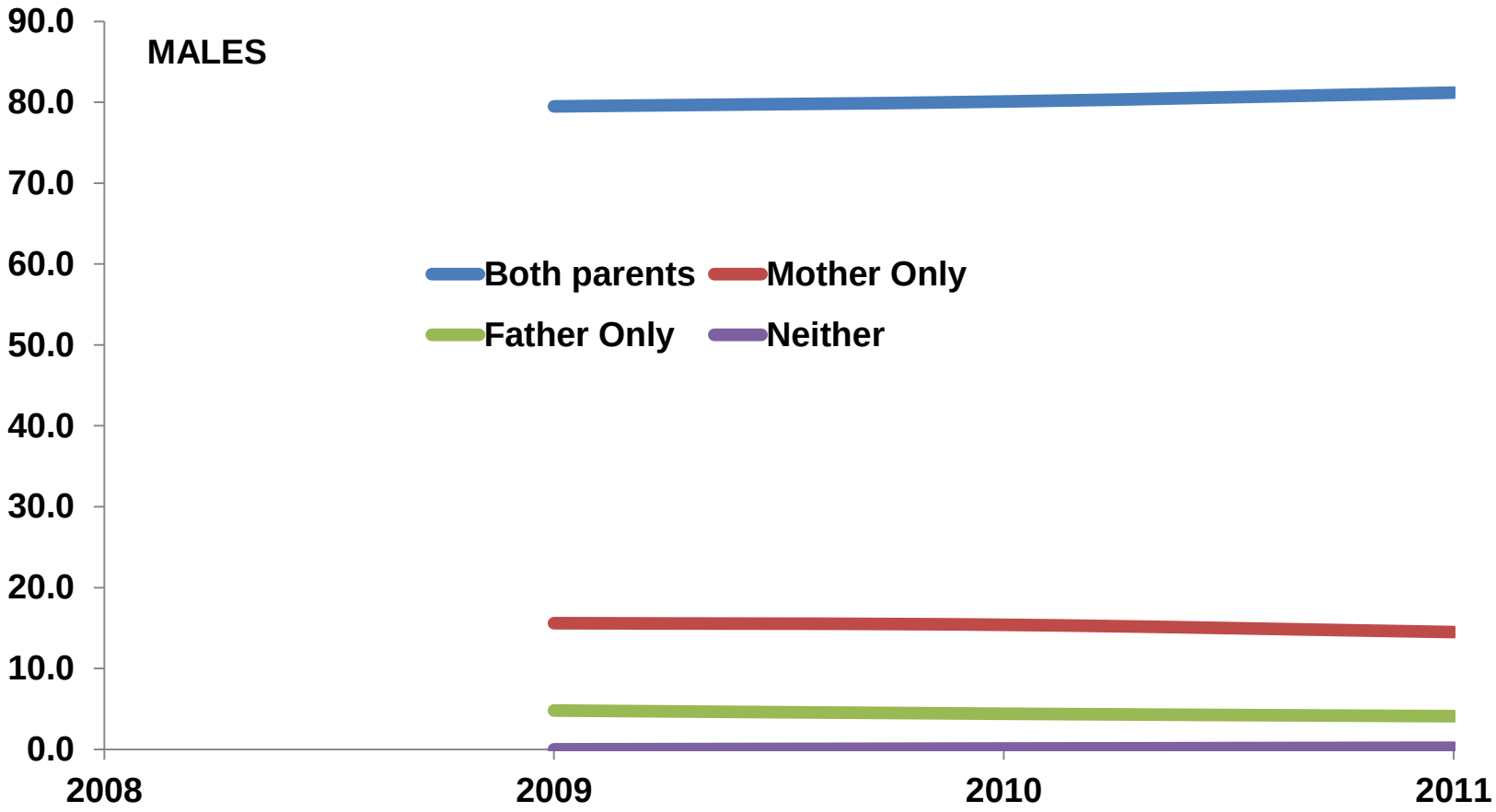
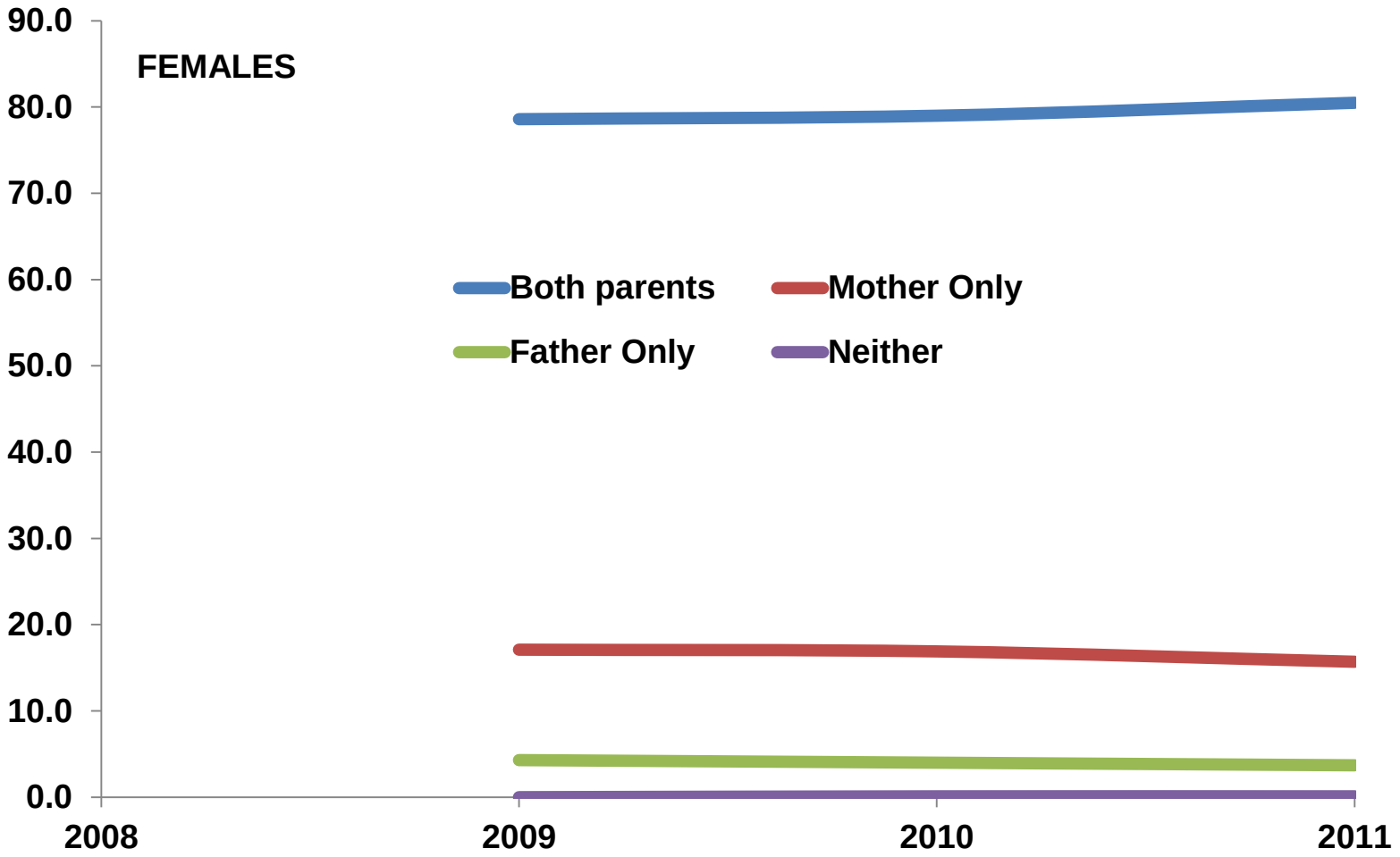
Figure 1: Gender analysis of children's living arrangements in sub-Saharan Africa

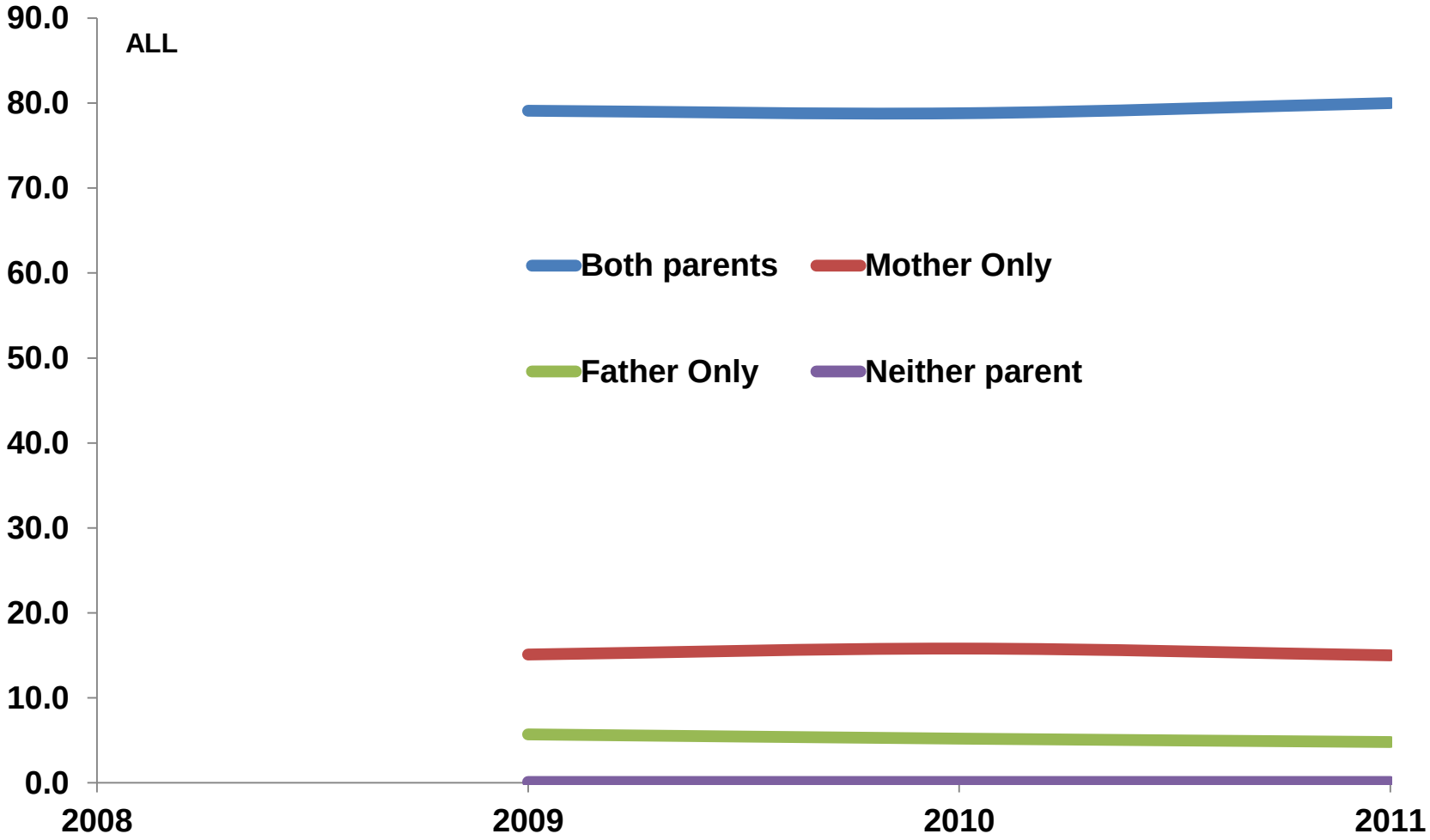
Panel A: Ouagadougou (Burkina Faso)

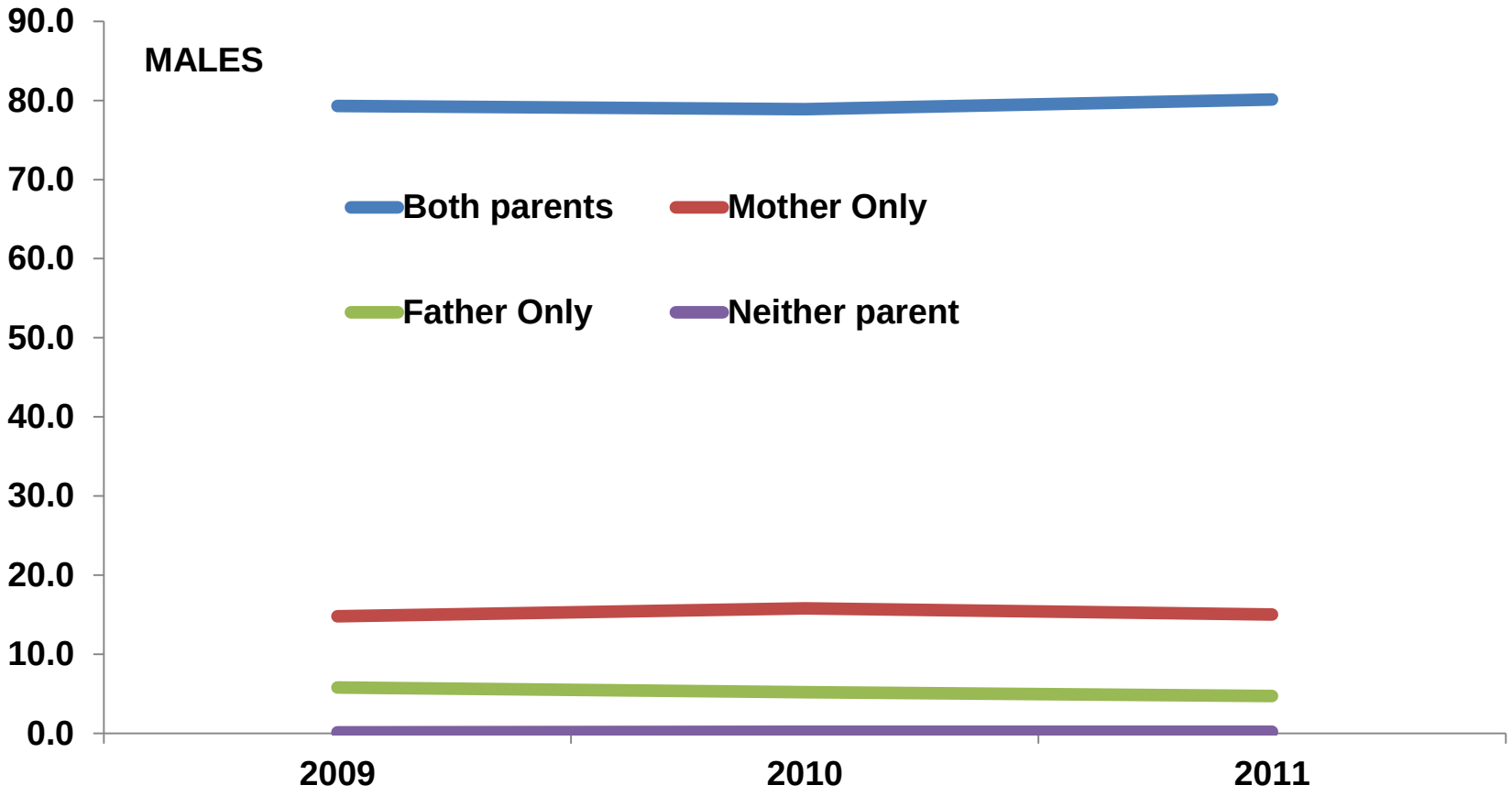


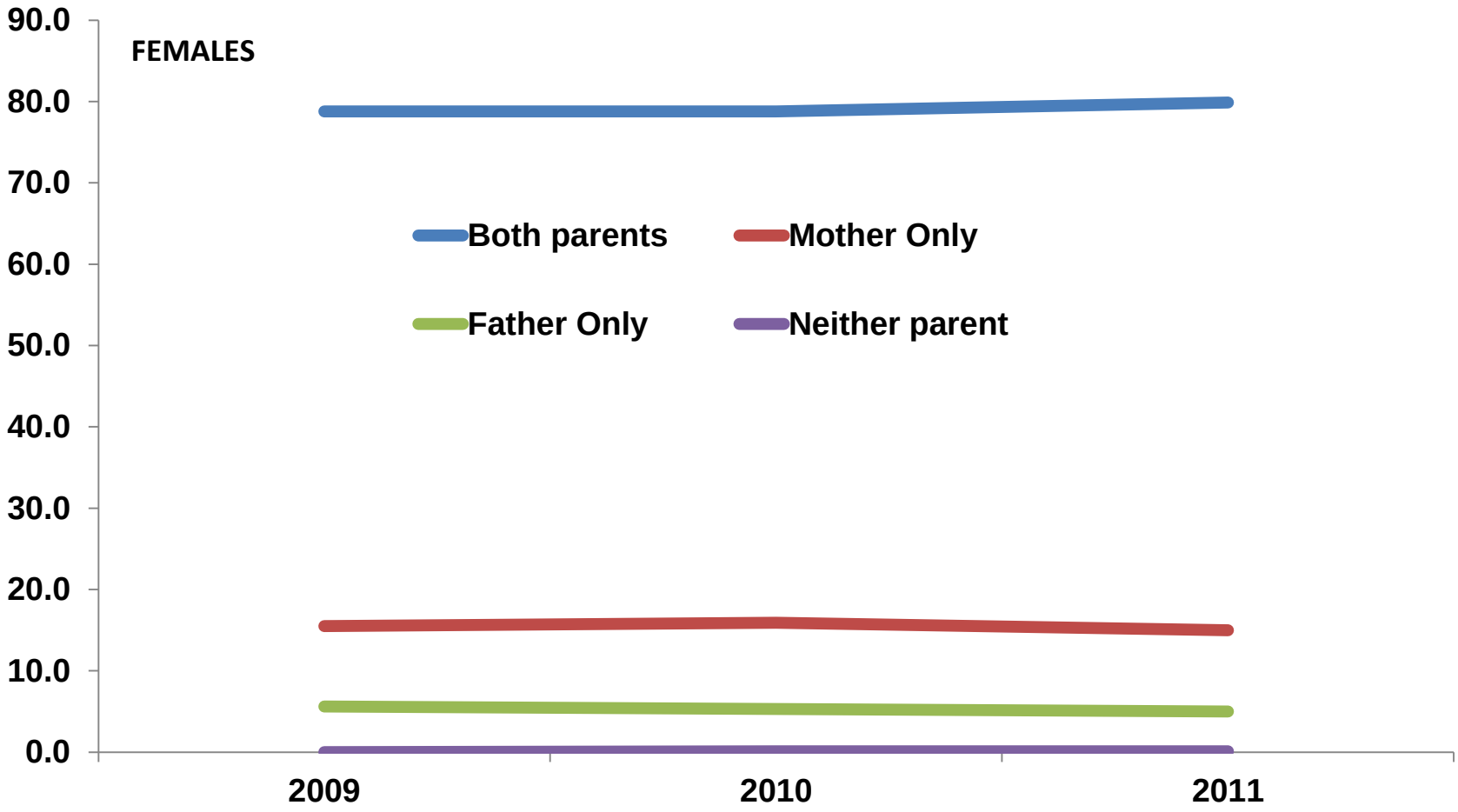

MALES
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
2008
2009
2010
2011
Both parents
Mother Only
Father Only
Neither


FEMALES
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
2008
2009
2010
2011
Both parents
Mother Only
Father Only
Neither

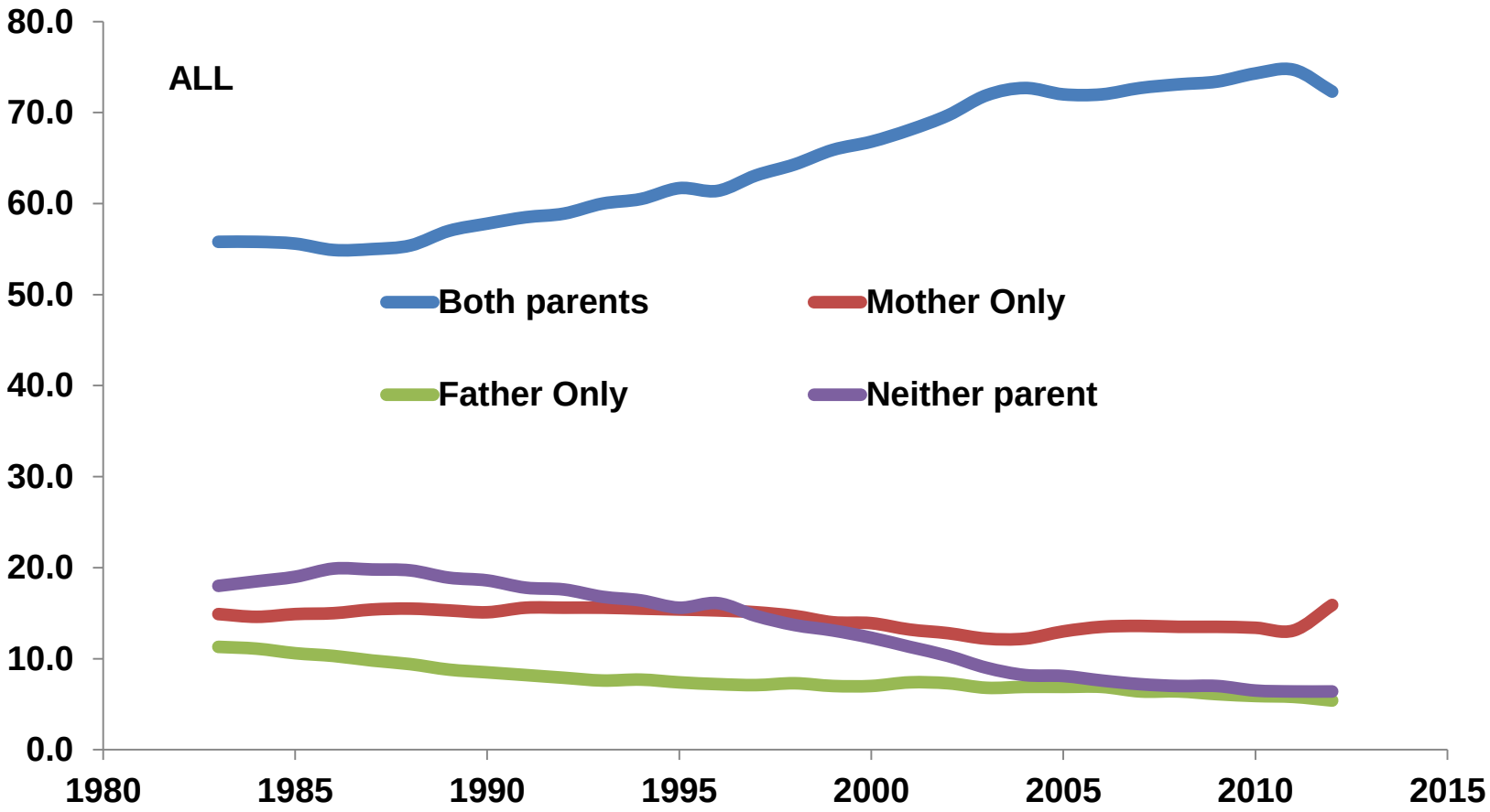
Panel B: Nanoro (Burkina Faso)

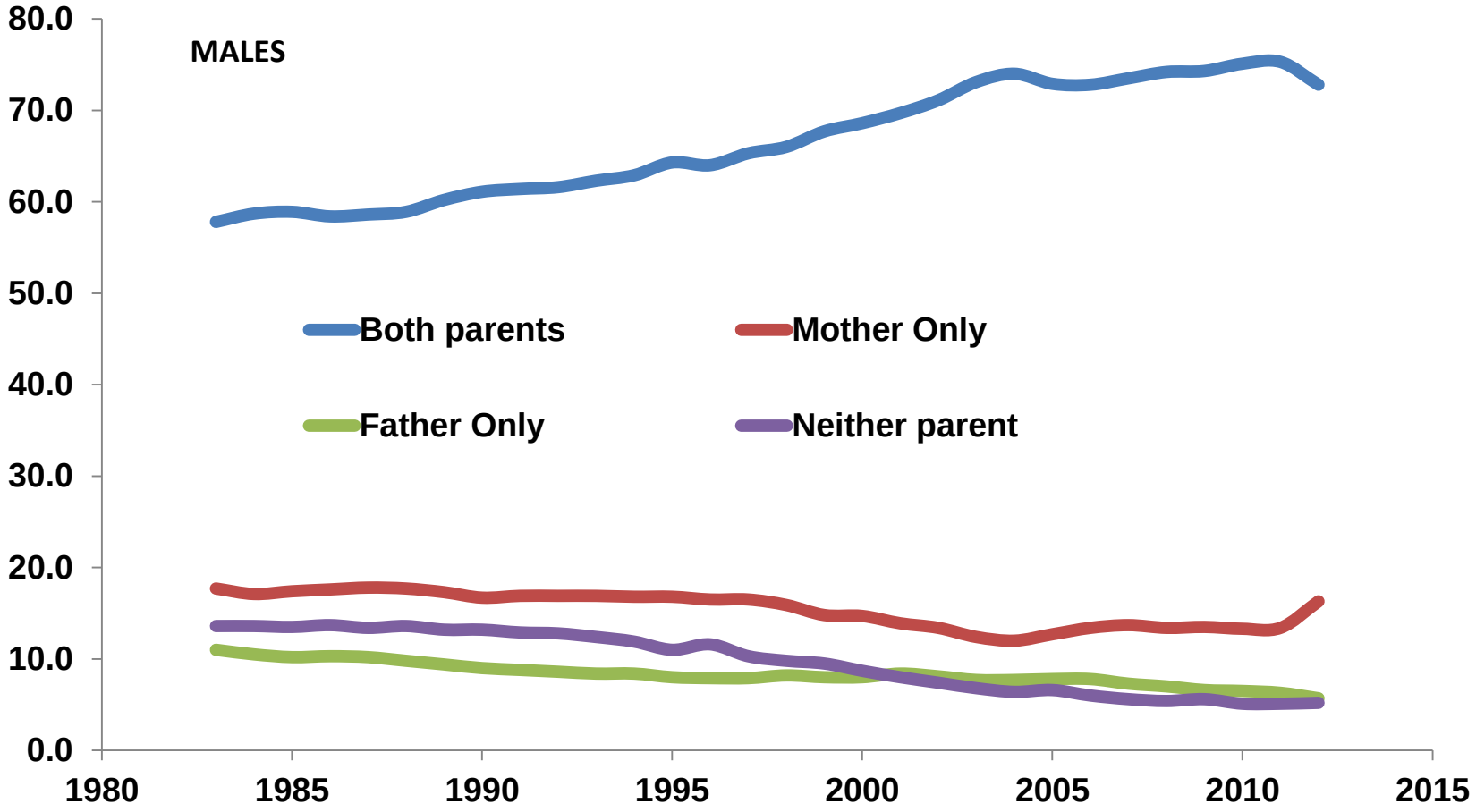


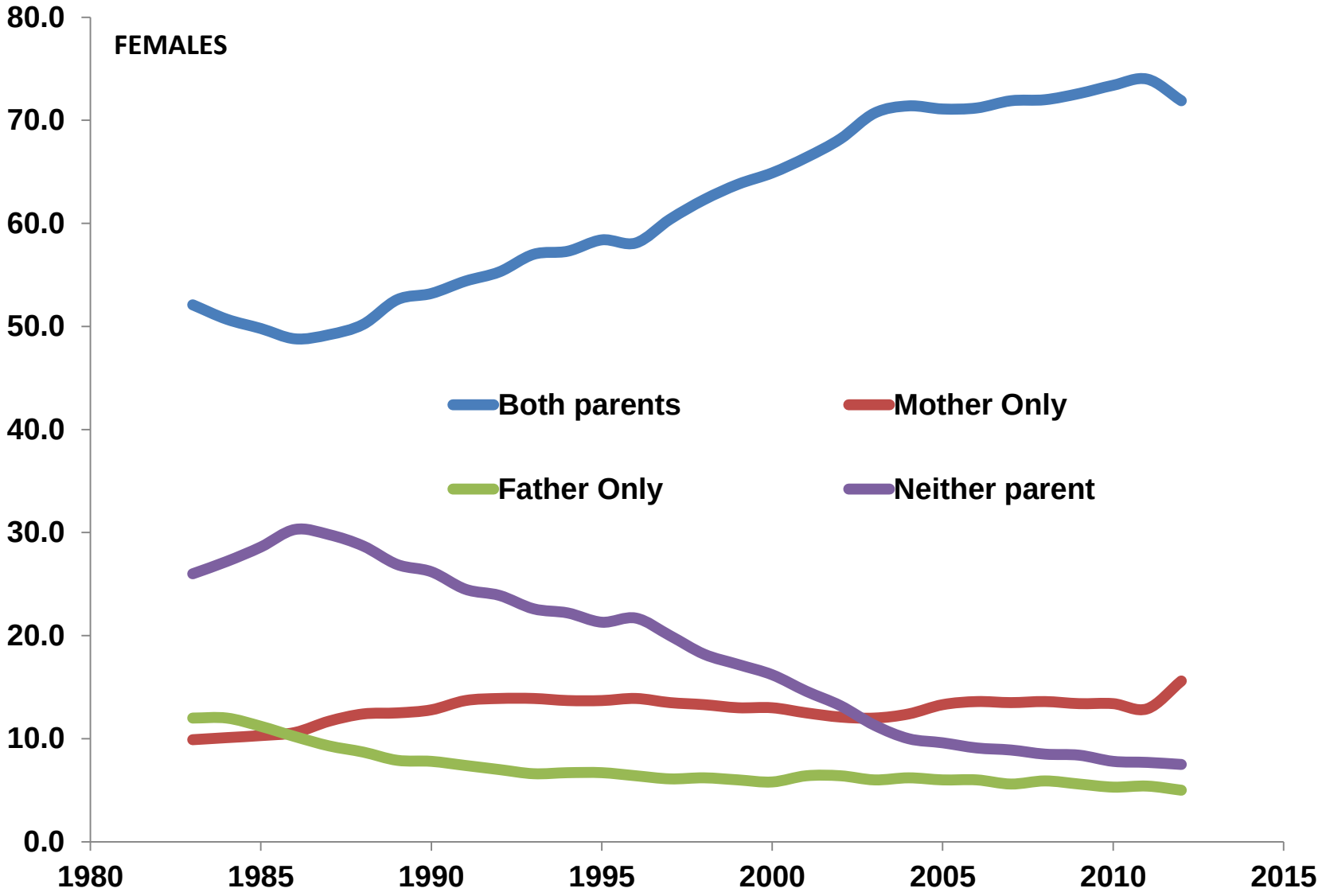

MALES
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Both parents
Mother Only
Father Only
Neither parent
2009
2010
2011


FEMALES
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Both parents
Mother Only
Father Only
Neither parent
2009
2010
2011

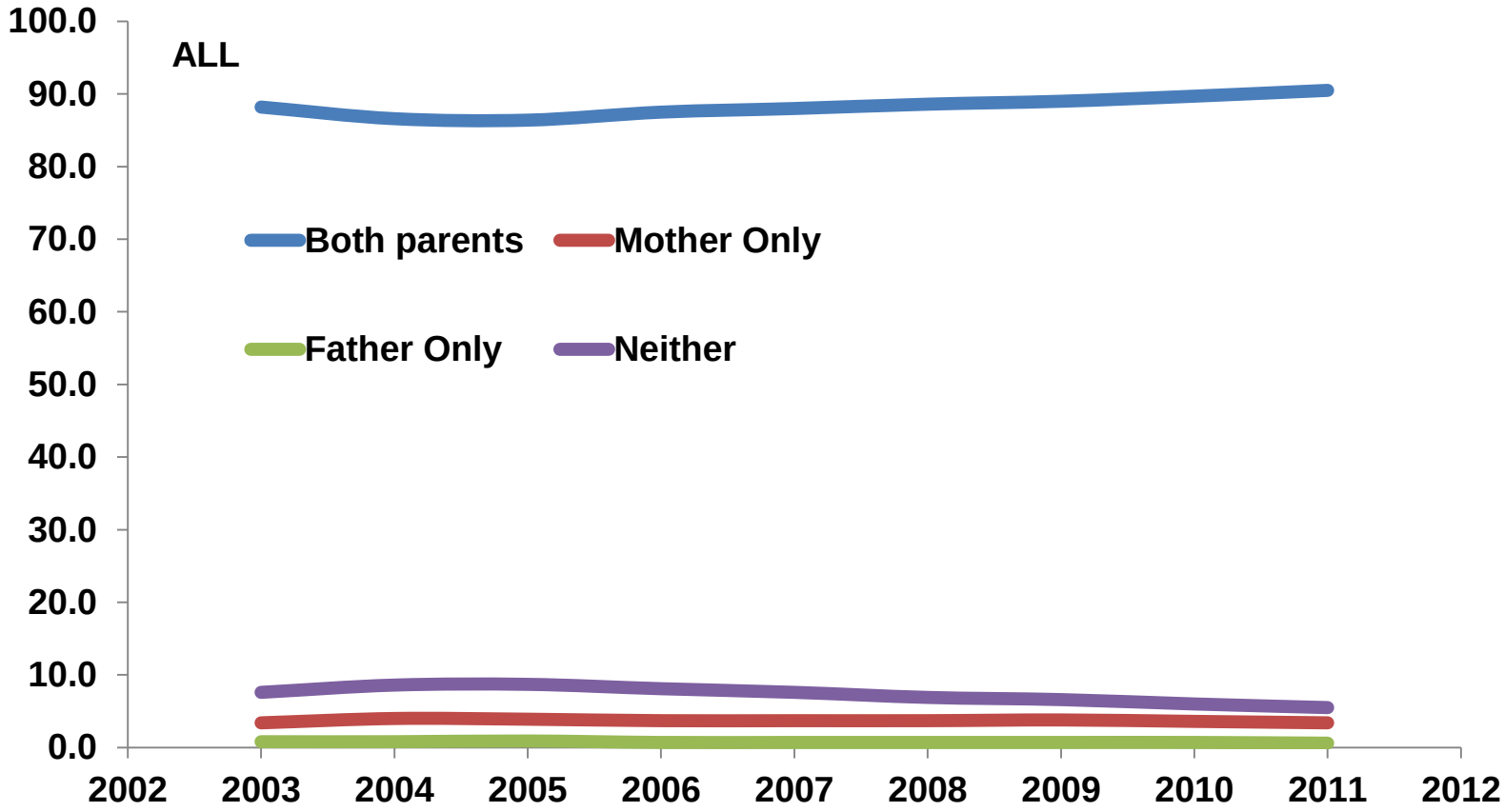
Panel C: Niakhar (Senegal)

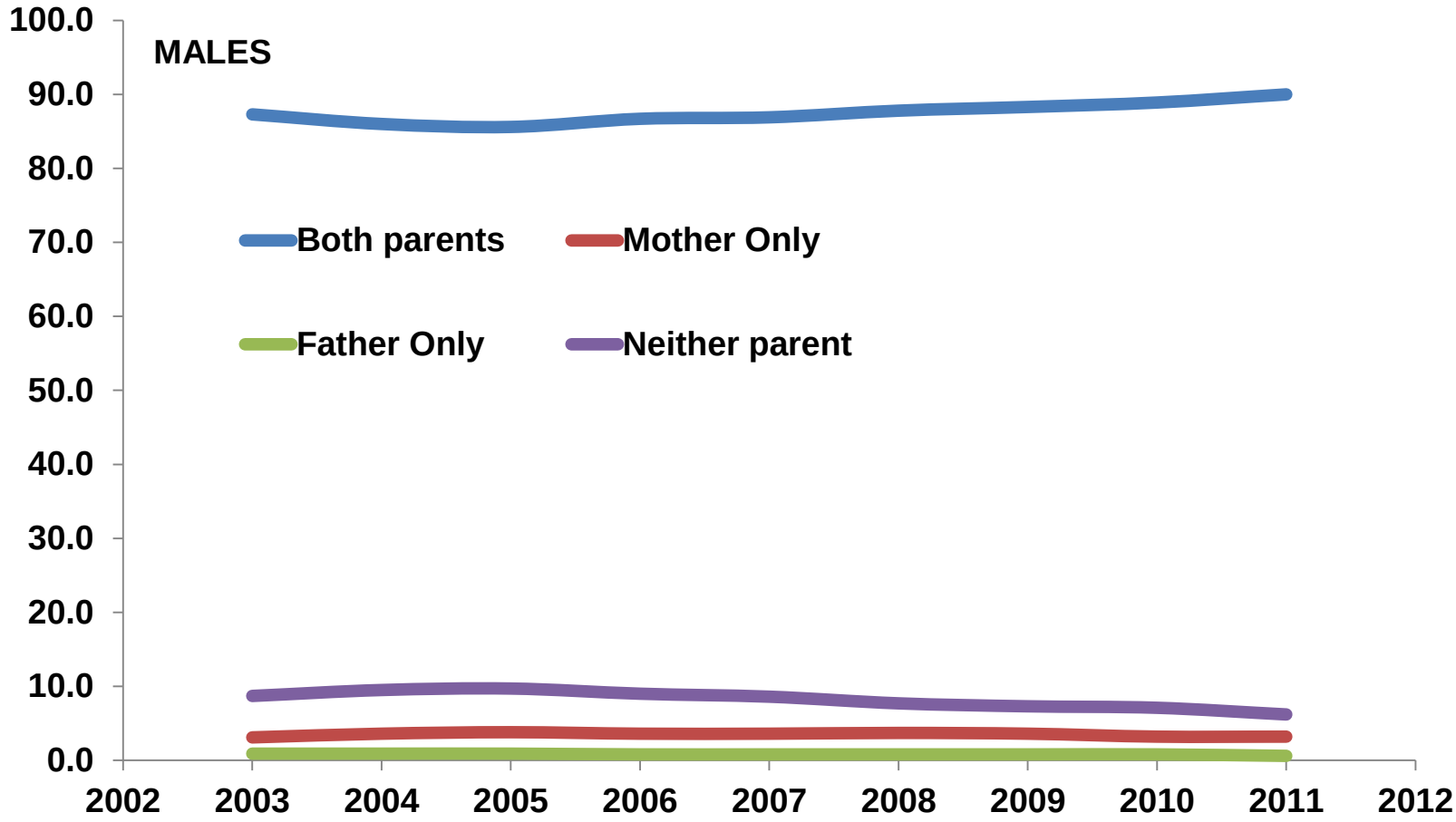


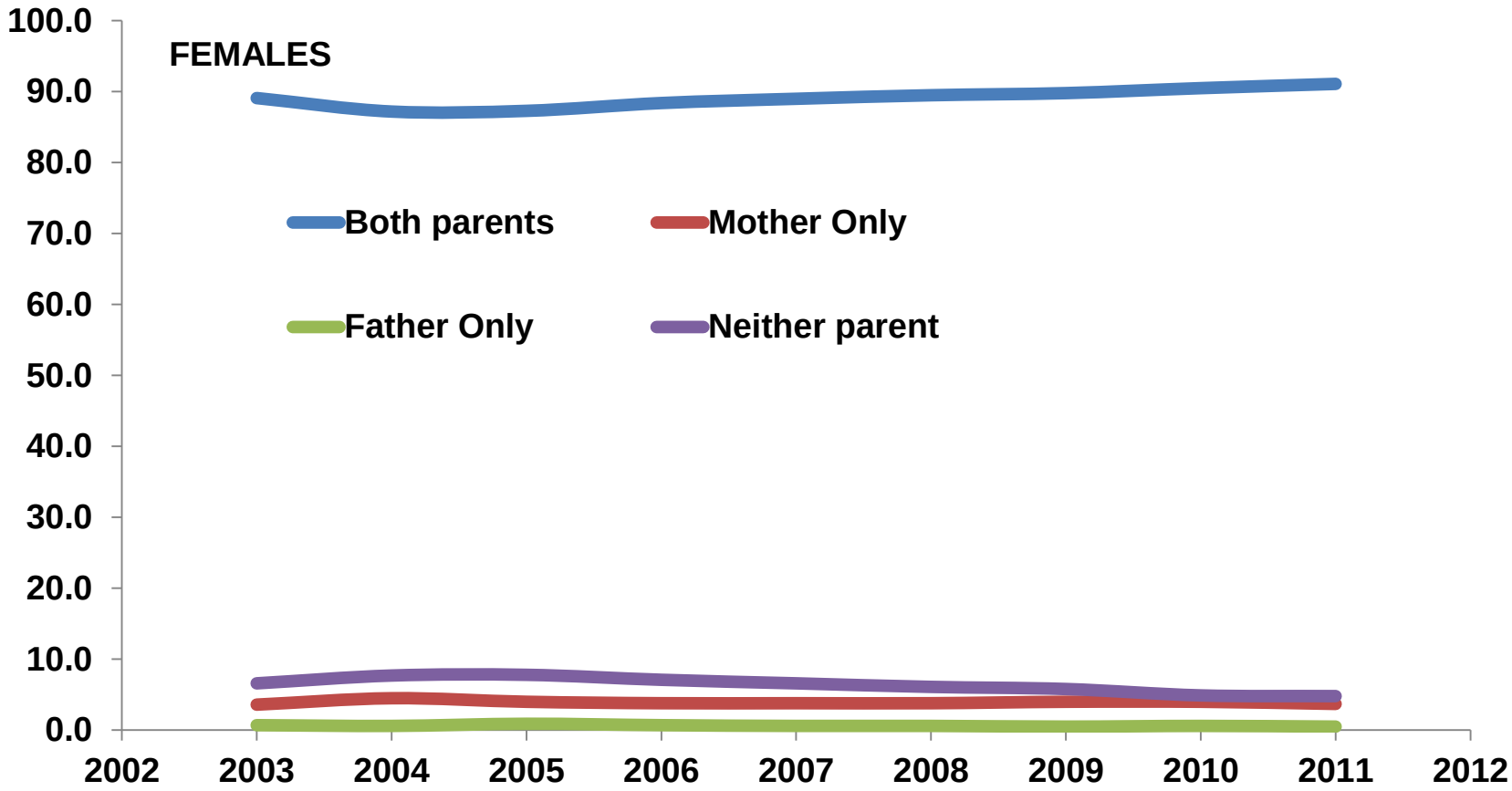

MALES
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
1980
1985
1990
1995
2000
2005
2010
2015
Both parents
Mother Only
Father Only
Neither parent


FEMALES
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
1980
1985
1990
1995
2000
2005
2010
2015
Both parents
Mother Only
Father Only
Neither parent

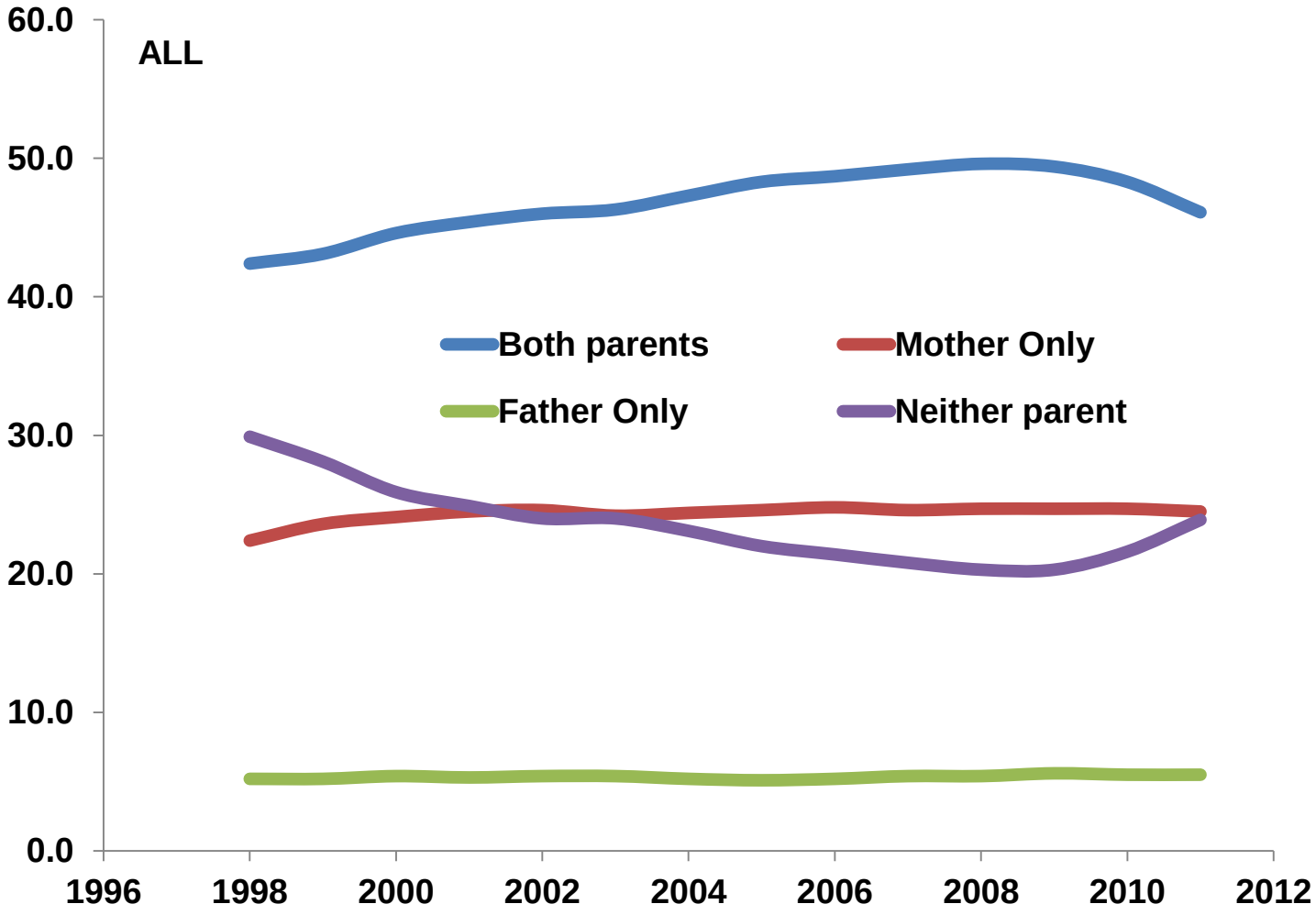
Panel D: Nairobi (Kenya)

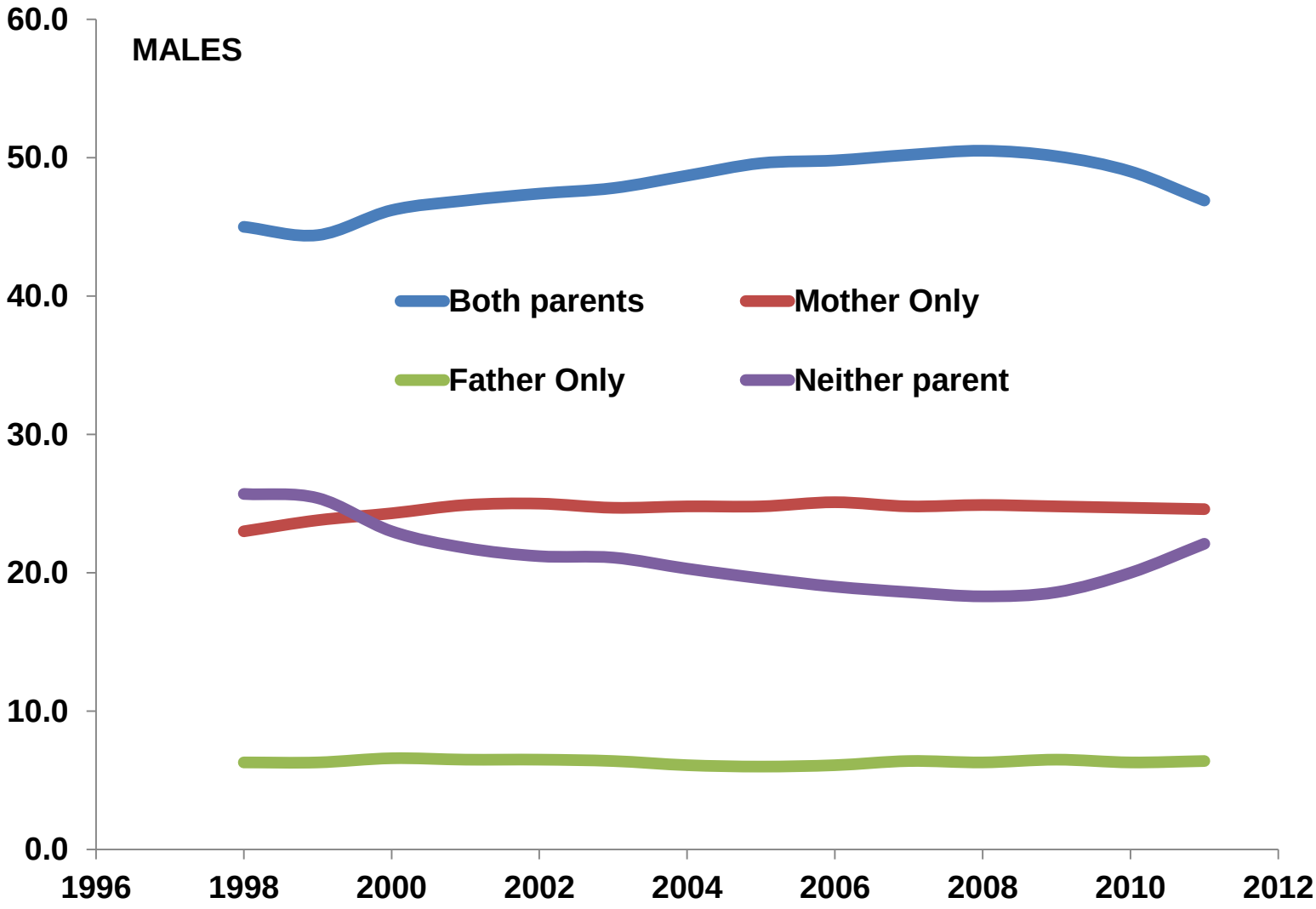


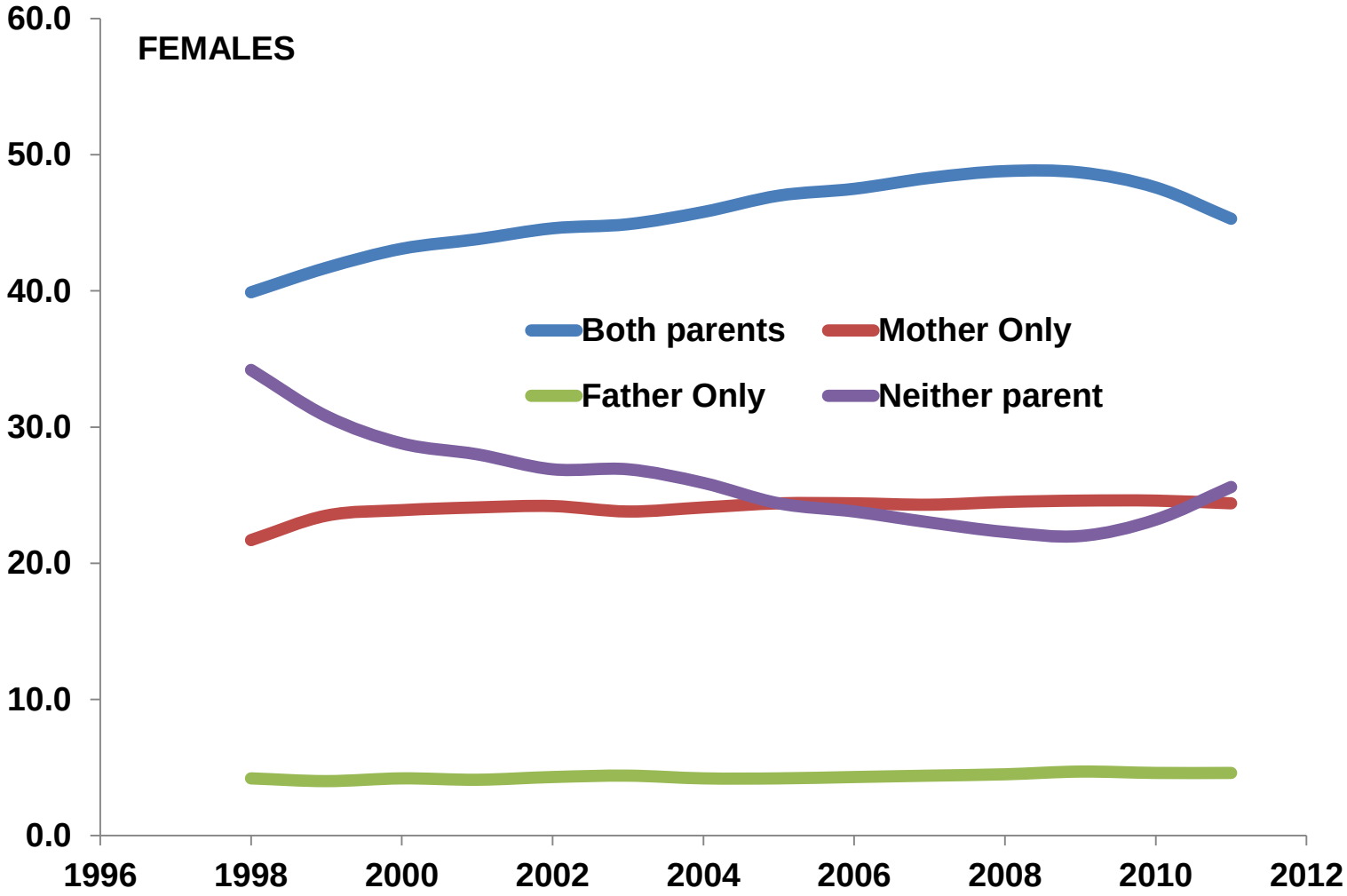

MALES
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Both parents
Mother Only
Father Only
Neither parent
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012


FEMALES
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
Both parents
Mother Only
Father Only
Neither parent
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012

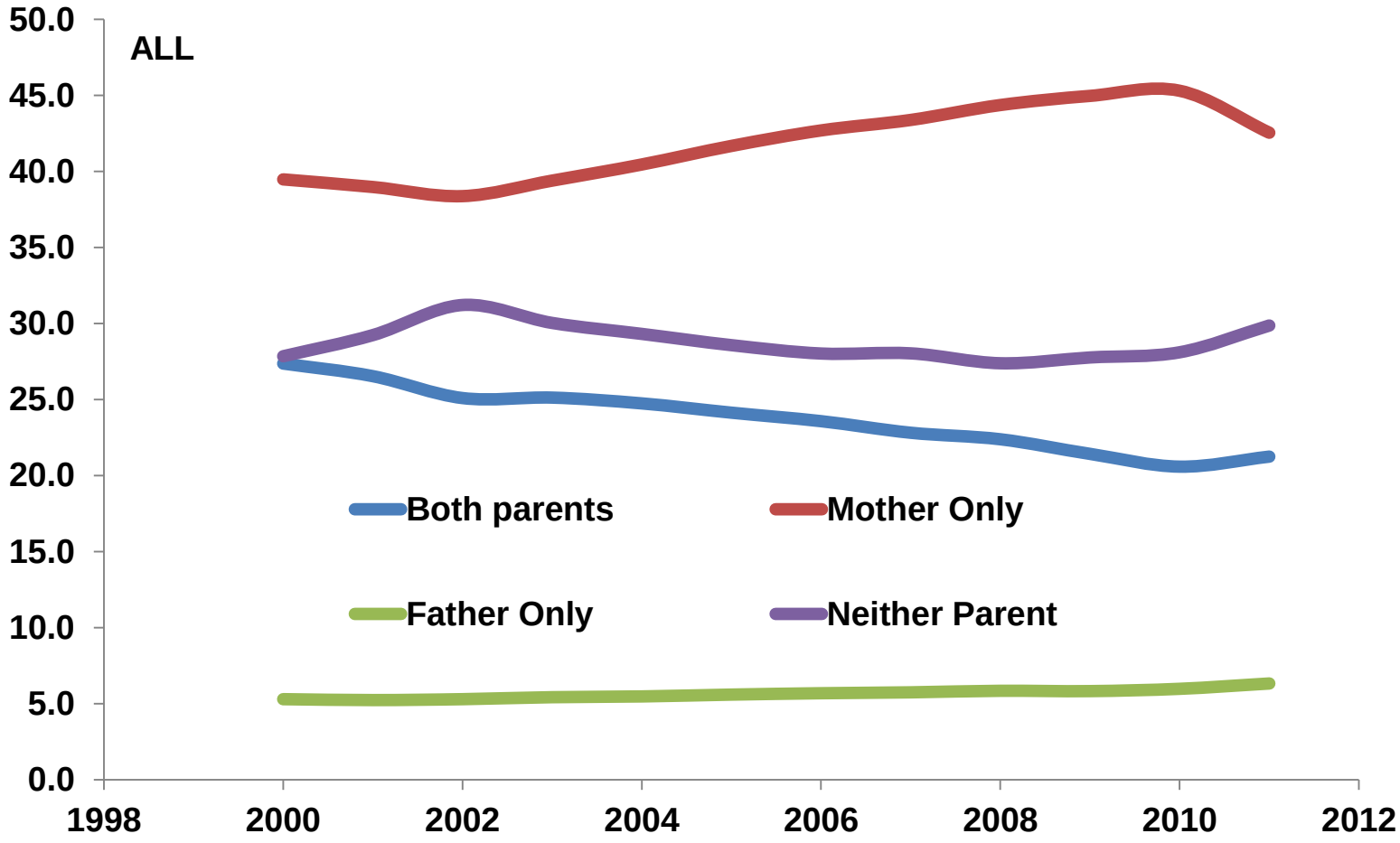
Panel E: Rufiji (Tanzania)

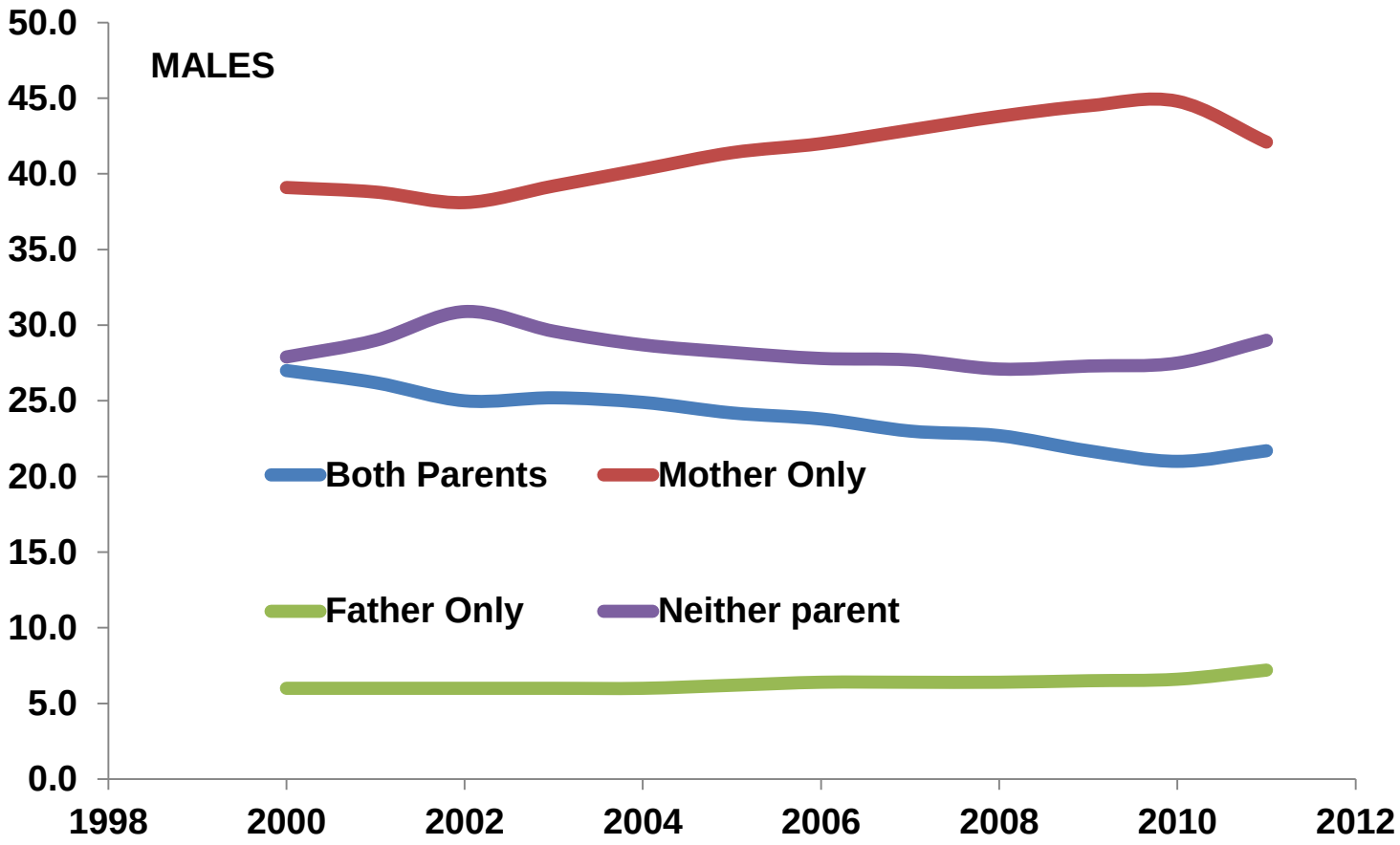



MALES
60.0
50.0
40.0
30.0
20.0
10.0
0.0
1996
1998
2000
2002
2004
2006
2008
2010
2012
Both parents
Mother Only
Father Only
Neither parent


FEMALES
60.0
50.0
40.0
30.0
20.0
10.0
0.0
1996
1998
2000
2002
2004
2006
2008
2010
2012
Both parents
Mother Only
Father Only
Neither parent

Panel F: Africa Centre (South Africa)




MALES
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
1998
2000
2002
2004
2006
2008
2010
2012
Both Parents
Mother Only
Father Only
Neither parent

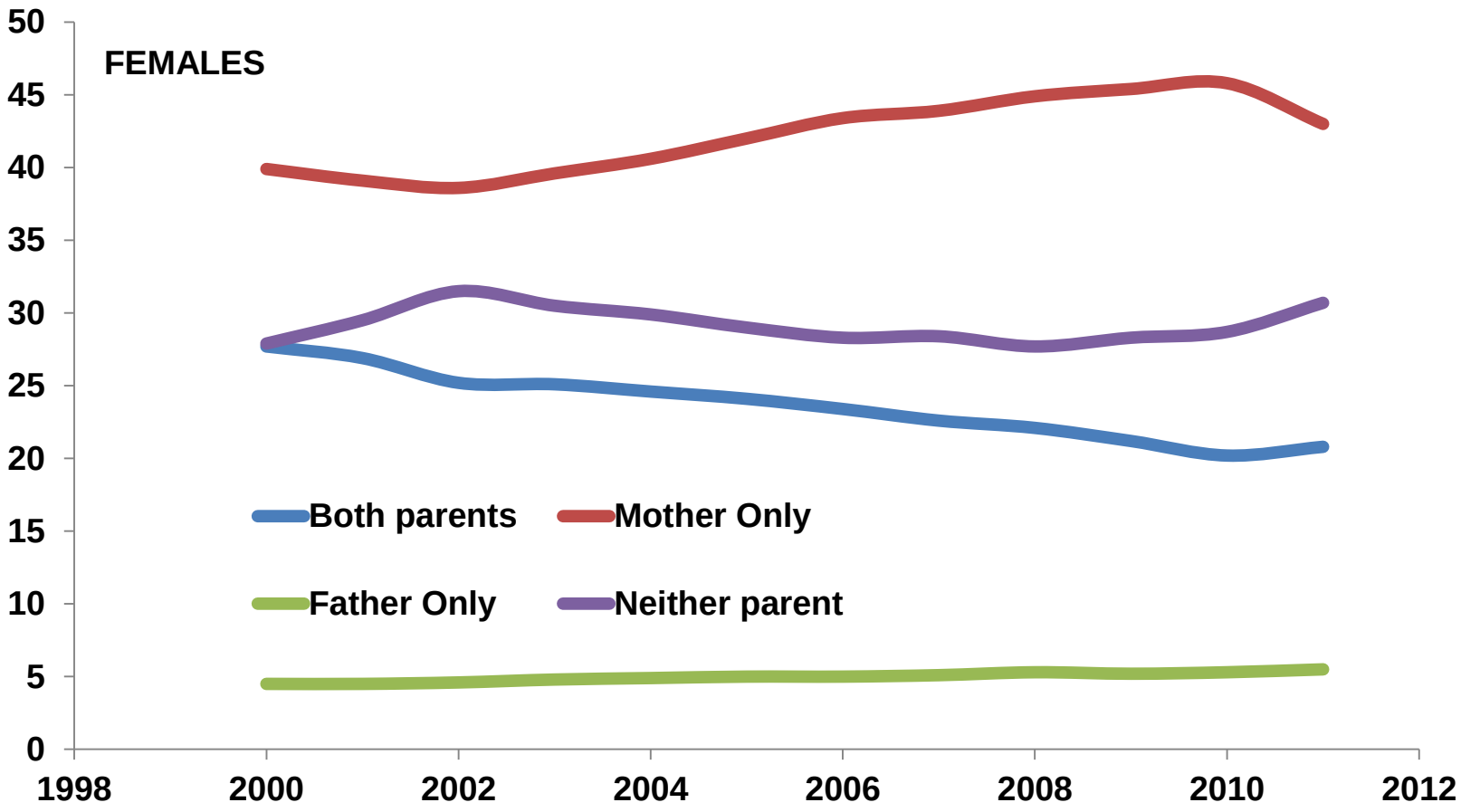
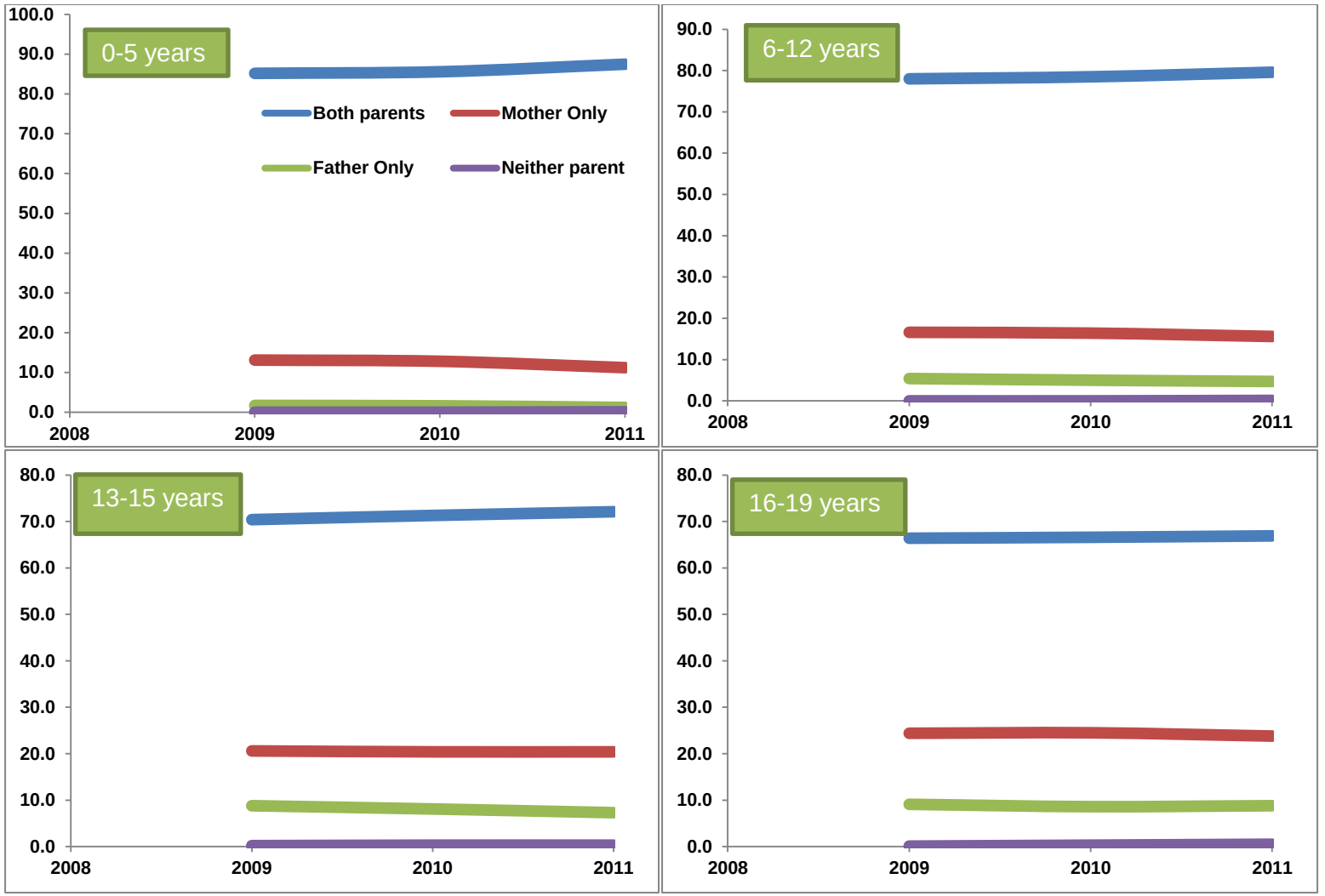
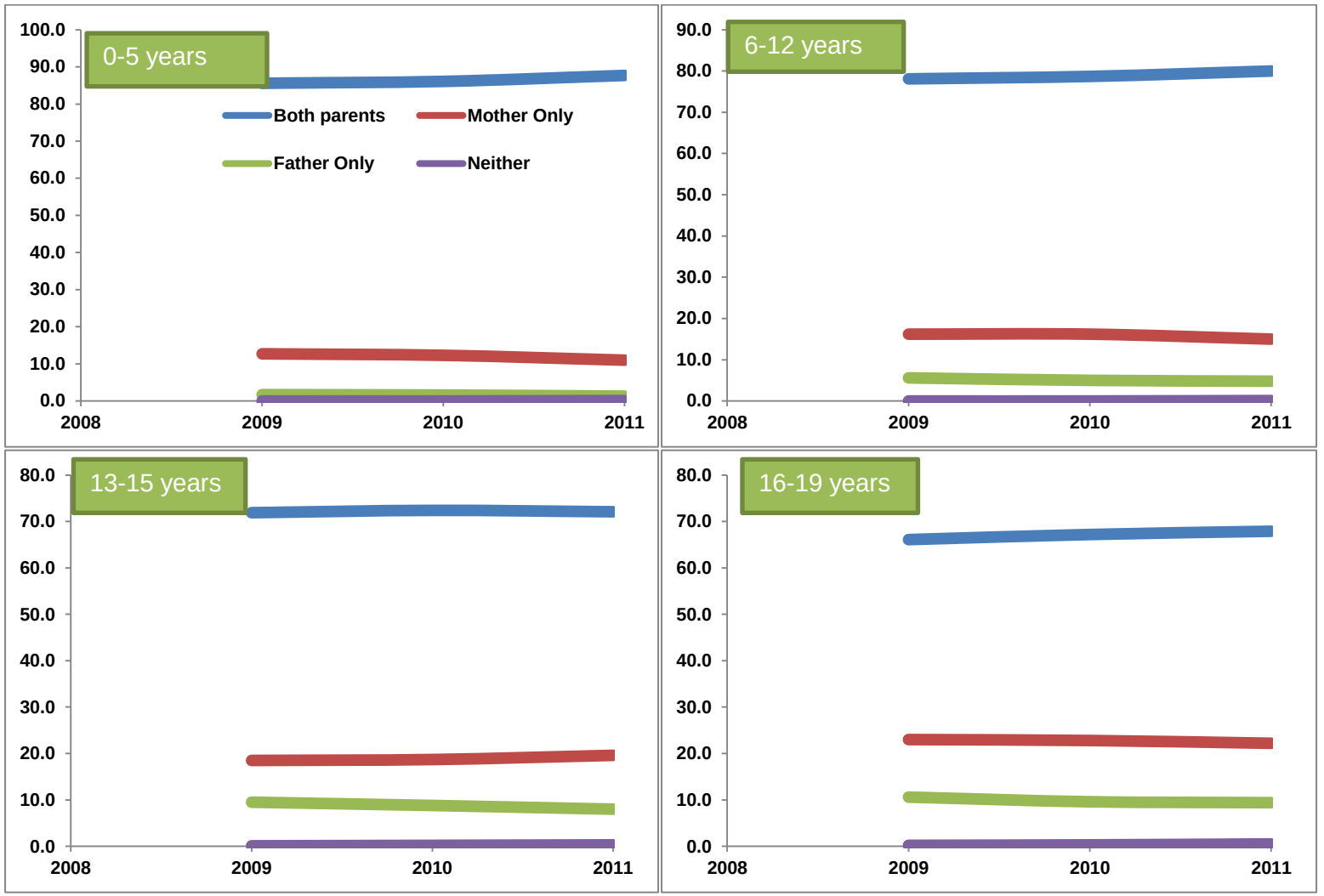

FEMALES
50
45
40
35
30
25
20
15
10
5
0
1998
2000
2002
2004
2006
2008
2010
2012
Both parents
Mother Only
Father Only
Neither parent

Figure 2: Gender and age-specific analyses of children's living arrangements in sub-Saharan Africa

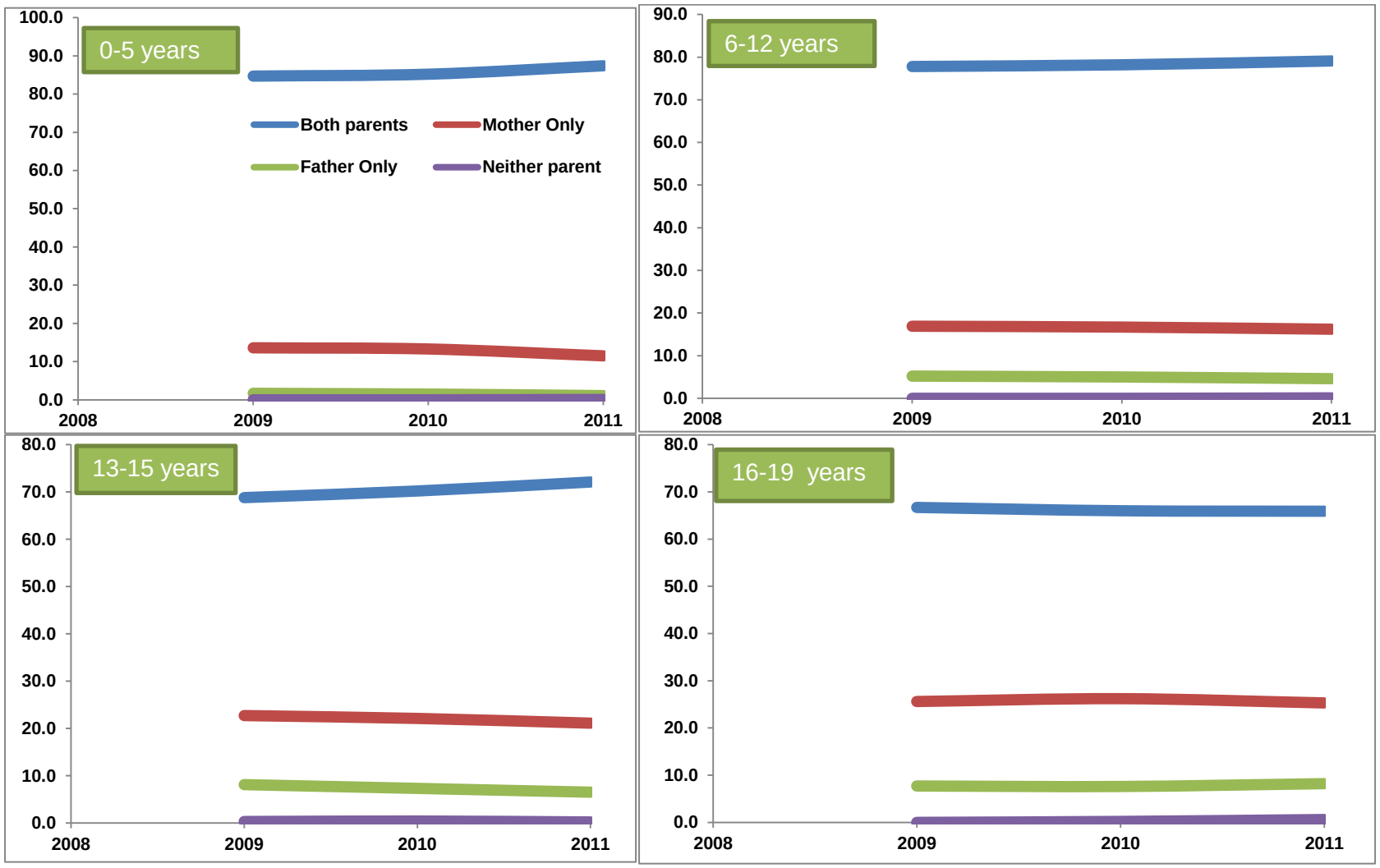
Panel A.1.: Ouagadougou (Burkina Faso) - ALL



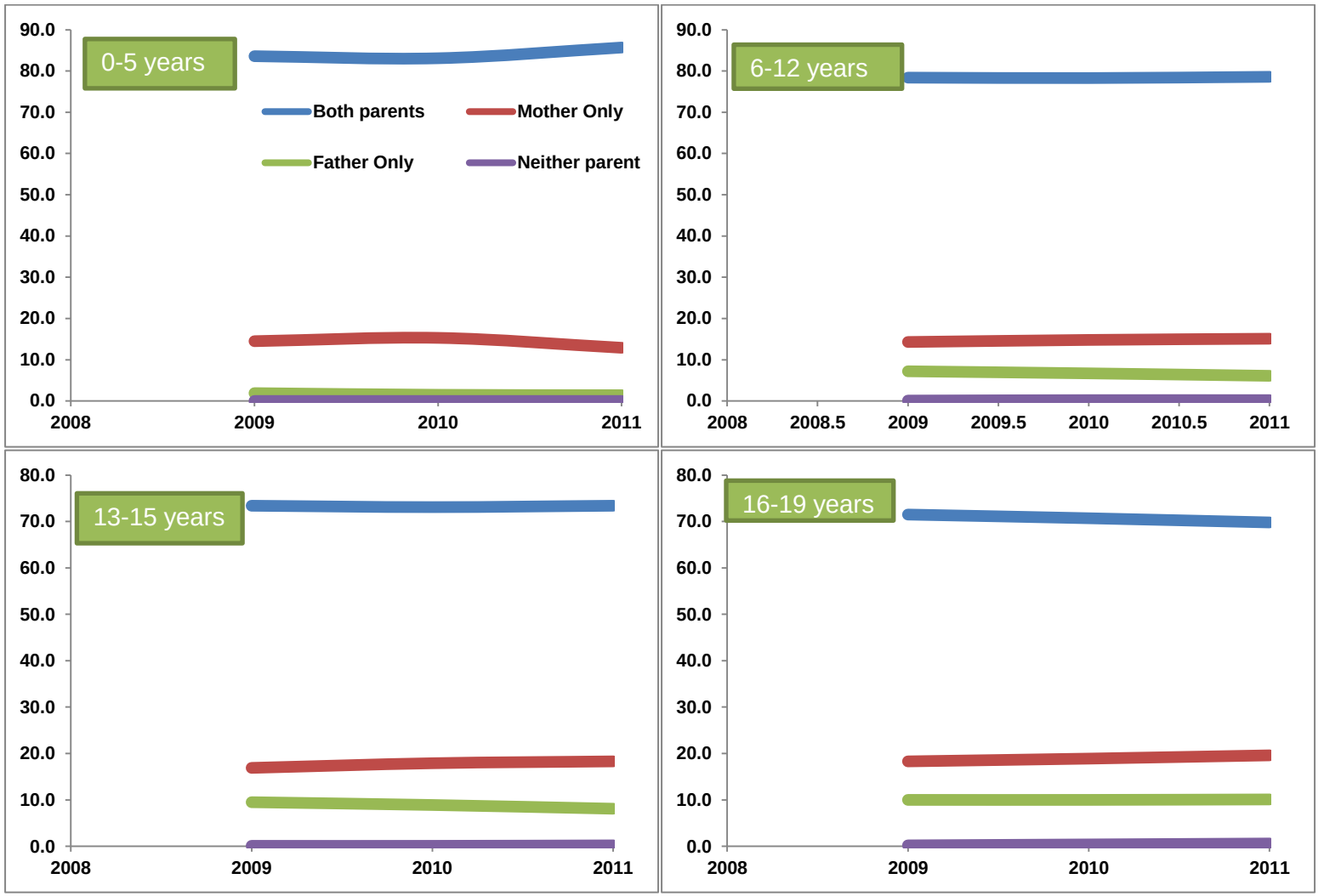
Panel A.2.: Ouagadougou (Burkina Faso) – MALES



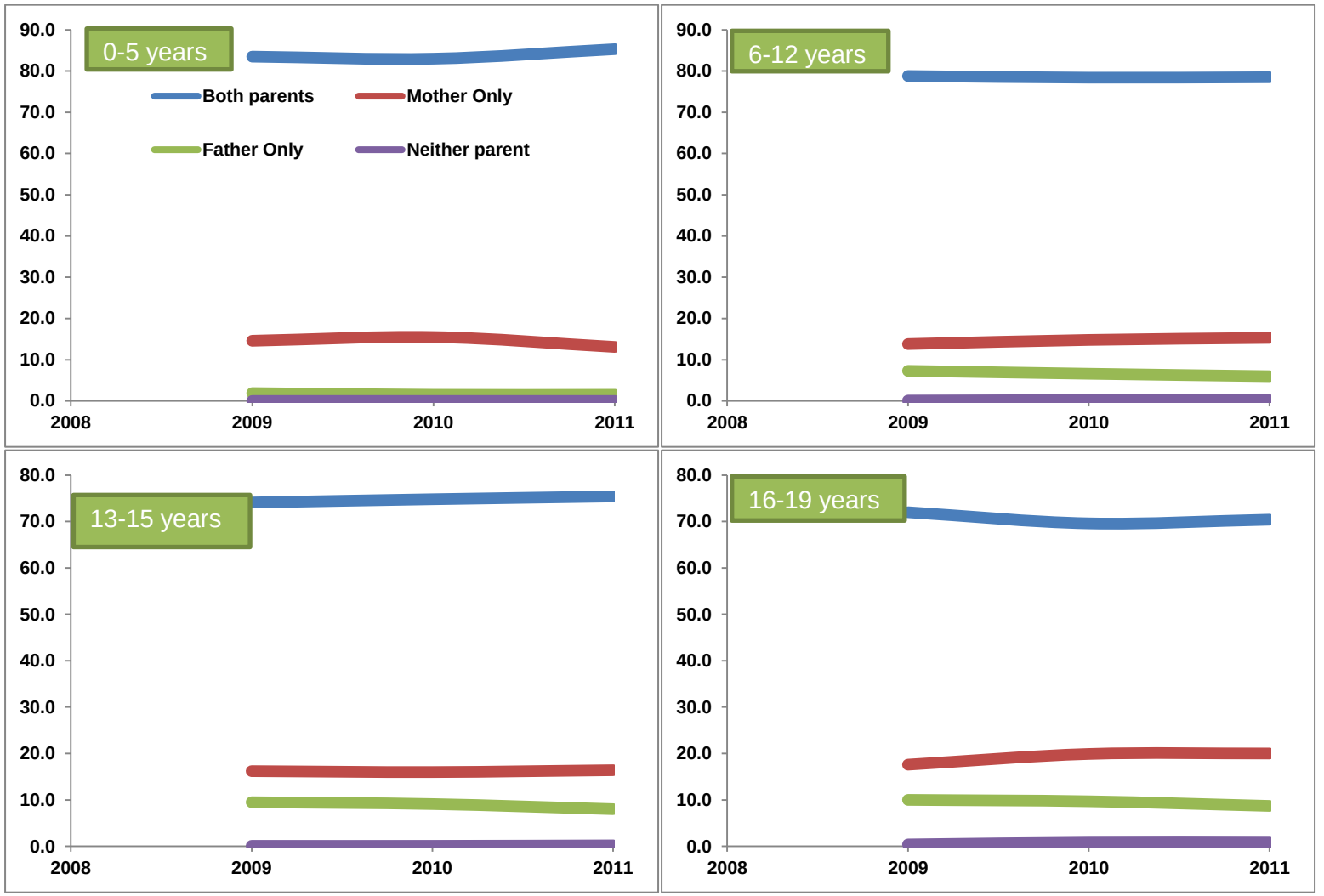
Panel A.3.: Ougadougou (Burkina Faso) – FEMALES



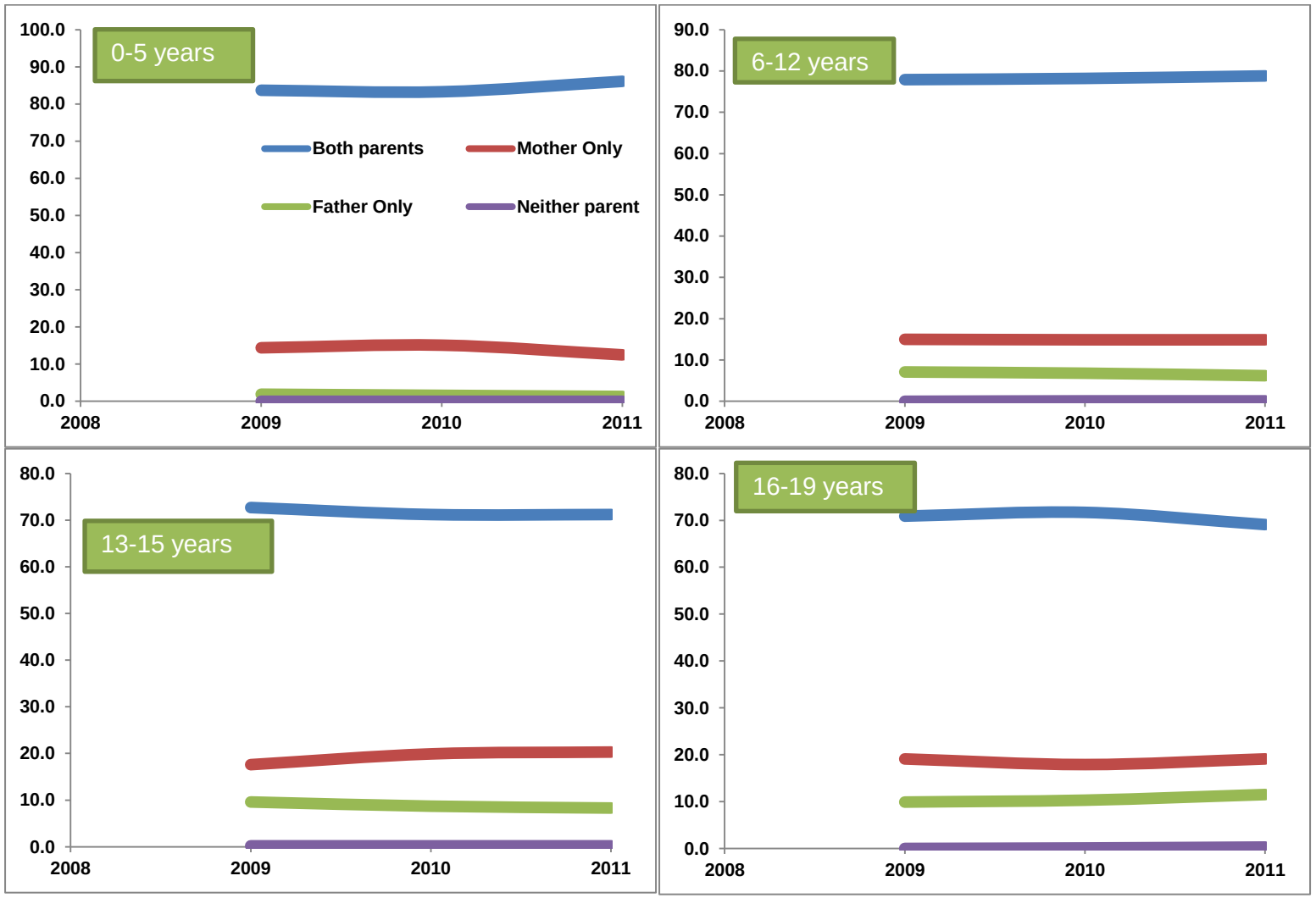
Panel B.1.: Nanoro (Burkina Faso) – ALL



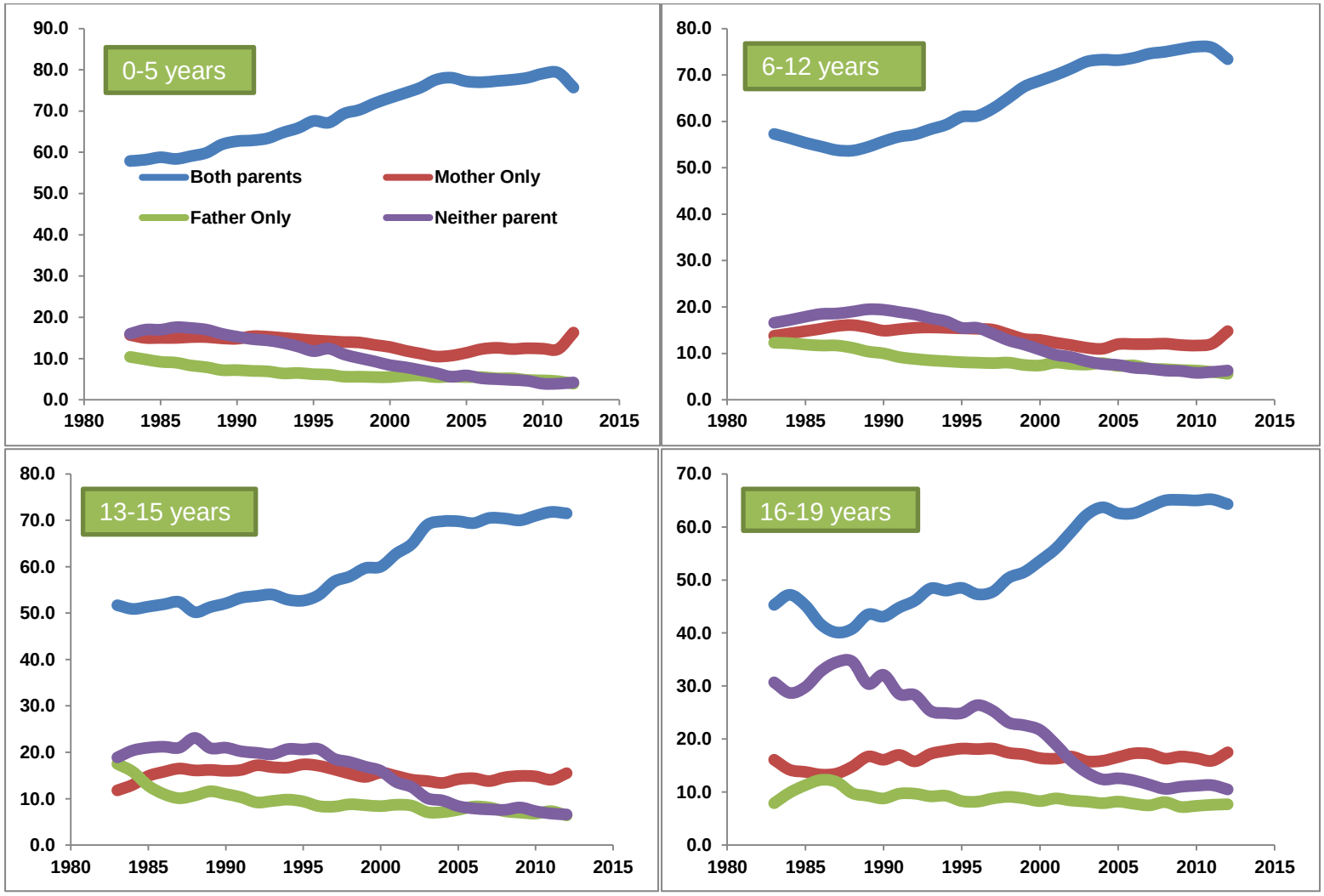
Panel B.2: Nanoro (Burkina Faso) – MALES



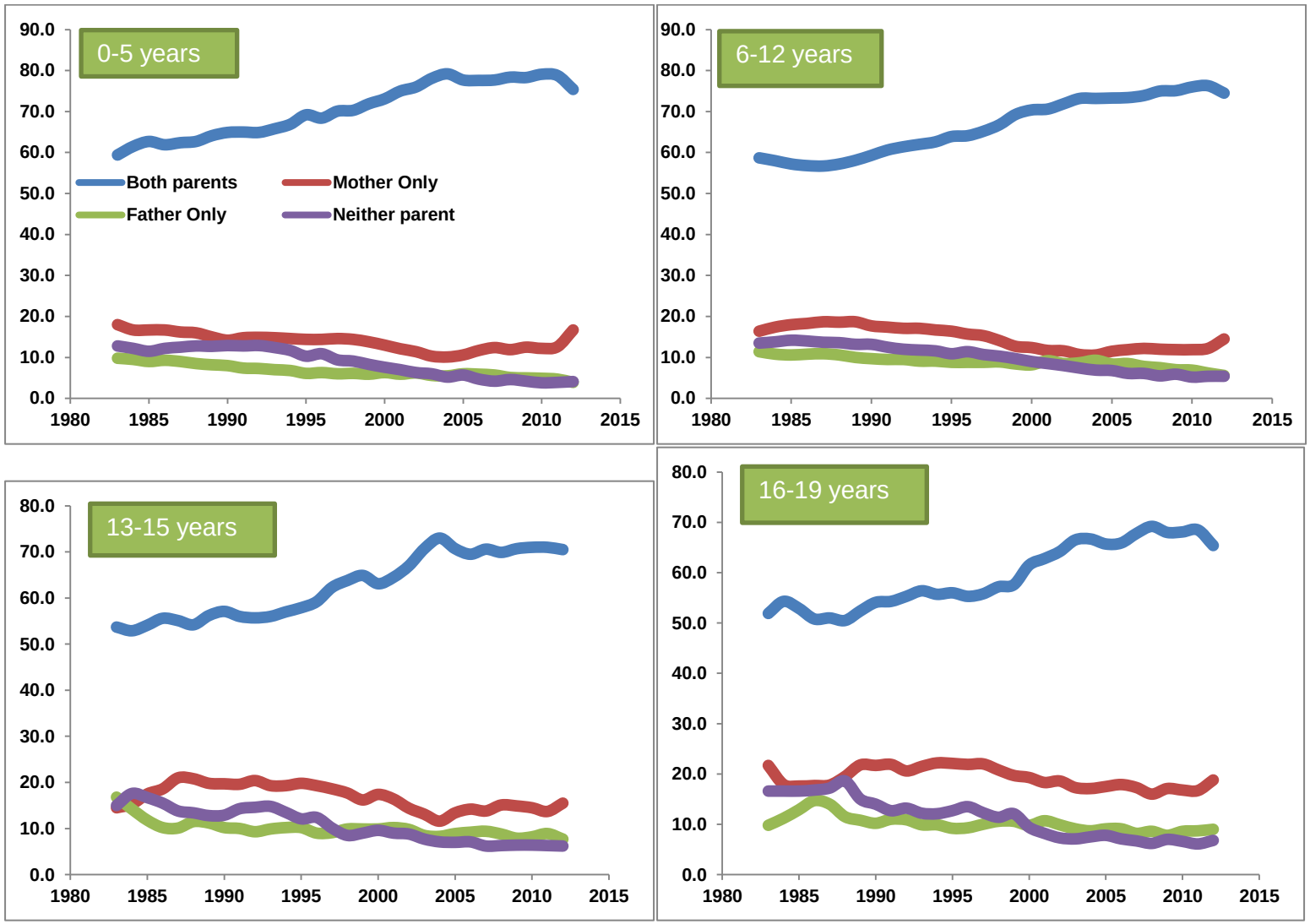
Panel B.3.: Nanoro (Burkina Faso) – FEMALES



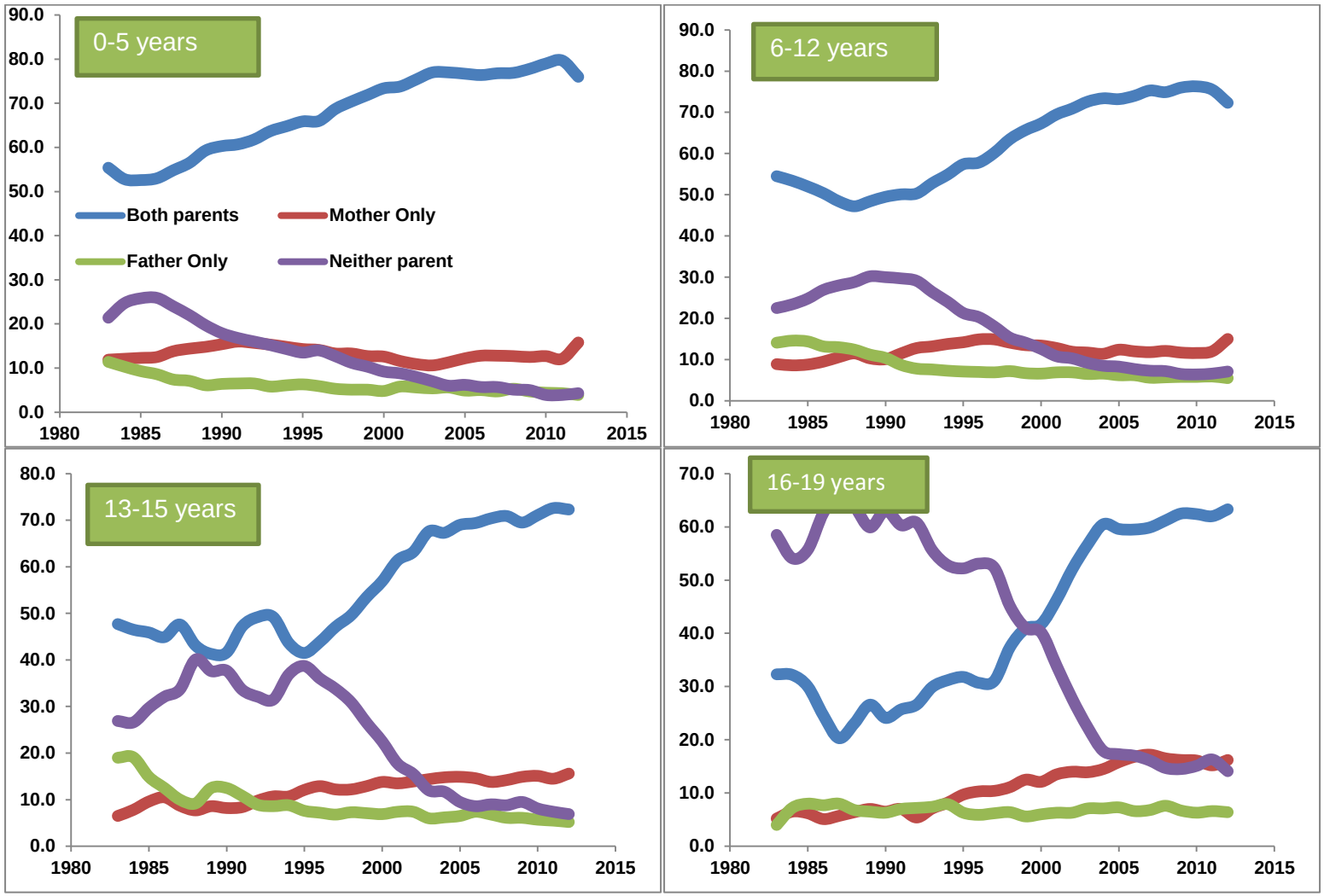
Panel C.1.: Niakhar (Senegal) – ALL



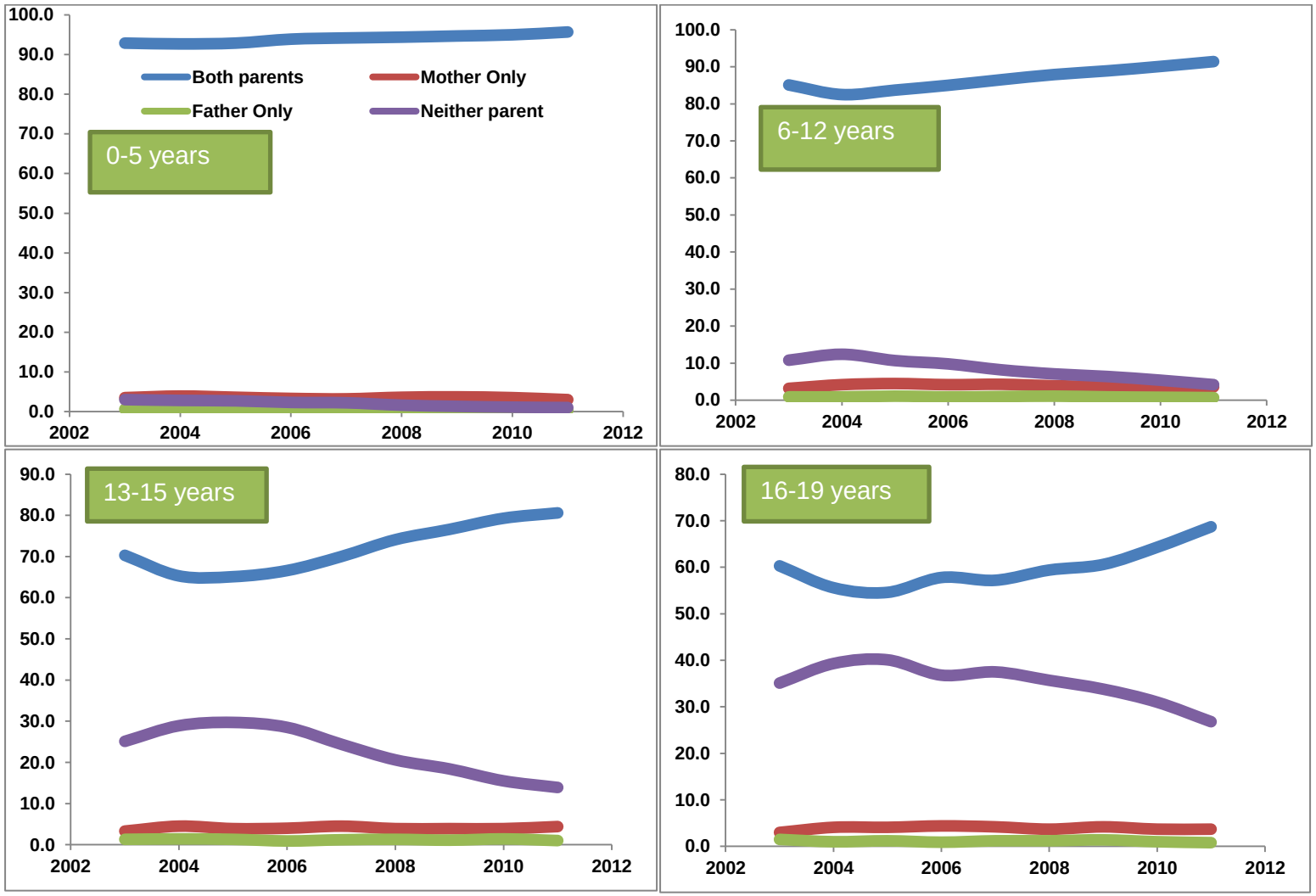
Panel C.2.: Niakhar (Senegal) – MALES



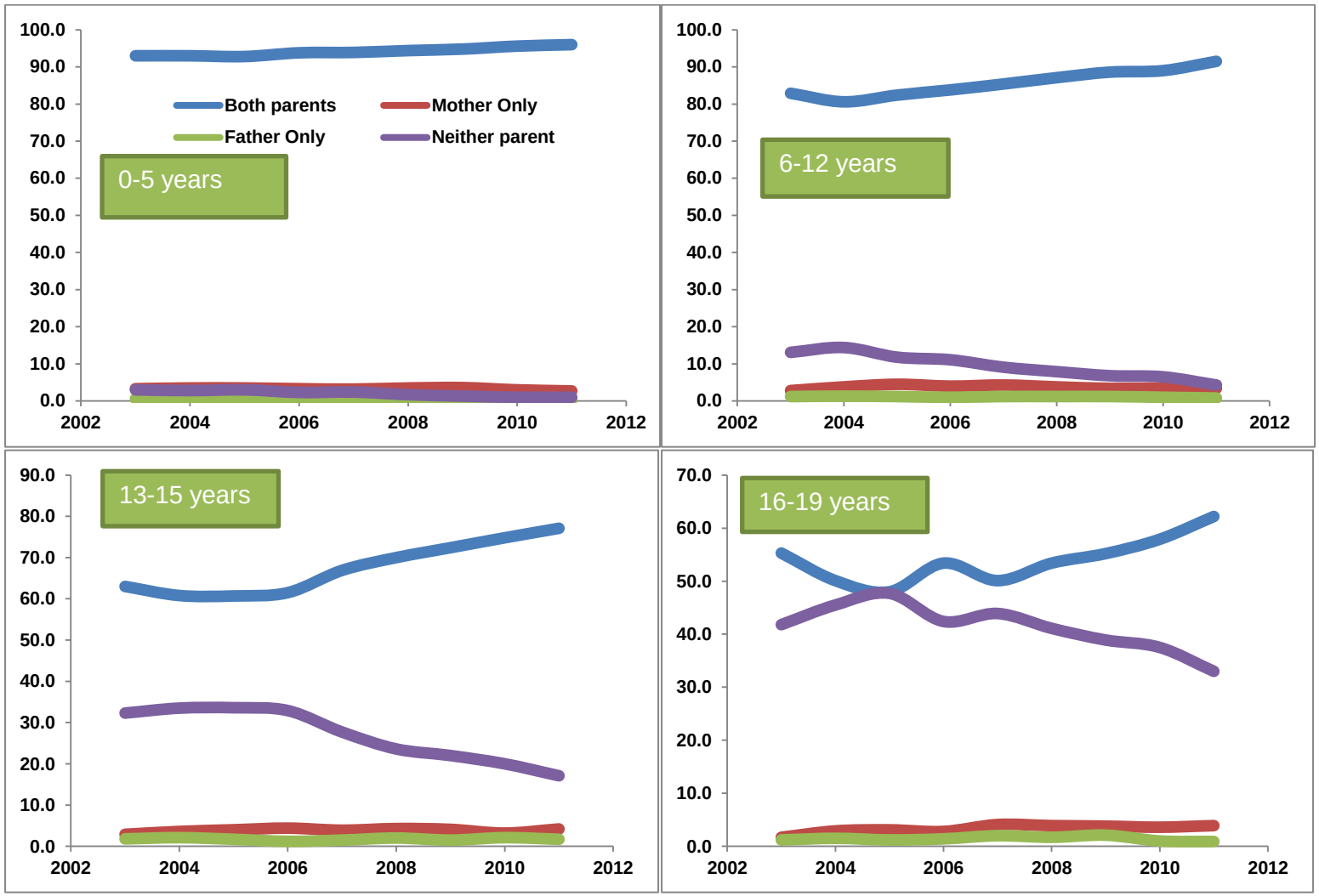
Panel C.3.: Niakhar (Senegal) – FEMALES



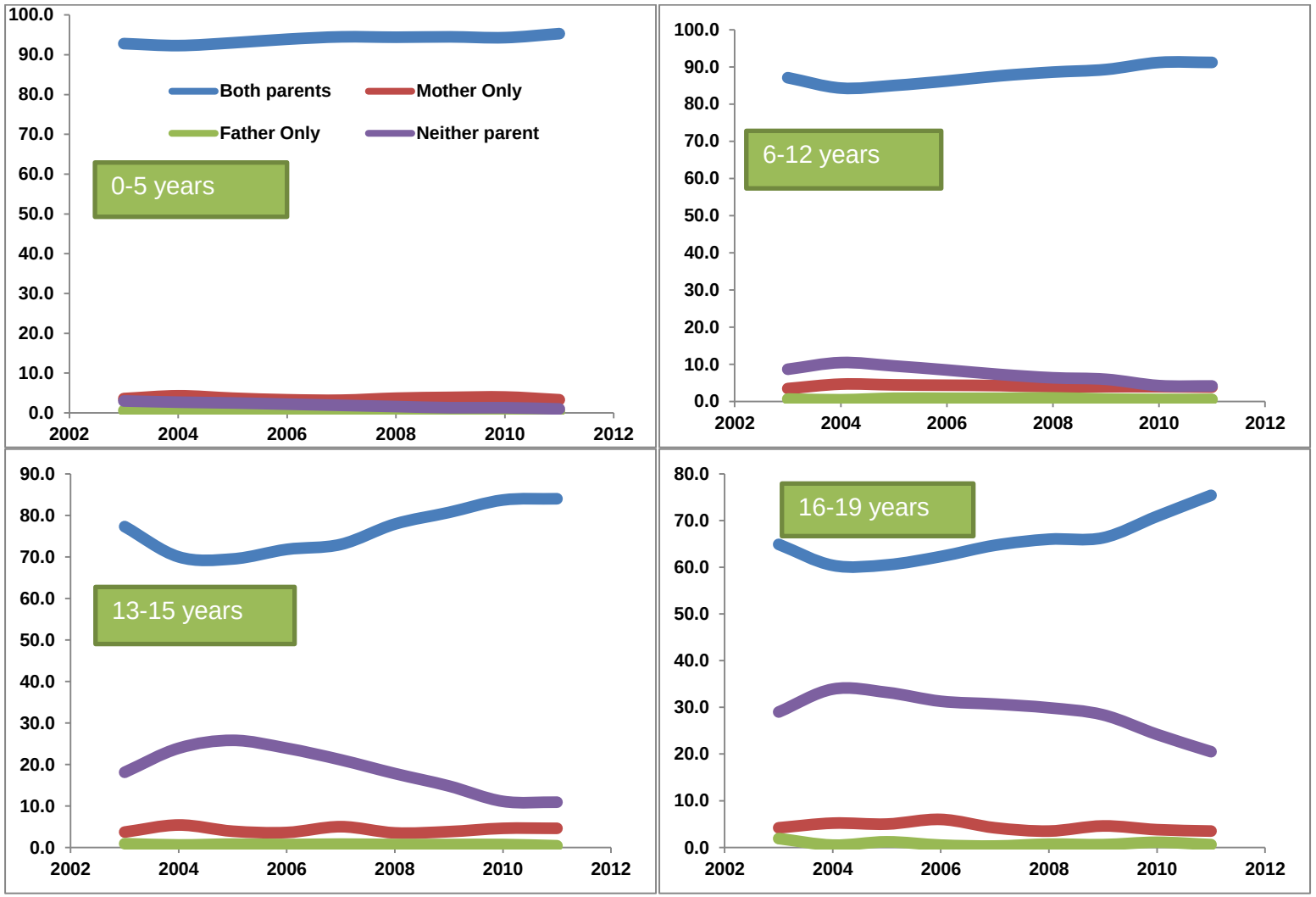
Panel D.1.: Nairobi (Kenya) – ALL



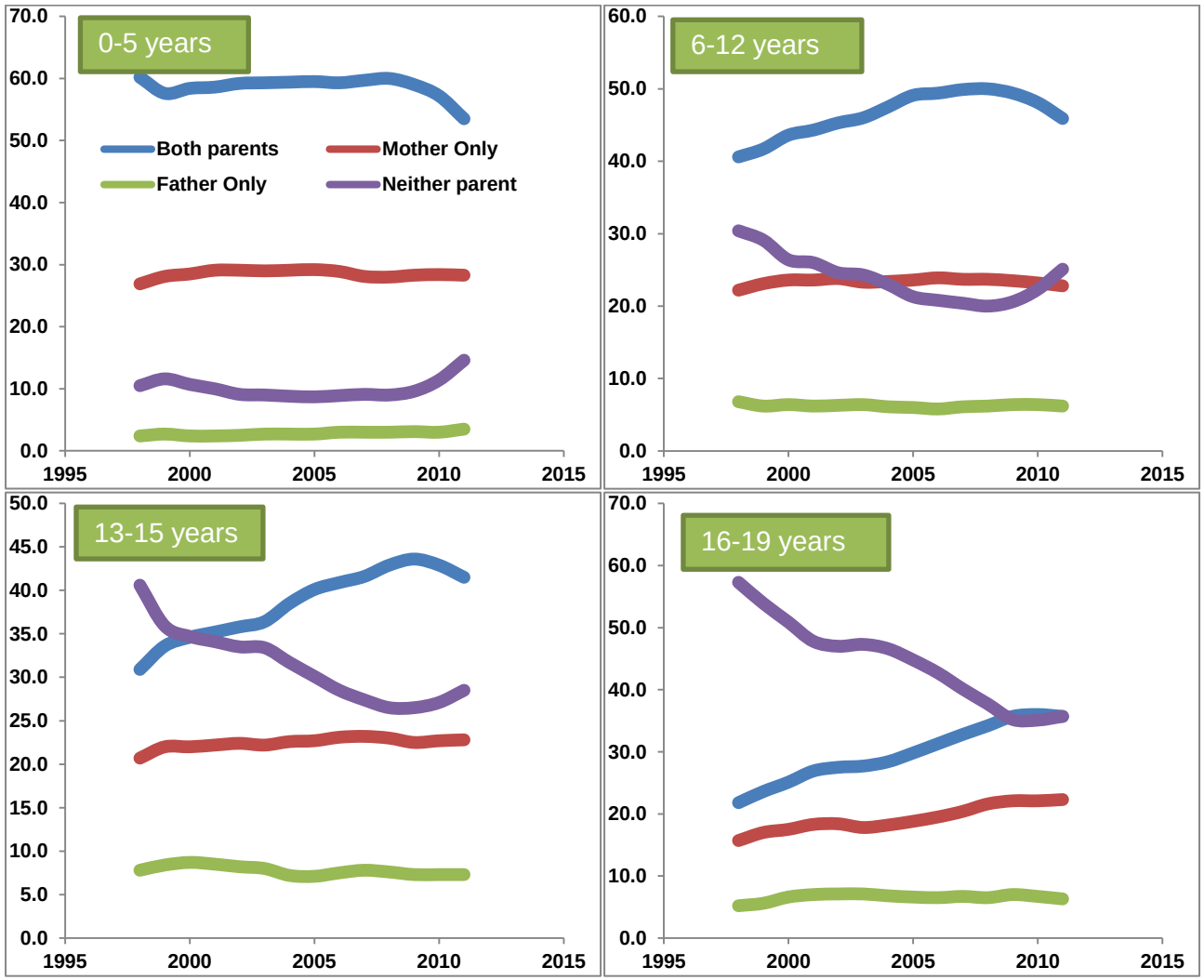
Panel D.2.: Nairobi (Kenya)- MALES



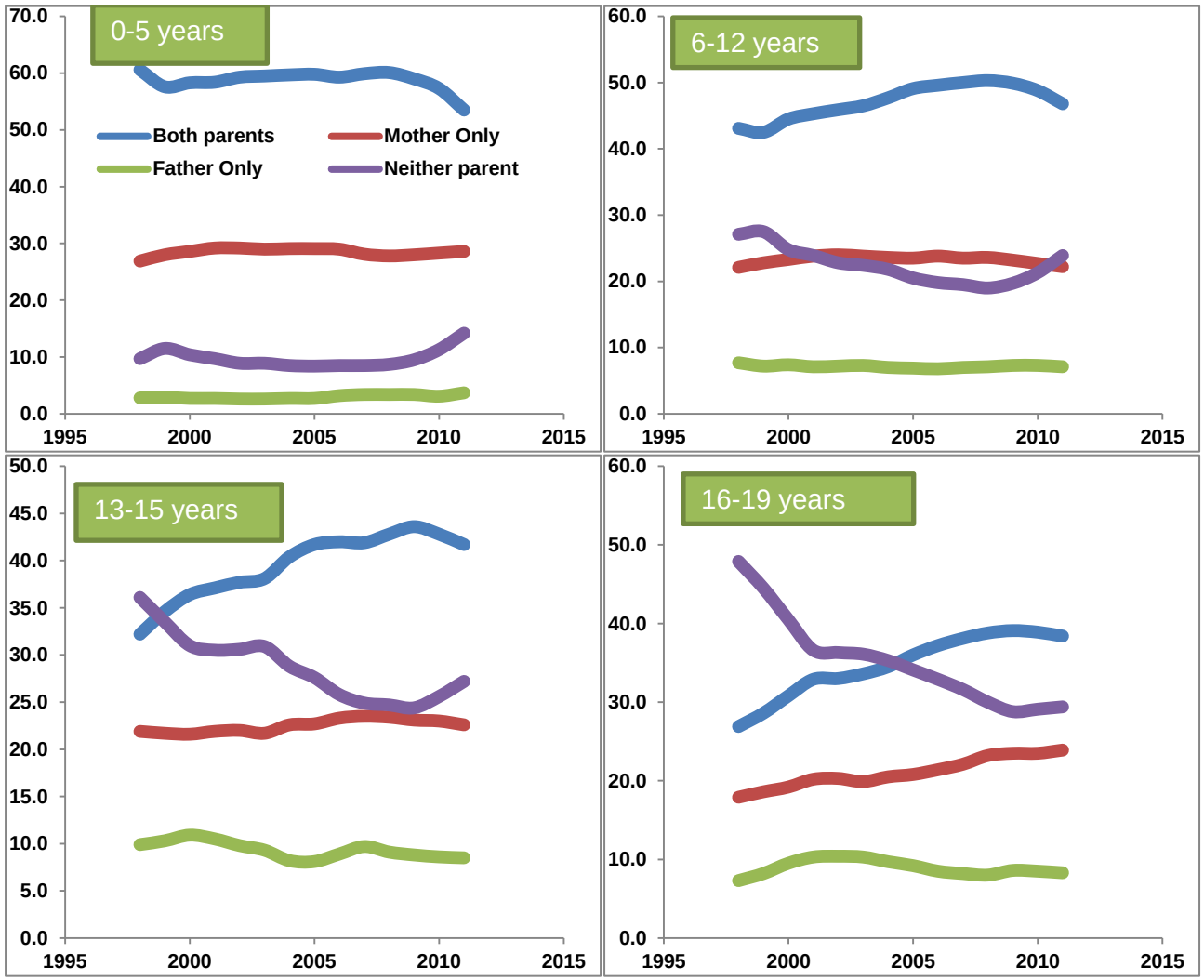
Panel D.3.: Nairobi (Kenya) - FEMALES



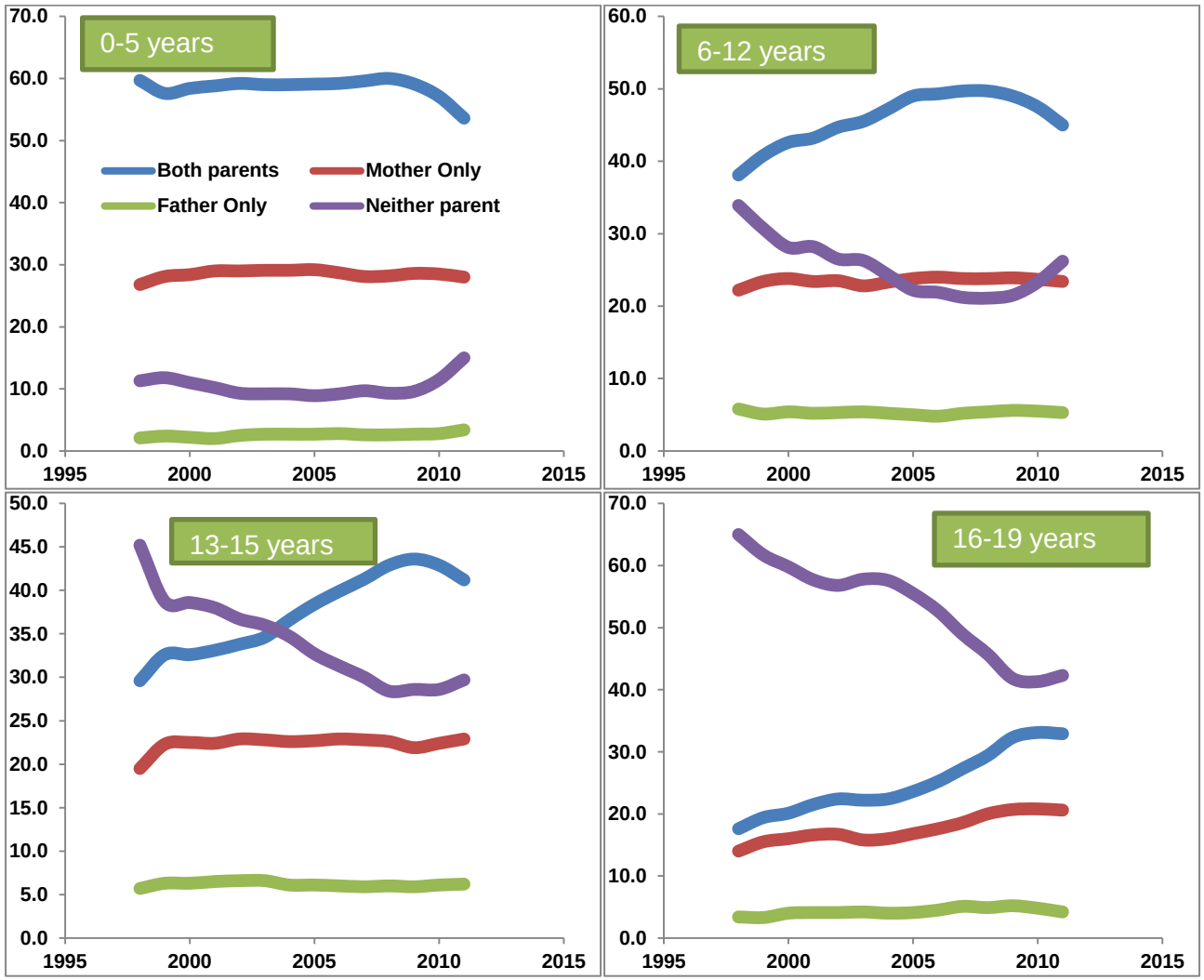
Panel E.1.: Rufiji (Tanzania) – ALL



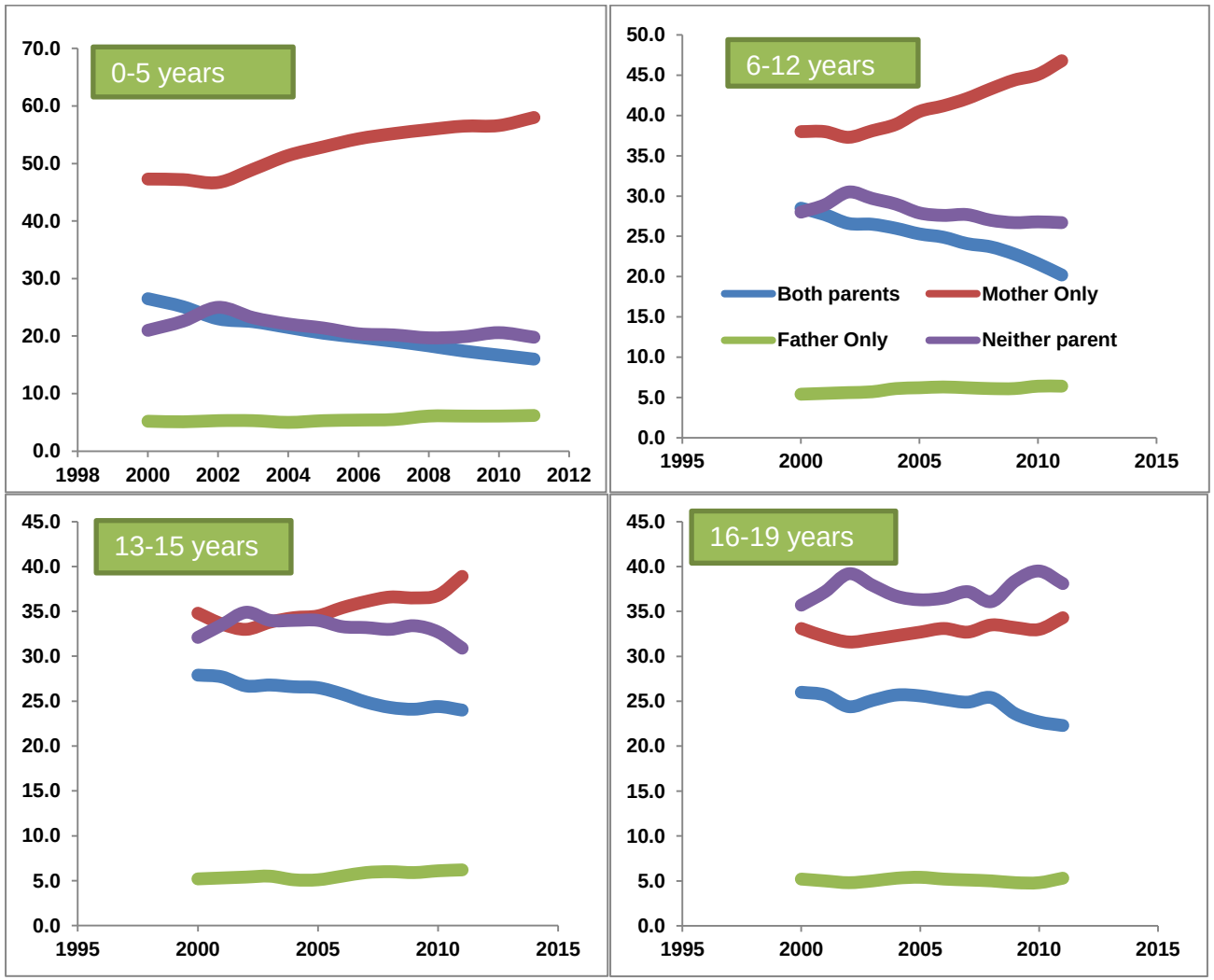
Panel E.2.: Rufiji (Tanzania) – MALES



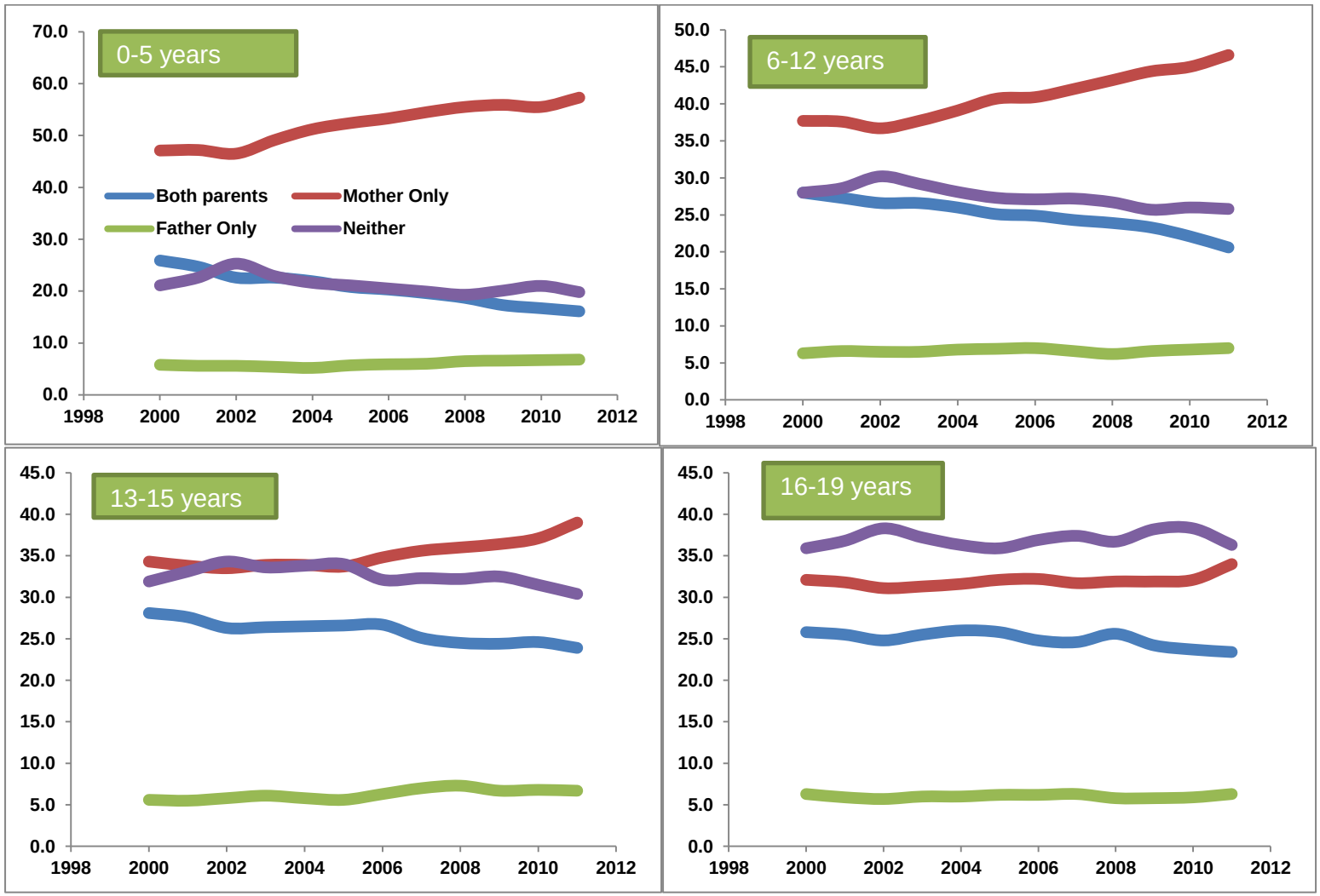
Panel E.3.: Rufiji (Tanzania) – FEMALES



Panel F.1.: Africa Centre (South Africa) – ALL



Panel F.2.: Africa Centre (South Africa) – MALES



Panel F.3.: Africa Centre (South Africa) – FEMALES

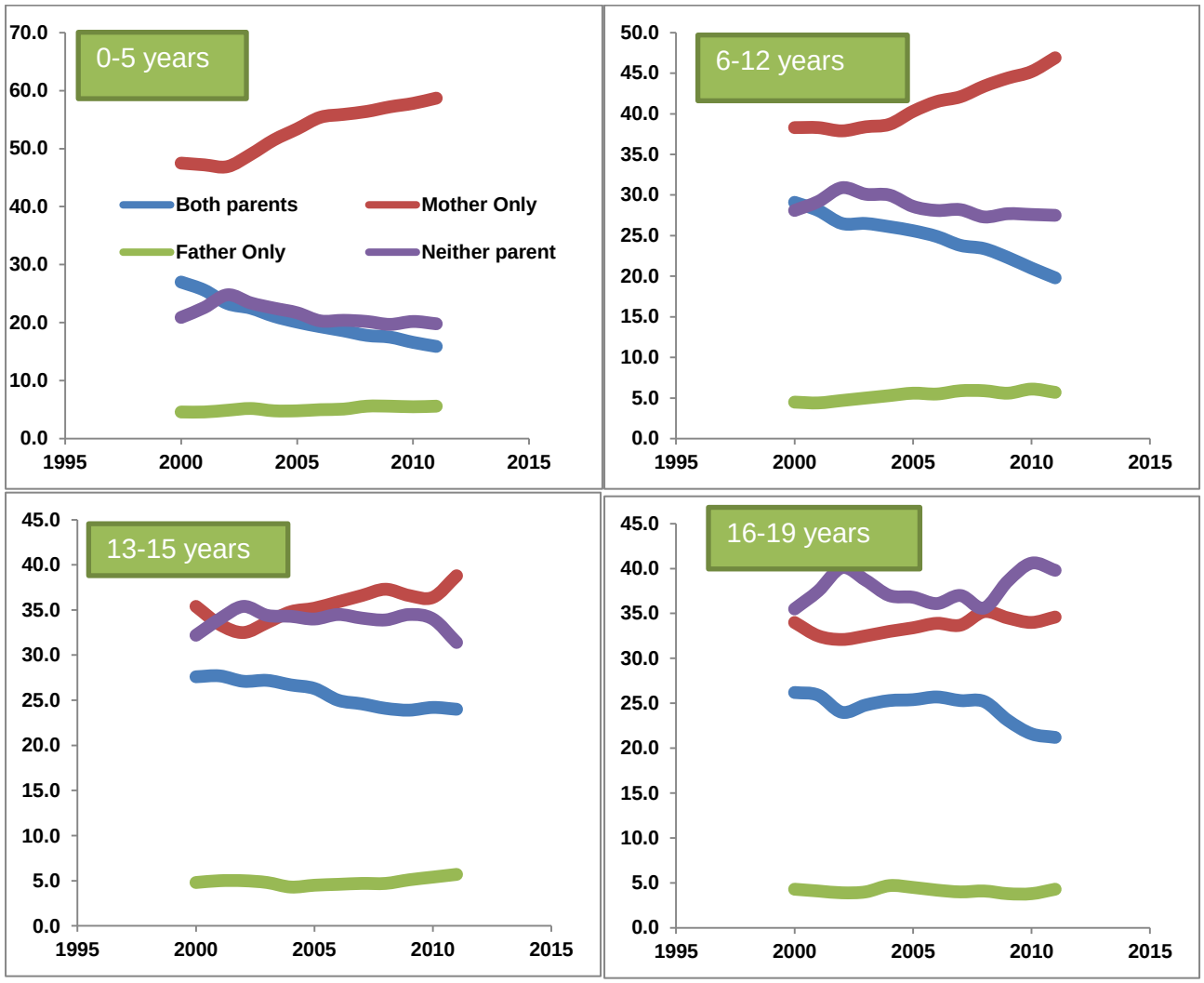


Table 1: Distribution of the observations per HDSS site and percentage of missing data

Name of site (Country)	Years covered	Number of children	Number of observations	Number of valid observations	% missing data
Africa Centre (South Africa)	2000-2012	85,914	1,621,947	1,103,413	34.0
Rufiji (Tanzania)	1983-2012	39,750	1,325,163	1,013,717	23.5
Nairobi (Kenya)	2003-2011	38,552	629,243	329,932	47.6
Nanoro (Burkina Faso)	2009-2011	33,137	108,192	89,047	17.7
Ouagadougou (Burkina Faso)	2009-2011	44,535	236,685	195,017	17.6
Niakhar (Senegal)	1983-2012	39,870	1,325,163	1,013,717	23.5

Source: HDSSs