Son Preference, Parity Progression and Contraceptive Use in South Asia

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Abstract

Background: The desire for sons has long been recognised as a significant determinant of childbearing decisions throughout most of South Asia. This paper provides an overview of the stated desire for sons and the manifestations of son-preferring behaviour in relation to parity progression and contraceptive use.

Methods: This paper uses the most recently available Demographic and Health Survey (or equivalent) data from five South Asian countries: Afghanistan, Bangladesh, India, Nepal and Pakistan. The extent of son preference in these countries is compared in terms of reported latent son preference as well as in terms of revealed son preference in relation to differential stopping behaviour, and choices about contraceptive use and contraceptive method.

Results: Parity progression is driven by son preference to some extent in all five countries studied. It is found that son preference is also a major factor in determining use of permanent contraceptive methods in every country apart from Afghanistan. The association is particularly strong in Nepal, India and Pakistan. Women with fewer than two sons are generally much less likely to use permanent contraceptive methods. On the other hand, son preference has little association with temporary or traditional contraceptive use in any country.

Conclusion: The desire for sons has a significant impact on fertility and contraceptive choices across much of South Asia, even in places where high fertility persists. Family planning programmes in these areas need to change deeply embedded attitudes in order to be successful. In Pakistan and Afghanistan in particular, future reductions in fertility could be hindered by high levels of son preference.

Keywords: son preference, fertility, contraceptive use, South Asia

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1. Background

Preference for sons is deeply rooted in South Asian culture, which is inherently patriarchal in its nature (Das Gupta and Bhat, 1997; Bhat and Zavier, 2003; Guilmoto, 2009; Basu and De Jong, 2010). Sons are valued over daughters for their ability to provide financial assistance, the fact that they can attract a dowry and a daughter-in-law, and the fact that sons will not join their spouse's family once they marry (Arnold, 2001; Das Gupta, Zhenghua et al., 2003). Previous research has found evidence for varying degrees of son preference in most countries of South Asia including Bangladesh, India, Nepal, Pakistan and Sri Lanka (e.g. Hussain, Fikree et al. 2000; Arnold, 2001; Leone, Matthews et al., 2003; Dahal, Padmadas et al., 2008; Jayaraman, Mishra et al., 2009).

The imperative to bear sons has a variety of negative social, health and demographic consequences. Son preference manifests itself in a variety of ways including differential stopping behaviour and sex-selective abortion. In high fertility contexts the main manifestation of son preference will be discrimination during the postnatal period. For example in India, differential feeding practices have been found, where boys are fed better and breastfed more than girls, leading to a higher mortality rate amongst young girls (Jayachandran and Kuziemko, 2009; Fledderjohann, Agrawal et al., 2014). In some cases female infanticide has also been used, though this is the extreme end of the continuum (Miller,

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1984; Miller, 1987; Sudha and Rajan, 1999). As fertility decreases and childbearing decisions are made more consciously, differential stopping behaviours become more prevalent. The potential culmination of this is sex-selective abortion which is currently seen in India and Nepal (Jha, Kesler et al., 2011; Frost, Puri et al., 2013), while current evidence suggests the practice is not common in Bangladesh (Kabeer, Huq et al., 2014), and the evidence on Afghanistan and Pakistan is scarce. As fertility falls, the need to bear a son at a lower parity increases, meaning that the manifest practices of son preference may tend to increase, and occur in parallel. This intensification effect has been found in India, China and South Korea (Das Gupta and Bhat, 1997).

Differential stopping behaviour has consequences which may not be immediately obvious; if it is widely practised within a population then, while the overall sex ratio at birth will not be affected, female children will be disadvantaged. Boys will tend to grow up in smaller families with fewer siblings, while girls will have more siblings and be more likely to be born at an earlier parity (Basu and De Jong, 2010). This means that girls will be more likely to be engaged in tasks of providing care for younger siblings. They will also tend to receive fewer resources in terms of health and education (Kingdon, 2002; Pande, 2003).

Contraceptive use and method mix is also likely to be affected by son preference. In the absence of son preference, contraceptive use and choice of a specific contraceptive method will not vary depending on the sex composition of previous children. In a context with high son preference, it has previously been shown that contraceptive use is higher after the birth of sons than daughters (Arnold, 1997; Jayaraman, Mishra et al., 2009). The effectiveness of family planning programmes may, therefore, be dependent upon the reduction of son preference. In the event that childbearing continues until a desired or target number of sons is reached, the result will be lower contraceptive prevalence, higher fertility (in the absence of prenatal sex selection), and girls living in larger households than boys (Basu and De Jong, 2010).

While there are both quantitative and qualitative studies looking at son preference in India, Bangladesh and Nepal (e.g. Dahal, Padmadas et al., 2008; Brunson, 2010; Kabeer, Huq et al., 2014), recent research on son preference in Afghanistan and Pakistan is notably lacking. Given that Bongaarts (2013) found reported preference for sons to be higher in Pakistan than in virtually any other country, the inclusion of this country is important. The lack of research in Afghanistan is due to the lack of data, though a cultural preference for sons has been documented (Sato, 2007).

2. Current Study

This paper seeks to provide up-to-date, comparative, quantitative evidence on the nature and extent of son preference in every South Asian country with available data. It begins by documenting reported levels of son preference in South Asia. It then considers the extent to which stated son preference matches with actual childbearing and contraceptive decisions.

Within the five study countries, three (Bangladesh, India, and Nepal) have relatively low fertility, while two (Pakistan and Afghanistan) have higher fertility – see Table 1. Afghanistan has notably higher fertility, with a TFR (Total Fertility Rate) of 5.1, and lower contraceptive prevalence with a CPR (Contraceptive Prevalence Rate) of 21.8, than any of the other countries. It is included here mainly to give an indication of whether son preference may have a part to play in future attempts to increase use of contraceptives and bring the fertility rate down. Afghanistan also stands out because of its low level of women's education, with nearly 90% of women reporting having no education. In contrast, women in Bangladesh reported a particularly high level of education for the region, with 40% being educated at secondary level or above. In India and Nepal around 50% of women had no education, while in Pakistan nearly 60% had no education. All five countries were predominantly rural, with Nepal and Afghanistan being the most rural (over 80% living in rural areas) and Pakistan the least rural (around 66% rural).

3. Data and Methods

Demographic and Health Surveys (DHSs) have been carried out in seven of the eight countries in South Asia, with Bhutan being the exception. However, the latest available data for Sri Lanka is from 1987 so it has been excluded from this study. The only currently available data from Afghanistan is a Mortality Survey, which lacks some of the questions of interest for this analysis. For this reason some of the analyses presented do not include Afghanistan, though every effort was made to incorporate it where possible. The data used for each country was the most recent publicly available dataset; these are: Afghanistan 2010, Bangladesh 2011, India

Table 1 Descriptive statistics and percentage distributions of married, non-pregnant, parous women aged 15-49 in five South Asian countries

	Afghanistan	Bangladesh	India	Nepal	Pakistan
N parous women	23,448	16,025	84,609	8,800	11,965
N >=35 and parous	9,484	6,168	37,441	3,656	5,564
TFR[1]	5.1	2.3	2.7	2.6	3.8
CPR[1]	21.8	61.2	56.3	49.7	35.4
CPR (modern method)[1]	19.9	52.1	48.5	43.2	26.1
Women's Education[2]					
None	89	29	49	51	59
Primary	5	31	15	19	16
Secondary or above	5	40	35	29	26
Residence					
Urban	19	26	31	13	34
Rural	81	74	69	87	66

Notes [1] This figure includes women without children, [2] In Afghanistan there are another 1% of women who reported that they had attended a madrassah.

2005-06, Nepal 2011, and Pakistan 2012-2013. It should be noted that Maldives also had a recent DHS, but when the analyses were run no significant associations were found; therefore it has been excluded from the presented results.

In order to study latent son preference, questions about the ideal number of children were used.[1] Specifically, for those with living children the question was asked "If you could go back to the time you did not have any children and could choose exactly the number of children to have in your whole life, how many would that be?", while for those with no living children the question was asked "If you could choose exactly the number of children to have in your whole life, how many would that be?". This was followed by the question: "How many of these children would you like to be boys, how many would you like to be girls, and for how many would it not matter if it's a boy or a girl?" (ICF International, 2011). From these questions a desired sex ratio at birth is calculated. There are, however, potential biases involved in responding to these questions (Bongaarts, 2013). One possible bias is "rationalisation", wherein the reported ideal reflects the number and sex of the children a woman has actually borne. For this reason, an estimate of desired sex ratio at birth was calculated for women with no children. Another possible bias occurs when a respondent is influenced by what they believe the interviewer (or the government, or society at large) thinks they should say. For example, if a woman is aware that sex-selective abortion is illegal then she might say she wants equal numbers of boys and girls even if this is not the case. Both types of bias are likely to result in the desired sex ratio at birth being understated. Nonetheless, the desired sex ratio at birth is likely to give a good indication of the underlying level of son preference in a population.

The sex ratio of the last-born child among women who have stopped childbearing is often used as a good measure of differential stopping behaviour. In the event that son preference drives parity progression, it is more likely that a woman will stop childbearing after she has a son than after she has a daughter. This can be tested by comparing the sex ratio at last birth to the expected ratio of 105 males to 100 females (Waldron, 1983; Garenne, 2002). The sex ratio at last birth is also driven by the level of fertility in a country and access to contraception. The sex ratio at last birth is likely to be more skewed in a context with low fertility, as there is more motivation to stop childbearing at a lower parity. Whether a woman has stopped childbearing or not is determined by whether she wants any more children. If she is sterilised, her partner is sterilised, or she states she wants no more children then it is taken that the woman has stopped childbearing. In Afghanistan this question was not used, so age is taken as a proxy instead. Women aged 35-49 are assumed to have stopped childbearing, which is an approach taken in

1 These questions were not included in the Afghanistan survey.

previous research on India and Korea (Park and Cho, 1995; Chaudhuri, 2012). Women who were pregnant and women with multiple births were excluded from all analyses apart from desired sex ratio at birth.

Multivariate analyses were then conducted. The sample was split by parity and number of sons. Binary logistic regression models were carried out to determine the association between number of sons already borne and likelihood of having another child. A regression model was estimated for each parity, where women who had borne children up to parity x were coded as 0 and women who had borne children of parity >x were coded as 1, while women with fewer than x children were excluded from that regression. For each country a regression model was estimated for parities one through to five, as it was assumed that conscious childbearing decisions were unlikely to be made much above parity 5 (Dahal, Padmadas et al., 2008). Controls were included for wealth, education of the woman, death of a previous child, religion (where relevant), region of residence, and age of the woman. As with the sex ratio at last birth, women were only included in these analyses if they had finished childbearing.

Multinomial logit models were then used to compare use of different categories of contraceptive use (Magadi and Curtis, 2003; Jayaraman, Mishra et al., 2009). There were four different categories of contraceptive method: not using any method, modern temporary, modern permanent, and traditional. As with the parity progression models, the association with the number of sons borne previously was studied separately for different parities. However, in this case parities two and three were combined, as were parities four and five. Parity one was excluded as the numbers using some contraceptive methods were low. In Afghanistan a multinomial model was not used as use of modern permanent methods was low. Instead, a binary logistic regression model was estimated for use of any contraceptive method. Controls were included as described for the parity progression models.

Results are presented as predicted probabilities to allow for ease of comparison. In all cases the predicted probabilities refer to a woman with primary education, in the middle wealth quintile, without the death of a previous child, and in a rural location.

Sampling weights were used throughout and clustering was accounted for.

4. Results

The desired sex ratio at birth was highest in Pakistan and Nepal at 133 overall, and lowest in Bangladesh at 111. In most countries the desired sex ratio at birth was reported as lower than the average by women with no children. If rationalisation bias were at play then this is the opposite of what we would expect, but in every other country women with children report a higher desired sex ratio at birth than women without. One explanation for this is that the strength of son preference is decreasing and childless women (who are generally young) do not have as strong a preference for sons as older women. Another explanation is that women who have still to begin childbearing are not yet being pressured by extended family and friends to bear sons.

4.1. Parity Progression

Sex ratio at last birth reflects the extent to which women choose to stop childbearing based on the sex of their previous child. Figure 2 shows the sex ratio at last birth by parity for all five study countries.[2] The levels of sex ratio at last birth mirror the desired sex ratio at birth in general, with Nepal showing a markedly high sex ratio at last birth for women who stopped childbearing at parities one, two or three. In Pakistan the sex ratio at last birth is elevated for parities two and higher, but not for parity one; this may be due to small numbers of women having a one-child family, but may also indicate that such small families do not occur through choice.

The association between number of sons and probability of parity progression based on logistic regression models is illustrated in figure 3 for all five countries, from parities one to five. For all parities, Nepal stands out as having a particularly strong association between number of sons and progression to the next parity. The predicted probability of a woman with two daughters and no sons progressing from parity two to three is 82%, compared to just 39% for women with two sons and no daughters. For women with three daughters and no sons the predicted probability of progressing from parity three to four is 77%, whereas for women with two or three sons the predicted probability is just over 25%. Generally,

2 Appendix 1 contains regression coefficients for the model of progression from third to fourth parity as an illustration of the full models. All models are available from the author on request.

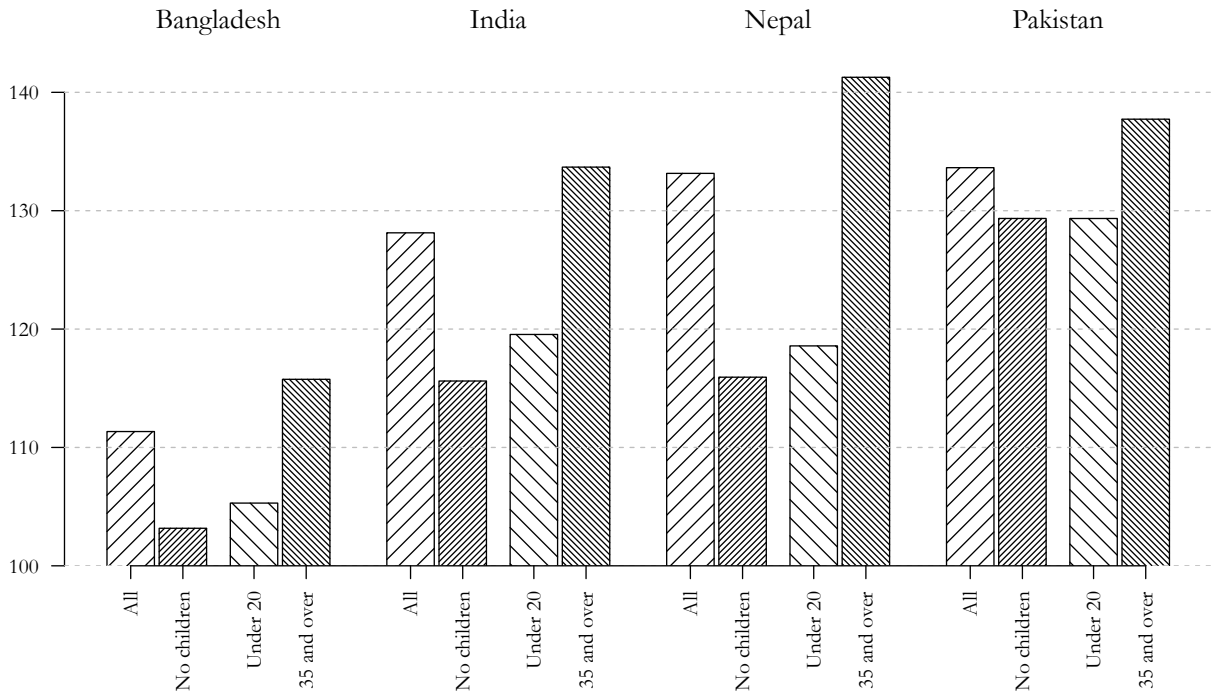

Figure 1 Desired sex ratio at birth in the latest Demographic and Health Survey in four South Asian countries, according to characteristics of the woman

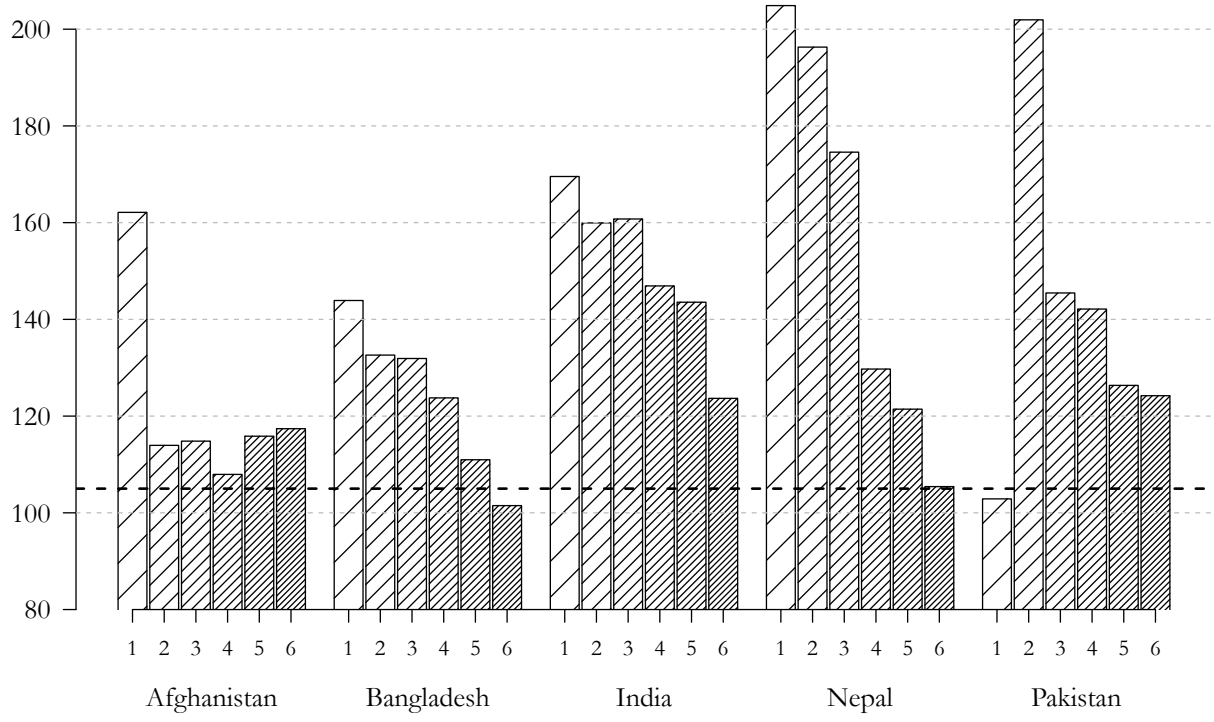

Figure 2 Sex ratio at last birth for women who had stopped childbearing by parity in five South Asian countries

the likelihood of having another child is minimised by having two sons, with extra sons having little significant effect. There is also a strong association in India across all parities, with having two sons again generally minimising the probability of having another child.

In Pakistan there is a significant association between number of sons and parity progression once

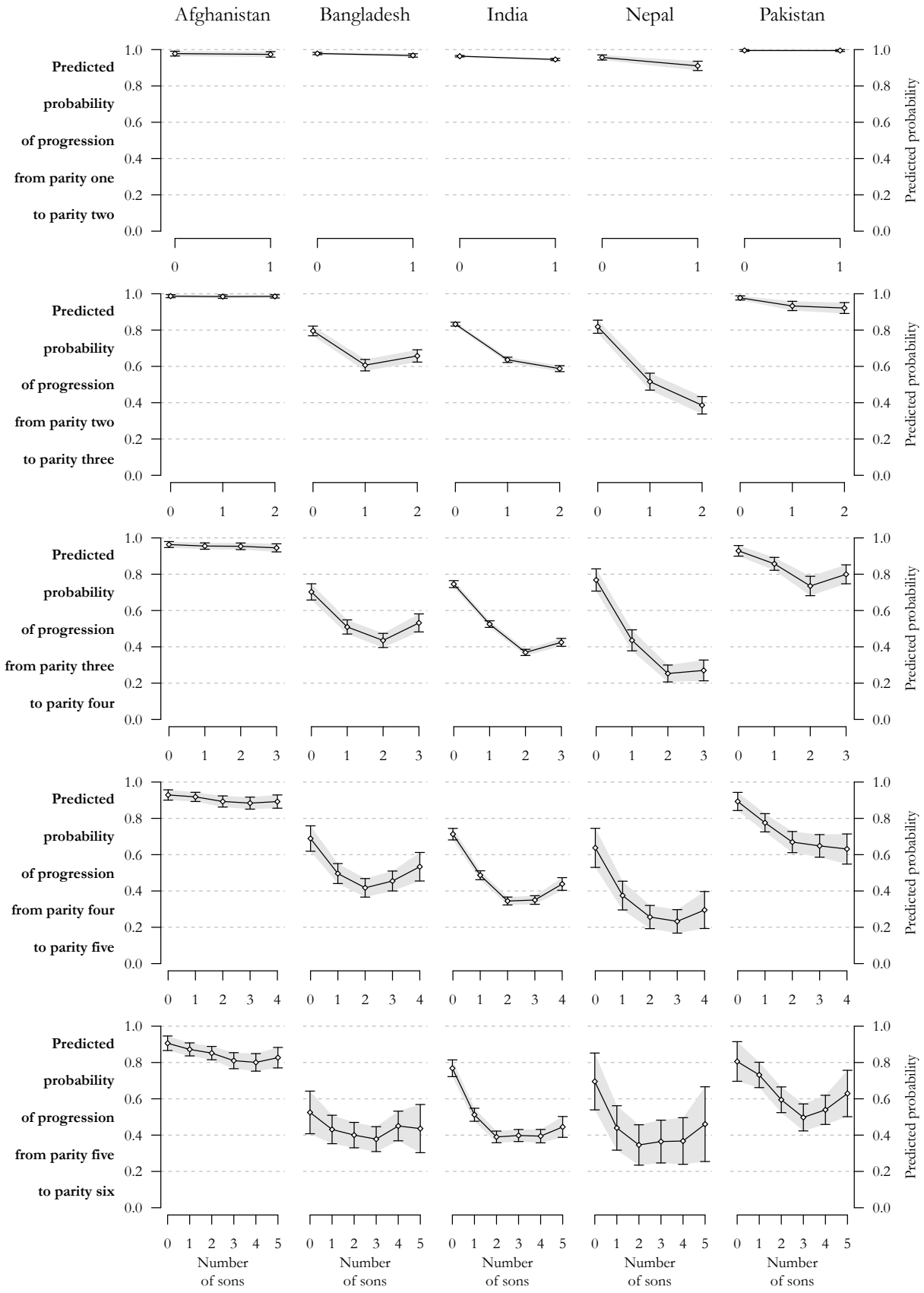

Figure 3 Predicted probabilities (with 95% CI) of parity progression depending on number of sons previously borne for women who had completed childbearing in five South Asian countries

a woman has had at least two children. However, the effect size is relatively small until the woman has had at least three children, which reflects that the TFR in Pakistan is still 3.8. Once again there seems to be a preference for two sons.

The association is delayed even further in Afghanistan, with number of sons only having a significant association with parity progression after a woman has borne three children, though the effect size is small and only significant if the woman has already borne three sons. In every other country studied there seems to be a preference for two sons, but in Afghanistan having more than two sons has an increased effect on the decision to stop childbearing. The preference here seems to be for three sons. It is not clear whether this is a reflection of the higher fertility and mortality levels in Afghanistan, or whether such an effect might continue to be observed if fertility declines.

Bangladesh has the lowest TFR of any of the study countries, but it does not exhibit particularly strong son preference. There is a significant association between number of sons and the decision to have another child after the first, second, third and fourth child, but not after the fifth child. The effect size is smaller in Bangladesh than Nepal or India, and the preference seems to be for at least one son, with a weak preference for two sons if a woman has three or four children.

Generally these results mirror the reported desired sex ratio at birth, which suggests that there is some use in studying the desired sex ratio at birth when trying to determine countries where son preference might have a significant effect on fertility and contraceptive decisions.

Interestingly, the magnitude of the association between number of sons and parity progression was generally larger than for wealth in all countries apart from Afghanistan. In India and Nepal the association between number of sons and parity progression was larger even than for education, except at the lowest parities. This is indicative of just how much son preference in these countries can drive the decision to have another child.

4.2. Contraceptive Use

Overall the level of contraceptive use was highest in Bangladesh, where the CPR was 61.2%, and lowest in Afghanistan, where the CPR was just 21.8%. Table 2 shows contraceptive use by broad method type amongst married, non-pregnant women with at least one child, according to number of sons and parity. Overall, permanent contraceptive methods can be seen to be dominant in India, with 44.6% of parous women using a permanent method. In Bangladesh and Afghanistan the dominant methods were modern temporary. While, in Nepal and Pakistan there was more of a mixture between modern temporary and modern permanent, with traditional method use also relatively high in Pakistan.

Generally, women with fewer children were less likely to be using contraception, and less likely to be using permanent methods of contraception. It was also the case that women with fewer sons were less likely to use contraception and less likely to use a permanent method, though this association was weak in Bangladesh. The strongest associations could be seen in India, Nepal and Pakistan at parities two and above. For example, only 2.8% of women in Nepal with two daughters and no sons were using a permanent contraceptive method, but 35.3% of those with two sons and no daughters were using a permanent method. In Bangladesh the association was not as strong, but those with only sons were still more likely to be using a permanent method than those with only daughters at all parities.

Afghanistan is unusual due to its high fertility and low contraceptive prevalence. However, there is a clear association between number of sons and contraceptive use for women with three children. For women of parity three with no sons only 10.3% were using any modern contraceptive method, whereas for women of parity three with three sons, 22.8% were using a modern contraceptive method. For women with fewer children there is no association, while for women with more children there is some indication that there may be a small association with permanent contraceptive use, but the numbers are small.

Pakistan should also be noted, given its high fertility in comparison to India and Nepal. Here the association with permanent contraceptive use only becomes substantial after parity three. For women with four or more children, only 3.3% were using a permanent method if they had no sons, 8.0% if they had one son and 20.7% if they had four or more sons. By comparison, in India for women with four or more children, contraceptive use (and permanent method use) peaked for women with a more balanced sex composition of children (i.e. those with roughly equal numbers of sons and daughters). This may indicate a difference in the way that son preference manifests itself at different levels of fertility.

Table 2 Percentage distribution of married, non-pregnant women aged 15-49 who were using different contraceptive methods by parity and sex distribution of children

	Afghanistan				**Bangladesh**				**India**				**Nepal**				**Pakistan**			
	None	**Temp**	**Perm**	**Trad**	**None**	**Temp**	**Perm**	**Trad**	**None**	**Temp**	**Perm**	**Trad**	**None**	**Temp**	**Perm**	**Trad**	**None**	**Temp**	**Perm**	**Trad**
N	14,004	4,036	341	947	5,405	7,136	1,011	1,412	30,020	9,336	36,917	6,424	3,764	1,816	2,200	576	5,980	2,116	1,091	1,157
All	72	21	2	5	36	48	7	9	36	11	45	8	45	22	26	7	58	21	11	11
Parity 1																				
0 sons	84	11	0	6	42	51	1	6	67	18	3	12	66	22	1	11	81	11	0	9
1 son	82	11	0	6	41	52	1	6	62	20	5	12	65	26	1	8	75	15	0	10
Parity 2																				
0 sons	76	18	0	6	36	54	3	8	46	13	32	9	59	30	3	8	69	21	0	10
1 son	76	19	0	5	29	59	5	8	29	16	47	8	45	28	18	9	60	25	1	14
2 sons	77	18	0	5	28	57	6	9	24	13	57	7	35	22	35	7	55	27	2	16
Parity 3																				
0 sons	81	10	0	9	38	46	5	11	44	10	37	9	63	20	11	6	75	15	1	9
1 son	73	20	1	5	31	50	8	10	28	11	54	7	41	21	30	7	58	23	8	11
2 sons	74	19	1	6	32	46	13	9	19	7	69	4	28	20	47	4	52	26	8	14
3 sons	72	21	2	5	34	48	11	7	22	6	67	5	32	14	50	4	60	21	9	9
Parity ≥4																				
0 sons	73	22	1	4	36	47	5	13	56	6	32	6	60	19	13	8	76	14	3	6
1 son	73	19	1	7	38	37	11	14	36	8	47	8	46	20	28	6	58	21	8	13
2 sons	70	23	2	5	38	38	12	12	29	6	58	6	38	16	40	6	52	22	16	11
3 sons	68	25	2	5	41	36	10	14	34	7	52	7	35	18	42	5	49	22	17	11
≥4 sons	69	24	3	4	47	28	10	15	46	8	38	8	48	18	29	6	51	19	21	9

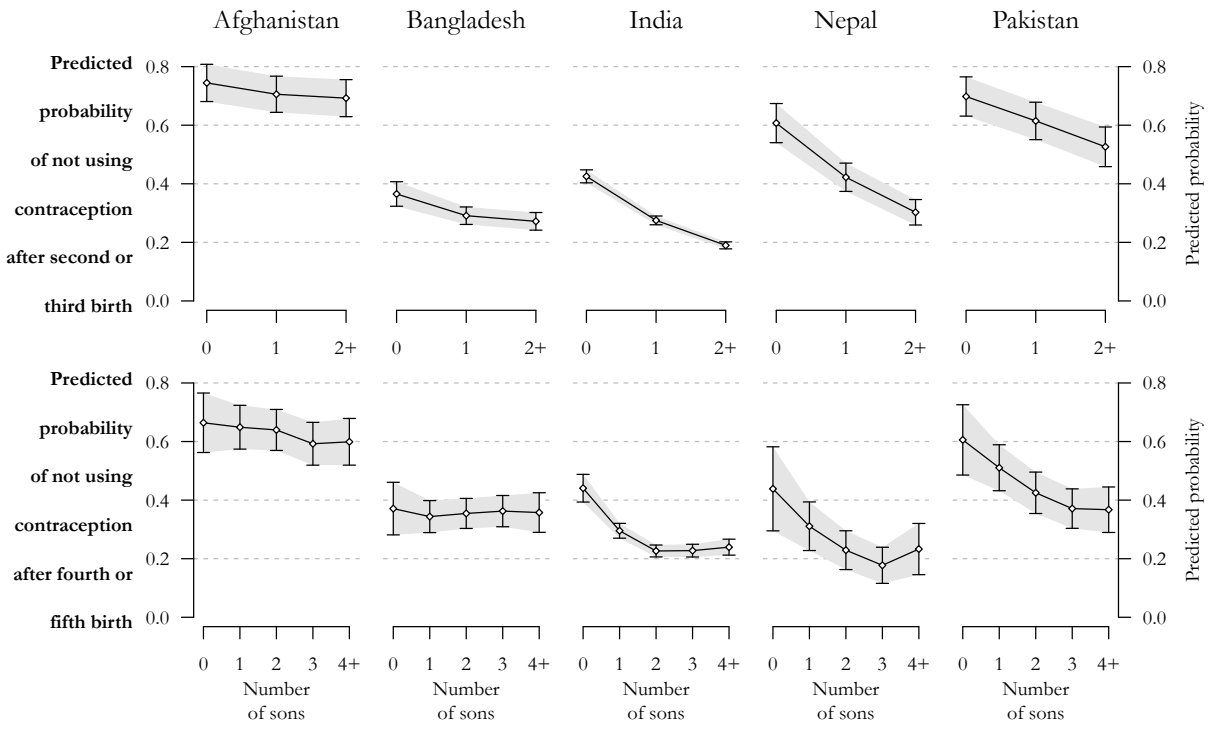

Figure 4 Predicted probabilities (with 95% CI) of not using contraception depending on number of sons previously borne, based on multinomial logistic regression models, for women who had completed childbearing in five South Asian countries

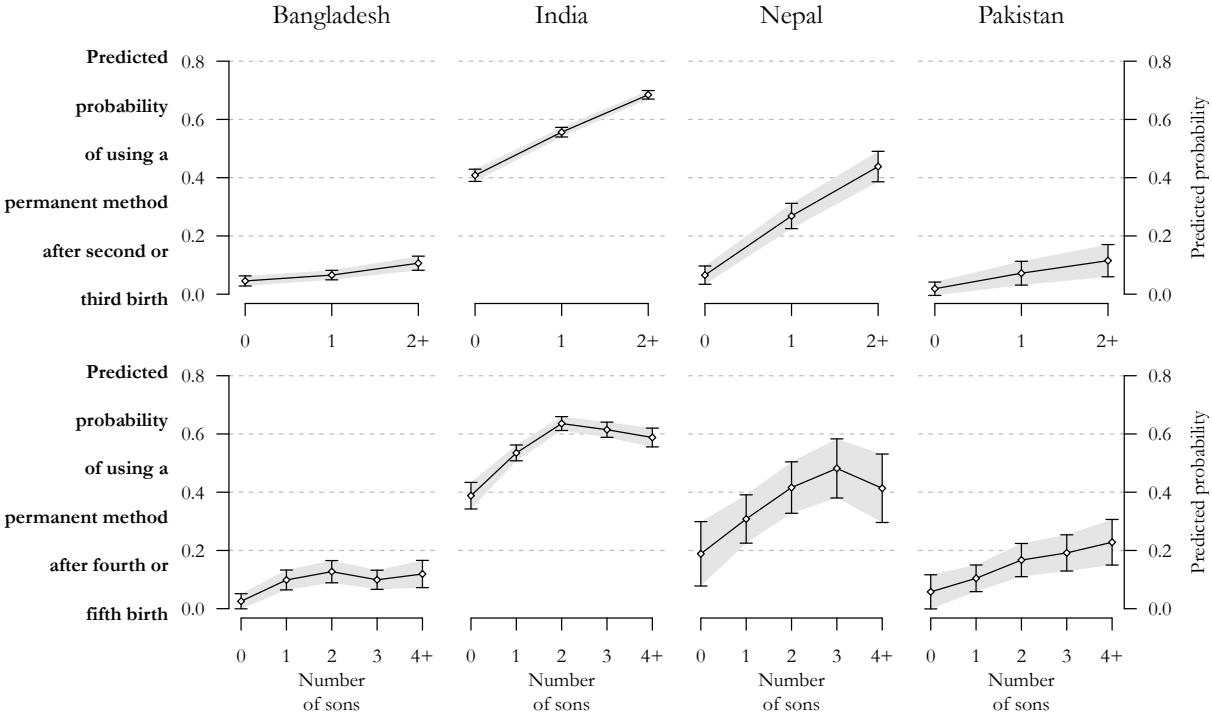

Figure 5 Predicted probabilities (with 95% CI) of using a modern permanent contraceptive method depending on number of sons previously borne, based on multinomial logistic regression models, for women who had completed childbearing in four South Asian countries

4.3. Multivariate Analysis

In India, Nepal and Pakistan the probability of not using contraception decreased with the number of sons after the second, third, fourth or fifth birth. Generally, there was no significant additional effect on contraceptive use once a woman had more than two sons. In Bangladesh the association only existed after the second and third birth, whereas there was no association after the fourth or fifth birth.

The associations between overall contraceptive use and number of sons were mainly driven by use of permanent contraceptive methods. The effects were particularly strong in India and Nepal, with the largest effect size seen in Nepal. For example, after the second or third birth the predicted probability of using a permanent method is just 7% if a woman has had no sons, but 44% if she has had two or more sons. By contrast, the predicted probability of using a temporary method is about 20% regardless of the number of sons.

In Pakistan the effect of the sex composition of previous children is strongest for women who have had four or five children; amongst these women the predicted probability of using a permanent contraceptive method is just 6% for women with no sons, compared with 22% for women with four or five sons. Modern temporary use also bore a significant association with sons already borne to women of parity four and five, though the magnitude of the association was smaller with a predicted probability of 25% for women with no sons compared to 30% for women with two to five sons. There was also a significant effect in Bangladesh though the effect size was relatively small, reflecting the low level of permanent method use there.

5. Discussion

The desired sex ratio at birth is not necessarily a good indicator of innate son preference at the individual level, though it is strongly indicative at the aggregate level. The results show that the sex ratio at last birth and the desired sex ratio do not correlate as well as we might expect. Previous research in Nepal found that women themselves say that they do not really "prefer" sons, but they do feel it is necessary for them to produce sons (Brunson, 2010). This is likely to lead to people understating their son preference when compared to manifest son-preferring behaviours such as differential stopping.

This paper has shown that in every country studied the number of sons already borne has an influence on parity progression, use of contraception and, particularly, use of permanent contraceptive methods. Generally, the effect of son preference appeared to be strongest in India and Nepal, which is in line with previous research (Jayaraman, Mishra et al., 2009; Kabeer, Huq et al., 2014). That said, given its high level of fertility, the effect of son preference in Pakistan was also strong. Multivariate techniques used to control for socioeconomic factors showed that these associations were robust. An important contribution of this paper is the inclusion of Pakistan and Afghanistan, though more work is needed to fully understand son-preferring behaviours in these countries. The analysis of Afghanistan was particularly hindered by the lack of available data, but indicates the importance of future research.

It is particularly important to note that permanent contraceptive methods are specifically affected by son preference, whereas other methods of contraception are not. This may, of course, differ in areas of the world where permanent contraceptive methods are less dominant. However, this indicates that the decision to stop childbearing permanently is frequently made only if a sufficient number of sons has been borne. Furthermore, temporary and traditional contraceptive methods are being used more to space births, and to make sure that the option to have further children (particularly sons) is kept open.

This research contributes to a large body of research emphasising the importance of tackling son preference when embarking on any family planning programme within South Asia. Afghanistan and Pakistan should be particularly noted, as little research has been carried out on this topic in these countries and they still have relatively high fertility. A substantial barrier to future decreases in fertility is likely to be the preference for sons. The data is limited for Afghanistan, but it is clear that some son-preferring behaviours exist in terms of contraceptive use and parity progression. In Pakistan, the data is more comprehensive and clearly shows a strong association between number of sons already borne and use of modern – particularly permanent – contraceptive methods.

It is impossible to compare higher fertility countries directly with lower fertility countries, but the worry must be that Pakistan and Afghanistan could follow in the footsteps of Nepal and India in terms of the intensity of differential stopping

behaviour and differential contraceptive use depending on the number of sons a woman already has. While Bangladesh exhibits some signs of innate son preference in terms of a stated preference for sons, this is relatively weak. There are signs of differential stopping behaviour in Bangladesh, but the effects are small. One thing to consider is whether the higher level of women's education in Bangladesh is partly responsible for the lower levels of reported son preference and son-preferring behaviours. However, there are also significant cultural differences to consider, and it should be remembered that more educated women in Nepal and India are more likely to have a sex-selective abortion (Jha, Kesler et al., 2011; Frost, Puri et al., 2013).

Another consideration is differences in religion. Previous research has found that son preference is stronger amongst Hindus than Muslims both in India and Bangladesh (Mukherjee, 2013; Kabeer, Huq et al., 2014). However, recent research in Bangladesh found that, while Hindus expressed the strongest son preference, amongst younger women (aged less than 30 years) conservative Muslims were more likely to express son preference than non-conservative Muslims (Kabeer, Huq et al., 2014). This may go some way to explaining why Pakistan appears to have stronger son preference than Bangladesh despite both being predominantly Muslim. This also suggests that Afghanistan may be more likely to follow the path of Pakistan than Bangladesh in the future. However, it is clear that more research is needed to disentangle the role of religion.

There are some limitations to this study. Firstly, comparisons between countries have been made more difficult due to differing levels of fertility, contraceptive use and method mix. Furthermore, the data is cross-sectional, providing an up-to-date snapshot of the situation in South Asia, but lacking the ability to consider trends and changes over time. In the future longitudinal surveys would be of particular value, but these are rare in South Asia.

Secondly, it should be noted that while India is treated as a whole within this paper there is a large body of literature looking at geographical variation of son preference and sex-selective abortion within India (Murthi, Guio et al., 1995; Jayaraman, Mishra et al., 2009; Jha, Kesler et al., 2011). Nepal is likely to display very similar levels of son-preferring behaviours to northern Indian states thanks to a shared, open border and similar cultural norms and values (Jayaraman, Mishra et al., 2009; Frost, Puri et al., 2013).

Finally, this paper has not discussed the issue of sex-selective abortion in detail. In the absence of sex-selective abortion, son preference will increase fertility and decrease contraceptive use. However, if prenatal sex detection is readily available then women may be able to manipulate the sex of their children, thereby choosing the sex of a particular child at a particular parity. In this case, son preference may speed fertility decline and increase use of permanent contraceptives once the desired sex composition of children has been achieved. Sex-selective abortion is known to be widespread in parts of India and Nepal, but there is less evidence that this is occurring in other South Asian countries (Jha, Kesler et al., 2011; Frost, Puri et al., 2013). Sex-selective abortion results in the same patterns of sex ratio at last birth, differential stopping and differential contraceptive use as would be visible without these methods in a country with high levels of son preference; the difference would be the overall sex ratio at birth, and the ability of more women to stop childbearing at a lower parity having borne at least one or two sons. The question of whether sex-selective abortion becomes widespread in Pakistan is likely to determine, in part, the speed at which fertility decline occurs.

Overall, this paper emphasises the continued importance of son preference in shaping fertility and contraceptive decisions in South Asia. Particular attention needs to be paid to the future trajectories taken by Pakistan and Afghanistan. Policies and programmes need to be put into place to enshrine the importance and value of daughters in these societies. It must be noted that research using the 1996 Nepal DHS found the impact of son preference to be moderate (Leone, Matthews et al., 2003), but in the wake of fertility decline the impact of son preference is now substantial (Jayaraman, Mishra et al., 2009; Frost, Puri et al., 2013). Changing attitudes and improving the status of women will take time, but if family planning programmes fail to recognise the importance of son preference in shaping behaviour they will be substantially less effective.

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Appendix I Binary logistic regression of parity progression from third to fourth birth in five South Asian countries

	Afghanistan			Bangladesh			India			Nepal			Pakistan		
	Odds Ratio		(SE)	Odds Ratio		(SE)	Odds Ratio		(SE)	Odds Ratio		(SE)	Odds Ratio		(SE)
Sons (ref: 0)															
1	0.809		(0.115)	0.426	***	(0.044)	0.379	***	(0.017)	0.227	***	(0.036)	0.485	***	(0.096)
2	0.784	†	(0.110)	0.305	***	(0.032)	0.187	***	(0.009)	0.091	***	(0.015)	0.226	***	(0.044)
3	0.655	**	(0.103)	0.476	***	(0.058)	0.232	***	(0.012)	0.100	***	(0.018)	0.337	***	(0.072)
Previous child died	1.791	***	(0.210)	3.231	***	(0.219)	3.383	***	(0.098)	3.707	***	(0.336)	2.336	***	(0.296)
Rural area	0.897		(0.098)	1.302	***	(0.095)	0.924	**	(0.026)	1.170		(0.120)	0.927		(0.093)
Education (ref: none)															
primary	0.959		(0.170)	0.816	**	(0.056)	0.582	***	(0.019)	0.627	***	(0.065)	0.708	**	(0.089)
secondary	0.441	***	(0.062)	0.404	***	(0.034)	0.373	***	(0.012)	0.352	***	(0.044)	0.350	***	(0.038)
Wealth quintile (ref: poorest)															
poorer	1.036		(0.138)	1.040		(0.097)	0.763	***	(0.033)	0.499	***	(0.057)	0.794		(0.142)
middle	1.101		(0.147)	0.818	*	(0.078)	0.602	***	(0.025)	0.360	***	(0.043)	0.642	*	(0.110)
richer	1.074		(0.141)	0.828	†	(0.083)	0.480	***	(0.021)	0.320	***	(0.041)	0.545	**	(0.097)
richest	1.008		(0.144)	0.647	***	(0.075)	0.304	***	(0.015)	0.216	***	(0.033)	0.326	***	(0.061)
Religion (ref: Hinduism)															
Islam	NA			2.715	***	(0.278)	2.789	***	(0.101)	4.231	***	(1.057)	NA		
Other	NA			0.908		(0.398)	1.846	***	(0.068)	0.917		(0.114)	NA		
Age (years)	1.086	***	(0.008)	1.107	***	(0.005)	1.075	***	(0.002)	1.125	***	(0.007)	1.088	***	(0.007)
Constant	0.803		(0.257)	0.030	***	(0.007)	0.575	***	(0.048)	0.205	***	(0.057)	1.670		(0.556)

Note: †, *, **, *** denote statistical significance at the 10, 5, 1 and 0.1 per cent levels respectively