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Life cycle measures of coresidence with relatives in Brazil, 1960-2010

Belo Horizonte, MG
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SUMMARY

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ABSTRACT

In the first stage of the life cycle, children depend on parents' care and financial support. As children grow older, they start new families, get married and have their own children. During adulthood, they can divorce/separate, become widowed or remarry. Finally, during old age, individuals may decide to live alone or reside with their adult children and other relatives until death. However, these phases are not fixed, and neither is the time spent in each one of them. In the last decades, there have been changes in both the duration and the age distribution of the different types of coresidence in Brazil, and we still have a lot to learn about this process. Therefore, the primary objective of this thesis is to look at the duration of coresidence of an average person in Brazil with different types of relatives over their life cycle. We are particularly interested in measuring how coresidence has changed between 1960 and 2010, a period of intense transformations in the country (demographic and non-demographic). Also, we examine in more detail the coresidence with own mother. We measure not only the extent to which the actual age-sex profiles of this type of coresidence have changed in the last fifty years, but disentangle the two main factors responsible for these changes: the availability of mothers and the propensity of children to reside with them. For this purpose, we draw data from 1960, 1970, 1980, 1991, 2000 and 2010 Brazilian population census, as well from 1993, 2003 and 2013 PNADs (a nationally representative Brazilian household survey). We calculate the mean duration of residence with own mother, father, spouse, children, other relatives and any relatives by using a method based on the works of Wolfbein (1949) and Sullivan (1971). The results showed that the duration of coresidence increased for all coresidence types, except coresidence with other relatives and between fathers and their children. Most of the increase in duration was due to changes in lifespan due to mortality gains over the life cycle. Except for children residing with mothers, the proportion of persons in all other forms of coresidence by age and sex has indeed reduced between 1960 and 2010, despite the increase in duration. In addition, our decompositions showed that the factor most responsible for the longer duration of the coresidence between children and their mothers was the higher propensity of coresidence during young adulthood, and not the higher availability of mothers because of survival gains. These findings confirm previous studies in showing that youngsters are postponing the transition to adulthood. Our study contributes to the literature by emphasizing the importance of disentangling demographic and non-demographic factors when studying changes in coresidence over time.

Key words: demography of family, coresidence with relatives, life cycle, demographic transition, Brazil

RESUMO

Na primeira fase do ciclo de vida, as pessoas dependem do cuidado e suporte financeiro de seus pais. À medida que envelhecem, elas iniciam novas famílias, se casam e têm filhos. Durante a fase adulta, elas podem se divorciar/separar, tornarem-se viúvas ou recasarem. Finalmente, durante a velhice, as pessoas podem decidir viverem sozinhas ou retornar a corresidir com seus filhos adultos ou outros parentes até a morte. Entretanto, essas fases e a duração de cada uma delas não é fixa. Nas últimas décadas, mudanças têm ocorrido tanto na duração quanto no perfil etário dos diferentes tipos de corresidência no Brasil e ainda temos muito o que aprender sobre esse processo. Assim, o objetivo principal dessa dissertação é investigar sobre a duração da corresidência de um indivíduo médio brasileiro com diferentes tipos de parente ao longo do seu ciclo de vida. Particularmente, interessa medir como a corresidência mudou entre 1960 e 2010, um período de intensas transformações (demográficas e não demográficas) para o país. Analisa-se, também, em maior detalhe, a corresidência dos indivíduos com suas mães, medindo como o perfil por sexo e idade desse tipo particular de corresidência tem mudado nos últimos 50 anos, decompondo estas mudanças em seus principais fatores explicativos: a disponibilidade de mães e a propensão dos filhos de residirem com elas. Para isso, utilizamos dados do, censos demográficos brasileiros de 1960, 1970, 1980, 1991, 2000 e 2010, assim como dados das Pesquisa Nacional por Amostra de Domicílios (PNAD) de 1993, 2003 e 2013. Calculamos a duração média da corresidência com a mãe, pai, cônjuge, filho, outros parentes e qualquer parente, utilizando um método baseado nos trabalhos de Wolfbein (1949) e Sullivan (1971). Os resultados mostram que o tempo de corresidência cresceu para todos os tipos de parentes, com exceção da corresidência dos filhos com o pai e e corresidência com outros parentes. A maior parte desse aumento foi devido a mudanças no tempo total de vida decorrente dos ganhos de mortalidade ao longo do ciclo de vida. Apesar deste aumento na duração da corresidência, a proporção de pessoas corresidindo com todos os tipos de parentes, exceto mães, reduziu-se entre 1960 e 2010. Por outro lado, os resultados da decomposição mostraram que o fator mais importante para o aumento da duração da corresidência entre filhos e mães foi a maior propensão de corresidir com a mãe durante a fase jovem-adulta, e não a maior disponibilidade de mães devido aos ganhos de sobrevivência. Esses resultados confirmam estudos prévios que discutem como jovens estão adiando a transição para a vida adulta. Esse estudo também contribui para essa discussão ao enfatizar a importância de analisar fatores demográficos e não demográficos, separadamente ao estudar as mudanças de corresidência ao longo do tempo.

Palavras-chave: demografia da família, corresidência com parentes, ciclo de vida, transição demográfica, Brasil

1. INTRODUCTION

In the last half-century, there have been important changes in household composition in Brazil and elsewhere. Both demographic and non-demographic factors have been responsible for these changes. On the one hand, fertility, mortality, and nuptiality affect the size and composition of the population and, therefore, the availability of relatives (number, types) for coresidence over the life cycle. On the other hand, coresidence with relatives depends on economic incentives, social and cultural norms and public policies. These non-demographic factors shape things such as the marriage and the job markets, the housing market, and the age at parenthood, with consequences for the propensity of persons to reside with relatives (DeVos & Palloni, 1989; Ruggles, 1986, Ruggles, 1994; Wajnman, 2012).

The role of the demographic factors, however, are not always taken into consideration, although they may be relevant. For example, higher life expectancy increases the number of surviving relatives available for coresidence, which may lead to an increase in coresidence. Lower mortality also improves the life expectancy of the individual in question, not only of their relatives. As persons live longer, they have more years of life available to reside with relatives. Even the increase in the number of divorces, which appears to be primarily connected to social and cultural changes, can be connected to the demographic dynamics: the number of marriages that end because of widowhood reduces when mortality declines, making divorce relatively more important, as Keyfitz (1987) points out. The extension of the life cycle because of survival gains affects the way people plan their lives and the way they perceive each stage of the life course (childhood, adulthood, retirement, older age), which will, in turn, affect their coresidence decisions.

Many studies have investigated specifically the trends and determinants of each stage of the life course. For example, there is great interest on the patterns of transition to adulthood (Vieira, 2008; Furstenberg, 2010; Settersten & Ray, 2010; Stone et al., 2011): the delaying of the age at which a person leaves parents' home can affect marriage and labor market patterns, with consequences for the

timing and duration of the stages of life that follow. In addition, there is much discussion on the growing number of elderly who live alone (Ruggles, 1994; Bongaarts, 2001; Ruggles & Heggeness, 2008; Willekens, 2009), as well as on the increase in divorce, remarriage and single-parenthood (Glick, 1984; Cherlin, 2004; Furstenberg 2010; Gerson & Torres, 2015). Most changes in the stages of the life course are associated with variations in the patterns of coresidence, with consequences for the mean duration of coresidence with different types of relatives.

Although there have been studies on the development of coresidence in Brazil, there is little literature on changes of coresidence patterns along the life course, and even fewer studies on how the demographic factors affect them. As Andersson and Philipov (2002) argue for high-income countries, it is important to have basic descriptions of the state of family dynamics and family demography that can aid further studies to look into the determinants of family demography behavior (p. 68). This argument should also apply to middle-income countries like Brazil. By employing unique demographic tools, it is possible to quantify the mean time spent residing with different types of relatives, how it has changed over the years, and the role of demographic factors for these news patterns. In other words, demographic studies can serve as a complement to the sociological and economic perspectives. Therefore, the main goal of this study is to contribute to the discussion on household and family formation and development by estimating life cycle measures of coresidence with relatives in Brazil, as well as to disentangle the possible roles of demographic (specifically survival gains) and non-demographic factors on the changes in coresidence from 1960 to 2010.

Our specific objectives are: 1) to estimate the average duration of coresidence in Brazil with different types of relatives (including mother, father, spouse, child, other relatives and any relative) over their life cycle between 1960 and 2010. 2) Investigate and compare the role of survival gains (increase in life expectancy) and changes in the proportion of persons residing with different types of relative for the mean duration of coresidence over the years. 3) Examine in more detail the time trends and determinants of children's coresidence with mothers, particularly the role of availability (survival) of mothers. We also look at whether the patterns of coresidence with mothers vary by income levels.

The next chapter will discuss the main literature related to changes in household structure and coresidence and it is divided in 4 subsections. In the first one, we discuss the determinants of household structure. The purpose of this section is to show how demographic and non-demographic factors interact to form different types of household and coresidence. The second section talks about how the demographic transition, including changes in fertility, mortality and nuptiality, has affected coresidence over time. In section three, we discuss how coresidence transitions over the life course have affected timing and duration of different types of coresidence. In the fourth section, we look at the Brazilian case and how household composition has changed in the last few decades to provide some context to this study.

Next, Chapter 3 will present the methodology including the reasons for using census and household data, and the details of the methods to calculate duration of coresidence, the effects of changes in life expectancy to this duration, and the effects of availability of mothers and the propensity to coreside with them on the mean duration of children's coresidence with mothers.

Chapters four, five and six present and discuss the results, starting with the changes in the age and sex-specific proportions of the population residing with each type of relative in Brazil, between 1960 and 2010. In Chapter 5, we show the results for duration of coresidence and the role of changes in life expectancy. Finally, in Chapter 6, we discuss the results that are specific for children's coresidence with mothers.

The summary of the findings, the implications of the results and future research are presented in Chapter 7.

2. LITERATURE REVIEW

In this chapter, we present the most important aspects of the international literature on household structure, coresidence and the life cycle. Also, we offer a contextualization of how household structure has changed over the last decades in Brazil.

2.1. The determinants of household structure

The demography of the household and family is concerned with the causes and consequences of the changes in size and composition of both these entities (Burch, 1979). A “household” can be defined as a residential unit with at least one individual, which may contain families or not. In the current work, we included only familial households, meaning a group of individuals who share a blood or conjugal relationship and live in the same household. As a result, a one-person household does not constitute a family in our study. Whereas family relations and support networks often extend beyond the household itself, the lack of data precludes us from examining extra-household families.

Several factors can affect household structure and how it evolves through time. The economic theory, strongly influenced by the work of Becker (1981), focuses mainly on the role of wages and the marriage market by gender (Blau & Klaauw, 2010; Scherger et al., 2015). According to Becker’s (1981) theory of marriage, increasing female education and labor market participation rates makes marriage less attractive for women, which may change traditional forms of household composition.

On the other hand, the sociological theories are more concerned with how ideational changes – including secularization, the growing importance of individual autonomy and gender equity (Scherger et al., 2015) – lead to changes in norm behaviors and household composition.

As argued by Scherger et al. (2015), sociology and economic theories are complementary, and cannot explain all the forces behind changes in household size and composition on their own. In an earlier work, DeVos & Palloni (1989) offer a framework of the determinants of household composition, which

incorporates cultural, socioeconomic and demographic factors. According to this framework, socioeconomic conditions, together with demographic factors, affect the rules of household formation and dissolution, which are, in turn, connected to the cultural and social norms that dictate what are the appropriate household structures and forms of coresidence. In addition, demographic factors and kinship rules affect the availability of kin for coresidence over the life cycle.

Using the ideas from DeVos & Palloni (1989) and Ruggles (1993, 1994), we can categorize the determinants of household structure into two groups: (i) the availability of kin and (ii) the propensity to coreside. The availability of kin is directly connected to demographic factors such as fertility, mortality and marriage, which define the number and types of relatives a person may have during the life course. The propensity to coreside, while indirectly affected by demographic factors, is mostly influenced by social norms and other institutions such as the labor market and the housing market. The mechanisms behind the propensity to coreside are complex and the social context of today is not the same as it was fifty years ago (Verdery, 2016; Connidis, 2009). Since kinship relations interact with other aspects of social life, including the economic context, migratory decisions, fertility control, health, and income distribution it is important to analyze how coresidence has changed with time.

2.2. The demographic transition and forms of coresidence

The demographic transition is characterized by the decline in mortality and fertility rates that result in lower population growth and rapidly population aging. The demographic transition affects not only population size and composition but also kinship relations and, therefore, the types of coresidence observed in a population.

For example, Ruggles (1986, 1993, 1994, 2015) discusses how demographic factors can have a great impact on observed household structure. The author shows that multigenerational households were not common in the U.S. until the 19th century, despite being the preferred household type by white Americans, because of limitations caused by high mortality levels and the cultural norm of late marriage. With time, the mortality, fertility and marriage transitions made the

multigenerational households more attainable. However, at the same time, urbanization, industrialization, and higher wages led to the fall of the traditional family economy model and the adoption of new behaviors and social norms, reducing the preference for multigenerational households while increasing the preference for nuclear households.

Several authors have discussed how family as an institution has changed in the last decades following the demographic transition (Berquó, 1989; Goldani, 1993; Cioffi, 1998; Furstenberg, 2010). The patriarchal model of family has become less prevalent, and new arrangement possibilities have arisen, such as single parent households, childbearing outside of marriage, same sex unions, cohabitation through informal unions and the acceptance and normalization of divorce (Cherlin, 1999; Jiang & O'Neil, 2007; Blau & Klaauw, 2010; Scherger et al., 2015). Authors such as Cioffi (1998) have argued that, while the traditional nuclear model of family is still predominant, there has been much greater diversification of family types, with alternative household compositions becoming more accepted.

The demographic transition affects each birth cohort differently and thus, implies in different forms of coresidence by cohort. For example, higher survival rates at older ages can increase the prevalence of both grandparents and multigenerational households, while the fall and postponement of fertility can reduce it by decreasing the number of grandchildren available (Herlofson & Hagestad, 2011). Another example is the increase in divorce rates. Lower mortality and the decline in the proportion of widows increases exposure to divorce (Keyfitz, 1987).

It is also important to look at different demographic mechanisms that may explain the availability of certain types of kin relations. For example, low fertility has replaced the role of high mortality as the main source of limitation for the number of siblings in adulthood and old age in more recent years (Murphy, 2011). In addition, changes to fertility and mean age of the mother at birth of the first child have affected both the number of generations that coexist and the number of years of coresidence (Connidis, 2009). Therefore, the number of living siblings a

person has in adulthood may be similar now to fifty years ago, but for very different reasons.

There is also the impact of recent demographic changes for the older generations as well. As discussed by Murphy (2011), a person born in 1940 will have fewer grandchildren because of changes in fertility that only happened decades later, showing the importance of looking at the demographic dynamic to connect the past and the present. Moreover, the demographic dynamics of the present can have long-lasting impacts. For example, a cohort with many siblings will increase kin availability for the next few generations, because more siblings potentially mean more uncles, cousins and grandchildren (Verdery, 2015).

Marteleto (2010) and Lam & Marteleto (2006), based on the works of Preston (1976), show what the different phases of the demographic transition mean for the size of cohorts and the size of families in Brazil. Initially, the decline of child mortality resulted in an increase in the number of surviving children with positive effects for the size of the cohorts and population growth. In the second phase, fertility decline lead to a reduction in the size of the families, because of the reduction of the mean number of children per woman. However, the size of the cohorts kept growing because of the increasing number of women in childbearing ages. In the third phase, when the proportion of women in childbearing ages finally diminished, fertility decline reduced the size of new birth cohorts. The authors show that children born during the first phase will have to compete for resources not only amongst their siblings, but also with other members of their cohorts, affecting their trajectories over the life course. This process will probably also affect descendants and future generations, since changes in the mean size of the families alter the distribution of resources and investment per child, affecting future wealth (Guerra et al., 2016).

There are also indirect effects of changes in demographic and other socioeconomic variables on coresidence. As discussed by Connidis (2009, p.5), widowhood may lead to changes in family ties and more time spent with other family members; retirement may alter marital relationships; and health changes can shift helping patterns and dependency. Therefore, it is important to keep in

mind the complexity of familial relationships when examining the determinants of changes in household composition and coresidence.

2.3. Coresidence transitions throughout the life cycle

The typical life course follows the usual milestones of birth, childhood, adulthood, birth of own children, children's departure of the household, death of the spouse and finally death of the individual. However, the number of phases, and the sequence and the timing of entering and leaving each phase can vary (Krishnamoorthy, 1979). The demographic transition, as aforementioned, affects life course phases, changing the types of coresidence a person will experience throughout her life.

When thinking of coresidence during infancy, childhood and teenage years, a decline in mortality should lead to a higher availability of kin for coresidence (Ruggles & Heggeness, 2008). With the rise in survival, a growth in the proportion of children and teenagers living with their parents would be expected. However, changes such as the rise in unmarried childbearing and divorce could also mean a reduction in coresidence, with fathers especially. Carlson et al. (2013) used data for the U.S. to analyze non-marital fatherhood, concluding that economic factors and education were key predictors of non-marital fatherhood and showing that different preferences can affect coresidence for families of different socioeconomic backgrounds.

Changes in the prevalence of multigenerational households can also affect the types of coresidence during childhood. As seems to be the case in Brazil, the decline in mortality and fertility resulted in the "verticalization" of the family, increasing the prevalence of multigenerational families (Jesus & Wajnman, 2008), including the coresidence of grandparents and grandchildren. Marcondes (2016) shows an increase of multigenerational households in Brazil, especially those made up of grandparents living with their grandchildren without the presence of the parents.

In addition, some events that used to happen earlier in the life cycle can now occur later in life due to the extension of the mean life span, such as the death of a grandparent, which could also influence coresidence (Murphy, 2011).

According to Murphy (2011) an increase in life expectancy would increase the diversity of family structures, including higher prevalence of unconventional kinships such as stepparents and stepchildren, half-siblings and ex-spouses.

In this context, one important transition in someone's life is the passage from young adult to full adulthood. Many studies discuss how the transition to adulthood – usually seen as either finishing school, getting a job, leaving home, getting married or having children – is being delayed in the recent years (Jesus & Wajnman, 2008; Vieira, 2008; Furstenberg, 2010; Stone et al., 2011; Gerson & Torres, 2015). In the 19th century, because most families depended on agricultural work, the youngsters would need to wait until they inherit a land before they were economically independent and able to marry. In the 20th century, however, industrialization and changes to economic conditions allowed young adults to secure a job earlier in life, accelerating the transition into full adulthood (Settersten & Ray, 2010). These days, the process has been postponed again due the higher demand for education, affecting the age at job market entry and marriage (Furstenberg, 2010; Settersten & Ray, 2010).

There is a consensus that transition to adulthood is being delayed mostly because of the postponing of the age at first marriage, the uncertainty regarding the job market and the increase in women's labor force participation (Aquilino, 1990; Glick, 1988; Furstenberg, 2010; Kahn et al., 2013). Guerra (2017) also argues that the demographic transition has changed the social, economic and cultural contexts imposing new obstacles to the independence of young adults. This process of delaying adulthood entry varies among socioeconomic groups in Brazil (Camarano, 2006; Oliveira et al. 2006; Vieira, 2008) and in the U.S. (Fustenberg, 2010).

The delay in the adoption of adult roles may affect the duration of coresidence with parents, with future spouse and children, and possibly grandchildren. Cultural changes surrounding marriage and divorce are also important in that regard, as the increase of acceptable alternatives to formal marriage have changed the ways people plan their future (Goldstein & Kenney, 2001; Gerson & Torres, 2015; Guerra, 2017). Cherlin (2004), for example, discusses how marriage has become deinstitutionalized in the U.S. in the last decades due to a

weakening of the social norms that define it. Although he argues that formal marriage is still desired by most people as the “most prestigious” form of union, it is now seen as a choice, and its alternatives, such as cohabitation, are more accepted.

Gerson & Torres (2015) argue that social changes such as the increasing economic autonomy of women helped them to divorce, as well as form less stable relationships such as cohabitation, and even having children outside of marriage. In the US, as the marriage age has risen, fewer young adults who have become pregnant decided to marry, as they didn’t see the benefits of it (Furstenberg, 2010).

In addition to the higher chance of getting a divorce, higher life expectancy has allowed an increase in the number of unions a person can have over life, affecting the time spent in coresidence with a spouse. In the US, since 1980, divorce rates have been increasing rapidly, but most of the divorces eventually become remarriages, although this trend has been losing momentum (Glick, 1984).

After marriage and the departure of children from the household, the next stage in the life cycle is the old age. Declining mortality and fertility means a growing share of the population at older ages, which increases the importance of understanding the coresidence patterns during this stage. Several studies point to a growing number of elderly living alone (Mindelt, 1979; Ruggles, 1994; Bongaarts, 2001; Ruggles & Heggeness, 2008; Willekens, 2009). This is usually linked to historical improvements in health status and income levels which allowed more independence and autonomy at older ages (Connidis, 2009; Kahn et al., 2013; Marcondes, 2016). Maybe the increasing number of elderly living alone just reflects individual preferences that only recently became social acceptable and economically viable (Keyfitz, 1987; Ruggles, 1994; Ruggles & Heggeness, 2008).

Gender differences in coresidence at older ages is also an important topic of analysis. Mindelt (1979) shows that in the U.S., in the late 70s, more than twice as many elderly men were married than elderly women. Men are more likely to remarry after a divorce or the death of the spouse, whereas widows usually live

alone and may stay without any support after the spouse's death of the spouse (Moreira, 1998).

There are also studies that have examined the importance of older people in providing support to their adult children, through income transfers or by helping to take care of grandchildren (Murphy & Grundy, 2003; Villegas et al., 2014; Maia & Sakamoto, 2016; Marcondes, 2016; Guerra, 2017). In a context of higher female labor force participation rates, the possibility of the elderly to transfer time can increase the frequency of coresidence of adult children and their parents (Ruggles and Heggeness; 2008, p.271-272) . Amorim et al. (2017) show that the likelihood that a child will live with their grandparents has increased over time in the U.S., especially for multigenerational households (those that include the child's parents). The probability is greater during the child's first year of life, which reinforces the hypothesis of grandparents helping their adult children who are young parents.

On the other hand, the elderly may want to live together with their adult children because of health issues. However, Kahn et al. (2013) show that in the US, multigenerational households benefit the younger generation more than their elderly parents, which may reflect improvements in health and financial status at older age due to the consolidation of social security and private pensions in the country.

2.4. The changes in Brazilian household composition

Globally, household diversity has been growing, but there are some common patterns everywhere. First, fertility decline resulted in a reduction of the mean household size. Population aging, combined with the preference of the elderly to live alone, helped to reduce household size. Married couples without children, one-person households and single-parent households are also becoming more common. Finally, there is an increase in the prevalence of consensual unions and divorces in many countries (Bengston, 2001; Willekens, 2009).

In the case of Brazil, the number of households grew from 13.5 million to 44.8 million between 1960 and 2000. At the same time, the total population went from 70 million to 170 million, showing that the number of households grew faster than

the total population. Both the decline in fertility and the increase in the prevalence of smaller households led to the reduction of the mean household size (Alves 2004). Berquó (1989) emphasizes the role of fertility decline and the rise in divorce and consensual unions for changes in household composition in Brazil. According to the author, celibacy, divorce and widowhood are the major contributors to the rise in the number of one-person households. Among the elderly, despite the large number of relatives available for coresidence, which is a consequence of mortality declines in the past (Guerra et al., 2016), there is an increasing number of older people living alone which is mostly related to changes in the preference to live alone (Wajnman 2012).

Before 1970, consensual unions were not very common in Brazil (Esteve et al., 2012). Since then, however, cohabitation has been growing and has become an acceptable form of union among all socioeconomic grups, gaining the same legal recognition as formal marriages in most regards (Couvre-Sussai, et al. 2015; Vieira & Alves, 2016). It was also in the 1970s that the legalization of divorce occurred, making this an important decade in the history of Brazil with respect to marriage and coresidence.

Over the decades, there has been a rise in the prevalence of one-person households, single parent households and of couples with children (Nascimento, 2006). On the hand, in opposition to the most developed countries, there has also been a noticeable growth in the proportion of extended family households (Medeiros & Osorio, 2001; Wajnman, 2012; Marcondes, 2016), making Brazil an interesting case study for the relation between types of coresidence and generations.

3. DATA AND METHODS

In this chapter, we discuss the data and methods used to examine the changes in the mean duration of coresidence with relatives over the life cycle of an average person in Brazil.

3.1. Data

To estimate the coresidence of an average person with different types of relatives, we draw data by age and sex from the Brazilian Population Censuses of 1960, 1970, 1980, 1991, 2000 and 2010[1]. To study the coresidence between children and their mothers, we combine census data with data from the *Pesquisa Nacional por Amostra de Domicílios* (PNAD), a nationally representative household sample survey, for the years 1993, 2003, and 2013. We use PNAD data because the survey asks the household members about the survival status of their mother; a piece of information that we will use to calculate the availability of mothers for coresidence.

For a preliminary analysis of household composition in Brazil, we use the following categories: one-person household; married/cohabiting couple without children; married/cohabiting couple with children; single-parent household (when the only members are the parent and child/children); extended household, which includes relatives other than the nuclear family (spouse and children); composite household which includes non-relatives as well as relatives; and non-family household, which is composed by more than one person and doesn't include relatives.

Next, to examine coresidence we use six categories: I) coresidence with mother; II) coresidence with father; III) coresidence with spouse; IV) coresidence with any child; V) coresidence with other relatives; VI) coresidence with any relative. We define both the biological and stepparents as parents (mother and fathers). The definition of spouses include spouses from both formal marriages and consensual unions, since in Brazil consensual unions receive similar legal

[1] The census is gathered by the *Instituto Brasileiro de Geografia e Estatística* (IBGE) and the version utilized here was harmonized and made available by the Integrated Public Use Microdata Series International (IPUMS), of the Minnesota Population Center.

recognition than formal marriages, and are socially accepted among all socioeconomic groups (Lopez-Gay et al., 2014; Couvre-Sussai, 2016). The term "children" refers to both biological and stepchildren, and we calculate coresidence with own children as a binary variable, independent of the number of children in the household. The category of "other relatives" includes all relatives other than mother, father, spouse or child. The list includes grandparents, grandchildren, siblings, parents-in-law, children-in-law, uncles, aunts, cousins, among other types. Finally, coresidence with any relative summarizes all other categories and it is also a binary definition, as it counts coresidence with at least one relative, regardless of the number of relatives.

We chose these categories because they represent the most important types of coresidence along the different phases of the life cycle. The Brazilian census only provides the relationships of household members to the household head (with varying degree of specificity depending on the census year). The IPUMS data adds to the original information by creating pointer variables that identify the mother, father and spouse of each household member. From these, it is possible to identify the rest of the kinship relations for all household members, independently of their relationship to the household head. We followed the work of Wajnman (2012) to define a matrix of kinship relations within the household as described in Figure 1. Confirmed relationships, reported in the census, are in dark letters. The lighter color tone indicates that the relationship was presumed by logic – for example, the head's brother is also the uncle to the head's children. The ones marked with an interrogation sign are presumed relationships that must be tested by some criteria, usually age – for example, if someone is the head's grandchild, they are also considered the head's spouse's grandchild if there's at least a 30-year difference between them, considering that childbearing starts at age 15 (Wajnman, 2012, p. 69-72)[2].

[2] The matrix was initially generated for all kinship relations mentioned in figure 1 and later reconfigured between mothers, fathers, children, spouses and "others".

FIGURE 1 - Example of a matrix of kinship relations between household members

Relationship between members	Head	Spouse	Child	Grandchild	Father	Sibling	Another relative	Non-relative
Head	-	Spouse	Child	Grandchild	Father	Sibling	Another Relative	Non-Relative
Spouse	Spouse	-	Child, Step-child	Grandchild?	Father-in-law	Another Relative	Another Relative?	Non-Relative
Child	Parent	Parent	-	Child, Nephew/Niece?	Grandparent?	Uncle/Aunt	Another Relative?	Non-Relative
Grandchild	Grandparent	Grandparent?	Parent, Uncle/Aunt?	-	Another Relative?	Another Relative?	Another Relative?	Non-Relative
Father	Child	Another Relative	Grandchild?	Another Relative?	-	Child, Another Relative?	Another Relative?	Non-Relative
Sibling	Sibling	Another Relative	Nephew/Niece?	Another Relative?	Father, Another Relative?	-	Another Relative?	Non-Relative
Another relative	Another Relative	Another Relative?	Another Relative?	Another Relative?	Another Relative?	Another Relative?	-	Non-Relative
Non-relative	Non-Relative	Non-Relative	Non-Relative	Non-Relative	Non-Relative	Non-Relative	Non-Relative	Non-Relative?

Source: Adapted from Wajnman (2012)

Brazil is a heterogeneous country and socioeconomic differences may define the duration of coresidence with different types of relatives. Whereas the focus of this dissertation is not to study the extent to which income distribution has changed over the years and affected coresidence in Brazil, we disentangle our estimates by income quintile specifically for coresidence with mothers. By doing this we hope to contribute to discussion of the association between coresidence and income levels.

3.2. Methods

A. Calculating the life expectancy of coresidence

The life expectancy of coresidence can be described as the mean duration of coresidence with relatives over the life cycle of an average person. To calculate it, we combined period prevalence rates of coresidence with Brazilian life tables by sex. We follow the steps of other authors – Wolfbein (1949) and Sullivan (1971) – who have applied the same methodological approach to estimate active and healthy life expectancy[3], respectively. The greatest strength of this method is that it requires data only for a single point in time and a period life table. But because it uses period proportions, it is not possible to estimate transition rates

[3] We considered other methods, including the variable-r method, but they have additional weaknesses that preclude us from using them.

between coresidence states and, therefore, one must assume that the prevalence rates by age in a population are similar to the rates in the life cycle[4].

We combine prevalence rates of coresidence estimates from the census data with Brazilian life tables estimated by the Population Division of the United Nations (UN). These tables are based on census data with corrections for underreporting[5]. Originally, the tables are available for five-year periods, from 1950-55 to 2010-15. We use linear interpolation to estimate life tables that corresponded to the census years.

Life expectancy of the coresidence type *i* can be estimated by dividing the person-years lived in the coresidence type *i* above age x by the number of survivors to age x:

$$LEIC^i = \frac{\sum {}_nC_x^i \cdot {}_nL_x}{l_x} \qquad (1)$$

where l_x is the number of survivors at exact age x, ${}_nC_x^i$ is the proportion of persons in the coresidence type *i* between ages x and x+n and ${}_nL_x$ is number of person-years lived between ages x and x+n. Therefore, ${}_nC_x^i . {}_nL_x$ is the number of person-years lived in the coresidence type *i* between ages x and x+n, and Equation 1 can be rewritten as:

$$LEIC^i = \frac{\sum {}_nT_x^i}{l_x} \qquad (2)$$

where $T_x^i = \sum {}_nC_x^i \, . \, {}_nL_x$

We can also estimate life expectancy lived outside of coresidence type *i* by dividing the person-years lived outside of the coresidence type *i* above age x by the number of survivors at age x:

[4] To test for the assumption that period and life cycle measures of coresidence were the same, we estimate pseudo-cohorts from census data and we did not found any relevant variations between period and cohort rates. The graphs with the results for the cohorts are presented in the annex.

[5] More detailed information on the data treatment is available in: United Nations, Department of Economic and Social Affairs, Population Division (2015), World Population Prospects: The 2015 Revision, DVD Edition. https://esa.un.org/unpd/wpp/Download/Other/Documentation/.

$$LEOC^i = \frac{\sum(1-{}_nC_x^i)\,{}_nL_x}{l_x} \quad (3)$$

We calculate life expectancy for each type of coresidence, which is equivalent to the mean duration of coresidence over the life cycle by age and sex, for the years 1960, 1970, 1980, 1991, 2000 and 2010.

B. The standardized life expectancy of coresidence

Life expectancy of coresidence is affected by: I) changes in the proportion of persons in coresidence and II) changes in survival rates. Therefore, even when there are no changes in the proportion of persons in coresidence, the average duration of coresidence can still vary because of mortality gains. Here, we try to disentangle the role of each effect by applying a standardization procedure. We use 1960 proportion of persons in coresidence as standard in 2010 to estimate a counterfactual measure of what would have happened if this proportion had not changed over the five decades:

$$\frac{\sum({}^{1960}_{n}C_x^i * {}^{2010}_{n}L_x)}{l_y} \quad (4)$$

Where ${}^{1960}_{n}C_x^i$is the proportion of persons in the coresidence type *i* between ages x and x+n in 1960, ${}^{2010}_{n}L_x$ are the person-years lived between ages x and x+n in 2010 and l_y is the radix of the life table.

By disentangling demographic and non-demographic factors, we can identify the exact role of the changes in the proportion of persons in coresidence.

C. The effects of availability for coresidence and propensity to coreside

As discussed in the literature review, Ruggles (1986, 1993, 1994) shows how the drivers of coresidence can be separated between the availability of relatives for coresidence, meaning, if they are alive or not, and the propensity a person has to coreside with this relative, related to such things as cultural norms or the current situation of the marriage or job market. Authors such as Wajnman (2012) have successfully utilized Ruggles methodologies to calculate the propensity and availability for different types of coresidence.

To calculate the availability for coresidence with a relative is necessary to know if this relative is alive. From the PNADs we can have the availability of mothers. The PNADs also provide us with the proportion of persons in coresidence.

Considering that the observed proportion of persons in coresidence is the result of the interaction between the availability and the propensity, the propensity can be calculated by dividing this proportion by the availability:

$$ {}_n\rho_x = \frac{{}_nC_x}{{}_n\alpha_x} \qquad (5) $$

Where ${}_nC_x$ is the proportion of persons in coresidence between ages x and x+n, ${}_n\rho_x$ is the propensity to coreside between ages x and x+n, and ${}_n\alpha_x$ is the availability of a relative, meaning, the proportion of persons with a live relative between ages x and x+n.

Having these three components, a decomposition between availability and propensity can be done by estimating what would be the observed coresidence proportions if the propensity (ρ) had stayed the same between two periods and only the availability (α) had varied. By comparing the estimated measures of coresidence with the observed ones, it is possible to say how much of the variation between the coresidence proportions in the two periods was due to the propensity or the availability changes:

Part of the variation explained by availability (here called $\Delta\ {}_n\alpha_x$):

$$ \Delta\ {}_n\alpha_x = \frac{\left({}_n\alpha_x^{year\ B} \cdot {}_n\rho_x^{year\ A}\right) - {}_nC_x^{year\ A}}{{}_nC_x^{year\ A}} \qquad (6) $$

Part of the variation explained by propensity (here called $\Delta\ {}_n\rho_x$):

$$ \Delta\ {}_n\rho_x = \frac{{}_nC_x^{year\ B} - \left({}_n\alpha_x^{year\ B} \cdot {}_n\rho_x^{year\ A}\right)}{{}_nC_x^{year\ A}} \qquad (7) $$

Analyzing the effects of propensity and availability at different stages of the life course allows us to better understand if the observed changes to coresidence have been mostly caused by demographic or non-demographic factors.

D. Socioeconomic status (SES) differences

As briefly mentioned before, we estimate measures of coresidence by quintiles of household income per capita for the coresidence with mothers. The household income was calculated separately for each family in the household. The household income of the “main family” (the one related to the household head) excludes the income of non-relatives. The non-relatives can have their own relatives living in the household. Those would form a secondary family, and their income would count for that family’s household income.

One methodological issue to estimate duration of coresidence by income quintile is the inexistence of life tables by socioeconomic status in Brazil. One alternative is to calculate infant mortality rates by the mother’s household income quintile and find a life table that matches each estimated infant mortality level.

We apply Brass and Coale’s method (Brass & Coale, 1968) to estimate infant mortality rates, based on the information of the number of surviving children and children ever born by age of mother. We then look for life tables from Coale and Demeny’s West Life Table Models whose probability of surviving to age 10 best matches the probabilities by income quintiles calculated with the Brass and Coale’s method. We estimate life tables for the years 1980 and 2010 since these were the census years that information on children ever born and surviving children were collected according to the sex of the child.

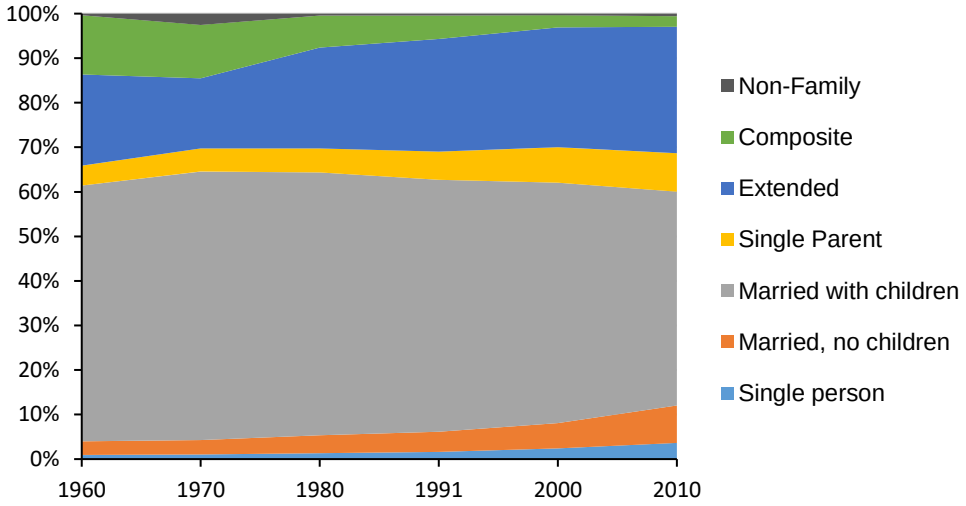
Our estimates have many limitations. First, Brass and Coale’s method can be biased due to the misreporting of children ever born or surviving children. Second, since the method uses period measures of mortality and fertility to adjust the proportions of surviving children, the accuracy of the mortality estimates can be affected by the demographic transition. Third, model life tables may not represent the actual mortality function of the population in question. In addition, we selected mortality life tables by matching of infant/child mortality rates, which may not represent the mortality experience of all ages. One way to buffer some of these limitations is to examine only the relative differences in the duration of coresidence by quintiles of household income instead of absolute numbers.

4. HOUSEHOLD COMPOSITION AND CORESIDENCE IN BRAZIL BETWEEN 1960 AND 2010

Between 1960 and 2010, Brazil went through significant socioeconomic and demographic changes. The population grew from less than 60 million to more than 190 million showing also a great change in age structure. As discussed by Alves (2004), the number of households grew faster than the population, leading to a reduction of household mean size: from around 6.5 in 1960 to 4.1 in 2010 (IBGE).

Most of households are still formed by nuclear families with the increasing reduction of composite households. However, as Wajnman (2012) points out, there has been an increase in the proportion of extended households, as shown in Figure 2:

FIGURE 2 - Proportion of the population by household type, Brazil, 1960-2010

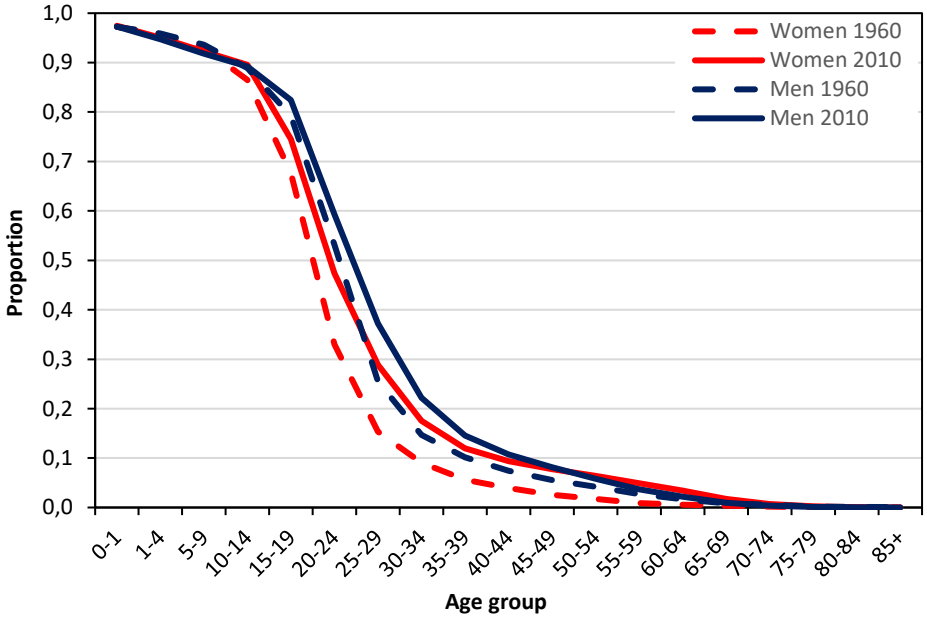


Source: IPUMS; IBGE, Demographic Census, 1960 to 2010.

Changes in household composition affect the distribution of the different types of coresidence. According to Figure 3, the proportion of persons residing with mother increased between 1960 and 2010[6]:

[6] Here, we present only the results for 1960 and 2010 to allow a better visualization of the age profiles. A full set of results can be found in the annex.

FIGURE 3 - Proportion of persons residing with own mother, by age and sex, Brazil, 1960 and 2010

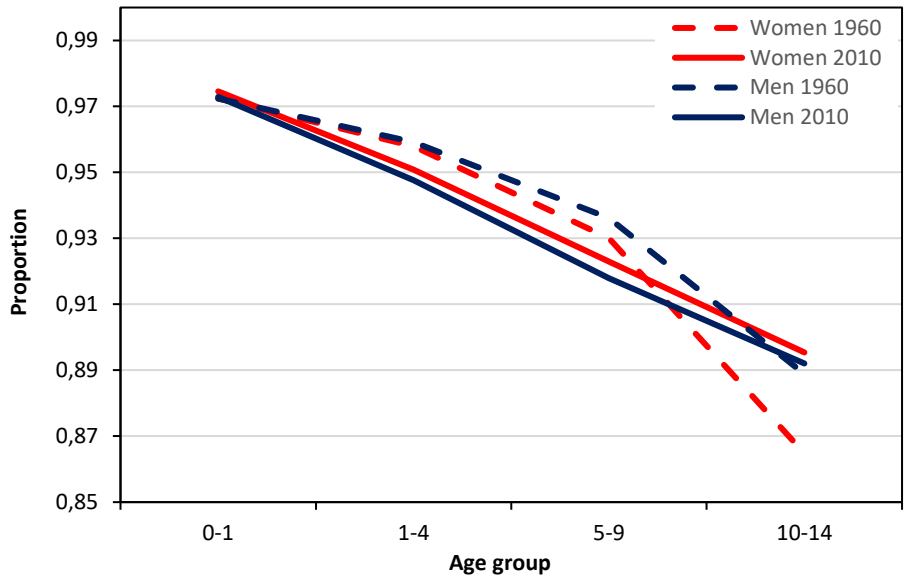


Source: IPUMS; IBGE, Demographic Census, 1960 and 2010.

There are notable differences between men and women. A higher percentage of men reside with their mothers, which suggest they leave their parents' houses at older ages than women. These results are in line with the literature on the transition to adulthood that argues that women make earlier household transitions because of marriage (Cohen et al., 2003; Costa-Ribeiro, 2014; Allendorf et al, 2017). Another possible explanation is that men are more likely than women to return to their parents' houses after having left it, a hypothesis we cannot test with the available data. However, the variation in the age profiles between 1960 and 2010 was larger for women than for men, as it will be further discussed in chapter 6. This result may be related to the increase in multigenerational families composed of single mothers, children and grandmothers (Wajnman, 2012; Jesus 2015).

Another important finding is the decline in the proportion of children at ages below 15 residing with mothers (Figure 4), which may be related to the increase in the prevalence of "skipped generation households" (children living with grandmothers without the presence of parents) in Brazil and other countries (Jesus, 2015; Pew Research Center, 2010 and Bryson & Casper, 1999, apud Wajnman, 2012, p.77).

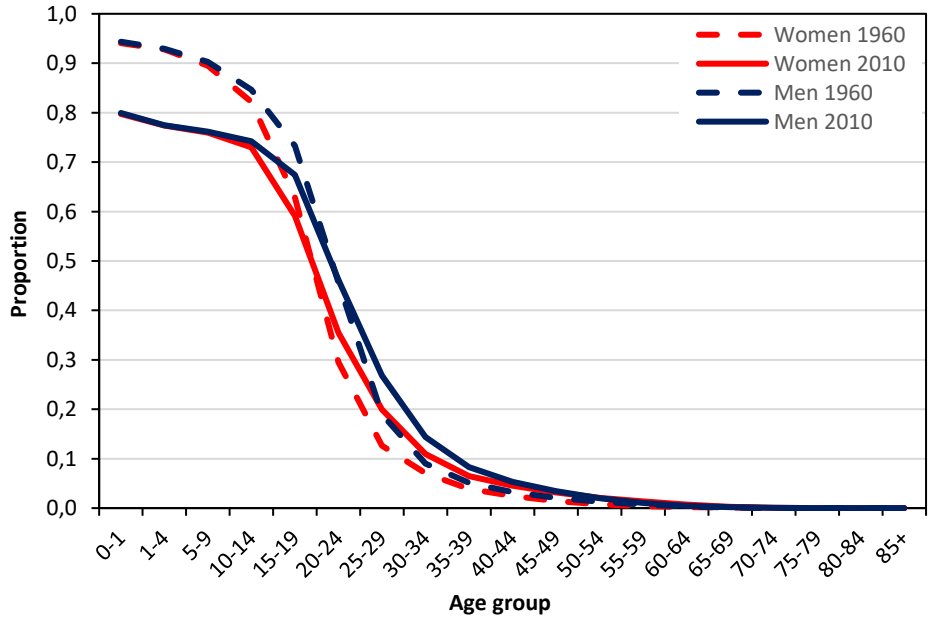
FIGURE 4 - Proportion of persons residing with own mother, ages 0-15, by sex, Brazil, 1960 and 2010



Source: IPUMS; IBGE, Demographic Census, 1960 and 2010.

Figure 5 shows that the age profiles of the proportion of persons residing with father and mother are similar, although, among children, the decline in the proportion of persons in coresidence were much larger for fathers than mothers:

FIGURE 5 - Proportion of persons residing with own father, by age and sex, Brazil, 1960 and 2010



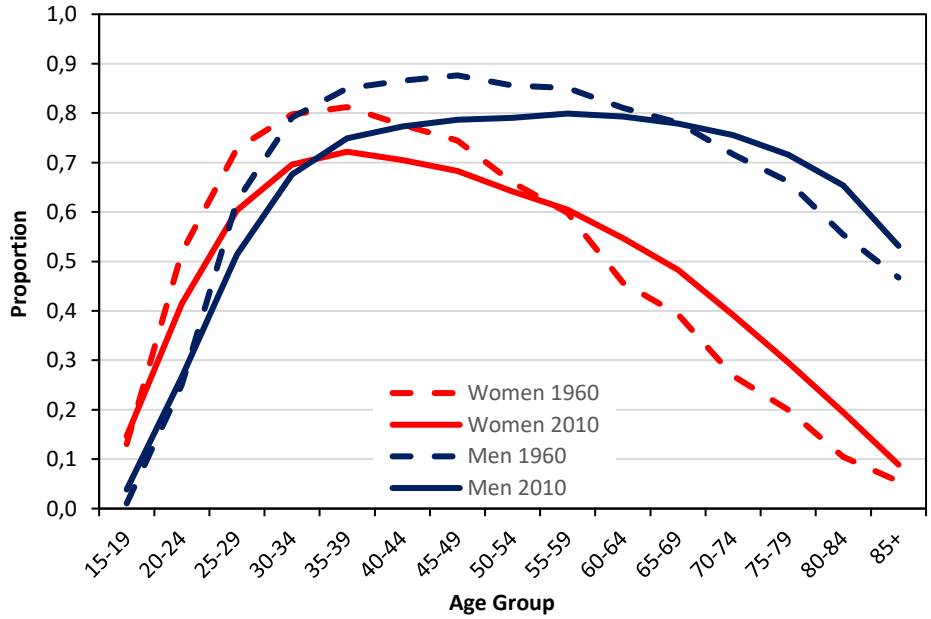
Source: IPUMS; IBGE, Demographic Census, 1960 and 2010.

This result may be related to an increase in the prevalence of single-parent families headed by women, as a consequence of higher social acceptance of

having a child outside of a union and greater union dissolution rates in Brazil, among all educational levels (Minamiguchi, 2017).

Regarding coresidence with a spouse, Figure 6 shows drastic differences by sex. Among women, coresidence with a spouse begins earlier than among men, but shows a much larger decline after age 40. Among males, coresidence with a spouse seems to start later in life and the proportion remains high, almost constant, until about age 60, when it starts to decline very slowly. The difference in the age profiles by sex may be related to differences in marriage patterns, as men tend to marry older than women (Allendorf et al, 2017). At the older ages, the sex gap in mortality makes so that women outlive their husbands (Goldman & Lord, 1983; Carr & Bodnar-Deren, 2009). There are also differences in the marriage market at older ages, since men tend to (re)marry younger women, whereas older women (either single, divorced or widowed) end up remaining unmarried (Mindelt, 1979; England & McClintock, 2009).

FIGURE 6 - Proportion of persons residing with spouse, by age and sex, Brazil, 1960 and 2010



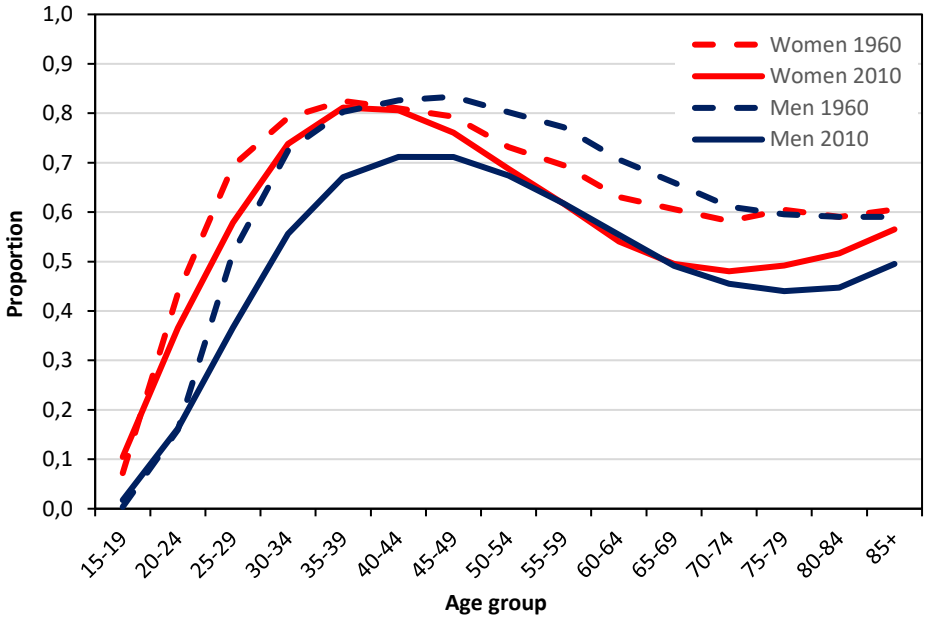
Source: IPUMS; IBGE, Demographic Census, 1960 and 2010.

In addition, Figure 6 shows that the age profiles have changed during the 50 year period: the proportion of persons residing with a spouse has decreased at the younger ages, but increased after age 60. This finding may be related to mortality gains, which reduced the prevalence of widowhood. Another possibility is that

changes in the social meaning of marriage and divorce may have increased the chances of widows and divorcees to remarry at older ages.

Next, Figure 7 shows the proportion of persons residing with at least one child. The profiles peak at ages 30-45 (0.8) for both men and women, when probably most of their children are already born. Then it declines, but it seems to increase slightly after age 80. As aforementioned, this could be due to both children returning to parents' house to help take care of them, or elderly moving into a child's house to help with household services, to take care of grandchildren or even to complement household income (Jesus & Wajnman, 2008; Ruggles & Heggeness, 2008; Kahn et al., 2013).

FIGURE 7 - Proportion of persons residing with at least one child, by age and sex, Brazil, 1960 and 2010



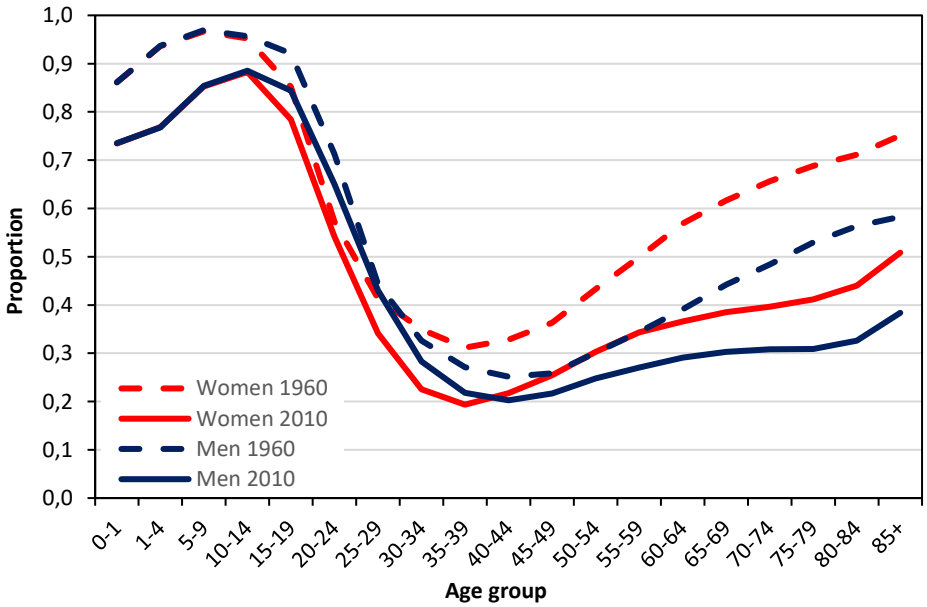
Source: IPUMS; IBGE, Demographic Census, 1960 and 2010.

Between 1960 and 2010, there was a decline in the proportion of both men and women living with their children, which may be related to lower fertility rates or an increase in the proportion of adults living alone (due to higher autonomy). It is important to note, however, that these trends vary whether we examine the children's or the parents' perspective (Preston, 1976; Wajnman, 2012). From the children's perspective, there was an increase in the availability of parents in Brazil, because of the decline in adult mortality. On the other hand, from parents'

perspective, the fertility declined reduced the availability of children despite the substantial survival gains during infancy.

Figure 8 shows the age profiles for the coresidence with any other type of relatives, including siblings, uncles/aunts, cousins, grandparents and grandchildren. There are no surprises: from birth to teenage years, the proportion of persons residing with any other type of relative increases, probably because of the presence of siblings in the household. From teenage years to around age 40, the proportion declines sharply, which is associated with the transition to adulthood and the start of new households. This transition is delayed for men compared to women. Next, above age 40, there is an increase in the proportion of coresidence with any other relative, particularly among women, which may be related to adults providing support for the older members of the family or vice-versa (Ruggles & Heggeness, 2008).

FIGURE 8 - Proportion of persons residing with other relatives, by age and sex, Brazil, 1960 and 2010

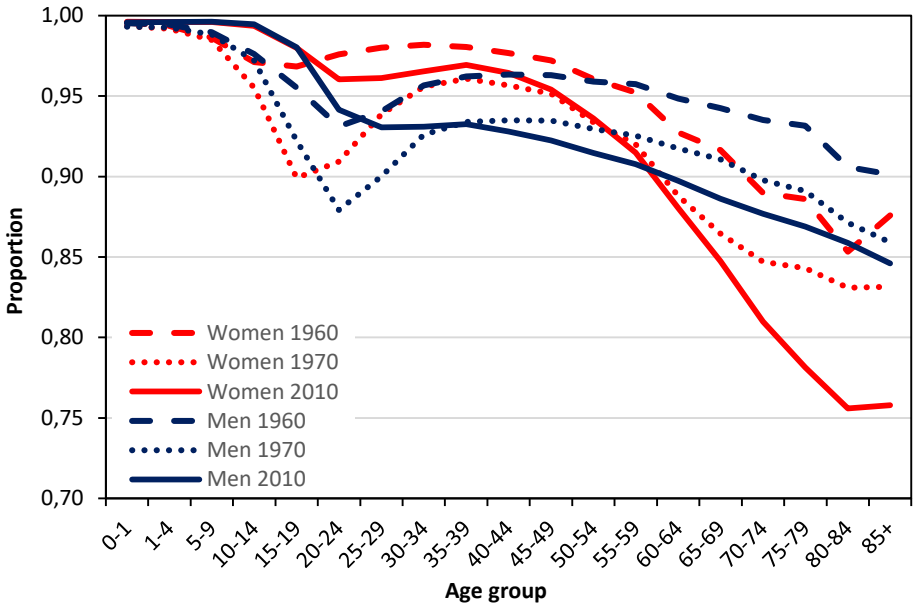


Source: IPUMS; IBGE, Demographic Census, 1960 and 2010.

Finally, Figure 9 shows the proportion of the population residing with any relative, including parents, children, spouse and all other types we discussed before. Of course, the age-sex-specific proportions are now much higher than for each type individually, and thus, the scale of the graph must be set differently to capture the higher levels of coresidence (minimum value at 0.7). The results show that almost

all persons start their lives in coresidence with a relative. The proportion decreases as people leave parents' home and then it increases again as they get married and have children. Then, in late adulthood, the departure of children to form their own families and the death of the spouse increases the proportion of individuals living alone.

FIGURE 9 - Proportion of persons residing with any relative, by age and sex, Brazil, 1960, 1970 and 2010



Source: IPUMS; IBGE, Demographic Census, 1960 and 2010.

The differences between men and women follow the patterns already discussed in each type of coresidence. Concerning the time trends, whereas we cannot discard data problems in the older censuses, there are a few hypotheses. It seems that until the 1960s, most persons left parents' home only after getting married. In the 1970s, possibly due to sociocultural changes, youngsters decided to delay marriage, but still leave the parents' home to live alone. After the 1970s, people continued to delay marriage, but instead of starting their own households, they stayed in coresidence with their parents for a longer period of time. In fact, when examining each type of coresidence separately, it is clear that the proportion of the population residing with spouse and children at young adult ages is lower in 1970 than 1960 and 1980.

5. MEAN DURATION OF CORESIDENCE WITH RELATIVES

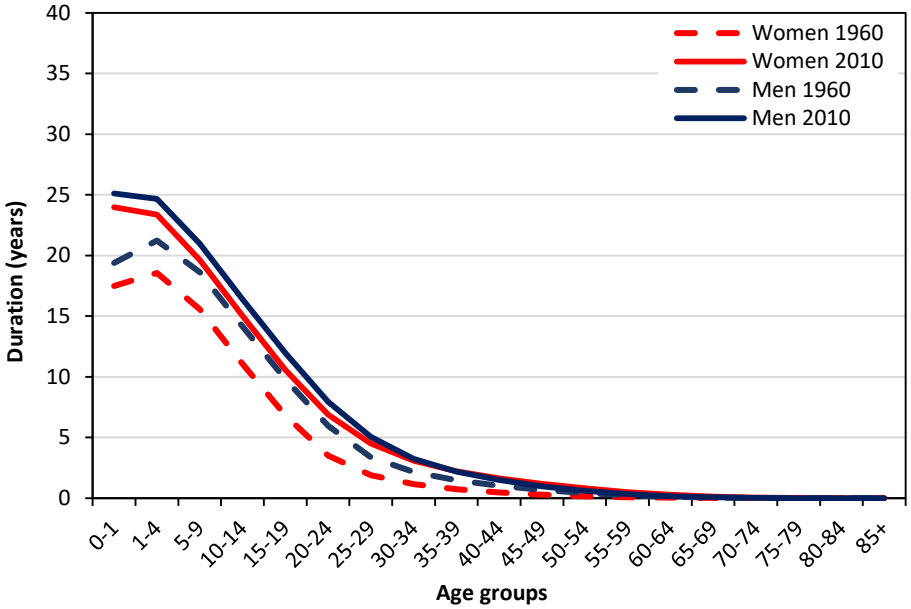
Chapter 4 showed that there have been important changes in the age-sex-profiles of the proportion of people residing with all kinds of relatives since 1960 in Brazil. The profiles depend on both the availability of relatives for coresidence and the propensity to coreside with them. Moreover, coresidence depends not only on the availability of relatives, but also on the individual's survival (or ego's survival). Therefore, we should not only measure the mean duration in coresidence, but also the proportion of the individual's life expectancy to be spent residing with each type of relative.

As life expectancy increases, the average number of years lived in each phase of the life cycle may change, since survival gains are not uniformly distributed across the life course. Of course, the distribution of survival gains affects the distribution of duration of coresidence by type of relative.

5.1. Coresidence with own mother

In 1960, there were about 32.5 million persons residing with their mothers (around 54% of the total population). In 2010, this number increased to about 79 million, although it represented a lower proportion of the total population (approximately 41%). Figure 10 shows the mean duration of coresidence in 1960 and 2010, calculated utilizing the methodology presented in section 3.2. The figure shows that the expected time to be lived in coresidence with own mother at birth increased by more than 5 years:

FIGURE 10 – Mean duration of coresidence with own mother, by age and sex, Brazil, 1960 and 2010



Source: IPUMS; IBGE, Demographic Census, 1960 and 2010.

Not surprisingly, the mean duration of coresidence with mother is longer for men than women. The duration of coresidence is higher in the first 15-20 years of life, after which it starts to rapidly decrease until around ages 35-40, when the expected time to be lived in coresidence is only about 1 year. As previously discussed, while the time lived in coresidence with mothers seems to have increased, it is important to stress that life expectancy at birth has also increased because of mortality gains (from 1960 to 2010, life expectancy at birth for women increased from around 56 to 77 years, and for men it went up from 52 to 70 years).

A comparison between the truncated life expectancy[7] of coresidence with mothers and total life expectancy is shown in Table 1:

[7] A truncated life expectancy, also referred to as temporary life expectancy, represents the average number of years that a person from a hypothetical cohort alive at age x will live from age x to age x+n (Arriaga, 1984). The age groups at which they were truncated were based on the behavior of the period coresidence rate for each type of relative.

TABLE 1 - Truncated total life expectancy and average duration of coresidence with own mother, by age group and sex, Brazil, 1960 and 2010

	1960					
	Both Sexes		Women		Men	
	Total (A)	Coresidence (B)	Total (A)	Coresidence (B)	Total (A)	Coresidence (B)
0-14	12,59	11,64	12,83	11,79	12,37	11,50
15-29	19,38	7,27	19,40	6,15	19,36	8,46
30+	34,03	1,12	34,94	0,73	33,05	1,48
	2010					
	Both Sexes		Women		Men	
	Total (C)	Coresidence (D)	Total (C)	Coresidence (D)	Total (C)	Coresidence (D)
0-14	14,68	13,54	14,72	13,61	14,64	13,48
15-29	19,72	9,14	19,88	8,38	19,56	9,90
30+	42,11	2,21	44,80	2,23	39,30	2,19

Difference (%) in the share of the truncated life expectancy spent in coresidence with mother between 1960-2010[8]			
	Both Sexes	Women	Men
0-14	-0,17	0,54	-0,87
15-29	8,83	10,46	6,91
30+	1,96	2,88	1,08

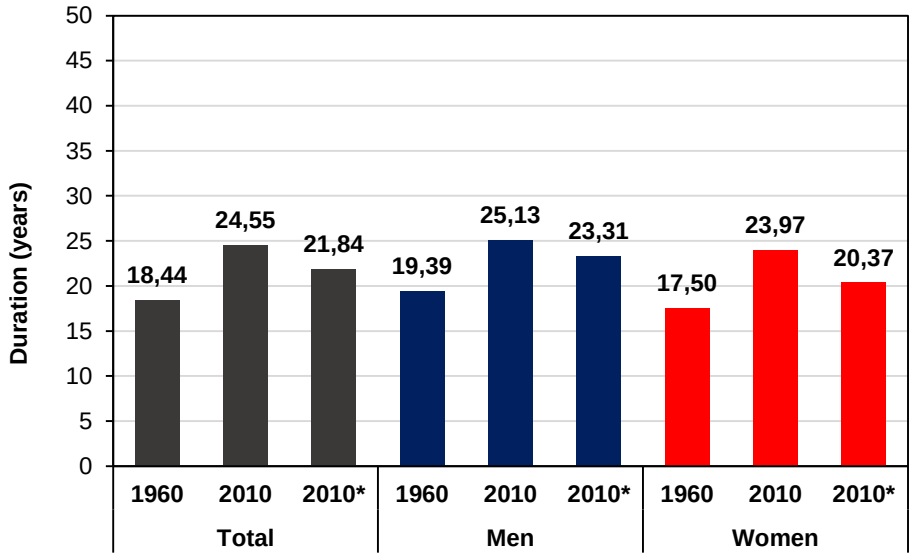
Source: IPUMS; IBGE, Demographic Census, 1960 and 2010.

For the age group 15-30 years of age, the fraction of time lived in coresidence with mother has increased by about 9% for both sexes. This average duration of time lived in each type of coresidence depends on both changes in mortality and in the propensity to coreside. One way to measure these factors is to estimate what would be the average duration if the age-sex-profiles of coresidence from 1960 had remained the same in 2010 and only mortality had changed.

Figure 11 shows the average duration of children residing with mothers at birth from 1960, 2010 and a counterfactual measure for 2010 (2010*), standardized using the age-sex-specific proportion of the population residing with mothers from 1960:

[8] Calculated as follows: $\big((D/C) - (B/A)\big).100$

FIGURE 11 - Actual and counterfactual average duration of coresidence with mother, measured at birth, by sex, Brazil, 1960 and 2010



* Counterfactual measure using the proportion of persons in coresidence from 1960
Source: IPUMS; IBGE, Demographic Census, 1960 and 2010.

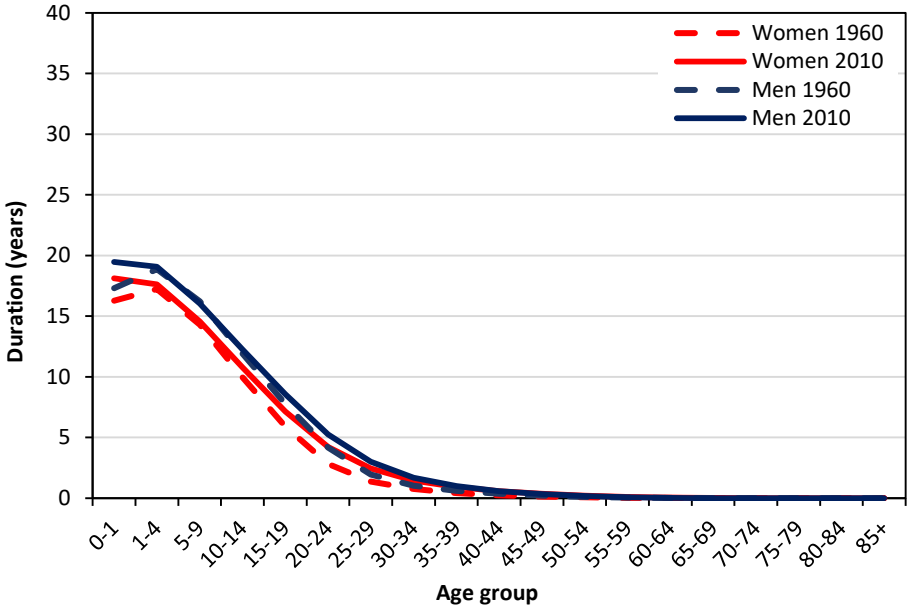
According to Figure 10, both the actual and counterfactual average duration of coresidence with own mother increased from 1960 to 2010. The fact that the 2010 counterfactual measure is higher than the actual duration for 1960 (21.84 versus 18.44 for both sexes) indicates that mortality gains helped to increase the time spent in coresidence. The even higher actual duration for 2010 (24.55 years) suggests that in addition to mortality changes, there was an increase in the age-specific proportion of the population residing with mothers that made duration even longer. These patterns are similar to men and women.

These findings show that one should be careful before concluding that teenagers are residing for a longer time with their parents today than in the past because of behavioral changes, since some of the time added is due to survival gains.

5.2. Coresidence with father

There were 30.3 million people living with their fathers (around 50.6% of the total population) in 1960. In 2010, this number increased to 61 million (about 32% of the population). Over the 50-year period, the average duration of coresidence has also increased as shown in Figure 12:

FIGURE 12 - Mean Duration of coresidence with own father, by age and sex, Brazil, 1960 and 2010



Source: IPUMS; IBGE, Demographic Census, 1960 and 2010.

At birth, the mean duration of coresidence with fathers increased by two years between 1960 and 2010. Among males, duration increased from 17.3 to 19.4 years, while among females, it increased from 16.3 to 18.1 years. The age pattern of duration is comparable to the case of coresidence with mothers: higher at younger ages with a rapid decline with age. The duration is longer for men than women. Yet, the variation in the duration of coresidence with father, between 1960 and 2010, was much smaller than in the case of mothers.

The estimation of truncated duration of coresidence in specific age groups shows that most of the time spent residing with a father occurs during childhood and teenage years (Table 2). Contrary to what happened with coresidence with mothers, however, the duration of coresidence with fathers did not change much between 1960 and 2010 despite the increase in life expectancy, particularly in the age group 15-30.

TABLE 2 - Truncated total life expectancy and average duration of coresidence with own father, by age group and sex, Brazil, 1960 and 2010

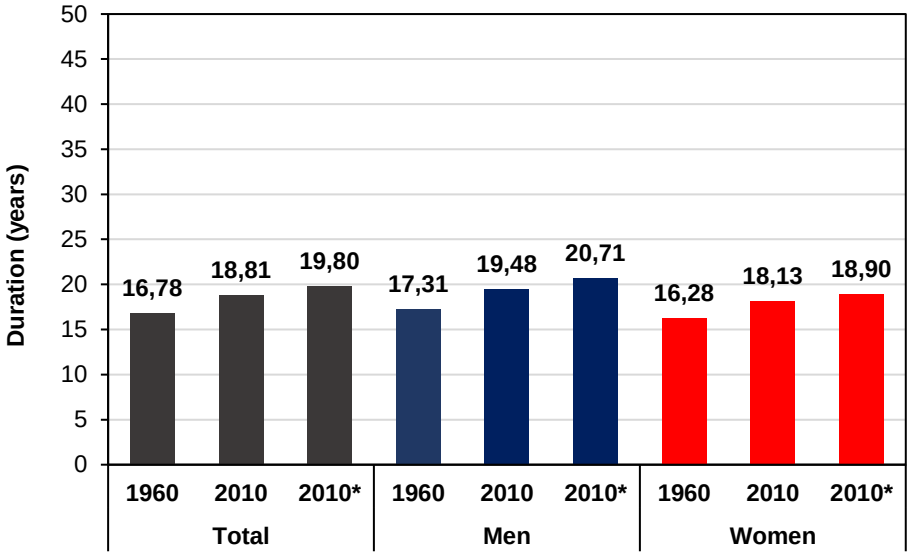
1960						
	Both Sexes		Women		Men	
	Total	Coresidence	Total	Coresidence	Total	Coresidence
0-14	12,59	11,20	12,83	11,33	12,37	11,07
15-29	19,38	6,34	19,40	5,52	19,36	7,22
30+	34,03	0,52	34,94	0,43	33,05	0,60
2010						
	Both Sexes		Women		Men	
	Total	Coresidence	Total	Coresidence	Total	Coresidence
0-14	14,68	11,14	14,72	11,13	14,64	11,14
15-29	19,72	6,94	19,88	6,25	19,56	7,63
30+	42,11	0,95	44,80	0,91	39,30	0,99

Difference (%) in the share of the truncated life expectancy spent in coresidence between 1960-2010			
	Both Sexes	Women	Men
0-14	-13,04	-12,73	-13,35
15-29	2,46	2,99	1,71
30+	0,73	0,79	0,71

Source: IPUMS; IBGE, Demographic Census, 1960 and 2010.

To isolate the effect of survival gains in the average duration over time, Figure 13 shows the actual and counterfactual measures of duration of coresidence with own father in 2010, using 1960 as the standard. There was an increase of about 2 years in the average duration of coresidence with fathers, measured at birth, between 1960 and 2010 (from 16.7 to 18.8 years). However, the counterfactual measure is now higher than the actual measure of duration in 2010, meaning that survival gains contributed to a longer time in coresidence with fathers whereas the decline in the proportion of the population residing with a father by age has worked in the other direction, by reducing it. Therefore, whereas the duration of coresidence with mothers increased because of both changes in the proportion of persons residing with mothers and survival gains, the longer average duration of coresidence with fathers is a consequence solely of higher life expectancy.

FIGURE 13 - Actual and counterfactual average duration of coresidence with own father, measured at birth, by sex, Brazil, 1960 and 2010

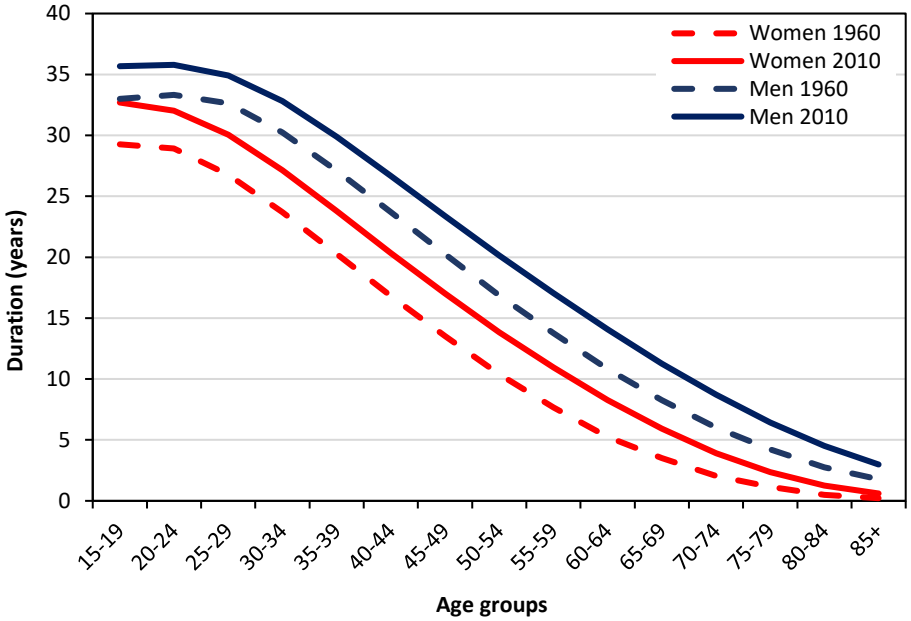


* Counterfactual measure using the proportion of persons in coresidence from 1960
Source: IPUMS; IBGE, Demographic Census, 1960 and 2010

5.3. Coresidence with spouse

In 1960 there were around 19.5 million people residing with a spouse (about 32.6% of the total population). In 2010, this number increased to about 81 million (around 42.4% of the population). The mean duration in coresidence with a spouse also increased and, not surprisingly, is higher for men than for women.

FIGURE 14 - Mean Duration of coresidence with own spouse, by age and sex, Brazil, 1960 and 2010



Source: IPUMS; IBGE, Demographic Census, 1960 and 2010.

According to Figure 14, the average duration of coresidence with a spouse for men in 1960 (33 years) was longer than the time spent by women with a spouse both in 1960 and in 2010 (29.2). This sex gap, as previously discussed, is related to the greater survival of women, who outlive their husbands, and the higher chance of men remarrying at older ages. However, between 1960 and 2010, the average duration of coresidence with a spouse at age 15 increased by 2.7 years among men and 3.4 years among women, indicating that this gap is getting narrower.

TABLE 3 shows the truncated life expectancy and the average duration of coresidence by age group and sex in 1960 and 2010. The average duration of coresidence decreased in the age groups 15-30 and 30-60 and increased for the age group of 60 and older, for both men and women. At the same time, however, the life expectancy increased for all age groups, especially above age 60. This led to a decline in the fraction of time spent in coresidence with a spouse, except for older women.

TABLE 3 - Truncated total life expectancy and average duration of coresidence with own spouse, by age group and sex, Brazil, 1960 and 2010

	1960					
	Both Sexes		Women		Men	
	Total	Coresidence	Total	Coresidence	Total	Coresidence
15-29	19,38	9,25	19,40	10,45	19,36	7,98
30-59	22,40	17,79	22,50	16,29	22,29	19,17
60+	15,55	8,20	16,31	5,24	14,67	10,82
	2010					
	Both Sexes		Women		Men	
	Total	Coresidence	Total	Coresidence	Total	Coresidence
15-29	19,72	8,23	19,88	9,23	19,56	7,24
30-59	23,79	17,21	24,19	16,26	23,37	18,20
60+	21,04	11,07	22,66	8,27	19,17	14,07

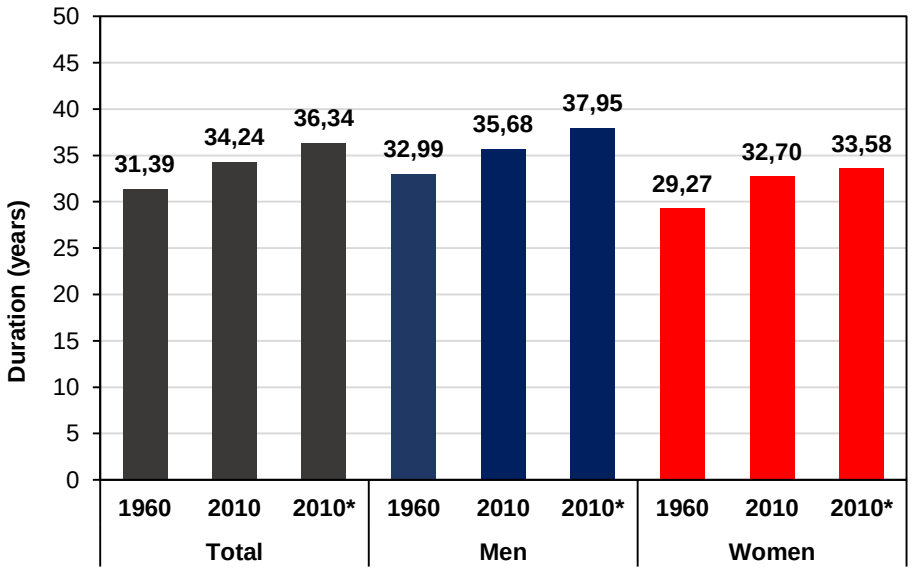
Difference (%) in the share of the truncated life expectancy spent in coresidence between 1960-2010			
	Both Sexes	Women	Men
15-29	-5,98	-7,43	-4,20
30-59	-7,08	-5,15	-8,10
60+	-0,12	4,36	-0,33

Source: IPUMS; IBGE, Demographic Census, 1960 and 2010.

Figure 15 compares the actual and counterfactual measures of duration, estimated at age 15. The conclusions are similar to those for coresidence with fathers: the counterfactual measure is higher than the actual measure of duration in 2010, meaning that survival gains contributed to a longer time in coresidence with spouse whereas the decline in the proportion of the population residing with a spouse by age has reduced it.

In addition, the difference between the counterfactual and actual measures in 2010 is larger for men than for women, suggesting that the role of survival gains is more important for men. This finding is in accordance with the fact that most men reside with a spouse in late life, increasing the impact of survival gains for them at older ages.

FIGURE 15 - Actual and counterfactual average duration of coresidence with own spouse, measured at age 15, by age and sex, Brazil, 1960 and 2010



* Counterfactual measure using the proportion of persons in coresidence from 1960
Source: IPUMS; IBGE, Demographic Census, 1960 and 2010.

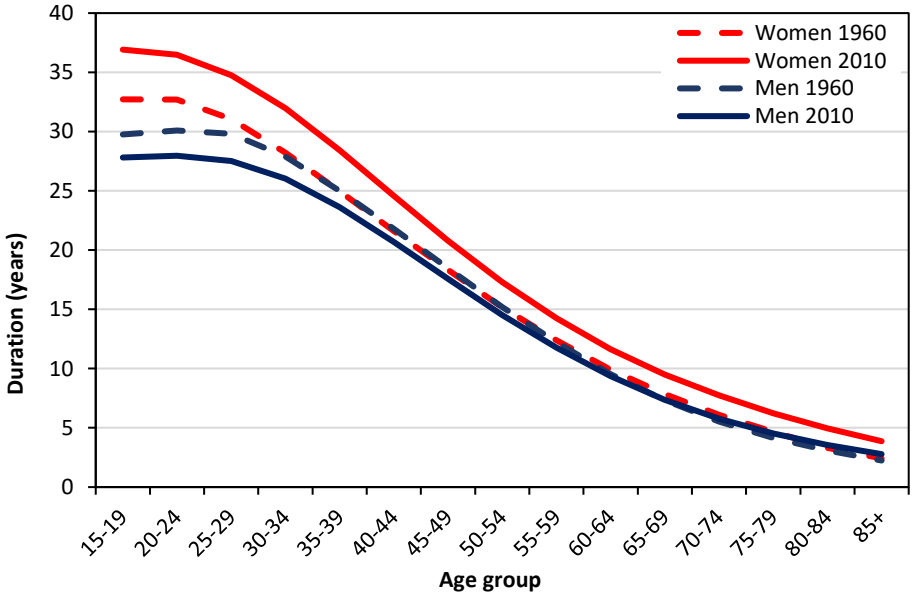
5.4. Coresidence with at least one child

The mean duration of coresidence with children is more complex to investigate, since the number of children a person has matters for duration, especially if children are born many years apart. Here, we only present estimates of duration for coresidence with at least one child and ignore the number of children.

In 1960, there were around 18.6 million people living with at least one child in Brazil (around 31% of the total population). In 2010, this number increased to 75.3 million (39.5% of the population). As in the case of coresidence with a spouse, the larger proportion of individuals residing with at least one child is associated to changes in the population age structure: a larger share of women in maternity ages, despite the decline in fertility.

According to Figure 16, the mean duration of coresidence with at least one child, measured at different ages, were similar for men and women in 1960, but became very different in 2010 since it declined for men and increased for women[9].

FIGURE 16 - Mean duration of coresidence with at least one own child, by age and sex, Brazil, 1960-2010



Source: IPUMS; IBGE, Demographic Census, 1960 and 2010.

Table 4 shows truncated life expectancy and duration of coresidence with at least one child by age group and sex in 1960 and 2010. The absolute variation of the duration was negative for both sexes at ages below 65. At the same time, the total life expectancy has increased for all age groups, leading to a negative variation in the share of years of coresidence between 1960 and 2010.

[9] Duration at age 15 was longest for women in 2000, equal to 38.5 years. In 2010, it reduced to 36.9 years. Among men, it was longest in 1980, equal to 30.9 years. Since then, it has decreased, reaching 27.8 years in 2010. The data for all years are presented in the annex.

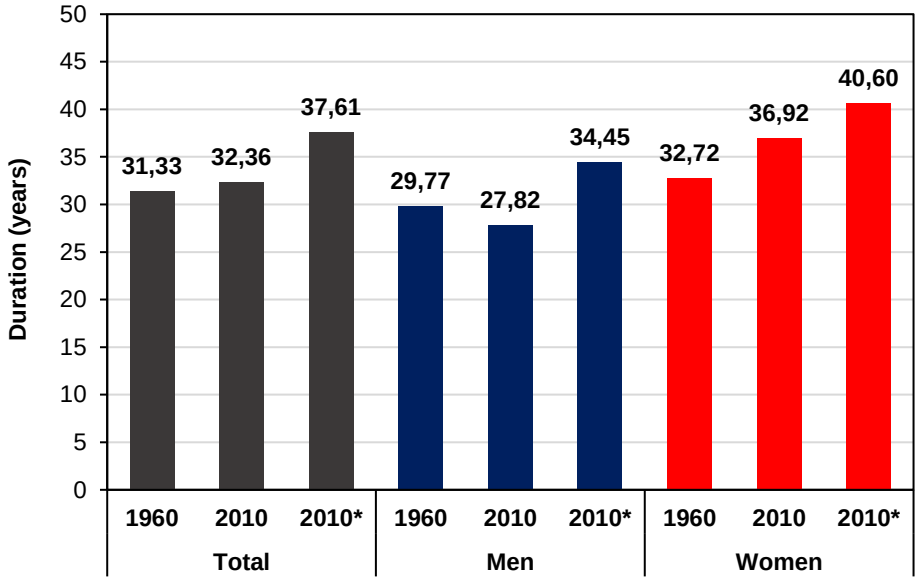
TABLE 4 - Truncated total life expectancy and average duration of coresidence with at least one own child, by age group and sex, Brazil, 1960 and 2010

	1960					
	Both Sexes		Women		Men	
	Total	Coresidence	Total	Coresidence	Total	Coresidence
15-34	19,38	8,15	19,40	9,55	19,36	6,68
35-64	25,90	20,09	26,09	19,69	25,69	20,42
65+	12,51	7,63	13,15	7,85	11,75	7,33
	2010					
	Both Sexes		Women		Men	
	Total	Coresidence	Total	Coresidence	Total	Coresidence
15-34	19,72	7,09	19,88	8,87	19,56	5,33
35-64	27,99	19,18	28,62	20,26	27,34	18,05
65+	17,41	8,51	18,77	9,50	15,77	7,36
Difference (%) in the share of the truncated life expectancy spent in coresidence between 1960-2010						
	Both Sexes		**Women**		**Men**	
15-34	-6,09		-4,67		-7,24	
35-64	-9,06		-4,70		-13,46	
65+	-12,10		-9,11		-15,72	

Source: IPUMS; IBGE, Demographic Census, 1960 and 2010.

The results are different by sex: among women, the absolute variation in the duration of coresidence was positive at ages above 35, which didn't happen for men. The growth was also larger for women at ages 65 and older than for men. Therefore, the variation in the fraction of time spent in coresidence reduced less significantly for women than for men.

FIGURE 17 - Actual and counterfactual average duration of coresidence with at least one own child, measured at age 15, by age and sex, 1960 and 2010



* Counterfactual measure using the proportion of persons in coresidence from 1960
Source: IPUMS; IBGE, Demographic Census, 1960 and 2010.

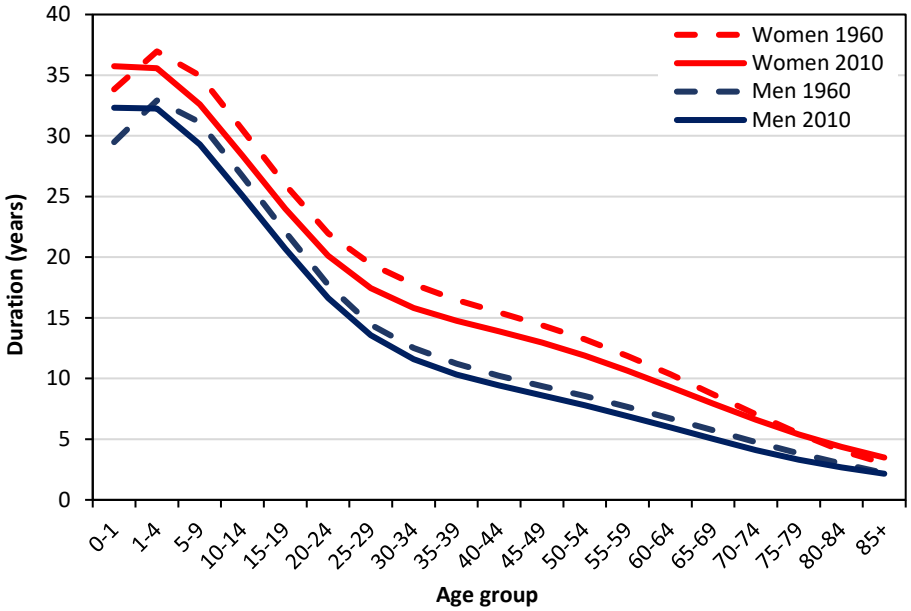
Figure 17 shows the actual and counterfactual measures of duration of coresidence with at least one own child for 2010 and 1960. The mean duration at age 15 for both sexes increased only slightly between 1960 and 2010 (from 31.33 to 32.36 years). However, this increase would have been much bigger, as shown by the standardized 2010 measure (37.61 years), had the proportion of the population residing with at least one own child by age in 1960 remained the same in 2010 and had not buffered the effect of survival gains. Of course, there are differences in the figures by sex, but for both men and women changes in the age-specific proportion of coresidence helped to the reduce the potential effect of the increase in life expectancy for the average duration.

5.5. Coresidence with at least one other relative

In 1960, there were about 41.6 million people residing with at least one relative from types not already discussed (69.4% of the total population). In 2010, the figure increased to 94.3 million (49.4% of the population). However, as shown in Figure 18, the average duration in coresidence with other types of relatives has decreased between 1960 and 2010, except for the first year of life, probably because of the reduction in infant mortality. Also, the duration is higher for men

than for women. Since we agglutinate many different types of relatives in the same group, the variation in duration over time is smaller than for parents, spouses, and children.

FIGURE 18 - Mean duration of coresidence with at least one other relative, by age and sex, Brazil, 1960 and 2010



Source: IPUMS; IBGE, Demographic Census, 1960 and 2010.

Concerning the truncated life expectancy and duration of coresidence by age group and sex (Table 5), the increase in duration between 1960 and 2010 is concentrated in the age group 0-15. It may be related to the increase in the proportion of extended households, particularly multigenerational households. It may also reflect youngsters residing more frequently with other relatives rather than parents. However, despite some increase in the number of years spent in coresidence, the fraction of time spent in coresidence declined in all age groups.

TABLE 5 - Truncated total life expectancy and average duration of coresidence with at least one other relative, by age group and sex, Brazil, 1960 and 2010

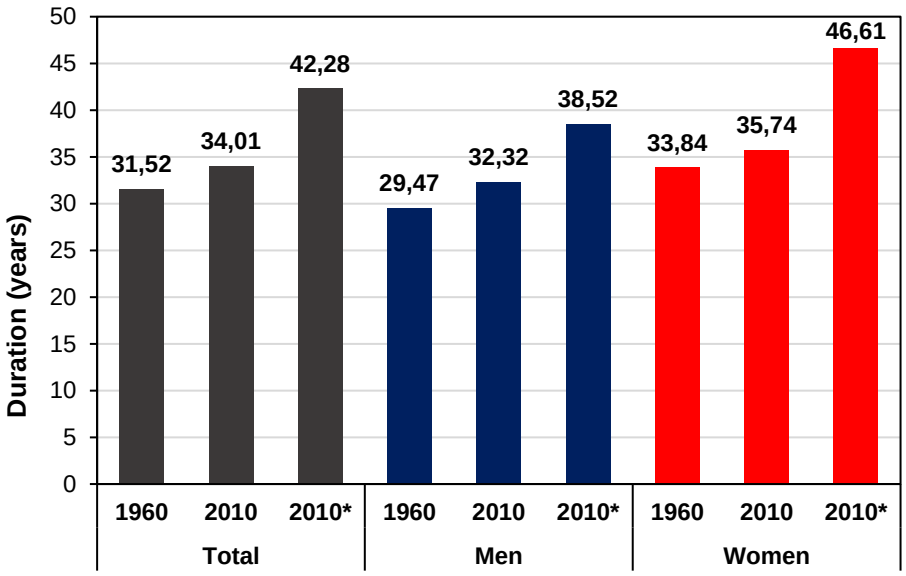
	1960					
	Both Sexes		Women		Men	
	Total	Coresidence	Total	Coresidence	Total	Coresidence
0-14	12,59	11,93	12,83	12,14	12,37	11,73
15-44	28,32	13,78	28,36	13,55	28,27	14,06
45+	26,20	11,79	27,13	14,38	25,19	9,37
	2010					
	Both Sexes		Women		Men	
	Total	Coresidence	Total	Coresidence	Total	Coresidence
0-14	14,68	12,22	14,72	12,25	14,64	12,20
15-44	29,28	12,13	29,67	11,43	28,89	12,82
45+	33,20	10,84	35,51	12,96	30,73	8,62
Difference (%) in the share of the truncated life expectancy spent in coresidence between 1960-2010						
	Both Sexes		**Women**		**Men**	
0-14	-11,44		-11,39		-11,50	
15-44	-7,25		-9,24		-5,37	
45+	-12,35		-16,50		-9,16	

Source: IPUMS; IBGE, Demographic Census, 1960 and 2010.

The analysis of actual and counterfactual measures of duration of coresidence with other relatives (Figure 19) shows that survival gains contributed to increase the observed duration, while the decline in the proportion of people in coresidence at each age operated in the opposite direction. Indeed, between 1960 and 2010, the mean proportion of persons residing with at least one other relative in the total population decreased from 69% to 49%.

These results confirm that except for coresidence with mothers, the decline in the proportion of people residing with relatives by age have indeed acted to reduce the average duration of coresidence. The increase in life expectancy was the main factor responsible for increasing or avoiding larger declines in the mean duration of coresidence.

FIGURE 19 - Actual and counterfactual average duration of coresidence with at least one other relative, measured at birth, by sex, Brazil, 1960 and 2010

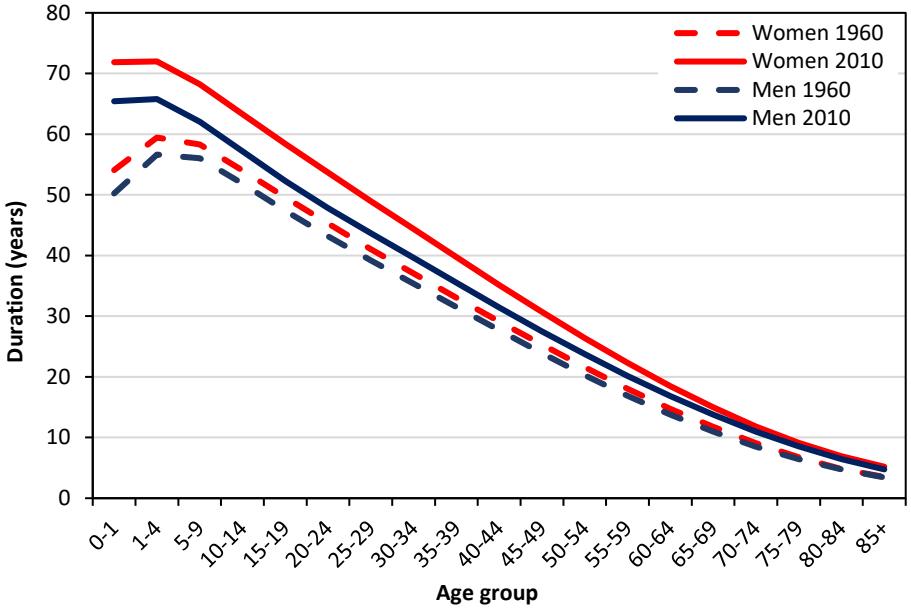


* Counterfactual measure using the proportion of persons in coresidence from 1960
Source: IPUMS; IBGE, Demographic Census, 1960 and 2010.

5.6. Total coresidence: coresidence with at least one relative

In 1960, there were 58.2 million people living with at least one relative, regardless of the degree of kinship (97% of the total population). In 2010, this number increased up to 181 million (95% of the total population). Whereas the proportion of the population residing with at least on relative decreased slightly, the mean duration of coresidence increased for men and women, as shown in Figure 20:

FIGURE 20 - Mean duration of coresidence with any relative, by age and sex, Brazil, 1960 and 2010



Source: IPUMS; IBGE, Demographic Census, 1960 and 2010.

In 1960, a newborn female expected to spend 54 years in coresidence with any relative, with a total life expectancy at birth was 56 years, whereas a newborn male expected to spend 52 years in coresidence out of 52.4 years of life. After 50 years, the durations changed to 71.8 years out of 77.4 years for women and 65.4 years out of 70 years for men. Therefore, the fraction of time spent in coresidence decreased as individuals spent more time living alone.

The estimation of truncated life expectancy and mean duration of coresidence by age group and sex is helpful in showing the distribution of time in 1960 and 2010. According to the results in Table 6, the mean duration of coresidence with any relative increased in all age groups. However, since total life expectancy also increased, the fraction of time spent in coresidence actually decreased, except among young men and women (age group 0-20) where it increased very little.

TABLE 6 - Truncated total life expectancy and average duration of coresidence with any relative, by age group and sex, Brazil, 1960 and 2010

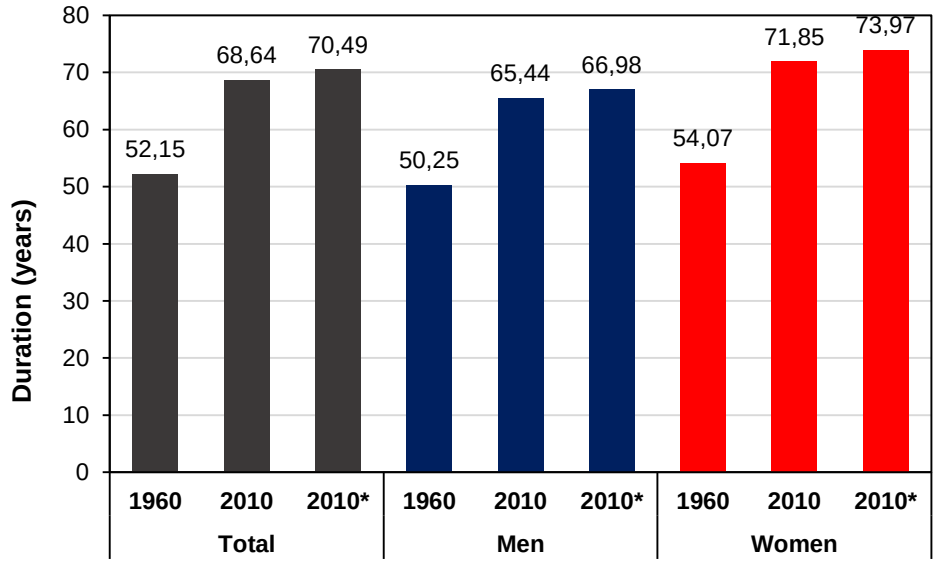
1960						
	Both Sexes		Women		Men	
	Total	Coresidence	Total	Coresidence	Total	Coresidence
0-19	16,67	16,33	16,98	16,65	16,36	16,02
20-49	27,85	26,88	27,91	27,29	27,79	26,47
50+	22,44	20,99	23,36	21,60	21,43	20,29
2010						
	Both Sexes		Women		Men	
	Total	Coresidence	Total	Coresidence	Total	Coresidence
0-19	19,54	19,38	19,61	19,44	19,48	19,32
20-49	29,09	27,55	29,54	28,44	28,65	26,67
50+	28,96	25,14	31,06	26,39	26,67	23,74

Difference (%) in the share of the truncated life expectancy spent in coresidence between 1960-2010			
	Both Sexes	Women	Men
0-19	1,19	1,12	1,27
20-49	-1,80	-1,54	-2,10
50+	-6,77	-7,49	-5,65

Source: IPUMS; IBGE, Demographic Census, 1960 and 2010.

The estimates of actual and counterfactual measures of duration of coresidence with at least one relative (Figure 21) show that this duration increased from 1960 to 2010 (from 52.1 to 68.6 years) because of survival gains. However, the increase would have been larger (from 52.1 in the observed scenario of 1960 to 70.5 years in the counterfactual scenario of 2010) if not for the changes in the proportion of the population in coresidence by age. These results reflect the decline in the mean proportion of the population residing with any relative between 1960 and 2010 (from 97.1% to 94.9%).

FIGURE 21 Actual and counterfactual average duration of coresidence with any relative, measured at birth, by sex, Brazil, 1960 and 2010



* Counterfactual measure using the proportion of persons in coresidence from 1960
Source: IPUMS; IBGE, Demographic Census, 1960 and 2010.

The estimates show that individuals spend almost their whole lives in coresidence with at least one relative. During childhood, coresidence is mostly with parents and other relatives. During adult age, persons reside with spouses and children, and during old age with spouses and other relatives. The mean duration of residence with parents and spouses have been growing in the last years; duration of coresidence with children increased only for women, while duration of coresidence with other types of relatives has decreased for both men and women.

Among all types of coresidence, only the duration of coresidence with mothers increased because of both higher age-specific proportions of coresidence and lower mortality. In the following chapter, we will look specifically to the patterns and components of children's coresidence with mothers.

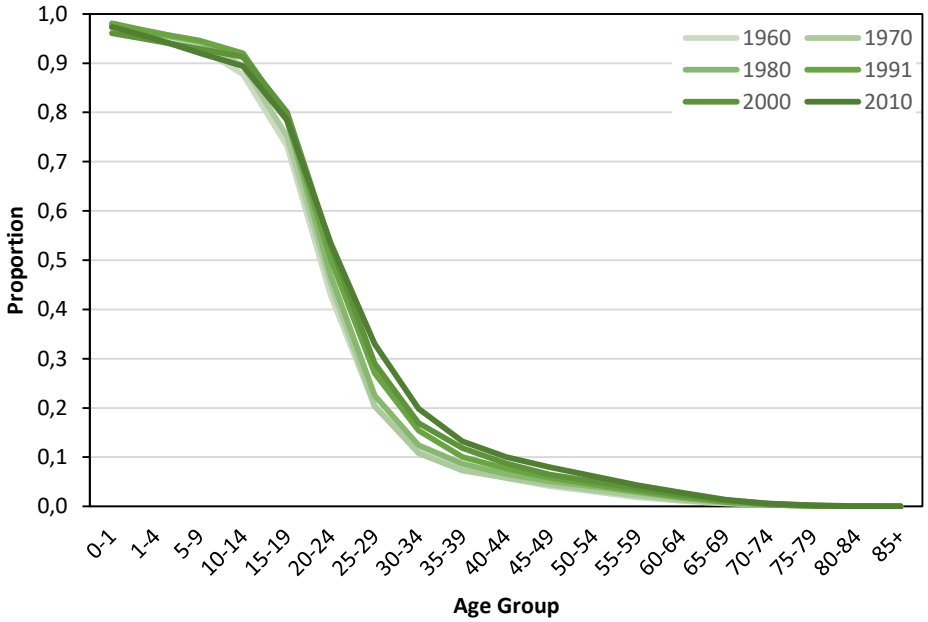
6. CHILDREN'S CORESIDENCE WITH THEIR MOTHERS

Chapters 4 and 5 showed an increase in the mean duration of coresidence with mothers in absolute and relative terms. It happened both because individuals (children) were living longer and because the proportion of children residing with mothers increased at most ages. In this chapter, we investigate another demographic component that may have affected the duration of children's coresidence with mothers, namely the survival status of mothers. However, before doing that, we present a more comprehensive analysis of the patterns of coresidence with mothers by age and sex.

6.1. Coresidence with mothers: a particular case

Figure 22 shows the proportion of the population residing with own mother for both sexes from 1960 to 2010. As we have highlighted before, over the decades, there was a clear decline in the proportion of the population aged 0 to 15 residing with mothers, as well as an increase in all other age groups:

FIGURE 22 - Proportion of persons residing with mother, by age group, Brazil, 1960 to 2010

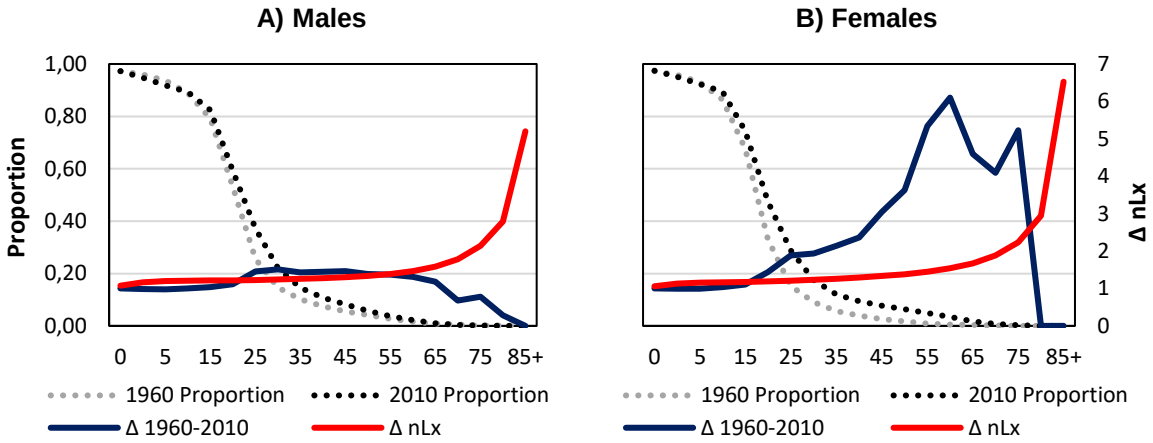


Source: IPUMS; IBGE, Demographic Census, 1960 to 2010.

Figure 23 bellow compares the changes in the proportion of coresidence with mothers by age with the absolute variation in person-years lived by age, between

1960 and 2010, for each sex. Changes in the proportion of the population residing with own mother are more important at adult ages (between ages 20 and 60 for men and 15 and 80 for women), which is expected since the proportion of young people residing with mothers were already high. On the other hand, the differences in persons-years lived were more concentrated at ages older than 65, which is not surprising given the patterns of mortality transition. In any event, Figure 23 emphasizes the importance of survival gains in increasing the mean duration of coresidence in all age groups:

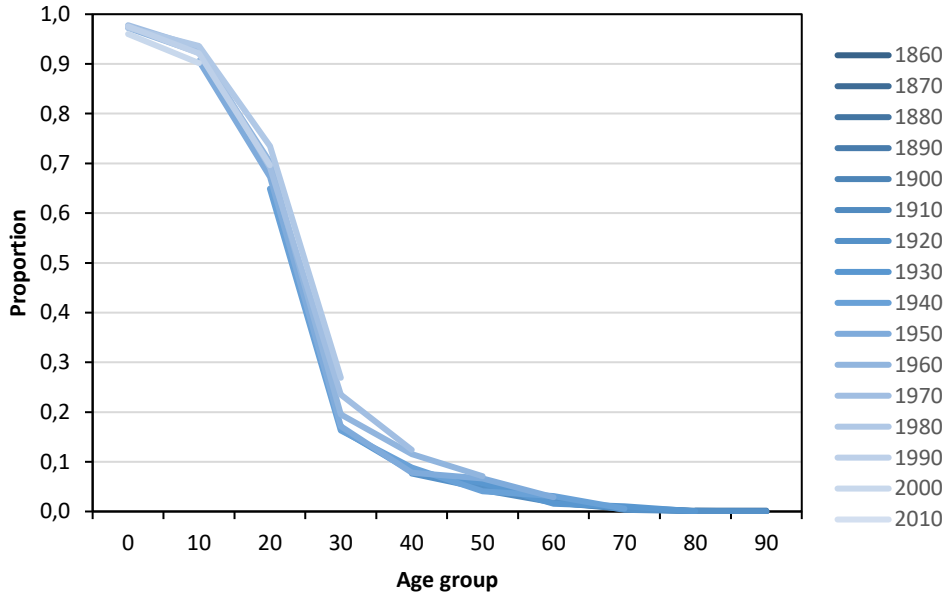
FIGURE 23 - Changes in the proportion of coresidence and person-years lived by age and sex, Brazil, 1960 and 2010



Source: IPUMS; IBGE, Demographic Census, 1960 and 2010.

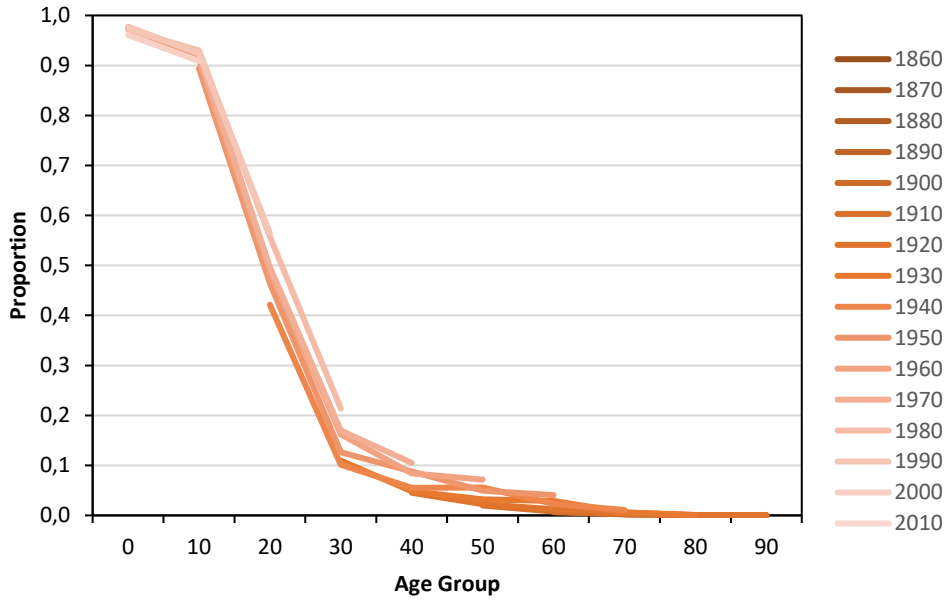
Our calculations use cross-sectional census data, and therefore, do not reflect the transition rates between coresidence and non-coresidence over the life cycle for real cohorts. If there are cohort differences in the proportion of persons residing with mothers, the period data may not represent the life cycle patterns accurately. To test this issue, we estimate the age profiles for pseudo-cohorts with data for consecutive censuses. The results are shown in Figures 24 and 25:

FIGURE 24 – Proportion of men residing with own mother, Brazil, by birth cohort and age group



Source: IPUMS; IBGE, Demographic Census, 1960 to 2010.

FIGURE 25 - Proportion of women residing with own mother, Brazil, by birth cohort and age group



Source: IPUMS; IBGE, Demographic Census, 1960 to 2010.

The age-profiles for the cohorts are similar to those for hypothetical cohort (period data) shown in Figure 21 (Chapter 4). Although the estimates do not show any transitions between states (in coresidence or not in coresidence), the lack of any clear-cut cohort differences assures us that the calculation of the mean duration of coresidence based on period data is not significantly biased. Therefore, even

if, at the individual level, people are transitioning between coresidence states, it doesn't seem to affect the average time lived in coresidence by the cohort as a whole.

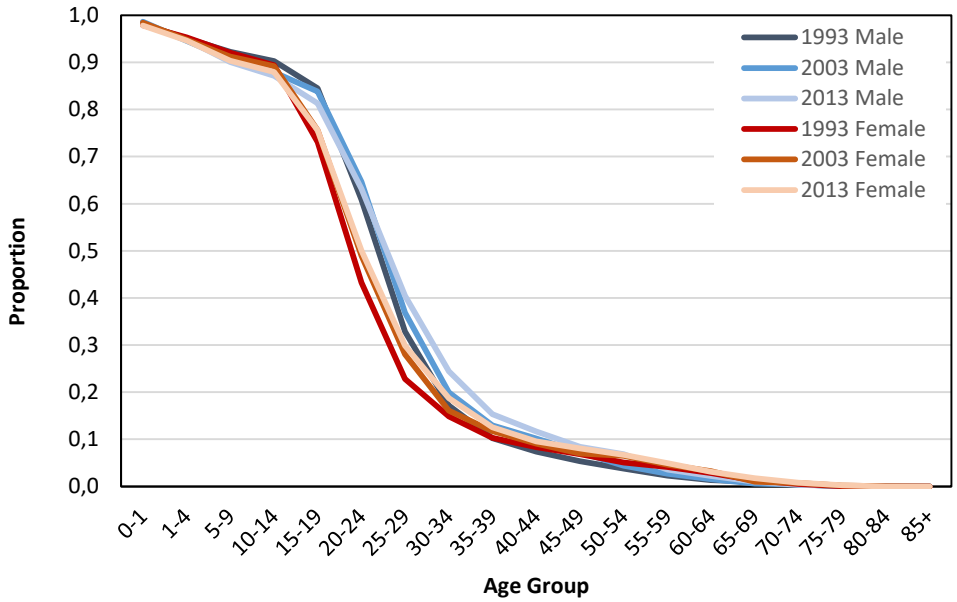
6.2. Availability and propensity to coreside

The results of chapters 4 and 5 showed large differences in coresidence patterns by type of relative, but do not clearly indicate why only the age-specific proportion of the population residing with mothers increased between 1960 and 2010. Since the lack of a living mother precludes a person to reside with her, one possible explanation for this is the decline in mortality rates among mothers. This is not a novel hypothesis in the international literature. As discussed in chapter 2, Ruggles (1986, 1993, 1994) discusses how the absence of multigenerational households in pre-industrial Europe was due to what he called the low availability of relatives for coresidence due to high mortality levels. Later, in the 20th century, when the availability of relatives increased because of the mortality transition, non-demographic factors – or as he called them, the propensity to coreside – detained the increase in the prevalence of multigenerational households.

Therefore, in this section we disentangle two components of the proportion of coresidence: the propensity to reside with mothers and the availability of mothers. Did the proportion of coresidence increase because mothers were living longer and therefore, were more available, or it happened because the coresidence preferences changed making coresidence with mothers more acceptable and desirable?

To answer these questions, we draw data from PNAD, since the survey contains information on the survival status of mothers. Figure 26 shows the age-specific profiles of the proportion of the population residing with mothers in three different decades: 1993, 2003 and 2013. Like the results based on the census data, there is an increase in the proportions over time, particularly at adult ages:

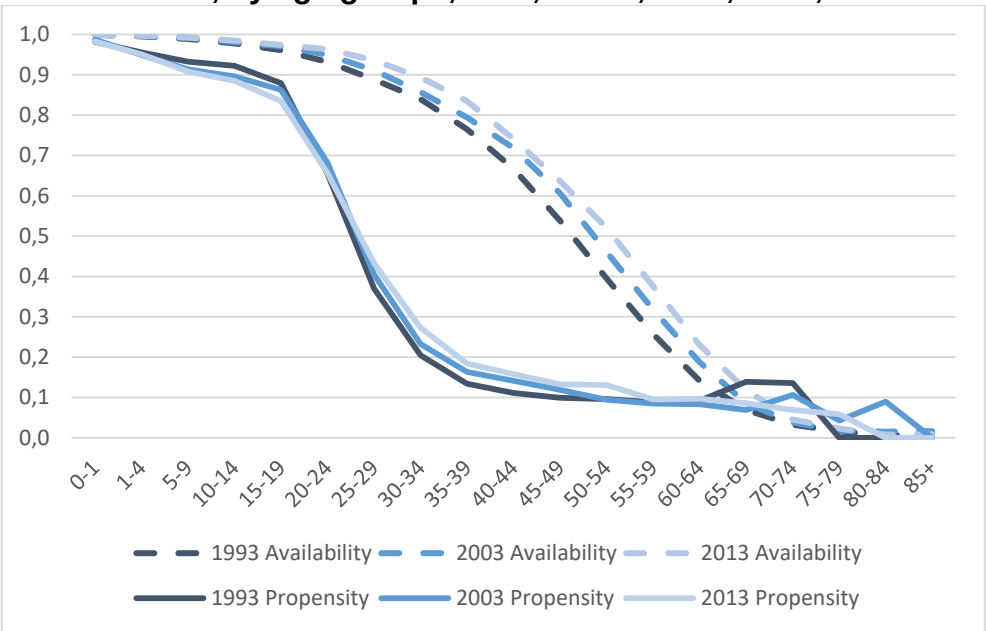
FIGURE 26 - Proportion of persons residing mother, by age group and sex, Brazil, 1993, 2003, 2013 (PNAD)



Source: IBGE, PNAD, 1993, 2003, 2013.

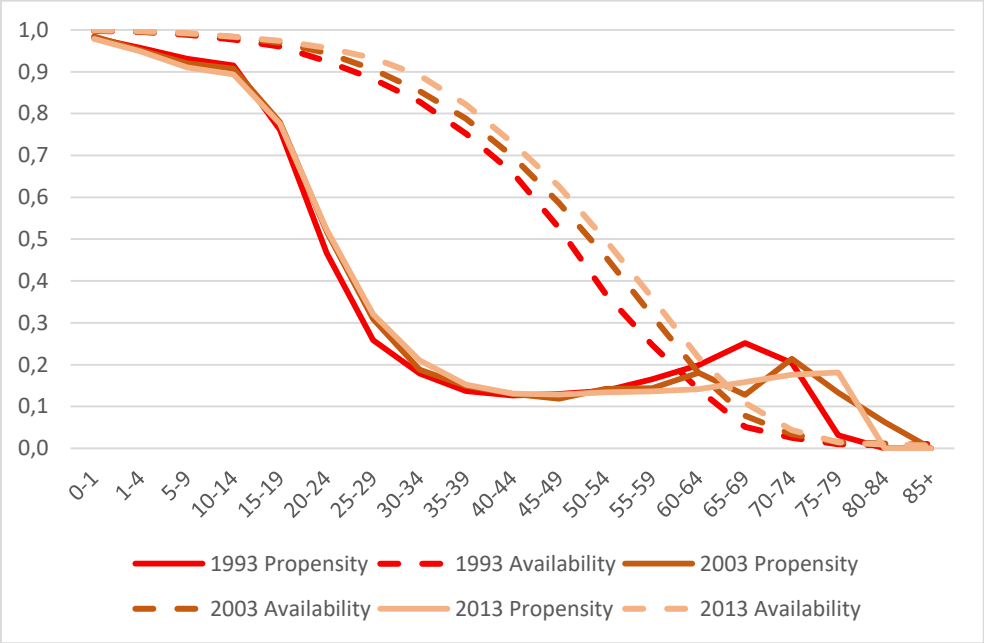
Following Ruggles' analysis, we estimate the availability of mothers as the proportion of people with a surviving mother by age. The complement of the total proportion by age is simply the propensity to coreside with mothers. Therefore, everything that isn't the mothers' survival is considered part of the propensity (or the "force") for coresidence. Figure 27 and 28 show the measures of propensity and availability for men and women in the years 1993, 2003 and 2013:

FIGURE 27 - Availability of mothers and propensity to coreside with mothers, by age groups, men, Brazil, 1993, 2003, 2013



Source: IBGE, PNAD, 1993, 2003, 2013.

FIGURE 28 - Availability of mothers and propensity to coreside with mothers, by age groups, women, Brazil, 1993, 2003, 2013



Source: IBGE, PNAD, 1993, 2003, 2013.

Both the propensity of coresidence and the availability of mothers increased between 1993 and 2013 in Brazil, although the variation in availability appears to be larger. The patterns of availability by sex are similar, which is not surprising assuming that the survival status of mothers are independent of the child's sex. Therefore, the sex differences in the proportions of coresidence that we stressed before (higher among men between ages 15 and 35) are due to sex differences in the propensity to coreside with mothers. In addition, during childhood, Figure 27 and 28 show that there are no differences in the propensity of coresidence between men and women, probably because the decisions of coresidence at these ages aren't made by the children.

Table 7 and 8 present, in detail, the decomposition of the age-specific proportions of coresidence by sex between 1993 and 2013:

TABLE 7 - Decomposition of the changes in the proportion of persons residing with mothers between propensity and availability, men, Brazil, 1993, 2013

Age group	1993			2013			1993-2013 variation in coresidence	Variation explained by propensity	Variation explained by availability
	Propensity	Availability	Coresidence	Propensity	Availability	Coresidence			
0-1	0,982	0,999	0,981	0,982	0,999	0,981	0,000	0,000	0,000
1-4	0,956	0,995	0,951	0,951	0,997	0,948	-0,003	-0,005	0,001
5-9	0,932	0,989	0,922	0,908	0,992	0,901	-0,024	-0,026	0,003
10-14	0,923	0,978	0,903	0,885	0,985	0,871	-0,034	-0,042	0,007
15-19	0,879	0,961	0,845	0,835	0,974	0,813	-0,037	-0,051	0,014
20-24	0,653	0,932	0,609	0,655	0,964	0,631	0,037	0,003	0,034
25-29	0,370	0,888	0,329	0,433	0,936	0,405	0,232	0,179	0,053
30-34	0,205	0,839	0,172	0,273	0,894	0,244	0,421	0,357	0,065
35-39	0,134	0,765	0,103	0,184	0,835	0,154	0,497	0,405	0,092
40-44	0,111	0,667	0,074	0,158	0,740	0,117	0,583	0,473	0,110
45-49	0,099	0,538	0,053	0,132	0,637	0,084	0,579	0,396	0,184
50-54	0,096	0,395	0,038	0,131	0,521	0,068	0,800	0,483	0,317
55-59	0,088	0,257	0,023	0,095	0,375	0,036	0,584	0,122	0,462
60-64	0,092	0,141	0,013	0,096	0,230	0,022	0,713	0,086	0,627
65-69	0,138	0,069	0,010	0,086	0,119	0,010	0,062	-0,650	0,712
70-74	0,136	0,032	0,004	0,069	0,045	0,003	-0,296	-0,688	0,392
75-79	0,000	0,016	0,000	0,059	0,023	0,001	0,000	0,000	0,000
80-84	0,000	0,006	0,000	0,000	0,008	0,000	0,000	0,000	0,000
85+	0,000	0,010	0,000	0,000	0,009	0,000	0,000	0,000	0,000

Source: IBGE, PNAD, 1993, 2013.

TABLE 8 - Decomposition of the changes in the proportion of persons residing with mothers between propensity and availability, women, Brazil, 1993, 2013

Age group	1993			2013			1993-2013 variation in coresidence	Variation explained by propensity	Variation explained by availability
	Propensity	Availability	Coresidence	Propensity	Availability	Coresidence			
0-1	0,981	0,998	0,979	0,979	0,999	0,978	-0,001	-0,002	0,001
1-4	0,957	0,995	0,953	0,949	0,997	0,946	-0,007	-0,009	0,002
5-9	0,931	0,989	0,920	0,911	0,992	0,903	-0,018	-0,022	0,004
10-14	0,915	0,977	0,894	0,894	0,984	0,879	-0,016	-0,023	0,007
15-19	0,761	0,961	0,731	0,776	0,974	0,756	0,034	0,020	0,014
20-24	0,467	0,925	0,432	0,523	0,957	0,500	0,158	0,123	0,034
25-29	0,259	0,883	0,228	0,320	0,932	0,299	0,308	0,252	0,056
30-34	0,179	0,829	0,148	0,210	0,891	0,187	0,263	0,188	0,075
35-39	0,137	0,752	0,103	0,153	0,822	0,125	0,221	0,128	0,093
40-44	0,126	0,659	0,083	0,131	0,730	0,096	0,151	0,043	0,108
45-49	0,130	0,527	0,068	0,129	0,626	0,080	0,174	-0,014	0,188
50-54	0,138	0,370	0,051	0,134	0,498	0,067	0,313	-0,035	0,348
55-59	0,165	0,247	0,041	0,137	0,359	0,049	0,202	-0,252	0,454
60-64	0,199	0,141	0,028	0,142	0,217	0,031	0,096	-0,442	0,537
65-69	0,252	0,051	0,013	0,158	0,108	0,017	0,332	-0,789	1,120
70-74	0,204	0,025	0,005	0,176	0,044	0,008	0,492	-0,236	0,728
75-79	0,031	0,010	0,000	0,181	0,014	0,003	7,041	6,644	0,397
80-84	0,000	0,007	0,000	0,000	0,009	0,000	0,000	0,000	0,000
85+	0,000	0,010	0,000	0,000	0,007	0,000	0,000	0,000	0,000

Source: IBGE, PNAD, 1993, 2013.

The column “1993-2013 variation in coresidence” of tables 7 and 8 shows the variation of the proportion of people in coresidence (“Coresidence” column) between 1993 and 2013. The last two columns show how much of the variation in the proportion of people residing with mothers, between 1993 and 2013, is explained by propensity or availability measures. The component with the biggest impact is in red, either if it has positive (increase) or negative value (reduction).

The tables show that the variation in propensity was negative at youngest ages, being only partly compensated by higher availability of mothers. Therefore, the decline in the proportion of young people residing with mothers until age 20 is mostly because of a stronger force not to coreside. Eventually, the variation in the propensity to reside with mothers becomes positive (late childhood or early adulthood). That, coupled with the increase in availability of mothers, which grows with age, results in an increase of the proportion of coresidence.

This means that the demographic effect of higher survival of mothers is preventing the proportion of coresidence from decreasing even more during childhood and helping it to increase at older ages. The propensity effect, however, is the most important factor for the increase in coresidence.

Comparing the results for men and women, the major differences are in the variation of propensity. Among men, the variation in propensity was negative until the age group 15-20, but for women, it was negative only up to ages 10-15. As it was presented in the proportion of persons residing with own mother by sex (Figure 3, chapter 4), men’s duration of coresidence is longer than women’s. Therefore, the fact that the propensity of coresidence with mothers for men is negative until later in life than for women shouldn’t be an indicative of a reduction of the age at leaving the mother’s house for men. What this could mean is that the propensity to live with other relatives, such as a father, grew for men between 1993 and 2013 and it is higher for men than for women.

The variation in propensity was negative also at some adult ages. For men, this pattern happens at ages 65-70, and for women it happens earlier, at ages 45-50. A possible explanation for this difference between the sexes is the growing independency of the elderly parents, who are now choosing to live alone instead

of residing with children. Considering that the great majority of caretakers are daughters, the increase in the prevalence of elderly living alone could explain the larger decline in propensity among women. Yet, the increase in availability of mothers compensates negative changes in propensity, leading to the growth in coresidence at these ages.

We should remember that contrary to the proportion of coresidence with mothers, coresidence with fathers did not increased over the last decades. This may be due to the responsibility of family and household care that women carry. With the rise in divorce and the prevalence of single-parent households, children tend to stay with their mothers.

In conclusion, the results of this decomposition show that the main factor influencing coresidence with mothers is the change in propensity to coreside, not the survival gains among mothers. These results reinforce the hypothesis that young adults have delayed their entry into adulthood by choosing to stay longer with their mothers, although the larger availability of mothers and also changes in individual's survival affected the time trends. This may very well be connected to the results of chapter 5 and to what was discussed in chapter 2: people are living longer and therefore plan their life course differently. With the extension of the life cycle, having 18 years now doesn't mean the same as having 18 years 50 years ago. The socioeconomic changes that accompanied the demographic transition have allowed, and even required, that a person obtain more formal education before they find a good job or start a new family. This leads to people extending their time spent at a parent's house.

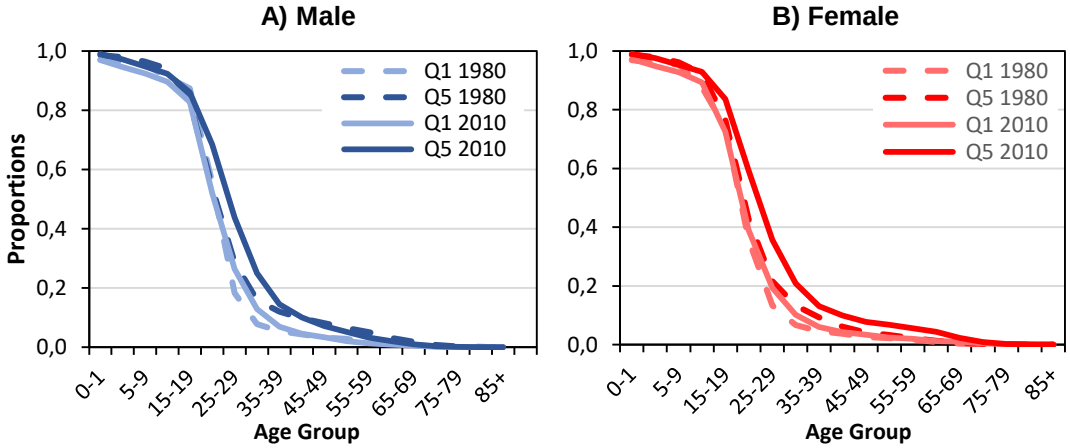
6.3. Socioeconomic status differences

Another important determinant of coresidence is socioeconomic status (SES), since it is associated with life expectancy, age at marriage and access to the job market. It is possible, then, that this increase in coresidence with mothers is only happening to a certain subgroup of the population. One hypothesis is that the difficulty of entering the job market and of getting financial independency would lead low SES young adults (the poorest) to reside with their parents for a long period. On the other hand, high SES young adults (the wealthiest) are able to

delay financial independency and marriage by staying longer in school, as Santos (2018) has shown in an earlier study.

Here, we use quintiles of household income per capita as a proxy for SES. We focus on the estimates for the first and fifth quintiles for the sake of better visualization[10]. Figure 29 confirms that the proportion of people residing with mothers changed mostly for the group in the fifth quintile. It has barely changed for the group in the first quintile. An analysis of all five quintiles (not shown here) shows that the higher the quintile, the greatest the increase in the proportion of coresidence between 1980 and 2010.

FIGURE 29 - Proportion of persons residing with mother by sex and household income per capita quintiles, Brazil, 1980 and 2010



Source: IPUMS; IBGE, Demographic Census, 1980 and 2010.

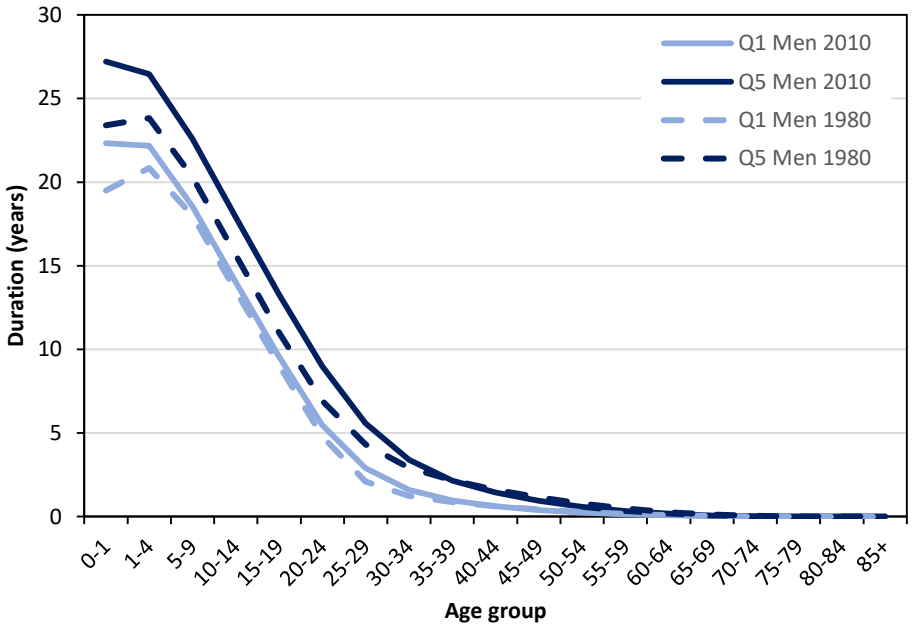
As we discussed previously, despite the increase in the proportion of the population residing with own mother, it declined at the younger ages between 1960 to 2010. The estimates by income quintiles show that in 2010, children from lower quintiles presented a much lower proportion of coresidence with parents than children from higher quintiles. This indicates that the decrease in coresidence with parents at early ages of the life cycle is due to changes involving people in the lower quintiles.

The mean duration of coresidence is presented in Figures 30 and 31. Because both the age-specific proportion of coresidence and life expectancy are higher for the subgroup in the wealthiest quintile, the mean duration of coresidence is longer

[10] Full data presented in the annex.

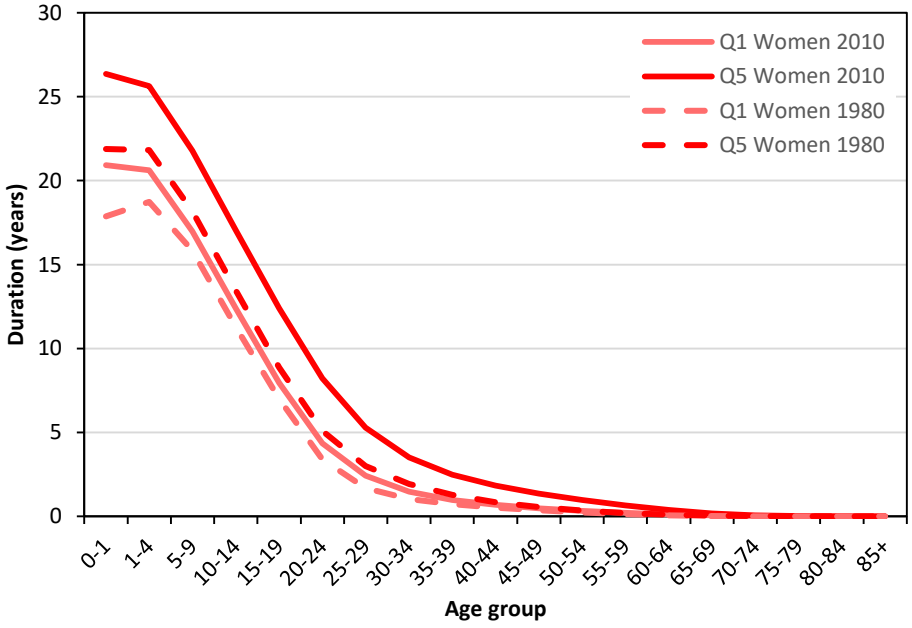
for them than for the poorest subgroup. This is true for both men and women. In addition, mean duration is higher for men than for women in all quintiles, but the differences between the sexes are decreasing over time, especially for the fifth quintile.

FIGURE 30 - Mean duration of coresidence with own mother by household income per capita quintile, men, Brazil, 1980 and 2010



Source: IPUMS; IBGE, Demographic Census, 1960 and 2010.

FIGURE 31 - Mean duration of coresidence with own mother by household income per capita quintile, women, Brazil, 1980 and 2010



Source: IPUMS; IBGE, Demographic Census, 1960 and 2010.

From 1980 to 2010, the mean duration of coresidence with mothers for the first quintile barely increased, except for the youngest ages, which is related to the decline in infant mortality. The increase in duration over time is much more noticeable for the fifth quintile.

Comparing these graphs to the ones presented in the previous chapter, we conclude that longer duration in coresidence with mothers is most likely due to changes that occurred among the wealthiest groups of the population. Therefore, when talking about how teenagers are postponing the transition to adulthood, one should remember to consider socioeconomic differences.

7. FINAL DISCUSSION AND CONCLUSIONS

This research was initially inspired by the literature on young people delaying the transition into adulthood by living longer with their parents. This has led to interest in how coresidence with relatives in the different phases of the life cycle may be changing and what could be causing these changes.

With that in mind, the main objectives of this dissertation were to estimate the changes in the average duration of coresidence with different types of relatives in Brazil throughout the life cycle. During the course of this research, it became clear that the time spent coresiding with different types of relatives presented different age and sex patterns that warranted further analysis. The coresidence with mothers, specifically, seemed to be different from the rest.

By utilizing a modification of the Wolfbein (1949) and Sullivan (1971) methods for calculating active and healthy life expectancy respectively, the mean duration of coresidence with different types of relatives was calculated, and the results were presented in chapter 5. An important result of this research was that, while the duration of coresidence with relatives grew in Brazil between 1960 and 2010, it was being affected not only by the proportion of the time lived in coresidence, but also by total time available for coresidence, meaning, the total life expectancy. Therefore, the results showed that this growth in the duration of coresidence was mostly due to an increase in life expectancy, as the age-sex profiles of coresidence were actually contributing to a decrease of this duration.

In summary, the results showed that between 1960 and 2010, the total time spent in coresidence increased for all phases of the life cycle due to increases in the duration of coresidence with different types of relatives. For mothers, fathers and spouses, duration of coresidence grew for both men and women, although it was higher for men. Duration of coresidence with own children grew for women but decreased for men and duration of coresidence with other relatives decreased for both men and women.

The results highlight important differences in the coresidence patterns of women and men. During childhood, women spend less time in coresidence with their

parents than men, but during adulthood, they spend more time with their children. In addition, although women marry earlier, they spent less time residing with their spouses than men, as they tend to outlive their husbands or stay divorced for longer. The amount of time lived coresiding with other types of relatives and with relatives in general is greater for women than men.

Specifically, for the coresidence with a spouse, the results highlight the importance of an analysis by sex. In this present research, the focus wasn't on this particular type of coresidence, but future research may look further into this different pattern of coresidence with a spouse by sex, as there seems to be much to be uncovered in this regard.

The calculations of expected time lived in coresidence at birth are relevant because they present a simple, comparable measure of coresidence similar to a life expectancy at birth. At the same time, the age-specific measures of coresidence can be used to understand how the pattern of a specific type of coresidence changes throughout one's life.

Here, it is important to emphasize the distinction between an increase in the proportion of time spent in coresidence and an increase in total time spent in coresidence. The first is connected to changes to coresidence habits, meaning that people are spending more of their life in coresidence, either because they chose to or because they have to. The second is connected to a lengthening of the life cycle. People may be living longer, having more years available to them for coresidence, but doesn't necessarily mean they'll spend more of this total time in coresidence.

When the literature discusses how people are taking longer to leave their parents' houses or marrying later in life, it alludes to a change in coresidence habits. However, the results show that coresidence in itself is going opposite to the expected direction. The age-sex profiles of coresidence were, in most cases, contributing to a reduction of coresidence. The duration of coresidence, however, is increasing for coresidence with most types of relatives. This was explained in the results by the increase in total life expectancy that led to the stretching of the phases of the life cycle. People are living longer, which means that even when

the proportion of the time spent in coresidence decreases, this is compensated by an increase of the total lime lived in coresidence.

So, while it is correct to say that people are delaying entry into adulthood by taking longer to leave their parents' houses, it is important to keep in mind that this is not because the youth of today is necessarily running away from the responsibilities of adulthood, as the subject seems to be discussed when brought up in news articles. This delaying is much more connected to the fact that a longer life expectancy leads to an adjustment of the transitional ages, so that the proportion of time spent in each life cycle phase stays somewhat constant.

Another important finding in this dissertation was the different behavior of the coresidence with mothers. Of the types of coresidence analyzed, the coresidence with mothers was the only one were both changes to life expectancy and to the proportion of persons in coresidence were contributing positively to increase the life expectancy of coresidence. Chapter 6 decomposed the rate of coresidence with mothers between propensity to coreside with mothers and availability of mothers for coresidence. The results showed that propensity is acting as a negative force for coresidence during childhood, which explains the reduction in coresidence at these ages for the years analyzed. During adult age, the propensity becomes positive and, alongside the positive force of availability of mothers, it leads to an increase in coresidence. Later in life, the propensity returns to having a negative effect, as expected, although this reversal happens earlier in life for women. The results also show differences of duration of coresidence by SES, concluding that the longer duration of coresidence with mothers is most likely due to changes that occurred among the wealthiest groups of the population.

The results point to the importance of considering demographic factors separated from non-demographic ones. In the literature on changes to household structure and coresidence, much attention is brought to the socioeconomic and cultural factors that may be affecting coresidence, and not enough credit is given to the demographic ones. As Ruggles (1986, 1993, 1994) and DeVos & Palloni (1989) point out, mortality, fertility and nuptiality are central to determining household structure, directly and indirectly.

One limitation of separating coresidence between propensity and availability is that it is not possible to clearly know what are the drivers of changes to propensity, as propensity is only seen as a complement to the availability. That includes everything that isn't the change in the survival of the relative, but that can mean a multiplicity of factors. Therefore, a future research could look into disaggregating propensity to coreside, based on what is seen in the literature as socioeconomic and cultural drivers of coresidence.

This research also presented other important limitations that lay the ground for future research. Some are due to the data available, such as period information being used to calculate life cycle measures. Comparing the results to the ones from pseudo-cohorts shows that the period data was a good proxy, but this analysis could have been much more detailed with actual life cycle data.

Something that wasn't tested here, but is also important to keep in mind, is that coresidence can also affect life expectancy. People that leave their parents' houses too early may be exposed to poor conditions that may affect their health and well-being. The same can be said for older people that don't have any familial support. With the data available, however, it wasn't possible to measure this here.

In the same vein, the SES differences presented here were very limited due to the data available and the method used. For a better assessment of differences in time of coresidence by SES, more accurate life tables by SES would be necessary.

Another limitation was the lack of a spatial analysis of coresidence differences. Brazil is a very diverse country and a more in-depth analysis would probably uncover many interesting nuances of coresidence. This is something that can be done in future research.

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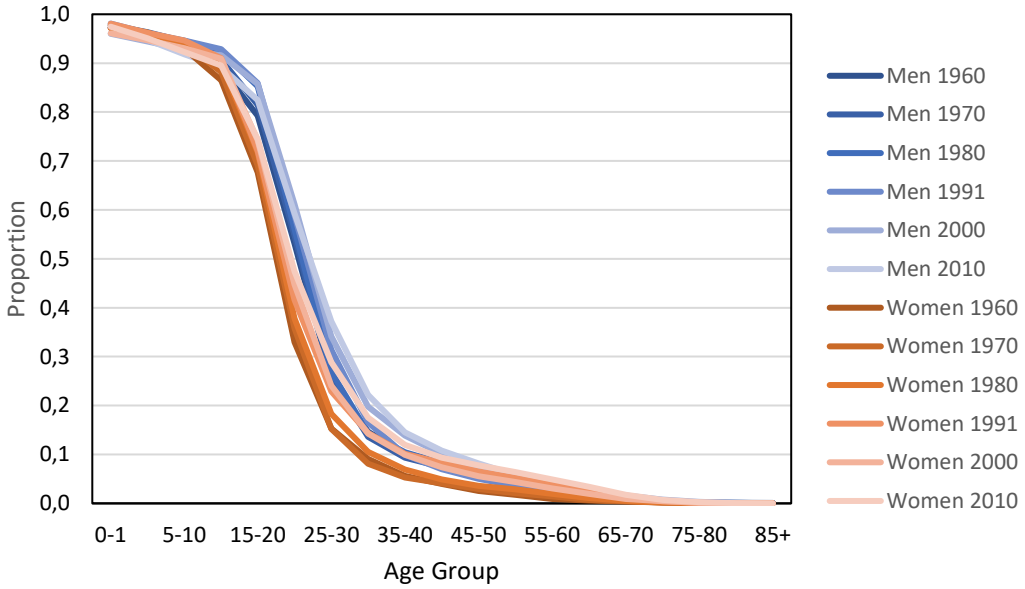
9. Annex

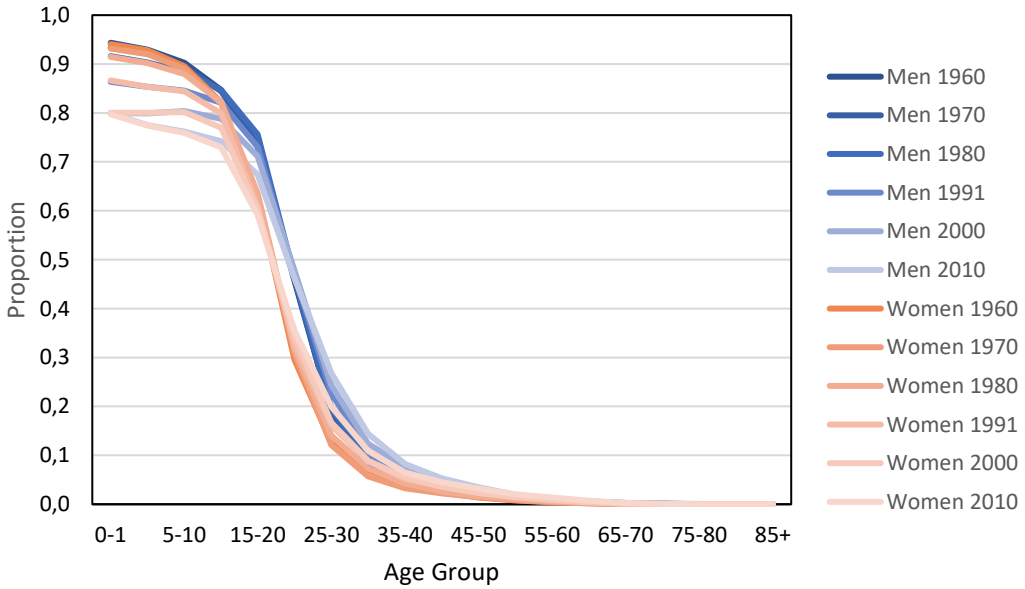
9.1. Proportion of persons in coresidence with relatives by sex and age group, for the censuses of 1960, 1970, 1980, 1991, 2000 and 2010

FIGURE A1 - Proportion of persons residing with own mother, by age and sex, Brazil, 1960-2010



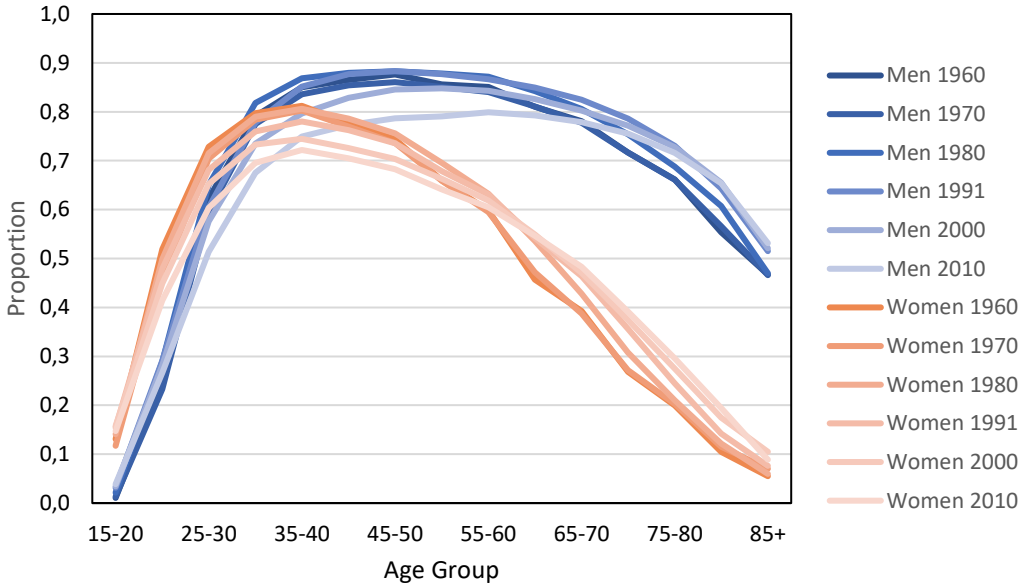
Source: IPUMS; IBGE, Demographic Census, 1960-2010.

FIGURE A2 - Proportion of persons residing with own father, by age and sex, Brazil, 1960-2010



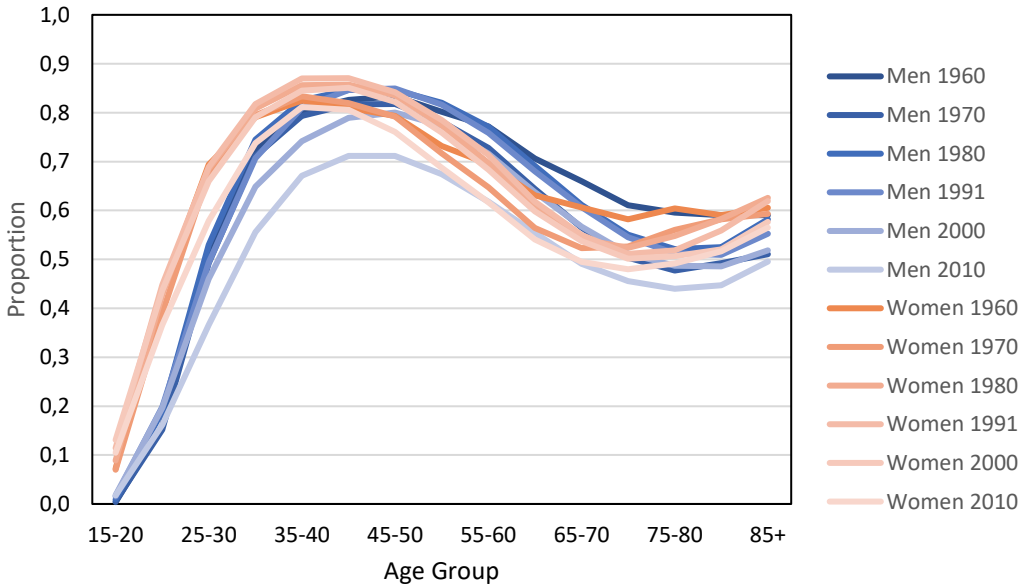
Source: IPUMS; IBGE, Demographic Census, 1960-2010.

FIGURE A3 - Proportion of persons residing with own spouse, by age and sex, Brazil, 1960-2010



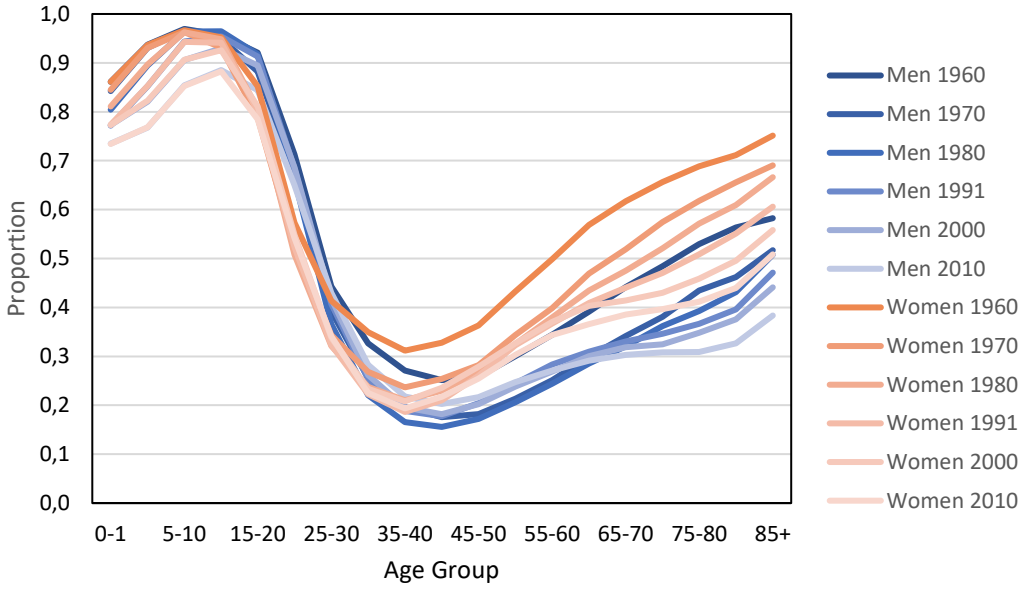
Source: IPUMS; IBGE, Demographic Census, 1960-2010.

FIGURE A4 - Proportion of persons residing with at least one own child, by age and sex, Brazil, 1960-2010



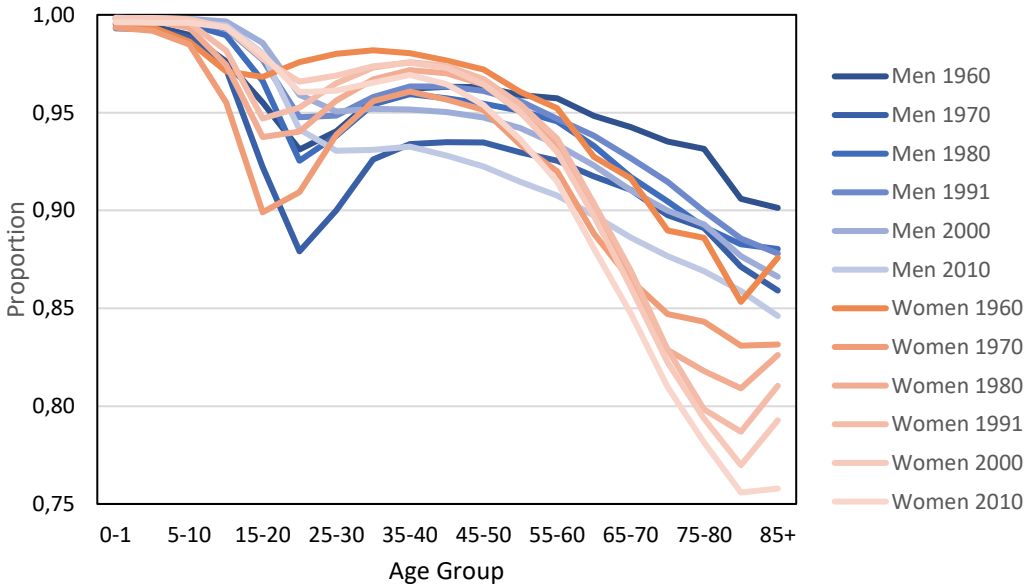
Source: IPUMS; IBGE, Demographic Census, 1960-2010.

FIGURE A5 - Proportion of persons residing with other relatives, by age and sex, Brazil, 1960-2010



Source: IPUMS; IBGE, Demographic Census, 1960-2010.

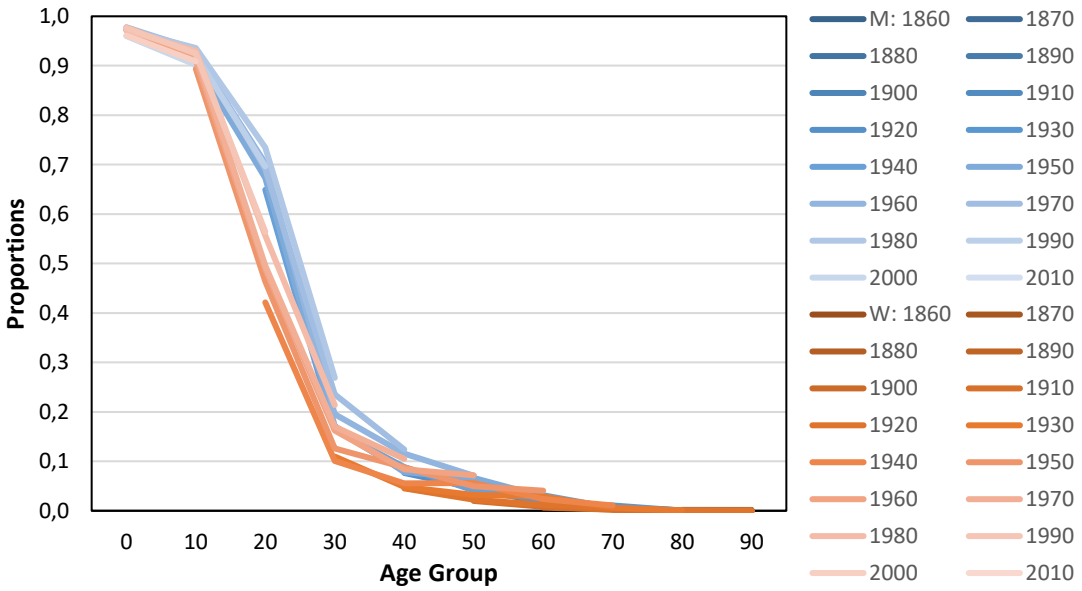
FIGURE A6 - Proportion of persons residing with at least one relative, by age and sex, Brazil, Brazil, by sex and age group, 1960-2010



Source: IPUMS; IBGE, Demographic Census, 1960-2010.

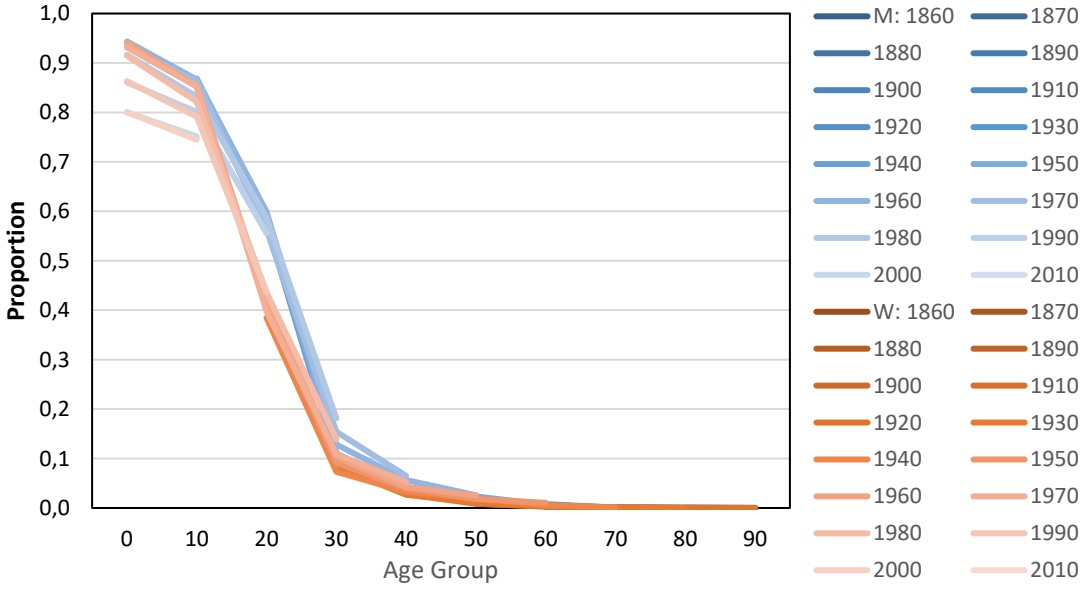
9.2. Proportion of persons in coresidence with relatives by birth cohort, sex and age group, for the censuses of 1960, 1970, 1980, 1991, 2000 and 2010

FIGURE A7 - Proportion of persons residing with own mother, by age, sex and birth cohort, Brazil, 1960-2010



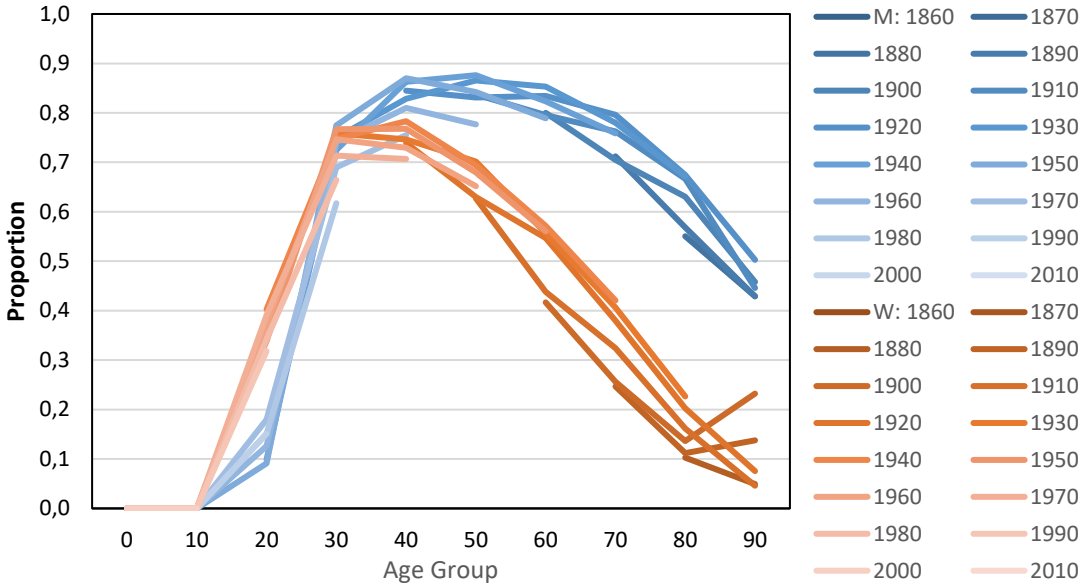
Source: IPUMS; IBGE, Demographic Census, 1960-2010.

FIGURE A8 - Proportion of persons residing with own father, by age, sex and birth cohort, 1960-2010



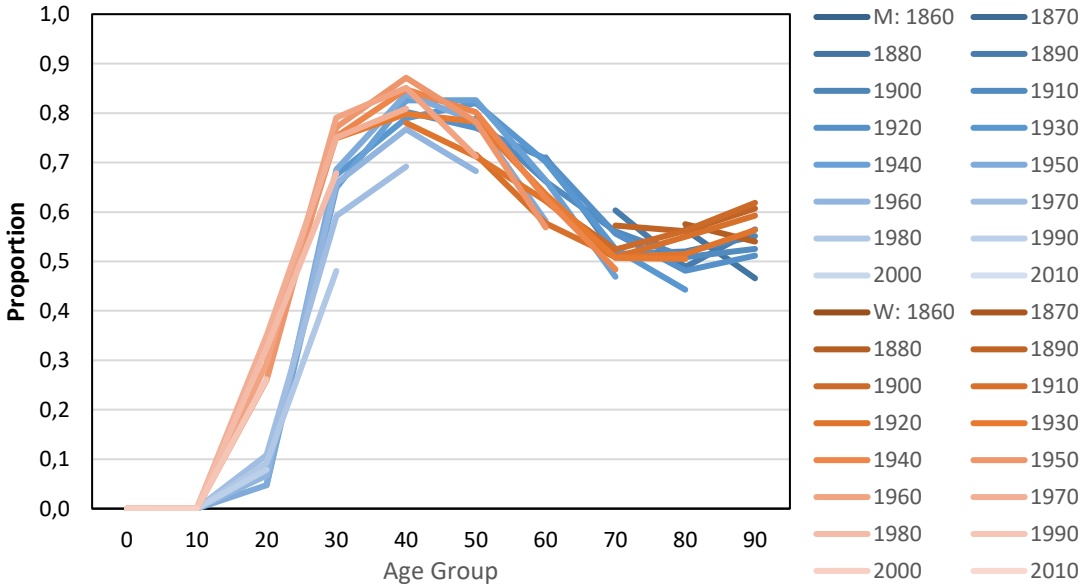
Source: IPUMS; IBGE, Demographic Census, 1960-2010.

FIGURE A9 - Proportion of persons residing with own spouse, by age, sex and birth cohort, 1960-2010



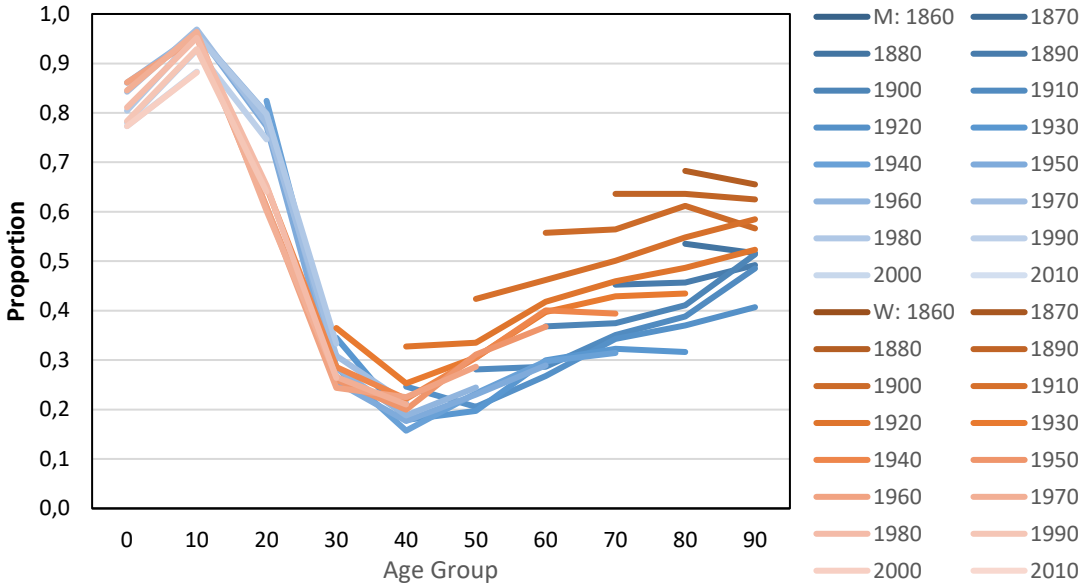
Source: IPUMS; IBGE, Demographic Census, 1960-2010.

FIGURE A10 - Proportion of persons residing with at least one own child, by age, sex and birth cohort, 1960-2010



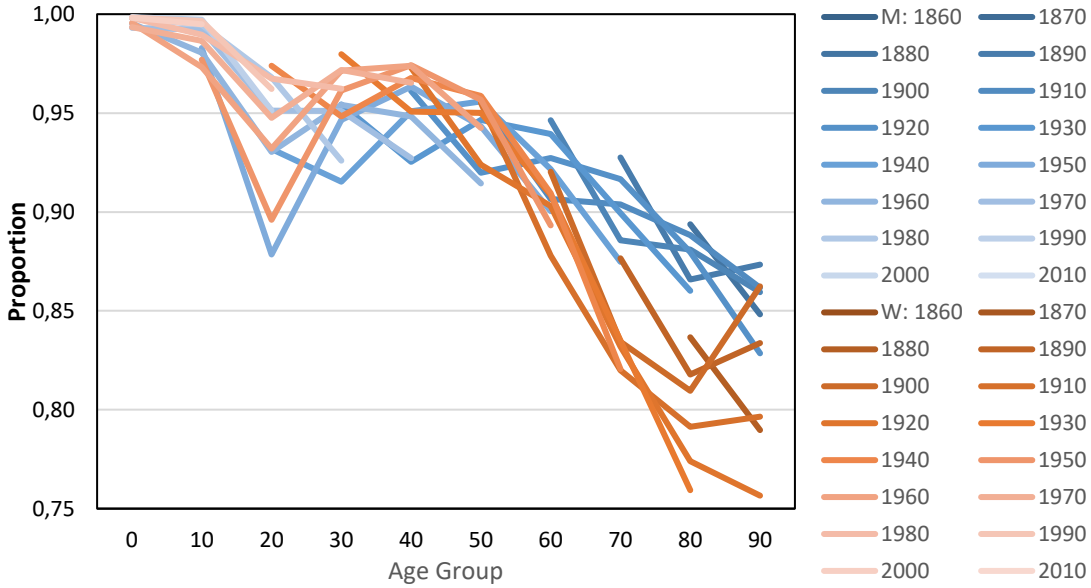
Source: IPUMS; IBGE, Demographic Census, 1960-2010.

FIGURE A11 - Proportion of persons residing with other relatives, by age, sex and birth cohort, 1960-2010



Source: IPUMS; IBGE, Demographic Census, 1960-2010.

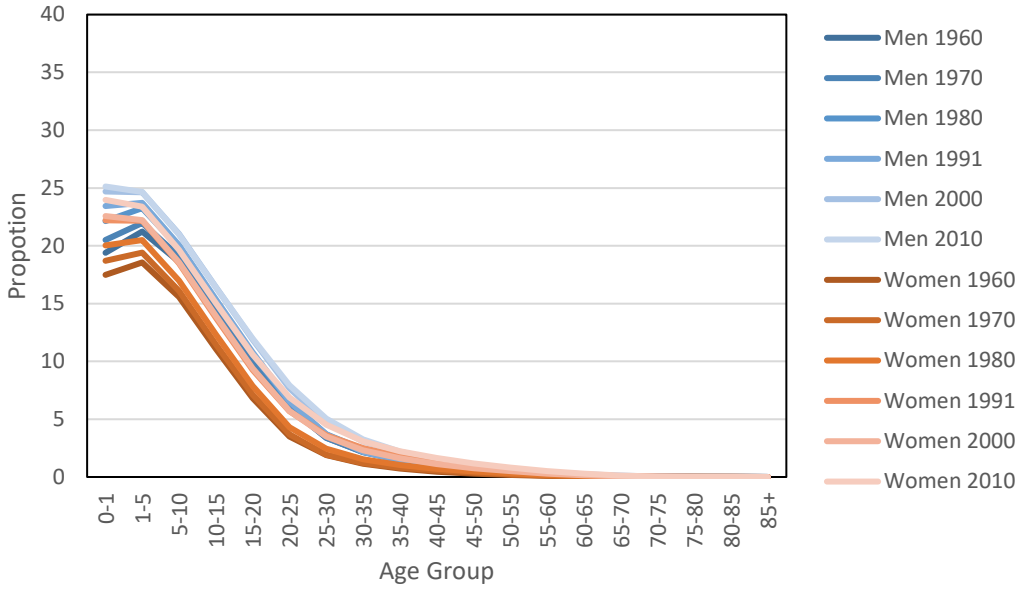
FIGURE A12 - Proportion of persons residing with at least one relative, by age, sex and birth cohort, 1960-2010



Source: IPUMS; IBGE, Demographic Census, 1960-2010.

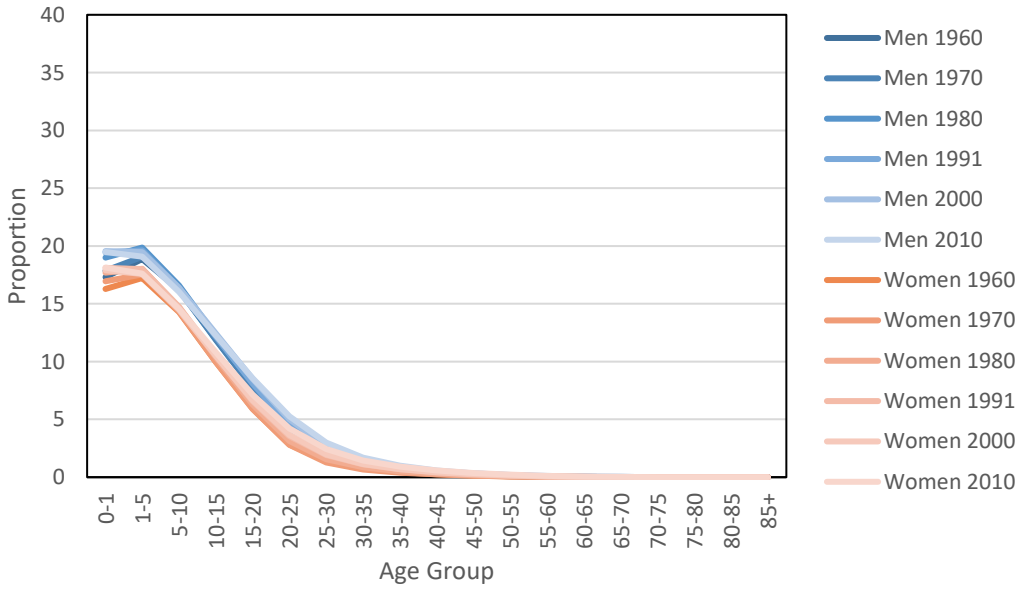
9.3. Mean duration of coresidence with relatives by age group and sex, for the censuses of 1960, 1970, 1980, 1991, 2000 and 2010

FIGURE A13 - Mean duration of coresidence with own mother, by age and sex, Brazil, 1960-2010



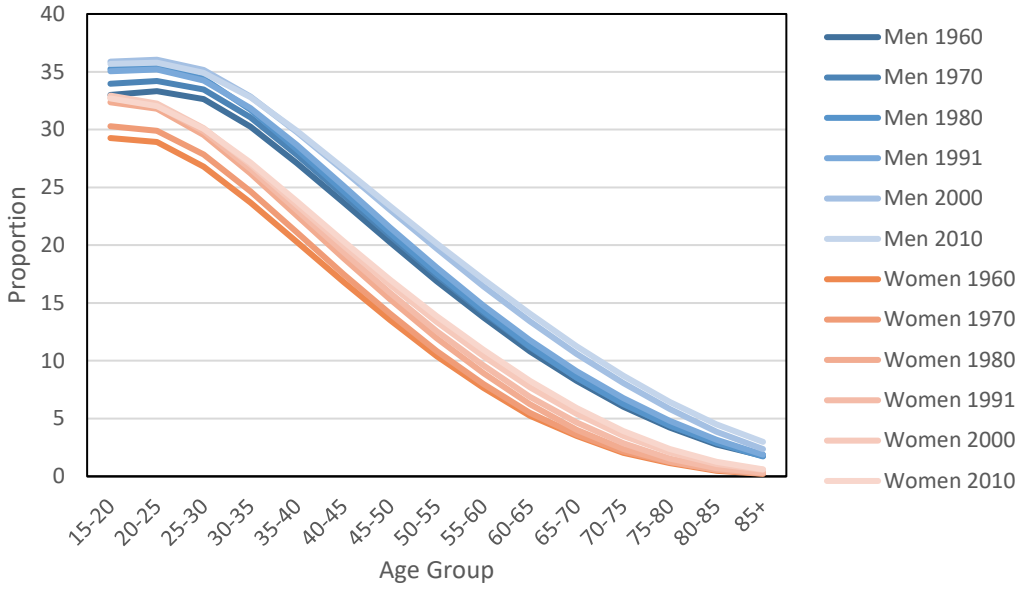
Source: IPUMS; IBGE, Demographic Census, 1960-2010.

FIGURE A14 - Mean duration of coresidence with own father, by age and sex, 1960-2010



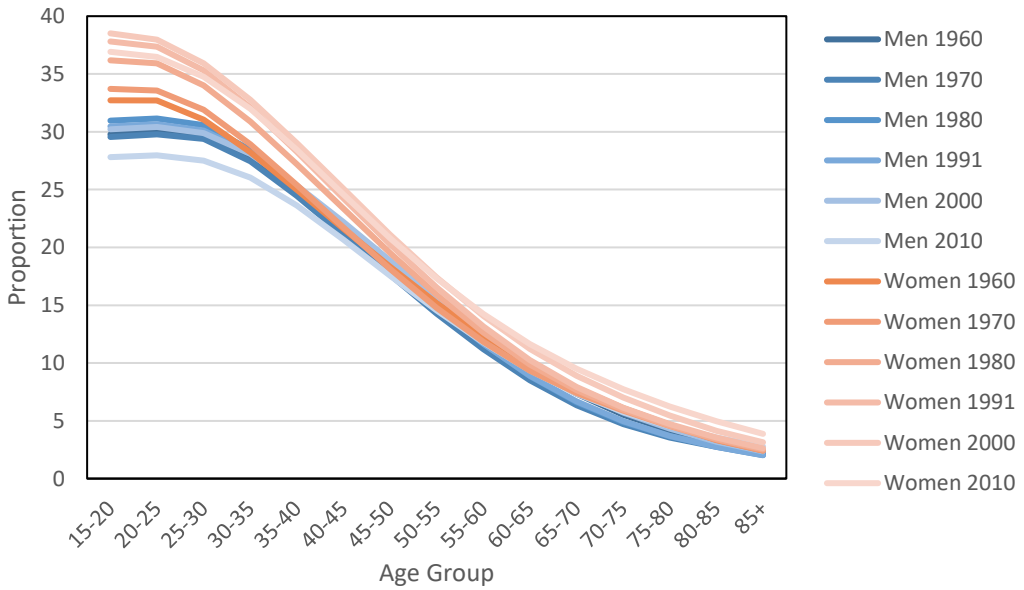
Source: IPUMS; IBGE, Demographic Census, 1960-2010.

FIGURE A15 - Mean duration of coresidence with own spouse, by age and sex, 1960-2010



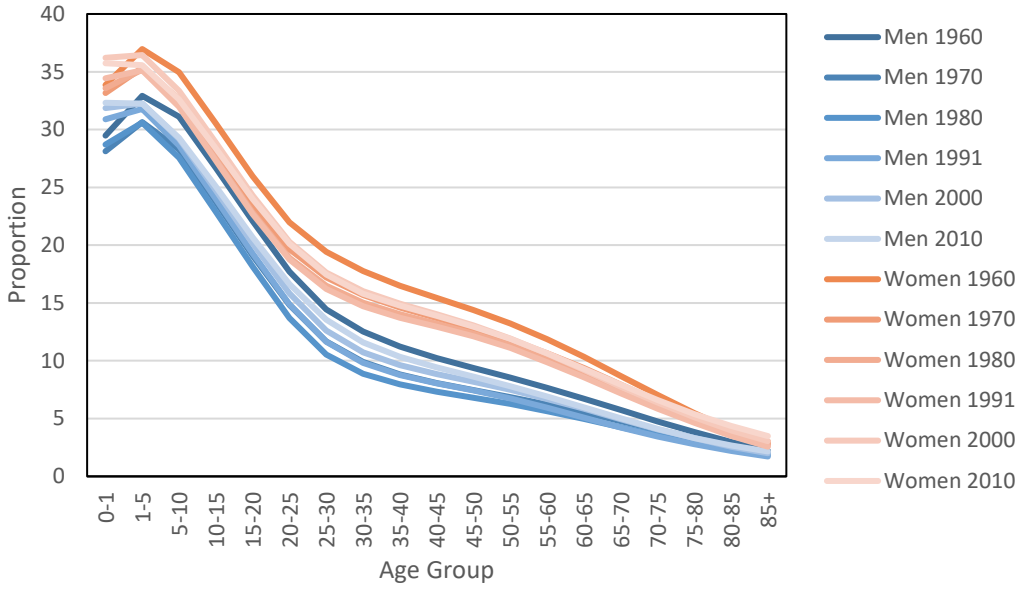
Source: IPUMS; IBGE, Demographic Census, 1960-2010.

FIGURE A16 - Mean duration of coresidence with at least one own child, by age and sex, Brazil, 1960-2010



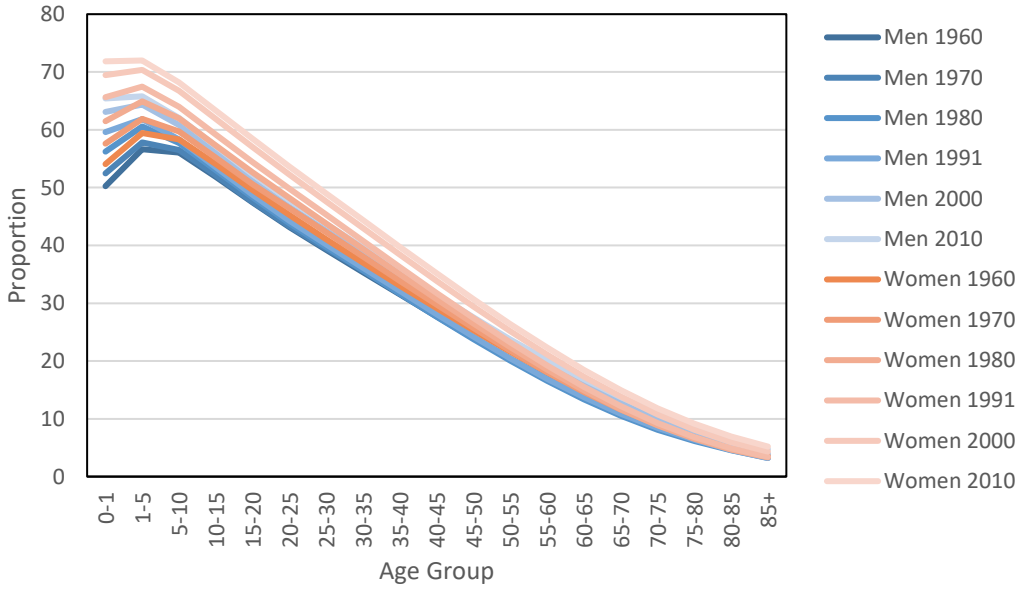
Source: IPUMS; IBGE, Demographic Census, 1960-2010.

FIGURE A17 - Mean duration of coresidence with other relatives, by age and sex, Brazil, 1960-2010



Source: IPUMS; IBGE, Demographic Census, 1960-2010.

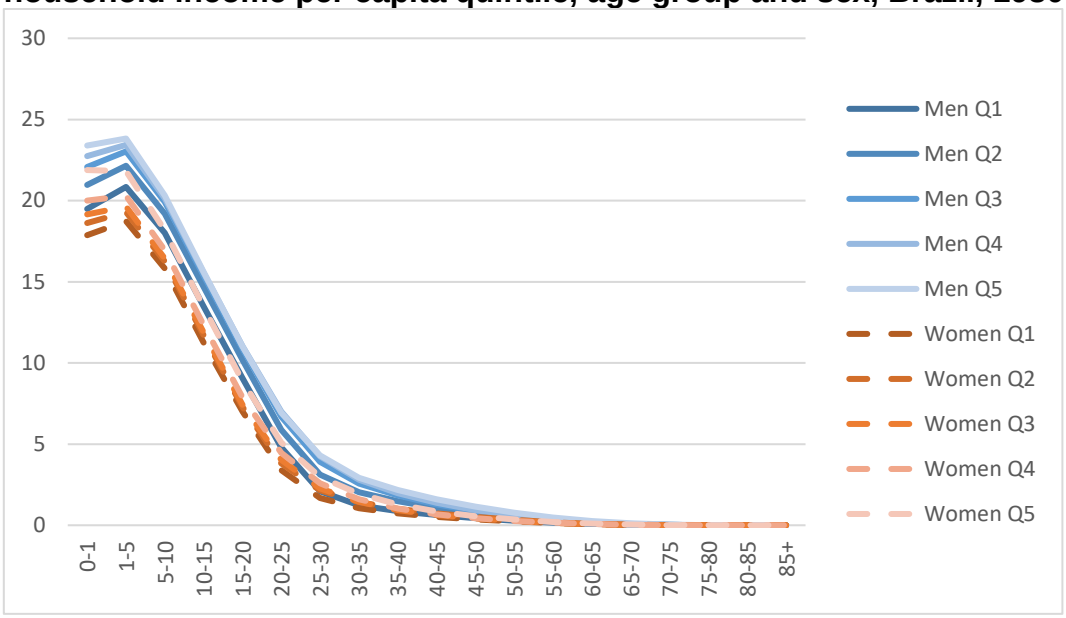
FIGURE A18 - Mean duration of coresidence with any relative, by age and sex, Brazil, 1960-2010



Source: IPUMS; IBGE, Demographic Census, 1960-2010.

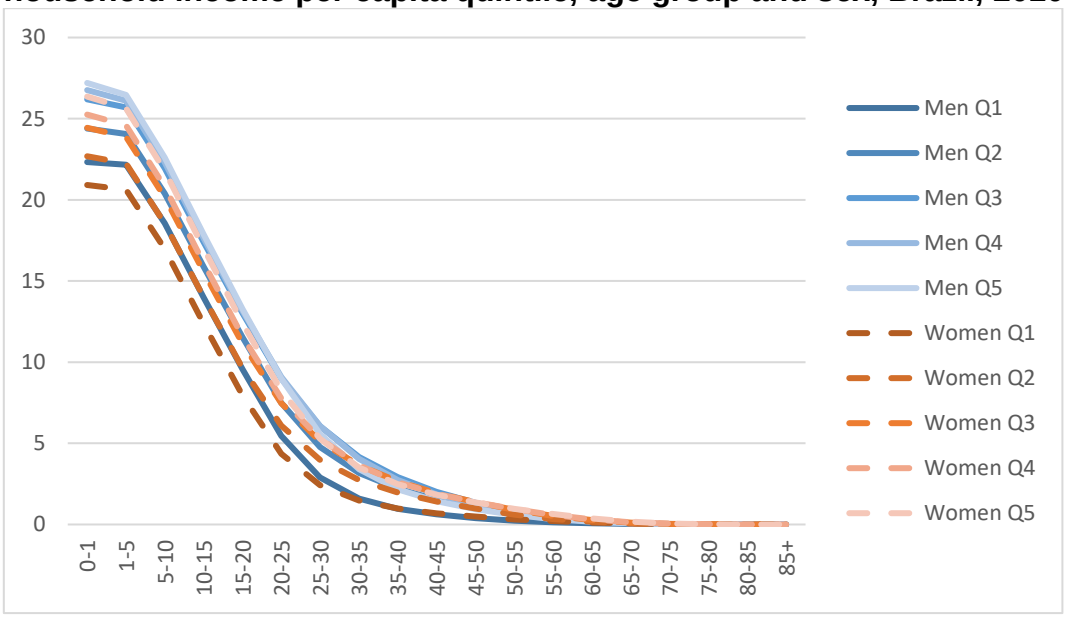
9.4. Mean duration of coresidence with relatives by household income per capita quintile, by age group and sex, for the censuses of 1980 and 2010

FIGURE A19 – Mean duration of coresidence with own mothers, by household income per capita quintile, age group and sex, Brazil, 1980



Source: IPUMS; IBGE, Demographic Census, 1960-2010.

FIGURE A20 – Mean duration of coresidence with own mothers, by household income per capita quintile, age group and sex, Brazil, 2010



Source: IPUMS; IBGE, Demographic Census, 1960-2010.