university of groningen

# The impact of internal migration on fertility rate

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**Abstract**

*Over the years, demographers have discovered a relationship between rural-urban migration and the number of children people have. In urban living situations, people have significantly fewer children than they would have had if they lived in a rural area. Not only do these differences exist between the two groups, but research has also shown that people who move from rural to urban change in this sense. This effect has mostly been seen in developing countries. This paper aimed to find if such a relationship also exists in the Netherlands. Using individual data, a significant difference is visible between urbanised areas in the Netherlands and rural areas. Not only does location play a factor in the fertility, sex also does. Females respondents tended to have significantly more children than their male counterparts. In internal migrants, we see the same pattern, where respondents who moved from the less urbanised to more urbanised areas experienced a lower fertility rate than their immobile counterparts*

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## 1. Introduction

Numerous studies have found that, in developing countries, fertility rates differ greatly between rural and urban areas. First studied in the 1950s, as the United States was experiencing a growth of cities, the question of how this internal migration would impact the demographic fabric of urbanizing nations(Goldberg, 1959). While these early studies did not find a change in migrant behaviour, a difference between urban and rural fertility was found. With most inhabitants of cities being of rural origin, it was a hot topic as to why the urban fertility did drop even though most inhabitants were not from an urban environment. Later research found that in a lot of developing countries the same difference between rural and urban fertility was existent, and in a lot of cases, the migrants also displayed the same level of fertility as the urban dwellers instead of the fertility levels displayed by their immobile peers. With the current problems regarding population growth and climate change, this drop in fertility rate is important to analyse. If this drop in fertility rate is also found to be significant in more developed countries such as those in Western Europe, it may also have an impact on socio-geographic problems such as the housing crisis. On the flipside, when fertility drops, the demographic pressure might also be placed on younger generations to take care of the elderly. In ageing societies like China, the impact of urbanization may also be of large importance in the coming decades. The decline in population in China is expected to have immense consequences, particularly for the social system in China, as the ageing population will have to be taken care of financially. In the last decades the overall living standard has increased in China, meaning people live longer, but can also be expected to work longer. This raising of the pension age could help alleviate the fiscal pressure on society, but is by no means a popular option, particularly among workers. (Lee, 2020) With the Chinese population also rapidly urbanizin (Werwath, 2011), if the impact of  urban fertility is also noticeable, the already ageing population could be placed under further strain.

That is why the main aim of this bachelor thesis is to find out if this is also the case for developed countries, with a focus in particular on the Netherlands. The aim is focused on migrants moving from the rural areas of the Netherland to urban areas and migrants moving from urban areas to rural areas of the Netherlands. This research aim causes the main research question to be: what impact does internal migration from the rural to the urban have on the fertility rate of the internal migrants? This question leaves room for sub-questions: Is there a difference in fertility and if so what may be the cause for these differences. Furthermore, other questions like what can be other causes that impact the fertility rate of these migrants are important to answer, to account for several variables that may be impactful. These questions may help to streamline the main question and clear up confusion.

## 2. Theoretical Framework

The current scientific theory on this subject speaks of four main hypotheses that impact the fertility of a migrant. First, (Kulu, 2005) mentions the adaptation hypothesis, where a migrant adapts to their new living area and slowly begins to behave like the native population of that area. In the case of the study by Kulu (2005) people who moved from the rural areas of Estonia to the urban areas began to experience a drop in fertility, and began to be more in line with the overall found lower fertility rate in urban areas. The other way around was also found, where people moving from urban to rural areas experienced an increase in fertility compared to peers who stayed in the urban areas.

Other hypotheses mentioned were the socialisation hypothesis, where the upbringing and norms and values taught during childhood had a large impact on fertility later on in life. This entails that people who migrate experience the same rate of fertility as their native area and not the receiving area. Also mentioned was the selection hypothesis, where people who already had significantly different ideas or live make-up from their home area decide to migrate to fit in better. This does not automatically mean that adaptation does not happen but it can mean they have to adapt less than the average migrant from their home area. The last hypothesis mentioned was the disruption hypothesis, which states that not the location or values of the receiving area lower the fertility but the migration itself is the reason fertility drops. Migration is often times a large step in a life course and can often times coincides with other life altering events, such as education and career. These hypotheses look like they are all separate, but in reality they often overlap and are not mutually exclusive.

These theories have been tested extensively, starting with the study done by (Goldberg, 1959) in which it was found that there was a significant difference between citizens of Detroit with an urban background and people with a farm or rural background. Between different socio-economic groups of urban background citizens there were no significant differences in fertility, so he concluded that socio-economic differences were not the variable that caused the difference in fertility. This study thus points us to the socialisation hypothesis, saying that the rural upbringing of citizens had an impact on their fertility, even though they lived in the city. In later research, the focus shifted more towards the adaptation hypothesis, as seen in the paper by (Rosenwaike, 1973) where the research was focused on first and second generation Italians in America. Results show that first generation Italians still experience the same fertility level as their country of origin, however second generation Italians display the fertility level of the host country. This trend has also been named assimilation theory, because the second generation assimilated or adapted to the host country. This trend of first generation and second generation may also offer us an explanation for the difference between people with a rural background and urban background found in the study by Goldberg (1959). As the people with a rural background were mostly first generation urban migrants after the urbanization following the second world war.

Looking at more recent trends within rural-urban migration, (Werwath, 2011) shows us the fertility drop in China, where 300 million people moved from the rural areas of the country to the urban areas. Within this research the selection and adaptation hypothesis of Kulu (2005) are mentioned as it is seen that rural migrants experience a significant drop in fertility once living in urban environments in China. This can either be caused by selection hypothesis in that the migrants migrated to pursue opportunities and placed childbirth on a backburner. The assimilation was mentioned in the context that the urban environment has a different norm in terms of later marriage and smaller families when compared to the rural environment. This links to the findings of rural migrants in Estonia (Kulu, 2005).

More recently, demographers have begun to create a framework to study these migration effects. A paper by (Liao *et al.*, 2020) creates a framework based on migration, fertility and wealth, in an attempt to showcase the in this paper mentioned the positive relationship between migration, development and fertility. At first glance, this paper seems to insinuate that there is a positive relationship between migration and fertility, but upon reading further we see they mean that when people migrate, particularly to urban areas, the fertility rate drops. The positive relation is more in the migration and overall living standard of the migrants. This paper suggests that in more developing nations this relation is even more visible. So in order to combat overpopulation and a too high fertility rate they suggest making the migration to cities less expensive or increasing living standard through policies, as these two will lower overall fertility.

Case studies into these countries, such as (Chattopadhyay, White and Debpuur, 2006), shows us that in Ghana these differences prevail. The results show us there is indeed a difference between rural and urban fertility, and that migrants display fertility rates similar to the native population they migrate towards. The results however also show us, this difference in fertility rate in migrants compared to their native peers is already present before their migration. This points towards the selection hypothesis more than other hypotheses, such as assimilation. Disruption was also mentioned, in combination with adaption as one of the factors influencing the low fertility rate in urban settings, but was found to have no impact on the overall number of children. At most it had impac on when in the lifecycle migrants had their children, and since disruption is often a temporary phenomenon, the amount of children the migrants had was similar to the host area eventually.

Moreover, (Lerch, 2018) shows that the urban fertility decline also has an impact on the rural fertility, specifically in high fertility countries in earlier stages of the demographic transition. As in (Chattopadhyay, White and Debpuur, 2006) the urban areas experience a significant decline in fertility. (Lerch, 2018) also finds a significantly faster decline in rural fertility than normally expected based on our current socio-economic transition models. This can perhaps be explained by the high level of interaction of rural-to-urban migrants with their original place of birth.

## 3. Conceptual model

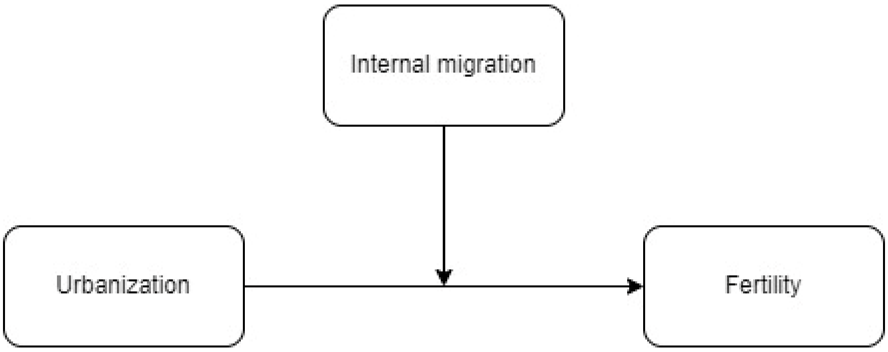


*Figure 1: Conceptual model*

To visualize the connection between both the degree of urbanization and fertility found in the literature, a conceptual model, figure 1, is created. This can either be a positive or a negative relationship, which is in turn influenced by internal migration. The migration is a moderator in this case, which means that the internal migration modulates the relationship between urbanisation and fertility. The research questions and results will attempt to first find the amount of influence urbanization has on fertility and afterward attempt to find these statistics in people who have migrated internally and see if there is a significant difference between the natives and the migrants.

## 4. Hypotheses

I firstly hypothesize that in rural areas the fertility rate is also higher than in urban areas in the Netherlands, just like in developing countries and in Estonia.
I hypothesize that the relations found in the framework for developing countries can also be found in the Netherlands, but perhaps to a lower degree. In Estonia, a more developed nation, differences in fertility were found between migrants and natives, but to a far lower degree than in developing nations. This suggests to me that this relation will also be visible in the Netherlands.

## 5. Methodology

The main focus of the research paper is to find out if there is a significant difference in fertility between migrants and non-migrants, in particular internal migrants who move from the rural to the urban environment. To further expand this research, three sub-questions will be analysed. Based on the results of these statistical analyses conclusions will be made. The first question to answer is: Do people who live in cities have fewer children than people who live outside cities? To answer this question, data from the Gender and generations survey can be used. This data set is of interest for its expansive data on fertility and the fact it has data on where people lived up until the age of 15. This is something the European Social Survey for example did not provide, which was my original choice of secondary data. The Gender and Generations Survey has country-specific datasets, so filtering for the Netherlands is possible.

The Generations and gender survey is a survey conducted all over Europe, with over a 100 indicators, and is collected every three years from the same participants, which also makes it a serviceable dataset to conduct longitudinal research on. The dataset is split up in respondents per country, with the dataset used in this paper being one focussing on the Netherlands. Every country conducts the same survey, as to ensure the possibility to compare between countries. With over 2600 variables, the dataset is expansive, providing specific data which other datasets lack. Some of the dataset specific variables include number of children and type of urban dwelling where respondents live. The total number of cases is 8161, which also makes it possible to research minorities, as they are likely to have respondents with a large sample like this.

Crucial for this study, the variable “type of dwelling” is divided into several categories: very strongly urbanised (>2500 addresses/km2), strongly urbanised (1500-2500 addresses/Km2), moderately urbanised (1000-1500 addresses/Km2), hardly urbanised (500-1000 addresses/Km2) and not urbanised (<500 addresses/Km2). The dependent variable used in the research will be number of children per respondent as that is a crucial part of the fertility rate.

The second question we have to determine is: does this differential persist after controlling for cofounding effects? The Gender and generations survey has several variables that can be of use for this analysis, such as age and education. These can be used as control variables to see if the geographical differences are behavioural or compositional. If these variables are of significant impact, and in this regression the type of dwelling is no longer significant, it leads us to the rejection of the hypothesis of the first question. In the model female will be the base variable to which male will be compared. The variable education level is divided in several different levels. The education level 4, which is post-secondary non tertiary level is removed from the model as this education level does not exist in the Netherlands so it has no cases.

The last question, does this differential persist after differentiating between people who always lived in their current type of environment and people who migrated there, is difficult but possible to answer with the Gender and Generation Survey . The survey provides us with data on which municipality the participant lived from until the age of 15. If these municipalities are filtered for urban and non-urban municipalities, the participants can be sorted and seen who lives in a different type of environment currently. Because of the variable which describes the current municipality and the variable that describes the type of environment described previously in question 1, it is possible to see which municipality is qualified as which in the dataset. By combining the two variables, I get a new variable that displays the type of environment the participant grew up in before the age of 15. To simplify the interaction between people who grew up in rural areas and people who grew up in urban areas, the variable will be simplified into 1 and 2. 1 represents 1801, 1802, and 1803 (highly-, strongly-, and moderately urbanised). 2 represents 1803 and 1804 (hardly- and not urbanised). To answer the question on if this difference in urban and rural fertility is also visible in internal migrants, they have been split up in 4 categories. Migrants who moved from rural to urban areas, migrants who moved from urban to rural areas and their immobile counterparts, so rural-rural and urban-urban.

This way a regression can be conducted on the difference between the migrants and the reference group, the rural inhabitants. To adapt to the count nature of this variable, the regression model used will be a Poisson model. The control variable will be age. Since this model is a regression, the age will account for the problem we would encounter with people being different ages and in different stages in their lives will be compensated.

## 6. Results

Table 3 shows us the distribution in percentage within the different variables processed. Most important for our research is the type of settlement variable that shows us the distribution of people per Urbanization degree. As shown in the table, there is a percentage distribution that does not vary a lot between the different categories, meaning all the different groups make up a similar percentage of the sample. This is favourable as this ensures we have ample respondents per type to be able to say with more confidence that the results are representative. This table exclusively shows the distribution of the categorical variables used in the model. Table 4 shows us the descriptive statistics of our continuous variables.

Table 5 shows us the deviance and the Pearson Chi-Square, one of the means to see if the data is not over-dispersed. A number above 1 signifies an over-deviation of the data. Below a 1 indicates an under-deviation. Given the fact the Pearson Chi-Square of this regression lies close to 1, being 1.015 this deviation is fit to use in a regression. If the Pearson chi-square is too high, certain over-deviance test have to be performed to ensure the data is fit to use in the Poisson regression. One of the assumptions of a poisson model is that the deviance and the mean are more or less equal in the variables.

Table 6, the Omnibus Test shows all the variables combined cause the model to be overall significant. Since this Omnibus Test shows to be significant we can conclude the overall model is significant and we can proceed to the individual variables and their significance

**Goodness of Fit[a]**

| | Value | df | Value/df |
|---|---|---|---|
| Deviance | 9893.667 | 8148 | 1.214 |
| Scaled Deviance | 9893.667 | 8148 | |
| Pearson Chi-Square | 8274.233 | 8148 | 1.015 |
| Scaled Pearson Chi-Square | 8274.233 | 8148 | |
| Log Likelihood[b] | -12550.046 | | |
| Akaike's Information Criterion (AIC) | 25126.092 | | |
| Finite Sample Corrected AIC (AICC) | 25126.136 | | |
| Bayesian Information Criterion (BIC) | 25217.184 | | |
| Consistent AIC (CAIC) | 25230.184 | | |

Dependent Variable: Number of children Respondent

Model: (Intercept), Sex Respondent, Highest Education Level of Respondent, Type of settlement (rural/ urban/ capital), Age of Respondent

a. Information criteria are in smaller-is-better form.

b. The full log likelihood function is displayed and used in computing information criteria.

*Table 5: Goodness of Fit*

The results of the Test of Model Effects (Table 7) shows that the model overall is significant. For the research question the most important variable is the categorical variable Type of settlement.

Table 8 shows the effect of each variable on the number of children. Generally speaking, the model confirms the urban gradient that was expected: the more urbanised the region people live in, the fewer children they have. When we compare the B of for example of for example very heavily urbanised this B value, or the number of children per year difference, is -0.437. This entails that, compared to the not urbanised, which is our reference category, living in an very strongly urbanised area decreases the number of children by 0.4. This is a significant difference between the two. When we look at the other results, like for strongly urbanised we also see a large difference, in this case -.179. Moderately urbanised gives us a B value of -.084. The only outlier in this category is hardly urbanised. This category has a B value of 0.13, meaning the model predicts 0.13 children per year more per respondent in this area than in the not urbanised. However the model also shows us this category is not statistically significant, so the difference in children between not urbanised and hardly urbanised is not significant. This regression also shows us the impact of other variables we added. The sex of the respondent is also statistically significant, where the model predicts men have on average -0.84 children per 1 child women have.
The education variable shows us that several categories are significant, when we compare for second tertiary education as the reference category. This may however be explained by the fact people whomst highest education level is lower than second stage tertiary are still in school and are not in a stage of their life where they want children. People who have a second stage tertairy education may be more likely to have finished with their educational ambitions, and are more likely to be in a further stage of their life.

**Parameter Estimates**

| Parameter | B | Sig. | Exp (B) | 95% Wald Confidence Interval for Exp(B) Lower | Upper |
|---|---|---|---|---|---|
| (Intercept) | -.419 | .037 | .658 | .444 | .974 |
| [Sex Respondent=1] Male | -.084 | .000 | .920 | .888 | .952 |
| [Sex Respondent=2] Female | 0[a] | . | 1 | . | . |
| [Highest Education Level of Respondent=0] Pre-primary education | -.140 | .240 | .869 | .687 | 1.099 |
| [Highest Education Level of Respondent=1] Primary education | -.194 | .027 | .824 | .694 | 0.978 |
| [Highest Education Level of Respondent=2] Lower secundairy | -.114 | .175 | .893 | .758 | 1.052 |
| [Highest Education Level of Respondent=3] Higher secundairy | -.173 | .038 | .841 | .714 | 0.991 |

| | | | | | |
|---|---|---|---|---|---|
| [Highest Education Level of Respondent=5] First stage of tertiary | -.249 | .003 | .780 | .662 | 0.919 |
| [Highest Education Level of Respondent=6] second stage of secundairy | 0 | - | - | 1 | 1.559 |
| Type of settlement = very strongly urbanised | -.437 | .000 | .646 | .605 | .689 |
| Type of settlement = strongly urbanised | -.179 | .000 | .836 | .790 | .884 |
| Type of settlement = moderately urbanised | -.084 | .005 | .919 | .866 | .975 |
| Type of settlement = hardly urbanised | .013 | .659 | 1.013 | .956 | 1.074 |
| Type of settlement = not urbanised | 0[a] | . | 1 | . | . |
| Age of Respondent | .025 | .000 | 1.025 | 1.024 | 1.026 |
| (Scale) | 1[b] | | | | |

*Table 8 : Parameters Estimates*

When looking at the model used to answer the question on if this difference in urban and rural fertility is also visible in internal migrants, different variables are visible.

Table 9 gives us the general information, with the dependent variable being number of children, the regression model type being poisson and the model being logaritmic. When we look at the case processing summary, table 10, we find that the number of people involved in the model has lowered, down from 8161 to 7137 This is due to the fact several participants did not provide a living location where they grew up before they turned 15, so these cases have been excluded from the model. When looking at table 11, we see the percentages of people who migrated to a different living situation.

Table 12 shows us general information on the statistics, it does not however show us significance.

Table 13, the goodness of fit table, is once more one of the more important tables to look at in our analysis process. We find that the Pearson Chi-square is a further from 1 than in table 5. This can be due to the lower amount of cases meaning the overall dispersion is more visible as the confidence interval is formed based on less varying data. Seeing as this number is still not far removed from the optimal, the model can be run.

When looking at the Omnibus test for this regression, table 14, we see the overall model is significant. This means we can proceed to the indiviudal variables and categories to see which ones in particular are significant. This can be found in table 15, the test of model effects. In this case we see that all variables are significant.

**Tests of Model Effects**

| Source | Type III Wald Chi-Square | df | Sig. |
|---|---|---|---|
| (Intercept) | 343.854 | 1 | .000 |
| asex | 20.598 | 1 | .000 |
| aeduc | 32.311 | 4 | .000 |
| aage | 1555.344 | 1 | .000 |
| combined_4 | 145.109 | 3 | .000 |

Dependent Variable: ankids

Model: (Intercept), asex, aeduc, aage, combined_4

*Table 15 : Test of Model Effects*

The main table used to see the results is table 16, where we see the results of all the individual results of the regression per category. The main variable we look at is the migration variable, which is divided in 4 categories. The reference category used is the group respondents who grew up in the rural areas and do so still. We see that the group who lived in urbn areas and still do so once more have significantly less children than the rural inhabitants. This is in line with what was found in the model covering all cases. The answer to our research question however, is the significantly lower amount of children that rural to urban migrants have, with a B value of -.222. This goes along with the findings of (Chattopadhyay, White and Debpuur, 2006) with migrants displaying fertility levels different from their rural orogins and closer to the native population of the urban area they move to. This would suggest in the Netherlands experience similar  When we compare this data with the existing literature we see that it alligns with the findings of Kulu (2005) as well, in which people moving from rural areas also experienced assimilation. The people who moved from the rural to the urban show the same drop in fertility the paper mentions happens in Estonia.

We do not see the same change in fertility rate when we look at urban to rural migration however, with the amount of children not being significantly different from the native rural population amoing these migrants.

We also once again see that sex has a significantly different B value which means men are expected to have -.087 children less for every 1 child women are expected to have.

**Parameter Estimates**

| Parameter | B | Sig. | Exp(B) | 95% Wald Confidence Interval for Exp(B) Lower | Upper |
|---|---|---|---|---|---|
| (Intercept) | -.422 | .000 | .656 | .550 | .782 |
| [asex=1] male | -.087 | .000 | .917 | .883 | .952 |
| [asex=2] female | 0[a] | . | 1 | . | . |
| [aeduc=1] primary level | -.193 | .027 | .825 | .696 | .978 |
| [aeduc=2] lower secondary level | -.116 | .165 | .890 | .756 | 1.049 |
| [aeduc=3] upper secondary level | -.174 | .038 | .841 | .713 | .991 |
| [aeduc=5] first stage tertiary level | -.246 | .003 | .782 | .664 | .922 |
| [aeduc=6] second stage tertiary level | 0[a] | . | 1 | . | . |
| aage | .026 | .000 | 1.026 | 1.025 | 1.027 |
| Urban→ Urban | -.294 | .000 | .746 | .696 | .799 |
| Rural → Urban | -.222 | .000 | .801 | .766 | .837 |
| Urban → Rural | -.017 | .590 | .983 | .922 | 1.047 |
| Rural → Rural | 0[a] | . | 1 | . | . |
| (Scale) | 1[b] | | | | |

Dependent Variable: ankids

Model: (Intercept), asex, aeduc, aage, combined_4

a. Set to zero because this parameter is redundant.

b. Fixed at the displayed value.

*Table 16 : Parameter Estimates*

## 7. Conclusion

For years, social scientists and demographers have noted that there is a significant relation between urban and rural living and the amount of children people have on average. In particular in early urbanising societies such as 50s USA and in developing countries this trend can be observed. The regression model used when we look at the Netherlands shows this same pattern also emerge in the Netherlands. The Poisson model shows a significant relation between the geographical location a person lives and the number of children. Strongly urbanised areas are predicted to have 83.6% the number of children as Rural areas, with slightly less urbanised areas still showing a negative trend when compared to the rural areas. Furthermore, not only the geographical location is found to be of significant impact, but the sex of the respondent as well, with male respondents being predicted to only have 92% of the children female respondents are predicted to have. Other control variables seem to be of less impact, with education level not having a significant impact on the eventual number of children a respondent is predicted to have. As far as migrants, especially those who move from the rural to the urban, are concerned the tests show us that migrants who move to urbanised areas from rural areas have a significantly lower fertility rate then those who remain in the rural areas. When we look at the reverse migration however we see the same pattern, with migrants who moved from the urban areas to the rural areas expected to have a similar number of children as the native rural population.

**Discussion**

The main question that remains is if this fertility drop has to do with assimilation, or if the reason for moving had to do with already differing views, the selection hypothesis. To better find an answer to this question qualitative research would be beneficial to discover the motivation and ideas these migrants experience prior to after their moves. This lack of in-dept knowledge is the main constraint with quantitative research, as we do have the absolute numbers but not the metadata behind these numbers.

One of the main difficulty found when writing this paper was getting the dataset organised and workable, as the data within was not completely fit for analyses from the start. Several variables had to be altered and fitted to answer the research question and be useable in a regression model.

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## Appendix

**Model Information**

| | |
|---|---|
| Dependent Variable | Number of children Respondent |
| Probability Distribution | Poisson |
| Link Function | Log |
| | |

*Table 1: Model Information*

**Case Processing Summary**

| | N | Percent |
|---|---|---|
| Included | 8161 | 100.0% |
| Excluded | 0 | 0.0% |
| Total | 8161 | 100.0% |

*Table 2: Case Processing Summary*

**Categorical Variable Information**

| | | | N | Percent |
|---|---|---|---|---|
| Factor | Sex Respondent | male | 3420 | 41.9% |
| | | female | 4741 | 58.1% |
| | | Total | 8161 | 100.0% |
| | Highest Education Level of Respondent | isced 0 - pre-primary education | 78 | 1.0% |
| | | isced 1 - primary level | 645 | 7.9% |
| | | isced 2 - lower secondary level | 2181 | 26.7% |
| | | isced 3 - upper secondary level | 2569 | 31.5% |
| | | isced 5 - first stage of tertiary | 2571 | 31.5% |
| | | isced 6 - second stage of tertiary | 103 | 1.3% |
| | | no response/not applicable | 14 | 0.2% |
| | | Total | 8161 | 100.0% |
| | Type of settlement (rural/ urban/ capital) | very strongly urbanised (> = 2500 addr/km2) | 1626 | 19.9% |
| | | strongly urbanised (1500-2500 addr/km2) | 2410 | 29.5% |
| | | moderately urbanised (1000-1500 addr/km2) | 1623 | 19.9% |
| | | hardly urbanised (500-1000 addr/km2) | 1586 | 19.4% |
| | | not urbanised (< 500 addr/km2) | 916 | 11.2% |
| | | Total | 8161 | 100.0% |

*Table 3: Categorical variable information*

**Continuous Variable Information**

| | | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|---|
| Dependent Variable | Number of children Respondent | 8161 | 0 | 11 | 1.64 | 1.433 |
| Covariate | Age of Respondent | 8161 | 17 | 80 | 46.47 | 15.133 |

*Table 4: Continuous Variable Information*

**Goodness of Fit[a]**

| | Value | df | Value/df |
|---|---|---|---|
| Deviance | 9893.667 | 8148 | 1.214 |
| Scaled Deviance | 9893.667 | 8148 | |
| Pearson Chi-Square | 8274.233 | 8148 | 1.015 |
| Scaled Pearson Chi-Square | 8274.233 | 8148 | |
| Log Likelihood[b] | -12550.046 | | |
| Akaike's Information Criterion (AIC) | 25126.092 | | |
| Finite Sample Corrected AIC (AICC) | 25126.136 | | |
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Dependent Variable: Number of children Respondent
Model: (Intercept), Sex Respondent, Highest Education Level of Respondent, Type of settlement (rural/ urban/ capital), Age of Respondent
a. Information criteria are in smaller-is-better form.
b. The full log likelihood function is displayed and used in computing information criteria.

*Table 5: Goodness of Fit*

**Omnibus Test[a]**

| Likelihood Ratio Chi-Square | df | Sig. |
|---|---|---|
| 2542.212 | 12 | .000 |

Dependent Variable: Number of children Respondent
Model: (Intercept), Sex Respondent, Highest Education Level of Respondent, Type of settlement (rural/ urban/ capital), Age of Respondent
a. Compares the fitted model against the intercept-only model.

*Table 6: Omnibus Test*

**Tests of Model Effects**

| Source | Wald Chi-Square | Type III df | Sig. |
|---|---|---|---|
| (Intercept) | 210.435 | 1 | .000 |
| Sex Respondent | 22.039 | 1 | .000 |
| Highest Education Level of Respondent | 49.628 | 6 | .000 |
| Type of settlement (rural/ urban/ capital) | 282.840 | 4 | .000 |
| Age of Respondent | 1722.086 | 1 | .000 |

Dependent Variable: Number of children Respondent

Model: (Intercept), Sex Respondent, Highest Education Level of Respondent, Type of settlement (rural/ urban/ capital), Age of Respondent

*Table 7 : Test of Model Effects*

**Model Information**

| | |
|---|---|
| Dependent Variable | ankids |
| Probability Distribution | Poisson |
| Link Function | Log |

*Table 9: Model Information*

**Case Processing Summary**

| | N | Percent |
|---|---|---|
| Included | 7137 | 87.5% |
| Excluded | 1024 | 12.5% |
| Total | 8161 | 100.0% |

*Table 10: Case Processing Summary*

**Categorical Variable Information**

| | | | N | Percent |
|---|---|---|---|---|
| Factor | asex | 1 male | 2997 | 42.0% |
| | | 2 female | 4140 | 58.0% |
| | | Total | 7137 | 100.0% |
| | aeduc | 1 primary | 609 | 8.5% |
| | | 2 lower secondary level | 1979 | 27.7% |
| | | 3 upper secondary level | 2262 | 31.7% |

| | | | | |
|---|---|---|---|---|
| | | 5 first stage tertiary | 2202 | 30.9% |
| | | 6 second stage tertiary | 85 | 1.2% |
| | | Total | 7137 | 100.0% |
| | combined_4 | Move to Urban | 851 | 11.9% |
| | | Stay urban | 4024 | 56.4% |
| | | move to rural | 708 | 9.9% |
| | | stay Rural | 1554 | 21.8% |
| | | Total | 7137 | 100.0% |

*Table 11: Categorical Variable Information*

**Continuous Variable Information**

| | | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|---|
| Dependent Variable | ankids | 7137 | 0 | 11 | 1.63 | 1.412 |
| Covariate | aage | 7137 | 17 | 80 | 46.63 | 15.198 |

*Table 12: Continuous Variable Information*

**Goodness of Fit[a]**

| | Value | df | Value/df |
|---|---|---|---|
| Deviance | 1933.112 | 1549 | 1.248 |
| Scaled Deviance | 1933.112 | 1549 | |
| Pearson Chi-Square | 1733.075 | 1549 | 1.119 |
| Scaled Pearson Chi-Square | 1733.075 | 1549 | |
| Log Likelihood[b] | -2138.995 | | |
| Akaike's Information Criterion (AIC) | 4301.990 | | |
| Finite Sample Corrected AIC (AICC) | 4302.192 | | |
| Bayesian Information Criterion (BIC) | 4366.227 | | |
| Consistent AIC (CAIC) | 4378.227 | | |

Dependent Variable: ankids

Model: (Intercept), atype, asex, aeduc, aage

a. Information criteria are in smaller-is-better form.

b. The full log likelihood function is displayed and used in computing information criteria.

*Table 13 : Goodness of Fit*

**Omnibus Test[a]**

| Likelihood Ratio Chi-Square | df | Sig. |
|---|---|---|
| 2101.892 | 9 | .000 |

Dependent Variable: ankids

Model: (Intercept), asex, aeduc, aage, combined_4

a. Compares the fitted model against the intercept-only model.

*Table 14: Omnibus Test*