"How Women Calculate on the Survival of their Children in the Context of HIV/AIDS: Strategies, Child Hoarding and Fertility Behaviours"

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Paper

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Abstract
This paper describes research on the relationship between women's mortality perceptions and their fertility desires in high mortality settings with soaring AIDS prevalence. The research focuses on how to estimate women's mortality perceptions, links their perceptions with desired family size, and looks at the possibility that couples use insurance strategies involving high fertility to compensate for possible future child loss. The study setting is Maputo City, Mozambique, where a specially designed quantitative survey of 800 respondents and in-depth interviews were carried out in 2003. Results suggest that women perceive mortality rates to be higher than they are in reality and that women use insurance strategies to a considerable extent in response to perceived child survivorship. Finally, women's intention to change their fertility behaviour due to AIDS is linked not only to AIDS awareness but also to women's empowerment and women's perceptions of child's survivorship into adulthood.

1. Introduction

This paper describes new research on the relationship between women's mortality perceptions and their subsequent fertility desires in high mortality settings. Demographers often posit that a decrease in mortality rates is a pre-condition for fertility decrease. This fertility decline only happens after a lag from the start of the mortality decline, the explanations for which are not yet fully understood. This lag might be related to parents' mortality perceptions and, if better understood, interpretations of fertility behaviour would be modified and enhanced. However, the dearth of research on mortality perceptions and their relationships with fertility behaviours have prevented the understanding of these links. The research described in this paper focuses on how to estimate women's mortality perceptions and the links between mortality perceptions and desired family size, and looks at the possibility that couples use insurance strategies involving high fertility to compensate for possible future child loss. In a context of high prevalence of HIV/AIDS, these factors may become important in fertility behaviour and this work specifically addresses the relationship between women's perceptions of AIDS mortality and possible effects on their fertility.

2. Effects of mortality on fertility

The relationship between mortality and fertility is one of the most significant areas of demographic studies and it has been researched thoroughly for some time. Indeed, this is one of the key issues in demographic transition theory, namely the effect of changes in mortality on reproduction. The fact that the pathways of these influences are still not clearly understood despite 40 years of research underlines the complexity of the issue.

Very high child mortality levels are characteristic of less developed countries and they differ enormously from child mortality levels in developed countries, reaching differences of an order of 25 times or even 50

times (UNDP, 1997). Nonetheless, infant and child mortality rates in less developed countries can change drastically in a relatively short period of time, but the same does not occur to the mortality rates at other ages. Hence, the effects of infant and child mortality changes on fertility have been, until recently, much more relevant for demographic studies than the effects of mortality rate changes at other ages. However, because the AIDS epidemic is drastically changing age-specific mortality rates at older ages (UNAIDS, 2000), adult mortality should also be taken into account when analyzing the effects of mortality on fertility.

2. 1 Effects of child mortality on fertility

The association between fertility and child mortality has three possible linkages (Rosero-Bixby, 1998): i) child mortality (and mortality in general) share a common set of socio-demographic determinants with fertility (mother's education, access to health and others) (Hanson et al); ii) higher fertility heightens child mortality due to weakened mother's health, diminution of lactation period (Trussel and Pebley, 1984), siblings competition for scarce resources (Pebley and Millman, 1986), and transmission of infections in child-crowded environments (Blacker, 1987); iii) increases in child survival provoke a decrease in fertility as the number of births necessary to achieve a certain desired number of surviving children lowers (Preston, 1978; Cohen and Montgomery, 1998). These three types of casual links are closely interrelated and difficult to disentangle. Chowdhurry (1988) empirically analyzed a causal relationship between child mortality and fertility for 35 developing countries and although no consistent results were evident, more countries appeared to support the existence of a strong relationship between fertility and mortality than did not. In this study only the effects of child mortality on fertility are considered

For simplicity, most researchers have used a single analytical framework to analyze the effects of child mortality on fertility. According to this analytical framework (see Randall Olsen, 1983, for example), the process of causation of child mortality on fertility is considered in terms of four categories: direct replacement, hoarding, societal replacement and biological replacement. Direct replacement is the direct effect of mortality on fertility: when a child dies, parents decide to have another one to replace it. The "hoarding" effect refers to the decision to have more children in anticipation of future child deaths. The "societal" replacement is the effect of changes in mortality of social norms related with fertility. Finally, "biological" replacement is the replacement of a dead child due to the shortening of the time to the next birth caused by his or her death, thus increasing the probability of another birth. The first three categories involve attitudes and volition while biological replacement does not.

Most studies have analyzed and attempted to measure the replacement and biological effects, and the results show that the lactation and the direct replacement effects together do not compensate for child loss, averaging between 0.2 and 0.5 additional births for each child death. If these were the only effects of child mortality on fertility, then the long term population growth rate would not decrease with the decrease of child mortality (Cohen and Montgomery, 1998).

In a setting with moderate to high mortality rates, it is not unreasonable to suppose that parents might think about mortality and fertility simultaneously. In other words, concerns about potential mortality may influence both fertility desires and outcomes. Caldwell (1987), commenting on an in-depth survey in Ibadan, Nigeria, said

> "We were surprised at the extent to which the women were always aware of the possibility that one or more children could suddenly die… While it is true that the vast majority of Ibadan parents do not control their family size because they fear the capricious inroads of mortality, that fear is so great that little concession is given to the substantial mortality declines that have already taken place."

However, not many studies trying to quantify the hoarding attitude have been carried out so far, and those studies that have attempted this are inconclusive. The major studies are Heer and Wu (1978) in Taiwan and Pebley, Delgado and Brinemann (1979) in Guatemala. Heer and Wu conducted a detailed study on the effects of mortality on fertility in two rural villages in Taiwan with different levels of mortality. They enquired about people's perceptions of survivorship out of 20 and 100 births, and concluded that the perception of a lower child mortality rate was associated with lower fertility, but no effect on the desire for an additional child existed. In addition, with the results of a latter control survey among the same people, they concluded that there was no correlation between the mortality perception variables in the two enquiries. Pebley, Delgado and Brinemann studied people's perceptions of mortality levels in two regions in Guatemala, asking how many children would survive out of five births and out of 10 births, and whether changes in child mortality had occurred during the previous five years. They concluded that their estimates were rather accurate, but their perceptions on mortality had no effect on fertility intentions.

The failure to achieve sound results in measuring the insurance attitude, has made some researchers question the relevance of the insurance strategies as a trigger for high levels of fertility (Legrand et al, 2001). Perhaps there are some explanations for the above-mentioned studies failure to measure the hoarding attitude. First, the two previously mentioned studies were carried out in moderate mortality levels settings, lower then in most sub-Saharan Africa countries. Hoarding strategies are typical of high mortality settings while replacement attitudes are more usual in moderate ones (Lloyd and Ivanov, 1988). Second, Heer and Wu's questions on survivorship estimates, use a considerably high base rate (20 or 100 births) that may confound people of low education levels. Finally, and perhaps the most important issue, the questions on survivorship perceptions in both studies concern people in general, but do not capture people's reasoning of their own situation.

Nevertheless, if there is a hoarding (insurance) attitudinal effect of mortality on fertility, then decision makers' perceptions of mortality are crucial. Indeed, the essence of the insurance effect lies in the combination of individual experience and social structure that forms individual perceptions of mortality and forms the basis of fertility goals (Cohen and Montgomery, 1998). However, remarkably little demographic research on these fundamental issues has been done. Part of the reason for this lack of research is that insurance effects are very difficult to detect with aggregate data or with any demographic data that is usually collected (Montgomery, 1998).

2.2 Effects of adult mortality on fertility

The potential consequences of AIDS epidemic on fertility are varied and complex. There is a significant increase in morbidity and mortality in many populations due to AIDS, where non-trivial changes of the rates of both child mortality and mortality of adults in their prime adult age have been seen. The channels through which the AIDS epidemic may influence fertility are related to the proximate determinants of fertility such as contraceptive use, breastfeeding, marriage, infecundity, sterility and abortion (Bongaarts, 1978). Examples of these effects are the increased use of condoms and the possible decrease in fecundity due to illness, among others. These indirect effects will not be dealt with in this paper.

Martha Ainsworth and colleagues (1998) analyzed the attitudinal effects resulting from mortality due to AIDS and concluded that they may appear in two opposite forms. First, the elevated child mortality rates due to AIDS will probably exert a strong positive effect on fertility through the insurance channel. As people's perceptions of child mortality reflect higher mortality due to AIDS, they will likely increase the number of excess births deemed necessary to achieve the number of desired surviving children. Second, adult mortality rates due to AIDS may reduce desired family size and the observed demand for children of individual women through the following channels: i) increased adult mortality rates will reduce the expected benefits of children as old age care-givers; ii) mortality of prime-age adults may reduce household income and raise the demand for labour of the surviving adults, which in turn would raise the cost of children per adult; iii) heightened adult mortality will leave many orphaned children to be absorbed

by the household relatives, which will burden the already tight income, thus reducing the demand for children in the receiving family (Ainsworth et al, 1998). In addition, empirical research has shown a complementary effect of AIDS mortality on fertility: parents fearing infection and an early death tend to decrease their initial desired family size so that the possibility of infecting their own children is reduced, and fewer children become orphaned (Rutenberg et al, 2000; Grieser et al, 2001).

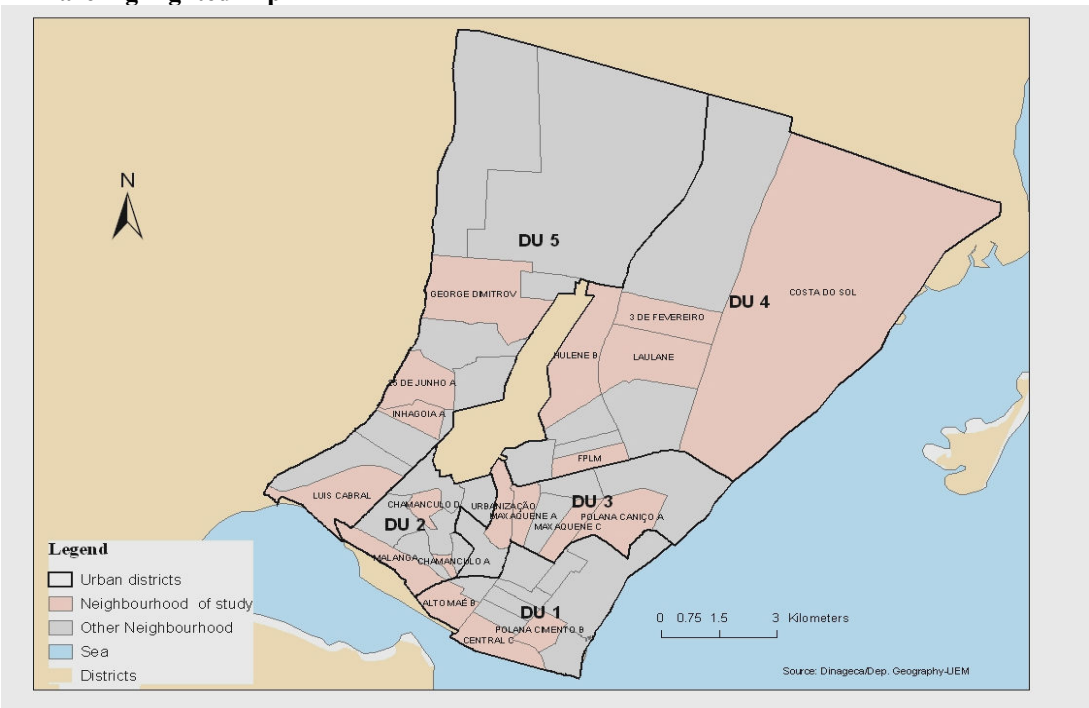
3. Methodology

The study setting is Maputo City, capital of Mozambique, a Southern African country with high infant and child mortality levels, in a context of rising HIV prevalence. In Mozambique, the infant mortality rate (IMR) and the under-five mortality rate (U5MR) for the ten years previous to the last Demographic and Health Survey are respectively 124 and 178 deaths per 1000 live births (MDHS, 2003). However, the corresponding rates for Maputo City are considerably lower, respectively 51 and 89 deaths per 1000 live births. Nevertheless, a large proportion of the adult population was born outside Maputo, and thus their mortality perceptions may be shaped by their upbringing on their origins.

HIV/AIDS prevalence is staggeringly high, estimated at 14.5% infected people among the adult population (Ministry of Health, 1999). Nevertheless, the number of AIDS patients and the number of people who die of AIDS is still relatively low. Probably due to the civil war that ravaged the country from 1982 to 1993, the high rates of HIV/AIDS prevalence are relatively recent, when compared with the rates in the neighbouring countries (Ministry of Health, 1999).

A special quantitative survey with a random sample of 800 women aged 20-49 years (see Figure 1) and in-depth interviews were carried out and analyzed to estimate the effects of mortality perceptions on fertility. Data was collected in May-August 2003. Logistic regression models were used to analyze the quantitative survey.

Figure 1 – Map of Maputo City, showing the urban districts - the sampled neighbourhoods are highlighted in pink



The survey instrument used was a pre-coded questionnaire and had the following questions:

I. Socio-economic and demographic characteristics of the interviewee (age, highest level of school attended, mother tongue, marital status, origin, religion, occupation, listen to radio or watch TV, reads newspaper, house construction materials, place of residence (urban district - UB);
II. Birth history;
III. Desired family size and fertility decision making process (ideal number of children, importance of sex, intention to have an additional child, who decides the number of children);
IV. Mortality perceptions and their relation with fertility (several questions on mortality perceptions and estimates of survivorship rates); Family planning
V. AIDS (awareness and intention to change fertility behaviour).

A key issue associated with the attempt to measure the hoarding attitude is women's fertility intentions. In this study, two major variables were used: the ideal number of children and the desire for a (another) child. The Demographic and Health Surveys' formulation of the ideal number of children question was used and a question was also added on whether the ideal number stated by the respondent was the number of births that they wanted to have or the number of surviving children that they wanted eventually to attain.

The socio-economic and demographic questions had a similar wording and categories to those in the Mozambique Demographic and Health Surveys held in 1997 and 2003. The questions relating to mortality perceptions on child mortality, described in detail on the next section, included respondents' estimates of survivorship into adulthood and survivorship of children into their first year, respondents' perceptions of recent changes in mortality levels and their attitudes and intentions regarding the substitution of a dead child. Based on some of these questions, several rates of perceived child survivorship were calculated.

The outcome variables used in the logistic regression were the following**:**

- Desire for an additional child;
- Intention to change fertility behaviour due to AIDS.

Finally, as mentioned above, a few in-depth interviews (28 women) were conducted, after the first results from the quantitative survey were analyzed, in order to assess the reasons of women's attitudes towards fertility and their links with mortality perceptions.

4. Descriptive results

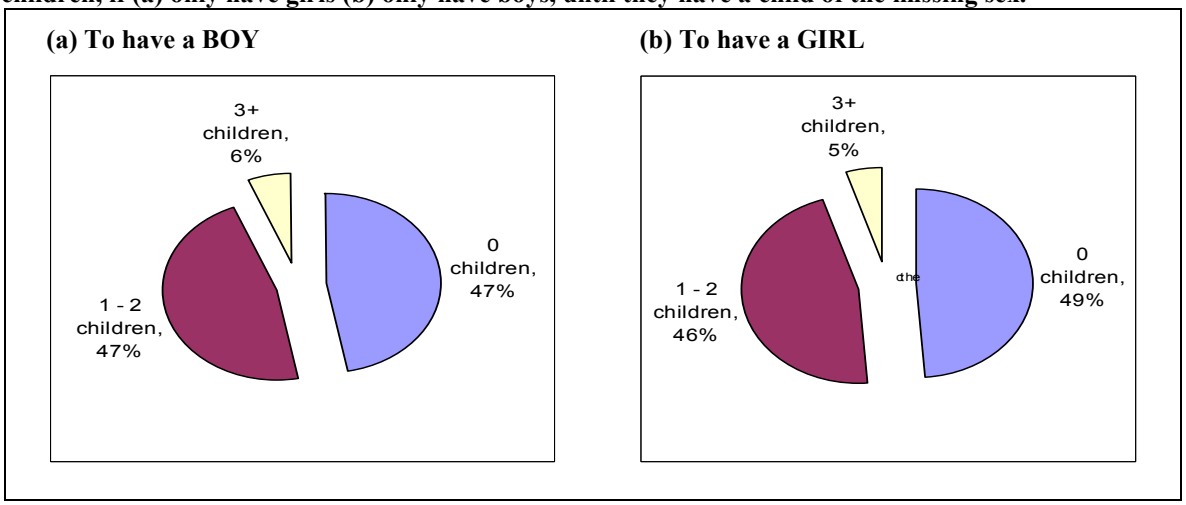
4.1 Desired family size and desired sex composition

The question on the ideal number of children had the same wording as the Demographic and Health Surveys, and was complemented with two additional questions (see below). The additional questions, 2 and 3 were designed to assess whether women would have more children in order to avoid having children all of one sex.

1. "(for women without children alive) How many children would you like to have through all your life? (for women with children alive) If you could go back in time, when you didn't have any child and if you could choose the total number of children you would like to have through all your life, how many would you like to have?"
2. "Suppose you have ____daughters (your ideal number of children), no boys. Would you like to have more children? If yes, how many more?"
3. "Suppose you have ____sons (your ideal number of children), no girls. Would you like to have more children? If yes, how many more?"

The average ideal number of children from the survey was 3.44. The answers to questions relating to an eventual family composition with only boys, or only girls can be seen in Figure 2.

Figure 2: Percentage of women who would like to have more children than the ideal number of children, if (a) only have girls (b) only have boys, until they have a child of the missing sex.



From the answers to the three questions cited above and those relating to the ideal number of children, the number of children can be estimated that are expected in addition to the ideal number of children, when the ideal number of children is only one sex and women are hoping for a child of the missing sex. In other words, if the implementation of the ideal number of children achieved, with the only exception of searching for a child of the missing sex, an estimate of the average additional children required can be made, provided some assumptions are met. The main assumptions are: (i) the probability of a woman having either a boy or a girl is 0.5 in any stage of her reproductive history, (ii) the event of the birth of a boy or a girl are independent from each other and independent from the past childbearing sex results, (iii) no mortality occurs.

The extent of this excess of desired fertility depends on the probability of a woman having the same sex children when they have had one, two or more children. This probability tends to diminish with the increase in the number of children born. The expected number of additional children for each woman depends on her ideal number of children and the answers to the questions above mentioned. Two examples show how this expected number can be calculated.

Example 1

A woman has ideal number of children equal to 2 and wants to have one more child if she has only girls, trying to have a boy.

In this case, the expected additional number of children will be: 0.25.

Example 2

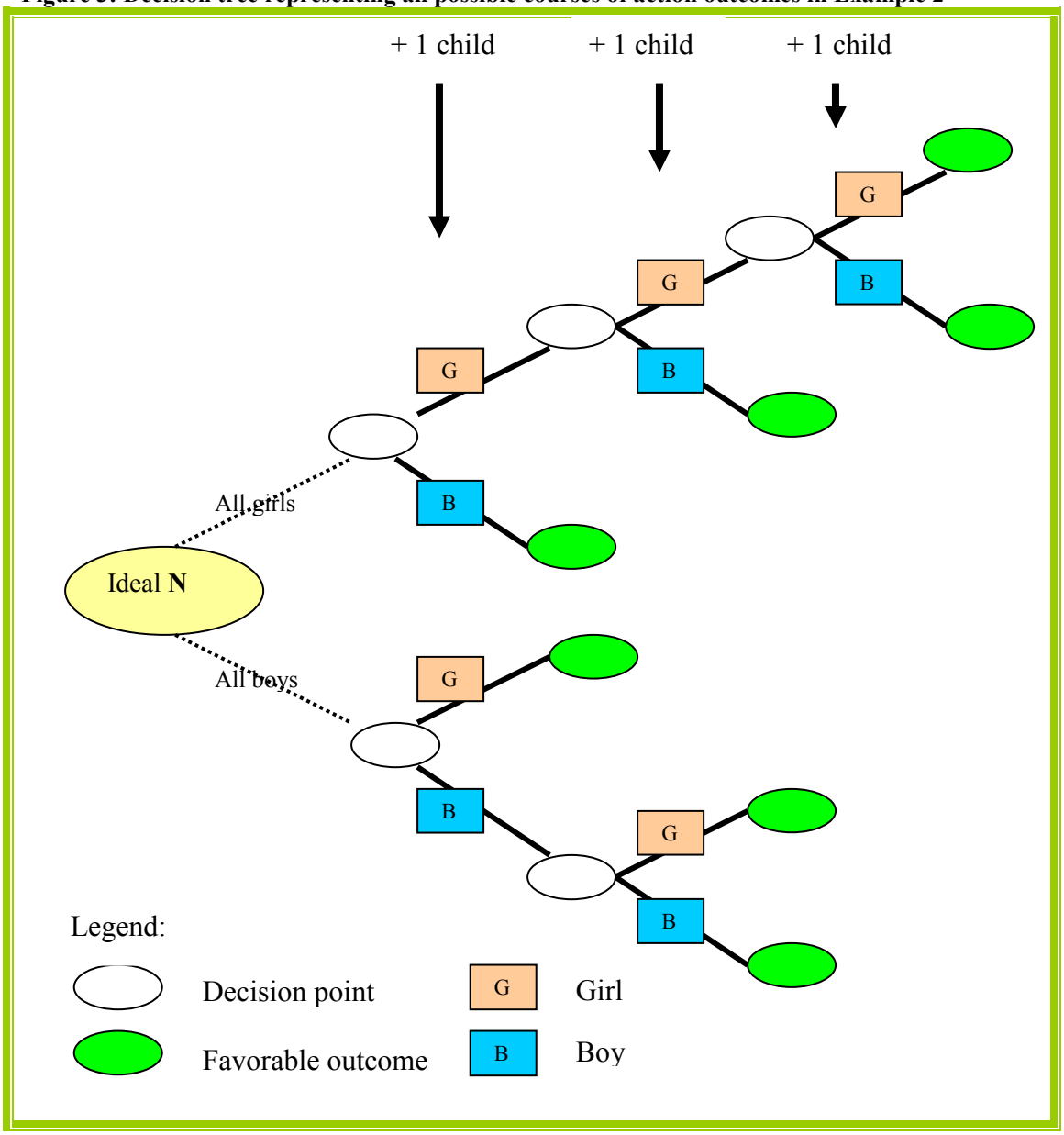
A woman has ideal number of children N and wants to have more children in order to get the missing child: if all N children are girls, she is willing to have more children until having a boy, maximum three more children; if all N children are boys, she is willing to have more children until having a girl, maximum two more children.

Figure 3 shows a decision three representing all possible courses of action. For each outcome, the expected number of additional children should be calculated:

$$\textit{Expected Number of Additional Children} =$$
$$= P(\text{all } N=\text{girls}) + P(\text{all } N+1=\text{girls}) + P(\text{all } N+2=\text{girls}) +$$
$$+ P(\text{all } N=\text{boys}) + P(\text{all } N+1=\text{boys})$$

In this case, for example, if the ideal number of children is two, then the expected number of additional children will be 0.8125.

Figure 3: Decision tree representing all possible courses of action outcomes in Example 2



From the answers to the Questions 2 and 3, all possible cases could be identified (using bivariate analysis) and the expected number of additional children needed in each case was calculated. Furthermore, since the bivariate analysis also evaluates the number of women in each case, the average additional children for all women was estimated. Therefore, the average additional expected number of children when searching for a missing sex for the 418 women who said they would have more children in case all their ideal number of children were of the same sex is 0.284. The equivalent figure for all women in the sample is 0.15.

4.2 The ideal number of children and children's mortality

After having answered the question about the ideal number of children and the other aforementioned related questions, the following question was asked:

"When you think that the ideal number of children for you is ___ are you thinking that some may not survive? In other words, does the possibility that some of the children may not survive influence your choice on the ideal number of children?"

Most women (66%) firmly declared that they were thinking only of survivors. However, a significant proportion (34%) said that they were taking into account that some might die. The average ideal number of children for women who answered that they were thinking only on surviving children is 3.26, while the equivalent figure for women who were thinking in the number of births was 3.78.

Interestingly, socio-economic and demographic characteristics seem to have little influence on women's responses on their ideal number of children in terms of surviving children or in terms of children born. When performing a bivariate analysis, the differences in the percentages of women who answered either way were quite small for a variety of women's characteristics – for example marital status, religion and language group (see Table 4 below). Furthermore, even taking into account the cases where the differences are more significant, it can still be concluded that the majority of women think of their ideal number of children as surviving children. However, a significant proportion, not corresponding to any particular socio–economic or demographic group, considers their ideal number of children as the number of births to have, taking into account that some children might die. In this sense, the question for obtaining the ideal number of children is somewhat imprecise.

Table 4: Percentage of women who answered the ideal number of children in terms of births, minimum, maximum values and level of significance for selected socio-economic and demographic characteristics.

	Minimum percentage	Maximum percentage	Level of significance *
Age	33%	37%	.717
Marital status	31%	46%	.205
Attended school level	28%	43%	.257
Was born in Maputo City	33%	35%	.483
Mother tongue	34%	35%	.967
Professional activity	33%	35%	.841
Religion	32%	38%	.340
Listens radio or watches TV	30%	36%	.638
House materials	33%	42%	.278
Has electricity	33%	36%	.421
Number of children alive	31%	37%	.581
At least one child died	33%	38%	.198
Urban district	28%	41%	.043

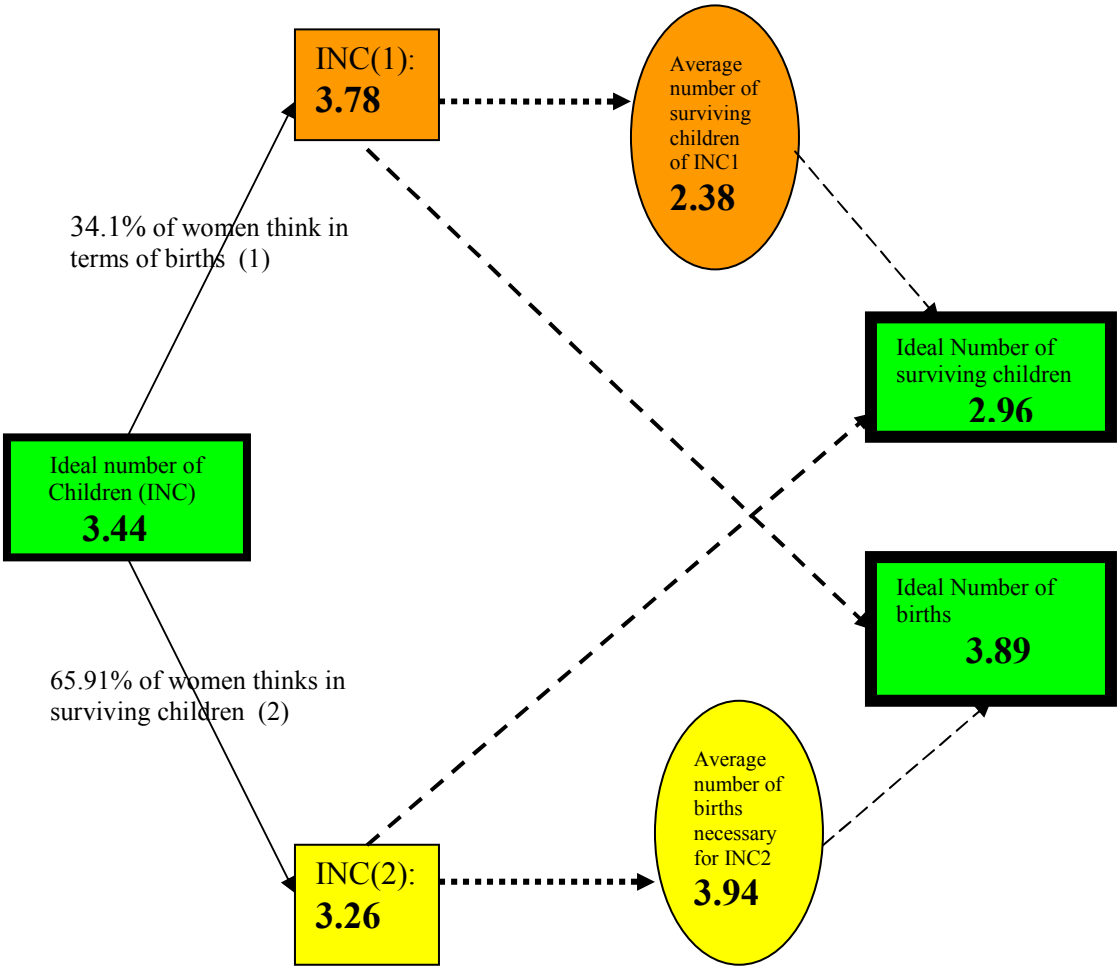
* Pearson Chi-Square (2-sided)

Two additional questions were asked in order to obtain a more precise meaning of the ideal number of children:

1. "(If she is thinking in terms of survivors) How many more children do you think you need to have in order to obtain your ideal number of children?"
2. "(If she is considering the possibility that some will die) How many of these children do you think will be alive when you grow old?"

The answers to these two questions allow for the estimation of (i) the ideal number of children, considering only the surviving children, and (ii) the ideal number of children considering the number of births women would like to have (see diagram in Figure 4).

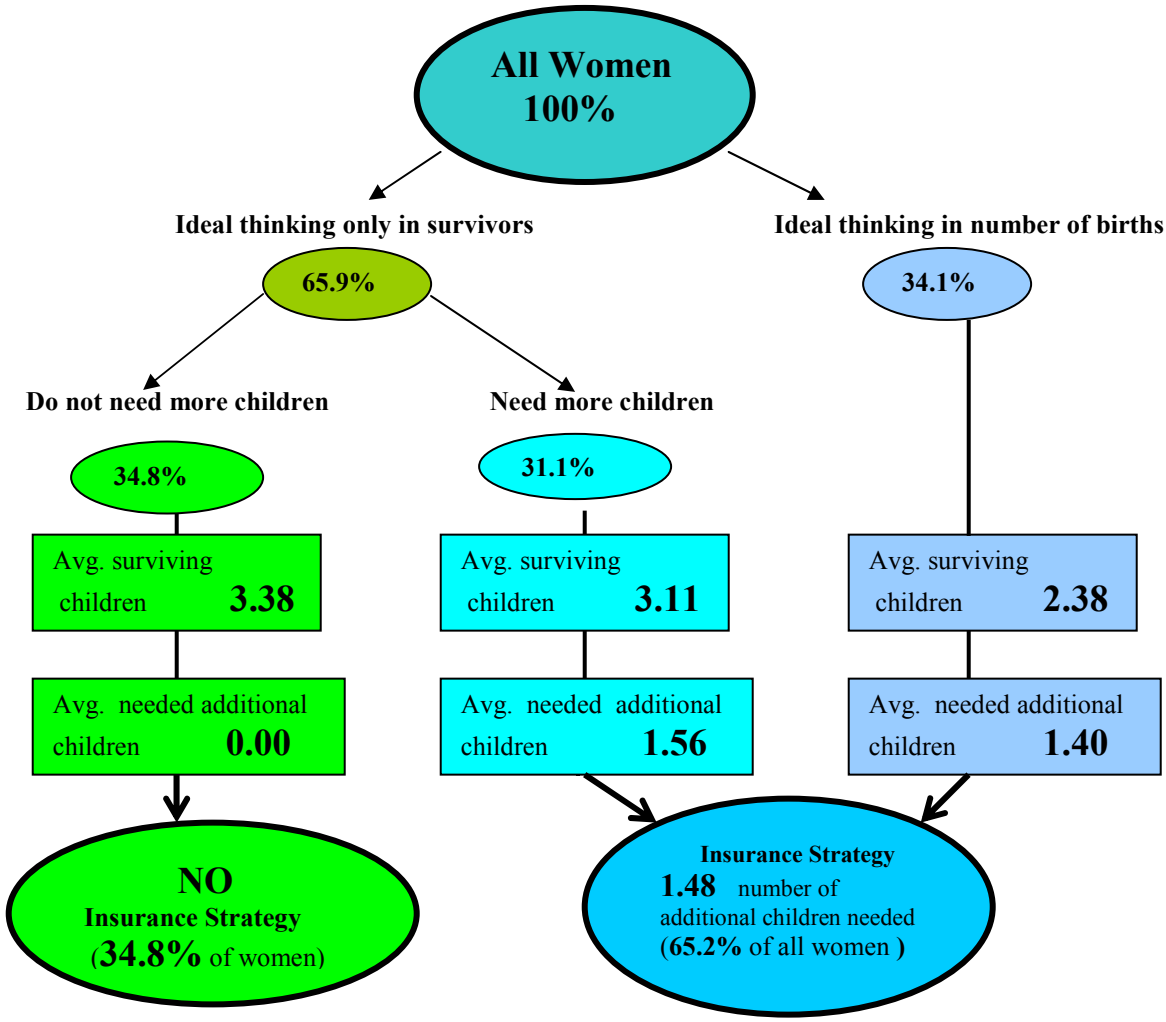
Figure 4: Diagram showing the estimated values for the ideal number of surviving children and the ideal number of births



The values obtained were 2.96 for the average ideal number of surviving children and 3.89 for the average ideal number of births. It can thus be inferred that women pursue an insurance strategy of considerable magnitude when thinking about the number of children they want to have. Indeed, the difference between the two estimates is almost one whole child on average.

Not all women mention child mortality when talking about the ideal number of children. In fact, of the 65.9% of women who answered the ideal number in terms of survivors only, a little more than half (34.8%) of all women think they need no more children to achieve their desired number of surviving children. This subgroup of women has an average ideal number of children of 3.38, and they do not appear to follow an insurance (hoarding) strategy (see Figure 5). The other subgroup of women, who thinks only in terms of surviving children when contemplating the ideal number of children (31.1% of all women), has an average ideal number of children of 3.11. This latter subgroup needs an additional 1.56 children, on average, in order to guarantee that they achieve their ideal (see Figure 5). Furthermore, the average additional children needed to achieve the average number of surviving children for women who think of the ideal number of children in terms of births (34.1% of all women) is 1.40 (3.78 average ideal number of children minus 2.38, the average number of surviving children) as seen above. Combining these two figures for the additional number of children needed as a weighted average, a value of 1.48 additional children needed is obtained for 65.2% of the women (see Figure 5).

Figure 5: Diagram of the estimate of additional children needed to have, when women think of child mortality



So, if women's fertility desires are translated into actual fertility, a large proportion of women, around 65%, would follow an insurance strategy as response to child mortality. The magnitude of this insurance strategy, among the women who would pursue it, is about 1.48 additional children. Because a significant proportion of women would not follow that strategy, the overall insurance strategy effect on fertility in Maputo City would be of 0.93 additional children. It is important to recall here that the infant mortality rate in Maputo City is reasonably low, 51 deaths per thousand live births, when compared with the country's rate, 124 per thousand (MDHS, 2003). It may happen that in the rest of the country the proportion of women who follow an insurance strategy and the value of this insurance strategy are higher than in Maputo's.

4.3 Other rates of survivorship

To have children who can take care of the parents when they grow old is of paramount importance in less developing countries. Regarding this issue, the following questions were asked:

1. “How many children do you think it is necessary to have in order to support you when you become old?”
2. “How many children do you think you must have so that when you are old you have the number of surviving children you mentioned in the last question?”
3. “Imagine that you will be reasonably happy if at least one of your children survives you. How many children do you think you need to have to be sure you get at least one to support you at old age?”

The average number of minimum survivors mentioned in Question 1is 2.76. Interestingly, this number is quite close to the estimated average number of ideal surviving children which is 2.95. Furthermore, it was calculated that for 73.8% of the women in the sample, the estimates of the ideal number of surviving children only differ at most by one when comparing to the number of children women deem it required to have when they grow old. Similarly, the average number of children that must be born in order to achieve the desired number of children declared in Question 1, given in the answer to Question 2, is 3.94. This figure is quite close to the ideal number of births estimated above, which is 3.89. This result suggests that the ideal number of surviving children is similar to the minimum number surviving children women would like to have to support them when they grow old. From the answers to Questions 1 and 2, the average rate of survivorship into adulthood was calculated and the value 0.7187 was obtained.

The average number of children needed to guarantee at least one child remaining alive when women grow old (answers to Question 3) is 2.60. Most women (56.1%) say they need only one or two children to guarantee the survivorship of at least one child into adulthood. However, the remainder think they need to have more children to guarantee at least a survivor. Translating this figure into rates of survivorship, results in an average rate of 0.456, a much lower rate than the one obtained from Questions 1 and 2. The difference in these results may partially be explained by the fact that fertility is a discrete variable. This is particularly pertinent to question 2. Indeed, once a person thinks that a child may die, even while attributing a low probability to this event, he/she must think of two children if they want a high degree of certainty that there will be a survivor. In this case, the corresponding estimated rate of survivorship will fall immediately to 50%. In any case, these results highlight the importance of the risk aversion of becoming childless as a very important issue.

Additional questions on rates of survivorship were asked, as follows:

4. **“**If someone has five births, how many should she expect that will survive the mother?”
5. **“**If someone has ten births, how many should she expect that will survive the mother?”
6. **“**Imagine that 10 babies are born in this community. How many do you expect will survive the first year?”

The average number of survivors is 3.55 out of 5 births, and 7.10 out of 10 births, which results in a survivorship rate equal to 71.0%. In addition, from the answers to Question 6, the calculated average rate of first year survivorship is 8.6 out of 10 live births. This means that around 140 children out of a 1,000 births would die, which is a much higher rate than 51 children out of a 1,000, the estimated infant mortality rate for Maputo City by MDHS- 2003.

4.4 Comparison of the different rates of survivorship

The different rates of survivorship calculated in the previous sections are compared in Table 5. It is interesting to note that the rate of survivorship into adulthood averages are quite similar, except the rate of survivorship to guarantee at least one survivor, which is much lower than the others. In addition, as expected, the rate of survivorship until the first year is higher than the rate of survivorship into adulthood.

Table 5: Averages of the women's estimates of different rates of survivorship

	Averages	Number of cases (N)
Rate of survivorship for minimum survivors	**.72**	**760**
Rate of survivorship for one survivor	**.46**	**744**
Rate of survivorship into adulthood out of 5 births	**.71**	**607**
Rate of survivorship into adulthood out of 10 births	**.71**	**610**
Rate of first year survivorship out of 10 births	**.86**	**614**
Rate of survivorship ideal survivors/ideal births	**.76**	**782**

There is a close relationship between all of the estimates. Table 6 presents the correlations between the variables. It is important to notice, however, that small differences in the estimates, such as one child difference, can produce large differences in the rates of survivorship.

Table 6: Pearson correlation coefficients of the women's estimates of different rates of survivorship

	Rate of survivorship for minimum survivors	**Rate of survivorship for one survivor**	**Rate of survivorship into adulthood out of 5 births**	**Rate of survivorship into adulthood out of 10 births**	**Rate of first year survivorship out of 10 births**	**Rate of survivorship ideal survivors/ ideal births**
Rate of survivorship for minimum survivors	1.000 (760)	**.238** ** (733)	.078* (586)	.093* (589)	.029 (590)	**.233**** (756)
Rate of survivorship for one survivor		1.000 (744)	**.101**** (577)	**.167**** (580)	-.008 (580)	.035 (739)
Rate of survivorship into adulthood out of 5 births			1.000 (607)	**.495**** (590)	.192 (555)	.026 (600)
Rate of survivorship into adulthood out of 10 births				1.000 (610)	**.196**** (568)	.004 (603)
Rate of first year survivorship out of 10 births					1.000 (614)	.053 (607)
Rate of survivorship ideal survivors/ideal births						1.000 (782)

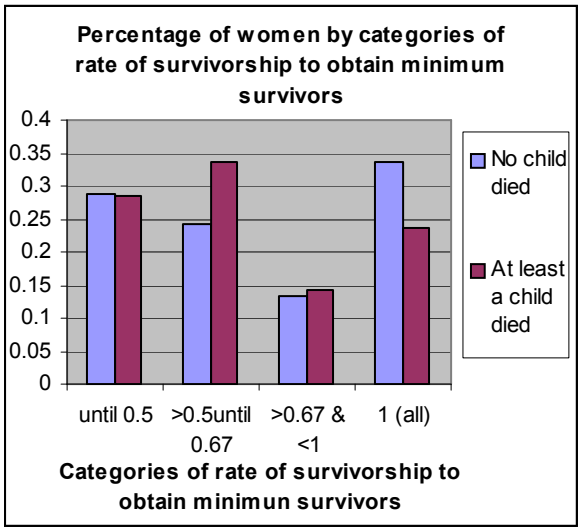
** significant at the 0.01 level (2-tailed) ; * significant at the 0.05 level (2-tailed)

4.5 Association between mortality perceptions estimates and experience of child death

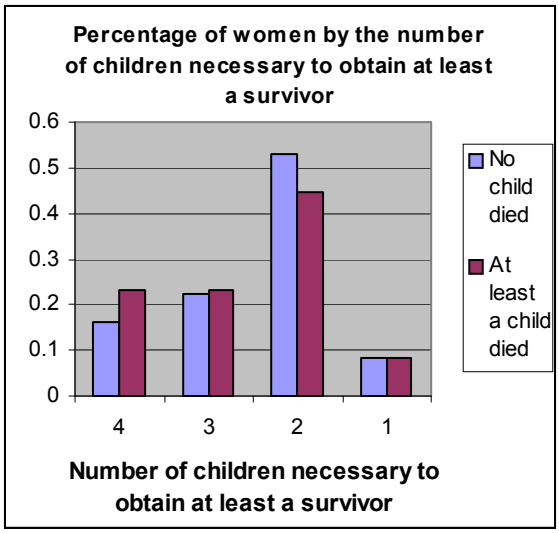
Interestingly, women's estimations of the different rates of survivorship do not seem to be very much related to women's experience of child death. Figure 6 shows four graphs comparing the different rates of survivorship with women's experience of child death. In some cases, there is a tendency for women to have a lower rate of survivorship estimate if at least one of their children has died. However, the differences are not very sharp and sometimes they are even in an opposite direction.

Figure 6: Graphs of the percentage of women by categories of rates of survivorship, for women who did not have experience of mortality and for women who had experience of mortality.

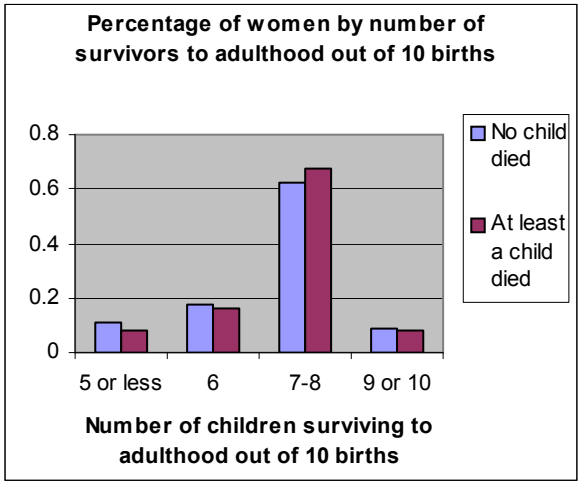
Graph1



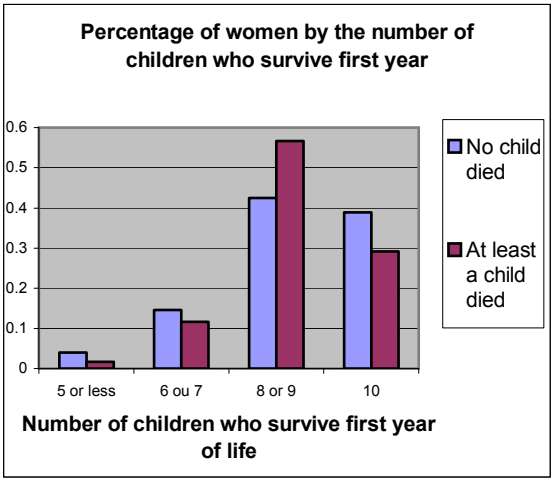
Graph 2



Graph 3



Graph 4



4.6 Perceptions on child mortality changes

A question on women's perceptions on changes in child mortality was asked as follows:

> "Do you think more or less infants and small children die now compared to 20 – 25 years ago?

In Figure 7, a chart shows the distribution of the four possible answers to this question. Around two thirds of the women think that more children die now than 20-25 years ago. According to the MDHS 1997 and MDHS 2003, there has been a decrease in the child mortality levels in the 15- 20 years in Mozambique, previous to the date of the MDHS field work (see Figure 8).

Figure 7: Percentages of women who think that less children die now, more children die now, it is the same, or do not know

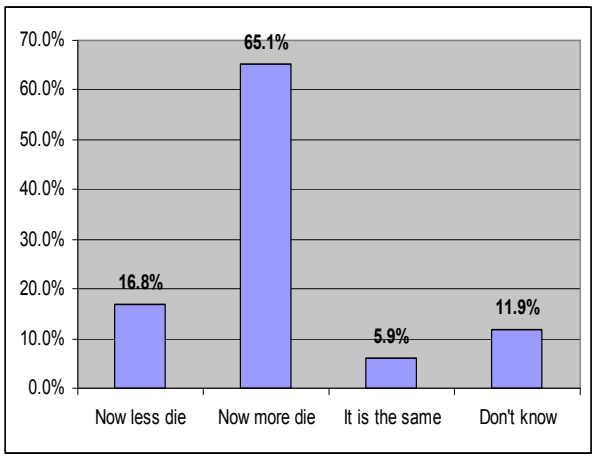
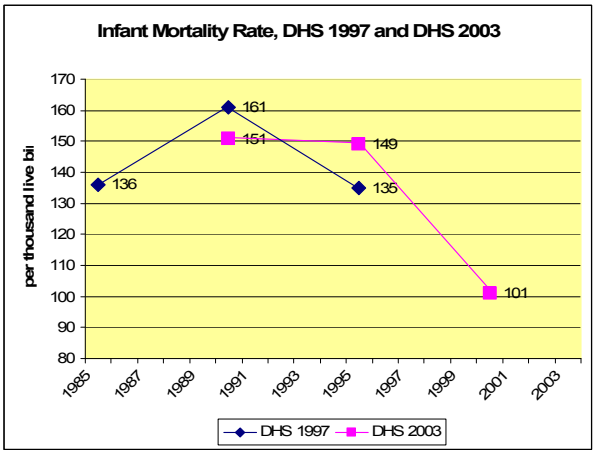


Figure 8: Infant mortality rates in Mozambique, Demographic and Health Surveys, 1997 and 2003



While there is no reliable historical data on mortality rates for Maputo City, it is not probable that infant and child mortality rates have increased for the past 20-25 years in Maputo. Indeed, Maputo City did not suffer in the civil war (1982-1993) as much as most other parts of the country. Hence, it seems that women's perceptions of child mortality levels in Maputo City are higher than the actual mortality rates. This conclusion is corroborated with the answers to the question on the number of survivors until one year old out of 10 births above described. Indeed, the average rate of survivorship is 8.6 survivors out of 10 births, which corresponds to a rate of around 140 children out of a 1,000 births. This is a much higher rate than 51 children out of 1,000 - the estimated infant mortality rate for Maputo City by MDHS 2003. Interestingly, the average number of survivors for the group of women who think that less children die now is 8.70, higher than the corresponding average for women who think that more children die now (8.58).

4.7 Another response to mortality

In order to capture women's intentions of response when facing the experience of mortality, the following question was posed:

> "(If at least a child had already died) When your child (children) died, did you think of having another one to compensate for the lost child? If yes, have you done anything? (If no child had already died) What do you think, if you had the misfortune of losing a child, would you do anything to compensate for this child, or would you let your children be born naturally?"

Interestingly, most women (69.1%) declared that they did not (they did not intend to) substitute a death child, while 20.8% said that either they had substituted the death child intentionally or they intended to substitute in case one of their children dies. The remainder 10.1% did not answer the question. If we only consider the women who have answered the question, 76.9% declared 'no' to this question and 23.1% declared 'yes.'

Eventually, the answering 'yes' or 'no' could be dependent on the experience of child death but this does not seem to be the case. In fact, among women who answered the question, the fact that a child died only had been substituted in 22.4% of the cases, while 25.5% of the women who did not experience a child death declared they would substitute. In addition, although some differences in the answers could be observed in cross-tabulations with the various socio-economic and demographic characteristics, the

maximum percentage who intended to substitute a child that died within a subgroup is 29.3%, which is the subgroup of women who have a house constructed with precarious materials. The results just mentioned are in accordance with literature elsewhere: that the substitution strategy is less than one, and that the rate of substitution using different models varies between 0.2 and 0.5.

4.8 AIDS

The AIDS section in the questionnaire begins with a general question on whether women had already heard about AIDS. Only 0.8% answered negatively. In addition, three questions were asked in order to ascertain whether they had any contact with someone who has or died of AIDS. Below these questions are presented:

1. "Do you have any relative, friend, or colleague infected with AIDS?"
2. "Do you have any relative, friend, or colleague who have or died with AIDS?"
3. "Do you have any relative, friend, or colleague who have or died with AIDS?"

Taken altogether, most women (62%) do not know anyone that has AIDS or knew someone who died of AIDS. The remainder either know or knew someone, or has doubts about someone. However, women's awareness of AIDS is somewhat incomplete and imprecise as it is shown in their answers to the questions below.

4. "Can a person who looks healthy be infected with AIDS?"
5. "Is AIDS a mortal illness?"
6. "If you have (unprotected) sexual relations with someone who has AIDS, even if he doesn't appear ill, will you be infected?"

Taking each answer separately, a large proportion of women seem to know about AIDS. Indeed, 84% of women know that a person looking healthy can be infected, 58% thinks that AIDS is always mortal and 68% say that if she has unprotected sexual relationship with an infected man she will always get infected herself. However, all answers taken together, few women, only 41% answered in this way to the three questions.

In addition a question on their assessment of their own possibilities to get infected was phrased as follows:

7. Do you think that the possibilities that you are infected or will be infected with AIDS are high, moderate or none (or already knows she is infected)?

Only 38% of women think that their possibilities of being infected are high. The remaining women are evenly distributed among the other categories. Indeed, 42% of the women think that their possibilities of getting infected are minimal or they don't know.

Finally, a last question was set aiming to capture women's intentions of fertility behaviour changing due to AIDS awareness. The majority of the women, 58% did not intend to change their childbearing, while the remainder did intend to make a change. The great majority of the women who intend to change their behaviour (35% of the total women) thought of having fewer children as a response to AIDS epidemic while a small proportion, 4.8%, wanted to have more children.

5. Multivariate analysis

The models presented in this section have, as mentioned above, the following outcome variables:

- the desire to have an additional child;
- the declared intention of fertility behaviour changes due to AIDS.

For each of the outcome variables, several models were tested using mortality perceptions, socioeconomic, demographic and AIDS awareness variables as explanatory variables. The distribution of the explanatory variables is shown in Annex 1.

5.1 Desire for an additional child

The chosen outcome variable, representing women's fertility intentions was defined as whether the respondent would like to have a, or another, child. The phrasing of the question in the survey is:

> "(*If she is not pregnant or is not sure)* Do you want another child or you don't want more children? (*If she is pregnant)* After having this child do you want more children?"

The possible answers to this question are: "want (another) child," "don't want any more," "can't" and "undecided/don't know." Women in the category "can't" were divided in two groups: if they had already a child, they were included in the group of women "don't want any more," while the remainder were discarded from this multivariate analysis. Women who said "undecided/don't know" were included in the category "want (another) child." In this sense, the variable representing the desire for an additional child became dichotomous and had 786 cases. The models studied have fewer cases as some explanatory variables have missing cases. The percentage of women who wanted a (another) child is 64%.

The objective of model building in this section is to capture the effects of the mortality perceptions variables on the desire for an additional child, using socio-economic and demographic variables as explanatory control variables. All explanatory variables (mortality perceptions, socio-economic and demographic variables, AIDS awareness) were tested, adding one by one to an initial basic model. The addition of most variables was not significant.

Two models (see Table 7) were fitted: Model A, where the variable "rate of survivorship to obtain at least one survivor into adulthood" was included as a dichotomous variable (see Table 7), and Model B where all variables where taken as continuous, including the rate of survivorship into adulthood.

All variables in the two models were significant. The percentage of variance explained is quite high with the Nagelkerke R square of 47.8% for model A and 47.9 for model B. All parameters are significant in both models, although some less significant than others (see Table 7). In addition, several possible interactions were tested and none was significant.

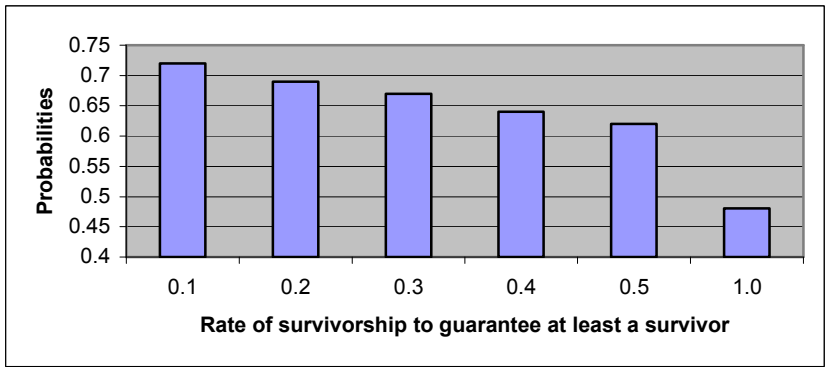
The probability of wanting an additional child is higher when women's perceptions of the survivorship rate of at least a child into adulthood is lower, in both Models A and B. Indeed, all being equal, in Model A, women who think that in order to guarantee at least one survivor into adulthood they will need to have three or more children have a higher probability of wanting more children than women who think that one or two children suffices to guarantee at least a survivor. This conclusion is confirmed in model B, where the rate of survivorship was taken as a continuous variable. Indeed, for the different values of this rate the differences of the probabilities of wanting an additional child are sharper than in model B, and are illustrated in Figure 9.

Table 7: Predicted probabilities for wanting an additional child

	Model A Age + Children Alive + Survivorship of a Child into Adulthood, (categorical) N =738		Model B Age + Children Alive + Survivorship of a Child into Adulthood, (continuous) N =738
Age in 10-year groups		Age	
20 to 29	0.79 ***	20 years	0.82***
30 to 39	0.67 ***	25 years	0.74***
40 to 49 years[R]	0.36	30 years	0.64***
		35 years	0.53***
		40 years	0.41***
		45 years[R]	0.31***
Number of children alive		Number of children alive	
0 child	0.98 ***	0 child	0.89***
1 - 2 children	0.73 ***	1 child	0.81***
3 - 4 children	0.43 **	2 children	0.70***
5+ children[R]	0.24	3 children	0.56***
		4 children	0.41***
		5 children	0.27***
		6+ children	0.17***
Rate of survivorship to obtain at least one survivor		Rate of survivorship to obtain at least one survivor	
less than .50	0.75 *	0.1	0.72*
more or equal to .50 [R]	0.66	0.2	0.69*
		0.3	0.67*
		0.4	0.64*
		0.5	0.62*
		1.0[R]	0.48*

*** p < .001; ** p < .01; * p < .05.

Figure 9: Probabilities of wanting an additional child, by the rate of survivorship to have at least a survivor



It is important to point out that with a larger sample more estimates of the rates of survivorship may become significant. However, even if this happens, the fact that with a smaller sample the rate of survivorship to guarantee at least a survivor into adulthood is the only mortality perceptions variable significant in explaining fertility desires, stresses the importance of this variable. This makes sense. Indeed, if a woman wants to have three surviving children when she grows old, but she ends up with two, she probably will be reasonably happy. Hence, the number of children needed to have the minimum

number of survivors, in this case three, may be a figure that does not guarantee the three survivors, as if the number of survivors becomes two, the woman will still be happy. However, she needs to have a sufficiently large number of children that guarantees that she will not become childless.

Moreover, the fact that other estimates of the rates of survivorship are not significant may have an additional explanation. Indeed, it would be expected, for example, that the rate of survivorship obtained from the number of children needed to obtain the minimum number of survivors into adulthood, is also significant in explaining fertility desires. This rate of survivorship was calculated on the basis of women's answers to the questions regarding the minimum number of desired surviving children and the number of children women need to have to guarantee these survivors into adulthood. Some of them are probably inexact. Indeed, during the interviews, women often mentioned two adjacent figures, but the interviewer asked them to choose only one. Because these figures are small integer numbers, their lack of exactitude may confound the results of the multivariate analysis. However, the rate of survivorship to obtain at least a survivor, based on the number of children needed to obtain at least a survivor, suffers less from this lack of exactitude, hence this variable represents more accurately women's perceptions of mortality and its influence in fertility desires becomes clearer.

Finally, it is interesting to note that the variable representing the perceptions of changes in mortality levels does not have influence on the desire for an additional child. A possible explanation for this result is that women's perceptions on the community levels of mortality may be somewhat independent of women's perceptions of their own children's survivorship. Indeed, they can control the care they can give to their child, but can not do the same to the community's children. On the other hand, a woman can be very poor and thus have difficulty to access health services, but regards the other women as richer and with capacity to provide better care to their children.

5.2 Intention to change fertility behaviour due to AIDS

The outcome variable is the women's intention to change fertility behaviour due to AIDS. The possible answers to this question were: to have more children, to have fewer children or to have the same number of children. Because only 38 women declared that they would have more children, this group was discarded from the analysis and the outcome variable only has two possible values: intention to change fertility behaviour and to have fewer children, or intention not to change fertility behaviour. The percentage of women who declared that they intend to change fertility behaviour and have fewer children due to AIDS became 40%.

The first step in modeling the intention to change fertility behaviour due to AIDS, was to analyze whether women's AIDS awareness have any effect on that change. Then, socio-economic and demographic variables were added, as well as mortality perceptions variables. Three models were fitted (see Table 9) with the following explanatory variables:

- Model C: whether AIDS is a mortal illness, women's assessment of own possibility to get AIDS, age, mother tongue and survivorship of at least one child into adulthood (dichotomous variable);
- Models D: same variables as C, but in Model D the rate of survivorship into adulthood is represented by the number of children necessary to guarantee a survivor;
- Model E: same variables as Model D, with two additional variables, one indicating who decides the family size and the other the number of children alive.

All the other mortality perceptions, demographic and socio-economic and AIDS awareness variables were tested but they were not significant.

The Nagelkerke R-Square for Models C, D and E is 19.2%, 19.4% and 25.6% respectively. Not all parameters are significant, especially for the 'Age,' 'Mother Tongue' and 'Children alive' categories.

Interestingly, in the three models, the most significant parameters correspond to the variables representing the perceptions of rate of survivorship and women's participation on the decision to have children.

Table 9: Predicted probabilities for the intention to change the fertility behaviour due to AIDS

	Model C N= 608	***Model D N=608***	***Model E N=608***
Is AIDS mortal			
Sometimes	0.28	0.28	0.29
Always	0.41 *	0.41 *	0.44 *
Don't know [R]	0.25	0.25	0.25
Possibilities of getting AIDS			
Minimal	0.30	0.30	0.31
Moderate	0.43 *	0.43 *	0.43 *
Great	0.39 *	0.39 *	0.43 *
Don't know [R]	0.27	0.26	0.28
Age (grouped)			
20 to 29 years old	0.40	0.40 a)	0.45 a)
30 to 39 years old	0.30 a)	0.30	0.30
40 to 49 years old [R]	0.29	0.29	0.29
Mother Tongue			
Xitsonga &similar	0.42	0.42	0.41
Portuguese	0.23 **	0.23 **	0.24 *
Other [R]	0.42	0.42	0.44
Rate of survivorship to obtain at least one survivor			
less than .50 [R]	0.20***		0.21 ***
more or equal to .50 [R]	0.48		0.50
Number of children necessary to obtain at least one survivor			
One child		0.47 ***	
2 children		0.48 ***	
3 children		0.23	
4 or more children [R]		0.17	
Who decides the number of children to have?			
The woman or woman and her husband			0.43 ***
The husband or others [R]			0.27
Number of children alive			
0 child			0.49
1 – 2 children			0.31
3 – 4 children			0.36
5 + children [R]			0.45

*** p < .001; ** p < .01; * p < .05. a) almost *

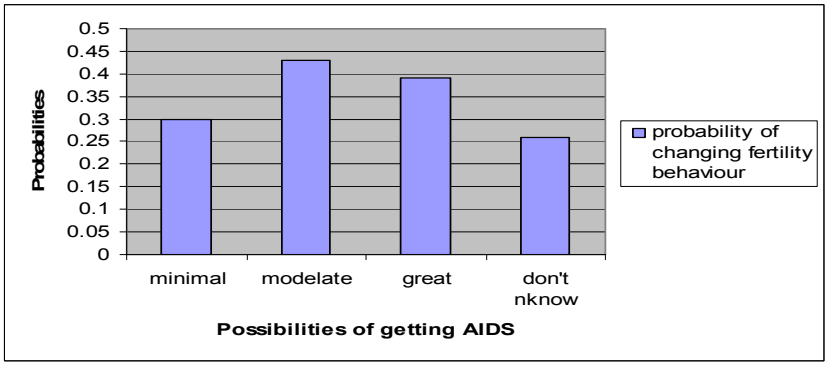
The variables representing the perceptions of rate of survivorship have a greater range of the predicted conditional probabilities than the other variables. This is truer for the number of children necessary to guarantee at least one survivor into adulthood in Model E. In Figure 10, these probabilities can be visualized in a graph. So, the greater the number of children needed to obtain at least one survivor, the smaller the probability of women changing their fertility behaviour due to AIDS.

Figure 10: Predicted probabilities of changing and of not changing fertility behaviour due to AIDS, by the number of children necessary to guarantee at least one survivor into adulthood.

In addition, if a woman thinks that AIDS is a fatal illness, the probability of changing her fertility behaviour is much higher than otherwise: a woman who thinks that AIDS is always fatal has a probability of changing behaviour of 0.41, while if a woman thinks that the illness is fatal only sometimes, or if she does not know if AIDS is fatal, the probability of changing behaviour are 0.28 and 0.25 respectively.

Age also has some effect on the intention of changing fertility behaviour due to AIDS, which is greater for younger women. Furthermore, for women whose mother tongue is Portuguese, the probability of changing fertility behaviour due to AIDS is much smaller than for women with another mother tongue. Another important variable in explaining women's intention of changing fertility intentions is their own assessment of getting AIDS. In Figure 11 the probabilities for each level of self assessment are shown. Indeed, if a woman thinks that her possibility of getting AIDS is moderate or high, the probability of changing fertility behaviour is greater than if she thinks that her possibilities of getting AIDS are small or if she doesn't know her own risk of getting AIDS.

Figure 11: Predicted probabilities of changing and of not changing fertility behaviour due to AIDS, by the women's own assessment of getting AIDS



Finally and interestingly, the probability of intending to change fertility behaviour due to AIDS and have fewer children is much greater (almost double) if women have a say on the decision of the number of children to have than otherwise. Indeed, the introduction of the dichotomous variable representing "who decides the number of children to have" in Model A6 produced an improvement of 6.4% on the percentage of the variance explained. In addition, the parameter estimate is significant at the level 0.01.

6. Summary of the main findings

Mortality is generally a very delicate issue, and even more so when a woman is talking about her own children. It can be painful to talk about past deaths, and dreadful to talk about the possibility of a child dying in the future. Religious beliefs and fear for the supernatural impregnated in traditions, add more complexities to this issue. It may be easier to talk about future survivors or deaths for a childless woman beginning her childbearing, but these women constitute a very small proportion in the group of women in the childbearing age. These are the premises that should be assumed when analysing perceptions of mortality and evaluating their influences on fertility. And these premises prevent or at least make difficult an accurate, precise analysis of this complex human issue. Mortality perceptions seem to be formed throughout one's lifetime, and it might happen that, for some women, a single event is strong enough to shape their perceptions, while for others these perceptions are built up through a series of relatively important events that occur throughout their lives.

Results suggest that women in Maputo City perceive mortality rates to be higher than they are in reality: women erroneously think that now more children die than a generation ago and women's estimates of rates of child' survivorship of first year of life and into adulthood are lower than they are in reality.

In addition, results imply that women use insurance strategies to a considerable extent in response to perceived child mortality: if women are to implement their stated intentions on the ideal number of surviving children, they pursue a considerable insurance strategy, and this strategy might increase fertility, in average, by one third to guarantee women's desired family size. This intention to have additional children due to mortality, if implemented, translates to having almost one extra child, whereas the additional children that would occur if they were to implement their intentions of having additional children in case they are seeking for a missing sex child is only about 0.15 children.

Women's perceptions of child' survivorship into adulthood strongly affect their fertility desires: the higher the women's estimate of the survivorship rate into adulthood to guarantee at least one surviving child, the lower the probability of women desiring an additional child. The dimension of this strategy is given by the different probabilities: if a woman thinks that she needs more than two children to guarantee at least one survivor then the probability of wanting an additional child is around 15% higher than the probability of having an additional child if she thinks that one or two children will be enough to guarantee that at least one child will survive.

AIDS awareness influences women's intentions of changing their fertility behaviour. If women consider AIDS to be always fatal, the probability of changing attitude and having fewer children is much higher than otherwise. In addition, if a woman considers that her possibilities of getting AIDS are moderate or high, the probability of changing fertility behaviour and having fewer children is higher than otherwise. Moreover, the probability of the intention to change fertility behaviour due to AIDS is much lower (less than half) for women who think they need more than two children to guarantee at least a surviving child than otherwise. Finally, the probability of women's intention of changing behaviour due to AIDS is greater if the decision of having children is hers or both hers and her husband's. This result suggests that women's empowerment in the family has a positive effect in making informed choice on fertility decisions when facing AIDS.

7. Conclusion and implications for policy

The innovative contributions of this study to demographic literature can be summarized as follows:

- Highlights the importance of using the ideal number of children to estimate the hoarding attitude, in differentiating the ideal number of surviving children and the ideal number of births women would like to have;

- Analyzes a wide range of mortality perceptions variables and identifies the rate of survivorship to obtain at least a survivor as the most important for fertility intentions, highlighting women's risk averse attitude of becoming childless;
- Provides two estimates of hoarding attitude, one using the concept of ideal number of children and the other one providing the different probabilities in desiring an additional child, dependent of women's perceptions on the rate of survivorship to obtain at least a survivor;
- Relates mortality perceptions variables with AIDS awareness, and demonstrates their influence in the women's intention of changing behaviour due to AIDS and have fewer children.

An important conclusion of this study is in relation to the 'insurance strategy'. The value of children is a multifaceted issue, in which the problem of insuring against old ages merges with the concern for having help in the house, and the desire to continue the family line intertwines with the issue of women's status in society. Results strongly suggest that women's perceptions of their children's mortality levels are higher than these rates are in reality and these higher levels of mortality perceptions may prompt women to use insurance strategies that lead to a family size larger than their ideal.

In high-mortality contexts, high fertility may be advantageous for parents, but a significant reduction in mortality may result in the parents becoming 'enslaved' by too many children. The cause of mortality declines may affect the mortality level at which people feel confident that their children will survive into adulthood, and, as a result, they may decrease their own fertility ambitions. Indeed, if mothers can improve their child's survival by using techniques that they control, they will more easily perceive mortality declines and be more confident to obtain at least a surviving child. A strong valorisation of health improvement may contribute to parents becoming more confident in their children's survival.

The effects of mortality perceptions and AIDS awareness on fertility behaviour may gain strength in the near future. AIDS awareness is still somewhat low, but it will probably increase soon with the increase of death rates due to AIDS. Indeed, only 35% of the respondents of the quantitative survey declared their intention of changing fertility behaviour. There are, however, signs of awakening fears: some women began to speak about the need to take the HIV test before having children, and a few others mentioned that there are women who have stopped their childbearing due to AIDS and have fewer children. There are some important characteristics associated with women's intention of changing fertility behaviour due to AIDS. Indeed, women who do not intend to change their fertility behaviour due to AIDS, are women who: i) do not think that AIDS is always fatal, ii) think that the possibility of getting AIDS is low, iii) have a low rate of survivorship perception to obtain at least one child for old age, and iv) have no voice in the decision to have children.

Fertility desires are not fertility outcomes, but population history shows that they are reasonable predictors of future fertility levels. Furthermore, understanding the forces driving fertility desires might help reproductive health and family planning officers to better fulfil their goals and to support women in making an informed choice. Women should have the right to make their own reproductive decisions, namely to decide if, when, and how often to reproduce.

An increased awareness of AIDS' deadly role will probably influence women to decide for fewer children. Furthermore, women's empowerment within the family will also reduce their childbearing. This is particularly important because AIDS continues to spread at high rates and it seems that a great part of the infected women are not yet aware of their infectious condition. The increased awareness of the AIDS deadly role and women's empowerment in the family could not only help prevent future contagions by an increase use of condoms, but also will probably decrease the number of children born with AIDS.

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ANNEX: Distribution of explanatory variables
Mortality perceptions variables

Explanatory variables		N	%
Rate of survivorship to obtain the minimum number of survivors	1 – less than .67	**266**	35.0
	2 – more or equal .67 and less than 1	**254**	33.4
	3 – equal to 1	**240**	31.6
Number of children necessary to obtain at least one survivor	1 – one child	**55**	8.0
	2 – two children	**349**	50.7
	3 – three children	**160**	23.2
	4 – four or more children	**125**	18.1
Rate of survivorship to obtain at least one survivor	1 – less than .50	**299**	40.2
	2 – more or equal to .5	**445**	59.8
Rate of survivorship to obtain at least one survivor	continuous		
Rate of survivorship into adulthood out of 5 births	1 – less than .8	**316**	52.1
	2 – more or equal .8and less than 1	**202**	33.3
	3 – equal one	**89**	24.6
Rate of survivorship into adulthood out of 10 births	1 – less than .6	**170**	27.9
	2 – more or equal .6 and less .9	**287**	67.5
	3 – equal .9 or more	**53**	4.6
Rate of first of year of life survivorship out of 10 births	continuous		
Rate of survivorship to obtain ideal number of surviving children	continuous		
Now more children die than 20-25 years ago	1 – now less children die	**133**	16.8
	2 – now more children die	**516**	61.1
	3 – it is the same or don't know	**141**	17.8

Socio-economic and demographic variables

Explanatory variables		N	%
Age	1 – 20 to 29 years old	**427**	53.8
	2 – 30 to 39 years old	**231**	29.1
	3 – 40 to 49 years old	**135**	17.0
Number of children alive	1 – none	**146**	18.4
	2 – 1 to 2 children are alive	**308**	38.8
	3 – 3 to 4 children are alive	**214**	27.0
	4 – 5 or more children are alive	**125**	15.8
Number of children who died	continuous		
At least one child died	1 – none	**621**	78.3
	2 – at least one	**172**	21.7
Who decides the number of children to have	1 – you	**165**	23.8
	2 – your husband	**151**	21.8
	3 – you and you husband	**283**	40.8
	4 – others	**95**	13.7
Who decides the number of children to have, dichotomous	1 – you or you & your husband	**448**	64.5
	2 – your husband or others	**146**	35.5
Highest level of school attended	1 – no school	**55**	6.9
	2 – primary school	**426**	53.7
	3 – secondary school	**210**	26.5
	4 – medium or high level	**102**	12.9
Mother tongue	1 – Xitsonga & similar	**434**	54.7
	2 – Portuguese	**251**	31.7
	3 – Other	**118**	13.7
Marital status	1 – single/widow/divorced	**510**	64.3
	2 - married	**283**	35.7
Born in Maputo	1 – yes	**398**	50.2
	2 – no	**395**	49.8
Religion	1 – catholic	**180**	22.7
	2 – protestant	**456**	57.5
	3 – other or no religion	**157**	19.8
Occupation	1 - don't work	**424**	53.6
	2 – vendor	**213**	26.9
	3 – other	**154**	19.5
Listen to radio or watch TV	1 – everyday	**432**	54.5
	2 – sometimes	**314**	39.6
	3 – never	**44**	5.5

(continue….)

(…continuation)

Reads newspaper	1 – everyday	**57**	7.2
	2 – sometimes	**367**	46.4
	3 – never	**367**	46.4
House construction	1 – definitive materials	**705**	89.1
	2 – precarious	**86**	10.9
Place of residence – urban district (UB)	1 – UB1 & 5	**310**	39.1
	2 – UB2 & 3	**296**	37.3
	3 – UB4	**187**	23.6

AIDS awareness variables

Explanatory variables		**N**	**%**
Do you have any relative, friend, or colleague who have or died with AIDS?	1- yes or has doubts about someone	**299**	38.0
	2 – no	**487**	62.0
A person who looks healthy can be infected with AIDS?	1 – yes	**663**	83.9
	2 – no or don't know	**127**	16.1
Is AIDS a mortal illness?	1 – Never or sometimes	**256**	32.5
	2 – always	**461**	58.6
	3 – don't know	**70**	8.9
If you have a sexual relation with someone who has AIDS, even if he doesn't appear ill, you will be infected?	1 – never or sometimes	**256**	32.5
	2 – always	**461**	58.6
	3 – don't know	**70**	8.9
Do you think that the possibility that you are infected or will be infected with AIDS are high, moderate or none (or already are)?	1 - minimal	**184**	23.2
	2 – moderate	**159**	20.1
	3 – great	**297**	37.5
	4 – don't know	**151**	19.1