

# Assessing the risk of child labor in Ethiopia and Uganda

## 4. Results

### 4.2 Exploratory Data Analysis of Outcome Variables

In this section, the distribution for each outcome variable is assessed, as well as the relationships between predictor and outcome variables. All variables in this section are assessed through logistic regression modeling.

#### 4.2.1 Ethiopia Household Level EDA

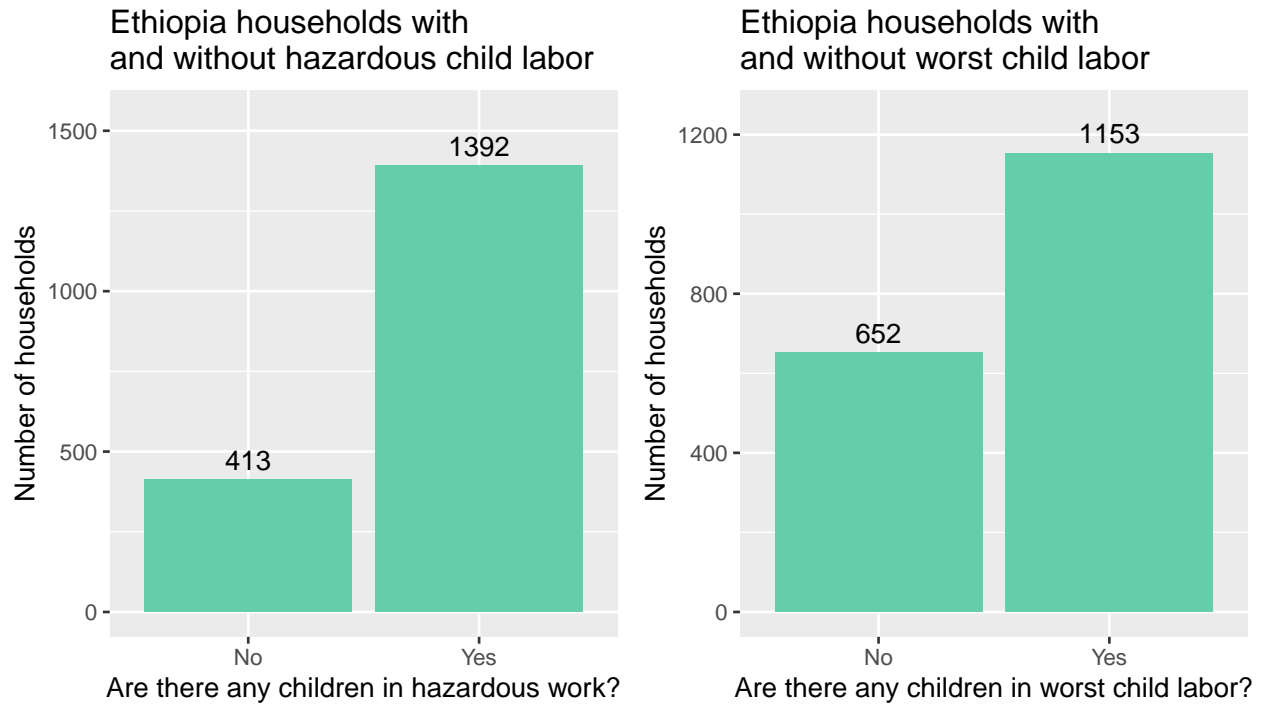
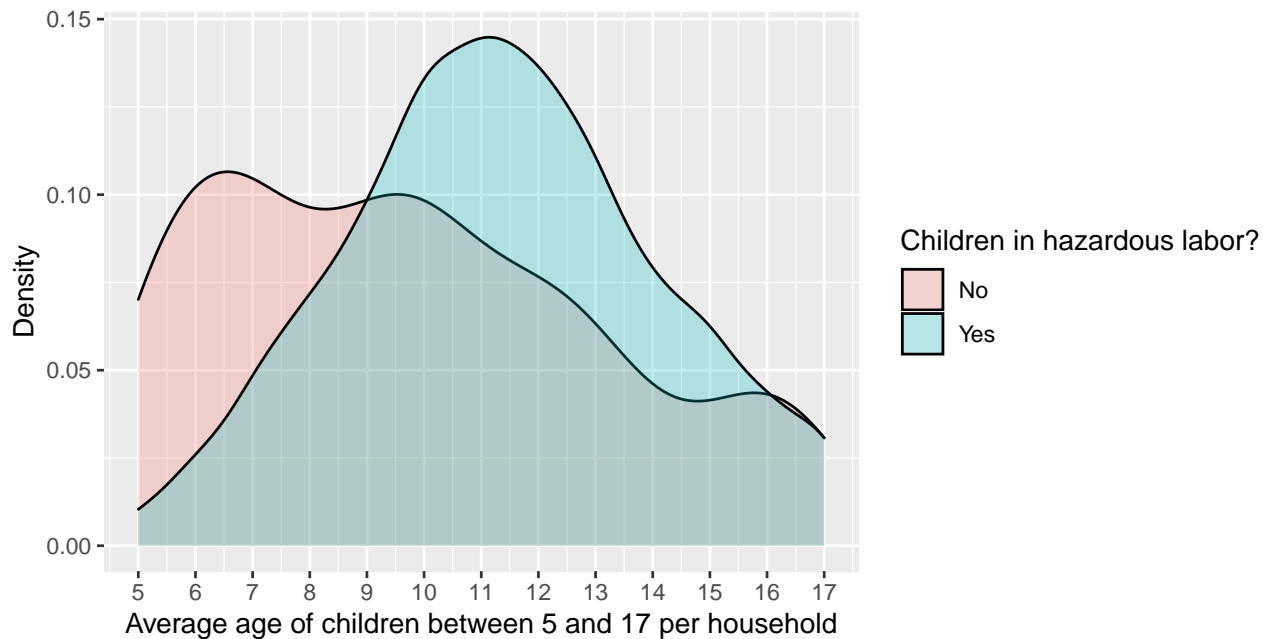


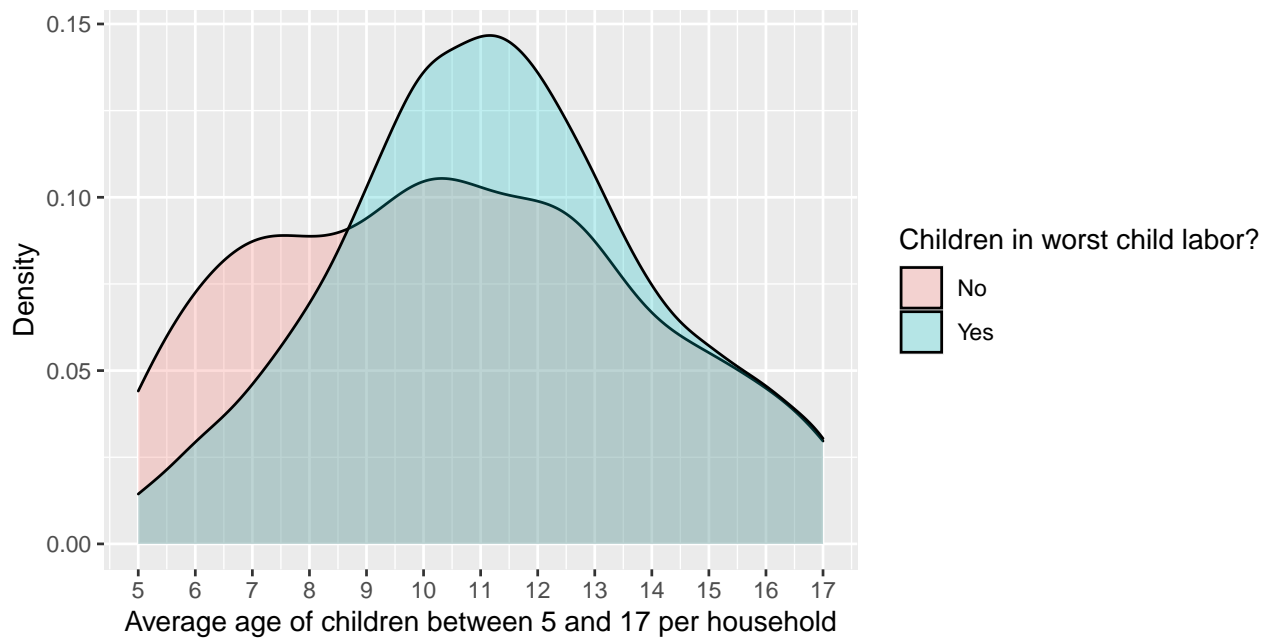
Table 1: Overlap between worst and hazardous labor outcomes for Ethiopia households

| Any children in worst child labor? | Hazardous Labor: Yes | Hazardous Labor: No |
|------------------------------------|----------------------|---------------------|
| Yes                                | 1081                 | 72                  |
| No                                 | 311                  | 341                 |

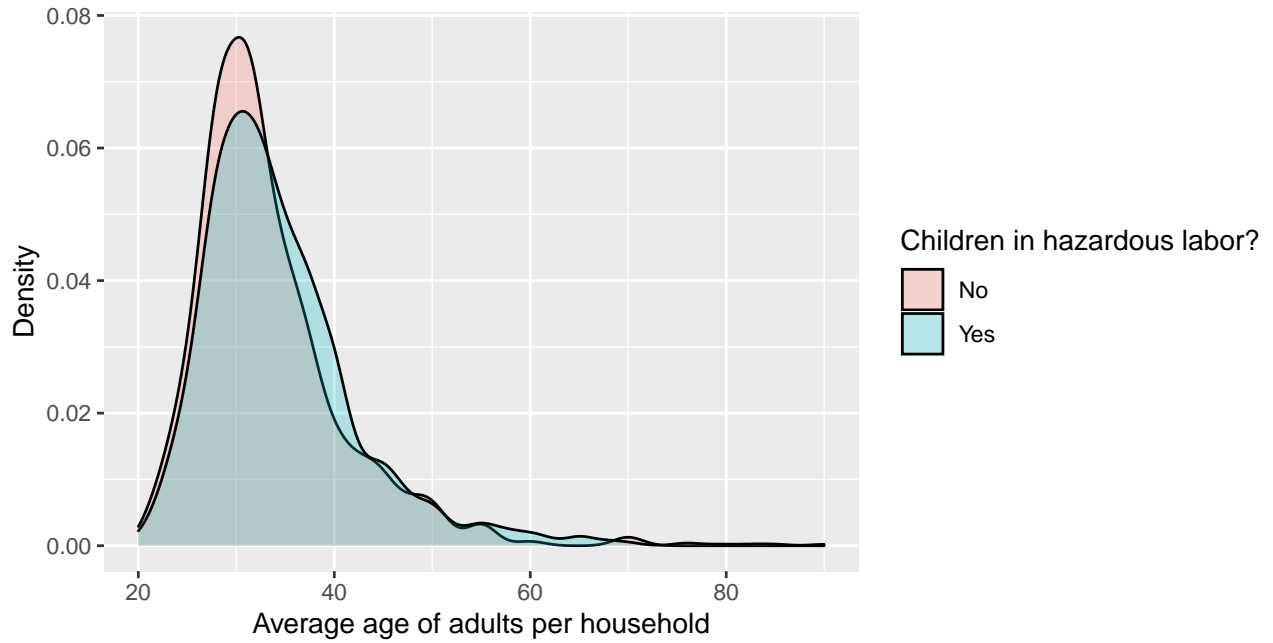
Comparing average age of children per household and hazardous labor outcome



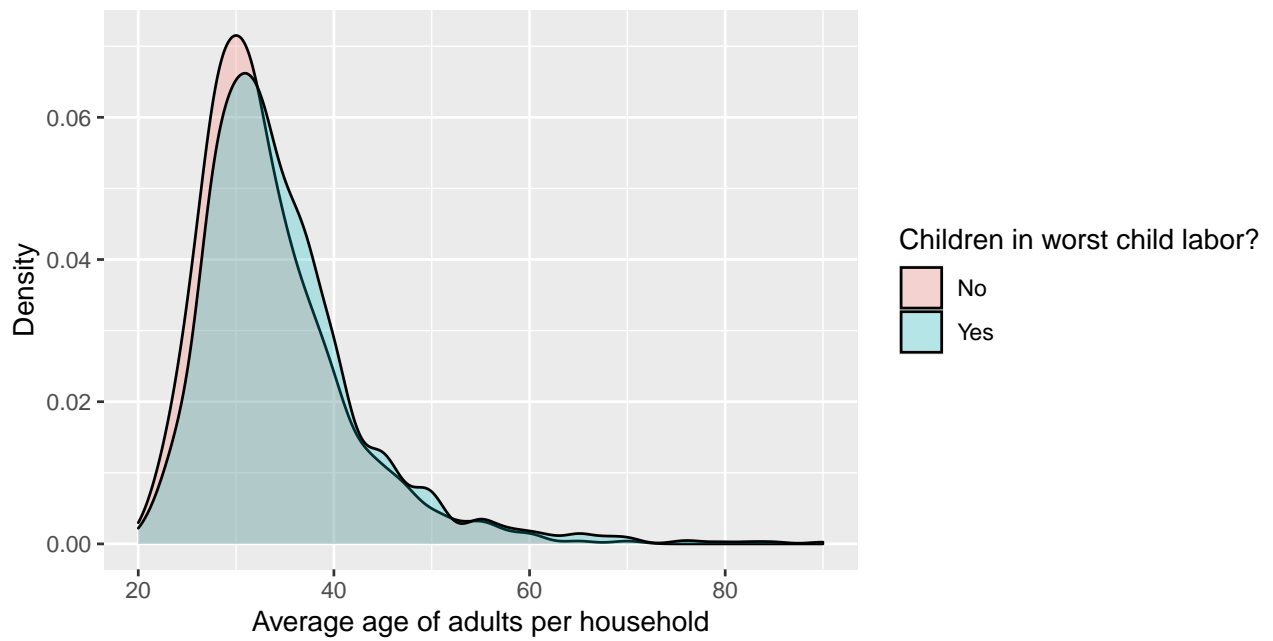
Comparing average age of children per household and worst child labor outcome



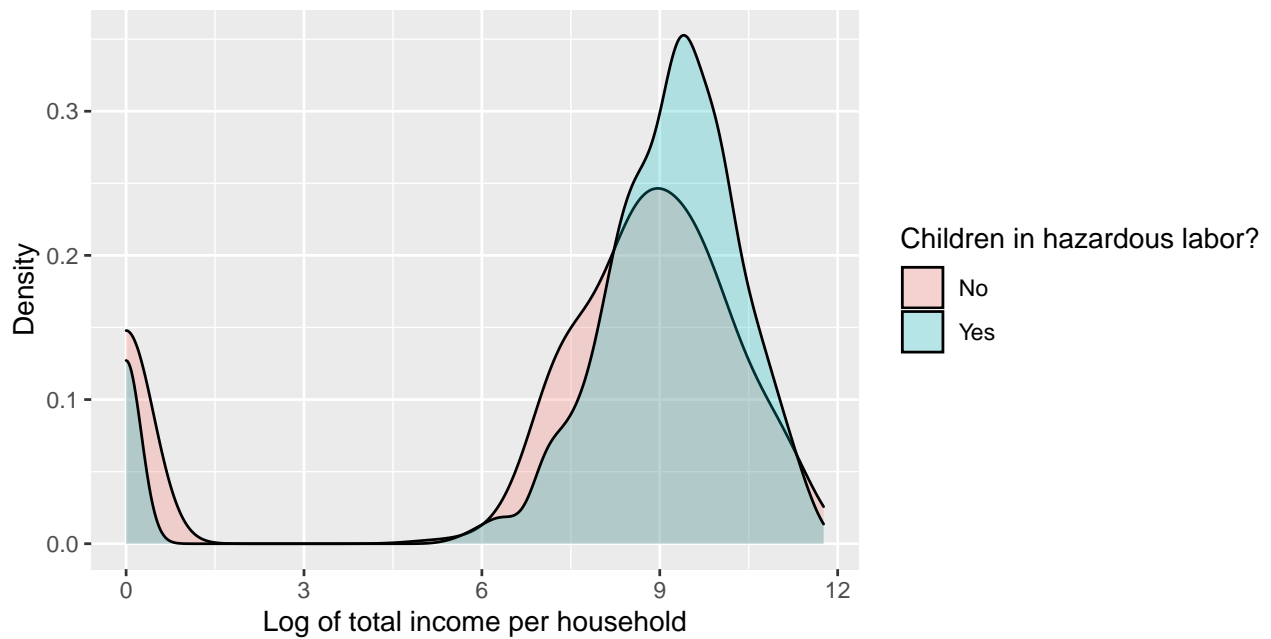
Comparing average age of adults per household and hazardous labor outcome



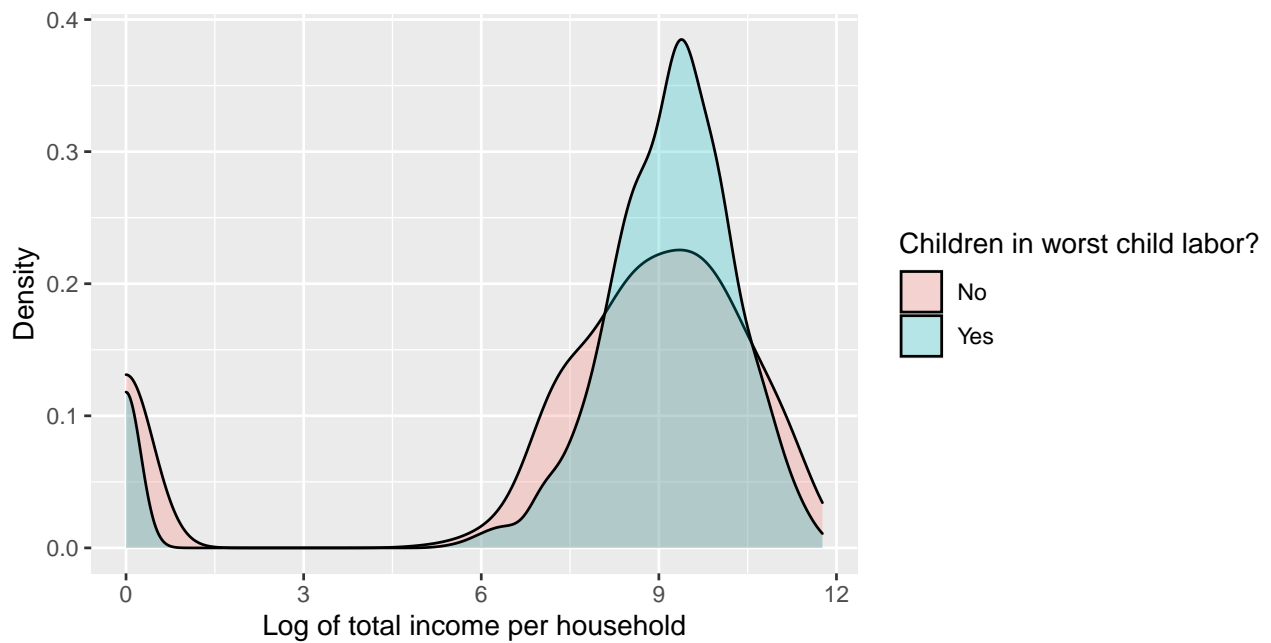
Comparing average age of adults per household and worst child labor outcome



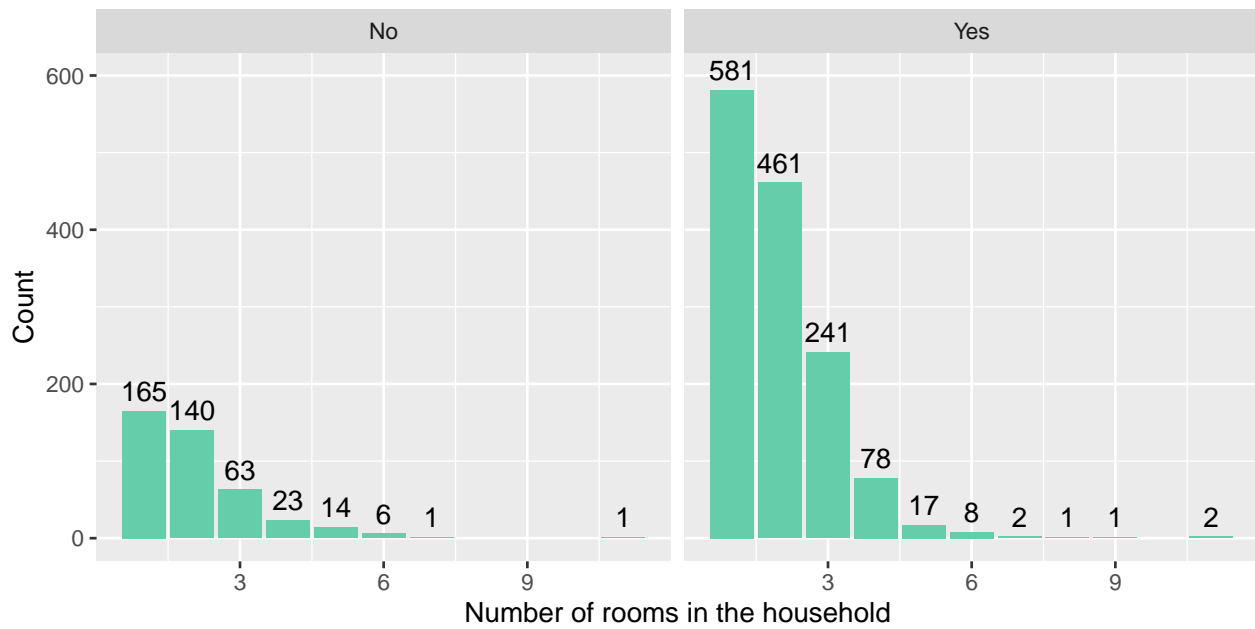
Comparing log of total income per household and hazardous labor outcome



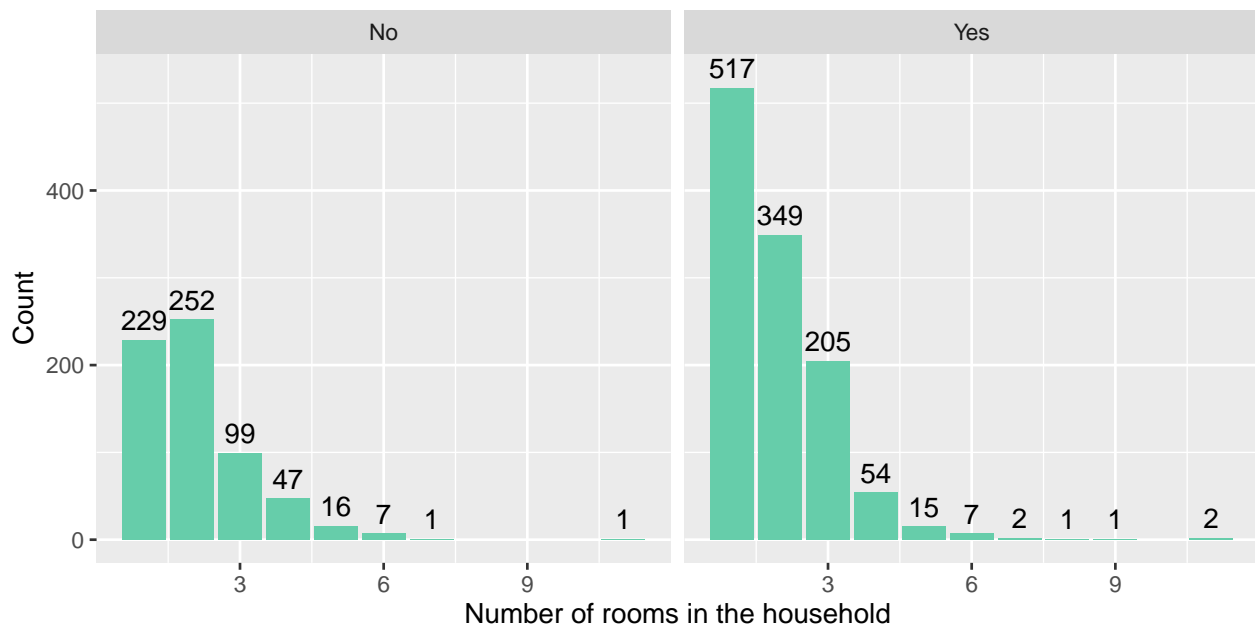
Comparing log of total income per household and worst child labor outcome



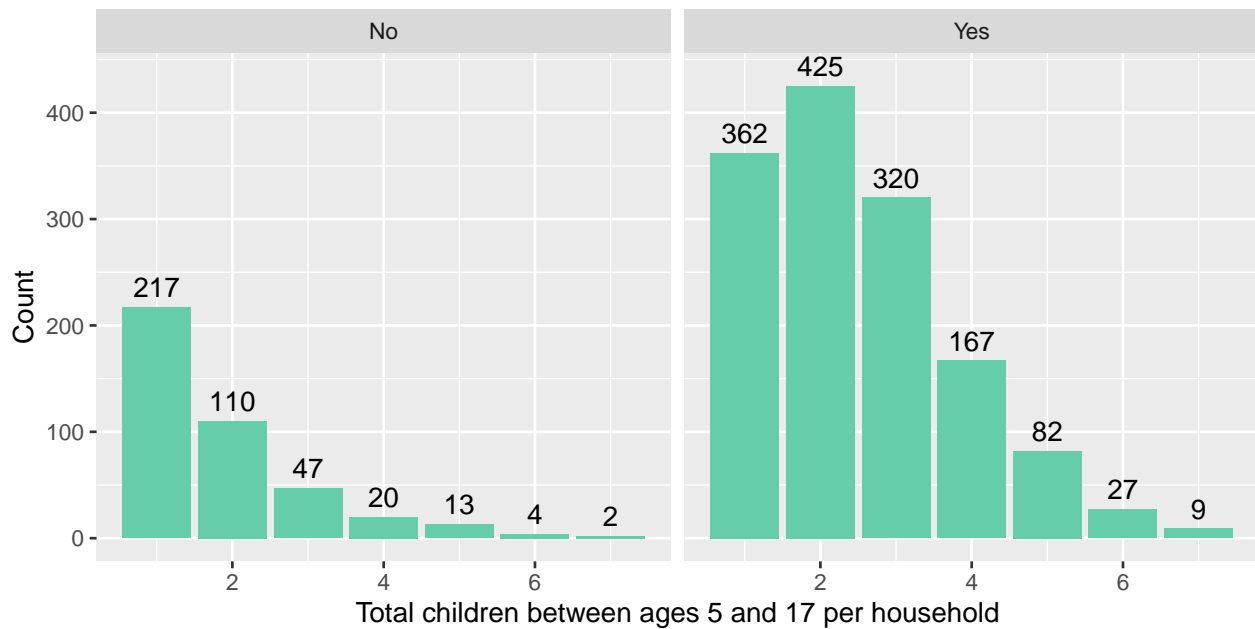
Number of rooms separated by whether or not household had a child in hazardous labor in Ethiopia



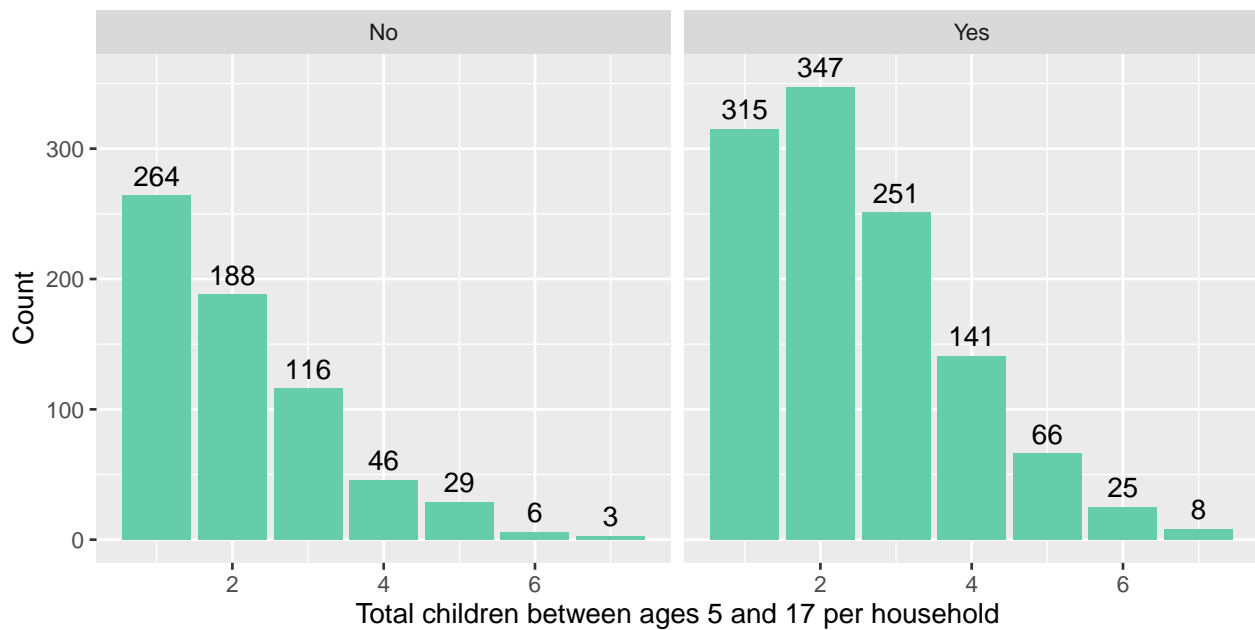
Number of rooms separated by whether or not household had a child in worst child labor in Ethiopia



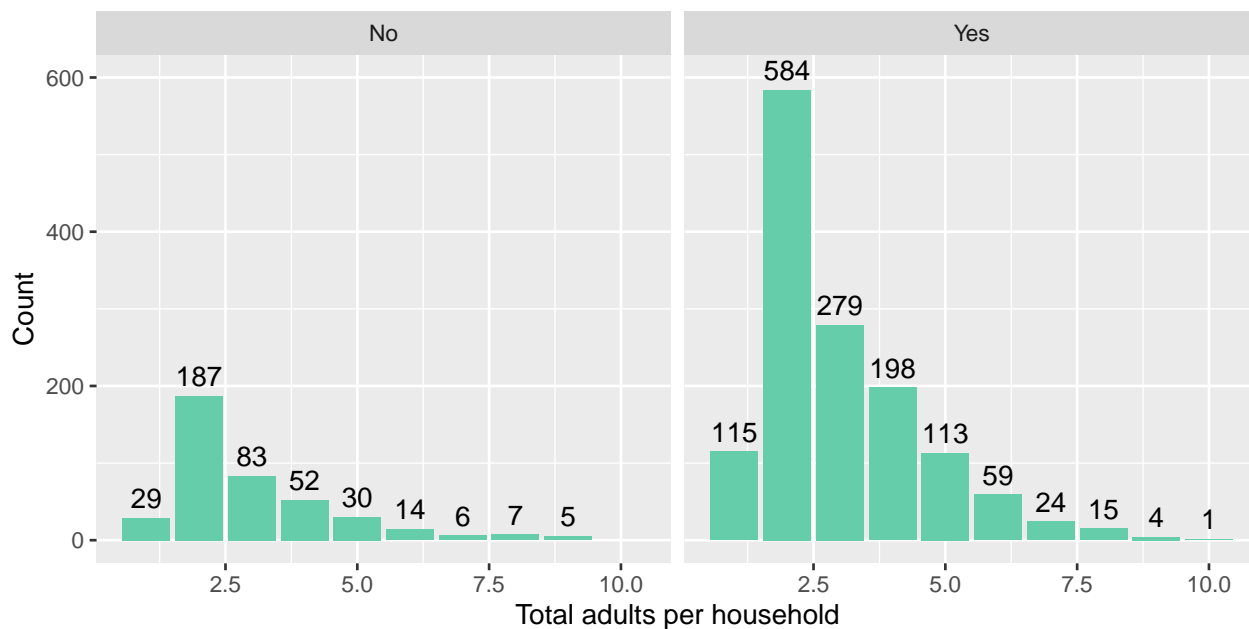
Number of children in household separated by whether or not household has a child in hazardous labor in Ethiopia



Number of children in household separated by whether or not household has a child in worst child labor in Ethiopia



Number of adults in household separated by whether or not household has a child in hazardous labor in Ethiopia



Number of adults in household separated by whether or not household has a child in worst child labor in Ethiopia

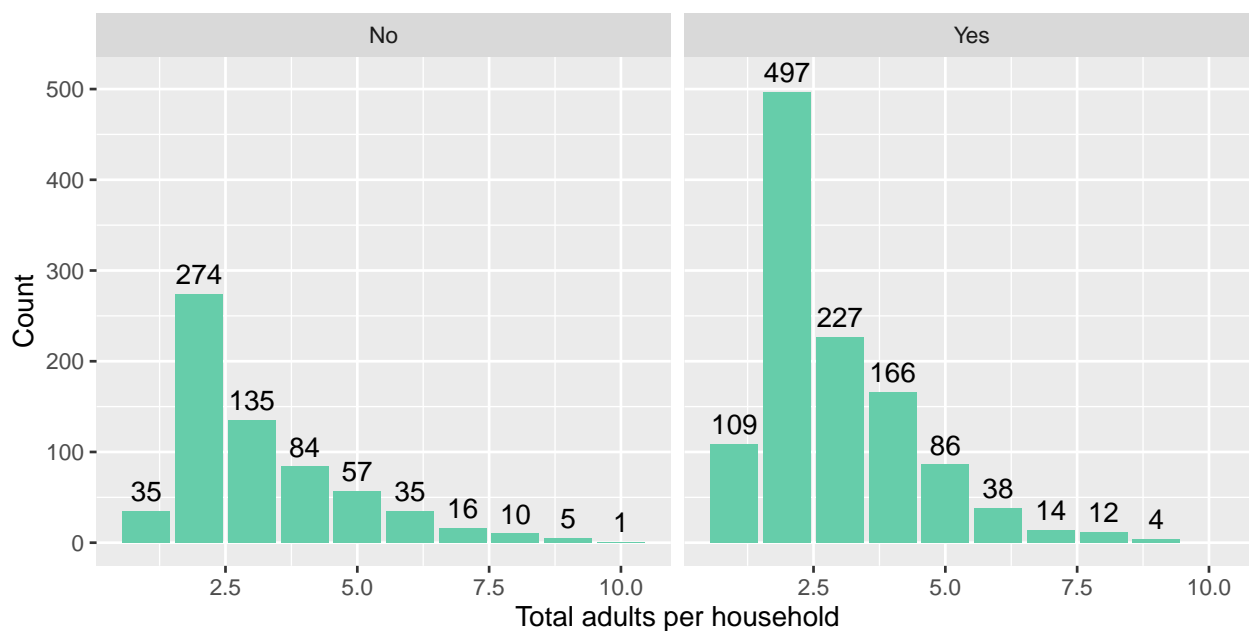


Table 2: Comparing counts for home ownership and hazardous labor outcome for Ethiopia households

| Any children in hazardous labor? | Home Owned | Home Rented | Other |
|----------------------------------|------------|-------------|-------|
| No                               | 315        | 88          | 10    |
| Yes                              | 1173       | 195         | 24    |

Table 3: Comparing counts for home ownership and worst child labor outcome for Ethiopia households

| Any children in worst child labor? | Home Owned | Home Rented | Other |
|------------------------------------|------------|-------------|-------|
| No                                 | 529        | 112         | 11    |
| Yes                                | 959        | 171         | 23    |

Table 4: Counts for residence type and hazardous labor outcome for Ethiopia households

| Any children in hazardous labor? | Rural | Urban |
|----------------------------------|-------|-------|
| No                               | 161   | 252   |
| Yes                              | 775   | 617   |

#### 4.2.2 Ethiopia Individual Level EDA

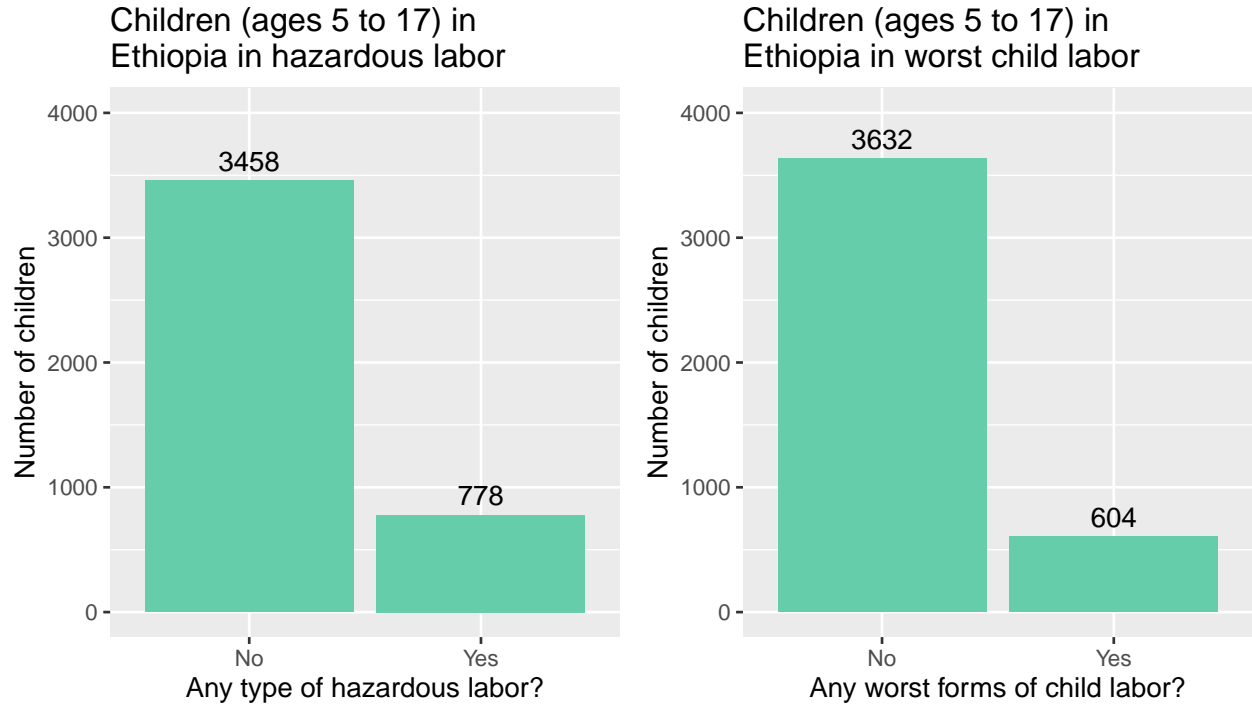




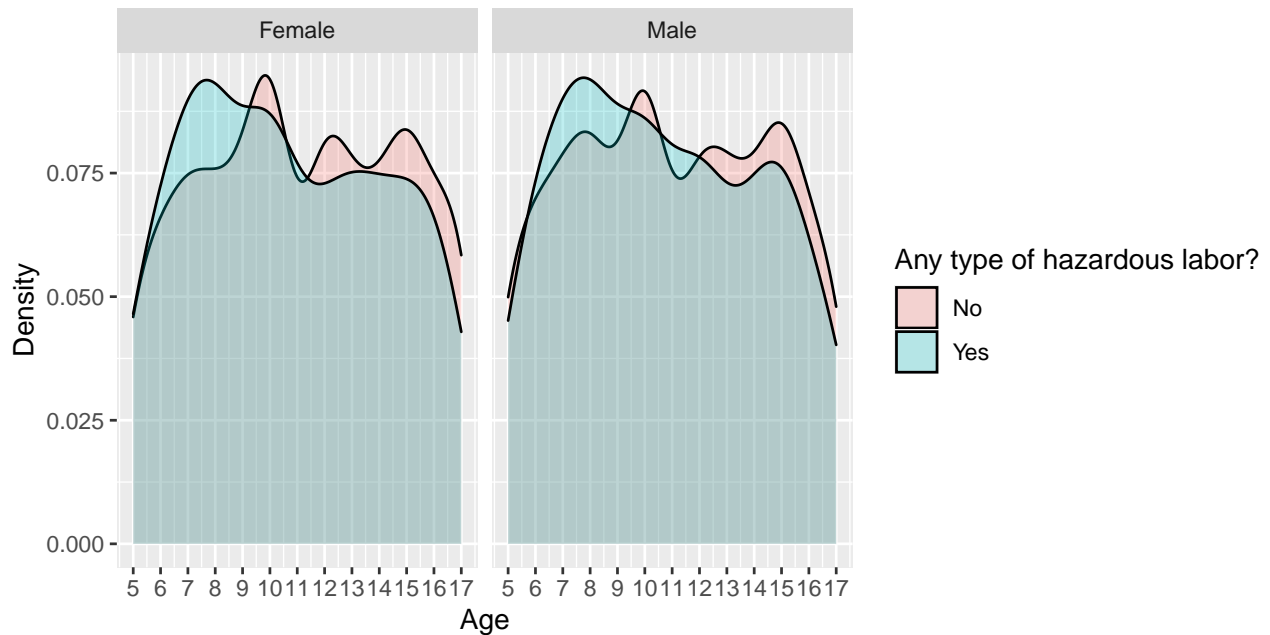
Table 5: Counts for residence type and worst child labor outcome for Ethiopia households

| Any children in worst child labor? | Rural | Urban |
|------------------------------------|-------|-------|
| No                                 | 287   | 365   |
| Yes                                | 649   | 504   |

Table 6: Overlap between worst and hazardous labor outcomes for children in Ethiopia

| Any children in worst child labor? | Hazardous Labor: Yes | Hazardous Labor: No |
|------------------------------------|----------------------|---------------------|
| Yes                                | 214                  | 390                 |
| No                                 | 564                  | 3068                |

Distributions of age between males and females for Ethiopia hazardous labor outcome



Distributions of age between males and females for Ethiopia worst child labor outcome

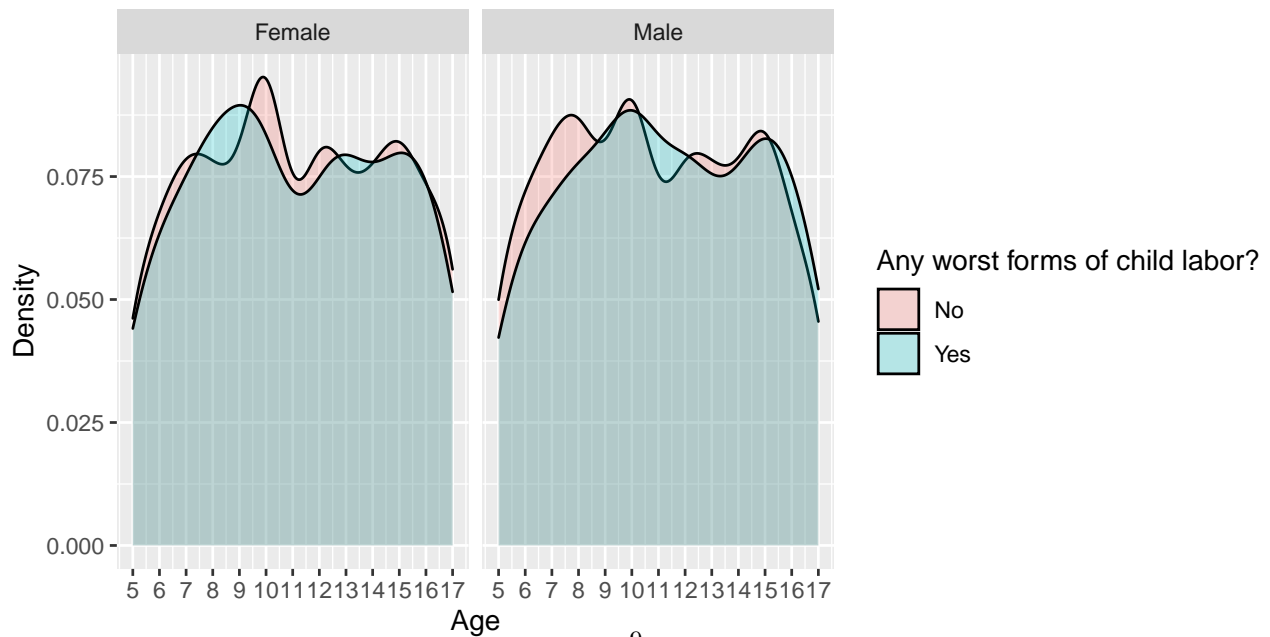


Table 7: Sex and hazardous labor outcome for children in Ethiopia

| Any type of hazardous labor? | Female | Male |
|------------------------------|--------|------|
| Yes                          | 376    | 402  |
| No                           | 1770   | 1688 |

Table 8: Sex and worst child labor outcome for children in Ethiopia

| Any type of worst child labor? | Female | Male |
|--------------------------------|--------|------|
| Yes                            | 315    | 289  |
| No                             | 1831   | 1801 |

Table 9: Literacy and hazardous labor outcome for children in Ethiopia

| Any type of hazardous labor? | Illiterate | Literate | Missing |
|------------------------------|------------|----------|---------|
| Yes                          | 198        | 580      | 0.00    |
| No                           | 865        | 2591     | 2.00    |

#### 4.2.3 Uganda Household Level EDA

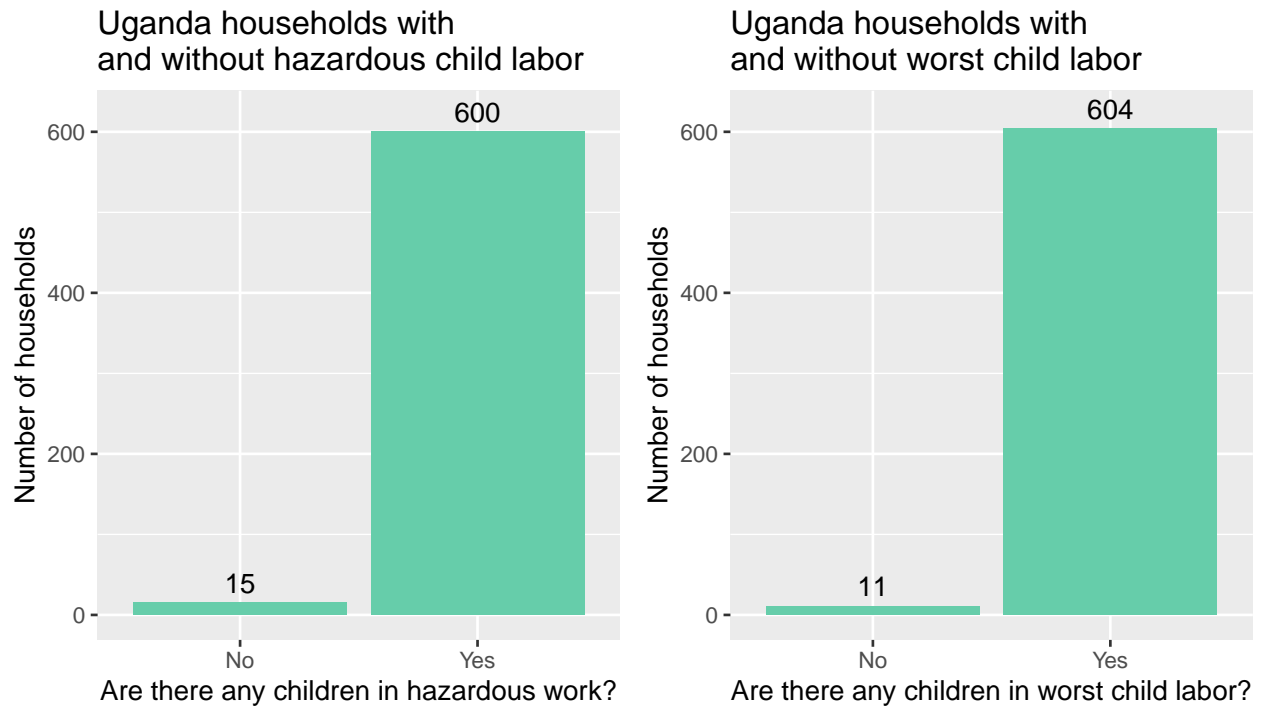


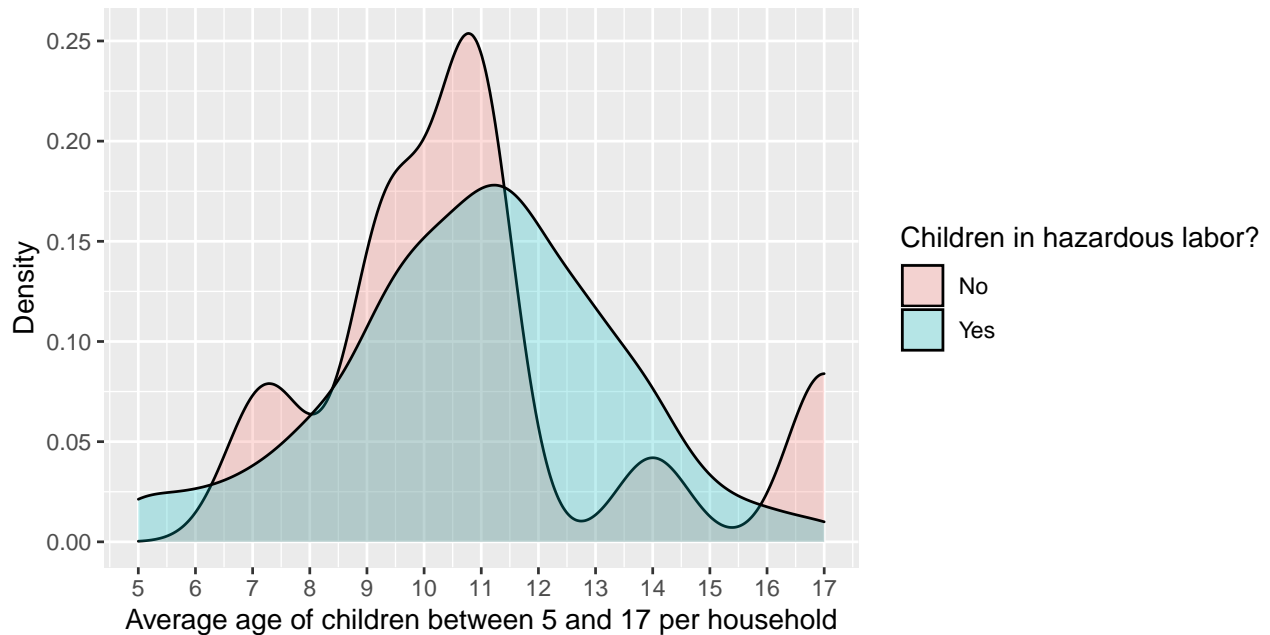
Table 10: Literacy and worst child labor outcome for children in Ethiopia

| Any type of hazardous labor? | Illiterate | Literate | Missing |
|------------------------------|------------|----------|---------|
| Yes                          | 136        | 468      | 0.00    |
| No                           | 927        | 2703     | 2.00    |

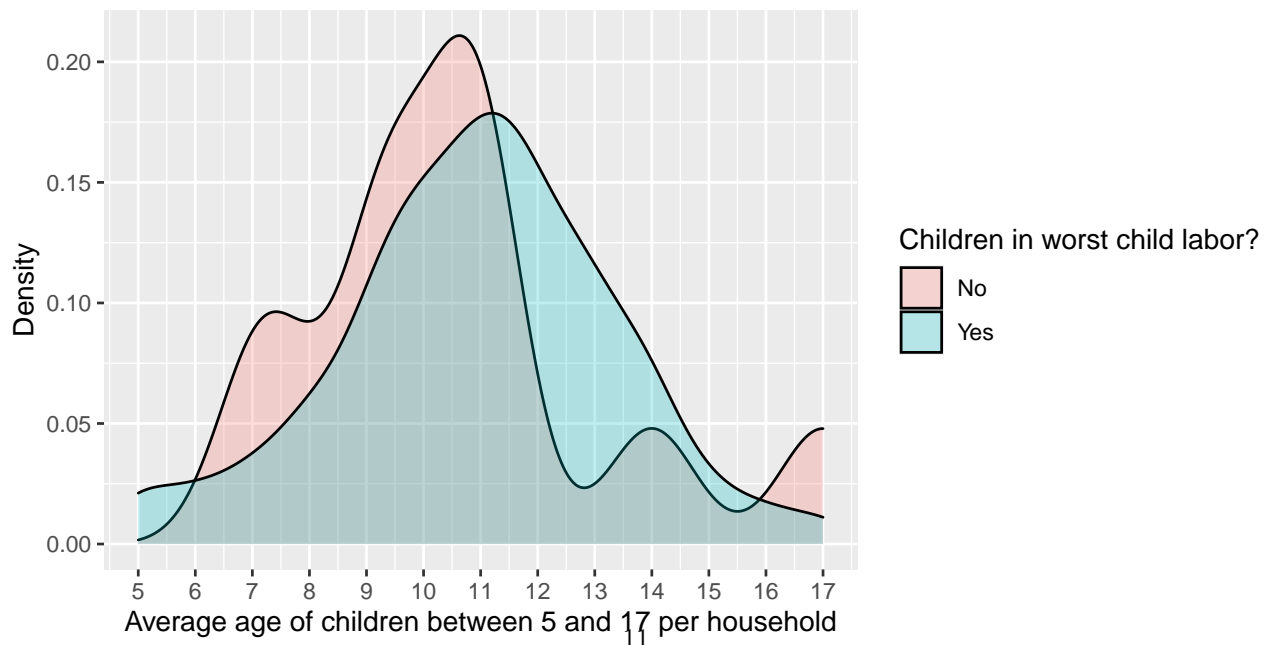
Table 11: Overlap between worst and hazardous labor outcomes for Uganda households

| Any children in worst child labor? | Hazardous Labor: Yes | Hazardous Labor: No |
|------------------------------------|----------------------|---------------------|
| Yes                                | 600                  | 4                   |
| No                                 | 0                    | 11                  |

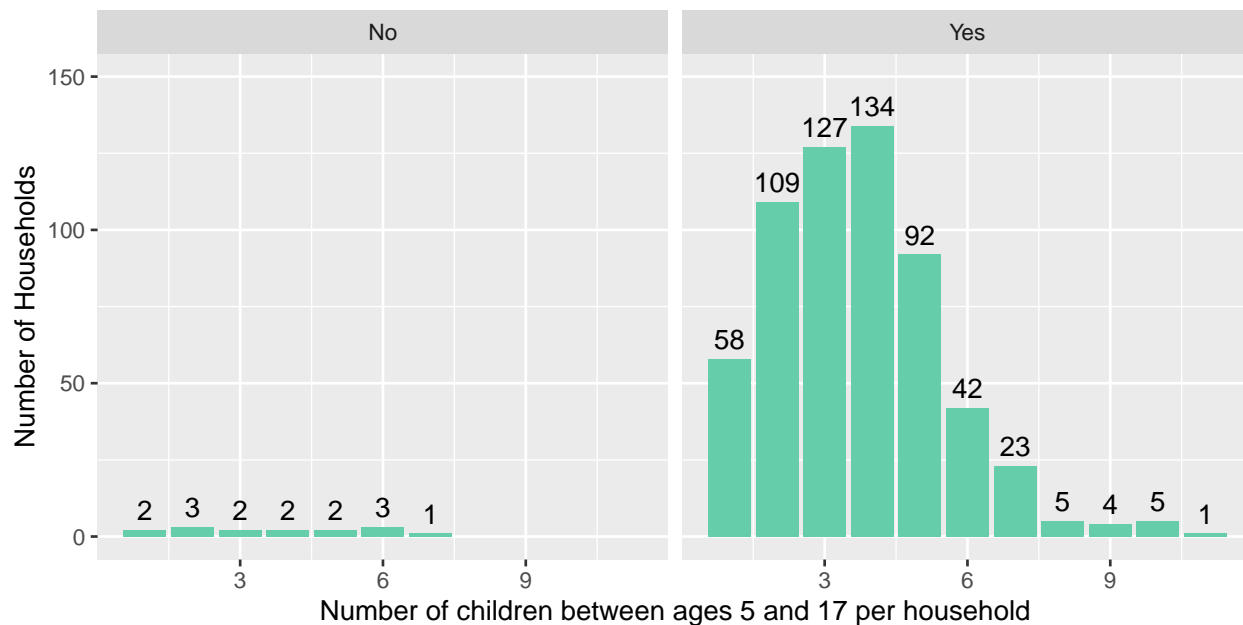
Comparing average age of children  
per household in Uganda and hazardous labor outcome



Comparing average age of children  
per household in Uganda and worst child labor outcome



Number of children per household separated by whether or not household has a child in hazardous labor in Ethiopia



Number of children per household separated by whether or not household has a child in worst child labor in Ethiopia

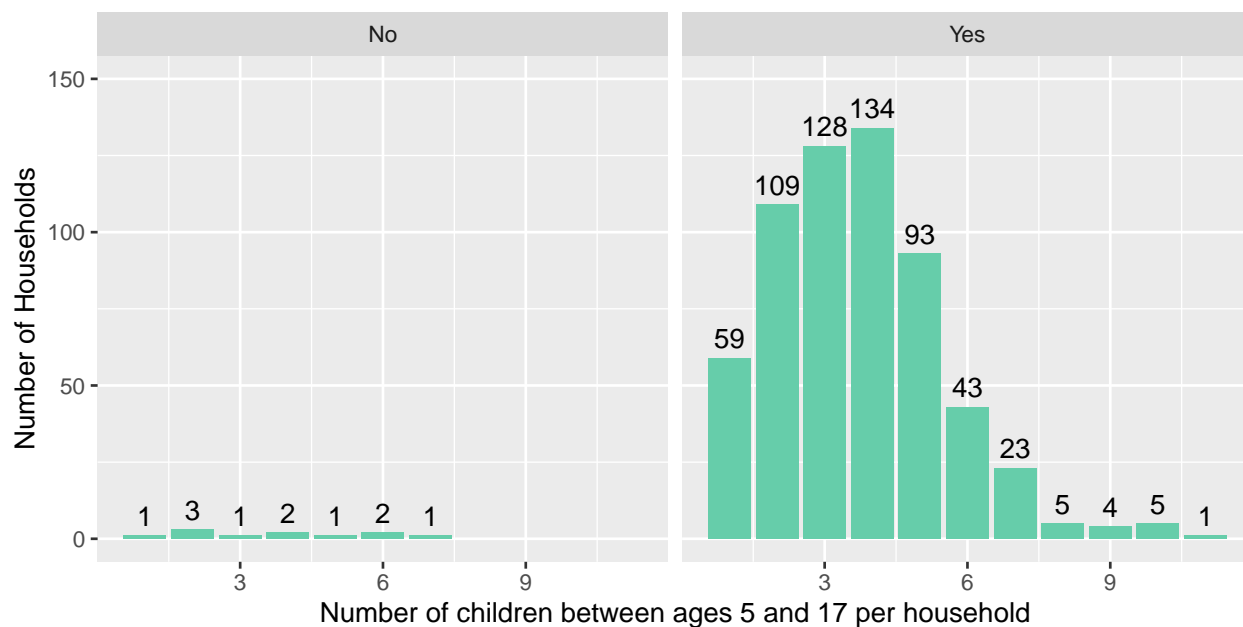


Table 12: Counts for residence type and hazardous labor outcome for Uganda households

| Any children in hazardous labor? | Rural | Urban | Missing |
|----------------------------------|-------|-------|---------|
| Yes                              | 389   | 134   | 77      |
| No                               | 11    | 3     | 1       |

Table 13: Counts for residence type and worst child labor outcome for Uganda households

| Any children in worst child labor? | Rural | Urban | Missing |
|------------------------------------|-------|-------|---------|
| Yes                                | 391   | 135   | 78.00   |
| No                                 | 9     | 2     | 0.00    |

#### 4.2.4 Uganda Individual Level EDA

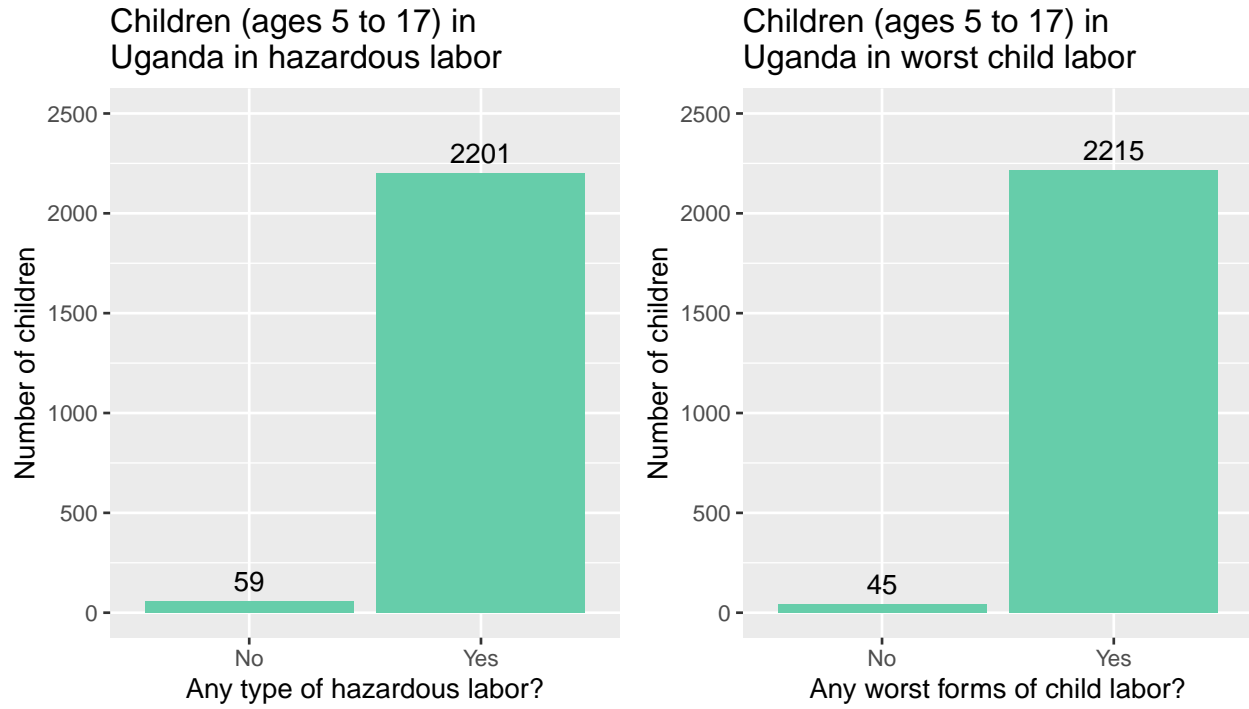
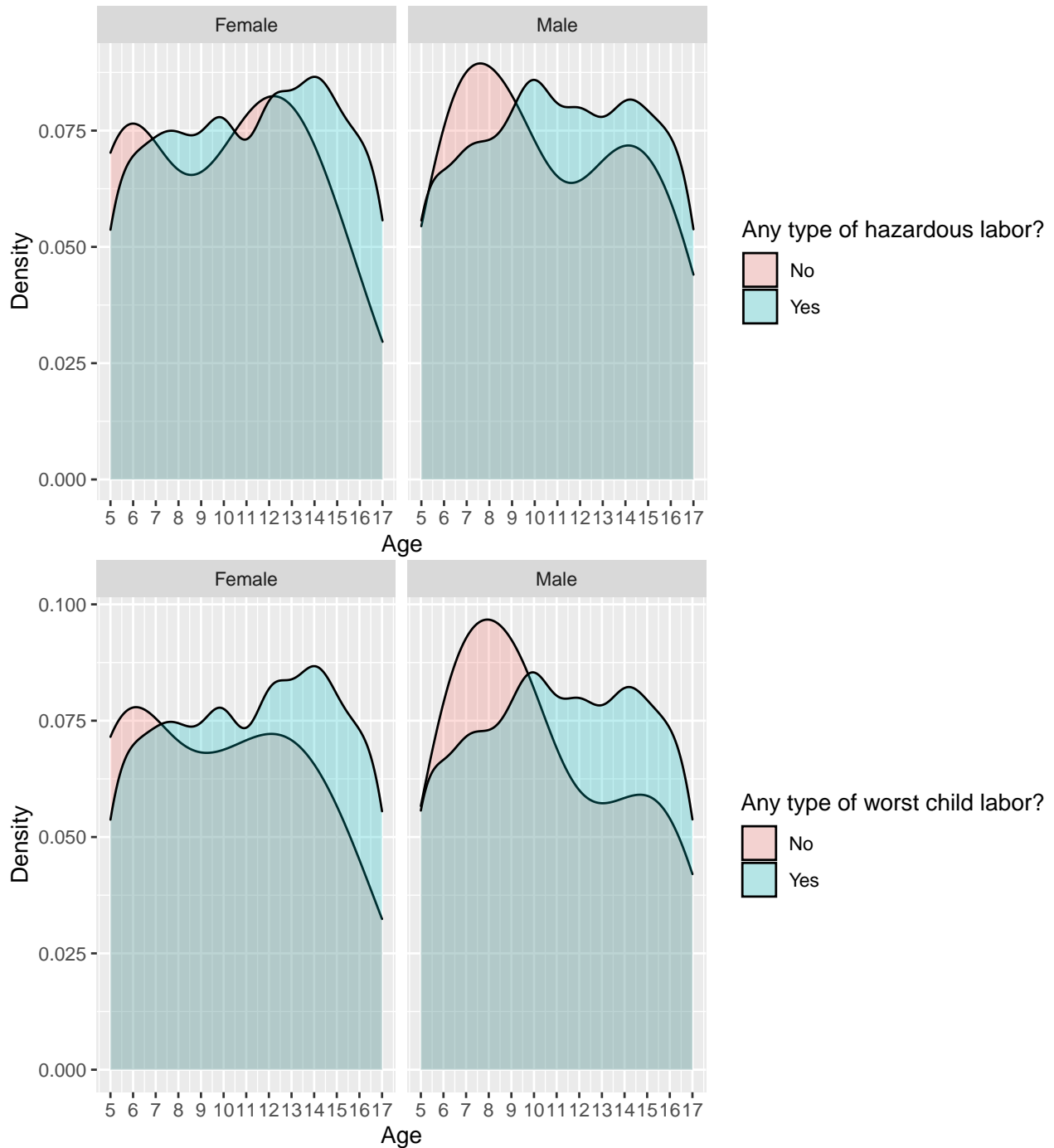


Table 14: Overlap between worst and hazardous labor outcomes for children in Uganda

| Any children in worst child labor? | Hazardous Labor: Yes | Hazardous Labor: No |
|------------------------------------|----------------------|---------------------|
| Yes                                | 2201.00              | 14                  |
| No                                 | 0.00                 | 45                  |



#### 4.4.1 Female vs. Male Headed Households

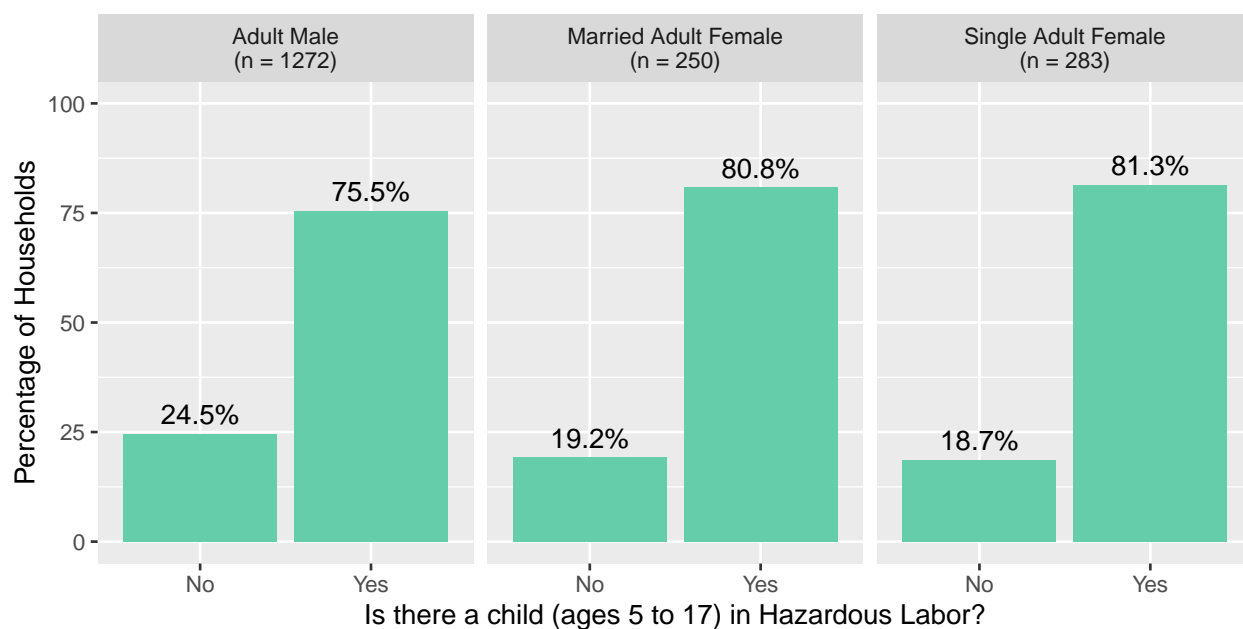
The figure below displays the number of children in hazardous labor per household in Ethiopia, separated by household head. Note instead of a binary indicator of whether or not the house has any children in hazardous work, the exact number of children in hazardous work in the household are shown. The number of observations for each type of household head is displayed as “n”, and instead of counts, the instances of how many houses contain a certain number of children in hazardous labor are displayed as proportions. For example, about 50% of single adult female headed houses have exactly one child in hazardous labor. Looking at these proportions across the three groups, adult male headed houses tend to have no children in hazardous

labor at a higher rate than both married and single adult female headed houses.

In fact, 25% of adult male headed households have no children in hazardous labor, meaning that 75% of adult male headed houses have at least one child in hazardous labor. Approximately 80% married adult female headed houses have at least one child in hazardous labor, and the same is true for single adult female headed houses. Among the houses that do have a child in hazardous labor, all household types tend to have only one child in hazardous labor, but adult male headed households proportionally have more households with more than one child in hazardous labor.

When this variable was included in predicting hazardous labor for Ethiopia households, it was found that both married adult female heads and single adult female heads were significant predictors, and associated with higher odds of hazardous labor compared to male headed households. Therefore, there is evidence to suggest that male headed households are associated with lower odds of housing a child in hazardous labor.

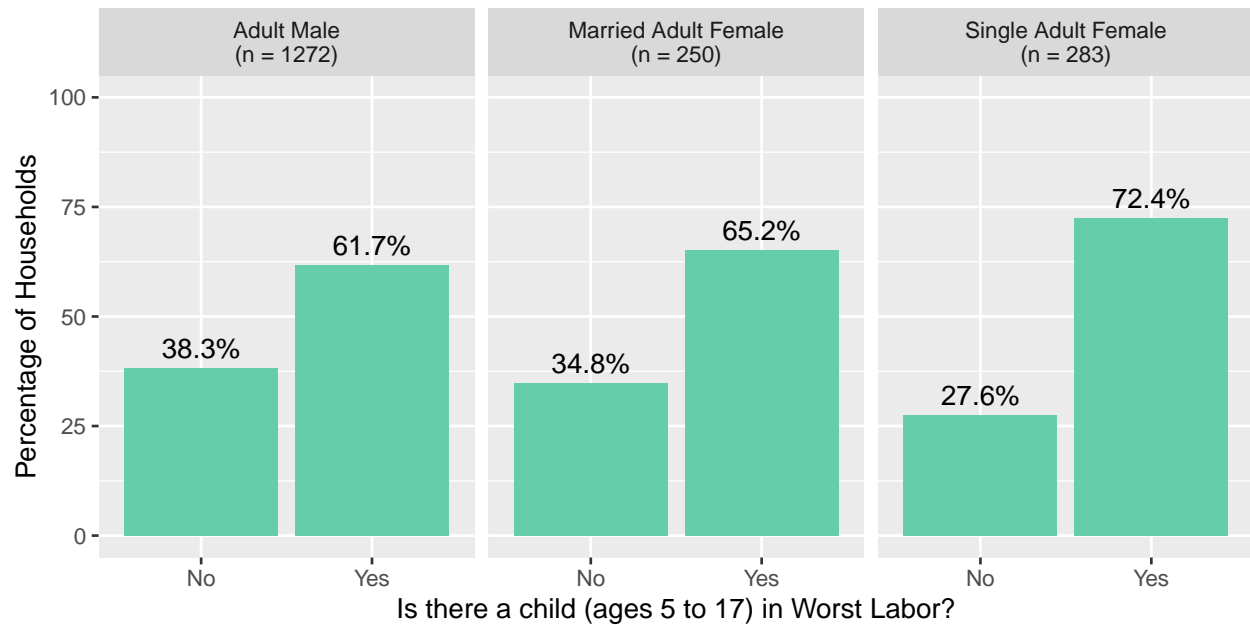
**Percentage of Houses with Children in Hazardous Labor Separated by Household Head Type in Ethiopia**



The figure below displays the same information except with children in the worst forms of child labor. The majority of all households have at least one child in the worst form of child labor, but adult males proportionally have more households with no children in the worst forms of child labor (with almost 40%) than married and single adult female households, which have 35% and 28% households with no children in the worst forms of child labor, respectively. Therefore, based on this graphic, it appears that female headed households (both married and single) have higher instances of having a child in child labor than adult male headed houses in Ethiopia.

When this parameter was included in predicting worst child labor instances at a household level in Ethiopia, single adult female headed households were significantly associated with increased odds of worst child labor household instances compared to male headed households. However, married adult female headed households were not found to be significantly different than male headed households.

**Percentage of Houses with Children in Worst Child Labor Separated by Household Head Type in Ethiopia**

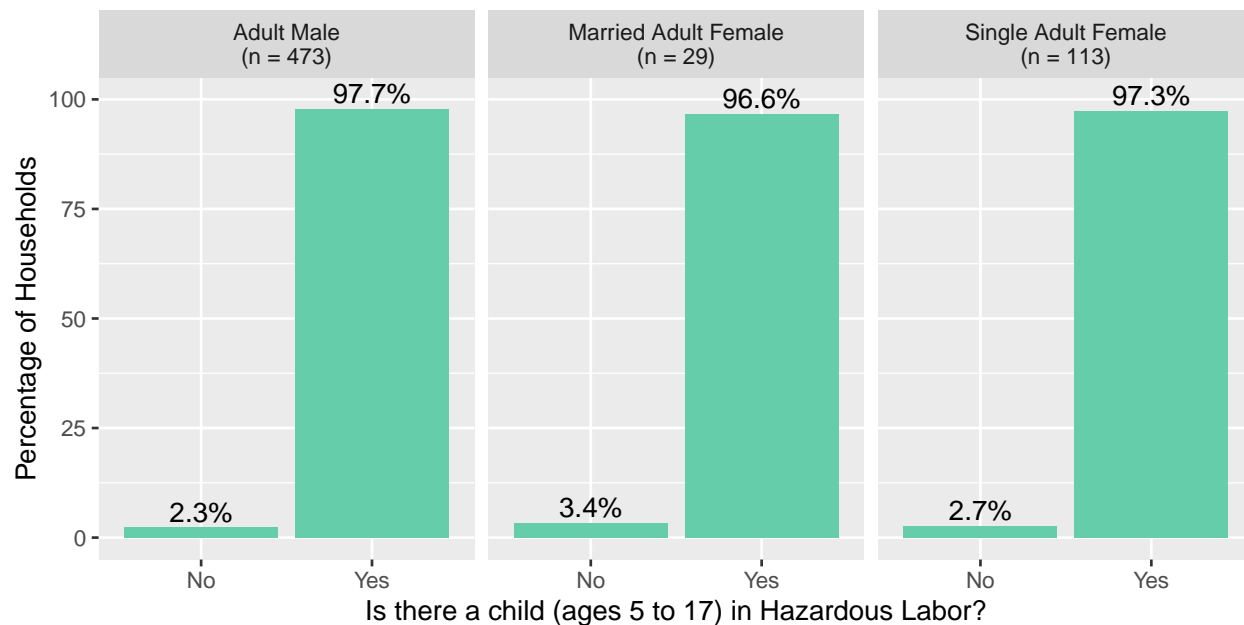


The figure below shows the same information concerning hazardous labor, except for Uganda. The first thing to note is that the maximum number of children in hazardous labor in one household observed is 11, which is more than what was observed in Ethiopia. Less than 5% of households for each household head type have no children in hazardous labor, and the majority of households have either 3 or 4 children in hazardous labor for all head types.

Based on this graphic, there does not seem to be a large difference between adult male, married adult female, and single adult female headed households in terms of the number of children in hazardous labor that live in the household. Furthermore, this predictor was not found to improve model performance for the logistic regression model. It is unclear whether these results are due to how the outcome variable (hazardous labor) was defined and created in the dataset, or if these results are due to only targeting areas in Uganda that were previously believed to have the highest instances of hazardous labor and worst forms of child labor.

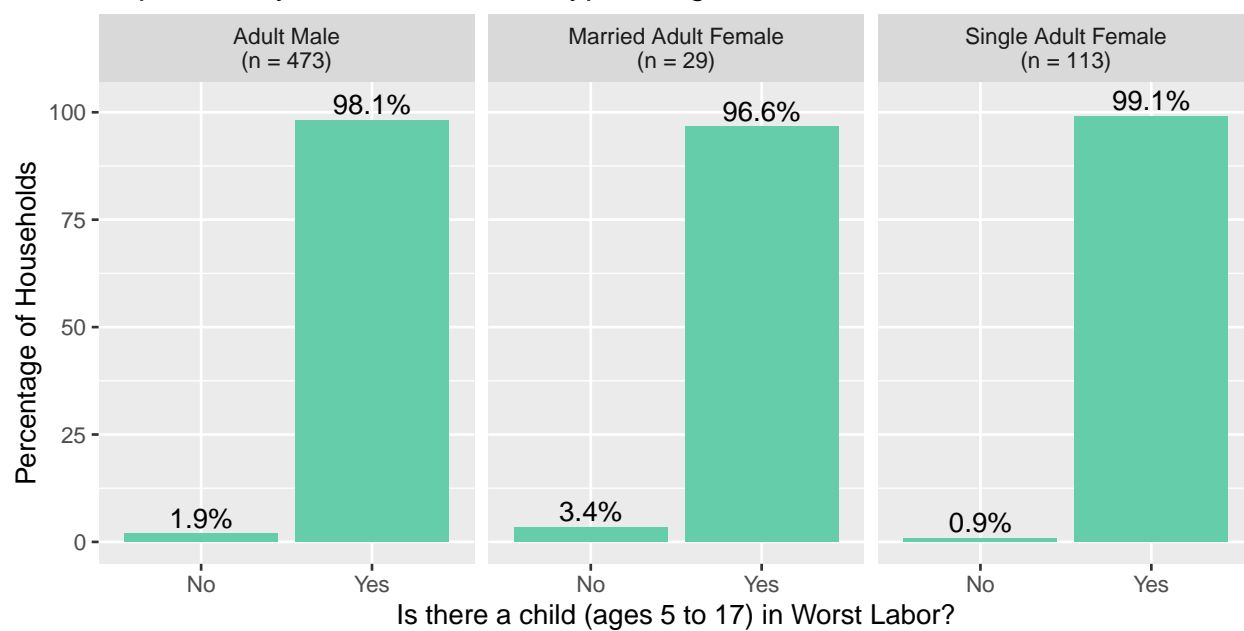


**Percentage of Houses with Children in Hazardous Labor Separated by Household Head Type in Uganda**



Lastly, the figure below displays the same information except with worst forms of child labor. The same conclusions can be made for Uganda households and the number of children in the worst forms of child labor, and this may be because there was an overlap of variables as to what contributed to counting children in hazardous labor or the worst forms of child labor. Again, these high proportions of households with at least one child in the worst forms of child labor may be due to how the outcome variable (worst forms of child labor) were defined and created from the survey data, and also the targeted areas from which data was collected.

**Percentage of Houses with Children in Worst Child Labor Separated by Household Head Type in Uganda**



#### 4.4.2 Child Headed Households

In Ethiopia, there are exactly 10 households that were reported being headed by children, and there were 2 households in Uganda that were headed by children. Since this is a small subset of households, these households were removed from modeling, but are analyzed here. The table displays the number child headed households that housed each possible value of the number of children in hazardous labor. The table shows the same information except with the worst forms of child labor. Among the 10 households, 5 of them did not house children in hazardous labor, while the other 5 housed at least one child in hazardous labor. Similarly, 5 households did not house any children in the worst forms of child labor, while 5 of them housed at least one child.

Table 15: Number of Children in Hazardous Work per Household for Child Headed Households

| Number of children in Hazardous Labor | Number of Households |
|---------------------------------------|----------------------|
| 0                                     | 5                    |
| 1                                     | 4                    |
| 3                                     | 1                    |
| Total                                 | 10                   |

Table 16: Number of Children in Worst Child Labor per Household for Child Headed Households

| Number of children in Worst Child Labor | Number of Households |
|---|----------------------|
| 0                                       | 5                    |
| 1                                       | 4                    |
| 3                                       | 1                    |
| Total                                   | 10                   |

Uganda only had 2 households headed by children. One household housed one child in hazardous work (which was in fact the household head, and the only person in that household), while the other housed 3 children in the worst forms of child labor and hazardous work. These children were the only members in that household, and were all considered to be in both hazardous and worst forms of child labor by the definitions outlined in this report.

Since only 12 households out of the entire survey data for both Ethiopia and Uganda were headed by children, it is difficult to discern whether or not child headed households have higher instances of housing a child in hazardous or worst forms of child labor than households headed by adults. Furthermore, one household in Ethiopia was reported as being headed by a child, while still housing adults aged above 40 years old. Therefore, some of the households in this small subset may have been inaccurately reported as being headed by children.

#### 4.5 Comparing Child Labor Patterns in Ethiopia and Uganda

As detailed in section 3.3 *Variables of Interest*, various questions were comprised to create a single outcome that denoted whether or not a child between the ages of 5 and 17 experienced any form of hazardous labor, or worst form of child labor. If a child answered “yes” to any question, then they were deemed as being in hazardous labor or the worst forms of child labor (depending on which category a question fell under). The majority of questions were “yes” or “no”, but other questions had the options to say “sometimes”, “always”, or “never”. In cases such as these, a child was defined as saying “yes” if they did not say “never”, regardless of the frequency.

For each question, the number of “yes”, “no”, and missing values were totaled to understand which forms of hazardous and worst forms of child labor were the most prevalent. The tables display the top five “yes” answered questions that pertained to hazardous labor, and worst child labor, respectively. Note that the questions in these tables were originally “yes” and “no” questions, with the exception of “Do you carry loads

with hands continuously at work?”, which was recorded as a weight. In this case, any child who did not say “0” was counted as saying “yes”.

For both hazardous and worst child labor, being exposed to dust/fumes at work was most common in Ethiopia. For hazardous work, carrying loads was the second most popular, while cultivating and harvesting agricultural products was the third. For the worst forms of child labor in Ethiopia, the second most common was being beaten or physically hurt, while the third most common was being repeatedly insulted. It is unclear whether the missing answers were truly “no” answers, whether the child/parent were reluctant to answer, or whether these data were lost in data collection. However, based on the number of children that answered yes to these questions, it can be concluded that these types of hazardous and worst working conditions appear to be the most common for children in Ethiopia.

Table 17: Most Common Types of Hazardous Labor in Ethiopia

| Question   | Yes  | No   | Missing | Total |
|--|------|------|---------|-------|
| Are you exposed to dust/fumes at work?                     | 1235 | 2259 | 757     | 4251  |
| Do you carry loads with hands continuously at work?        | 704  | 473  | 3074    | 4251  |
| Do you cultivate or harvest agricultural products at work? | 681  | 2737 | 833     | 4251  |
| Do you care for children/old/sick household members?       | 665  | 2819 | 767     | 4251  |
| Do you keep domestic animals?                              | 561  | 2858 | 832     | 4251  |

Table 18: Most Common Types of Worst Child Labor in Ethiopia

| Question  | Yes  | No   | Missing | Total |
|---|------|------|---------|-------|
| Are you exposed to dust/fumes at work?                    | 1235 | 2259 | 757     | 4251  |
| Have you ever been beaten or physically hurt during work? | 497  | 2997 | 757     | 4251  |
| Have you ever been repeatedly insulted during work?       | 496  | 2998 | 757     | 4251  |
| Are you exposed to fire, gas, or flames at work?          | 454  | 3040 | 757     | 4251  |
| Are you exposed to extreme cold or heat at work?          | 445  | 3049 | 757     | 4251  |

The tables display the top five most “yes” answered questions that fall under hazardous work and worst forms of child labor in Uganda, respectively. The questions included in the table were originally “yes” and “no” questions, while the questions in the table had only the option to say “yes”, or leave blank. This is problematic, as it does not allow for a distinction between children who said “no”, or children who did not or could not answer the question. The most common hazardous work in Uganda included facing general injuries, illnesses, or poor health, sexual abuse, and extreme fatigue. However, it should be noted that the language used in these questions are ambiguous, as it asks about the “likeliness” of these things occurring, but does not ask whether or not these instances are actually happening to the child or not. This flaw may be the reason for which there are an overwhelming amount of children that answered “yes” (2071 out of the total 2264 children aged 5-17 included in the dataset).

Similarly, the table displays the same information, as the top three answered “yes” questions for hazardous work also were the top three questions answered “yes” for the worst forms of child labor. Based on the distribution for the responses, it is clear that these three questions reflect the most common forms of abuse and endangerment for working children in Uganda.

Table 19: Most Common Types of Hazardous Labor in Uganda

| Question  | Yes  | No | Missing | Total |
|---|------|----|---------|-------|
| Are you likely to face injury, illness, or poor health due to work? | 2071 | NA | 193     | 2264  |
| Are you likely to face sexual abuse due to work?                    | 1489 | NA | 775     | 2264  |
| Are you likely to face extreme fatigue due to work?                 | 1438 | NA | 826     | 2264  |
| Are you likely to face physical harassment due to work?             | 1273 | NA | 991     | 2264  |
| Are you exposed to dust, fumes, or gas at work?                     | 76   | NA | 2130    | 2264  |

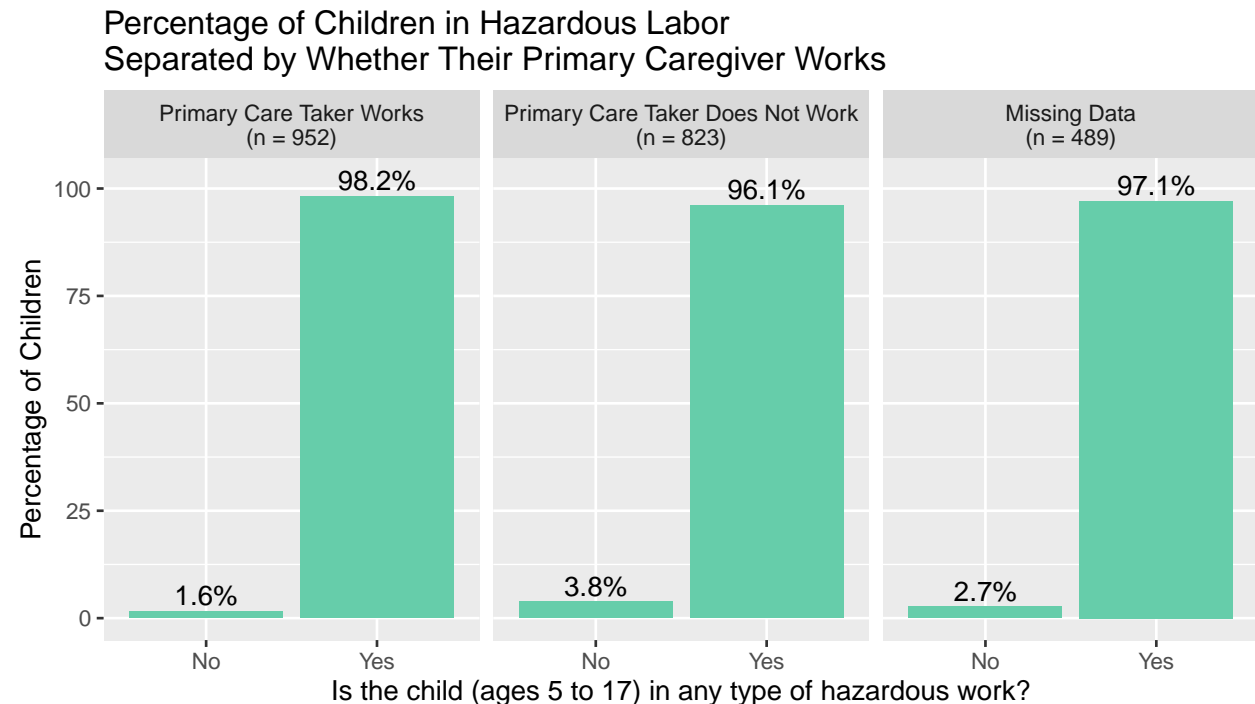
Table 20: Most Common Types of Worst Child Labor in Uganda

| Question  | Yes  | No | Missing | Total |
|---|------|----|---------|-------|
| Are you likely to face injury, illness, or poor health due to work? | 2071 | NA | 193     | 2264  |
| Are you likely to face sexual abuse due to work?                    | 1489 | NA | 775     | 2264  |
| Are you likely to face extreme fatigue due to work?                 | 1438 | NA | 826     | 2264  |
| Are you likely to have no time to go to school due to work?         | 1376 | NA | 888     | 2264  |
| Are you likely to face physical harassment due to work?             | 1273 | NA | 991     | 2264  |

In terms of hazardous work, it appears that common instances of hazardous work in Ethiopia pertained to the nature of work the child was involved in, whereas in Uganda, common instances of hazardous work pertained to how the child was treated by the people at his or her workplace. For worst forms of child labor, the top five most answered questions appear to again be more related to work conditions (dust/fumes, extreme cold) in Ethiopia, whereas in Uganda, abuse from other people is more common. However, it is difficult to compare patterns of child labor between Ethiopia and Uganda since the questions asked in the surveys were different, and worded in very different ways.

#### 4.6 Analyzing Work Status of Primary Care Giver and Hazardous/Worst Forms of Child Labor

In Uganda, it was recorded whether or not a child's primary caregiver was working at the time of the survey. This question was not asked in the survey for Ethiopia, and for this reason, this research question will only be considered for Uganda. The figure below displays the proportion of children between ages 5 and 17 who were and were not in any type of hazardous work. These proportions are separated between primary caregivers who work, do not work, and for children who did not have information on the work status of their primary caregiver. For all three categories, the vast majority of children experienced hazardous work. This suggests that based on the data, the work status of a child's primary caregiver does not decrease the chance that a child experiences child labor.



The figure below shows the proportion of children who are in the worst forms of child labor, again separated

by whether their primary caregiver is working or not, or whether that information is missing. Similar to hazardous work, it does not appear that the work status of a child's primary caregiver changes whether or not a child is in the worst forms of child labor.

### Percentage of Children in Worst Child Labor Separated by Whether Their Primary Caregiver Works

