

P N Mari Bhat: An Intellectual Tribute

Mari Bhat, director of the International Institute of Population Sciences in Mumbai and among the finest demographers of his generation in the world, died suddenly on July 30. A tribute to his work.

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PN Mari Bhat, who died suddenly on July 30, 2007 at the age of 56, was the director of the International Institute for Population Sciences (IIPS) in Mumbai. He was a gifted applied mathematical demographer, amongst the best of his generation in the world, and transformed our understanding of important social problems by applying his technical skills to some of the most pressing issues of the day. Mari published extensively, but often in places that can be difficult to access. This is a pity, since his research is highly relevant to the wider community of social scientists working on India. We therefore take this opportunity to pay homage to him by summarising some of his work to make it more accessible.

Professional Life

To know Mari was to engage with him intellectually. He had a deep and humble concern with science that dominated

matters of a personal nature, and a warm and generous spirit. He combined his single-minded dedication to excellence in research with a genuine lack of interest in material rewards. Mari could have worked anywhere, and had several visiting professorships at prestigious universities abroad, but he always chose to live life on his own terms, focused solely on the work he wanted to do. For him, this meant working in Indian research institutions and engaging with Indian social science research in a hands-on fashion.

His career did not follow a linear path. He obtained his bachelor's degree in physics, chemistry, and mathematics from the University of Mysore in 1970, followed in 1972 by a master's degree in psychology from Andhra University. He found his niche as a demographer when he went to IIPS to take their Diploma in Population Studies in 1975. He then joined the Institute for Social and Economic Change (ISEC) in Bangalore where V K R V Rao recognised his remarkable talent and encouraged him to pursue further studies.

V K R V Rao chose well. In 1979, while at ISEC, Mari presented his work

on mortality estimation to a seminar organised by a panel of the US National Academy of Sciences that was responsible for preparing a monograph on the population of India. His work was so careful and creative that Sam Preston, who was chairing the panel, recruited him on a Population Council fellowship for the PhD programme at the University of Pennsylvania. There he passed both his master's exam and his PhD exam after one year, an extremely rare achievement. His technical skills and knowledge of Indian materials, some readily available and some long buried, proved invaluable to the India panel, and he was made principal author of their classic monograph on Indian vital rates.

Mari returned to India at the age of 36 to work at the Centre for Development Studies, Thiruvananthapuram, for three years. Perhaps the most creative phase of his career began when he moved to the quiet life of a pure researcher, as director of the Population Research Centre in Dharwad (1991-97). His publications during this phase are peppered with papers exploring new issues, and typified by an iconoclastic approach to research.

Mari then moved to Delhi to take up a professorship at the Institute of Economic Growth. This period marked a shift from being a pure researcher to a more active role in advising various government ministries and other institutions on demographic issues. He nevertheless continued with a very creative and productive research agenda during this period.

In 2005, Mari took up the position of director of the International Institute for Population Sciences. At IIPS Mari focused on expanding the research and teaching agenda to include important newly-emerging issues, improving the incentives for good quality research, strengthening the infrastructure, and enhancing the international profile of the institute – including a major international conference that he helped organise last year to celebrate the institute's golden jubilee. He had a real vision for IIPS and worked hard to achieve it.

Despite his busy administrative responsibilities, he always made it a point to engage classes for the students and will always be remembered for his commitment to teaching. In fact, on that fateful day he was coming to take classes for visiting students from Nordic countries on his pet theme on "Population and Development", when he collapsed on his way with a

book in his hand. His sudden death has left a huge void in Indian demography, and is a great loss to IIPS.

Research on Differentials

Mari worked on many highly topical issues, as we discuss below, but his work on the fertility differences between Muslims and other religious groups in India is perhaps the work of widest interest. As he pointed out, this is a highly politicised subject on which much baseless propaganda is disseminated:

A phobia raised by the Hindu right is that if the Muslim population were to grow at the present rate, one day Muslims would outnumber Hindus in India. A recent book published under the auspices of the Indian Council of Social Science Research has echoed this sentiment through a mischievous forecast that claimed that within six decades, "Indian religionists" (Hindus, Sikhs, Buddhists, Jains, and Tribes) would become a minority in India. Not only was the methodology of the projection too simplistic, it included Pakistan and

Bangladesh within India, perhaps to hype up the communal sentiments" [Bhat and Zavier 2005: 399. The ICSSR work referred to was A P Joshi, M D Srinivas and J K Bajaj 2003, *Religious Demography of India*, Centre for Policy Studies, Chennai].

Mari countered such propaganda with an authoritative assessment of exactly how much of a differential there is between religious groups in their fertility levels, and how this varies over time and between different parts of the country. To begin with, he gives us some useful descriptive statistics on Hindu-Muslim differences. He shows that Hindus and Muslims have fairly similar levels of poverty and female education in rural areas, but in urban areas Hindus fare much better than Muslims. The differences are striking: for example, in urban areas, 49 per cent of Muslims are below the poverty line compared with 30 per cent amongst Hindus.

He finds that Muslims in India do indeed have higher fertility than Hindus. However, Muslim fertility is falling a little more quickly than that of Hindus, and so the

gap between them is shrinking. Between 1992-93 and 1998-99, the total fertility rate amongst Hindus fell by 15.75 per cent from 3.30 to 2.78, while amongst Muslims it fell by 18.59 per cent from 4.41 to 3.59 children per woman. By the time India's population growth stabilises by the second half of the 21st century, the proportion of Muslims will have increased to 18 per cent of the total population – certainly higher than that of today, but a very far cry from the claims of fear-mongers.

He also found that Muslim women are more likely to report that they do not intend to use contraception in the future than Hindu women. In the second National Family Health Survey (NFHS) of 1998-99, 28.9 per cent of Muslim women reported this, as compared with 16.3 of Hindu women and 19.9 per cent of Christian women. Most of this gap is accounted for by differences in the percentages reporting the reasons to be "against religion", where 9 per cent of Muslim women reported this versus 0.2 per cent of Hindus and 0.5 per cent of Christians. By contrast,

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One post of Chairman, Commission for Agricultural Costs and Prices (CACPC), in the Ministry of Agriculture (Department of Agriculture and Cooperation) is required to be filled by deputation (including short-term contract) basis. The post is in the scale of pay of Rs. 26,000/- (fixed) and is categorized as General Central Service Group 'A', Gazetted, Non-Ministerial.

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- (ii) with at least 2 years regular service in the pay scale of Rs. 22,400-24,500.

Or

(II) Officers under the Central Government/State Governments possessing:

- (i) Ph.D in Agricultural Economics/Agricultural Statistics from a recognized University; and
- (ii) twenty years of teaching/research experience and evidence of extensive research work on different aspects of agriculture, including agricultural trade policy; and
- (iii) ability to apply quantitative techniques; and
- (iv) holding analogous posts on regular basis or with at least two years regular service in the pay scale of Rs. 22,400-24,500.

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- (i) Ph.D in Agricultural Economics/Agricultural Statistics from a recognized University; and
- (ii) twenty years of teaching/research experience and evidence of extensive research work on different aspects of agriculture, including agricultural trade policy; and
- (iii) ability to apply quantitative techniques;

3. Maximum age for appointment on deputation or short-term contract shall not exceed 56 years as on the closing date of receipt of applications. Period of deputation/short-term contract including period of deputation in another ex-cadre post held immediately preceding this appointment in the same or some other Organisation/Department of the Central Government shall not ordinarily exceed three years.

4. The officer selected on 'deputation' basis will have the option to draw his grade pay plus deputation(duty) allowance or to have his pay fixed in the scale of the post in accordance with DOPT's O.M. No.2/8/97-Estt.(Pay.II) dated 11.03.1998, as amended from time to time.

5. Applications(in triplicate) along with the complete and up-to-date Confidential Reports (photocopies of the C.Rs are to be got attested by an officer not below the rank of Under Secretary to the Government of India) and Integrity Certificate of eligible officers who could be spared in the event of their selection, may be forwarded to Under Secretary (EA), Department of Agriculture and Cooperation, Room No.37-A, Krishi Bhawan, New Delhi – 110001, by 23.10.2007. While forwarding the application, it may also be verified and certified that the particulars furnished by the officers are correct and that no vigilance case is either pending or contemplated against them and no major/minor penalty has been imposed on them during the last 10 years.

6. Applications received after expiry of last date or without the A.C.Rs, Vigilance Clearance, Integrity Certificate and a statement of major/minor penalty, if any, imposed on the officers during the last 10 years or otherwise found incomplete, shall be rejected.

7. The application proforma has been hosted on the Department's website at agricoop.nic.in which may be downloaded.

there are very small differences between religious groups in the per cent of women reporting that they will not use contraception because they want to have as many children as possible.

His work also throws up some riddles: he shows that a miscellany of data sources from the 1960s to 2000 clearly indicate that Muslims have significantly lower infant and child mortality than Hindus. Elsewhere [Bhat 2002a], he found that Muslim women experience lower maternal mortality than Hindus. This is somewhat puzzling in view of their higher fertility (which makes for lower parental ability to invest in each child), lower income and female education in urban areas (characteristics typically associated with higher infant and child mortality), and slightly lower mobility than Hindu women (which might impact on their ability to seek healthcare when needed). The reasons why Muslims have lower maternal and child mortality than Hindus need to be explored further.

Research on Gender Issues

One of Mari's early works was a seminal article on widow remarriage, using indirect estimation techniques on the 1971 Census data [Bhat and Kanbargi 1984]. They estimated that one-third of all widows had remarried, compared to two-thirds of all widowers, thus debunking the notion that widow-remarriage rates in India are very low. Later, he estimated the mortality rates of widows and widowers [Bhat 1998a], and concluded that widows and widowers have about an 80 per cent higher mortality rate than their married counterparts. There are strong regional patterns to this – compared with the south, northern women have a lower risk of widowhood because of higher remarriage rates, but once widowed they have a higher risk of death.

Mari had some interesting findings also on the “marriage squeeze” [Bhat and Halli 1999]. Some authors had argued that the rapid rise in dowries in India was largely because there was a surplus of women in the Indian marriage market,¹ and projected that this situation will reverse for those born after 1980 because of falling fertility.² This may seem counter-intuitive given that sex ratios in India are imbalanced in favour of males. But, because husbands are older than wives and, in a growing population, there are always more younger people than older people

– the number of women of marriageable age is larger than the number of men of marriageable age. One consequence of this is that the economics of the marriage market favoured males resulting in a rise in dowries with all its negative social consequences.³ Bhat and Halli (1999) estimated that there was an 11 per cent increase in the proportion of potential bridegrooms to brides during 1911-71, but that this imbalance should reverse from 1991 because of fertility decline. By 2011 the availability of grooms and brides should equalise, and by 2021 there could be a 10 per cent surplus of men in the marriage market.

Gender differentials in child mortality were another of Mari's research interests. He dissected the well known fact that the sex ratio of children has been becoming more masculine in India over recent decades [Das Gupta and Bhat 1997]. He found that the gender differential in child mortality remained constant during this period, so the increased masculinity in child sex ratios is attributable to sex-selective abortion or infanticide of girls who are not reported as live births. Yet the role of these latter factors was still fairly small during 1981-91: for each of these deaths before or at birth, an estimated four excess deaths of girls took place after birth. The total excess mortality resulting from discrimination amounted to almost 5 per cent of female live births. Moreover, almost all the additions to the “missing females” during this decade were in the age-group 0-6, not at adult ages.

Mari also examined how fertility decline might impact on discrimination against girls. In Das Gupta and Bhat (1997), he argued that in a society with strong son preference, the net effect of fertility decline on excess mortality of girls relative to that of boys is influenced by two countervailing forces. One is the “parity” effect, which suggests that as fertility declines and the proportion of births of higher parity decreases, the excess mortality of girls will also fall. This is based on the observation from studies in south Asia that excess mortality of girls is concentrated in births of higher parities.⁴ Offsetting this is the “intensification” effect, which is based on the observation from studies in east Asia that excess mortality of girls at each parity has become more pronounced as total fertility has fallen,⁵ apparently because as fertility declines the total number of children couples desire initially falls more rapidly than

the total number of desired sons. The actual magnitude of the sex differential in survival in a population is the result of a mixture of these countervailing forces. He later analysed the data from the first two NFHS surveys [Bhat and Zavier 2003], and found that in India the preference for sons fell along with desired family size. He concluded that in India the “intensification” effect accounts for only a small part of the rise in child sex ratios during the 1990s, and that most of this is attributable to the greater ease with which parents can now manifest their son preference given the new sex-selective technologies.

In his last published article in *EPW*, he argued that the effect of the use of prenatal diagnostic techniques (PNDT) on the sex ratio at birth is found to be contingent on whether or not women have at least one previous birth but have had no sons. While income and education are found to increase the use of PNDT, their misuse is governed more by cultural factors and the sex composition of children already born [Bhat and Zavier 2007].

Mari was always highly creative at using different data sources and developing new methodologies to study the complexities of fertility and mortality trends in India. The US National Academy of Sciences monograph [Bhat, Preston and Dyson 1984] was a comprehensive analysis of Indian demography by state. Complete with 48 tables and armed with many new methods of analysis, some of which were being used for the first time, it argued that fertility had declined substantially in India by 1981. This was a controversial proposition at the time but one that has proven accurate. Mari followed up this work with a steady stream of fundamental papers on Indian demography that provided both new methods of analysis and sound new estimates of demographic parameters.

Mari's subsequent work on trends in mortality and fertility of India during 1881

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to 1961 was also formidable. He argued that the age pattern of mortality that prevailed in India during the early decades of 20th century was substantially different from the patterns observed in recent decades. The high mortality regimes were characterised not so much by high child mortality, as model life tables indicate, but by extraordinarily high adult mortality. His analysis also showed that Indian life expectancy at birth during the period 1881 to 1951 was probably higher than most previous studies have suggested. Furthermore, he argued that it was not until 1951-61 that male life expectancy at birth exceeded that of females [Bhat 1989 and 1990].

In a series of studies, Mari sought to assess the current trends in fertility and mortality in India [Bhat 1995, 1996, 1998b,c,d, 2001, 2002b]. He showed that the apparent discrepancy between the trends in contraceptive levels and birth rates, a topic which was widely debated in the late 1980s and early 1990s, was partly due to the improvement in the netting of events in the sample registration system (SRS). He also confirmed what others have found in other countries, that once the fertility transition sets in, it occurs in an increasingly rapid pace.

Using the district level estimates of fertility derived from the 1991 Census, he argued that no more than 10 per cent of the differences in fertility levels between northern and southern India could be attributed to economic factors [Bhat 1998b]. At least 30 per cent of the variation in fertility is explained by differences in socio-demographic characteristics (such as family structure, religion, caste, sex ratio, and age at marriage), and at least another 40 per cent is accounted for by factors that influence people's ideas (such as literacy, media exposure, transport and communication facilities, and population density). His analysis suggests that exposure to mass media has played a key role in shaping the regional variation, probably by changing life style preferences, raising aspiration levels, and modifying child care practices. Thus the diffusion of lower fertility norms can be accelerated by making use of formal and non-formal communication channels.

Mari also examined the complex relationship between female education and fertility [Bhat 2002c]. He found that although at the initial stages of demographic transition in India family size reduction was strongly associated with

female education, this behaviour subsequently spread to illiterate women. Given that illiterate women constitute such a large proportion of the childbearing population, he found that much of the recent reduction in fertility and rise in use of contraception came from changes in the reproductive behaviour of these women rather than their more educated counterparts. Further, he found that illiterate parents, while regulating their fertility, are increasingly sending their children to school – which is consistent with his earlier findings that the rise of aspirations has much to do with the phenomenon. He also found that the first-born daughter benefits more than other children from the fertility decline, because she is released from the burden of caring for younger siblings and is more likely than before to be sent to school.

In an interesting regional analysis of the NFHS data, Bhat and Zavier (1999) found that even in the otherwise demographically backward BIMARU states, some regions showed remarkable dynamism in demographic indicators. The spatial patterns that emerge from this comprehensive analysis illustrate the limitations of state-specific models of demographic change and illustrate the nexus between poverty, malnutrition, and disease.

Another area of examination was whether the official estimates of vital rates

are consistent with the patterns of population growth recorded by the censuses and other information on demographic trends. To this end, he produced an integrated set of estimates for fertility and mortality for the country as a whole from 1941 to 1991 by carefully weighing the evidences from diverse sources, and employing methods that are least susceptible to data error [Bhat 1998c]. A number of interesting conclusions follow. He estimated, for example, that about half of the rise in the growth rate of population between 1941-51 and 1951-61 could be attributed to a rise in fertility levels, rather than just a fall in mortality levels.

Mari estimated that India's population will reach 1.4 billion by 2025 [Bhat 2004a], and that 63 per cent of India's population growth during 2000-25 would be in the northern states of Uttar Pradesh, Bihar, Madhya Pradesh, Rajasthan, Orissa, Jharkhand, Chhattisgarh and Uttaranchal. Consequently these states' share of India's population is expected to rise from 45 to 50 per cent during this period. By contrast, south India has low fertility and has begun to "age". He drew attention to the need to expand employment opportunities such that India could benefit from the "demographic bonus", when cumulative fertility decline would result in low dependency ratios and a high proportion of working age people [Bhat 2004a and b].

44th ANNUAL CONFERENCE OF THE INDIAN ECONOMETRIC SOCIETY (TIES)

ANNOUNCEMENT AND CALL FOR PAPERS

The 44th Annual Conference of the Indian Econometric Society is scheduled to be held at University of Hyderabad, Hyderabad from 3rd to 5th January, 2008. All those who are interested in submitting papers for the Conference should send the soft copy of the full paper and the abstract (300 words) to Prof K N Murty, Convener, Programme Committee (e-mail: knmurty@yahoo.com) and one copy each to the President and Secretary of the society. More information can be obtained at www.tiesindia.net.

The last date for submission of papers is 15th October 2007. Communication about the acceptance of papers will be conveyed to the authors in the first week of November 2007.

Members are requested to communicate change of address, if any, to the Secretary, TIES, at the earliest.

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He also cautioned on the negative social and other consequences of failure to provide employment to the burgeoning young population.

In summary, Mari's career as a demographer was marked by very careful and detailed attention to critically important issues in Indian demography. These qualities will ensure that his findings stand the test of time and will remain active research topics for future generations of demographers and other social scientists. His choice of topics and methods was highly imaginative, and his dedication to answering questions using evidence rather than rhetoric or ideology was unswerving. His career was a model of integrity, humility, and achievement. ॥॥

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Notes

- 1 J C Caldwell, P H Reddy and P Caldwell, 'The Causes of Marriage Change in South India', *Population Studies*, 1983, 37 (4): 343-61.
- 2 Monica Das Gupta and Li Shuzhuo, 'Gender Bias in China, South Korea and India 1920-90: The Effects of War, Famine and Fertility Decline', *Development and Change*, 1999, 30(3): 619-52.
- 3 Vijayendra Rao, 'The Rising Price of Husbands: A Hedonic Analysis of Dowry Increases in Rural India', *Journal of Political Economy*, Vol 101, No 4, August 1993.
- 4 See Monica Das Gupta, 'Selective Discrimination against Female Children in Rural Punjab, India', *Population and Development Review*, 1987, 13: 77-100; and Pradip Muhuri and Samuel Preston, 'Effects of Family Composition on Mortality Differentials by Sex among Children in Matlab, Bangladesh', *Population and Development Review*, 1991, 17: 415-34.
- 5 See Zeng Yi et al, 'Causes and Implications of the Recent Increase in the Reported Sex Ratio at Birth in China', *Population and Development Review*, 1993, 19: 283-302.

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