

Anthropo-Demographic Study Among the Caste and Tribal Groups of Central Himalayas: 4. Selection Intensities

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ABSTRACT Selection potential based on differential fertility and mortality has been computed for the caste groups of Kumaun and the Bhotia tribal groups of the hill region of Uttar Pradesh (Central Himalayas) using the methodology of both Crow (1958) and Johnston and Kensinger (1971). Highest values for the index of total selection as computed by Crow's methodology have been found in Dharchula Bhotias (0.859) and in Rajputs (0.501) among the Bhotia tribal groups and the Kumauni caste groups, respectively whereas the groups showing the lowest value are the Juhar Bhotias (0.487) and the Brahmins (0.41). A similar trend is seen when Johnston and Kensinger's methodology is used. The relative contribution of the fertility component to the index of total selection is lower than the mortality component for both the caste groups and the Bhotia tribal groups. However the contribution of the post natal mortality component is higher among the tribal groups whereas the contribution of the fertility component is higher for the caste groups.

Crow (1958) devised an index that help estimates the selective pressure, given the reproductive pattern of a population. The reproductive pattern of a population *i.e.* its fertility and mortality components is influenced by a number of socio-cultural and environmental factors which also exerts an influence on the selection potential. Selection intensity has been computed for the caste groups of Kumaun and the Bhotia tribal groups. The caste groups comprise of the Brahmins, Rajputs and Scheduled Castes. The three groups of the Bhotia tribals are the Marcha Bhotias or the Bhotias of Mana and Niti, the Juhar Bhotias or the Bhotias of Munsiyari and the Dharchula Bhotias who includes Darma, Choudansi and Bynasi Bhotias.

MATERIAL AND METHODS

The study sample was collected from three districts of Central Himalayas (Pithoragarh, Almora and Chamoli) and comprised of 198 mothers, from the caste groups of Kumaun-Brahmins, Rajputs and Scheduled Caste and the

Bhotia tribal groups, who have completed their reproductive cycle. Data collected included fertility, mortality and various socio-cultural factors. The data were collected through the help of questionnaire and details of each women's reproductive performance was obtained. The index of total selection has been computed following Crow (1958) and Johnston and Kensinger (1971).

RESULTS AND DISCUSSION

From the fertility and mortality data collected from 72 Bhotia tribal mothers and 126 Kumauni caste group mothers the selection intensity has been computed. The demographic variables used in the calculation of selection intensity is presented in table 1. It is observed that the average number of livebirths is higher for the caste groups (6.01) than for the Bhotia tribal groups (5.68). Among the caste groups the average number of livebirths ranges from 6.27 for the Scheduled Castes to 5.58 for the Rajputs. The overall average number of livebirths for both the communities is 5.89. The proportion of survivors from birth to reproductive age (P_x) is higher for the caste groups (0.81) than for the Bhotia tribal groups (0.73). Among the caste groups the Brahmins have the highest proportion of survivors (0.83) whereas the Scheduled Caste have the lowest proportion of survivors (0.79). Among the Bhotia tribal groups, the Juhar Bhotias have the highest proportion of survivors from birth to reproductive age (0.79) whereas the Dharchula Bhotias have the least proportion of survivors.

The indices of total selection among the caste groups and Bhotia tribal groups have been computed and presented in tables 2 and 3. For both the methods used *i.e.* Crow (1958) and Johnston and Kensinger (1971), the total index

Table 1: Demographic variables used in calculating selection intensity among Kumauni Caste Groups and Bhotia Tribal Groups of Uttarakhand

Group	No. of mothers	No. of rep. pregnancies	No. of livebirths	Avg. no. of livebirths	Variance of livebirths	P_s	P_d	P_b	$P_N P_s$
I.Kumauni Caste Groups									
Brahmins	46	298	281	6.10	4.18	0.83	0.163	0.943	0.788
Rajputs	36	214	201	5.58	6.53	0.80	0.194	0.939	0.757
S. Castes	44	288	276	6.27	2.99	0.79	0.206	0.958	0.760
Kumauni (Total)	126	800	758	6.01	4.44	0.81	0.187	0.947	0.770
II.Bhotia Tribal Groups									
Marchas	25	164	152	6.08	3.49	0.69	0.309	0.920	0.636
Juhars	41	226	217	5.29	3.71	0.79	0.203	0.955	0.761
Dharchulas	6	40	40	6.66	3.06	0.57	0.425	0.975	0.560
Bhotias (Total)	72	430	409	5.68	3.71	0.73	0.268	0.944	0.690
Total	198	1230	1167	5.89	4.18	0.78	0.215	0.946	0.742

Table 2: Index of selection potential based on livebirths and subsequent pre-reproductive mortality (Crow, 1958) among Kumauni Caste Groups and Bhotia Tribal Groups of Uttarakhand

Group	I_1	I_m	I_f	I_f/P_s	% of fertility component	% of post natal mortality component
I.Kumauni Caste Groups						
Brahmins	0.330	0.195	0.112	0.134	40.7	59.2
Rajputs	0.501	0.240	0.209	0.260	51.9	48.0
S. Castes	0.356	0.260	0.076	0.095	26.9	73.0
Kumauni (Total)	0.381	0.230	0.123	0.151	39.6	60.3
II.Bhotia Tribal Groups						
Marchas	0.584	0.447	0.094	0.136	23.3	76.6
Juhars	0.421	0.255	0.132	0.166	39.4	60.5
Dharchulas	0.859	0.739	0.069	0.120	13.9	86
Bhotias (Total)	0.525	0.367	0.115	0.157	29.9	70
Total	0.428	0.275	0.120	0.153	35.8	64.1

Table 3: Index of total selection potential based on total pregnancies and total pre-reproduction mortality including embryonic mortality (Johnston and Kensinger, 1971) among Kumauni Caste Groups and Bhotia Tribal Groups of Uttarakhand

Group	I_2	I_{nc}	I_{sc}	I_f	$I_f/P_s P_b$	I_{nc}/P_b	% of fertility component	% of postnatal mortality component	% of embryonic mortality component
I.Kumauni Caste Groups									
Brahmins	0.410	0.060	0.195	0.112	0.142	0.207	34.7	50.5	14.7
Rajputs	0.596	0.064	0.240	0.209	0.275	0.256	46.4	42.9	10.8
S. Castes	0.414	0.043	0.260	0.076	0.100	0.271	24.1	65.4	10.4
Kumauni (Total)	0.458	0.055	0.230	0.123	0.159	0.243	34.8	53.0	12.0
II.Bhotia Tribal Groups									
Marchas	0.720	0.086	0.447	0.094	0.148	0.485	20.6	67.4	11.9
Juhars	0.487	0.046	0.255	0.132	0.174	0.267	35.7	54.8	9.4
Dharchulas	0.906	0.025	0.739	0.069	0.123	0.758	13.5	83.5	2.8
Bhotias (Total)	0.615	0.059	0.367	0.115	0.166	0.389	27.0	63.3	9.5
Total	0.509	0.056	0.275	0.120	0.161	0.290	31.8	57.0	11.1

of selection was found to be higher for the Bhotia tribal groups than for the Kumauni Caste groups. The index of total selection for these groups is 0.509.

The index of total selection as computed by

Crow's methodology and also by Johnston and Kensinger's methodology yields the highest value for Dharchula Bhotias among the Bhotia tribal groups and among the caste groups the Rajputs have the highest value. Among the

Bhotia tribal groups the Juhar Bhotias have the lowest total index of selection whereas among the caste groups the Brahmins have the lowest total index of selection.

Furthermore for all the population groups except the Rajputs the contributions of the mortality component to the index of total selection is more than the contribution of the fertility component. However, for the caste groups on the whole and for both the communities the fertility component's contribution is less than the mortality component's contribution. The percentage of fertility component is higher among the caste groups (39.6) than among the Bhotia tribal groups (29.9) whereas the mortality component is higher among the Bhotia tribal groups (70.0) than among the Kumauni caste groups (60.3).

The proportion of embryonic mortality was computed through Johnston and Kensinger's methodology. Among the Bhotia tribal groups the contribution of prenatal mortality varied from a maximum of 11.9 per cent in Marcha Bhotias to 2.8 per cent in Dharchula Bhotias. Among the caste groups the contribution of prenatal mortality ranges from 10.4 per cent in Scheduled Castes to 14.7 per cent in Brahmins. The caste groups has a slightly higher per cent of pre-natal mortality (12) than the Bhotia tribal groups (9.5). Suri Babu and Bhasin (1991) found the indices of total selection (Crow, 1958) to be a high 0.83 among the Kammas of Andhra Pradesh whereas the Yadavas had a low selection potential of 0.75. Sen Gupta and Phukan (1997) found quite low selection intensities among the Oraons of Assam. Bhasin and Kshatriya (1990) also found low selection intensities among the various Buddhists and Hindu population groups of Sikkim.

Studies among Indian tribes indicate that

pre-reproductive mortality contributes heavily to the process of natural selection, whereas in the population of industrially developed countries pre-reproductive mortality is extremely low (Spulher, 1962; Cavalli-Sforza and Bodmer, 1971). A number of factors contribute to higher pre-reproductive mortality including a number of environmental and socio-cultural factors. The Bhotia tribal groups and the Kumauni caste groups show a higher contribution of the post-natal mortality component to the index of total selection than the fertility component; however, the contribution of the mortality component is higher among the Bhotia tribal groups than the Kumauni caste groups and the contribution of the fertility component is comparatively more for the caste groups than for the Bhotia tribal groups.

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