

Research Report for Religion and Child Death in India RES-167-25-0236, Sonia Bhalotra

1. Background

The high rates of child mortality in developing countries today constitute one of the harshest failures of development. It is estimated that about 10 million children die each year before their first birthday and that a fourth of these deaths occur in India (Black et al. 2003). A socio-economic gradient in mortality has been demonstrated in India and other developing countries (Gwatkin et al. 1999, Wagstaff 2000) and it seems clear that, on average the burden of disease and death is born primarily by poorer people within poorer countries.

The initial motivation of this project was to present and analyse evidence that challenges the conventional wisdom on the overwhelming importance of socio-economic status, introducing a systematic role for culture (identified here as religion). In India, Muslims have poorer socioeconomic status (SES) on average but they have persistently achieved substantially higher child survival rates than Hindus. This remarkable fact has escaped attention and analysis. An aspect of religion that is closely examined in this project is gender preference. We also extend the analysis of religion differentials in health to look at religion differentials in education as this helps sort explanations in terms of investments in children *vs* healthy behaviours. Similarly, we extend the analysis to separate low and high caste Hindus because low caste Hindus have lower SES than Muslims while high caste Hindus have higher SES than Muslims. Introducing caste helps investigate whether the omitted variables that drive the Muslim advantage are correlated with SES or not.

Muslims constituted 13.5% of the Indian population in 2001, almost 140 million people and the second largest concentration of Muslims in the world, 10.3% of all, second to Indonesia which has 12.9% of all.

We have argued that the child survival advantage exhibited by Muslims is remarkable because it is despite their socio-economic disadvantage. Here are some further motivating facts and findings.

- (1) It is large. If child mortality rates amongst upper [lower] caste Hindus were to converge to the level exhibited by Muslims, Hindus would avert 0.13 [0.24] million under-5 deaths each year.
- (2) It is larger than the more commonly analysed gender differential in child mortality in India.
- (3) It is not isolated. We analyse a sample of about half a million children that is representative at the all-India level.
- (4) It is persistent. There is evidence of a differential across most of the four decades for which we have data.
- (5) Muslims show no similar advantage with respect to education. In fact Muslim children show a substantial deficit in education relative to Hindus, consistent with the lower education of their parents. So there is something peculiar to health that Muslims are “good at”.
- (6) After controlling for observable characteristics we find that an “unexplained” Muslim survival advantage is apparent with respect to both low and high caste Hindus.
- (7) Muslims have higher fertility and shorter birth intervals than Hindus. Taking account of this only deepens the seeming puzzle as regards their child survival advantage.
- (8) Similarly with respect to the fact that Muslims are a minority group which, it has been argued, may have poorer access to public services (Government of India 2006, Betancourt and Gleason 2000, Banerjee and Somanathan 2006).

We find some evidence that the Muslim advantage in child survival may derive partly from the fact that they are less likely than Hindus to favour sons over daughters. We show that the Muslim advantage is greater for girl survival although they do have an advantage for boy survival. We suggest this is related to their better maternal health- which is supported by the fact that most of the differential is apparent soon after birth. We argue that better maternal health is also related to lower son preference. We show that across three post-Independence decades, Muslim women have gained height (a function of childhood nutrition) more rapidly than Muslim men while Hindu women have lagged behind their men (and behind Muslim women). To tie this in, we also show that mother's height lowers child mortality and that it makes a significant contribution to the religion gap. We also show that Muslims have committed less female foeticide than Hindus, a sharp sign of the strength of gender preference. This research challenges, implicitly, the popular perception that the status of women in Muslim communities is lower than that of men, showing that it is even lower in Hindu communities. This research also undermines the argument that Muslims have "lower human capital" than Hindus because they have been discriminated against. It shows that they have stronger health capital and suggests that they may have stronger social capital, alongside their clearly weaker educational capital.

The analysis speaks to wider questions concerning the determinants of inequality and mobility, and the relevance of culture and tastes or behaviours in determining health. It contributes to a recent literature in economics which finds that socioeconomic status as a determinant of health or survival may be less important than other factors, such as attitudes at the individual level (Fuchs 2004) or medical technology and services at the aggregate level (Cutler et al. 2006). It extends this discussion to incorporate the importance of culture or community. Although there is a surge of interest amongst economists in ethnicity effects, especially in education (e.g. Fryer and Levitt 2004, Wilson et al 2005), there remains limited research on religion effects. The effects of religion on fertility have been analysed, for example, for India (Bhat and Zavier 2005) and historical Europe (Guinnane 2005), but there is little work on religion and health. There is some relevant work in the sociological literature, see, for example, Dwyer et al. (1990) who find that religion explains a substantial share of the variation in cancer mortality rates across US counties. In their review of the sociological literature they argue that religion effects appear to work through social disapproval of unhealthy behaviours and the benefits of social networks.

2. Objectives

The main aim of this project was to investigate the seeming paradox indicated in the preceding section, that Muslims in India exhibit substantially lower child mortality than Hindus. Here we set out specific objectives in terms of questions addressed by the individual papers that have emerged. The previous section indicated how the papers tie in with one another and with the main aim.

(1) As this is a phenomenon that has not been sufficiently noticed, an initial objective was to profile it. Establishing stylized facts offers insights into likely causes.

(2) The objectives of our second paper are to investigate

- (a) whether Muslims exhibit the same advantage within villages as they do overall- this is relevant to understanding the role of community segregation and local public goods,
- (b) the extent to which differences between Hindus and Muslims in a wide set of characteristics and behaviours explain the religion differential. Distinguishing whether the advantage enjoyed by one social group over another is associated with inalienable characteristics or slowly changing cultural practices rather than, for example, with the

geographic location of the group is relevant to understanding how easily the advantage may be acquired by the laggard group to bring overall mortality down.

(c) whether the Muslim advantage in survival goes along with a Muslim advantage in child nutritional status.

The analysis consistently distinguishes low and high caste Hindus. We argue that the layering of religion and caste in Indian society provides an opportunity to identify the effects of religion independently of the effects of (possibly omitted indicators of) socioeconomic status.

(3) The objective of our third paper is to endogenise birth-spacing and fertility in the analysis of mortality. This paper makes a more general methodological contribution and addresses wider questions concerning persistence or clustering of mortality within families but, for the purposes of this project, it seeks to establish the extent of the Muslim survival advantage in this more general case.

(4) Our fourth paper was motivated to test a hypothesis emerging from paper-2, which is that maternal health in Hindu families is worse than in Muslim families. We do this by investigating differentials in height growth across 31 birth cohorts of men and women across religious groups. Height is an indicator of cumulative net nutritional over the life-course.

(5) A sharp test of religion differentials in gender preference is to consider differences in the extent of female foeticide by religion. We do this in a fifth paper, contributing at the same time to a revival of research on the worsening trend in the sex ratio at birth in the recent two decades (which have seen unprecedented economic growth).

(6) Two further papers analyse religion (and caste) differentials in education for the reasons stated in the preceding section.

In the grant application, we listed objectives (1) and (2) above and suggested two further objectives. One was to identify religion networks or information sharing amongst mothers within religious groups. We had flagged this as tentative, suggesting that it may be difficult to achieve with the available data. It was because sample sizes at the village level in our data are too small. We tried to acquire longitudinal data at the district level from the Reproductive Child and Health Surveys of India (RCH) but only one round was publicly available. The other stated objective was to study the political economy of public goods allocation across religious groups. I have initiated a more ambitious project along these lines, involving collaborators from Harvard, Madrid and India- see Impact-Stimulus to Further Research lower down in this document. We have deviated from our original objectives for what we feel are sound reasons but the volume of work done up until completion of the award is larger than was proposed and the new work is equally related to the original objective.

3. Methods

The research primarily uses large and complex household survey data from three rounds of the National Family Health Survey of India (NFHS) conducted in 1992/3, 1998/9 and 2005/6. The NFHS is one of a family of Demographic and Health Surveys (DHS) available for about 70 developing and transition countries.² As a result, the somewhat innovative ways in which we use these data can be adopted in studies of a wide set of other developing countries, widening the impact of our research.

In each survey round, approximately 90000 ever-married women aged about 15-49 at the time of the survey are interviewed and asked to record their entire fertility history, including

² The data and details of the survey and sample design are available at www.measuredhs.com.

number of live births, birth intervals, and the time and incidence of child deaths. In each round, the number of live births is around 250000. Births occur across a period of almost 50 years.

These data offer the following advantages, which the analysis exploits, sometimes in unique ways-

1. They provide large samples, representative at the state and all-India levels. This is especially useful as Muslims constitute only about 14% of the population.
2. The three cross-sections of data can be employed to generate long time-series which we exploit in two ways in two different papers. Previous work using these data has tended to limit analysis to recent cross-sectional information.
 - a. The retrospective fertility histories are used to generate infant mortality rates and sex ratios by (child) birth cohort. After trimming, we use cohorts 1970-2005. Previous studies that exploit time-variation in *mortality* in these data are Bhalotra 2009 (for India), Bhalotra and Rawlings 2009 (for 38 developing countries) and Kudamatsu 2010 (for several African countries). No previous work has used the full histories to study *sex ratios*.
 - b. *Height* is measured for mothers and fathers aged about 15-50 years at the time of survey. This can be exploited to generate cohort profiles of height growth over the period 1950-1980. Deaton (2007) takes a similar approach but there are few other similar studies. About half of the DHS surveys include measurements of mother's height but the third survey in India is unique in gathering data on father's height. Since religion is recorded for all individuals, it is straightforward to examine gender differences in the evolution of height within religious groups.
 - c. The retrospective histories effectively provide a *panel of births within mother*. This permits controls for unobserved heterogeneity and the modelling of dynamics in the structural paper on the relationship of mortality, fertility and birth spacing. It is also essential to the paper on sex-selective abortion, which relies upon studying trends in the conditional sex ratio within families. We have used panel data techniques to analyse the mortality data in our own previous work (Arulampalam and Bhalotra 2006, 2008, Bhalotra 2007, 2009, Bhalotra and Rawlings 2009) but other than Kudamatsu (2010), we know of no other work that has used these data in this way. [These data have been publicly available for many years].

The rest of this section isolates examples of methodology interest from amongst the work related to this project.

Bhalotra and van Soest (2008) estimate a structural model of mortality, fertility and birth spacing using dynamic panel data models to distinguish causality from unobserved heterogeneity. Identification is gained by exploiting the natural sequencing of the birth and mortality processes, avoiding questionable identifying assumptions made in previous work. The estimation takes a novel approach to correcting for the right-censoring of birth interval data by using information on sterilization. We are able to address the initial conditions problem arising in dynamic models with unobserved heterogeneity by modelling jointly with the dynamic model a reduced form for first-born children (as in Arulampalam and Bhalotra 2006). In contrast to most previous studies (with a few notable exceptions such as Rosenzweig and Wolpin 1995), we account for the endogeneity of maternal age at birth and birth year of the child. The contribution to this project is that we estimate the religion differential in (neonatal) mortality allowing for endogenous reproductive behaviour, state dependence in mortality within families and unobserved heterogeneity in the mortality and fertility processes.

Bhalotra, Valente and van Soest (2009) use a single equation model for each of neonatal, infant and under-5 mortality and child height-for-age and weight-for-age. We conduct an Oaxaca style decomposition with a view to isolating the religion effect from compositional factors and differences in characteristics between communities. We estimate counterfactuals such as how Muslim mortality would change if Muslims retained their characteristics but experienced Hindu “returns” to these characteristics (i.e. the marginal effects estimated on the sample of Hindus) and vice versa. Bhalotra and Zamora (2008) employ a similar approach to analyse education differences by religion, caste and gender. The decomposition approach is preferable to one that pools data across religions and includes a religion dummy because it is more flexible: it allows the effects of all covariates to differ by religion or, equivalently, it allows the effect of religion to vary with (observed) socio-economic characteristics). We use recent methods that extend this approach to the case of nonlinear models (Fairlie 2005) and take a “design based” approach, using sample weights.

Bhalotra and Cochrane (2009) analyse religion differences in sex-selective abortion. We conduct a triple difference analysis, using information on the timing of the introduction and diffusion of prenatal sex determination technology to identify structural breaks in the sex ratio of higher order births conditional upon the sex of the first child, allowing these breaks to differ by religious group. The premise, supported by field-based research, is that families seldom attempt sex selection for first births. The assumption that the sex of the first birth is random creates a natural experiment in which the incentive to conduct sex selective abortion at higher birth orders varies exogenously across families. This provides the first difference. Variation in the ability to conduct sex selective abortion in line with variation in availability of the technology for prenatal sex determination provides the second difference. The third difference is introduced using family level indicators of heterogeneity in preference and access. We expect that preferences differ by religion. The analysis uses non-parametric and parametric techniques.

4. Results

(1) Bhalotra, Valente and van Soest (2009a) profile the religion mortality differential, describing its size and persistence, its variation with age, gender, caste and birth-order, and the extent to which a similar differential is apparent in data on child anthropometrics. By age five, the Muslim survival advantage over upper-caste Hindus is 1.30%-points, or about 10% of baseline mortality risk, and the advantage relative to lower-caste Hindus is larger. More than two-thirds of the survival advantage of Muslims over high-caste Hindus is apparent in the neonatal period. Muslims exhibit lower son preference in terms of a lower sex ratio (male/female) at birth and a smaller gender gap in child mortality. This suggests better survival chances amongst girls as a candidate explanation of the overall Muslim advantage, even if they also show some advantage for boys. While Muslims exhibit a survival advantage over low caste Hindus in rural and urban areas, their advantage over high caste Hindus is only significant in rural areas.

(2) Bhalotra, Valente and van Soest (2009b) model mortality and nutritional status using microdata on more than 0.6 million children born to about 200,000 Indian women during most of half a century, 1960-2006. We show that the religion differential is undiminished upon controlling for village fixed effects which, amongst other things, pick up local public goods. The finding that the within-village differential is similar to the total differential undermines the hypothesis that the religion differential arises because the geographical distribution of communities is such that one group faces a better local environment, whether in terms of access to public services or in terms of climate.

In this same paper the decomposition identifies a fixed effect of religious affiliation on mortality conditional upon individual characteristics. In general, almost all of the Muslim advantage in under-5 mortality over high caste Hindus is unexplained by differences in community characteristics. At least half of their advantage over low caste Hindus is also unexplained. Differences in standardized heights and weights of children between communities are smaller than differences in survival but there remains some tendency for Muslims to do well relative to their observed characteristics.

These findings motivate consideration of what attitudes, behaviours or unobserved traits Muslims might have, unlocking the key to which could make an enormous impact on average mortality rates in India. We take one step in this direction, investigating richer specifications of the child survival model that include indicators of behaviours and attitudes that are not commonly analysed. Maternal height and non-vegetarian diet contribute significantly to explaining the Muslim advantage. Some other variables like mother's employment, breastfeeding and antenatal care also contribute towards an explanation but as their effects are individually insignificant and they are potentially endogenous, we do not put much weight on these findings. Amongst hypotheses that we believe may hold the potential to explain the persistent Muslim advantage but that we are unable to investigate to our satisfaction, are that Muslims enjoy closer kinship, have a lower degree of son preference, and have healthier behaviours.

(3) Bhalotra and van Soest (2008) show that the Muslim advantage in survival persists, indeed, is enlarged by endogenising fertility, consistent with the fact that Muslims tend to have higher fertility and shorter birth intervals. It identifies considerable persistence in mortality within families which suggests multiplier effects of the advantage that Muslims have. This paper was drafted when we applied for the grant but substantially extended and published after. We do not use the structural model for the decomposition because accounting for fertility differences only deepens the paradox. Also the structural model is only identified for neonatal mortality. Neonatal mortality is closely related to foetal [maternal] health, the impact of the socio-economic environment increasing with postnatal exposure. It is therefore important for understanding the source of the religion differential to extend exposure to look at infant and under-5 mortality.

(4) Using non-parametric and parametric techniques and triple differences to eliminate confounding factors, Bhalotra and Cochrane (2009) find evidence consistent with sex selective abortion becoming available in the 1980s and prevalent by the mid-1990s. We show that this practice started earlier in and remains more prevalent amongst Hindu families as compared with Muslim families.

(5) Bhalotra and Zamora (2008) describe and analyse religion and caste differentials in primary enrolment for 6-14 year old children. This was a decade of unprecedented economic growth and overall enrolment rates rose rapidly but there is as yet limited evidence of how social inequalities evolved. We find initial community enrolment gaps of the order of 15-20 percentage points and within-community gender gaps of a similar magnitude. Every group progresses during the 1990s. The initially disadvantaged groups progress a bit faster, with girls from low caste and Muslim households exhibiting the greatest progress. Nevertheless community and gender gaps of the order of 10 percentage points remain at the end of the decade. Decomposition of enrolment differences between communities shows that, while 70-80% of the enrolment gap between high and low caste Hindus is explained by the weaker socio-economic characteristics of the low caste group, characteristics can explain only about 35% of the enrolment differential between high caste Hindus and Muslims. This suggests that Muslims either have a lower "taste" for education or have been "discriminated" against in this sphere. We draw upon our research on health differentials between communities to argue that the evidence points more towards tastes, while

recognising that tastes may evolve in response to institutions and past outcomes so that a role for discrimination cannot be ruled out. We observe that the contribution of observed characteristics to enrolment differentials has declined over time in both comparisons. Bhalotra (2009) revisits the analysis in Bhalotra and Zamora (2008) using an alternative data source, the National Sample Survey and describing the path of community differentials across a longer period into the next decade.

(6) Bhalotra (2009) examines gender differentials in height growth by religious community using survey data for birth cohorts 1950-80 in India. Height reflects the cumulative impact of the health environment from conception to adulthood (Cole 2000; Deaton 2007; Martorell and Habicht 1986; Fogel 2004). It is therefore a useful indicator when one is interested in identifying the extent of male-preference in resource allocation. I find that Muslim (and Christian) women have gained height more rapidly than men while the growth of Hindu women has lagged behind that of Hindu men. This indicates religion-related cultural differences in the status of women. If other factors such as income, biological differences or survival selection were driving these differences, they would have to operate very differently by religion and gender. Our interaction of religion and gender eliminates many potential explanations that may be put forward in looking at either the gender or the religion difference. We argue that the most likely explanation of our findings is that women are treated unequally within the Hindu community. Introducing religion differences lends supports to the results of Deaton (2008), who analyses gender differences in height averaging across religion.

5. Activities

Networks

1. Invited by the Equality and Human Rights Commission (UK) to join network of researchers interested in research on equality and human rights regarding religion or belief, 2009-
2. I have communicated the results of my research to Prof Tariq Madood who heads the Centre for Ethnicity and Citizenship at the University of Bristol. He is a leading figure in the research and policy concerning ethnicity and equality.

Organisation of special sessions

1. I am the organiser/proposer of a session on *Abortion, Sex Ratios and Wantedness* at the forthcoming American Society of Health Economics conference at Cornell University.
2. I have invited Dr Sabu George, an activist specialising in female foeticide in India, Fellow at an Indian NGO, Intercultural Resources in New Delhi to give a talk at the School for Policy Studies, Bristol, March 2010.
3. I am organising a major international workshop on *Sex Ratios and Son Preference* in Bristol (or London) for October 2010 as this is an area in which there has been a recent growth of high quality research. I have drawn up a programme but have not yet finalised funding for this event.

Papers presented at conferences (refereed, competitively selected)

1. Panel Data conference, Cambridge 2007- BV
2. European Society of Population Economics, UCL London, June 2008- BZ
3. European Society of Population Economics, Sevilla, June 2009- BVV
4. Indian Statistical Institute annual conference, Delhi, 16-18 Dec 2009- BC
5. American Society of Health Economics (ASHE), Cornell, 21-23 June 2010, forthcoming- BC

Invited seminars

1. Reproductive Health Department, WHO Geneva, July 2009- BC

2. Economics Department University of Newcastle, 2009- BVV
3. Economics Department University of Sussex, 2009- BVV
4. DFID London, Economics Seminar, 15 March 2010- BC
5. Econometrics Department, Tilburg University, 28 April 2010- BC

BV= Bhalotra and van Soest (2008)

BVV= Bhalotra, Valente and van Soest (2009b)

BC= Bhalotra and Cochrane (2009)

BZ= Bhalotra and Zamora (2008)

6. Impacts

Impact during the period of the award-

1. I have been appointed to the research committee of a new Scientific Resource Group on Health Equity Analysis & Research at the *World Health Organisation*, a reflection of wider recognition of my research on health in developing countries, which includes this project. My membership of this group may allow me to influence research and policy priorities at the WHO.
2. I have been elected to the Council of the *European Society of Population Economics* (ESPE). The research conducted under this project falls has been presented at the annual ESPE conference. I expect my membership to widen the scope of ESPE interests to include more research on health, demography, gender and education in developing countries.
3. I was invited by *UNESCO* (Paris) to contribute a paper on social marginalisation in education in India to their 2009 Global Monitoring Report on Education for All. They approached me after seeing the paper on religion and caste differences in education in India (Bhalotra and Zamora 2008).
4. *The Prime Minister's Office* in India commissioned a major report on the Status of Muslims in India. Two papers from this project were invited as contributions to that report (Bhalotra, Valente and van Soest 2009a and Bhalotra and Zamora 2009) and subsequently published in an OUP collection. The report is widely cited and the book, just released, is likely to be similarly widely used as a core reference for policy makers and scholars interested in religion, society and economics in India.
5. I was invited to act as *External Examiner* for a PhD thesis submitted to the University of Otago in New Zealand by Marie-Claire Robitaille. It focuses upon religion differentials in survival and son preference and so is closely related to the work under this project. It cites our work and my invitation to act as examiner is an indicator of the impact of our work.
6. I visited the Ministry of Health and Family Welfare in New Delhi in 2009 to present my findings to relevant officials.

I am a research affiliate of IZA (Bonn) and CHILD (Turin) – this widens the scope of the impact of my research.

Stimulus to further research

1. I have initiated a new research project on *religion and political identity* with Lakshmi Iyer (Harvard) and Irma Clots Figueras (Carlos III Madrid). We have submitted a grant application for this research to the International Growth Centre at the LSE. We will gather

data on the religious identity of every elected member of state legislative assemblies in India and match this constituency level information to individual outcomes. We propose to test two hypotheses: (a) There is post-election favouritism in public goods allocation with, say, Muslim leaders, favouring Muslim voters; (b) Muslim legislators are more effective than Hindu legislators at curbing Hindu-Muslim violence. Hindu v Muslim identity in India is a vibrant and topical political issue. Political quotas for Muslims are currently being debated.

2. This research has led to an incipient collaboration with Prof Frances Stewart and her group at CRISE in Oxford. We are interested in *modelling differences by religion in intergenerational mobility* in order to understand persistent differences by religion in education and health. It relates to other (unfunded) research I have been doing on the intergenerational transmission of health and, recently, education.
3. The core paper in this project (Bhalotra, Valente and van Soest 2009b) has recently led to a potential collaboration with Prof Steve Grundy in the Engineering department at Bristol University. Our purpose is to test the hypothesis that *better hygiene is inculcated amongst Muslims* on account of the rigours of regular prayer (you have to be washed to pray). We will conduct our own survey using an *objective test for differences in water quality* across households that Prof Grundy has developed; see <http://www.bristol.ac.uk/aquatest/>.
4. Christine Valente was employed on this research grant as a postdoctoral research assistant. Within a year of leaving, with my guidance, she has won her own ESRC grant to study *the impact of legalising abortion in Nepal*. This work uses the same data source and similar techniques to those used in the India research programme. It is an example not only of the stimulus that this project has provided to further research but also of its capacity building.
5. My collaboration with Christine has led to our initiating a paper together on the *impact of the early life health environment on final educational attainment* using microdata on 66 developing countries.

General, longer run impact

The output from this research programme is likely to benefit policy makers interested in (a) lowering the overall incidence of childhood mortality, by virtue of providing new insights into the causes and correlates of early death, (b) closing the large gap in education between Muslims and Hindus, (c) removing girl foeticide and, amongst surviving girls, the relative neglect of their health in Hindu households,

7. Outputs

Publications

1. Bhalotra, S., C. Valente and A. van Soest (2009b). The puzzle of Muslim advantage in child survival in India, *Journal of Health Economics*. Published online November 2009.
2. Bhalotra, S. and A. van Soest (2008). Birth-spacing, fertility and neonatal mortality in India: Dynamics, frailty and fecundity. *Journal of Econometrics*, 143 (2): 274-290.
3. Bhalotra, S. (2009), *Educational deficits and social identity in India*. The 2010 Global Monitoring Report on Reaching and Teaching the Most Marginalised, UNESCO, Paris. Available on the GMR website.
4. Bhalotra, S., C. Valente and A. van Soest (2009a). Religion and childhood death in India, A. Sharif and R. Basant (eds.), *The Handbook of Muslims in India*, Delhi: Oxford University Press.
5. Bhalotra, S. and B. Zamora (2009). Social divisions in education in India, A. Sharif and R. Basant (eds.), *The Handbook of Muslims in India*, Delhi: Oxford University Press.

Mimeographs and work in progress

1. Bhalotra, S. and T Cochrane (2009). Sex-selective abortion and the rising girl deficit in India.
2. Bhalotra, S. (2009). Religion differences in gender inequality in height growth in India- evidence for birth cohorts 1950-80.
3. Bhalotra, S. and B. Zamora (2008). A decomposition of educational gaps between religion and caste groups in India.
4. Valente, C. (2010). Improved access to abortion, neonatal mortality, and gender bias: evidence from Nepal.

Dissemination: Presentation of seminars and conference papers listed under Activities above.

8. Capacity Building

1. Christine Valente was appointed as a 9-month research assistant. This led directly to her own work set in Nepal funded by the ESRC. The papers from this project and the grant were influential in her securing first a postdoc at Nottingham and then a tenured lectureship at Sheffield.
2. Tom Cochrane was appointed as a 3-month casual research assistant. He was intending to look for a city job after but, as a result of the inspiration that his work on the project provided, he has joined a research consultancy group, CEPA, in London, where he is particularly interested in health/econometrics. He is currently assessing the GAVI (vaccinations) initiative in developing countries and I sometimes provide advice.
3. Bhalotra and van Soest (2008) makes a methodological contribution. Other methodological aspects of this research are discussed under Methods above.

9. Future Research Priorities

Yes, details are under Impact- Stimulus to further research

Here is a summary of research that has, in some manner, originated from this award and that is now ready to start-

1. *Religion and political identity*, with Lakshmi Iyer (Harvard) and Irma Clots Figueras (Carlos III Madrid). Grant application under review with the International Growth Centre, LSE.
2. *Religion differences in intergenerational mobility*, with Prof Frances Stewart (Oxford).
3. *Religion and mortality- what is the role of hygiene?*, with Prof Steve Grundy (Engineering, Bristol). Proposed field study using aquatest on non-piped water in a large sample of Hindu and Muslim homes in India.
4. *The impact of the early life health environment on final educational attainment*, with Christine Valente (Sheffield).
5. *The impact of legalising abortion on mortality in Nepal*- Christine Valente has an ESRC grant for this work.

We are currently not studying *social networks organised by religion* but our JHE paper concludes that this is a promising avenue for further research.

Appendix- References

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To cite this output:
Bhalotra, Sonia (2010). Religion and Childhood Death in India: Full Research Report
ESRC End of Award Report, RES-167-25-0236. Swindon: ESRC
REFERENCE No.

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