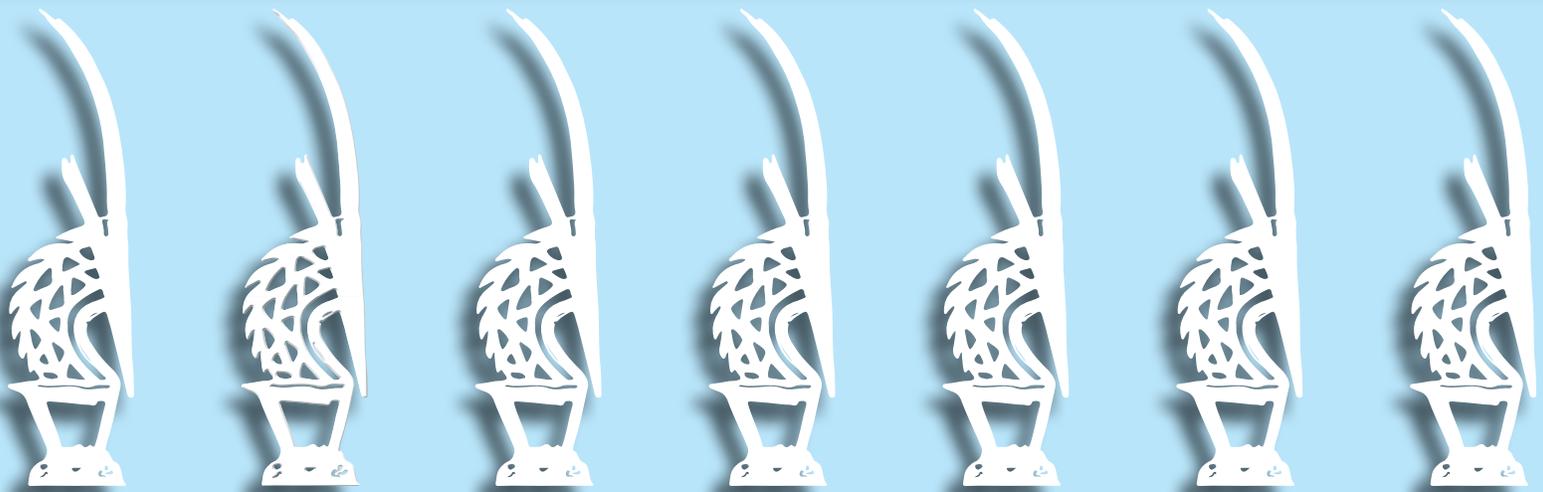


Household Structure and Healthcare Seeking Behaviour in Mali

Further Analysis of the Mali Demographic and Health Survey 2018



DHS Further Analysis Reports No. 133

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Further Analysis of the Mali Demographic and Health Survey 2018

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EXECUTIVE SUMMARY

This paper is one of the Further Analysis Reports that use data from the Demographic and Health Surveys conducted in Mali. This report is based exclusively on the 2018 survey. The research question is whether healthcare seeking, by women age 15-49 and on behalf of children age 0-4, varies according to aspects of household structure.

Three indicators of healthcare seeking behaviour are used for women and three for children. The indicators for women include whether (1) the woman has had an HIV test; (2) she had four or more antenatal care visits for her most recent birth, and (3) her most recent birth was in a facility. The indicators for children include whether (1) the child received postnatal care, (2) the child was taken for treatment if the child had diarrhoea in the past 2 weeks, and (3) the child was taken for treatment if the child had a fever in the past 2 weeks.

Several indicators of household structure are included. The first is a simple distinction between nuclear and extended households. By definition, a nuclear household consists solely of persons who are classified as the head, spouse of head, or child of head. A household that includes any *de jure* members with a different relationship to the head is an extended household. About one-third of households in the 2018 survey are extended. Such households are more common in urban rather than rural areas. About 26% of children in rural areas and about 47% of children in urban areas live in an extended household. For women, the percentages are 33% and 54%.

Healthcare seeking tends to be greater in extended households, for both women and children. This effect appears to be due to the presence of more adults in the extended households, who are able to substitute for one another with child care and other responsibilities when a woman is temporarily away from home for her own healthcare or that of a child.

Three indicators of the household head are included: sex, age (in broad categories), and education. Since the proportion of adults with secondary or more schooling is small in Mali, the schooling indicator is simply if the head has some schooling at any level, or does not. The most pronounced effect is related to this indicator. If the household head has any schooling, healthcare seeking tends to be greater than if the head has no schooling. The age of the head is beneficial for age 45 and over, compared to younger ages. A male household head is beneficial for most outcomes, but not for all.

The third indicator of household structure is the relationship of the woman or child to the head. For most outcomes, the beneficial effect of an extended household extends to all women and children, regardless of whether they are the spouse or child of the head.

The report also examines the potential effect of three standard indicators of women's empowerment—whether a woman makes decisions alone (or together with her spouse) or lacks the power to do so—for seeking healthcare, making major purchases, or visiting friends or relatives. The third has the strongest evidence of a relationship, although in a multivariate analysis with statistical controls, none of the three is statistically significant. These indicators were not applied to healthcare seeking for children, because we do not know specifically who in the household takes a child for treatment for diarrhoea or fever.

Perhaps the most striking findings in the report are that the women and children in a household are benefitted if the head has had any schooling, even just primary; and that healthcare seeking appears to be more likely if the household is extended and includes members who can substitute for a woman when she temporarily leaves the household for her own healthcare or for a sick child.

Key words: Healthcare seeking, household structure, relationship to household head

ACRONYMS AND ABBREVIATIONS

ANC	antenatal care
DHS	Demographic and Health Survey
HIV	human immunodeficiency virus
NCD	non-communicable disease
PNC	postnatal care
USAID	United States Agency for International Development
WE	women's empowerment

1 INTRODUCTION

Healthcare seeking—an effort to obtain health or medical assistance from a provider or facility—is an important component of healthcare. Most interventions take the form of enhancing a country’s infrastructure and capacity, and often include community health workers and other forms of outreach. There is a limit to what can be accomplished, however, without the active participation of the intended beneficiaries of these interventions.

Ideally, household members will seek services if the services are physically accessible. Adults will visit the facilities, where children will be taken by their parents or other adults. In this report, we focus on specific health services for women and children and on factors that may affect healthcare seeking. The primary interest is the potential influence of household structure, which is measured in three ways: whether the household is nuclear or extended; characteristics of the household head such age, sex, and education; and the relationship of the household member to the household head. This analysis focuses on households and not families. We refer to a “nuclear household” and not a “nuclear family” because households, and not families, are the sampling units of the Demographic Healthy Surveys (DHS). We briefly review some previous research on the relationship between household structure and healthcare seeking behaviour in West Africa and more specifically, Mali.

In the absence of formalised social programmes, extended households serve as social and economic protection, relative to nuclear households. Additional household members may diversify income generation, share daily labour tasks in agricultural communities, share limited resources, and provide support for the household’s overall success. This support includes caring for children in the household in terms of health, education, and professional success (Locoh and Mouvagha-Sow 2005).

During the last 40 to 50 years, according to Locoh and Mouvagha-Sow (2005), household structure has been changing in West Africa, in part due to shifts in the market economy, economic opportunities, migration, and the attraction of urban cities. These factors, among others, have increased the prevalence of smaller, nuclear households with a husband, wife, and children, especially in urban areas in West and Central Africa, including Mali. However, there is great diversity in residential arrangements, with extended households more common than nuclear households in some circumstances (Locoh and Mouvagha-Sow 2005).

In West African households, conjugal family links are generally weaker than lineage family links. Marriage is usually patrilocal, where a couple moves into the husband’s home or community, although women traditionally maintain ties with their lineage family and household after marriage. Husbands and wives may have separate budgets and responsibilities, which is a benefit for the polygamous relationships which are common in the region (Caldwell 1996).

In Mali, it is normative for a woman to live with her husband’s family after marriage. The woman’s linear family may or may not live in the same area as her conjugal family, depending on the customs and traditions of the area. Polygyny is specific to a clan or village’s traditions and is more common in some areas than others. West African societies, including Mali, traditionally view the children of a marriage as belonging to the father’s family (Adams et al. 2002; Castle 1993; Tolhurst et al. 2006).

Several factors influence a woman's decision to seek healthcare for herself and child, including finances, time, and social support. These factors are influenced by the conjugal family members within the household (Castle 1993; Tolhurst et al. 2008). In Mali, where children are viewed as belonging to the father's line, the father or the father's family are ultimately responsible for providing financial support for the child's health (Castle 1993; Tolhurst et al. 2008). Women are typically in charge of their children and their health and can pay for minor costs, although the change in health costs in West Africa has shifted care-seeking behaviour within households. The need for greater financial support in seeking healthcare has led to greater involvement of the father and his family in decision-making (Caldwell 1996).

Evidence from rural Mali suggests that household context, dynamics, and social structure affect the management of children's health (Castle 1993; Ellis et al. 2013). In West Africa, the mother serves as the primary caregiver for the child, and bears the treatment costs and decisions in minor cases (Caldwell 1996; Castle 1993; Ellis et al. 2013). The mother's status in the household, and her ability to leverage financial and social resources, influence her healthcare seeking behaviour for her own health and her child's health (Adams et al. 2002; Castle 1993). Evidence also suggests that a woman's social network and support system within and beyond the household are important in childcare outcomes, although few studies have explored this relationship in developing countries (Adams et al. 2002). Additional household factors that may contribute to healthcare seeking behaviour include a woman's relationship to the household head and the education and age of the household head (Castle 1993).

When a child is ill, a woman living in an extended household with her mother-in-law is expected to consult with her or other elders, such as elder sisters-in-law, to diagnose the illness and suggest treatment options (Adams et al. 2002; Castle 1993). However, a woman's status within the household may influence who she consults in the decision making to seek care for her child. If she does not live with her mother-in-law, and is higher in the hierarchical household, she may consult her husband before making major decisions (Castle 1993).

With treatment, the structure of a woman's household may influence her time and knowledge for seeking treatment options. Household tasks can be shared among households with multiple sisters-in-law, for example, which then make available more time for the woman to seek treatment for her child (Castle 1993). Such relationships also enhance the capacity to consult about the child's illness and gather knowledge on how to proceed with treatment (Castle 1993).

Both households and families are social constructs. In all DHS surveys, the household is a sampling unit. The Guide to DHS Statistics (p. 1.36) provides this definition:

“...a person or group of related or unrelated persons who live together in the same dwelling unit(s), who acknowledge one adult male or female as the head of the household, who share the same housekeeping arrangements and who are considered a single unit.”

The DHS surveys in Mali have not used a consistent single working definition of a household. Since only the 2018 survey is used in this analysis, we provide the definition from the survey's main report (page 15), as a verbatim translation of the definition in the Guide to DHS Statistics:

“Une personne ou un groupe de personnes apparentées ou non qui vivent ensemble dans le même logement, qui reconnaissent un adulte, femme ou homme, comme chef de ménage, qui partagent les mêmes arrangements ménagers et qui sont considérés comme une seule unité.”

The definition relies on the identification of a single person who is the household head or *chef de ménage*. Censuses¹ and surveys generally rely on the identification of such a person, largely as a device for describing relationships with the household, rather than for classifying the household. If there are N persons in a household, then there are a total of N(N-1) pair-wise relationships. However, there are only N-1 pair-wise relationships with the household head, which is a far more manageable number to record during data collection. As a trade-off for easier data collection, the reduced set of relationships somewhat limits our understanding of each member's role and the social resources within the household.

The DHS surveys include some supplementary information about children's positions in the household. For every child age 0-17, the household respondent is asked whether the child has a surviving mother, and, if so, whether the mother is living in the same household as the child. If the mother is living and is in the same household, her line number on the household roster is recorded. The same information is asked about the child's father. From these questions, it is possible to identify nine combinations of parental survival and co-residence for every child age 0-17. A standard table in every main report includes this information.² In addition, in the women's birth histories, which are collected during the interviews with women, the information about each child includes the line number of the child in the household roster (as well as the line number of the woman). Thus, it is possible to link the data about the child—as well as the mother—to the household data.

This report simplifies the description of household structure into two types—nuclear and extended. A household is nuclear if the only relationships to head are head, spouse of head, and child of head. We do not require that all these roles be occupied. An extended household is one that includes any other relationships to the head. Within these two types, there can be many variations that are not well described by the labels “nuclear” or “extended.” For example, an elderly man and woman whose children are adults and live elsewhere are classified as a nuclear household. Two elderly sisters whose children have grown, whose husbands have died, and are living together, are considered an extended household. However, these two examples and others that might be identified do not really enter into this analysis, because they do not include women age 15-49 or children age 0-4.

The central research questions are whether healthcare seeking behaviour for women and children depends on whether the household is nuclear or extended; whether it depends on characteristics of the household head, and whether it depends on the person's relationship to the head. Some other characteristics, such as type of place, region, and wealth quintile are taken into account. The report is not intended to identify a full range of influences on healthcare seeking, beyond those we identified.

¹ The decennial U.S. Census no longer refers to a household head, but describes relationships to “the person on line 1”.

² In the main report of the Mali 2018 DHS survey, this is Table 2.10 on page 32.

2 DATA AND VARIABLES

2.1 Data

This analysis is limited to the 2018 Mali DHS. The design and content of this survey is described in detail in the main report (Institut National de la Statistique, et al. 2019).

2.2 Outcome Variables for Women and Children

This report is focused on factors that affect the use of healthcare services. The 2018 DHS includes five candidate outcomes related to women age 15-49. Three are used in this analysis. Each is coded 1 if the event occurred, 0 if it did not, and NA if not applicable:

- **Had_HIV_test:** ever had an HIV (human immunodeficiency virus) test, regardless of whether the results were returned.
- **Antenatal_4_plus:** had 4 or more antenatal visits (ANC) before the most recent birth in the previous 5 years
- **Facility_birth:** most recent birth in the previous 5 years was in a health facility

The question about an HIV test was asked of all women. The question about the number of ANC visits was only asked about the most recent birth in the previous 5 years. The question about place of birth was asked about all births in the past 5 years, but we only use the response for the most recent birth in the past 5 years. We used the most recent birth because it is the same birth for which the number of ANC visits was asked. The household characteristics at the time of the survey are most likely the same as the time of the birth. The circumstances of the most recent birth in the past 5 years are somewhat more advantageous than those of all births in the past years because their preceding birth intervals tend to be longer (Rutstein 2014). This bias should not affect inferences about the differences by household characteristics.

Two other outcomes were considered but are not included. The first is whether the respondent visited any facility for any reason during the previous year. This question is too general. The principal interest here is visits related to maternal and child health. A second outcome of interest is whether the woman was ever treated for a non-communicable disease (NCD), which is only asked if the woman had been diagnosed with an NCD. Diagnosis and treatment probably, but not necessarily, occur during a visit to a facility; there is no adequate reference period for the treatment and diagnosis; and the number of women reporting an NCD is small.

For children there are three outcomes for children under age 5, which are coded 1, 0, or NA:

- **Facility_PNC (postnatal care)_check:** had a PNC check by a medical professional (whether or not the birth was in a facility) within 2 days after the birth
- **Diarrhoea_treatment:** taken for medical treatment (if diarrhoea occurred in the past 2 weeks)
- **Fever_treatment:** taken for medical treatment (if fever occurred in the past 2 weeks)

We follow the criteria for a PNC examination that were used in the main report of the Mali DHS 2018 (Table 9.11), except we use data for the youngest child born in the past 5 years. The indicator in the report is calculated for fewer children—the youngest child born in the past 2 years. The exam could have been conducted by a doctor, nurse, midwife, traditional birth attendant (trained or not trained), or a community/village health worker. For a child born at home, it is difficult to determine whether the exam took place in a facility or the health professional visited the home. Some children who had a PNC check-up may not have been taken to a facility.

The diarrhoea and fever indicators apply if a child was taken for treatment. It is possible that advice or treatment was sought but was not provided or was not appropriate. The interest here is in care seeking rather than the efficacy of treatment.

There is also information about medical treatment for cough. However, even with supplementary questions about the type of cough, DHS surveys are not able to diagnose pneumonia or acute respiratory syndrome. Therefore, only care seeking for diarrhoea or fever are included. Fever is a potential symptom of malaria, but is not sufficient as a diagnosis of malaria.

The outcomes for women are defined only for women age 15-49 and the outcomes for children are defined for children under 5. Any household that did not include any such persons was omitted from the analysis. The child variables are only available for children whose mother is included in the survey of women. Children who are in the household but whose mother is not in the household, either because she died or because she lives elsewhere, are not included.

It is the mother who provides the information about the three child outcomes, and it is generally the mother who takes the child for treatment. The DHS questionnaire does not explicitly ask who took the child for treatment.

2.3 Indicators of Household Structure

When the interviewer for the household survey arrives, one of the first tasks is to identify an adult who will serve as the “household respondent.” The household respondent identifies the household head. In the Mali DHS 2018, the household head and the person listed on line 1 are always the same person. Typically, the household respondent is either the head or the spouse of the head. The household respondent was the head and male for 53.6% of households; was the spouse and female for 24.5% of households; and was the head and female for 16.6% of the households. An adult child (age 15 and above) of the head was the household respondent for only 3.1% of households. The remaining 2.3% of household respondents were women and men with varied relationships to the head. The household respondent provides the interviewer with a list by name of all members of the household, and also every household member’s relationship of to the head.

All DHS surveys include a variable called “relation to head”, or hv101, for every member of the household. The standard codes that were observed³ for the Mali DHS 2018 survey are:

Relationship to household head

- 1 head
- 2 wife or husband
- 3 son/daughter
- 4 son/daughter-in-law
- 5 grandchild
- 6 parent
- 7 parent-in-law
- 8 brother/sister
- 10 other relative
- 11 adopted/foster child
- 12 not related

These codes in the data files (for hv101) are a slight modification of the codes appearing in the French language Household Questionnaire (page 448 of the main report):

LIEN DE PARENTÉ AVEC CHEF DE MÉNAGE

- 01 CHEF DE MÉNAGE
- 02 FEMME OU MARI
- 03 FILS OU FILLE
- 04 GENDRE OU BELLE-FILLE
- 05 PETIT FILS / FILLE
- 06 PÈRE / MÈRE
- 07 BEAU-PARENT
- 08 FRÈRE OU SŒUR
- 09 AUTRE PERSONNE APPARENTÉE
- 10 ADOPTÉ / EN GARDE / ENFANT DE LA FEMME / MARI
- 11 SANS PARENTÉ
- 98 NE SAIT PAS

The Mali DHS 2018 codes match with the standard codes for codes 1 through 8, but codes 9, 10, and 11 were mapped into standard code 10, 11, and 12, respectively. The standard DHS codes include code 9 for

³ Three codes in the label for hv101 were not actually used in the Mali DHS 2018: 9 (co-spouse), 13 (niece/nephew by blood), and 14 (niece/nephew by marriage). The data include two cases with code 98 (don't know). Both were girls age 14, living in different households, who would not appear in the analysis of women age 15-49 or children age 0-4, and were excluded from the process of classifying households as nuclear or extended.

“co-spouse,” but code 9 was dropped from this survey. Most respondents are Muslim, and Islam allows up to four wives. Since Code 2 was allowed for any spouse, code 9 was not needed.

There appears to be one substantive change from the standard codes. Mali DHS 2018 code 10 (“ADOPTÉ/ EN GARDE / ENFANT DE LA FEMME / MARI”) is not exactly equivalent to standard code 11 (“adopted/foster child”). As stated in French, code 10 includes children of the spouse who are not also children of the head. The standard DHS coding does not specify that code 11 includes such children. This distinction will not affect the analysis.

Every person on the household roster can also be classified by whether they are a “usual” or *de jure* member of the household and whether they “slept here last night” and are a *de facto* member. Nearly all people on the roster are both *de jure* and *de facto* members. The survey of women, which is the source of information about children as well as women, consists of *de facto* residents (nearly all of whom are also *de jure* residents).

We base the description of household structure on the composition of *de jure* residents. That is, for the construction of household type, only the *de jure* residents are used. Women and children who are *de facto* but not *de jure* residents are presumed to be *de jure* residents in some other household. Their healthcare seeking behaviour potentially depends on the structure of that other (unknown) household, rather than the household where they are staying temporarily.

A very simple indicator of household structure is constructed from the values of hv101 within the household. “hh_type” is coded 1 if the household is nuclear and 2 if extended. The household is nuclear if all members, apart from the household head (for whom hv101=1) have hv101=2 (wife or husband, i.e., spouse), or hv101=3 (son/daughter, i.e. child). If the household includes anyone with a value of hv101 that is other than 1, 2, or 3, the household is classified as extended. This definition is consistent with virtually all sources.

The classification of household type into nuclear and extended households is based on the *de jure* or “usual” residents of the household (hv102=1). The analysis of individuals is further restricted to those individuals who are both *de jure* and *de facto* residents (hv102=1 and hv103=1).

For this classification, no age range is specified for the children of the head. They can be adults, but if they are adults and are married, the household will usually also include a son-in-law or daughter-in-law (hv101=4) and the household will no longer be nuclear. A child of the head might not be a child of the spouse of the head, or vice versa. That potential distinction is not included in the analysis (see the comments on hv101=10 above). There is a large literature on the nature of extended households, as described in Chapter 1. Households can be extended vertically and/or horizontally, but we do not make any such distinction here.

Some of the distinction between nuclear and extended households can be captured with family size. We also define a set of indicators that are the total number of household members who are in the six possible combinations of sex (male and female) and age (0-14, 15-49, 50+), as well the subtotals by sex and age, and the overall total.

2.4 Characteristics of the Household Head

Three variables—sex, age, and education—that describe the household head and the household respondent are attached to the household. Given the relatively narrow range of education in Mali, persons with primary, secondary, or post-secondary education are consolidated into an “any education” category.⁴ For some purposes, a typology based on combinations of the three variables is used. In the typology, some combinations with small frequencies are consolidated.

- Sex of head: Male, female
- Age of head: 15-29, 30-44, 45-59, 60+
- Education of head: None, any

2.5 Covariates and Control Variables

We include additional variables at two levels: the household and the woman/mother. These are characteristics other than those mentioned above that could affect the outcomes. In another analysis, they might be the variables of main interest, but in this analysis the focus is the effect of household structure, after adjusting for these other variables.

There is considerable geographic variation in household structure and the use of health services within Mali. Some of the analysis will take this sub-national variation into account. When it is not taken into account, there is a risk of misinterpretation of the relationship between household structure and the use of health services.

In the 2018 survey, about 77% of the population was rural and 23% was urban. Two regions, Bamako and Kidal, were exclusively urban⁵. The other seven regions are at least 84% rural. The sample size is insufficient to allow analysis at a lower level of aggregation. Most outcomes will be described separately for the following subpopulations:

- Type of place of residence (urban, rural)
- Region of residence (Bamako, Kidal, Kayes, Koulikoro, Sikasso, Segou, Mopti, Tombouctou, and Gao)
- Stratum (the 16 combinations of type of place and region)
- Wealth quintile

⁴ DHS often combines the secondary and post-secondary education categories. In Mali, an even broader consolidation is necessary because, in much of the country, the number of adults in the survey with primary schooling is too small for a separate analysis.

⁵ Kidal has both urban and rural areas, but the rural area was omitted from the sample design. The rural part of Kidal is sparsely populated. Strictly speaking, this omission prevents the sample from being completely national.

The DHS wealth quintiles are based on a principal component analysis of a wide range of household assets, including type of housing materials, source of water, and type of sanitation.

Two additional variables were considered for inclusion but are omitted: religion and ethnicity. These were collected as part of the surveys of women and men and not as part of the household survey, although it is likely that they are shared with all or most of the members of a specific household.⁶ Among women age 15-49, 94% are Muslim, 2% are Roman Catholic, 1% are Protestant, and 3% responded with “no religion.” A consolidation of the non-Muslim categories would not be interpretable, because they are very different, and individually there are too few cases for statistical analysis. There is much more diversity across ethnicity than across religion. Nearly half of the women self-identify as either Bambara (33%) or Peulh (14%). Most of the other half is in five other ethnicities or combinations of related ethnicities. Apart from Bamako, the capital, which is the most ethnically diverse part of Mali, there is a fairly strong association between ethnicity and region. It would be difficult to separate variation by ethnicity from variation by region. For these reasons, religion and ethnicity are omitted from the analysis.

Chapter 4 includes three variables that describe empowerment and are specific to women:

- The woman determines her healthcare by herself or with her spouse: No/Yes
- The woman determines major household purchases by herself or with her spouse: No/Yes
- The woman determines her visits to her family or relatives by herself or with her spouse: No/Yes

⁶ Using the file of couples and comparing the reported religion of the woman and the man in each couple, kappa is 0.46. This index could range from 0 if the religion of the woman and the man were independent to (nearly) 1 if they agreed completely. Thus, the woman’s and man’s religion are strongly associated but are far from identical. This is similar for ethnicity, for which kappa is 0.60.

3 DIMENSIONS OF HOUSEHOLD STRUCTURE

3.1 Household Type

As described earlier, the main explanatory variable is household type and the distinction between whether a household is nuclear or extended. A household is nuclear if it consists exclusively of individuals who are classified as head, spouse of head, or child of head. If the household includes individuals with any other relationship to the head, the household is considered to be extended.

The codes for possible relationships to the household head, listed earlier but repeated here for convenience, are as follows:

- 1 head
- 2 spouse
- 3 child
- 4 child-in-law
- 5 grandchild
- 6 parent
- 7 parent-in-law
- 8 sibling
- 10 other relative
- 11 adopted/foster child
- 12 not related

In this version of the list, “wife or husband” has been replaced with “spouse,” “son/daughter” has been replaced with “child,” and “brother/sister” has been replaced with “sibling.” Other relationships of potential interest, such as those between other pairs of persons within the household, are not described in the data.⁷ It is possible that some stated relationships are not accurate in terms of a biological relationship, but here they are taken at face value.

Code 11 for “adopted/foster child,” combines two categories, “adopted” and “foster” that can be quite different in terms of the rights and protections of children. “Adopted” implies a more permanent commitment and responsibility for the child. However, it is likely that during fieldwork, the distinction between adoption and fostering is difficult to apply. In any case, the number of children in the combined category is relatively small and further disaggregation would not produce statistically stable estimates.

The composition of nuclear and extended households in Mali can be described in more detail, first by taking the households as the units of analysis and describing the number of members of each type, and then taking

⁷ For children age 0-17, the biological mother and father can be identified if they are living in the same household as the child, but that information will not be used here.

individual household members as the units of analysis, and describing the age distributions of the members of each type.

Both nuclear and extended households have exactly one head. Both types of households may have a spouse of the head (a number ranging from 0 to 4, if the head is a man). Both types of households may have any number of children of the head (including zero). To be extended, the only difference is that a household must include at least one person who has one of the other relation to head codes. We refer to the roles of head, spouse of the head, and child of the head as the nucleus of the household. A nuclear household consists exclusively of a nucleus. An extended household includes a nucleus plus additional members.

Table 1a provides an overview of the prevalence of nuclear and extended households at the national level and separately for the urban and rural parts of Mali. **Tables 1b, 1c, and 1d** provide similar information for the regions, the strata (combinations of region and urban/rural place of residence), and wealth quintiles, respectively. Each table includes three groups of five columns: one group for households as units, one group for children age 0-4 as units, and one group for women age 15-49 as units. Within each group, the first two are most useful. The third column is the difference between the first two, calculated as the second column minus the first. The fourth column in each group gives weighted frequencies and the fifth column gives the unweighted frequencies. The weighted frequencies are useful for identifying the relative size of subgroups in the sample and the population. The unweighted frequencies are more informative than the weighted frequencies for inferences about the statistical stability of the estimates.

Table 1a The percentage of households that are nuclear or extended, and the percentage of women and children who live in nuclear or extended households, by type of place of residence. Mali DHS 2018

Type of residence	Households					Children age 0-4					Women age 15-49				
	Percent nuclear	Percent extended	Delta	Weighted cases	Unweighted cases	Percent nuclear	Percent extended	Delta	Weighted cases	Unweighted cases	Percent nuclear	Percent extended	Delta	Weighted cases	Unweighted cases
Urban	57.7	42.3	-15.4	2,117.7	2,940	53.2	46.8	-6.4	1,910.4	2,281	45.8	54.2	8.3	2,750.6	3,460
Rural	70.0	30.0	-40.0	7,386.8	6,563	73.8	26.2	-47.6	7,471.4	6,598	67.4	32.6	-34.8	7,856.6	6,960
All	67.3	32.7	-34.5	9,504.6	9,503	69.6	30.4	-39.2	9,381.8	8,879	61.8	38.2	-23.6	10,607.2	10,420

Table 1b The percentage of households that are nuclear or extended, and the percentage of women and children who live in nuclear or extended households, by region. Mali DHS 2018

Region	Households					Children age 0-4					Women age 15-49				
	Percent nuclear	Percent extended	Delta	Weighted cases	Unweighted cases	Percent nuclear	Percent extended	Delta	Weighted cases	Unweighted cases	Percent nuclear	Percent extended	Delta	Weighted cases	Unweighted cases
Kayes	72.6	27.4	-45.3	1,442.1	1,184	76.5	23.5	-53.0	1,513.1	1,230	69.4	30.6	-38.8	1,563.7	1,284
Koulikoro	71.2	28.8	-42.4	1,893.2	1,299	72.5	27.5	-45.0	1,753.1	1,217	65.7	34.3	-31.4	2,017.1	1,379
Sikasso	72.8	27.2	-45.5	1,516.1	1,332	74.3	25.7	-48.6	1,726.9	1,507	68.9	31.1	-37.9	1,807.0	1,613
Segou	68.3	31.7	-36.5	1,571.1	1,235	72.2	27.8	-44.4	1,460.3	1,154	63.7	36.3	-27.5	1,644.4	1,292
Mopti	64.9	35.1	-29.8	1,080.9	753	76.1	23.9	-52.2	1,047.3	724	67.8	32.2	-35.5	1,059.4	745
Tombouctou	45.9	54.1	8.2	373.9	981	48.2	51.8	3.6	365.7	950	42.3	57.7	15.4	387.3	1,016
Gao	73.6	26.4	-47.1	314.7	768	77.5	22.5	-55.1	250.5	590	71.9	28.1	-43.9	292.8	715
Kidal	59.2	40.8	-18.3	10.6	752	67.1	32.9	-34.1	5.0	357	61.1	38.9	-22.1	9.5	670
Bamako	54.6	45.4	-9.2	1,301.9	1,199	47.1	52.9	5.8	1,259.9	1,150	41.3	58.7	17.4	1,826.1	1,706
All	67.3	32.7	-34.5	9,504.6	9,503	69.6	30.4	-39.2	9,381.8	8,879	61.8	38.2	-23.6	10,607.2	10,420

Table 1c The percentage of households that are nuclear or extended, and the percentage of women and children who live in nuclear or extended households, in combinations of region and type of place of residence. Mali DHS 2018

Region and type of place of residence	Households						Children age 0-4						Women age 15-49							
	Percent nuclear	Percent extended	Delta	Weighted cases	Unweighted cases	Percent nuclear	Percent extended	Delta	Weighted cases	Unweighted cases	Percent nuclear	Percent extended	Delta	Weighted cases	Unweighted cases	Percent nuclear	Percent extended	Delta	Weighted cases	Unweighted cases
Bamako (Urban)	54.6	45.4	-9.2	1,301.9	1,199	47.1	52.9	5.8	1,259.9	1,150	41.3	58.7	17.4	1,826.1	1,706	62.4	37.6	-24.9	52.1	221
Gao Urban	68.3	31.7	-36.5	49.5	209	71.3	28.7	-42.6	38.4	160	62.4	37.6	-24.9	52.1	221	74.0	26.0	-48.0	240.7	494
Gao Rural	74.6	25.4	-49.1	265.2	559	78.7	21.3	-57.4	212.2	430	74.0	26.0	-48.0	240.7	494	49.6	50.4	0.8	251.2	164
Kayes Urban	58.7	41.3	-17.3	226.2	152	54.8	45.2	-9.6	177.5	122	49.6	50.4	0.8	251.2	164	73.2	26.8	-46.4	1,312.5	1,120
Kayes Rural	75.2	24.8	-50.5	1,215.9	1,032	79.4	20.6	-58.7	1,335.6	1,108	73.2	26.8	-46.4	1,312.5	1,120	61.1	38.9	-22.1	9.5	670
Kidal (Urban)	59.2	40.8	-18.3	10.6	752	67.1	32.9	-34.1	5.0	357	61.1	38.9	-22.1	9.5	670	43.9	56.1	12.2	141.0	96
Koulikoro Urban	59.3	40.7	-18.6	107.5	77	66.5	33.5	-33.0	91.0	65	43.9	56.1	12.2	141.0	96	67.3	32.7	-34.7	1,876.1	1,283
Koulikoro Rural	71.9	28.1	-43.9	1,785.6	1,222	72.8	27.2	-45.7	1,662.1	1,152	67.3	32.7	-34.7	1,876.1	1,283	57.0	43.0	-14.1	103.6	117
Mopti Urban	64.8	35.2	-29.6	96.6	104	67.7	32.3	-35.4	81.5	89	57.0	43.0	-14.1	103.6	117	68.9	31.1	-37.8	955.8	628
Mopti Rural	64.9	35.1	-29.8	984.3	649	76.8	23.2	-53.6	965.8	635	68.9	31.1	-37.8	955.8	628	62.4	37.6	-24.7	111.3	115
Segou Urban	66.0	34.0	-32.0	101.4	104	66.4	33.6	-32.7	74.0	77	62.4	37.6	-24.7	111.3	115	63.8	36.2	-27.7	1,533.0	1,177
Segou Rural	68.4	31.6	-36.8	1,469.7	1,131	72.5	27.5	-45.1	1,386.2	1,077	63.8	36.2	-27.7	1,533.0	1,177	62.4	37.6	-24.8	216.8	247
Sikasso Urban	68.9	31.1	-37.8	180.7	203	71.7	28.3	-43.5	161.0	184	62.4	37.6	-24.8	216.8	247	69.8	30.2	-39.6	1,590.2	1,366
Sikasso Rural	73.3	26.7	-46.6	1,335.5	1,129	74.6	25.4	-49.2	1,565.9	1,323	69.8	30.2	-39.6	1,590.2	1,366	47.3	52.7	5.5	39.1	124
Tombouctou Urban	48.2	51.8	3.6	43.3	140	66.4	33.6	-32.8	22.0	77	47.3	52.7	5.5	39.1	124	41.7	58.3	16.5	348.2	892
Tombouctou Rural	45.6	54.4	8.8	330.6	841	47.0	53.0	6.0	343.7	873	41.7	58.3	16.5	348.2	892	61.8	38.2	-23.6	10,607.2	10,420
All	67.3	32.7	-34.5	9,504.6	9,503	69.6	30.4	-39.2	9,381.8	8,879	61.8	38.2	-23.6	10,607.2	10,420					

Table 1d The percentage of households that are nuclear or extended, and the percentage of women and children who live in nuclear or extended households, by wealth quintile of the household. Mali DHS 2018

Wealth quintile	Households						Children age 0-4						Women age 15-49							
	Percent nuclear	Percent extended	Delta	Weighted cases	Unweighted cases	Percent nuclear	Percent extended	Delta	Weighted cases	Unweighted cases	Percent nuclear	Percent extended	Delta	Weighted cases	Unweighted cases	Percent nuclear	Percent extended	Delta	Weighted cases	Unweighted cases
Poorest	70.2	29.8	-40.3	1,829.6	1,873	75.8	24.2	-51.7	1,943.7	1,767	70.5	29.5	-41.0	1,868.3	1,851	67.2	32.8	-34.4	2,009.6	1,830
Poorer	69.0	31.0	-38.0	1,904.6	1,768	72.3	27.7	-44.5	1,982.6	1,816	67.2	32.8	-34.4	2,009.6	1,830	66.7	33.3	-33.5	2,040.8	1,948
Middle	70.7	29.3	-41.5	1,944.5	1,860	73.7	26.3	-47.4	2,031.3	1,904	66.7	33.3	-33.5	2,040.8	1,948	64.3	35.7	-28.5	2,235.5	2,322
Richer	68.8	31.2	-37.6	1,983.3	2,114	71.4	28.6	-42.7	1,802.3	1,814	64.3	35.7	-28.5	2,235.5	2,322	44.4	55.6	11.2	2,453.0	2,469
Richest	57.2	42.8	-14.4	1,842.6	1,888	51.8	48.2	-3.6	1,621.9	1,578	44.4	55.6	11.2	2,453.0	2,469	61.8	38.2	-23.6	10,607.2	10,420
All	67.3	32.7	-34.5	9,504.6	9,503	69.6	30.4	-39.2	9,381.8	8,879	61.8	38.2	-23.6	10,607.2	10,420					

Households as units of analysis

Households are the units of analysis in the first four columns of **Table 1a**. The bottom row of the table refers to all of Mali. At the national level, 67% of households are nuclear and 33% are extended.⁸ The third column shows the difference (taking the nuclear households as the reference value, the difference is the percent extended minus the percent nuclear), which rounds to 34%.

Most households in Mali (78%) are located in rural areas. In both urban and rural areas, as at the national level, most households are nuclear, although the percentage nuclear is somewhat lower in urban areas than in rural areas. The percentage extended is 30% in rural areas and is higher (42%) in urban areas.

At first glance, this result might be unexpected because extended households are often characterised as more traditional and therefore more rural. However, the result is consistent with the current urban context of most African countries, including Mali. Several authors including Pilon and Vimard (1998) have documented the change in family configurations and have argued that family solidarity and the prominence of extended households tend to increase with the standard of living.

Increasingly, the trend in Mali is towards family solidarity and the acceptance of other members within a framework of rights and obligations towards lineage, especially among the wealthiest populations who live most often in urban centres, where economic opportunities and schools are concentrated, especially at the university level. These urban households express their solidarity towards kin, notably by welcoming children (for schooling and preparing wedding kits for girls), or by taking in adults with limited access to housing or migrants from the countryside. This receptivity to kin gives these households a more diverse composition and an extended structure.

Tables 1b and 1c show that the regions with the highest percentage of households that are extended are Tombouctou (54%), and Bamako (45%). The percentage is lowest in Gao (26%), Sikasso and Kayes (27%), and Koulikoro (29%). Within most regions, the percentage extended is higher in urban areas than in rural areas. The only exception is Tombouctou, although only a small part of Tombouctou is classified as rural.

The relationship with wealth quintiles (**Table 1d**) is unusual. For the top wealth quintile, 43% of households are extended. For the other four quintiles, the percentage rounds to a very narrow range, 29% to 31%. Given the way the wealth index is constructed, using household assets such as source of water, type of sanitation, or type of housing, most of the top quintile is urban, which is consistent with the urban/rural breakdown. As Pilon and Vimard (1998) observed in Ivorian, Senegalese, and Cameroonian's households, extended households in Mali tend to be associated with populations that are economically more prosperous. It appears that in some African contexts, household nuclearisation characterises the most socioeconomically disadvantaged groups and may result in instability. According to the same authors, individuals do not join nuclear households by choice but rather through an adaptive preference imposed by precariousness because poor households do not have enough resources and housing to maintain extended family ties. Furthermore, given their relative economic success, the wealthiest households generally attract dependent members of other households (Cissé 2018).

⁸ Following general DHS practice, the tables in this report include one number to the right of the decimal point but in the text we round to the nearest integer. This practice occasionally results in some rounding error.

We provide some additional description in which the households are the units of analysis. In the great majority of households, both nuclear and extended, the household head is a man; 82% of the heads of households are men; 18% are women. If the household head is a man, there is an 80% probability of one wife. However, in 7% of such households there is no wife, in 12% there are two, and in 1% there are three. There are only 10 households in the entire sample with a male head and four wives living together. If the household head is a woman, there is an 86% probability of no spouse, but for the remaining 14%, there is a spouse who is a man.

About 15% of households include no household members who are classified as a child of the head. The percentage of households with no children is 12% in nuclear households and 22% in extended households.

Nuclear households in Mali can be large. About 4% have more than ten members. Extended households tend to be larger than nuclear households, with about 16% having more than 10 members. This highlights the difficulties in capturing complex household configurations when studying household structure. In countries that are in demographic pre-transition phases, such as Mali, household nuclearisation is not systematically associated with modernity and reductions in fertility, in contrast to what is observed in developed countries. This difference is corroborated by the greater prevalence of nuclear households in rural areas when compared to urban areas.

Figure 1 Bar graph showing the distribution of different relationships to the household head. Households are the units of analysis; children can be any age. Mali DHS 2018

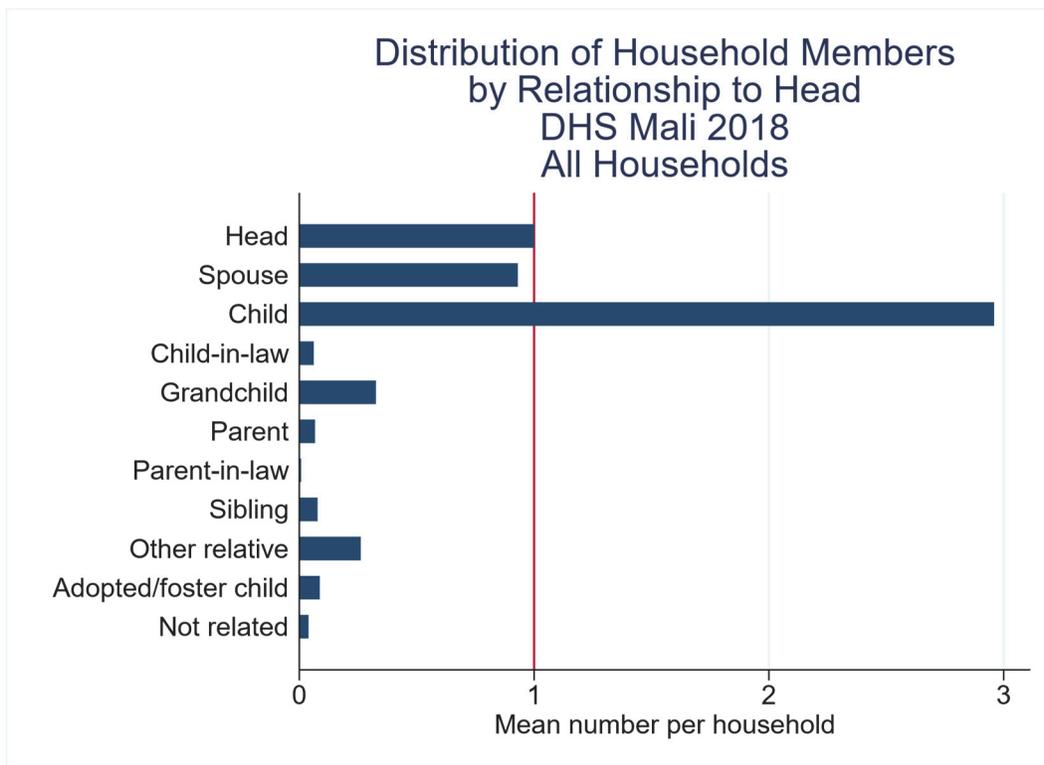
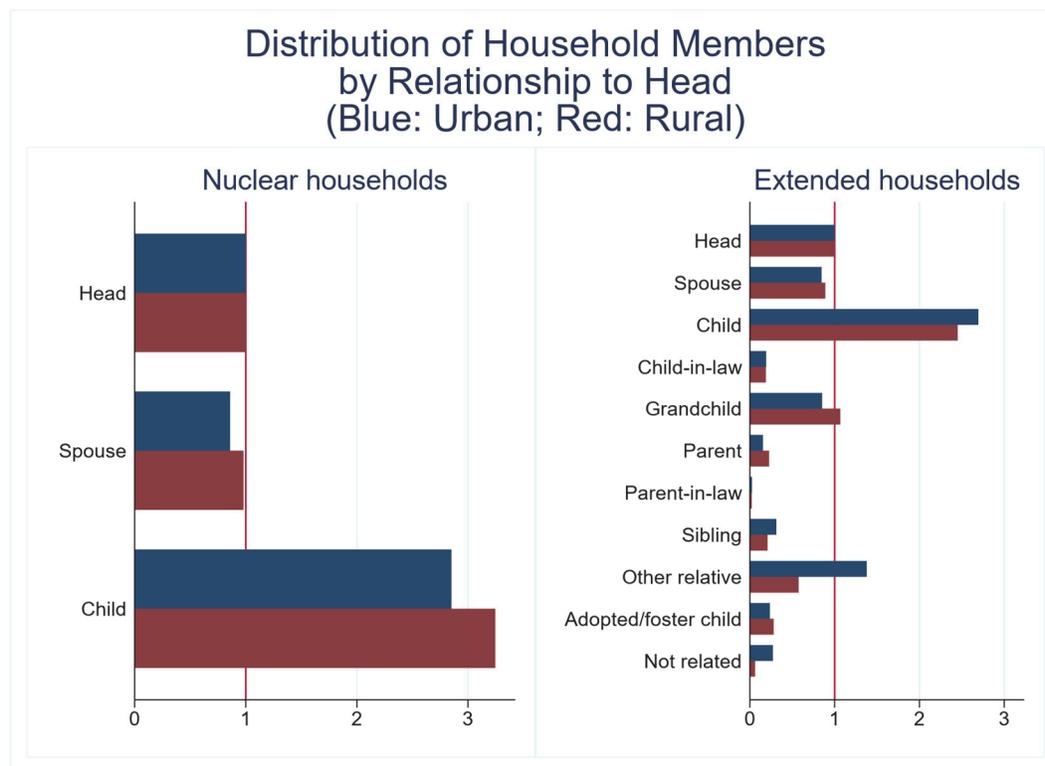


Figure 2 Bar graph showing the distribution of different relationships to the household head, separately for nuclear and extended households. Households are the units of analysis; children can be any age. Mali DHS 2018



Continuing with households as the units of analysis, **Figure 1** uses a horizontal bar graph to profile the number of household members of each type of relationship to the household head, in all households in the Mali DHS. The horizontal axis is the mean number for each type of member listed on the left side of the figure. A red vertical line is positioned at 1 and shows that each household has one head. The mean number of spouses is just below 1. The mean number of children is just over 3.

Figure 2 is similar to Figure 1 but shows the mean numbers separately for nuclear households, on the left, and extended households, on the right. Within each of those panels, the blue bars refer to urban households and the red bars to rural households. The mean number of spouses and children are similar in nuclear and extended households, but are slightly lower in the extended households. The additional types of relationships that are most common in extended households are grandchildren (an average of about one person, and slightly more in rural than in urban areas) and “other relatives” (also an average of about one person, but considerably more in urban areas than in rural areas). All the other possible relationships, when aggregated, add approximately one additional person. The mean number of persons who are not related to the head, either consanguineally or by marriage, is very small and is virtually zero in rural areas.

3.2 Relationship to the Head of the Household

We now turn to the second and third groups of five columns in **Tables 1a-1d**, which include information about the children age 0-4 and the women age 15-49, respectively, who live in nuclear and extended households. The perspective shifts from households as the units of analysis and describing the composition

of those households, to women and children as the cases, and describing their type of household and their relationship to the household head.

Overall, there are 9,505 households in the survey, which include 9,382 children age 0-4 and 10,607 women age 15-49. (These children and women are both *de facto* and *de jure* residents of their household.) On average, the households include slightly less than one child (0.99) age 0-4 and slightly more than one woman (1.16) age 15-49.

At the national level, 70% of children age 0-4 live in nuclear households and 30% live in extended households. In urban areas, the percentages are 53% and 47%, and in rural areas, the percentages are 74% and 26%. For children, the association between type of household and place of residence is strong.

Among women age 15-49, at the national level, 62% live in nuclear households and 38% in extended households. In rural areas the division is 67% nuclear and 33% urban. In urban areas, 46% of women live in nuclear households and 54% in extended households. Of all the nuclear versus extended comparisons in **Table 1a**, this is the only one in which a majority of cases are extended rather than nuclear. This result will be explored in more detail.

In **Table 1b**, there are two regions in which the percentage of women in extended households exceeds the percentage in nuclear households: in Bamako, the percentages are 41% nuclear and 59% extended, and in Tombouctou 42% nuclear and 58% extended. In **Table 1c**, the percentage of women in extended households exceeds 50% for Bamako (which is entirely urban), for both the urban and rural parts of Tombouctou, and for the urban portion of Koulikoro. The percentage of children age also 0-4 exceeds 50% in Bamako and urban Tombouctou.

There is a potential explanation for the higher percentages of women, and sometimes children, who are living in extended households in the most urbanised areas of Mali. The presence of these women is the reason the households are classified as extended. That is, additional women and children who are related to the head have been incorporated into the urban households.

Figure 3 Bar graph showing the age distribution of persons with different relationships to the household head. Individuals are the units of analysis. Mali DHS2018

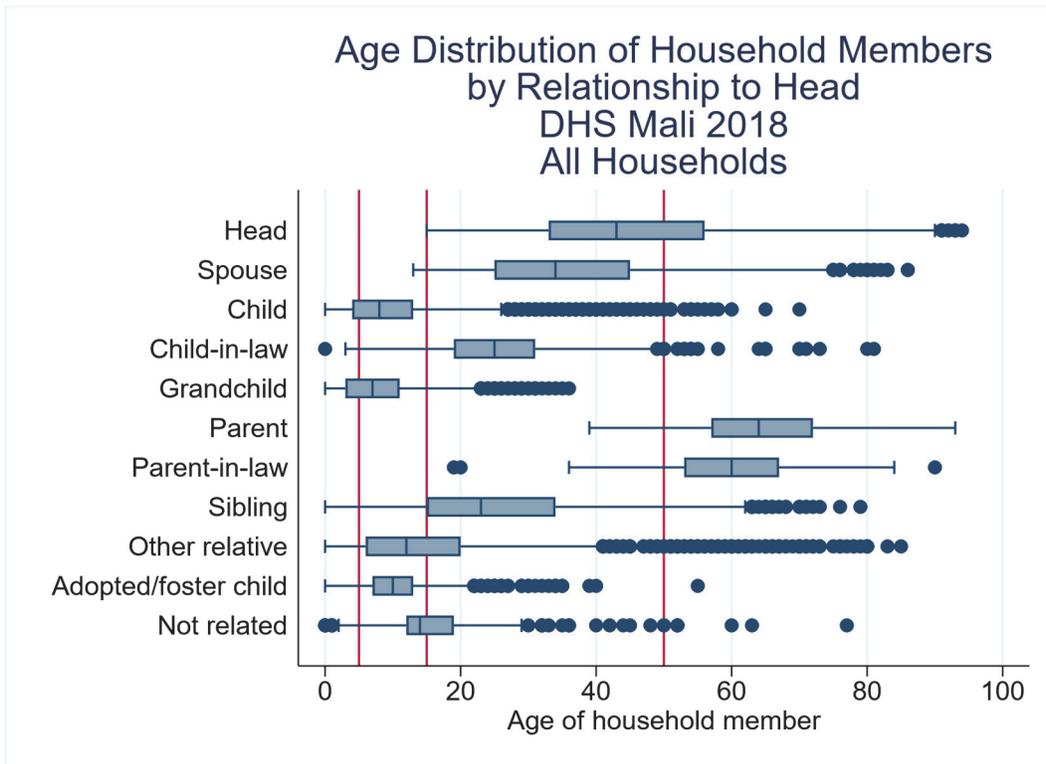
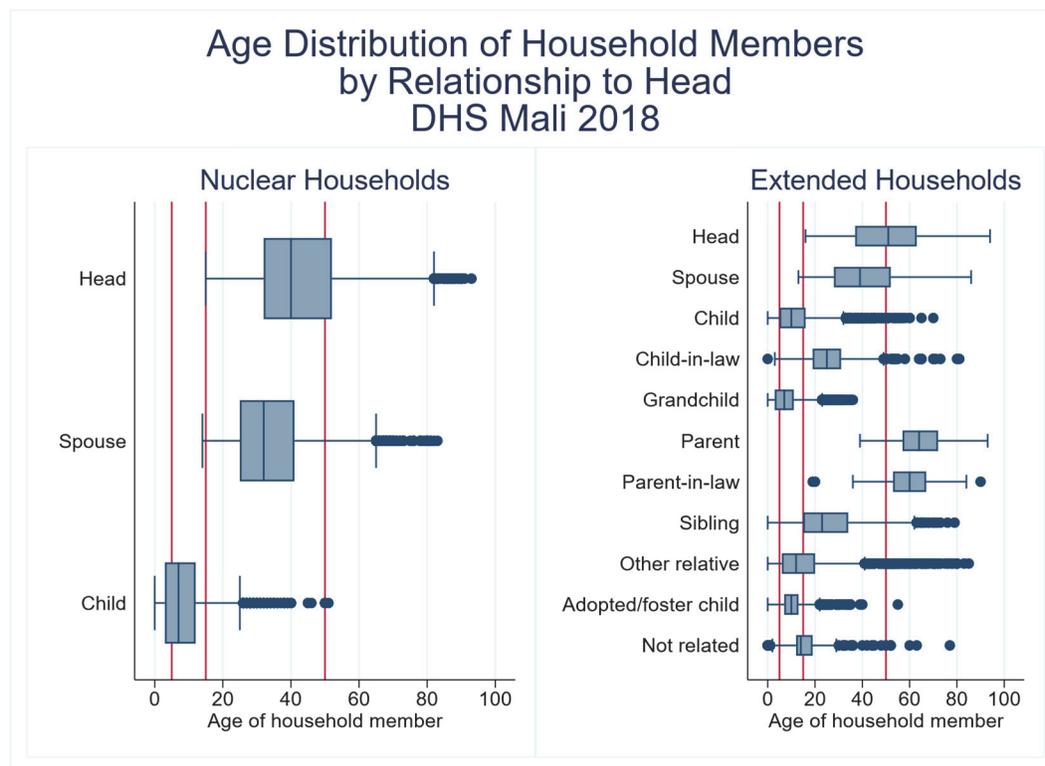


Figure 4 Bar graph showing the age distribution of persons with different relationships to the household head, separately for nuclear and extended households. Individuals are the units of analysis. Mali DHS 2018



All individuals in the household survey can be classified by their relationship to the head and their current age. The age ranges of the different relationship types are shown with horizontal boxplots in **Figures 3** and **4**. Each boxplot includes a shaded rectangle that encloses the middle half of a distribution that ranges from the 25th to 75th percentiles (first to third quartiles). The line in the middle of the rectangle identifies the median. The extensions to the rectangle reflect the rest of the distribution. Outliers are represented with points. In these figures, three vertical red lines are positioned at ages 5, 15, and 50. Children age 0-4 are to the left of the red line at age 5. The women age 15-49 are between the red lines at ages 15 and 50.⁹

Figure 3 refers to all household members in the household survey who are both de jure (“usual”) and de facto (“slept here last night”) residents of the household. A few outliers, indicated by dots, are potentially misclassified, because the ages appear to be too young or too old for the specified relationship to the head, but we will not attempt to make corrections. We repeat that the “child of head” category refers to a biological relationship that is not related to the age of the person. In other contexts, the age range for a child would be

⁹ The household file includes 53,006 persons who are both de jure and de facto residents. Of these, 54 have “don’t know” for age and 28 have age “95+”. These 82 persons are omitted from Figures 3 and 4, but are included in all other figures or tables that do not explicitly refer to age.

0-4 or 0-14 or 0-17, although those age ranges do not apply to the relationship to head. Similarly, a “child-in-law” or “grandchild,” could be almost any age.¹⁰

Figure 4 is analogous to Figure 3 but distinguishes between people living in nuclear households, on the left, or in extended households, on the right. There is little difference between urban and rural areas, which were distinguished in Figure 2, so they are not distinguished within Figure 4.

A comparison of the two panels of **Figure 4** shows that the middle half of the age distributions (indicated by the gray rectangles) for a head, spouse, and child is shifted upwards by several years. For all three, the upper tail of the age distribution (although not the lower tail) is shifted upward. That is, in terms of age composition, the nucleus of an extended household tends to be older than the nucleus of a nuclear household.

These simple observations are consistent with a dynamic perspective on household structure. Individuals move through the life course from the status of child to youth, adult, and elder. Household and familial roles change with age, as well as with marriage, the births of children, and the deaths of parents, siblings, and spouses. Households are composed of individuals who are moving through these roles. The snapshot of household structure seen from a single survey does not capture the balance of continuity and change that each household, and its members, experience over time.

3.3 Characteristics of the Household Head

The final description of household characteristics includes the sex, age, and education of the household head, and how those may differ between nuclear and extended households. **Tables 1e-1g** describe these characteristics with a structure similar to **Tables 1a-1d**.

¹⁰ Taken at face value, the “child-in-law” category identifies males who are the husband of a married daughter and females who are the wife of a married son. The survey includes 11 males under 18 (age 4-17) and 72 females under age 18 (age 0-17) with this stated relation to head. They comprise 14% (unweighted) of the 577 persons with this stated relation to head. We suspect that the category actually includes other relationships.

Table 1e The percentage of households that are nuclear or extended, and the percentage of women and children who live in nuclear or extended households, by sex of household head. Mali DHS 2018

Sex of household head	Households					Children age 0-4					Women age 15-49				
	Percent nuclear	Percent extended	Delta	Weighted cases	Unweighted cases	Percent nuclear	Percent extended	Delta	Weighted cases	Unweighted cases	Percent nuclear	Percent extended	Delta	Weighted cases	Unweighted cases
Male head	69.2	30.8	-38.4	7,850.9	7,764	70.5	29.5	-41.1	8,214.3	7,736	63.3	36.7	-26.7	8,965.5	8,732
Female head	57.9	42.1	-15.9	1,653.6	1,739	63.2	36.8	-26.5	1,166.4	1,141	53.6	46.4	-7.3	1,637.4	1,684
All	67.3	32.7	-34.5	9,504.6	9,503	69.6	30.4	-39.2	9,380.7	8,877	61.8	38.2	-23.7	10,602.8	10,416

Table 1f The percentage of households that are nuclear or extended, and the percentage of women and children who live in nuclear or extended households, by age of household head. Mali DHS 2018

Age of household head	Households					Children age 0-4					Women age 15-49				
	Percent nuclear	Percent extended	Delta	Weighted cases	Unweighted cases	Percent nuclear	Percent extended	Delta	Weighted cases	Unweighted cases	Percent nuclear	Percent extended	Delta	Weighted cases	Unweighted cases
<30	77.6	22.4	-55.2	1,396.5	1,327	79.1	20.9	-58.2	1,381.6	1,261	73.6	26.4	-47.1	1,366.7	1,260
30-44	76.6	23.4	-53.3	3,671.8	3,502	77.2	22.8	-54.4	4,819.1	4,436	71.9	28.1	-43.9	4,277.0	4,049
45-59	64.7	35.3	-29.3	2,478.7	2,540	65.1	34.9	-30.2	2,163.3	2,110	57.7	42.3	-15.5	3,225.2	3,226
60+	45.6	54.4	8.8	1,957.7	2,134	30.6	69.4	38.9	1,016.6	1,070	35.3	64.7	29.4	1,733.9	1,881
All	67.3	32.7	-34.5	9,504.6	9,503	69.6	30.4	-39.2	9,380.7	8,877	61.8	38.2	-23.7	10,602.8	10,416

Table 1g The percentage of households that are nuclear or extended, and the percentage of women and children who live in nuclear or extended households, by education of household head. Mali DHS 2018

Education of household head	Households					Children age 0-4					Women age 15-49				
	Percent nuclear	Percent extended	Delta	Weighted cases	Unweighted cases	Percent nuclear	Percent extended	Delta	Weighted cases	Unweighted cases	Percent nuclear	Percent extended	Delta	Weighted cases	Unweighted cases
No education	67.7	32.3	-35.4	6,522.1	6,600	70.5	29.5	-41.0	6,469.9	6,152	63.7	36.3	-27.5	7,097.2	7,039
Any education	66.4	33.6	-32.8	2,911.7	2,833	67.8	32.2	-35.6	2,844.7	2,656	58.0	42.0	-16.1	3,419.1	3,288
All	67.3	32.7	-34.6	9,433.8	9,433	69.7	30.3	-39.3	9,314.6	8,808	61.9	38.1	-23.8	10,516.3	10,327

We first examine the first group of five columns in these three tables, in which the households themselves, as in Section 3.1, are the units of analysis. Of the male-headed households, 69% are nuclear and 31% are extended. A majority of female-headed households also are nuclear, but by a smaller margin: 57% nuclear versus 42% extended. In terms of age, if the head is relatively young, the household is much more likely to be nuclear - 78% of heads are under age 30 and 77% of heads age 30-44 are the head of a nuclear household. For age 45-59, the percentage is 65% and for age 60 and over, the percentage declines to 46%. Thus, a majority of household heads who are age 60 or above live in a household with additional members, such as children-in-law and grandchildren.

Table 1g indicates that the education of the head is not related to the type of household. If the head has no education, the chance that the household is nuclear is 68%; for a head with any education, the chance is virtually identical at 66%.

Although we do not have longitudinal data, these observations are consistent with a pattern in which young couples form a nuclear household in which the husband is the head. The household grows as children are born. At some point, there may be a transition to an extended household as some children marry, have children of their own, and live within the same household before forming a household of their own. The greater probability that a woman will be the head of an extended household may be related to the higher mortality and higher migration of men.

We emphasise that this potential narrative of the household trajectory over time is speculative, because of the nature of the data. There are certainly other dynamic features of households. For example, some of the higher prevalence of extended households in urban areas may be due to greater opportunities as well as greater expenses associated with living in urban areas. An urban household may take in an “other relative” who is a child whose rural parents want the child to attend a better school, or an “other relative” who is a young adult trying to economise on living costs while transitioning to urban employment. Many potential scenarios can lead to transitions in household structure.

In **Tables 1e-1g**, the middle panels refer to children age 0-4, and the characteristics of their households and household heads: 71% of the children whose household has a male head are living in a nuclear household and 29% in an extended household. If the household head is female, the children are less likely to be living in a nuclear household; 63% are in a nuclear household and 37% in an extended household. The pattern by age of the head is stronger. If the household head is under age 45, the great majority (77%-79%) live in a nuclear household. If the household head is age 60 and above, only 31% are in a nuclear household and 69% live in an extended household. Children age 0-4 in a household with an older head tend to be grandchildren, and the presence of grandchildren classifies the household to be extended.

As noted earlier, household type has almost no relationship with the education of the head, in terms of the numbers of children. There is a difference of only 2 to 3 percentage points in the balance of nuclear and extended households depending on the head’s education.

The third panel of **Tables 1e-1g** describes women age 15-49. If the head is male, 63% of women live in nuclear households and 37% in extended households. If the head is female, the percentages are 54% and 46%, respectively. As with children, if the head’s age is younger than age 45, more than 70% of women live in a nuclear household and less than 30% in an extended household. If the head is age 60 and above, only 35% of women live in a nuclear household, while 65% live in an extended household. For young heads

of households, the women are predominantly the spouse of the head. For older heads, a woman is increasingly likely to have a different relationship to the head, and her presence in the household classified it as extended. Later in the analysis we examine combinations of sex, age, and education of the head.

4 HEALTHCARE SEEKING BY WOMEN

We now turn to healthcare seeking behaviour by women, using indicators that require a physical visit to some type of health facility. The data do not include information about whether the woman went to the facility on her own or was accompanied, which would allow us to assess the benefit of belonging to an extended household. As described in Chapter 2, three outcomes were selected to describe healthcare seeking by women age 15-49: ever had an HIV test, had 4+ ANC visits during the pregnancy for the most recent birth in the previous 5 years, and the most recent birth in the past 5 years was delivered in a health facility.

The first of these indicators is not, strictly speaking, a maternal and child health indicator, but it is included in part because it has the broadest base—and was asked of all women age 15-49.

4.1 Household Type

Table 2a shows the results for these outcomes for Mali as a whole and for urban and rural places of residence. This format is used for most of the remaining tables in this report. The table has rows for the subpopulations, including “all” of Mali in the bottom row. There are 15 columns, 5 for each of the 3 outcomes. Within each group of five columns, the first column shows the percentage with the outcome in all households; the second column is the corresponding percentage for nuclear households; and the third column is the percentage for extended households. The fourth column, labelled “Delta,” is the difference between the extended and nuclear households, calculated as the percentage for extended households minus the percentage for nuclear households. That is, nuclear households are the standard. If the Delta is positive, the percentage for extended households is greater than the percentage for nuclear households. If Delta is negative, it is less.

Table 2a The percentage of women in nuclear or extended households who experienced each of three possible types of care seeking behaviour, by type of place of residence. Mali DHS 2018

Type of place of residence	Percent who ever had an HIV test						Percent who had 4+ antenatal visits						Percent who had facility delivery					
	In all house-holds		In nuclear house-holds		In extended house-holds		In all house-holds		In nuclear house-holds		In extended house-holds		In all house-holds		In nuclear house-holds		In extended house-holds	
	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta
Urban	35.6	35.5	35.6	0.1	2,725.9	70.0	67.4	72.9	5.5	1,357.2	93.2	92.6	93.8	1.2	1,428.7			
Rural	13.1	12.8	13.7	1.0	7,712.4	37.4	36.5	39.9	3.4	5,068.1	63.9	62.3	67.8	5.5	5,155.5			
All	19.0	17.2	21.8	4.6	10,438.3	44.3	41.6	50.0	8.4	6,425.3	70.2	67.3	76.1	8.8	6,584.2			

Table 2b The percentage of women in nuclear or extended households who experienced each of three possible types of care seeking behaviour, by region. Mali DHS 2018

Region	Percent who ever had an HIV test						Percent who had 4+ antenatal visits						Percent who had facility delivery					
	In all house-holds		In nuclear house-holds		In extended house-holds		In all house-holds		In nuclear house-holds		In extended house-holds		In all house-holds		In nuclear house-holds		In extended house-holds	
	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta
Kayes	13.8	12.7	16.4	3.7	1,530.8	43.8	45.4	39.1	-6.3	1,004.5	60.9	59.8	64.0	4.2	1,030.4			
Koulikoro	16.3	15.5	17.9	2.4	1,993.7	49.7	47.7	53.9	6.2	1,237.8	80.3	77.2	87.0	9.8	1,254.9			
Sikasso	8.3	7.7	9.6	1.9	1,767.2	35.1	33.0	40.6	7.6	1,189.5	74.1	72.2	79.1	6.9	1,195.7			
Segou	22.5	20.9	25.1	4.2	1,606.3	36.5	34.3	41.5	7.2	1,012.4	58.3	55.6	64.5	8.9	1,026.0			
Mopti	14.1	15.9	10.2	-5.7	1,045.8	28.6	28.2	29.7	1.4	671.1	58.2	57.8	59.4	1.6	707.8			
Tombouctou	6.2	6.0	6.3	0.4	380.9	28.0	23.8	31.4	7.6	242.7	31.9	32.1	31.6	-0.5	243.0			
Gao	17.4	17.0	18.3	1.3	291.6	37.3	34.4	47.0	12.6	172.2	56.6	53.3	67.7	14.4	173.5			
Kidal	3.1	1.4	5.8	4.3	10.1	9.7	7.6	12.9	5.3	4.0	25.5	24.8	26.5	1.8	4.1			
Bamako	39.4	40.6	38.5	-2.1	1,811.9	76.5	74.7	78.2	3.5	891.1	96.7	95.7	97.4	1.7	948.8			
All	19.0	17.2	21.8	4.6	10,438.3	44.3	41.6	50.0	8.4	6,425.3	70.2	67.3	76.1	8.8	6,584.2			

Table 2c The percentage of women in nuclear or extended households who experienced each of three possible types of care seeking behaviour, in combinations of region and type of place of residence. Mali DHS 2018

Region and type of place of residence	Percent who ever had an HIV test						Percent who had 4+ antenatal visits						Percent who had facility delivery					
	In all house-holds		In nuclear house-holds		In extended house-holds		In all house-holds		In nuclear house-holds		In extended house-holds		In all house-holds		In nuclear house-holds		In extended house-holds	
	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta
Bamako (Urban)	39.4	40.6	38.5	-2.1	1,811.9	76.5	74.7	78.2	3.5	891.1	96.7	95.7	97.4	1.7	948.8	948.8	948.8	948.8
Gao Urban	33.7	36.7	28.6	-8.1	51.1	59.3	58.4	61.8	3.5	28.6	82.8	81.0	87.6	6.6	28.6	28.6	28.6	28.6
Gao Rural	13.9	13.5	15.1	1.6	240.5	32.9	29.9	43.5	13.6	143.6	51.4	48.1	63.1	15.0	144.9	144.9	144.9	144.9
Kayes Urban	26.7	30.0	23.5	-6.5	243.3	50.8	59.6	39.9	-19.8	129.4	76.3	85.7	64.8	-20.9	133.5	133.5	133.5	133.5
Kayes Rural	11.4	10.5	13.8	3.4	1,287.5	42.8	43.9	38.9	-5.1	875.1	58.6	57.1	63.8	6.7	896.9	896.9	896.9	896.9
Kidal (Urban)	3.1	1.4	5.8	4.3	10.1	9.7	7.6	12.9	5.3	4.0	25.5	24.8	26.5	1.8	4.1	4.1	4.1	4.1
Koulikoro Urban	36.2	28.6	42.2	13.6	145.3	65.4	65.6	65.2	-0.4	61.2	91.7	88.7	95.5	6.8	62.9	62.9	62.9	62.9
Koulikoro Rural	14.7	14.8	14.6	-0.2	1,848.4	48.9	47.0	53.1	6.2	1,176.6	79.7	76.7	86.4	9.7	1,192.0	1,192.0	1,192.0	1,192.0
Mopti Urban	31.1	36.3	24.2	-12.1	104.3	60.1	52.4	72.7	20.4	57.0	95.7	96.6	94.1	-2.5	62.0	62.0	62.0	62.0
Mopti Rural	12.2	14.1	8.1	-6.0	941.5	25.7	26.3	24.0	-2.4	614.0	54.6	54.6	54.7	0.1	645.8	645.8	645.8	645.8
Segou Urban	38.7	41.0	35.1	-5.9	109.3	79.1	75.7	85.3	9.6	49.8	95.0	94.6	95.9	1.3	49.8	49.8	49.8	49.8
Segou Rural	21.3	19.5	24.4	4.9	1,497.0	34.3	32.3	38.8	6.5	962.6	56.4	53.7	62.6	8.9	976.2	976.2	976.2	976.2
Sikasso Urban	19.4	17.0	23.3	6.3	212.9	53.1	50.5	59.7	9.2	121.5	90.0	88.3	93.9	5.5	124.1	124.1	124.1	124.1
Sikasso Rural	6.8	6.6	7.2	0.7	1,554.3	33.0	31.0	38.3	7.3	1,068.0	72.3	70.4	77.3	6.9	1,071.6	1,071.6	1,071.6	1,071.6
Tombouctou Urban	12.8	7.4	17.6	10.3	37.7	47.5	29.0	81.2	52.1	14.6	79.4	76.9	84.0	7.1	14.9	14.9	14.9	14.9
Tombouctou Rural	5.5	5.8	5.2	-0.6	343.1	26.7	23.3	29.4	6.0	228.1	28.8	27.9	29.5	1.6	228.1	228.1	228.1	228.1
All	19.0	17.2	21.8	4.6	10,438.3	44.3	41.6	50.0	8.4	6,425.3	70.2	67.3	76.1	8.8	6,584.2	6,584.2	6,584.2	6,584.2

Table 2d The percentage of women in nuclear or extended households who experienced each of three possible types of care seeking behaviour, by wealth quintile of the household. Mali DHS 2018

Wealth quintile	Percent who ever had an HIV test						Percent who had 4+ antenatal visits						Percent who had facility delivery					
	In all house-holds		In nuclear house-holds		In extended house-holds		In all house-holds		In nuclear house-holds		In extended house-holds		In all house-holds		In nuclear house-holds		In extended house-holds	
	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta
Poorest	7.2	7.7	6.3	-1.4	1,835.4	26.2	25.2	29.0	3.9	1,259.0	49.4	48.6	51.7	3.2	1,273.7	1,273.7	1,273.7	1,273.7
Poorer	8.6	8.2	9.5	1.2	1,972.7	31.5	30.3	34.3	4.1	1,341.9	56.1	53.9	61.4	7.5	1,367.0	1,367.0	1,367.0	1,367.0
Middle	11.7	11.4	12.3	1.0	2,001.6	37.9	37.5	38.9	1.3	1,367.2	66.1	64.1	71.0	6.9	1,391.7	1,391.7	1,391.7	1,391.7
Richer	22.1	21.1	23.7	2.6	2,201.0	52.9	52.1	54.8	2.7	1,285.6	85.0	84.6	86.0	1.3	1,317.3	1,317.3	1,317.3	1,317.3
Richest	39.4	41.7	37.6	-4.1	2,427.6	76.6	75.3	77.9	2.5	1,171.6	96.1	96.3	96.0	-0.3	1,234.6	1,234.6	1,234.6	1,234.6
All	19.0	17.2	21.8	4.6	10,438.3	44.3	41.6	50.0	8.4	6,425.3	70.2	67.3	76.1	8.8	6,584.2	6,584.2	6,584.2	6,584.2

The fifth column in each set is the weighted number of women. Because of the way in which the sampling weights are calculated, the weighted frequencies are approximately proportional to the national numbers of women in the subpopulations. Some subpopulations in the tables are very small and have small weighted frequencies. However, in these instances the subpopulations have been over-sampled—that is, the unweighted number of cases is larger than the weighted number, which leads to greater statistical stability than implied by the weighted frequency.¹¹

In **Table 2a**, the national percentage of women who report having had an HIV test is 19%, although there is a substantial urban/rural difference: 36% in urban areas and 13% in rural areas. The percentage difference between extended and nuclear households (Delta) rounds to 5% at the national level. This difference is almost entirely explained by the different urban/rural composition of the nuclear and extended households. Within the urban areas or the rural areas, there is virtually no difference by household type.

Tables 2b, 2c, and 2d describe these outcomes by region, urban/rural residence in each region, and wealth quintile, respectively. There is enormous variation in the percentage of women who have had an HIV test, across regions, from low values of 3% in Kidal and 6% in Tombouctou to 39% in Bamako. The national level difference between extended and nuclear households, 5%, is generally small within regions—and within strata—but there are many exceptions. Women in extended households are 14 percentage points more likely to have been tested than women in nuclear households in urban Koulikoro, and 10 points more likely in urban Tombouctou, but 12 points *less* likely in urban Mopti. The pattern of geographic variation presumably reflects, in part, variation in the perceived risk of infection as well as access to testing. By wealth quintiles, the percentage tested increases monotonically with wealth, in all households, as well as separately in nuclear households and extended households. In the highest wealth quintile, the percentage tested is lower for extended households, relative to nuclear, by 4 points.

The second outcome for women is having 4 or more ANC visits for the most recent birth. The overall percentage is 42%, which is 70% in urban areas and 37% in rural areas. Again, the overall percentage is higher for women in extended households than women in nuclear households, by 8 points. The difference is reduced to 6 points in urban areas and 3 points in rural areas, which implies that much of the 8 point difference is explained by the urban/rural mix of nuclear and extended households. Within regions and strata, there are several examples of extreme differences between the coverage of this outcome in nuclear and extended households. The most extreme example is urban Tombouctou, where 81% of the women in extended households had 4 or more ANC visits, compared with only 29% of the women in nuclear households. This 52 point difference deserves further analysis. The next largest differences are 20 points in urban Mopti, 14 points in rural Gao, and a reversal of -20 points in urban Kayes. It is not clear why the differences between nuclear and extended households are so large. The ANC coverage for women in extended households is lower than that for women in nuclear households, by at least 1 percentage point in

¹¹ For example, Kidal, a sparsely populated region in the northeast of Mali that shares a border with Algeria and Niger, contains 10 weighted cases, only 0.1% of the total weighted number of women age 15-49. As noted earlier, the sample design omitted rural areas. However, the urban part of Kidal was substantially over-sampled, and accounts for 687 unweighted cases, 6.5% of the entire sample. Estimates for (urban) Kidal are therefore much more stable than the unweighted frequency would suggest.

only 3 of the 16 strata. The differences within wealth quintiles are 4 percentage points or less, always half or less than the national difference of 8 points, and therefore mostly compositional.

The third outcome is place of delivery for the most recent birth.¹² At the national level, 70% of deliveries take place in a facility, either public or private, rather than in the woman's home or another home. In urban areas, the level is 93%, and in rural areas 64%. Nationally, and in both urban and rural areas, the coverage of facility births is somewhat better for women in extended households than for women in nuclear households. The difference is 9% nationally. However, as with the other two indicators, the difference between the two household types is much less within the urban and rural sectors, and is reduced to 1 percentage point in urban areas and 6 points in rural areas.

In nearly all regions, strata, and wealth quintiles, the coverage of facility births is higher for women in extended households than for women in nuclear households. The only conspicuous exception is that in urban Kayes, where the level is 86% for nuclear households and only 65% for extended households, a -21 point difference. This is similar to the much lower level of ANC visits in urban Kayes noted above. There is only one other stratum (urban Mopti) for which the coverage of facility births is lower for extended households by at least 1 percentage point, and there the difference is only -2. With the other two indicators, the coverage of facility births increases monotonically with wealth, in all households, as well as separately in nuclear households and extended households. Within wealth quintiles, the differences between the two types of households are negligible for the top two wealth quintiles.

Broadly speaking, for all three outcomes, healthcare seeking is at a higher level for women in extended households, nationally and within most subpopulations. The magnitude of the difference is usually much smaller within a subpopulation than at the national level, although a few strata deviate from this pattern, which can reverse the sign of the difference.

4.2 Characteristics of the Household Head

Characteristics of the household head are potentially important for all members of the household. The only characteristics to be considered here are the sex, age, and education of the household head. The age and education categories for the head were described in Chapter 2. The interest here is in how these characteristics affect the woman's healthcare seeking and, secondly, whether those effects depend on household type.

¹² Tables in the main report describe place of birth for all births in the past 5 years. Here, women (not births) are the unit of analysis and only the most recent birth is used.

Table 2e The percentage of women in nuclear or extended households who experienced each of three possible types of care seeking behaviour, by sex of household head. Mali DHS 2018

Sex of household head	Percent who ever had an HIV test						Percent who had 4+ antenatal visits						Percent who had facility delivery					
	In all house-holds		In nuclear house-holds		In extended house-holds		In all house-holds		In nuclear house-holds		In extended house-holds		In all house-holds		In nuclear house-holds		In extended house-holds	
	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta
Male head	19.2	17.3	22.5	5.2	8,822.2	44.3	41.4	50.4	8.9	5,600.8	70.7	67.8	76.8	9.0	5,731.7	9.0	8.4	8.8
Female head	17.6	16.5	18.9	2.4	1,611.7	44.5	42.5	47.8	5.3	823.4	67.2	63.9	72.2	8.4	851.4	8.4	8.4	8.8
All	19.0	17.2	21.8	4.7	10,433.9	44.3	41.6	50.0	8.4	6,424.2	70.2	67.3	76.1	8.8	6,583.1	8.8	8.8	8.8

Table 2f The percentage of women in nuclear or extended households who experienced each of three possible types of care seeking behaviour, by age of household head. Mali DHS 2018

Age of household head	Percent who ever had an HIV test						Percent who had 4+ antenatal visits						Percent who had facility delivery					
	In all house-holds		In nuclear house-holds		In extended house-holds		In all house-holds		In nuclear house-holds		In extended house-holds		In all house-holds		In nuclear house-holds		In extended house-holds	
	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta
<30	16.1	15.4	18.1	2.7	1,343.1	40.6	39.0	46.9	7.9	956.0	65.3	63.9	70.2	6.3	986.4	6.3	8.4	8.4
30-44	21.4	19.7	25.8	6.1	4,208.0	43.0	40.6	50.5	9.9	3,124.0	70.8	68.7	77.1	8.4	3,202.5	8.4	10.7	10.7
45-59	18.0	16.3	20.3	4.0	3,173.8	47.8	46.1	50.6	4.5	1,574.2	71.0	66.9	77.6	10.7	1,606.1	10.7	9.2	9.2
60+	17.1	10.4	20.7	10.3	1,709.0	47.1	40.9	49.8	8.9	769.9	72.6	66.2	75.4	9.2	788.0	9.2	8.8	8.8
All	19.0	17.2	21.8	4.7	10,433.9	44.3	41.6	50.0	8.4	6,424.2	70.2	67.3	76.1	8.8	6,583.1	8.8	8.8	8.8

Table 2g The percentage of women in nuclear or extended households who experienced each of three possible types of care seeking behaviour, by education of household head. Mali DHS 2018

Education of household head	Percent who ever had an HIV test						Percent who had 4+ antenatal visits						Percent who had facility delivery					
	In all house-holds		In nuclear house-holds		In extended house-holds		In all house-holds		In nuclear house-holds		In extended house-holds		In all house-holds		In nuclear house-holds		In extended house-holds	
	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta
No education	13.6	12.5	15.5	3.1	6,978.0	37.7	35.7	42.0	6.3	4,377.9	63.9	61.5	69.0	7.5	4,471.9	7.5	10.1	10.1
Any education	29.9	27.7	32.9	5.2	3,370.2	58.2	54.2	66.0	11.8	2,005.8	83.3	79.7	89.9	10.1	2,061.9	10.1	8.9	8.9
All	18.9	17.1	21.8	4.7	10,348.3	44.2	41.4	49.9	8.5	6,383.7	70.0	67.1	76.0	8.9	6,533.8	8.9	8.9	8.9

Table 2h The percentage of women in nuclear or extended households who experienced each of three possible types of care seeking behaviour, by combinations of age, sex, and education of household head. Mali DHS 2018

Characteristics of household head	Percent who ever had an HIV test						Percent who had 4+ antenatal visits						Percent who had facility delivery											
	In all house-holds		In nuclear house-holds		In extended house-holds		Weighted cases		In all house-holds		In nuclear house-holds		In extended house-holds		Weighted cases		In all house-holds		In nuclear house-holds		In extended house-holds		Delta	
Man, No education, 15-29	9.2	8.3	12.7	4.4	486.3	27.5	27.4	27.6	0.2	354.5	57.2	56.5	60.0	3.5	360.4									
Man, No education, 30-44	14.2	13.8	15.5	1.7	2,295.7	34.3	32.8	39.0	6.2	1,840.8	63.4	62.5	66.7	4.2	1,884.9									
Man, No education, 45-59	12.7	12.4	13.1	0.7	1,867.3	42.9	42.0	45.0	3.1	1,004.5	64.5	61.4	71.4	10.0	1,022.3									
Man, No education, 60+	15.7	10.0	19.5	9.5	1,136.4	42.2	36.6	45.1	8.5	541.0	70.6	65.3	73.3	8.0	552.9									
Man, Any education, 15-29	24.5	23.5	26.9	3.4	400.9	55.7	52.7	64.6	11.9	286.0	80.8	80.0	83.0	3.0	295.2									
Man, Any education, 30-44	35.3	33.3	38.8	5.5	1,268.0	58.0	54.3	67.2	12.9	958.0	84.1	80.6	92.5	12.0	983.2									
Man, Any education, 45-59	28.8	25.4	33.3	7.9	906.3	60.9	57.5	66.5	9.0	429.3	84.6	81.0	90.3	9.3	437.3									
Man, Any education, 60+	20.9	10.8	26.3	15.5	375.7	60.9	56.8	62.6	5.8	146.2	80.2	67.4	85.5	18.1	146.3									
Woman, 15-29	16.0	16.5	14.7	-1.8	448.2	41.4	40.2	46.0	5.8	310.4	59.7	57.8	65.9	8.1	325.8									
Woman, 30-44	19.0	16.9	23.9	7.0	610.3	46.5	45.0	51.8	6.8	301.2	70.8	69.9	74.1	4.1	308.3									
Woman, 45+	17.4	14.6	18.1	3.4	553.2	46.3	39.7	47.0	7.3	211.7	73.3	65.7	74.1	8.4	217.3									
All	18.9	17.1	21.8	4.7	10,348.3	44.2	41.4	49.9	8.5	6,383.7	70.0	67.1	76.0	8.9	6,533.8									

Table 2e focuses on the sex of the head.¹³ A woman in a nuclear household with a male head must be the spouse, and a woman in a nuclear household with a female head must herself be the head, and usually is the only adult in the household. In an extended household, whether the head is male or female, a woman may have a different position in the household structure. **Table 2f** focuses on the age of the head, **Table 2g** on the education of the head, and **Table 2h** on a combination of sex, age, and education.

For all three outcomes in **Table 2e**, we first examine the columns headed “in all households.” The columns show that the coverage of HIV tests is higher if the household head is male, rather than female, but by a very small amount, 1% to 2%. For ANC visits, the difference rounds to 0%, while delivery in a facility is more likely if the head is male than female, and the difference rounds to 4%. These differences suggest that a woman’s healthcare seeking may be slightly higher, particularly for a facility delivery, if the head is male.

The corresponding columns in **Table 2f** imply that healthcare seeking is conspicuously lower than average if the household head’s age is below age 30. The optimal age interval is age 30-44 for HIV testing, age 45 and above for ANC visits, and age 60 and above for facility delivery. In **Table 2g**, the columns for all households show clearly that healthcare seeking is much higher if the head has at least some formal schooling. The advantage provided by some schooling is 17 percentage points for HIV testing, 20 for ANC visits, and 19 for facility delivery. Thus, a more educated head provides a clear advantage to the women in the household.

The columns headed “in all households” in **Table 2h** show the coverage of the three outcomes for a composite variable based on the sex, age, and education of the head. There are $2 \times 4 \times 2 = 16$ combinations of these three variables, although some, which are mostly combinations that involve female heads, have very small frequencies. **Table 2h** includes all 8 possible combinations for men, but only 3 for women, for ages 15-29, 30-44, and 45+.

With having had an HIV test, regardless of the age of the head, a male-headed household in which the head has some education has the highest levels; a male-headed household in which the head has no education has the lowest levels, and a female headed household is intermediate. The optimal combination is a male-headed household in which the man is age 30-44 and has some education.

For ANC visits and facility births, the pattern is similar: coverage is highest in households with a male head who has some education, lowest in households with a male head and no education, and intermediate in women-headed households. The optimal combination for ANC visits is a male-headed household in which the head is educated and age 45 and above. The optimal combination for facility delivery is a male-headed household in which the head is educated and age 30 and above. For all outcomes, the coverage is lowest if the head is male, has no schooling, and is younger than age 30.

Next we consider how the head’s characteristics may have different implications in nuclear or extended households. First, regardless of whether the head is male or female, the healthcare seeking outcome is more likely if the household is extended than if it is nuclear. That is, the “Delta” values in **Table 2e** are positive in all rows and for all three outcomes.

¹³ The “All” row in this table and other tables in this chapter may have slightly different numbers than the corresponding row in Tables 2a-2d because of different patterns of missing values.

Coverage is generally (in 5 comparisons out of 6) higher for women in male-headed households than for women in female-headed households. The only exception is that the percent of women with 4 or more ANC visits is slightly lower by 1% for women in male-headed households than for women in female-headed households. The combination of a male head and an extended household is the combination with the highest coverage for all three outcomes.

The percentage of women whose most recent birth was in a facility reaches 77% for women in an extended household with a male head. By contrast, in a nuclear household with a female head—in which the woman is herself the head and is a single head—the percentage is 64%.

In **Table 2f**, with the age of the household head, it is again observed that Delta is always positive: coverage is consistently higher in extended households than in nuclear households. Coverage is lowest, for all households, for nuclear households, and for extended households, if the household head is younger than age 30. For HIV testing, coverage is highest if the household head is age 30-44. For ANC visits and facility birth, the age of the head has little relationship to coverage after age 30.

Table 2g describes the household head in terms of education, with a simple dichotomy. For all three outcomes, coverage is much higher if the head has at least some formal schooling, regardless of whether the household is nuclear or extended. The effects of education and extended household structure reinforce each other. Delta is consistently larger if the head has some education versus none.

Only one value of Delta in **Table 2h** is negative. In a woman-headed household in which the woman is age 15-29 and the household is extended, the woman's chance of having had an HIV test is 17% if the household is nuclear (in which case the woman herself is the head) and 15% if the household is extended. Otherwise, Delta is positive, and for several combinations the advantage of an extended household exceeds 10%.

For every outcome, the coverage is lowest for households in which the head is a man with no education (the first four rows of **Table 2h**). About half of all women in Mali live in such households. If these households are nuclear, rather than extended, there is an additional penalty because all values of Delta for these combinations are greater than 0.

For all three outcomes, the coverage is highest if the household is extended, with a male head with at least some education. The percentage of women in such households who have had an HIV test peaks at 39% when the head is age 30-44; the coverage of ANC peaks at 67% if the head is age 30-59; and the coverage of facility births peaks at 93% if the man is age 30-44. All other combinations are below these levels.

4.3 Relationship to the Household Head

Table 2i describes the outcomes for women according to the information about their relationship to the head, as well as whether the household is nuclear or extended. Some cells involve very few women. A woman age 15-49 who is in a nuclear household is either the head, or a spouse, or a child, because those are the only possible relationships to the head in a nuclear household. The number of women who are a child of the head, in a nuclear household, and age 15-49, is very small and not included here.

Table 2i The percentage of women in nuclear or extended households who experienced each of three possible types of care seeking behaviour, by relation to household head. Mali DHS 2018

Relation to household head	Percent who ever had an HIV test						Percent who had 4+ antenatal visits						Percent who had facility delivery					
	In all house-holds		In nuclear house-holds		In extended house-holds		In all house-holds		In nuclear house-holds		In extended house-holds		In all house-holds		In nuclear house-holds		In extended house-holds	
	holds	Weighted cases	holds	Weighted cases	holds	Delta	holds	Weighted cases	holds	Delta	holds	Delta	holds	Weighted cases	holds	Delta	holds	Weighted cases
Head	18.1	1,011.4	18.0	186	18.6	0.6	44.0	1,011.4	42.7	7.4	50.1	7.4	65.1	599.8	63.6	8.6	72.2	619.7
Spouse	20.5	6,665.4	18.8	25.3	25.3	6.4	43.5	6,665.4	41.4	9.1	50.6	9.1	69.3	4,916.8	67.8	6.9	74.6	5,027.6
Child	10.3	1,435.5	5.1	15.8	15.8	10.8	45.7	1,435.5	36.5	10.5	46.9	10.5	77.8	223.4	77.8	0.0	77.8	223.7
Child-in-law	24.9	497.5		24.9	24.9		48.3	497.5			48.3		73.4	384.0			73.4	398.1
Grandchild	9.0	96.0		9.0	9.0		39.6	96.0			39.6		74.4	10.3			74.4	10.3
Parent	0.0	6.4		0.0	0.0		100.0	6.4			100.0		100.0	1.3			100.0	1.3
Parent-in-law	0.0	3.7		0.0	0.0			3.7					100.0				100.0	2.6
Sibling	26.2	109.2		26.2	26.2		45.8	109.2			45.8		79.5	38.0			79.5	38.0
Other	23.2	444.5		23.2	23.2		54.0	444.5			54.0		86.5	214.7			86.5	223.1
Foster	18.1	60.3		18.1	18.1		63.8	60.3			63.8		89.9	8.6			89.9	8.6
Unrelated	6.5	108.4		6.5	6.5		44.7	108.4			44.7		84.1	28.5			84.1	31.3
All	19.0	10,438.3	17.2	21.8	21.8	4.6	44.3	10,438.3	41.6	8.4	50.0	8.4	70.2	6,425.3	67.3	8.8	76.1	6,584.2

To interpret **Table 2i**, we focus on these questions:

First, if the woman is the head or the spouse, how does her healthcare seeking behaviour compare with that of all women, regardless of their relationship to the head?

Second, if the woman is the head or spouse, does her healthcare seeking behaviour depend on whether she is in a nuclear household or an extended household?

Third, if a woman in an extended household is not the head or the spouse, how does her healthcare seeking behaviour differ from the head or spouse?

The overall coverage of HIV tests, as seen before, is 19%. Ignoring the distinction between nuclear and extended households, women who are the head are 1 percentage point less likely, and women who are the spouse are 1 percentage point more likely, compared to all women, to have had an HIV test. That is, they are very close to the overall coverage. The women who are most likely to have had an HIV test are sister, daughter-in-law, or “other relative” of the spouse, and they are located only in extended households. Apart from categories with very small denominators, the percentage is lowest for women who are a daughter of the head (16%) or the head in a nuclear household (18%). If a woman is the head of a household, she has virtually the same chance of having had an HIV test, whether that household is nuclear or extended, and in both cases, the chance is just slightly below the overall mean.

The pattern is similar for having 4 or more ANC visits. The overall coverage is 44%. For women who are the head or spouse “in all households,” the coverage is also 44%. If the woman is a head or spouse in a nuclear household, the coverage is somewhat less at 43% and 41%, respectively. If she is a head or spouse in an extended household, the coverage is notably higher, 50% and 51%, respectively. If she is an “other relative” in an extended household, the percentage is higher still at 54%.

In the column “In all households” for facility deliveries, 70% of all women had their most recent birth (in the past 5 years) in a facility. If the woman was a household head, the percentage was 65%; if she was a spouse, it was 69%. Thus, both the head and the spouse, but especially women who are household heads, are slightly less likely than other women to have a facility birth.

Comparing the head and spouse in an extended household with the head and spouse in a nuclear household, the values of Delta are 9 and 7 percentage points, respectively. Women who are the head or the spouse in extended households are substantially more likely than women in nuclear households to have had a facility birth.

We next consider women who have other relationships to the head, who are only found in an extended family. For facility births, the unweighted frequencies are greatest for daughter, daughter-in-law, and “other relative.” Five other relation to head codes appear but very rarely. For daughters, the coverage of facility delivery is 78%; for daughters-in-law it is slightly lower at 73%; and for “other relatives” it is much higher at 87%. There is a 5 percentage point penalty for daughters-in-law, compared with daughters, although all three percentages are higher than the overall level of 70%. “Other relatives” have a much higher level than the mean for all women living in extended households at 76%.

4.4 Relationship to Women's Empowerment

Next we consider measures of the empowerment of women, and their ability to make decisions about their own activities. It is helpful to know exactly how the measures are constructed from the responses to questions Q919-Q924 in the Women's Questionnaire. These questions are only asked for women who are currently in a union. Q919-920 are asked only if the woman is working for money or payment in kind. Below are the questions (identified by the number in the questionnaire and the corresponding variable in the recode files) in French and then in English.

- Q919/v739: *Habituellement, qui décide comment l'argent que vous gagnez va être utilisé?*
- Who usually decides how the money you earn will be used?
- Q920/v746: *Diriez-vous que vous gagnez plus que votre mari/partenaire, moins ou à peu près la même chose?*
- Would you say you earn more than your husband/partner, less, or about the same?
- Q921/v743f: *Habituellement, qui décide comment l'argent que votre mari/partenaire gagne va être utilisé?*
- Who usually decides how the money your partner/husband earns will be used?
- Q922/v743a: *Habituellement, qui prend les décisions en ce qui concerne vos propres soins de santé?*
- Who usually makes decisions concerning your healthcare?
- Q923/v743b: *Qui prend habituellement les décisions concernant les achats importants pour le ménage?*
- Who usually makes decisions concerning important household purchases?
- Q924/v743d: *Qui prend habituellement les décisions concernant les visites à votre famille ou parents?*
- Who usually makes decisions concerning visits to your family or relatives?

Here we will only use questions Q922-Q924. The response categories for these questions, in French and English, are:¹⁴

1 *ENQUÊTÉE*; Respondent alone

2 *MARI/PARTENAIRE*; Husband/partner alone

¹⁴ The codes for these responses in the questionnaire are 1, 2, 3, 4, 6, respectively, but in the recode files the response codes are 1, 4, 2, 5, 6, respectively. The label list includes "3: Respondent and other person" but that option does not appear in the Mali questionnaire or recode files.

- 3 *CONJOINTEMENT ENQUÊTÉE ET MARI/PARTENAIRE*; Respondent and husband/partner
- 4 *QUELQU'UN D'AUTRE*; Someone else
- 5 *AUTRE*; Other

We reduce the response codes to just 0 and 1:

- 1 *ENQUÊTÉE ou CONJOINTEMENT ENQUÊTÉE ET MARI/PARTENAIRE*: Respondent alone or jointly with her husband/partner
- 0 *AUTRE*; Other

That is, the original responses 1 and 3 are consolidated as 1, and responses 2, 4, 5, are consolidated as 0. The new codes are interpreted as the presence or absence of empowerment / autonomy.

The three items will be referred to as “determines healthcare,” “determines purchases,” and “determines visits.” We will investigate their relevance separately, rather than through a composite variable, which would be more difficult to interpret.

Table 2j The percentage of women in nuclear or extended households who experienced each of three possible types of care seeking behaviour, by whether the woman determines her healthcare herself / together with her spouse. Mali DHS 2018

	Percent who ever had an HIV test						Percent who had 4+ antenatal visits						Percent who had facility delivery						
	In all house-holds		In nuclear house-holds		In extended house-holds		In all house-holds		In nuclear house-holds		In extended house-holds		In all house-holds		In nuclear house-holds		In extended house-holds		
	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	
No	20.1	17.8	25.0	7.2	6,838.1	44.0	41.3	50.2	8.9	4,996.3	69.3	66.8	75.0	8.3	5,125.4				
Yes	22.6	22.2	23.4	1.2	1,683.2	45.1	42.6	50.1	7.5	1,175.7	72.1	69.3	77.6	8.3	1,200.5				
All	20.6	18.6	24.6	6.0	8,521.3	44.2	41.5	50.1	8.6	6,172.0	69.8	67.2	75.6	8.3	6,325.9				

Table 2k The percentage of women in nuclear or extended households who experienced each of three possible types of care seeking behaviour, by whether the woman determines purchases herself / together with her spouse. Mali DHS 2018

	Percent who ever had an HIV test						Percent who had 4+ antenatal visits						Percent who had facility delivery						
	In all house-holds		In nuclear house-holds		In extended house-holds		In all house-holds		In nuclear house-holds		In extended house-holds		In all house-holds		In nuclear house-holds		In extended house-holds		
	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	
No	19.5	17.5	23.7	6.2	6,793.6	43.1	40.8	48.6	7.8	4,972.2	68.7	66.2	74.5	8.3	5,108.5				
Yes	25.0	23.2	27.8	4.6	1,727.7	48.6	44.9	55.6	10.7	1,199.8	74.4	71.8	79.4	7.7	1,217.4				
All	20.6	18.6	24.6	6.0	8,521.3	44.2	41.5	50.1	8.6	6,172.0	69.8	67.2	75.6	8.3	6,325.9				

Table 2l The percentage of women in nuclear or extended households who experienced each of three possible types of care seeking behaviour, by whether the woman determines visits herself / together with her spouse. Mali DHS 2018

	Percent who ever had an HIV test						Percent who had 4+ antenatal visits						Percent who had facility delivery						
	In all house-holds		In nuclear house-holds		In extended house-holds		In all house-holds		In nuclear house-holds		In extended house-holds		In all house-holds		In nuclear house-holds		In extended house-holds		
	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	
No	18.3	16.1	22.7	6.6	6,132.1	42.4	39.6	49.0	9.4	4,497.2	68.2	65.6	74.2	8.5	4,597.7				
Yes	26.6	25.1	29.4	4.3	2,389.2	48.9	47.0	53.0	6.0	1,674.8	74.1	71.7	79.0	7.3	1,728.2				
All	20.6	18.6	24.6	6.0	8,521.3	44.2	41.5	50.1	8.6	6,172.0	69.8	67.2	75.6	8.3	6,325.9				

For statistical analysis, the first question can be stated “What is the relationship between healthcare seeking and the indicator of empowerment?” The columns headed “In all households” in **Tables 2j, 2k, and 2l** provide strong evidence of a positive association between each outcome and each indicator of empowerment. In every case, coverage is higher if the response to the empowerment question is “Yes” than if “No.” For all three outcomes, the difference between “Yes” and “No” is greatest for “determines visits,” intermediate for “determines purchases,” and least, although still conspicuous, for “determines healthcare.” Both the questions about healthcare and visits would seem relevant to healthcare seeking, although the question about visits (which, as asked, is about visits with the woman’s family and relatives, rather than visits to a health facility) has a stronger relationship with healthcare seeking.

Our second question is “Does this relationship hold within nuclear and extended households?” Examination of the three tables and the column for the two types of household households—a total of 18 comparisons—shows that in every case, coverage is higher for women who respond “Yes” to the respective empowerment question than for those who respond “No.” The relationship holds for both household types.

Third is the question “Does the relationship tend to be stronger in one type of household than the other?” We find that with one exception, coverage is higher for women who respond “Yes” to the empowerment question AND live in an extended household. That is, the positive effects of empowerment and an extended household tend to reinforce one another. Thus, for HIV tests, the combination of empowerment and household type that has the highest prevalence is 29%, for the third question, in **Table 2l**. For ANC, the combination with highest prevalence is 56%, for the second question, in **Table 2k**. The combination with the highest prevalence of facility births is 79%, for both the second and third questions. The only departure from this pattern is that for the first question, in **Table 2j**, and HIV tests for women in extended households, prevalence is 23% for “Yes” but slightly higher, 25% for “No.” Otherwise, there is a relative advantage, in terms of healthcare seeking, for women in extended households.

5 HEALTHCARE SEEKING FOR CHILDREN

This chapter investigates the potential relationship between household structure and healthcare seeking behaviour on behalf of children age 0-4. Three outcomes are reviewed: Had a PNC check in a facility within 2 days after birth; treatment for diarrhoea (if the child had diarrhoea in the past 2 weeks); and treatment for fever (if the child had a fever in the past 2 weeks). Treatment for diarrhoea and fever refers to the child being taken to a facility of some kind, even a pharmacy, and may or may not involve treatment with medication. We do not know who took the child—if it was the mother or the father or someone else in the household. It is even possible that the child was taken by someone other than a household member. As with women’s healthcare seeking, we do not know whether any appropriate facility was even physically accessible. The denominators for diarrhoea and fever treatment are restricted to children who showed symptoms in the past 2 weeks and are relatively small—only 1,602 and 1,487 children, respectively, whereas the PNC indicator applies to 6,146 children. For that reason, we do not address those two indicators for the subpopulations with especially small frequencies.

5.1 Household Type

Table 3a has a similar structure to **Table 2a**, with three groups of five columns each. The groups of five columns pertain to the three outcomes. The table has rows for urban, rural, and all households. **Tables 3b, 3c, and 3d** have a similar structure with rows for regions, strata, and wealth quintiles, respectively.

Table 3a The percentage of children in nuclear or extended households who experienced each of three possible types of care seeking behaviour, by type of place of residence. DHS Mali 2018

Type of place of residence	Percent who had postnatal check						Percent treated for diarrhoea						Percent treated for fever					
	In all house-holds		In nuclear house-holds		In extended house-holds		In all house-holds		In nuclear house-holds		In extended house-holds		In all house-holds		In nuclear house-holds		In extended house-holds	
	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta
Urban	69.0	63.9	74.5	10.5	1,334.7	58.0	53.8	61.6	7.8	278.4	65.6	60.3	70.1	9.8	249.4	249.4	249.4	249.4
Rural	50.8	48.9	55.7	6.7	4,811.5	49.1	48.3	51.0	2.7	1,323.4	46.7	47.5	44.9	-2.6	1,237.3	1,237.3	1,237.3	1,237.3
All	54.8	51.4	61.8	10.4	6,146.2	50.7	49.0	54.0	5.0	1,601.7	49.9	49.0	51.5	2.5	1,486.7	1,486.7	1,486.7	1,486.7

Table 3b The percentage of children in nuclear or extended households who experienced each of three possible types of care seeking behaviour, by region. Mali DHS 2018

Region	Percent who had postnatal check						Percent treated for diarrhoea						Percent treated for fever					
	In all house-holds		In nuclear house-holds		In extended house-holds		In all house-holds		In nuclear house-holds		In extended house-holds		In all house-holds		In nuclear house-holds		In extended house-holds	
	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta
Kayes	50.2	49.0	53.8	4.8	955.0	44.2	45.4	40.4	-5.0	385.0	42.4	43.1	39.9	-3.2	279.6	279.6	279.6	279.6
Koulikoro	61.1	56.2	72.9	16.7	1,183.8	54.1	54.5	53.1	-1.4	233.1	58.3	54.1	66.2	12.2	247.4	247.4	247.4	247.4
Sikasso	41.9	40.7	45.1	4.4	1,126.8	42.5	38.6	50.0	11.3	173.4	47.0	43.4	57.1	13.6	178.5	178.5	178.5	178.5
Segou	60.9	59.2	64.9	5.7	942.5	51.6	50.9	53.0	2.1	302.6	47.1	52.2	39.2	-13.0	335.3	335.3	335.3	335.3
Mopti	51.5	49.2	57.9	8.7	675.1	54.1	49.7	68.6	18.9	204.9	61.8	58.3	75.9	17.7	141.7	141.7	141.7	141.7
Tombouctou	29.4	28.2	30.4	2.1	217.0	36.8	40.2	34.0	-6.2	82.6	17.9	14.7	20.2	5.5	101.1	101.1	101.1	101.1
Gao	49.2	45.9	60.5	14.7	151.4	68.1	63.9	77.8	13.9	39.5	48.0	50.8	43.8	-7.0	33.0	33.0	33.0	33.0
Kidal	16.7	16.5	17.0	0.5	3.6	36.3	16.3	65.9	49.6	0.9	42.6	46.6	38.2	-8.4	0.8	0.8	0.8	0.8
Bamako	70.7	64.7	75.8	11.1	890.8	64.8	59.7	68.3	8.6	179.6	67.9	61.2	73.6	12.4	169.4	169.4	169.4	169.4
All	54.8	51.4	61.8	10.4	6,146.2	50.7	49.0	54.0	5.0	1,601.7	49.9	49.0	51.5	2.5	1,486.7	1,486.7	1,486.7	1,486.7

Table 3c The percentage of children in nuclear or extended households who experienced each of three possible types of care seeking behaviour, in combinations of region and type of place of residence. Mali DHS 2018

Region and type of place of residence	Percent who had postnatal check						Percent treated for diarrhoea						Percent treated for fever						
	In all house-holds		In nuclear house-holds		In extended house-holds		In all house-holds		In nuclear house-holds		In extended house-holds		In all house-holds		In nuclear house-holds		In extended house-holds		
	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	
Bamako (Urban)	70.7	64.7	75.8	11.1	890.8	64.8	59.7	68.3	8.6	179.6	67.9	61.2	73.6	12.4	169.4	67.9	61.2	73.6	12.4
Gao Urban	76.7	75.4	80.9	5.5	24.1	61.8	45.9	84.3	38.4	8.0	47.2	47.8	46.5	-1.3	8.4	47.2	47.8	46.5	-1.3
Gao Rural	44.0	40.4	56.3	15.9	127.3	69.7	67.6	75.3	7.7	31.5	48.3	51.8	42.7	-9.0	24.6	48.3	51.8	42.7	-9.0
Kayes Urban	59.5	61.4	57.4	-4.0	123.9	32.8	39.4	22.6	-16.8	40.4	37.2	38.4	36.3	-2.2	25.4	37.2	38.4	36.3	-2.2
Kayes Rural	48.8	47.8	52.6	4.9	831.1	45.6	46.0	44.2	-1.8	344.6	43.0	43.3	41.1	-2.3	254.1	43.0	43.3	41.1	-2.3
Kidal (Urban)	16.7	16.5	17.0	0.5	3.6	36.3	16.3	65.9	49.6	0.9	42.6	46.6	38.2	-8.4	0.8	42.6	46.6	38.2	-8.4
Koulikoro Urban	74.1	55.7	100.0	44.3	59.9	33.3	54.5	0.0	-54.5	9.0	77.8	58.3	83.3	25.1	13.5	77.8	58.3	83.3	25.1
Koulikoro Rural	60.4	56.2	70.8	14.6	1,123.9	54.9	54.5	55.8	1.3	224.1	57.2	54.0	63.9	9.9	233.8	57.2	54.0	63.9	9.9
Mopti Urban	46.2	42.2	53.0	10.8	55.4	52.9	57.4	47.4	-10.0	12.7	72.3	100.0	24.1	-75.9	8.4	72.3	100.0	24.1	-75.9
Mopti Rural	52.0	49.8	58.5	8.8	619.6	54.2	49.3	71.5	22.2	192.2	61.1	56.2	82.3	26.1	133.2	61.1	56.2	82.3	26.1
Segou Urban	95.4	100.0	86.3	-13.7	47.4	72.2	61.7	87.8	26.1	14.9	87.3	76.8	100.0	23.2	13.1	87.3	76.8	100.0	23.2
Segou Rural	59.1	57.2	63.6	6.4	895.1	50.5	50.4	50.8	0.3	287.7	45.5	51.3	36.3	-15.0	322.2	45.5	51.3	36.3	-15.0
Sikasso Urban	64.8	61.9	71.8	9.9	114.8	41.1	0.0	66.9	66.9	8.8	67.3	37.6	100.0	62.4	7.4	67.3	37.6	100.0	62.4
Sikasso Rural	39.3	38.4	41.8	3.4	1,012.0	42.6	39.8	48.3	8.4	164.6	46.2	43.6	53.6	10.0	171.0	46.2	43.6	53.6	10.0
Tombouctou Urban	61.1	45.1	89.0	43.9	14.6	58.8	82.5	14.5	-68.0	3.8	60.6	66.1	57.0	-9.1	2.9	60.6	66.1	57.0	-9.1
Tombouctou Rural	27.1	26.5	27.5	1.0	202.4	35.7	37.2	34.6	-2.6	78.7	16.7	13.2	19.1	5.9	98.2	16.7	13.2	19.1	5.9
All	54.8	51.4	61.8	10.4	6,146.2	50.7	49.0	54.0	5.0	1,601.7	49.9	49.0	51.5	2.5	1,486.7	49.9	49.0	51.5	2.5

Table 3d The percentage of children in nuclear or extended households who experienced each of three possible types of care seeking behaviour, by wealth quintile of the household. Mali DHS 2018

Wealth quintile	Percent who had postnatal check						Percent treated for diarrhoea						Percent treated for fever						
	In all house-holds		In nuclear house-holds		In extended house-holds		In all house-holds		In nuclear house-holds		In extended house-holds		In all house-holds		In nuclear house-holds		In extended house-holds		
	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	
Poorest	42.9	40.7	49.6	8.9	1,182.7	46.8	44.8	53.0	8.2	378.9	45.3	48.3	36.5	-11.7	342.0	45.3	48.3	36.5	-11.7
Poorer	46.2	44.8	49.6	4.8	1,272.8	46.1	48.4	41.1	-7.3	402.7	39.0	39.2	38.7	-0.5	385.8	39.0	39.2	38.7	-0.5
Middle	49.7	48.5	52.8	4.3	1,307.6	50.6	49.9	52.3	2.4	322.8	47.3	47.9	45.8	-2.1	310.7	47.3	47.9	45.8	-2.1
Richer	64.3	60.7	72.8	12.1	1,225.9	51.8	49.7	56.3	6.6	266.3	57.0	56.2	58.3	2.2	226.2	57.0	56.2	58.3	2.2
Richest	71.8	68.7	75.1	6.4	1,157.2	63.7	59.7	66.5	6.8	231.0	72.3	68.2	76.1	7.9	222.0	72.3	68.2	76.1	7.9
All	54.8	51.4	61.8	10.4	6,146.2	50.7	49.0	54.0	5.0	1,601.7	49.9	49.0	51.5	2.5	1,486.7	49.9	49.0	51.5	2.5

In all of Mali, indicated by the bottom row of **Table 3a**, 55% of the youngest children born in the past 5 years received a PNC check within 2 days. The coverage was 69% in urban areas and 51% in rural areas. Of children who had diarrhoea in the past 2 weeks, the national coverage was 51% and in urban and rural areas 58% and 49%, respectively. For children who had fever in the past 2 weeks, the national coverage was 50%, and in urban and rural areas 66% and 47%, respectively. Thus, the national coverage of each outcome is in the vicinity of half of children under age 5, with markedly higher levels in urban areas.

Nationally, for each outcome, coverage is higher if the child is in an extended household, rather than a nuclear household. As shown in the bottom row of **Table 3a**, in the Delta columns, the advantage given by the extended household is 10 percentage points for PNC, 5 points for diarrhoea treatment, and 3 points for fever treatment. However, the national-level advantage for extended households does not apply uniformly in all subpopulations. In urban areas, the Delta is 11, or 8, or 10 percentage points, respectively. In rural areas it is 7, 3, or -3, respectively.

Table 3b shows wider variation across regions. The PNC coverage is highest in Bamako, as would be expected. There is an apparent advantage for extended households in all eight regions, especially in Koulikoro, Gao, and Bamako. However, for the other two indicators, in several regions the general advantage of an extended household is reduced or reversed. Bamako, Mopti, and Sikasso are the only regions which show an advantage for extended household for all three outcomes. Kayes shows an advantage for nuclear households for both the diarrhoea and fever indicators. Otherwise, it is difficult to identify a pattern because of the small denominators for these two indicators.

Table 3c shows the breakdown by strata, for which the denominators are even smaller (except for Bamako, which is completely urban, and Kidal, where only the urban areas were included in the sample). Apart from two relatively small strata (urban Kayes and urban Segou), extended households have a consistent advantage over nuclear households. Extended households have higher coverage for diarrhoea treatment in 10 of 16 strata and higher coverage for fever treatment in 8 of 16 strata.

Table 3d is more interpretable because there are only five wealth quintiles that have approximately equal denominators. The PNC coverage is higher in extended households in every quintile. Treatment for diarrhoea has higher coverage in extended households for all quintiles except the second (“poorer”) quintile. The pattern for fever treatment is monotonic: nuclear households have an advantage of 12 percentage points in the lowest wealth quintile, but there is a steady reversal as wealth increases, such that in the highest (“richest”) quintile, the extended households have an 8 point advantage. Treatment for fever is higher in extended households for only the top two quintiles. This monotonic pattern, by which the advantage for fever treatment shifts steadily from nuclear to extended households, as household wealth increases, could be explored further. The pattern by wealth in **Table 3d** is related to the urban/rural pattern in **Table 3a**, because the components of the DHS Wealth Index tend to be higher in urban areas and lower in rural areas.

5.2 Characteristics of the Household Head

Next we consider the relationship of coverage to the sex, age, and education of the head of the household in which the child lives.

Table 3e The percentage of children in nuclear or extended households who experienced each of three possible types of care seeking behaviour, by sex of household head. Mali DHS 2018

Sex of household head	Percent who had postnatal check						Percent treated for diarrhoea						Percent treated for fever					
	In all house-holds		In nuclear house-holds		In extended house-holds		In all house-holds		In nuclear house-holds		In extended house-holds		In all house-holds		In nuclear house-holds		In extended house-holds	
	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta
Male head	54.9	51.5	62.5	11.0	5,352.3	50.7	48.8	54.6	5.7	1,357.9	50.1	49.5	51.4	1.9	1,291.5			
Female head	53.8	51.1	58.0	7.0	792.7	50.2	49.8	50.9	1.1	243.6	48.6	46.0	52.8	6.9	194.2			
All	54.7	51.4	61.8	10.3	6,145.0	50.6	49.0	54.0	5.0	1,601.5	49.9	49.0	51.6	2.6	1,485.8			

Table 3f The percentage of children in nuclear or extended households who experienced each of three possible types of care seeking behaviour, by age of household head. Mali DHS 2018

Age of household head	Percent who had postnatal check						Percent treated for diarrhoea						Percent treated for fever					
	In all house-holds		In nuclear house-holds		In extended house-holds		In all house-holds		In nuclear house-holds		In extended house-holds		In all house-holds		In nuclear house-holds		In extended house-holds	
	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta
<30	49.8	47.7	57.5	9.9	925.7	47.0	44.6	54.6	9.9	279.3	51.0	50.4	52.4	2.0	214.1			
30-44	54.4	52.6	60.0	7.4	3,028.0	51.6	50.9	53.2	2.3	802.7	51.0	51.1	50.6	-0.5	715.6			
45-59	56.0	51.9	62.9	11.0	1,480.1	51.3	46.3	60.3	13.9	345.7	48.7	44.1	57.2	13.1	375.8			
60+	60.1	49.3	64.8	15.5	711.2	51.1	57.1	48.8	-8.2	173.8	47.0	46.7	47.1	0.4	180.3			
All	54.7	51.4	61.8	10.3	6,145.0	50.6	49.0	54.0	5.0	1,601.5	49.9	49.0	51.6	2.6	1,485.8			

Table 3g The percentage of children in nuclear or extended households who experienced each of three possible types of care seeking behaviour, by education of household head. Mali DHS 2018

Education of household head	Percent who had postnatal check						Percent treated for diarrhoea						Percent treated for fever					
	In all house-holds		In nuclear house-holds		In extended house-holds		In all house-holds		In nuclear house-holds		In extended house-holds		In all house-holds		In nuclear house-holds		In extended house-holds	
	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta
No education	50.2	47.0	57.0	10.0	4,166.8	49.4	48.4	51.5	3.1	1,150.3	45.3	45.8	44.2	-1.6	1,057.1			
Any education	64.2	60.8	70.9	10.0	1,931.5	53.1	50.2	57.8	7.6	437.9	61.2	57.7	66.6	8.9	416.5			
All	54.6	51.3	61.6	10.3	6,098.3	50.4	48.9	53.5	4.6	1,588.2	49.8	48.9	51.3	2.4	1,473.6			

Table 3h The percentage of children in nuclear or extended households who experienced each of three possible types of care seeking behaviour, by combinations of age, sex, and education of household head. Mali DHS 2018

Characteristics of household head	Percent who had postnatal check						Percent treated for diarrhoea						Percent treated for fever											
	In all household holds		In nuclear household holds		In extended household holds		Weighted cases		In all household holds		In nuclear household holds		In extended household holds		Weighted cases		In all household holds		In nuclear household holds		In extended household holds		Delta	
Man, No education, 15-29	40.5	38.0	52.1	14.1	335.8	45.0	39.7	65.2	25.5	93.6	48.4	51.7	40.8	-10.8	88.1									
Man, No education, 30-44	48.8	47.3	54.3	7.1	1,765.4	48.6	47.9	50.4	2.4	509.1	44.1	45.8	38.6	-7.2	441.3									
Man, No education, 45-59	51.8	50.3	55.1	4.8	938.6	51.9	48.7	60.2	11.4	233.8	47.6	44.6	55.5	10.8	251.1									
Man, No education, 60+	58.0	47.0	63.7	16.7	504.7	47.3	54.4	43.9	-10.4	125.8	40.0	46.7	37.2	-9.4	123.2									
Man, Any education, 15-29	61.5	59.2	68.6	9.4	276.6	52.2	48.3	63.3	15.0	67.8	73.4	68.7	78.5	9.7	48.4									
Man, Any education, 30-44	65.6	63.0	72.0	9.1	925.9	56.6	56.7	56.4	-0.4	209.8	63.1	62.3	64.8	2.4	203.4									
Man, Any education, 45-59	62.8	56.3	73.6	17.3	407.7	48.5	37.9	65.1	27.2	77.8	52.4	43.0	65.7	22.6	88.0									
Man, Any education, 60+	65.4	56.8	69.1	12.3	130.9	61.3	70.3	57.3	-13.0	26.8	63.9	47.0	69.2	22.1	35.9									
Woman, 15-29	48.8	48.3	50.7	2.5	308.2	45.1	46.1	42.1	-4.0	117.0	39.0	41.0	30.3	-10.6	76.6									
Woman, 30-44	51.6	54.6	41.0	-13.6	291.9	56.6	56.4	57.2	0.7	77.7	59.1	54.4	79.6	25.2	64.0									
Woman, 45+	65.0	41.7	66.8	25.1	192.6	52.4	34.3	54.0	19.7	49.0	49.6	24.4	52.7	28.2	53.7									
All	54.6	51.3	61.6	10.3	6,098.3	50.4	48.9	53.5	4.6	1,588.2	49.8	48.9	51.3	2.4	1,473.6									

Table 3e does not show an advantage or disadvantage for children that depends on the sex of the household head. For the first indicator, the coverage is 55% if the head is male and 54% if female. For diarrhoea treatment, the percentages are 51% and 50%, respectively, and for fever treatment, 50% and 49%. Coverage consistently rounds to 1 percentage point higher for a male head than for a female head, but the difference is negligible. For both male-headed and female-headed households, children in an extended household are more likely to experience the outcomes. The advantage for children in extended households is strongest for PNC and diarrhoea treatment if the head is male and for fever treatment if the head is female.

The rows of **Table 3f** refer to age of the head. For PNC, coverage increases steadily if the head is older, reaching a peak of 60% if the head's age is 60 and above, 10 points greater than if the head is under age 30. For the other two outcomes, the range is more narrow and the pattern by age is less clear. The advantage for children in extended households is found for most combinations of age of head and outcome. It is especially pronounced for PNC if the head is age 60 and above (16 points), and for diarrhoea treatment as well as fever treatment if the head is age 45-59 (14 points and 13 points, respectively).

Table 3g shows again that education is the most important characteristic of the head. All three outcomes are much more likely if the head has any schooling than if she/he has none. The advantage is 14 percentage points for PNC, 14 points for diarrhoea treatment, and 16 points for fever treatment. For PNC and diarrhoea treatment, the advantages of head with some education and an extended household structure reinforce each other. The only exception to this pattern is that children with an uneducated head and an extended household are slightly *less* likely to receive treatment for fever than children with an uneducated head and a nuclear household.

Care is required in the interpretation of **Table 3h**, in which the rows describe combinations of the sex, age, and education of the head. Although categories have been consolidated, the number of children in some combinations is small, especially for the diarrhoea and fever treatment indicators. Therefore, we focus on PNC in the first five columns. For this outcome, the highest categories are for men with any education, for which 62%-66% of children received PNC. The only other combination with PNC coverage above 60% is a female household head age 45 and above. For each type of head, children in extended households usually have an advantage compared with children in nuclear households, especially if the head is male and has some schooling, but there are exceptions to this pattern.

5.3 Relationship to the Household Head

As described in Chapter 4, an outcome can potentially vary by relation to head, and there is some confounding with household type because relationships other than head, spouse of head, and child of head can only appear in an extended household. The child outcomes do not apply to the head or spouse of head. The only relationships occupied in **Table 3i** are child, grandchild, "other relative," and a handful of foster children and unrelated children. The interpretation of **Table 3i** is limited by very small frequencies.

Table 3i The percentage of children in nuclear or extended households who experienced each of three possible types of care seeking behaviour, by relation to household head. Mali DHS 2018

Relation to household head	Percent who had postnatal check						Percent treated for diarrhoea						Percent treated for fever																							
	In all house-holds		In nuclear house-holds		In extended house-holds		In all house-holds		In nuclear house-holds		In extended house-holds		In all house-holds		In nuclear house-holds		In extended house-holds																			
	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta	Weighted cases	Delta																		
Head	100.0		100.0		100.0		0.5		49.9		53.2		49.9		53.1		4.1		50.6		55.8		6.7		1,381.3		49.0		49.0		55.8		6.7		1,268.2	
Child	52.9		58.2	6.7	5,322.5		546.3		53.2		53.2		49.0		53.2		4.1		41.9		41.9		41.9		132.0		49.0		41.9		41.9		136.1			
Grandchild	100.0		100.0		1.3																															
Sibling	71.5		71.5		236.8				57.1		57.1		57.1		57.1					51.5		51.5		51.5		80.4		51.5		51.5		51.5		72.0		
Other	41.2		41.2		15.6			66.0		66.0		66.0		66.0		66.0				38.3		38.3		38.3		4.4		38.3		38.3		38.3		5.2		
Foster	67.5		67.5		23.2			75.9		75.9		75.9		75.9		75.9				74.6		74.6		74.6		3.6		74.6		74.6		74.6		5.3		
Unrelated	54.8		61.8	10.4	6,146.2			50.7		50.7		49.0		49.0		54.0		5.0		49.9		49.9		49.9		1,601.7		49.0		49.0		51.5		1,486.7		
All																																				

The coverage of PNC is 51% for children of the head in nuclear households and 58% for children of the head in extended households. There is a 7 point advantage for a child in an extended household. Grandchildren of the head, who by definition are only found in extended households, have 66% coverage of PNC—a 14 point advantage¹⁵ over a child in a nuclear household. A child who is an “other relative” has a 20 point advantage over a child in a nuclear household. For diarrhoea treatment, both a child and a grandchild in an extended household have a 4 point advantage over a child in a nuclear household. For fever treatment, a child in an extended household has a 7 point advantage over a child in a nuclear household. The only exception to the general pattern is that a grandchild in an extended household has a lower, rather than higher (by 7 points) chance of receiving fever treatment, compared with a child in a nuclear household.

We note that women’s empowerment variables for the child’s mother are not included for the child outcomes because we do not know that the child’s mother is the person who took the child for care.

¹⁵ This difference is calculated before, rather than after, rounding to the nearest percentage.

6 REGRESSION ANALYSIS

To supplement the analysis with tabulations in the preceding chapters, we conducted several logit regressions. Regression models allow the incorporation of multiple covariates as predictors or controls, provide coefficients that describe the strength of relationships, and allow for tests of statistical significance. The models described here include adjustments for the complex survey design, including sample weights, clustering, and stratification. Since all outcomes in this report are binary, logit regression is appropriate. For easier interpretation, all (except one) of the predictors are also expressed with binary variables.

Seven predictors are included for both women and children:

Extended:	1 if the household is extended and 0 if it is nuclear
Number of Adults:	The number of women and men age 15-49 (<i>de jure</i> residents)
3+ Adults 15-49:	1 if the number of adults is 3+, 0 otherwise
Female Head:	1 if the household head is a woman, 0 if a man
Educated Head:	1 if the household head has any schooling, 0 if none
Older Head:	1 if the household head is 45+ years old, 0 if younger
Relation to Head:	1 if not a nuclear member, 0 otherwise

Three additional predictors are included for women. These are based on the women's empowerment (WE) indicators described earlier:

WE Health:	1 if the woman makes healthcare decisions herself or with husband, 0 otherwise
WE Purchases:	1 if the woman makes decisions about purchases herself or with husband, 0 otherwise
WE Visits:	1 if the woman makes decisions about visits to relatives or friends herself or with husband, 0 otherwise

Each outcome is regressed on each predictor twice. The first regression is “unadjusted” and does not include any controls. The second regression is “adjusted” because stratum and wealth quintile are included as controls. The regression output includes an estimated odds ratio. If the odds ratio is greater than 1, there is evidence of a positive association between the outcome and the predictor. The output also includes the p-value of the odds ratio. If the p-value is less than .05, the result is assigned one asterisk; if less than .01, two asterisks; and if less than .001, three asterisks. The more asterisks, the more confident we are that the sample has correctly identified a relationship in the population. Although we identify a .05 level of significance (with one asterisk), we prefer to base inferences on the .01 or .001 levels (with two or three asterisk).

Table 4a Results of logit regressions with three care seeking outcomes for women age 15-49. The adjusted models include controls for stratum (all combinations of region and place of residence) and the household's wealth quintile. Mali DHS 2018.

Outcome	Predictor	Unadjusted Model			Adjusted Model		
		Odds Ratio	p-value	Statistical significance	Odds Ratio	p-Value	Statistical significance
Had HIV test	Extended	1.56	0.0000	***	1.12	0.0416	***
Had HIV test	Number of Adults	1.10	0.0000	***	1.00	0.9041	***
Had HIV test	3+ Adults 15-49	1.11	0.1265	ns	0.91	0.0903	ns
Had HIV test	Female Head	1.03	0.7928	ns	0.99	0.9024	ns
Had HIV test	Educated Head	2.55	0.0000	***	1.45	0.0000	***
Had HIV test	Older Head	1.14	0.0470	*	1.05	0.4121	*
Had HIV test	Relation to Head ¹	0.19	0.0000	***	0.16	0.0000	***
Had HIV test	WE Health	1.17	0.1233	ns	1.04	0.6979	ns
Had HIV test	WE Purchases	1.38	0.0007	***	1.12	0.2844	***
Had HIV test	WE Visits	1.62	0.0000	***	1.22	0.0353	***
4+ Antenatal Visits	Extended	1.40	0.0000	***	1.15	0.0629	***
4+ Antenatal Visits	Number of Adults	1.10	0.0001	***	1.00	0.9491	***
4+ Antenatal Visits	3+ Adults 15-49	1.11	0.1363	ns	1.00	0.9983	ns
4+ Antenatal Visits	Female Head	1.01	0.9293	ns	0.98	0.8508	ns
4+ Antenatal Visits	Educated Head	2.30	0.0000	***	1.38	0.0002	***
4+ Antenatal Visits	Older Head	1.23	0.0008	***	1.25	0.0007	***
4+ Antenatal Visits	Relation to Head ¹	1.24	0.0341	*	0.99	0.9063	*
4+ Antenatal Visits	WE Health	1.05	0.6444	ns	0.93	0.5284	ns
4+ Antenatal Visits	WE Purchases	1.25	0.0141	*	1.11	0.2908	*
4+ Antenatal Visits	WE Visits	1.30	0.0029	**	1.04	0.6648	**
Facility Delivery	Extended	1.54	0.0001	***	1.35	0.0051	***
Facility Delivery	Number of Adults	1.22	0.0000	***	1.10	0.0267	***
Facility Delivery	3+ Adults 15-49	1.40	0.0014	**	1.22	0.0611	**
Facility Delivery	Female Head	0.85	0.1733	ns	0.88	0.3129	ns
Facility Delivery	Educated Head	2.80	0.0000	***	1.45	0.0004	***
Facility Delivery	Older Head	1.10	0.1837	ns	1.21	0.0214	ns
Facility Delivery	Relation to Head ¹	1.64	0.0004	***	1.47	0.0030	***
Facility Delivery	WE Health	1.14	0.2542	ns	1.05	0.6718	ns
Facility Delivery	WE Purchases	1.32	0.0192	*	1.19	0.1549	*
Facility Delivery	WE Visits	1.33	0.0298	*	1.12	0.3509	*

¹ Relation to Head is coded 0 if the woman is the head or spouse, and 1 otherwise.

ns = not significant

p-values *<0.05, **<0.01, ***<0.001

Table 4b Results of logit regressions with three care seeking outcomes for children age 0-4. The adjusted models include controls for stratum (all combinations of region and place of residence) and the household's wealth quintile. Mali DHS 2018.

Outcome	Predictor	Unadjusted Model			Adjusted Model		
		Odds Ratio	p-value	Sig.	Odds Ratio	p-Value	Sig.
Postnatal Check	Extended	1.52	0.0000	***	1.43	0.0000	***
Postnatal Check	Number of Adults	1.16	0.0000	***	1.12	0.0000	***
Postnatal Check	3+ Adults 15-49	1.37	0.0006	***	1.37	0.0001	***
Postnatal Check	Female Head	0.96	0.6547	ns	0.95	0.6419	ns
Postnatal Check	Educated Head	1.79	0.0000	***	1.30	0.0023	***
Postnatal Check	Older Head	1.18	0.0191	*	1.21	0.0049	*
Postnatal Check	Relation to Head ¹	0.56	0.0000	***	0.61	0.0000	***
Diarrhoea Treatment	Extended	1.22	0.1162	ns	1.14	0.2771	ns
Diarrhoea Treatment	Number of Adults	1.09	0.0368	*	1.05	0.2074	*
Diarrhoea Treatment	3+ Adults 15-49	1.39	0.0160	*	1.35	0.0244	*
Diarrhoea Treatment	Female Head	0.98	0.8967	ns	1.00	0.9881	ns
Diarrhoea Treatment	Educated Head	1.16	0.2768	ns	0.96	0.7811	ns
Diarrhoea Treatment	Older Head	1.03	0.7947	ns	1.04	0.7662	ns
Diarrhoea Treatment	Relation to Head ¹	0.81	0.2363	ns	0.89	0.4923	ns
Fever Treatment	Extended	1.10	0.4727	ns	1.08	0.5933	ns
Fever Treatment	Number of Adults	1.06	0.1599	ns	0.99	0.8858	ns
Fever Treatment	3+ Adults 15-49	1.20	0.1993	ns	1.11	0.4577	ns
Fever Treatment	Female Head	0.94	0.7588	ns	1.10	0.6670	ns
Fever Treatment	Educated Head	1.90	0.0000	***	1.40	0.0283	***
Fever Treatment	Older Head	0.89	0.3822	ns	0.89	0.4071	ns
Fever Treatment	Relation to Head*	1.22	0.2539	ns	1.38	0.0656	ns

¹ Relation to Head is coded 0 if the woman is the head or spouse, and 1 otherwise.

ns = not significant

p-values *<0.05, **<0.01, ***<0.001

Table 4a presents the results for women age 15-49. We focus on the adjusted odds ratio and the regressions in which the adjusted odds ratio is significant at the .05 level or better:

- If the household is extended, women are more likely to have had an HIV test or a facility delivery.
- If the household head has some schooling, all three outcomes are more likely.
- If the woman is not the head or spouse, she is less likely to have an HIV test but more likely to have had a facility delivery.
- If the head is age 45+, the woman is more likely to have 4+ antenatal visits and a facility delivery.
- The more household members who are adults age 15-49, the more likely that the woman had a facility delivery
- If the woman is more empowered for visits, the more likely she is to have had an HIV test

All these statistical relationships are positive, with the sole exception of relation to head and HIV visits, for which the odds ratio is far below 1. The most significant relationships are between healthcare seeking and the education of the head.

Of the nine combinations of outcomes and women's empowerment variables, only one (mentioned above) is statistically significant in an adjusted model. Earlier we observed differences in the expected direction, in which healthcare seeking was greater for women who stated that they have more autonomy. Further elaboration of the relationship between empowerment and wealth, place of residence, and education would be possible.

Next we consider the logit regressions for child outcomes given in **Table 4b**. The adjusted odds ratio is significantly different from 1 in eight regressions:

- If the household is extended, children are more likely to have a postnatal check.
- The greater the number of adults age 15-49, the more likely the child is to have a postnatal check.
- If there are 3+ adults age 15-49, the child is more likely to have a post-natal check and to be taken for diarrhoea treatment.
- If the household head has some schooling, the child is more likely to have a post-natal check and to be taken for diarrhoea treatment.
- If the head is age 45 or above, the child is more likely to have a post-natal check.
- If the child is not the son or daughter of the household head, the less likely he/she is to receive a post-natal check.

Consistent with the pattern for women, all these relationships are positive, except that a non-nuclear member of the household is less likely to be taken for a post-natal check.

The most powerful covariate is Educated Head, which has a significant and consistently positive effect for five of the six outcomes. This finding is striking because the measure is a very crude dichotomy that simply distinguishes between *no* schooling and *any* schooling.

Several of the adjusted odds ratios in **Tables 4a and 4b** are 1.30 or greater. An adjusted odds ratio of 1.43 for the effect of residence in an extended household on a child being taken for a post-natal check, for

example, implies that the odds of being taken are 43% greater for such a child, compared to a child in a nuclear household. This is a substantial advantage.

In other regressions, not shown here, the beneficial effect of living in an extended household, which is significant for three of the six outcomes, is largely attributable to the presence of additional adults in the household, especially if they are in the age range of 15-49.

7 DISCUSSIONS AND CONCLUSIONS

This analysis has sought to identify systematic relationships between several aspects of household structure and healthcare seeking by women and on behalf of children. Several patterns have been identified. The bulleted points in Chapter 6 provide a helpful summary of the findings.

A serious limitation has been the restriction to just three types of healthcare seeking for women, and three for children. These are not necessarily the best indicators of healthcare seeking, even among those that are available with DHS data. The interpretation of any possible outcome, not just the six that were used, is restricted by the service environment in the vicinity of where the women and children reside. Each outcome depends on access to at least one relevant facility or provider in the vicinity of the household. If a relevant facility exists, it must be known to the woman or the child's caregivers and there must be a way to visit it and to pay for the visit, if a fee is required. Otherwise, if there are no viable options, the characteristics of the respondents and households are not relevant.

A principal limitation of this analysis is that all the outcomes occurred before the date of the survey, but household characteristics are assessed at the date of the survey. This is a limitation of most analyses with DHS data and is inherent with any survey design that is cross-sectional rather than longitudinal. We are in the unfortunate situation of analyzing outcomes that temporally precede the predictors. There is an implicit assumption that the household characteristics are relatively stable over time and therefore the current status is a good proxy for the status over the past 5 years or so. For some characteristics, such as the education of the household head, this is a safe assumption. All household heads are well past the age at which they would be attending school, especially primary school. However, household structure—including the basic distinction between whether the household is nuclear or extended—can easily change in a short period of time. The presence or absence of just one person who is not a member of the nucleus will make the difference between a household being classified as extended or nuclear.

We have made the classification less transitory by basing it on the *de jure* household members rather than the *de facto* household members. Even so, we do not know for how long the *de jure* members have been with the household, and we do not know about someone who may have been in the household but died or left recently and may even have been the household head, the spouse, or the main caregiver for children in the household.

Household structure is dynamic. Many, and perhaps most, individuals in Mali spend some of their lives within a nuclear household and some within an extended household. Moreover, during the life course everyone (in any country) passes through different roles within their household. People have a dependent status when young and (if they live long enough) when old. In Mali, many or most individuals spend some of their adult years as the head of a household and most women spend some of their adult years as the spouse of the head. The DHS data do not allow us to estimate how much of a person's life is spent in different roles, in different relationships to the head, and in different types of households, but we know that people change roles within households.

The analysis has shown that women and children in extended households generally have better outcomes—higher levels of healthcare seeking—than women and children in nuclear households. This advantage is in

addition to other beneficial characteristics, such as urban residence, a male household head, an older (age 45 and above) head, a head with at least some education, and greater female autonomy.

What is it about extended households that is responsible for this advantage? It can be shown that what appears as an additive advantage for the extended household is due almost entirely to the presence of a greater number of adults in the household. Indeed, the number of adults age 15-49 in the household, whether men or women, is more important for healthcare seeking by household members than the simple distinction between nuclear versus extended household structure. Healthcare seeking by women, and on behalf of children, is more difficult if a woman (for herself or on behalf of her children) must leave her household duties or her other children unattended when visiting a facility, even if only for a few hours. Additional household members can substitute for the woman and at least temporarily assume some of her responsibilities. This potential benefit from other adults in the household was also identified in the literature review in Chapter 1. It is interesting that extended households, and the benefit they tend to provide for healthcare seeking, are not just found in rural and traditional settings. They are also found in urban areas, including Bamako.

Household structure, in itself, is not a policy variable. Policies that promote a particular type of household structure are not likely to succeed. However, access to schooling is certainly a policy variable and is important in that the education of the household head, in addition to its many other benefits, is beneficial for healthcare seeking within the household. In terms of lessons for programmes and policies to promote healthcare seeking, perhaps the most important finding is the evidence that a woman may be more likely to go to a facility or provider, on her own behalf or on behalf of her children, if someone is available to step in and assume her normal responsibilities, whatever they may be, while she is temporarily absent. Greater sensitivity, by providers, to this very practical difficulty could potentially lead to increased healthcare seeking. We suggest further research into whether the presence of several young children, combined with the absence of other adults or even of older children who can care temporarily for the younger children, has a negative effect on healthcare seeking, and into the effectiveness of other categories of adults or older children as substitutes for the woman or mother.

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