

# Slowly Rising Hilly Young Population of Himachal: A Step Towards Stabilization

Gupta SN, Ahmed N<sup>1</sup>, Gupta N<sup>2</sup>, Gupta S<sup>3</sup>

Department of Health and Family Welfare, Regional Health and Family Welfare Training Centre, Chheb, Kangra, <sup>1</sup>Officer on Special Duty, (NRHM) Directorate of Health and Family Welfare, Department of Health and Family Welfare, Shimla, <sup>2</sup>Freelance Researcher in Epidemiology and Ayurveda, Kangra, <sup>3</sup>Freelance Researcher in Infectious and Food Technology, Shoolini University, Solan, Himachal Pradesh, India

## Address for correspondence:

Dr. Surender Nikhil Gupta,  
Epidemiologist-in-Charge, Chamba  
District of Himanchal Cum Faculty,  
Regional Health and Family Welfare  
Training Centre, Chheb,  
Kangra, Himachal Pradesh, India.  
E-mail: drsurendernikhil@yahoo.com

## Abstract

**Background:** Socioeconomic development is the best contraceptive. Himachal Pradesh has made developments in all the fields, especially reducing the size of the family via family planning program. **Aim:** The objectives of this analysis are to describe the various methods of family planning used from 2003 to 2010 and their impact in averting the births in the state and in stabilizing the population. **Materials and Methods:** We collected secondary data of the family planning program and the various methods employed from the total population (Census 2011) covered under family planning program (FPP) of the state. We analyzed and compared the results with India. We measured the impact of the program due to FP methods adopted. We employed the standardized program indicators- total fertility rate, birth rate, death rate, growth rate and census trend towards population growth; fertility rate (in %), birth rate and death rate (per thousand of the population per year) from 3.8, 31.5 and 11.1 in 1981 to 1.9, 17.2 and 7.2 in 2009. We entered dataset by double data entry technique and analyzed descriptively using Epi info version 3.3.2 and stat calc software. **Results:** The state has the population of 6,856,509, sex ratio in age 0-6 years is 906/1000 males. The unmet need for family planning services is 15%. The impact of family planning program has resulted in averting of 3,387,744 of pregnancies from 2003 to 2010. The total fertility rate (TFR) has come down to 1.9 in 2008 from 3.8 children per woman in 1981. The death rate has declined from 11.1 per 1000 live births in 1981 to 7.2 per 1000 live births in 2009. The trend in decadal growth rate of the state is observable as 23.0% in 1971 while in 2011, it is 12.8%; more towards young population and for geriatric one as well but not exploding like India. **Conclusion:** Total population is on the increase with reference to the population of reproductive age bracket (15-49 years) and also geriatric population above 60 steadily despite good social and health indicators. Bulging reproductive age group with mild upward shift of the geriatric population is the root cause for increasing population in hills of Himachal Pradesh.

**Keywords:** Geriatric population, Hills population, Himachal Pradesh, Reproductive age group

## Introduction

John D. Rockefeller III actually uttered the aphorism, "Socioeconomic development is the best contraceptive" at a 1974 UN population conference in Bucharest.<sup>[1,2]</sup> Overall

development includes per capita income, literacy rate, standard of living, economic growth, availability of means of communication, employment rate etc., From the "Health for All" declaration made at Alma Alta in 1978 to the recently created Commission on Social Determinants of Health, a recurrent theme is health equity, whereby all segments of society should have equal access to and reap the benefits of health-enhancing interventions.<sup>[3,4]</sup> Marmot has pointed out that attributing differences in health behavior and status to socioeconomic factors is risky business.<sup>[5]</sup> Indeed, his discussion highlights how little we know about differences in health found within and between countries. Himachal Pradesh has made developments in all the fields, if we may

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10.4103/2141-9248.117959

observe the year 2011, indicators of social development of the state with the population<sup>[6]</sup> of 6,856,509 sex ratio in 0-6 years is 906/1000 males. Himachal Pradesh is situated in the northwest corner of India right in the lap of the Himalayan ranges and is almost entirely mountainous with altitudes ranging from 350 to 6,975 meters above the sea level. The state is located at latitude of 30° 22'40" N to 33° 12'40" N and longitude of 75° 45'55" E to 79° 04'22" E. The altitude of state ranges from 350 meters to 6,975 meters above mean sea level. The state has an area of 55,673 sq. kms. It constitutes 1.69% of India's area and 10.54% of the Himalayan land mass.<sup>[7]</sup> The hilly state of Himachal Pradesh came into being as Union Territory on 15<sup>th</sup> April 1948 with integration of 30 princely states. The state is divided in to three zones, 12 districts; 51 sub divisions; and 78 blocks; and 3,037 Gram Panchayats having 17,495 villages. So, it has deeply dissected and difficult topography and a complex geological structure in the various districts, especially, Lahoul and Spiti, Chamba Bharmour etc., with prevalence rate of HIV/AIDS < 1% but highly vulnerable. The objectives of this analysis are to describe the various methods of family planning used since 2003 to 2010 and their impact in averting the births in the state and population stabilization.

## Materials and Methods

### Descriptive epidemiology

#### Study area

State of Himachal Pradesh with twelve districts, namely Kangra, Una, Chamba, Hamirpur, Mandi, Kullu, Bilaspur, Shimla, Kinnour, Sirmour, Solan and Lahoul and Spiti of Himachal Pradesh, India.

#### Study population

The total population was 6,856,509 (Census 2011) covered under family planning program and out of that, the size of population in need of family planning is 3,771,080.

#### Study design

Analysis of primary and secondary data of family planning generated by family planning program from the twelve districts in the state between a period December 2010 and January 2011.

### Data Sources

Records and reports from the office of the Directorate of Health, Shimla. For quality measurement, filtered and accurate data from districts are pushed up to the state level keeping in view for the source data, like completeness, timeliness, accuracy etc.

### Measurement of impact of family planning program

It is by averting the number of births by the eligible couples by various contraceptive methods. It is assumed that by sterilizing one male we prevent 2.01 births, by sterilizing one female we avert 2.08 births. In the same way by protecting a couple with intra uterine contraceptive device, oral pill, condom contraceptive - 0.65, 0.11, 0.11 births are averted respectively.<sup>[8]</sup>

### Indicators used for analysis

1. Total fertility rate: The total fertility rate is used to describe the total number of children the average women in a population is likely to have based on current birth rates throughout her life.
2. Birth rate is defined as the total number of birth in one year per mid year population by one thousand. Crude birth rate is the number of childbirths per 1,000 people per year.
3. Death rate: The ratio of total deaths to total population in a specified community or area over a specified period of time. The death rate is often expressed as the number of deaths per 1,000 of the population per year. It is also called mortality rate.
4. Growth rate is defined as birth rate minus death rate (Birth Rate-Death Rate) and it shows as to how many persons are increasing per year per 1,000 or per 100 of the population. Ethical committee review was not indicated, since this analysis was purely conducted in the context of a public health exercise to a surveillance data review. We entered dataset by double data entry technique and analyzed descriptively using Epi info version 3.3.2 and stat calc software.

## Results

The state has the population of 6,856,509 sex ratio in 0-6 years is 906/1000 males with density of the population is 123 persons per sq. km and ranges from 2 in district Lahaul and Spiti (L and S) to 369 in the district Hamirpur. It has the literacy rate of 83.78%. The population of the state

**Table 1: The indicators of social development of hills of Himachal Pradesh, India**

Census	Population	Percentage of population under 15 years	Percentage of population between 15-49 years	Percentage of population above 70 years	Decadal growth rate (%)	Literacy rate
1951	2,386,000	-	-	-	-	-
1961	2,812,000	-	-	-	-	17.9
1971	3,460,434	41.2	45.3	2.7	23.0	31.9
1981	4,280,818	39.5	46.4	3.0	23.7	42.5
1991	5,170,877	35.5	49.6	3.4	20.8	63.9
2001	6,077,900	31.4	52.7	4.0	17.5	76.5
2011	6,856,509	29.3	55.0	4.4	12.8	83.8

constitutes 0.5% of the India's population. The majority of the population is rural (90.2%). Most of the villages have less than 500 persons (81.5%). The sex ratio is 968 females per 1,000 males. Himachal Pradesh has a large area under tribal belt, which covers two districts of Lahaul and Spiti and Kinnour and also Bharmour and Pangri development blocks of Chamba district. The state is placed 21<sup>st</sup> on the population chart followed by Tripura at 22<sup>nd</sup> place. Kangra district has been top ranked with population strength of 1,507,223 (21.9% - Census, 2011) [Table 1]. There is increase in young population in the age group of 15-49 years (55.4%) and geriatric population (>70 years) 4.4%. [Table 2] The unmet need for family planning services in Himachal Pradesh is 15%<sup>[9]</sup> as against 21.5% for India.<sup>[10]</sup> It means that out of those couples who require family

planning services the department is unable to provide the services to 15% of such couples. But, this unmet need has further slipped down to 9%<sup>[11]</sup> and 7%<sup>[12]</sup> gradually among married women.

The total fertility rate (TFR) of Himachal Pradesh is 1.9<sup>[13]</sup> as against 2.7 of India.<sup>[14]</sup> If a community achieves a TFR of 2.1 then it is called replacement level. The state vividly demonstrates the journey of TFR as 3.8 in 1981 to 1.9 in 2008 [Table 3]. For purpose of population stabilization continuous decrease in birth rate is necessary. The trend of decline of birth rate in Himachal Pradesh ranges from 31.5 per 1000 live birth in 1981 to 17.2 per 1000 live birth in 2009 [Table 5]. Due to various improved social determinants of health such as number of Janani Surksha Yojana beneficiaries in the state increased from 0.002 million in 2005-06 to 0.006 million in 2006-07 and 0.01 million in 2007-08. A total of 0.011 million beneficiaries have availed of the services in 08-09. Referral transport system of state for emergency medical response has been strengthened with support from Emergency Management and Research Institute (EMRI). State has initiated home based newborn care (HBNC) in all the districts in current year<sup>[15]</sup> and availability of good health care services like mothers who received 3 or more antenatal care checkups - 61.4%; children 12-23 months age fully immunized - 82.3; use of any modern contraceptive method - 68.1,<sup>[16]</sup> the death rate of Himachal Pradesh has caused decline of death rate from 11.1 per 1000 live births in 1981 to 7.2 per 1000 live births in 2009 [Table 3]. Similarly, growth rate is defined as birth rate minus death rate (Birth Rate-Death Rate) it shows that how many persons are increasing per year, per 1,000 of the population. The trend in growth rate of the state is observable as 23.04 in 1971 while in 2011, it is 12.81.

Data for achievement in family planning has been recorded since the inception of the program. Filtered accurate data from districts are pushed up to the state level keeping in view for quality measurement for the source data, like completeness, timeliness, accuracy etc., As incentive is provided to every case of sterilization; hence the figure

**Table 2: Year-census wise population versus growth rate and literacy rate (in %) of hills of Himachal Pradesh, India**

Population	6,856,509
Males	3,473,892
Females	3,382,617
Sex ratio	974
Density	123 per sq. km
Literacy rate*	
Male (%)	90.8
Female (%)	76.6
0 to 6 years population (%)	11.1
Sex ratio in 0 to 6 years	906/1000 males

\*Operational definition of literacy a person of age 7 years or more who can read and write in any language (reference year 2011)

**Table 3: Year-wise birth rate, death rate (per thousand of the population per year) and total fertility rate of hills of Himachal Pradesh, India**

Year	Birth rate	Death rate	Total fertility rate
1981	31.5	11.1	3.8
1991	28.5	8.9	3.2
2001	21.2	7.1	2.2
2003	20.6	7.1	2.1
2005	20.0	6.9	2.1
2006	18.8	6.8	2.1
2009	17.2	7.2	1.9

**Table 4: Year-wise achievement in family planning of hills of Himachal Pradesh**

Year-wise achievement	Male sterilization	Female sterilization	IUCD*	OP**	CC***
Since the inception (1952) of the program till 2003	232,174	712,414	812,165	324,592	1,386,386
2003-04 (1)	3,160	29,177	32,265	24,750	79,744
2004-05 (2)	2,956	30,575	30,941	28,036	88,806
2005-06 (3)	2,917	25,466	30,452	26,662	88,080
2006-07 (4)	3,144	23,301	28,983	28,368	92,895
2007-08 (5)	5,135	21,942	27,694	28,199	97,164
2008-09 (6)	3,935	26,481	25,663	29,803	99,732
2009-10 (7)	3,181	24,063	24,171	29,378	102,058
2010-11 (8)	2,618	21,020	21,220	26,303	81,549
Total (1 to 8)	27,046	202,025	221,389	221,499	730,028

IUCD\*: Intra uterine contraceptive device, OP\*\*: Oral pills, CC\*\*\*: Conventional contraceptive (condom)

**Table 5: Impact of family planning program of hills of Himachal Pradesh**

	Total achievement till 2011	No. of birth averted by the user	Total birth averted
Male sterilization	259,220	259220*2.01	521,032.2
Female sterilization	914,439	914439*2.08	1,902,033
IUCD	1,033,554	1033544*0.65	671,803.6
OP	546,091	546091*0.11	60,070.01
CC	2,116,414	2116414*0.11	232,805.5
Total			3,387,744.47

IUCD: Intra uterine contraceptive device, OP: Oral pills, CC: Conventional contraceptive (condom)

of sterilization so received is correct. However, minor variation may be noted in oral pills (OP) users and conventional contraceptives users. Every month regularly and religiously reports are collected from all the twelve districts of the state. The state monitors regarding female and male sterilization, intra-uterine contraceptive devices and condom users. The achievement made till 31<sup>st</sup> March 2011 has been depicted in the form of increased frequency of permanent sterilization in the year 2003 to adoption of temporary methods in the later years [Table 4]. The Impact of family planning program in the state has been observed by protecting the couples by various contraceptive methods and how many births have been averted. It is assumed that by sterilizing one male we prevent 2.01 births, by sterilizing one female we avert 2.08 births. In the same way by protecting a couple with IUCD, OP, CC - 0.65, 0.11, 0.11 births are averted respectively.<sup>[17]</sup> In the list of number of births averted in Himachal Pradesh till 31<sup>st</sup> March 2011 by various contraceptive methods, the female sterilization tops the list with 1,902,033 followed by IUCD-671803. Thus, we observe that by effectively implementation of the program 3,387,744.47 births have been averted [Table 5]. Had we not been able to avert these births, it is estimated that the total population of Himachal Pradesh today would have been about 20 millions since 1971. Improved access to contraception has the potential to reduce poverty and hunger, avert 32% of maternal deaths and nearly 10% of childhood deaths, contribute substantially to women's empowerment, and help achieve universal primary schooling and environmental sustainability - and thus contribute significantly to addressing the Millennium Development Goals set forth by the United Nations.<sup>[18]</sup>

## Discussion

Socioeconomic development is the best contraceptive in Himachal Pradesh. Due to better achievement in the factors of social development, the demand in the community for family planning services in Himachal Pradesh is well generated. But in the beginning in 1951, the situation was not like this when national family planning program was launched.

But Himachal got status of hilly statehood in 1971 and big state Panjab separated out with plain areas; so the data has been provided since 1971. The department of health and family welfare of the state has played a very crucial role to make the community aware about family planning program and the data for contraceptive prevalence rate in Himachal Pradesh is highest (73%) in India.<sup>[19]</sup> In the year 1965-2009, contraceptive usage has more than tripled (from 13% of married women in 1970 to 48% in 2009)<sup>[20]</sup> In the beginning of the program in 1951, the achievement of the program was much less in India. It was purely based on informed choice. Lippes loop was introduced in 1965 and thereafter other contraceptives were rolled out. But it is the workers of the department who went house to house and convinced the people that family planning program is for their benefit. Slowly the program picked up momentum and the people voluntarily started to come for the services. Now the demand is so well generated that the health department is struggling to meet it. The unmet need of the couple has dwindled down to 7% among the married women. About one of every four married women in sub-Saharan Africa has an unmet need for family planning.<sup>[21]</sup> The state has as high female literacy rate as 77%. Comparative studies have indicated that increased female literacy is correlated strongly with a decline in fertility. Studies have indicated that female literacy levels are an independent strong predictor of the use of contraception, even when women do not otherwise have economic independence. Female literacy levels in India may be the primary factor that helps in population stabilization, but they are improving relatively slowly: A 1990 study estimated that it would take until 2060 for India to achieve universal literacy at the current rate of progress.<sup>[22]</sup>

The TFR of Himachal Pradesh is 1.9 and hence is heading towards population stabilization. The replacement rate is defined as the total fertility rate at which newborn girls would have an average of exactly one daughter over their lifetimes. In more familiar terms, women have just enough babies to replace themselves. Factoring in infant mortality, the replacement rate is approximately 2.1 in most industrialized nations and about 2.5 in developing nations (due to higher mortality). Discounting immigration and population momentum effects, a nation that crosses below the replacement rate is on the path to population stabilization and, eventually, population reduction. In fact, we are below the replacement level. Today a woman in her whole reproductive period the average number of children born by her is less than 2. From the point of view of population stabilization it is very important milestone where we have arrived. Seven Indian states have dipped below the 2.1 replacement rate level and are no longer contributing to Indian population growth - Andhra Pradesh, Goa, Tamil Nadu, Himachal Pradesh, Kerala, Punjab and Sikkim. Four Indian states have fertility rates above 3.5 - Bihar, Uttar Pradesh, Meghalaya and Nagaland. Of these, Bihar has a fertility rate of 4.0, the highest of any Indian state.<sup>[23]</sup>

## Trend in total population growth

If the census data from 1951 to 2011 are observed the total population of the state is on the increase steadily. But by having a look on the data of growth rate it is clear that growth rate is declining continuously. The total population is still increasing because the growth rate is declining continuously. The total population is still increasing because the growth rate is positive, however it is declining. This shows that we are heading towards population stabilization which is quite not illusionary. If we analyze the age group pyramid of population of the state, then interesting trends are emerging. The population of less than 15 years is declining continuously. The population of reproductive age period, i.e., (15-49 years) is on the rise continuously and also geriatric population above 70 years too reflects upward trend. To conclude flatly, bulging reproductive age group (15-49 years) with mild upward shift of the geriatric population is the root cause for steadily increasing population in hills of Himachal but heading towards stabilization and of course, not exploding like India with booming fertility rate. The fertility rate has more than halved (from 5.7 in 1966 to 2.6 in 2009), but the national fertility rate is still high enough to cause long-term population growth.<sup>[24]</sup> Despite good social and health indicators in the state, the topography and geography are extremely zigzag and tough; and so is the socio-economic status of the various sections of the multicultural society. Calls to close the poor-rich health gap will not and cannot be effectively answered until our understanding of health inequities is greatly increased.<sup>[25]</sup> The point of note as a limitation here is the issue of death under-registration.

Adolescent friendly Reproductive and Sexual Health Services are one of the best possible alternatives available to slash the flab of the rising population towards steady population stabilization in the state. No doubt the unmet needs of contraception has gone down tremendously but reach beyond married women to engage men and address the needs of unmarried are too important. Youth regarding contraception<sup>[26]</sup> Family planning approaches-traditionally offered through health centers and among married couples-need to expand to reach more young people, promoting access to contraceptives, especially to those who are sexually active, single, living in large cities, or newly married and underserved. Condoms need promotion for dual protection for unintended pregnancy and disease prevention. Programs need to answer questions that concern men and youth and offer the services that they want.<sup>[27]</sup> The clarion calls of governments and organizations to close the health equity gap of rural versus urban in the hills will remain unanswered and unanswerable without investments in research to inform policy makers and to guide program administrators on what can and should be done to close the inequity gap.

## Acknowledgments

We acknowledge profusely the various program officers/officials of directorate of health and family welfare, Kangra and Shimla, Himachal Pradesh for providing us the primary and secondary data and intellectual inputs.

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**How to cite this article:** Gupta SN, Ahmed N, Gupta N, Gupta S. Slowly rising hilly young population of Himachal: A step towards stabilization. *Ann Med Health Sci Res* 2013;3:385-90.

**Source of Support:** Nil. **Conflict of Interest:** None declared.

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