The ‘Missing’ Girl Child in Uttarakhand

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Last year when the provisional population totals for the 2011 census were published, I wrote a short paper analysing the data for Uttarakhand (Joshi: 2011). One result that caught my attention, as indeed that of others, and caused considerable disquiet was the sharp decline in the sex ratio (expressed as females per thousand males) in the 0-6 age group between 2001 and 2011. Census 2001 reported a 0-6 sex ratio of 908 for the state, which declined to 886 in 2011 (Table 1).

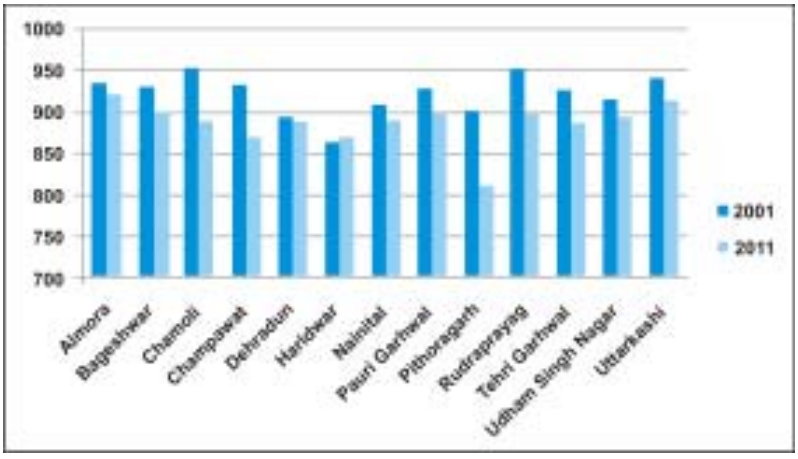
Table 1: Child (0-6 years) Sex Ratio (2001 & 2011) & Decadal Population Growth (2001-2011) in Uttarakhand

District/State	Child (0-6 years) Sex Ratio		% Population Growth 2001-11
	2001	2011	
1	2	3	4
Uttarakhand	**908**	**886**	**19.17**
Almora	933	921	-1.73
Bageshwar	930	901	5.13
Chamoli	953	889	5.6
Champawat	934	870	15.49
Dehradun	894	890	32.48
Hardwar	862	869	33.16

Nainital	910	891	25.2
Pauri Garhwal	930	899	-1.51
Pithoragarh	902	812	5.13
Rudraprayag	953	899	4.14
Tehri Garhwal	927	888	1.93
Udham Singh Nagar	913	896	33.4
Uttarkashi	942	915	11.75

Source: Census 2011, Paper I of 2011 (Uttarakhand)

Figure 1: Child (0-6 years) Sex Ratio (2001 & 2011) in Uttarakhand



Twelve of the thirteen districts saw a reduction in the ratio; Hardwar was the sole exception with a small increase from 862 to 869. In Dehradun, the reduction was slight – from 894 in 2001 to 890 in 2011. In the remaining eleven districts, the absolute magnitude of the decline varied from a low of 12 in Almora to a high of 90 in Pithoragarh.

While analysing the above data I had remarked:

The sharp deterioration in the child sex ratio, more so in the mountain districts than in the plains, raises serious suspicion about the widespread prevalence of female foeticide and perhaps killing of girl children soon after they are born. However, in the absence of any corroborating evidence e.g., district level information on births of boys and girls and sex specific infant mortality rates, it is not possible to make such an assertion.

Fortunately some of the information that was lacking in 2011 is available now through the Annual Health Survey, 2010-11 (AHS) conducted by the Registrar General of India. Available data strengthens the suspicion about prevalence of female foeticide in all districts of Uttarakhand. There is, however, no supporting evidence for the prevalence of female infanticide.

The AHS is a virtual gold mine of data on health and other social indicators. Among a large number of other variables, it contains information on sex ratio – at birth, in the 0-4 year's age group and for all ages – for the state and for each district. This information is further disaggregated by rural and urban areas (see Table 2).

Table 2: Sex Ratio in Uttarakhand – At Birth, 0-4 years and All Ages

State/District	Sex Ratio								
	At Birth			0-4 Years			All Ages		
	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban
1	2	3	4	5	6	7	8	9	10
U.K.	**866**	**877**	**833**	**877**	**888**	**846**	**992**	**1026**	**913**
Almora	874	879	802	896	899	843	1131	1144	968

Bageshwar	823	831	667	880	885	776	1089	1099	925
Chamoli	857	856	864	879	900	781	1045	1077	903
Champawat	880	853	1017	888	877	943	1017	1045	891
Dehradun	836	876	800	865	880	852	944	953	937
Hardwar	870	870	868	847	842	862	881	868	904
Nainital	918	908	932	882	872	896	910	924	890
Pauri Garhwal	885	890	854	912	920	861	1134	1162	989
Pithoragarh	764	781	668	817	844	699	1067	1084	991
Rudraprayag	861	863	500	894	897	586	1194	1200	720
Tehri Garhwal	890	895	843	922	929	867	1220	1273	929
Udham Singh Nagar	867	914	787	877	912	817	904	918	880
Uttarkashi	868	882	741	821	933	818	996	1012	891

Source : Annual Health Survey, 2010-11, Fact sheat : Uttarakhnad

Figure 2 a: Sex Ratio at Birth: 2010-11.

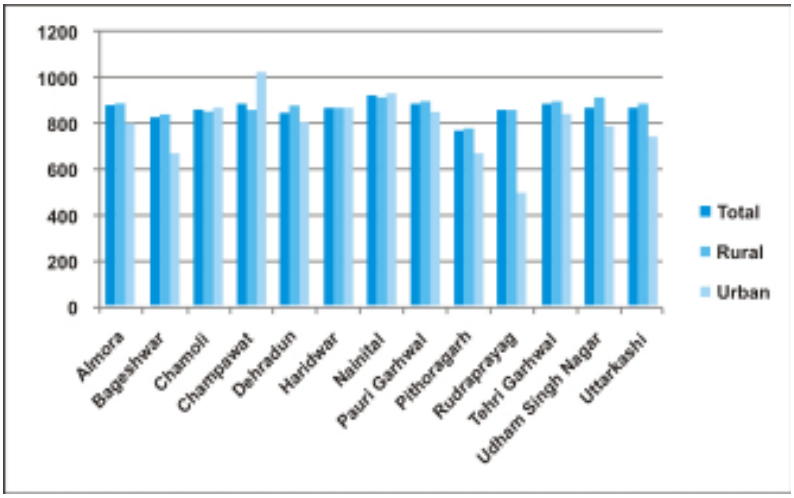
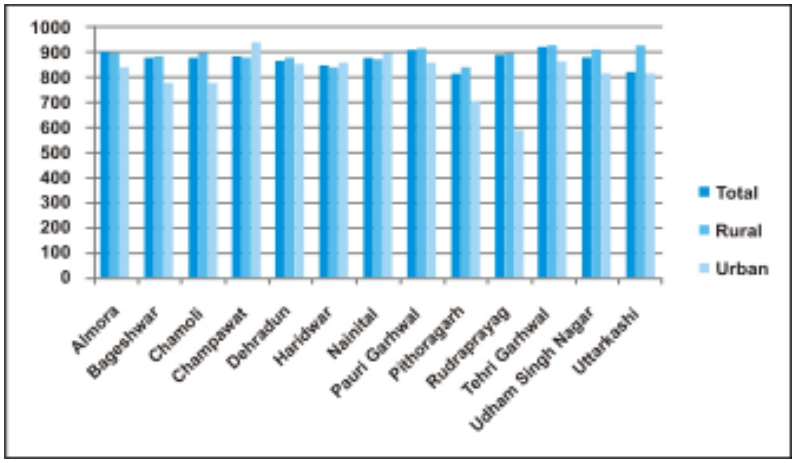


Figure 2 b: Sex Ratio 0-4 Years: 2010-11.



Even a cursory examination of the data highlights two features that stand out. First, there is a clear difference in the sex ratio at the three different points of the age-cycle. The ratio is lowest at birth, somewhat higher in the 0-4 years age group, and even higher for all ages taken together, in the state and in all districts. Second, sex ratio in the urban areas is lower than in the rural areas in all the three variants. Champawat and Nainital are the two exceptions where the urban ratio is higher than the rural ratio at birth as well as in the 0-4 age group.

The generally low level of sex ratio at birth (SRB) is a cause of particular concern. In all districts and at the state level it is consistently lower than the norm of 950[1] in both rural and urban areas. It exceeds the norm only in urban parts of Champawat district, while in urban Nainital it is close to the norm. The situation is especially worrisome in urban areas of Rudraprayag, Bageshwar and Pithoragarh districts. It is not much better in urban Uttarkashi and Udham Singh Nagar districts too. These data only strengthen the suspicion about the widespread prevalence of sex-selective termination of pregnancy in both rural and urban areas of the state.

Fortunately, AHS has also collected information on prevalence of abortion. The district wise pattern of abortion is given in Table 3. In the state as a whole 4.5 per cent of pregnant women – 3.9 per cent in rural areas and 6.2 per cent in urban areas – in the 15-49 years age group had an abortion. Of these almost one-third (31.6 per cent) – 23.7 percent in rural areas and 45.3 per cent in urban areas – went in for ultrasound before aborting. Quite clearly, a large percentage of women who had an abortion also had a prior ultrasound in both rural and urban areas. The implication is obvious. What is disconcerting is that this pattern is repeated in all the districts, though there is a distinct difference in the pattern between the plains districts and mountain districts. In Hardwar and Dehradun, a much higher percentage of pregnancies resulted in abortion in both the urban and rural areas compared to other districts. The mountain districts, except Tehri Garhwal, Pauri Garhwal and Nainital to some extent, had a relatively lower percentage of pregnant women undergoing abortion. However, despite their well-known deficiencies in the availability of health facilities, the mountain districts are not lagging behind in the incidence of ultrasound leading to abortion. With the exception of Bageshwar and Uttarkashi, in all other districts more than 20 per cent of the pregnant women who had an abortion had a prior ultrasound. This figure was as high as 47 per cent in Nainital and Udham Singh Nagar, 37 per cent in Dehradun and 34 per cent in Champawat. The rural data also follows the same pattern. The picture is quite alarming, though not very surprising, in the case of urban areas in the districts of Almora, Udham Singh Nagar, Champawat, Hardwar, Dehradun and Tehri Garhwal. In Almora, all pregnant women who went in for abortion had a prior ultrasound. The corresponding figures for Udham Singh Nagar, Champawat, Hardwar, Dehradun and Tehri Garhwal are 57.1 per cent, 50 per cent, 48.5 per cent, 41.6 per cent and 38.7 per cent respectively

Table 3: Incidence of Abortion

State/District	Pregnant women aged 15-49 years who had abortion (%)			Women who went in for ultrasound before abortion (%)		
	Total	Rural	Urban	Total	Rural	Urban
1	2	3	4	5	6	7
Uttarakhand	**4.5**	**3.9**	**6.2**	**31.6**	**23.7**	**45.3**
Almora	1.0	1.0	0.3	23.6	22.3	100.0
Bageshwar	1.5	1.5	0.0	18.3	16.3	0.0
Chamoli	1.4	1.4	1.5	21.7	21.0	25.0
Champawat	1.4	1.3	1.8	34.1	29.7	50.0
Dehradun	7.9	7.0	8.7	37.2	31.1	41.6
Hardwar	8.7	8.3	9.5	29.2	20.6	48.5
Nainital	3.3	2.0	5.1	47.4	38.5	52.3
Pauri Garhwal	4.5	4.0	8.2	23.6	24.3	21.5
Pithoragarh	1.2	1.4	0.2	20.5	20.9	0.0
Rudraprayag	1.2	1.2	-	24.1	24.1	-
Tehri Garhwal	5.3	5.0	7.9	21.3	17.8	38.7
UdhamSingh Nagar	1.6	1.3	2.2	47.1	38.2	57.1
Uttarkashi	2.9	2.9	2.8	18.8	18.0	25.0

Source: Annual Health Survey, 2010-11, Fact Sheet: Uttarakhand

Figure 3 a: Pregnant women aged 15-49 years who had abortion (%)

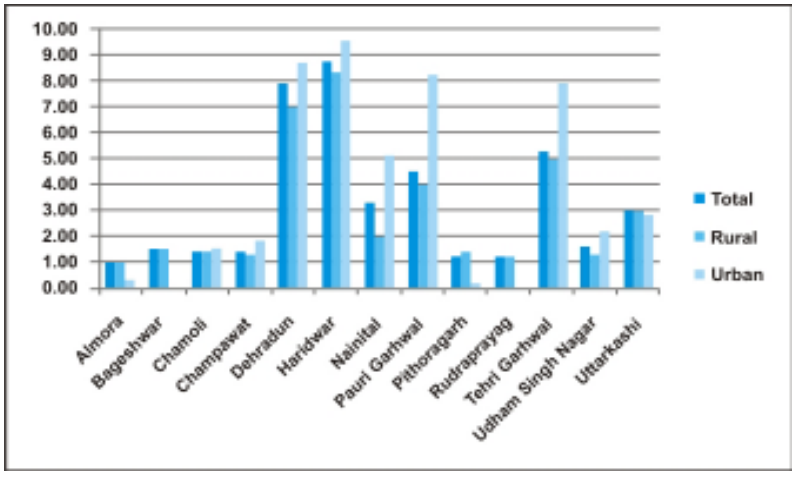
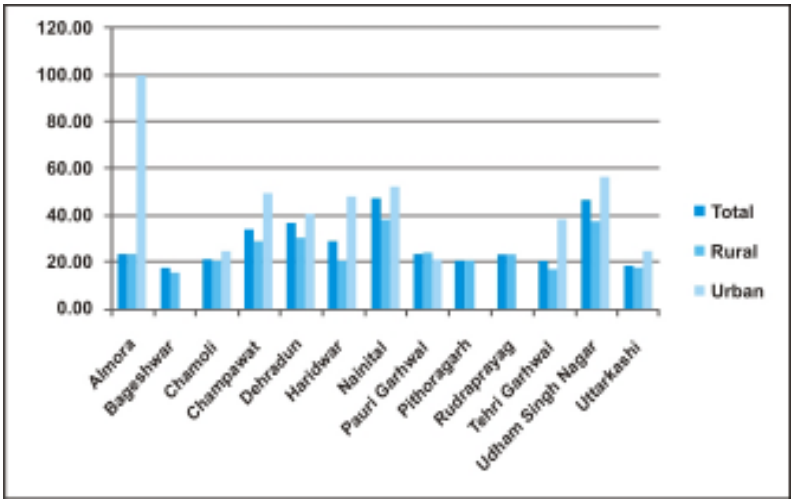


Figure 3 b: Women who went in for an ultrasound before abortion (%)



Cursory examination seems to suggest some anomalies in the data. For instance, the district level figures of SRB do not seem to bear much of a relation to either the percentage of pregnant women undergoing abortion or the percentage of women going in for abortion who had a prior ultrasound in the same districts. SRB is lowest in Rudraprayag and Bageshwar, but these two districts do not figure either among those where a high percentage of pregnant women went in for abortion or a high percentage of women who went in for abortion had a prior ultrasound. At the other extreme, we have Champawat, which had the highest SRB of 1017 – even higher than the Indian norm of 950 – but though it had a low percentage of pregnant women who underwent abortion, the percentage of such women who had a prior ultrasound was moderately high at over one-third overall and 50 per cent in the urban areas. Statistically too, there is no correlation between SRB and either of the two other variables.[1] The anomaly, however, is only apparent. Data on abortion

and SRB are both for the same year. The impact of abortion on SRB (assuming that all, or most, abortions are sex-selective) can only be visible in the following year's data. Only when the results of the AHS 2011-12 are available can we conclude with some confidence whether or not low SRB in Uttarakhand is due to sex selective abortions. Ideally, there should be a longer time-series.

I have also tried to estimate the number of girl children "missing" in Uttarakhand in 2010-11 from the data available in AHS. "Missing" girl children are defined as those girls who should have been, but were not, born for whatever reason. The estimation has been done by first calculating the number of children born in 2010-11 based on the population of the state as given in the census and the crude birth rate provided by the AHS.[1] Next, I have estimated the number of girl children born using the figures for SRB from the AHS. The number of girl children that should have been born has been estimated based on the normative SRB of 950. The difference between these two estimates gives the number of "missing" girl children. My calculations show that in 2010-11 the number of "missing" girl children in Uttarakhand was 4344. For individual districts, the estimated numbers are given in Table 4. They vary from a low of 86 (Champawat) and 95 (Rudraprayag) to a high of 968 (Dehradun) and 960 (Hardwar). The factors influencing this result are population of the district, birth rate and SRB, with population size being the dominant one.

The available AHS data do add weight to the suspicion that foetal sex determination and abortion of female foetus is quite prevalent all through the state and this may be a reason for low SRB. However, the other apprehension about prevalence of female infanticide expressed in my earlier paper does not find support when we compare sex ratio in the 0-4 years age group with sex ratio at birth we find

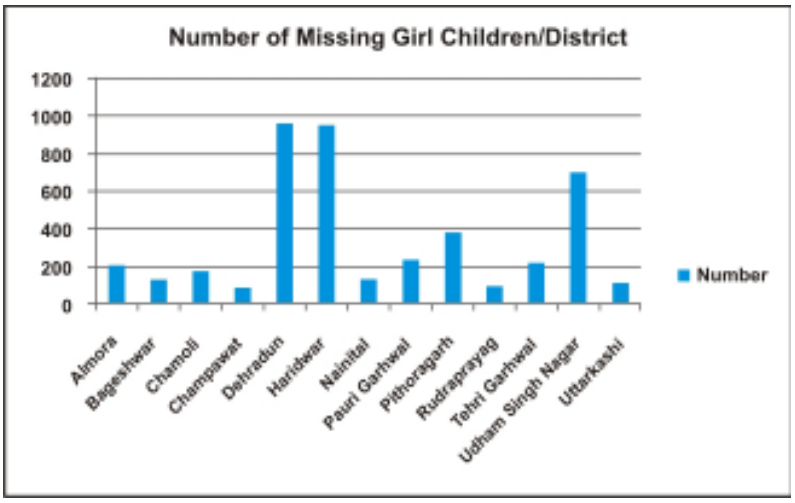
that the former is higher than the latter in all the three variants (total, rural and urban) in the state as a whole and in ten districts viz., Almora, Bageshwar, Dehradun, Pauri Garhwal, Pithoragarh, Rudraprayag, Tehri Garhwal and Udham Singh Nagar. In Haridwar and Nainital, on the other hand, SRB is higher than in the 0-4 years age group, while in Chamoli and Champawat the 0-4 year figure is higher than the SRB figure for the district as a whole and for rural areas but not for urban areas. One interpretation could be that after birth, girl children have a better chance of survival leading to an improved sex ratio. This would tend to refute the suspicion of female infanticide in most of the districts. Before jumping to this conclusion, we have to keep in mind that such a categorical conclusion is not justified from only one year's data. It could also be speculated that the higher sex ratio in the 0-4 year's age group may be because of past actions. In other words, fewer women may have undergone sex selective abortion in the past as compared to the latest year.

Data on infant mortality rate (IMR) and neo-natal mortality rate also lend support to the view that survival rate of female infants is not much different from that of male infants, except in a few places (Table 5). In the state as a whole and in eleven districts there is not much difference between male and female IMR. In nine of these districts, there is either no difference between male and female rates or the latter is slightly higher, while in Champawat and Nainital female IMR is much lower than male IMR, especially in the rural areas.

Table 4 & Figure 4: Estimates of "Missing" Girl Children in Uttarakhand: 2010-11

State/District	Estimated "Missing" Girl Children
Uttarakhand	**4344**
Almora	211
Bageshwar	137
Chamoli	178
Champawat	86
Dehradun	968
Hardwar	960
Nainital	137
Pauri Garhwal	242
Pithoragarh	386
Rudraprayag	95
Tehri Garhwal	225
Udham Singh Nagar	699
Uttarkashi	120

Computed from Census 2011 and AHS 2010-11 data. The total of the district estimates differs from the state estimate because of differences in birth rates and SRB.



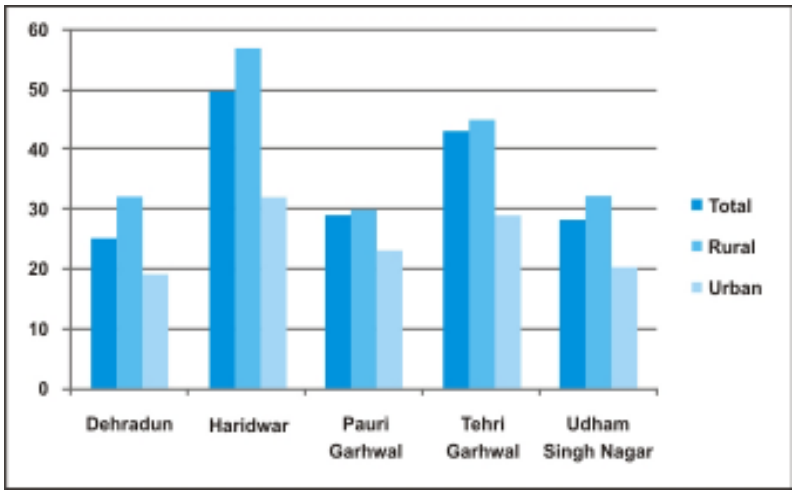
The problem districts in terms of IMR appear to be Hardwar (rural), Pithoragarh (rural) and Tehri Garhwal (urban). The male and female infant mortality rates in rural areas of Hardwar are 75 and 89 respectively, and 21 and 27 respectively in Pithoragarh. In urban areas of Hardwar IMR (female) is much lower than IMR (male) – 41 as against 52. Information on urban IMR for Pithoragarh is not available. In urban areas of Tehri Garhwal, on the other hand IMR (female) at 53 is much higher than IMR (male) at 29.

The neo-natal mortality rate (NNMR) shows a slightly different picture. This data is not available separately for male and female new-borns. Only the rural and urban NMMR is available, and that too for five districts shown below (Table 5).

Table 5: Neo-Natal Mortality Rates

District	Total	Rural	Urban
Dehradun	25	32	19
Hardwar	50	57	32
Pauri Garhwal	29	30	23
Tehri Garhwal	43	45	29
Udham Singh Nagar	28	32	20

Figure 5: Neo-Natal Mortality Rates



There is major difference in the rural and urban NNMR in all the five districts, but the situation seems to be especially serious in Hardwar and Tehri Garhwal. There is obviously an urgent need for the government of Uttarakhand to investigate the reasons for, and take corrective action in respect of; (I) high IMR, especially high female IMR in rural areas, and the very high female IMR and NNMR in rural areas of Hardwar; (ii) the high IMR and NNMR in rural areas of Tehri Garhwal and Pauri Garhwal districts and high female IMR in urban areas of Tehri Garhwal district; and (iii) relatively higher NNMR in rural areas of Dehradun and Udham Singh Nagar Districts.

Finally, we turn our attention to the sex ratio among all ages. Of the three sex ratios under consideration, this has the highest value in all the districts and in the state as a whole. In the state as a whole and in nine districts viz. Almora, Bageshwar, Chamoli, Champawat, Pauri Garhwal, Pithoragarh, Rudraprayag, Tehri Garhwal and Uttarkashi it either exceeds 1000 or is just short of it. Furthermore, in all these districts the rural figure is much higher than the urban figure. It is lower than 1000 in Dehradun, Hardwar, Nainital and Udham Singh Nagar. What we see is a clear mountain-plain divide. Sex ratio exceeds 1000 in the mountain districts and is lower than 1000 in the plain districts. Dehradun and Nainital may appear to be an exception to this pattern, but we must keep in mind that though both these districts are largely mountainous, a large part of their population resides in the plain area – in Dehradun in the Doon valley where the three valley-based tehsils of Dehradun, Rishikesh and Vikasnagar account for ninety per cent of the population of the district, and in Nainital in the Bhabar belt containing the large urban settlements of Haldwani-Kathgodam and Ramnagar and some other urban areas like Kaladhungi, Lalkuan etc. The relatively favourable sex ratio in the mountain districts is not a pointer to the relatively good social status of women, but is actually a result of the high levels of male out-migration from these districts. It appears that the rate of migration has only increased during the last decade. This is evident from the decadal (2001-2011) population growth figures given in column 4 of Table 1. Two districts, Almora and Pauri Garhwal, had a negative growth. In simple terms, it means there were fewer people in these districts in 2011 than in 2001. All other mountain districts, except Uttarkashi and Champawat, had a low rate of population growth during the decade of 2001-2011 – ranging between 1.93 per cent and 5.60 per cent. On the other hand, in the plains districts, including Dehradun and Nainital, the decadal population growth rate was high; in Udham Singh Nagar and Hardwar population grew at more than

33 per cent, in Dehradun at close to 33 per cent and in Nainital at over 25 per cent. It is apparent that these four districts attracted migrants while the mountain districts sent out migrants.

Conclusion

Before drawing any definite conclusion, it is necessary to reiterate that since we are dealing only with a single year data, any inference is bound to be tentative. Nevertheless, certain broad trends are quite visible. Firstly, there is strong evidence of sex selective abortion in all districts of the state. It is quite apparent that there is considerable laxity in the enforcement of the law banning misuse of techniques like ultrasound for determination of foetal sex. The government must tighten its monitoring and enforcement systems and machinery as required by the Pre-Natal Determination Techniques (Regulation & Prevention of Misuse) Act, 1994 (commonly known as the PNDT Act). The medical profession must also play a pro-active role in this matter. Secondly, there is need for more rigorous studies of demographic patterns and change and their relation to socio-economic factors in Uttarakhand. We also need a number of research studies based on primary field level data. Among the issues that need to be studied are: (i) prevalence of pre-natal sex determination, incidence of subsequent abortion, where the abortion takes place – hospital, private clinic, by local health providers or at home etc. – and with what consequences for the health of the woman; (ii) incidence of migration, profile of migrants – only male members or whole families – preferred destinations, and impact of migration on the migrants, family members not migrating and on the local economy and society. It would also be worthwhile to undertake studies on particular issues like: (i) impact of large-scale dislocation of rural population caused

by the Tehri dam on social mores that were protective of women and children in particular female children; (ii) reasons for relatively better sex ratios in districts like Nainital as compared to the neighbouring plains district: could it be related to better facilities that exist there for whole family relocation from rural to an urban area (e.g., Haldwani) unlike the far away plains where women and children can't be taken as they are considered a risk and a burden?

The findings of these studies could provide important inputs for formulation of policy.

Notes

[1] O, P, Sharma & Carl Haub of the Population Reference Bureau point out "Worldwide, the normal sex ratio at birth (SRB) is about 105 male babies per 100 female babies. India measures the SRB in reverse of the usual standard, female births per 1,000 male births, making 950 a normal SRB in India."

[2] Correlation coefficient (Pearson's r) between SRB and per cent of women undergoing abortion was only 0.19 and not significant.

[3] Crude Birth Rate (CBR) for Uttarakhand in 2010-11 according to the AHS was 18.6, which is slightly lower than the SRS estimate of 19.3 for 2010. I have used the AHS estimate as it is based on a much larger sample size than SRS. The SRS sample for Uttarakhand in 2010 consisted of 150 units (100 rural and 50 urban) covering a population of 1,15,000 (84,000 rural and 32,000 urban) while the AHS sample had 2,501 units (1,962 rural and 539 urban) covering a population of 1,605,561 (128,019 rural and 325,370 urban). Secondly, the AHS provides estimates of CBR at the district level too – not available in SRS – that I have used for estimating the number of

"missing" girl children at the district level. Hence, in the interests of consistency I have stuck to the AHS estimates.

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