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Family matters: The impact of kin on the mortality of the elderly in rural Bangladesh

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Abstract. This study uses high quality longitudinal data on kin availability, proximity, and marital status from the Matlab surveillance area in rural Bangladesh to explore the impact of kin members on the survival of the elderly over a six year period. The results – from discrete time hazard models- suggest that the presence of a spouse, sons, and brothers substantially improves survivorship, but with differing effects by the sex of the elderly and the number of sons and brothers. This study offers little support of any of the following as mechanisms by which kin affect the survival of the elderly: changes in the economic status of the elderly as proxied by land holdings; improved access to instrumental support as proxied by the marital status of sons; decreases in social isolation as proxied by proximity of kin.

INTRODUCTION

Bangladesh, like most of the developing world, has not paid much attention to its elderly largely because there has been and continues to be a tacit assumption that they will be taken care of by the family (Martin 1990). Owing to inadequate institutional sources of support (pensions, insurance, credit markets), either through the government or the private sector, the elderly in Bangladesh are for the most part completely dependent on primary kin (spouses, adult children and siblings) for aid. Moreover there is some evidence from small cross-sectional studies that elderly women without sons may be particularly vulnerable (Cain 1985, 1986). This dependence on kin and particularly sons for old age security may turn out to be an important barrier to further declines in fertility in a region that has experienced relatively sharp fertility declines in recent years (Cain 1984, 1985; Nugent 1985). As Bangladesh plans for the future (one in which those aged 65 and above are projected to triple between 1990 and 2025), much more information than is currently available is needed to evaluate the importance to the elderly of family members and the consequences of a lack of them.

In this paper I use data from rural Bangladesh to examine the consequences of differences in kin networks for the mortality of the elderly. This study is distinctive in a number of important ways: First, it uses longitudinal data of high quality which tracks changes in kin networks over time to explore the impact of kin on the survival of the elderly. Previous work has been largely cross-sectional in nature, using relatively small samples, which makes it difficult to establish cause and effect (Cain 1984; 1985; Vlassoff 1990). Secondly, this study, unlike previous work that focuses on spouses and sons (Cain 1985; 1986; Rahman, Menken and Foster 1992; Rahman 1997) explores directly the impact of other kin (daughters and brothers) on the survival of the elderly. Thirdly, this study investigates the impact of both co-resident and non-coresident kin, while other research has focused on co-resident kin (Rahman, Menken and Foster 1992; Rahman 1997). Finally, because this study examines the differing impacts of kin characteristics such as marital status on the survival of the elderly, we can explore possible mechanisms by which kin have their impact.

DATA AND METHODS

Study population

The data used in this study come from the Matlab Surveillance System in rural Bangladesh, operated under the aegis of the International Centre for Diarrhoeal Disease Research, Bangladesh. This surveillance system has maintained a continuous register of all vital events (births, marriages, migrations, and deaths) for a defined population of 40,000 households and approximately 200,000 individuals in the Matlab sub-province, about 40 miles south east of the capital city of Dhaka, for the last two decades. In addition to the continuous register, censuses were held in 1974 and 1982 to assess a variety of socio-demographic variables, including age, disability, and marital status. The surveillance population is considered to be typical of rural Bangladesh. A more detailed description of the surveillance system can be found in Shah and Koenig (1988) and Menken and Phillips (1990).

This analysis uses a data file (subsetted from the regular surveillance and census data) consisting of information on the six-year mortality experience of a random sample of approximately 10 per cent of individuals aged 60 years and above in the Matlab surveillance population on 15 June, 1982.

In August 1991, a random sample of 609 women and a separate random sample of 620 men both aged 60 years and above on 15 June, 1982, were chosen from the 1982 Matlab census frame. For each of these selected elderly individuals, in addition to age, disability status, and marital status recorded in the 1982 census, exact dates of death and migration from the Matlab surveillance area were abstracted from the prospective vital events register in the Matlab computerized database.

Teams of interviewers were sent to each of these identified elderly individuals in August 1991, and retrospective information was collected on various characteristics of them and their kin for each year of a six-year period from 15 June, 1982 to 14 June, 1988. The retrospective information included:

(i) marital status of the selected elderly individual for each year of the follow-up.
(ii) survival status, marital status, and proximity to the elderly individual of each son, daughter and brother for each year of the follow-up.
(iii) land owned by the elderly individual for each year of the follow-up.

For those of the elderly who were alive, interviewers recorded information directly about changes in marital status, changes in land owned, and changes in the availability, marital status, and proximity of kin during the follow up period. For those of the elderly who had died or migrated from the surveillance area before August 1991, the relevant information was obtained from remaining family members (spouses, children, or siblings).

Of the 609 selected elderly women, information was obtained on 588 women (96.55 per cent). Of the 620 selected elderly men, information was obtained on 573 men (92.42 per cent). Thus data on a total of 1161 elderly individuals out of the initially selected sample of 1229 were eventually analyzed.

Statistical methods

Discrete time hazard models with a one-year spell duration were used to analyze the mortality experience of 1161 elderly individuals followed from 15 June, 1982 to 14 June, 1988. All 1161 were alive at the beginning of the follow-up period and there was no censoring due to out-migration because all relevant information (e.g. survival status, kin availability) was collected for those who had migrated out of the surveillance area. Using standard procedures for discrete time hazard models, if someone died within a one-year spell, exposure for the whole year was assumed. Similarly, changes in marital status of the elderly, and survival status and proximity of kin were assumed to have taken place at the end of the one-year spell (Allison 1982).

The final step in the estimation procedure was to pool all the observations for each individual and calculate maximum likelihood estimates of the logistic regression model:

$$\log (P/(1-P)) = \text{constant} + B_1{*}X_1 + B_2{*}X_2 + B_3{*}X_3 + \ldots B_k{*}X_k$$

In the above model the log odds of dying for an elderly individual in a given year of exposure is modelled as a function of the various characteristics of elderly and kin. In the case of categorical variables, the exponent of each coefficient [exp (B_k)] is interpreted as the odds of dying with and without that characteristic X_k. In the case of continuous variables, the exponent of each coefficient [exp (B_k)] is interpreted as the increase in the odds of dying due to a one unit change in the variable X_k.

RESULTS

Table 1 describes the socio-demographic characteristics of the study population stratified by sex and marital status. A number of points are worth noting. First, ages of the elderly are abstracted from the census record of 1982, and then adjusted for each year of follow-up. Owing to the two-decade long continuous surveillance of this study population, with ages first being recorded in 1974 or at first entry into the surveillance area, recorded ages are thought to be very accurate (Shah and Koenig 1988). Second, with respect to proximity of kin, we include within the category 'at home', both kin living in the same household and those living in adjacent households in the family compound (known as the bari). Third, as there are very few divorced and never married elderly, the non-married category comprises primarily widowed individuals. Fourth, disabled refers to gross physical and or mental handicap measured at the beginning of follow-up for the 1982 census record. Fifth, apart from disability status, all other characteristics (marital status, presence and proximity of kin, economic status) are tracked in yearly intervals. Thus the figures in Table 1 refer to the proportion

Table 1. *Socio demographic characteristics of the elderly aged 60 years and above in rural Bangladesh by sex and marital status*

Category	Married (%) (*N*=546 pyrs)	Non-married (%) (*N*=2471 pyrs)	Total (%) (*N*=3017 pyrs)	Marital status differences
Women				
Spouse alive	na	na	18	na
>=1 son alive	89	84	84	*
>=1 daughter alive	84	81	81	
>=1 brother alive	48	37	39	*
>=1 son at home	84	77	78	*
>=1 daughter at home	13	18	17	*
>=1 brother at home	3	3	3	
>=50 decimals of land	9	14	13	*
Death rate				6.33 deaths per 100 pyrs
Age<=70 years				50%
Disabled				6.63%
Men	(*N*=2590 pyrs)	(*N*=320 pyrs)		(*N*=2910 pyrs)
Spouse alive	na	na	89	na
>=1 son alive	95	93	95	
>=1 daughter alive	90	84	90	*
>=1 brother alive	51	46	50	
>=1 son at home	89	88	89	
>=1 daughter at home	41	22	39	*
>=1 brother at home	37	37	37	
>=50 decimals of land	68	58	67	*
Death rate				6.53 deaths per 100 pyrs
Age<=70 years				47%
Disabled				5.52%

Notes: (i) *pyrs:* person years of exposure; (ii) *na:* not applicable; (iii) *at home:* this category actually encompasses kin living in the same household or in adjacent households in the family compound; (iv) *Disabled*: the presence of gross physical or mental handicap at the beginning of the follow up period; (v) *decimals of land:* 100 decimals equal an acre; (vi) *Testing for differences:* Note: *=*p*value<0.05 – there were statistically significant differences between men and women for each of the categories above except for the death rate and the proportion disabled.

of time that elderly respondents have that characteristic during the follow-up period.

Tables 2 and 3 present results from a set of logistic regressions in which the log odds of dying, for an elderly individual for a given one-year duration in the follow-up period June 1982-June 1988, is modeled as a function of various predictors (a mix of characteristics of the elderly and their kin).

Different (but parallel) models are presented for elderly men and elderly women. There are three reasons for treating the mortality experience of the men and women separately. First, the sample for follow-up was drawn independently for each sex. Second, there was differential attrition by sex. Finally, there is good reason to suppose that the determinants of mortality for elderly men and women are somewhat different.

The results of this analysis (Table 2) show that the presence of a spouse substantially reduces mortality for elderly men (O.R.=0.57; 95 per cent C.I.=[0.38–0.85]), but has a statistically insignificant impact on elderly women (O.R.=0.79; 95 per cent C.I.=[0.50–1.25]). Surviving sons on the other hand significantly reduce mortality for both elderly men and women, but with the beneficial impact becoming significant only when there are two or more surviving sons (males O.R.= 0.42; 95 per cent C.I.= [0.24–0.73]; females O.R.= 0.60; 95 per cent C.I.= [0.40–0.88]). Moreover, there is no additional benefit from having more than two sons. Models were tested with different groupings of surviving sons: one son, two sons, three sons, etc. No statistically significant difference exists between two sons and three or more sons (results not shown).

Once one controls for the total number of surviving sons, neither the proximity (model 1 of Table 3), nor the marital status of the sons (model 2 of Table 3) has a statistically significant effect on mortality of the elderly. The results also show that sons are equally important for both married and non-currently married women – (interactions between marital status and number of living sons are not significant – model 3 of Table 3 for females). Finally, interactions between wealth status (as

Table 2. *Odds ratios of mortality for the elderly in rural Bangladesh controlling for numbers of kin and land owned*

Variable	Women		Men	
	Odds Ratio	95% C.I.	Odds Ratio	95% C.I.
Age in years	1.05	(1.03—1.07)*	1.06	(1.04—1.09)*
Presence of spouse	0.79	(0.50—1.25)	0.57	(0.38—0.85)*
Disabled	3.86	(2.59—5.75)*	3.84	(2.52—5.84)*
One living son	0.79	(0.51—1.21)	0.57	(0.29—1.09)
>=2 living sons	0.60	(0.40—0.88)*	0.42	(0.24—0.73)*
One living brother	0.74	(0.50—1.10)	1.12	(0.78—1.61)
>=2 living brothers	0.50	(0.29—0.86)*	0.68	(0.42—1.10)
One living daughter	0.72	(0.47—1.10)	1.30	(0.73—2.32)
>=2 living daughters	0.81	(0.56—1.18)	1.37	(0.81—2.30)
>=50 decimal of land	0.69	(0.43—1.12)	0.91	(0.66—1.25)

Notes: All the above variables are time-varying throughout the period of follow-up except for disability status which is measured only at the beginning of follow-up. Disabled: presence of gross physical/mental handicap. Land: 100 decimals equals one acre. *= p<0.05.

Table 3. *Odds ratios of mortality for the elderly controlling for proximity and marital status*

Variable	Baseline Odds ratio	Model 1 Odds ratio	Model 2 Odds ratio	Model 3 Odds ratio
Women				
Age in years	1.05*	1.05*	1.05*	1.05*
Spouse present	0.87	0.88	0.86	1.00
Disabled	3.65*	3.63*	3.72*	3.63*
No. living sons	0.86*	0.86*	0.90	0.87*
No. living brothers	0.77*	0.77*	0.76*	0.77*
>=1 son at home		1.04		
>=1 brother at home		0.98		
>=1 married son			0.80	
Spouse * No. living sons				0.94
-2Log likelihood	1341.26	1341.22	1340.44	1341.06
No. of parameters	5	7	6	6
Men				
Age in years	1.06*	1.06*	1.06*	
Presence of spouse	0.58*	0.58*	0.57*	
Disabled	3.95*	4.03*	3.94*	
No. living sons	0.86*	0.90	0.88*	
No. living brothers	0.93	0.83	0.93	
>=1 son at home		0.71		
>=1 brother at home		1.39		
>=1 married son			0.83	
-2 Log likelihood	1283.64	1279.46	1283.00	
No. of parameters	5	7	6	

Notes: *= p<0.05. Spouse * no. living sons = interaction between spouse and number of living sons. Each of the models (1,2,3) above are separate regressions which should be compared individually to the baseline regression. Each model tests whether the addition of controls for specific characteristics (e.g. proximity, marital status of sons, interaction between spouse and no. sons) adds any explanatory power to the baseline regression.

proxied by owning land >=50 decimals) and number of sons were tested and found to be non-significant, suggesting that sons are equally beneficial to both the rich and the poor elderly (results not shown).

With regard to daughters, the results show that daughters, regardless of their number, do not have any impact on the survival of their parents (Table 2). The effect of daughters on the survival of the elderly for those without any sons was also investigated and found to be non-significant (results not shown). Furthermore, no differential impact was found by proximity of daughters (results not shown). In addition, daughters were found to be no more useful for married than for non-married elderly (results not shown).

Surviving brothers reduce mortality for elderly women but have a non-significant impact on elderly men's mortality. Furthermore (see Table 2) one needs at least two brothers to reduce significantly mortality for elderly women – (females O.R.= 0.50; 95 per cent C.I.= [0.29–0.86]). No differential impact was found by proximity of the brothers – (model 1 of Table 3). In addition, brothers were found to be equally important for both married and non-married elderly women (results not shown).

DISCUSSION

This study describes a social setting where certain types of kin (spouses, sons, and brothers) have a major impact on the mortality of the elderly, with differences in impact by their sex, and their number of surviving sons and brothers. Furthermore the impact of sons and brothers on the mortality of the elderly appears to be independent of the proximity and marital status of these kin. I review below, for each type of kin member, possible explanations for these strong effects on mortality.

The impact of spouses on mortality

For elderly women aged 60 years and over in rural Bangladesh, husbands do not have any statistically significant impact on mortality. Conventionally husbands have been thought to enhance the survival of women through improvements in social standing or in economic status or in both (Ellickson 1980; Cain 1984; 1985; 1986). While it is true that, for younger women in the setting of rural Bangladesh, having a husband is a marker of higher social status (Bertocci 1970; Ellickson 1988), the beneficial impact of enhanced social status due to having been married may be less important for elderly women as the majority of them have been widowed. Furthermore, given that the husbands of elderly women are on average ten years older than their wives, even surviving husbands' ability to contribute to the economic welfare of the household and care-taking responsibilities is significantly constrained.

In stepwise sequential logistic regression models (results not shown), the beneficial impact of husbands for elderly women in this study population (never statistically significant) is ssubstantially reduced once one controls for the number of surviving sons. This may be due to the fact that sons are providing partial substitutes for the economic role of husbands, thus controlling for sons is analogous to controlling for economic status. This is in keeping with evidence from developed countries which suggests that once one controls for income, husbands do not have any impact on their wives' mortality (Trovato and Lauris 1989; Korenman, Hu and Goldman 1990; Lillard and Waite 1993).

With regard to the decreased mortality of elderly men with spouses present, a plausible explanation consistent with the results is that elderly married men may to some extent be selected into the married state because of better health (Goldman 1993). This hypothesis is consistent with the low proportions of elderly men who are not married, and evidence from other studies in the Matlab study population which show high rates of remarriage for elderly men, and a higher incidence of disability (gross physical handicap) among non-currently married than among currently married elderly men (Rahman 1990; 1997). In stepwise sequential logistic regression models (results not shown), introducing controls for disability status (at the beginning of follow-up) does in fact attenuate somewhat the coefficient for wives, suggesting that some of the beneficial impact of wives on husband's survival is indeed due to the higher probability of non-disabled men being currently married. However, adjusting for disability status still leaves us with a significant residual beneficial impact of wives on husband's survival.

Controlling for disability status, a plausible hypothesis for the significant residual beneficial impact of spouses on elderly men's survival in rural Bangladesh is that presence of spouse may be related to decreases in social isolation, better nutrition, less risk taking etc. Studies in the developed world have suggested that non-married men may have higher mortality risks owing to increased social isolation (Berkman and Syme 1979; Bowling 1987) or lack of home management skills (Umberson, Wortman, and Kessler 1992). I conducted a pilot study of 200 elderly men and women in the same study population in 1991 and found that elderly men aged 60 and over consider wives as the primary source of instrumental help and care-taking both on a regular basis and during illness. The results of that pilot study appear to be consistent with the findings of the beneficial impact of wives on husband's survival shown in this analysis.

The impact of surviving sons on the mortality of the elderly

An important contribution of this paper is that it demonstrates quite conclusively that sons have a substantial impact on reducing mortality for both elderly men and elderly women. Both the married and the non-married elderly benefit equally in terms of improved survival from having sons (results shown for females only). Furthermore, the results indicate that the beneficial impact of sons on the survival of the elderly becomes significant once they have at least two surviving sons; there appears to be little additional benefit from having more than two. The mechanisms by which sons improve parental survival remain, however, unclear. This study investigated three potential mechanisms: (i) improvements in economic status of the elderly as proxied by land holdings; (ii) improved access to instrumental support (day-to-day care) by the elderly, as proxied by the marital status of sons and (iii) decreased social isolation for the elderly, as proxied by the proximity of sons. Little support was found for any of the three mechanisms.

Earlier research had suggested that in rural Bangladesh elderly women and especially widowed or divorced women might be particularly vulnerable to the lack of sons and might dis-proportionately suffer the consequences of 'reproductive failure' (Cain 1986). These results suggest that elderly men are no less vulnerable than women to the lack of sons in this social setting.

There appear to be important threshold effects with regard to the number of sons required to improve parental survival. The fact that the elderly with at least two sons are better off than those with one or no sons may reflect the advantage of a diversification of risk strategy, of a sort of hedging of bets. (For example, just one son may be unreliable or may have a low income.) Having two, on the other hand, increases the options for the elderly and may improve bargaining power. Having more than two sons may not necessarily improve parental survival owing to quantity-quality trade-offs, since the elderly with larger numbers of sons may on average have 'poorer' sons.

With regard to the mechanism by which sons may improve parental survival, economic theory suggests than sons may improve parental economic status, which in turn may lead to such advantages as improved access to health care services and better nutrition. A corollary of this hypothesis is that the rich elderly may need sons less than the poor elderly. This hypothesis and its corollary was explored by examining data on land owned by the elderly. The premise was that increased income from sons would be reflected in increased land ownership. However, differences in land ownership did not account for the beneficial impact of sons. Moreover no significant interactions were found between land owned and number of surviving sons.

These results suggest that the beneficial impact of sons on parental survival is not mediated through improvements in elderly economic status as proxied by ownership of land, and moreover that the rich elderly need sons just as much as their poor peers. However, some caution should be used in interpreting these results. Land owned by the elderly represents relatively long-term cumulative investments which may be only weakly related to changes in number of sons and changes in mortality. Measures which reflect short-term household resource variation, such as the value of weekly household consumption, may be more strongly correlated with numbers of sons and the mortality risks of the elderly. Unfortunately the data needed to test this possibility were not available.

Aside from changes in economic status, social integration theory (Kobrin and Hendershot 1977) would suggest that improved social status for the elderly in rural Bangladesh (in this case associated with having at least two surviving sons) leads to improved survival prospects through decreased social isolation, improved instrumental support, increased stress buffering, better information networks, better access to health care, and healthier habits (Cassel 1976; Pearlin and Johnson 1977; Berkman and Syme 1979; Umberson 1987).

In the absence of direct measures of these characteristics, this study investigated proximity of sons as a proxy measure. The premise was that the elderly with sons living nearby would do better in terms of survival than their peers with sons living further away. The results, however, show that controlling for the number of surviving sons, those with no sons living very near - in the same household or bari (family compound) - are no worse off than their peers having at least one son living nearby. Superficially this suggests that the beneficial impact of sons on parental survival is not dependent on proximity, but this result too needs to be interpreted with caution. In this study population, during the six year follow-up among the elderly who had at least one surviving son, elderly women had no sons living in the household/bari only 7.87 per cent of the time (201 person years/2553 person years) and elderly men only 6.27 per cent of the time (174 person years/2600 person years). Thus it is a highly uncommon living arrangement. It is therefore possible that this living arrangement occurs only when the elderly are in better health and sons feel confident about leaving their parents alone. Although this potential selection effect was controlled by adjusting for the disability status of the elderly, it is possible that finer measures of poor health may be needed to reveal the effect.

Another possibility is that the elderly with all sons living further away may benefit from increased remittances because income-earning opportunities in distant urban areas may be higher than in rural areas (a not implausible scenario for the essentially stagnant rural economy of Bangladesh). This increased remittance (not captured by land holdings) may more than compensate for the psychological and social disadvantages of not having at least one son living nearby.

Yet another possibility arises from the finding of current survey work (Aziz 1979, personal communication 1996) that some proportion of the elderly in rural Bangladesh who do not have any sons themselves living nearby (i.e. in the household or bari) may still have the families (spouse and children) of those sons living nearby. Thus these elderly may in fact be enjoying the benefits of increased remittances from sons living further away, and the advantages of compliant daughters-in-law to provide day to day care (instrumental support) and grandchildren whom they can indulge (Islam 1974; Ellickson 1988).

In the absence of direct measures of receipt of instrumental support, this study compared the impact of married sons and non-married sons on the survival of the elderly. The premise was that the elderly with married sons – particularly women – would enjoy a higher level of instrumental support than the elderly without married sons. The results show however that, controlling for the number of surviving sons, having no married sons does not put an elderly man or woman into any significant survival disadvantage relative to those with some married sons.

The impact of surviving daughters on the mortality of the elderly

This study suggests that daughters have no significant impact on the mortality of their elderly parents. This is true even for those parents who have no surviving sons (results not shown). These findings are in keeping with the fact that, in rural Bangladesh, daughters are considered part of their husband's family and, owing to the norms of early marriage (singulate mean age of marriage for females is 15.9 (Rahim 1988) and of village exogamy, are usually living far away from their natal family by the time the parents reach age 60 years (Islam 1974; Aziz, 1979). The lack of earning power of women in this society also makes it difficult for distant daughters to contribute to their parents' welfare.

The impact of surviving brothers on the mortality of the elderly

A very interesting result of the study is that elderly women with two or more surviving brothers have better survival prospects than their peers with fewer brothers, but the beneficial impact of brothers on survival does not hold true for men. One hypothesis that can be proffered to explain this result is that the survival of siblings may be correlated, that is, there may be family-specific factors (genetic or environmental) that may make all children of some parents more likely to survive than children in other families. However the finding that brothers appear to be more important for elderly women than for elderly men suggests that there is more to this issue. Another possibility is that brothers may provide crucial economic support, a proposition supported by various pieces of evidence. Anthropological work in rural Bangladesh has revealed a strong norm of brothers helping sisters in need, a norm related to the fact that sisters do not take their share of the land inherited from their parents but forgo it in favour of their brothers. Thus elderly women with multiple surviving brothers may be better off than their peers with none (McCarthy 1967; Islam 1974; Aziz 1979).

For elderly men the value of brothers is more ambiguous. The predominant mode of social organization in rural Bangladesh is the bari which is a cluster of households linked in a patriarchal fashion (patriarch and his brothers and sons) around a common compound with a significant amount of joint economic decision-making (Islam 1974; Aziz 1979). This study shows that 40 per cent of elderly males have a brother living adjacent to them in the bari. There is little empirical evidence, however, of how much brothers help each other. The few data there are suggests a complex reality, where brothers are both the primary source of financial credit in times of economic distress and also the primary beneficiaries of distress sales of land (Islam 1974; Aziz 1979; Jansen 1990). On balance the analysis suggests that the survival prospects of elderly men, unlike those of elderly women, are not improved by having more brothers.

As in the case of sons, I investigated the beneficial impact of brothers on survival of the elderly by examining associated changes in their land ownership. Controlling for land owned by the elderly did not, however, account for the impact of brothers on survival. Once again this may reflect the inadequacy of land as a measure of financial support.

Finally, one methodological issue which has some bearing on the results of this study needs to be addressed. This study is able to examine only those individuals who survived to participate in it. Thus if there was differential mortality selection by marital status and kin availability at younger ages, it would affect the results for those aged 60 years and above. For example, if younger non-married (i.e. widowed/ divorced/ never-married) women were to have higher mortality rates than their married peers, the sample of non-married women surviving to age 60 and thus being included in our study would over-represent robust, non-married women in good health (Goldman, Korenman and Weinstein, 1995). This would lead to an attenuation of the survival advantage of married women aged 60 and above over their non-married peers. The same argument can be generalized to elderly men and to other kin availability and proximity categories. The key issue here is that the bias will be greatest for individuals at older ages, in settings when differential mortality rates by kin characteristic are large and when overall mortality rates are high (Rahman, Strauss, Gerter and Fox 1994). To the extent that having surviving kin and having them live nearby confers a significant survival advantage on younger individuals in rural Bangladesh, mortality selection may cause the results of this study to underestimate the advantage of kin and their proximity to the elderly aged 60 years and above.

CONCLUSION

In conclusion, this study shows primary kin play an important and complex role in determining the survival of the elderly in rural Bangladesh. These results have two important implications. First, they allow us to identify particularly vulnerable groups in this society who are at high risk for mortality, such as elderly men without spouses and without sons, and elderly women without sons and brothers. These disadvantaged groups can benefit from institutional (non-family) support services such as access to credit, and access to health care services. Second, the finding that sons substantially improve the survival prospects of both elderly men and elderly women in rural Bangladesh, and that daughters have little impact, suggests that, in the absence of family support, a concern for security in old age will continue to lead to strong son preference. Furthermore the finding that at least two sons are necessary for a measurable impact on the survival of the elderly does not bode well for a continuation of the rapid fertility decline that Bangladesh has experienced in recent years.

In order to allay the old age security concerns which may form a barrier to fertility decline, much more attention needs to be directed towards understanding the precise mechanisms by which various kin members affect the survival of the elderly. No single mechanism can satisfactorily explain the impact of kin. This study provides little support for any of the following as possible mechanisms: changes in economic status as proxied by land holdings, improved access to instrumental support, as proxied by the marital status of sons, and to decreases in social isolation as proxied by proximity of kin. Further insight into the mechanisms of kin impact will require more detailed information about the initial morbidity status of the elderly and finer measures of support provided by kin.

NOTES

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