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Tracking Public Health Transition in Himachal Pradesh: A Comparative Analysis of Demographic, Reproductive, Maternal, Child, Nutritional, Behavioural and Non-Communicable Disease Indicators Using NFHS-5 (2019-21) and NFHS-6 (2023-24)

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Abstract **Background:** The National Family Health Survey (NFHS) is India's principal source of nationally representative data on demographic characteristics, reproductive health, maternal and child health, nutrition, behavioural risk factors and non-communicable disease (NCD) indicators. This study compared key public health indicators between the Himachal Pradesh NFHS-5 (2019-21) and NFHS-6 (2023-24) Fact Sheets to assess the state's evolving public health profile and identify areas of progress and persistent challenges. **Methods:** A comparative secondary analysis of the Himachal Pradesh NFHS-5 (2019-21) and NFHS-6 (2023-24) Fact Sheets was conducted. Comparable state-level indicators related to population characteristics, family planning, maternal and child health, infant and young child feeding, nutrition, women's empowerment, gender-based violence, behavioural risk factors and NCD risk factors were extracted and compared using absolute percentage-point differences. **Results:** Himachal Pradesh demonstrated substantial improvements across multiple public health domains between NFHS-5 and NFHS-6. Health insurance coverage increased from 38.9-61.4%, while internet use increased from 49.7-75.4% among women and from 52.7-83.0% among men. Maternal healthcare utilization improved considerably, with first-trimester antenatal care increasing from 72.4-84.0%, four or more antenatal care visits from 70.6-83.2% and iron-folic acid supplementation for at least 180 days during pregnancy from 43.0-62.9%. Institutional deliveries increased from 88.2-91.7%, while full immunization among children aged 12-23 months reached 90.1%. Marked improvements were observed in child nutritional status, with stunting declining from 30.8-20.6%, wasting from 17.4-10.4% and underweight from 25.5-16.8%. However, modern contraceptive use declined (63.4-58.3%), exclusive breastfeeding among infants aged below six months decreased (69.9-60.8%), preschool attendance among children aged 2-4 years declined (64.7-50.9%) and access to improved drinking-water sources decreased (96.2-89.5%). Simultaneously, overweight or obesity, elevated blood glucose and hypertension increased among adults, indicating a growing burden of non-communicable diseases. **Conclusions:** The findings demonstrate that Himachal Pradesh has made substantial progress in maternal and child healthcare, childhood nutrition, immunization, financial protection, digital inclusion and several dimensions of women's empowerment. Nevertheless, declining modern contraceptive use, reduced exclusive breastfeeding, lower preschool attendance, reduced access to improved drinking-water sources and the increasing burden of obesity, hypertension and diabetes represent emerging public health challenges. Sustained, evidence-based and multisectoral strategies integrating maternal and child health, nutrition, environmental health and NCD prevention will be essential to consolidate recent gains and accelerate progress towards Universal Health Coverage and the Sustainable Development Goals.

Key Words National Family Health Survey, NFHS-6, Himachal Pradesh, Public Health, Maternal and Child Health, Nutrition, Non-Communicable Diseases, Health Transition, Universal Health Coverage

INTRODUCTION

The National Family Health Survey (NFHS) is India's largest nationally representative household survey and serves as the principal source of information on demographic characteristics, reproductive and child health, nutrition, family welfare, Non-Communicable Disease (NCD) risk factors and several other population health indicators. Conducted periodically under the stewardship of the

Ministry of Health and Family Welfare, Government of India and coordinated by the International Institute for Population Sciences (IIPS), Mumbai, NFHS provides robust evidence for monitoring health trends, evaluating national health programmes, informing policy decisions and assessing progress towards national priorities and the Sustainable Development Goals (SDGs). Owing to its standardized methodology, nationally representative sampling design and comprehensive scope, NFHS has become one of the most reliable and widely utilized sources of public health data in India [1-4].

The sixth round of NFHS (NFHS-6; 2023-24) maintained methodological comparability with previous survey rounds while expanding its scope to include emerging public health domains such as digital literacy, digital financial transactions, Direct Benefit Transfer (DBT), Self-Help Group (SHG) participation and enhanced biomarker assessments, including HIV testing. The survey employed a rigorous two-stage stratified sampling design with Computer-Assisted Personal Interviewing (CAPI), generating representative estimates at the national, state and district levels. These data provide an important opportunity to evaluate changes in population health, identify emerging priorities and monitor the performance of ongoing health and social welfare programmes [2,4-6].

Himachal Pradesh has undergone substantial demographic, socioeconomic and epidemiological changes during the past decade. Improvements in healthcare utilization, education, financial inclusion and child survival have occurred alongside population ageing and an increasing burden of lifestyle-related non-communicable diseases. Simultaneously, changes in maternal and child health practices, nutritional indicators, family planning behaviour, women's empowerment and behavioural risk factors continue to influence the state's public health landscape. Periodic assessment of these transitions is essential for identifying achievements, recognizing emerging challenges and guiding evidence-based planning and resource allocation.

Although the NFHS Fact Sheets provide comprehensive state-level estimates across multiple health domains, published studies integrating these indicators into a comprehensive assessment of the evolving public health profile of Himachal Pradesh remain limited. Most available reports focus on selected programme indicators, while comparatively few studies have examined demographic, reproductive, maternal, child health, nutritional, behavioural, women's empowerment and non-communicable disease indicators together within a single analytical framework.

Therefore, the present study aimed to compare key public health indicators between NFHS-5 (2019-21) and NFHS-6 (2023-24) Fact Sheets for Himachal Pradesh and to describe the state's evolving public health profile across demographic characteristics, family planning, maternal and child health, infant and young child feeding, nutritional status, women's empowerment, gender-based violence, behavioural risk factors and non-communicable disease risk factors. By identifying areas of improvement, persistent gaps and emerging public health challenges, the study seeks to generate evidence that can support policymakers, programme managers, clinicians and public health professionals in strengthening health programmes and advancing equitable, evidence-based health development in Himachal Pradesh.

MATERIALS AND METHODS

Study Design

This study was a comparative secondary analysis of publicly available state-level data from the National Family Health Survey-6 (NFHS-6), 2023-24 Fact Sheet for Himachal Pradesh. Key public health indicators reported in NFHS-6 were compared with the corresponding indicators available in the NFHS-5 (2019-21) Himachal Pradesh Fact Sheet to assess temporal changes in demographic characteristics, reproductive and maternal health, child health, nutrition, behavioural risk factors, women's empowerment, gender-based violence and Non-Communicable Disease (NCD) risk factors.

Data Source

The study utilized data from the Himachal Pradesh NFHS-5 (2019-21) and NFHS-6 (2023-24) Fact Sheets released by the Ministry of Health and Family Welfare, Government of India and coordinated by the International Institute for Population Sciences (IIPS), Mumbai. The NFHS-6 survey in Himachal Pradesh was conducted during Phase I (23 June 2023 to 20 January 2024) by the Population Research Centre (PRC), Institute of Economic Growth (IEG), Delhi.

The NFHS employed a nationally standardized two-stage stratified sampling design and collected information using Computer-Assisted Personal Interviewing (CAPI). For Himachal Pradesh, NFHS-6 included 10,437 households, 10,271 women aged 15-49 years and 1,469 men aged 15-54 years, providing representative estimates at the state level. The present analysis was restricted to indicators reported in both NFHS-5 and NFHS-6 Fact Sheets to ensure direct comparability between survey rounds.

Study Variables

Indicators common to both NFHS-5 and NFHS-6 Fact Sheets were extracted and grouped into the following thematic domains:

- Population and household characteristics
- Characteristics of adults
- Marriage and fertility
- Family planning and unmet need
- Maternal healthcare
- Postnatal care
- Child immunization and vitamin A supplementation
- Childhood illnesses
- Infant and Young Child Feeding (IYCF)
- Nutritional status of children
- Nutritional status of adults
- Blood glucose and hypertension
- Women's empowerment
- Gender-based violence
- Tobacco and alcohol consumption

Only indicators reported in both survey rounds were included in the comparative analysis.

Data Extraction

All indicators were extracted manually from the official Himachal Pradesh NFHS-5 and NFHS-6 Fact Sheets. To ensure data accuracy, every value was independently cross-checked against the published Fact Sheets before analysis. Indicators that were introduced only in NFHS-6 or were not directly comparable between survey rounds were excluded from the comparative analysis.

Data Analysis

A descriptive comparative analysis was performed using published state-level estimates from the two survey rounds. For each comparable indicator, the NFHS-5 value, NFHS-6 value and absolute percentage-point change were calculated.

Absolute change was computed as:

$$\text{Absolute Change} = \text{NFHS-6 (\%)} - \text{NFHS-5 (\%)}$$

A positive value indicated an increase in the indicator between survey rounds, whereas a negative value indicated a decline. Changes were interpreted within the context of existing national and state public health programmes, considering whether an increase or decrease represented a favourable or unfavourable public health outcome. The findings were summarized using descriptive tables and narrative interpretation; no inferential statistical analyses were performed because the study utilized aggregated state-level estimates rather than individual-level survey data.

Ethical Considerations

The study utilized publicly available, anonymized secondary data from the NFHS-5 (2019-21) and NFHS-6 (2023-24) Himachal Pradesh Fact Sheets. No individual-level identifiable information was accessed and no human participants were directly involved in the study. Therefore, approval from an Institutional Ethics Committee and informed consent were not required for this secondary analysis in accordance with national ethical guidelines for research involving publicly available anonymized data.

RESULTS

Population, Household Profile and Demographic Indicators

Table 1 presents the demographic and household profile of Himachal Pradesh based on the NFHS-6 (2023-24) Fact Sheet and compares these findings with NFHS-5 (2019-21). The proportion of the population aged below 15 years declined slightly from 21.8-20.9%, while the proportion of older adults aged 60 years and above increased from 14.7-16.4%, reflecting an ongoing demographic transition towards an ageing population. Household electrification remained almost universal, increasing marginally from 99.5-99.8%. Coverage under a health insurance or financing scheme showed the most substantial improvement, rising from 38.9-61.4%. Small improvements were also observed in the proportion of households with a bank or post office account (97.4-98.6%), female educational attainment (81.0-83.3%) and households with a female member owning a house and/or land (16.1-18.7%). In contrast, the proportion of households with access to an improved drinking-water source declined from 96.2-89.5%, iodized salt use decreased slightly from 99.1-96.7% and preschool attendance among children aged 2-4 years declined markedly from 64.7-50.9%. The proportion of children below 5 years remained unchanged at 6.4%.

Characteristics of Adults, Marriage and Fertility

Table 2 summarizes the characteristics of adults and selected marriage and fertility indicators in Himachal Pradesh by comparing NFHS-6 (2023-24) with NFHS-5 (2019-21). Educational attainment improved among both women and men, with the proportion completing 10 or more years of schooling increasing from 65.9-72.1% among women and from 71.3-76.0% among men. Internet use increased remarkably during the inter-survey period, rising from 49.7-75.4% among women and from 52.7-83.0% among men, indicating substantial improvement in digital access and connectivity. In contrast, the prevalence of early marriage increased, with the proportion of women aged 20-24 years married before 18 years rising from 5.4-7.9% and men aged 25-29 years married before 21 years increasing from 4.6-11.5%. The total fertility rate remained well below the replacement level despite a marginal increase

Table 1: Population and Household Profile in Himachal Pradesh: Comparison of NFHS-5 (2019-21) and NFHS-6 (2023-24)

Indicator	NFHS-6 (2023-24)	NFHS-5 (2019-21)	Absolute Change
Population below age 5 years (%)	6.4	6.4	0.0
Population below age 15 years (%)	20.9	21.8	-0.9
Population aged 60 years and above (%)	16.4	14.7	+1.7
Population living in households with electricity (%)	99.8	99.5	+0.3
Population living in households with an improved drinking-water source (%)	89.5	96.2	-6.7
Households using iodized salt (%)	96.7	99.1	-2.4
Households with any usual member covered under a health insurance/financing scheme (%)	61.4	38.9	+22.5
Households with any usual member having a bank account/post office account (%)	98.6	97.4	+1.2
Female population aged ≥6 years who ever attended school (%)	83.3	81.0	+2.3
Households with any usual female member owning a house and/or land (alone or jointly) (%)	18.7	16.1	+2.6
Children aged 2-4 years attending preschool (%)	50.9	64.7	-13.8

Table 2: Characteristics of Adults, Marriage and Fertility in Himachal Pradesh: Comparison of NFHS-5 (2019-21) and NFHS-6 (2023-24)

Indicator	NFHS-6 (2023-24)	NFHS-5 (2019-21)	Absolute Change
Characteristics of Adults			
Women (15-49 years) with 10 or more years of schooling (%)	72.1	65.9	+6.2
Men (15-49 years) with 10 or more years of schooling (%)	76.0	71.3	+4.7
Women (15-49 years) who have ever used the internet (%)	75.4	49.7	+25.7
Men (15-49 years) who have ever used the internet (%)	83.0	52.7	+30.3
Marriage and Fertility			
Women aged 20-24 years married before age 18 years (%)	7.9	5.4	+2.5
Men aged 25-29 years married before age 21 years (%)	11.5	4.6	+6.9
Women aged 15-19 years who were already mothers or pregnant at the time of the survey (%)	2.9	3.4	-0.5
Total fertility rate (children per woman)	1.8	1.7	+0.1

Table 3: Family Planning Indicators in Himachal Pradesh: Comparison of NFHS-5 (2019-21) and NFHS-6 (2023-24)

Indicator	NFHS-6 (2023-24)	NFHS-5 (2019-21)	Absolute Change
Currently married women (15-49 years) using any contraceptive method (%)	76.1	74.2	+1.9
Currently married women (15-49 years) using any modern contraceptive method (%)	58.3	63.4	-5.1
Currently married women (15-49 years) using any traditional contraceptive method (%)	17.8	10.8	+7.0
Female sterilization (%)	32.2	37.7	-5.5
Male sterilization (%)	2.3	3.3	-1.0
Total unmet need for family planning (%)	6.3	7.9	-1.6
Unmet need for spacing (%)	2.6	2.8	-0.2
Unmet need for limiting (%)	3.7	5.1	-1.4

Table 4: Maternal Health Care Indicators in Himachal Pradesh: Comparison of NFHS-5 (2019-21) and NFHS-6 (2023-24)

Indicator	NFHS-6 (2023-24)	NFHS-5 (2019-21)	Absolute Change
Mothers who had an antenatal check-up in the first trimester (%)	84.0	72.4	+11.6
Mothers who had any antenatal care (ANC) visit (%)	94.3	88.2	+6.1
Mothers who had four or more antenatal care (ANC) visits (%)	83.2	70.6	+12.6
Mothers who consumed iron-folic acid (IFA) tablets/syrup for 100 days or more during pregnancy (%)	82.1	67.2	+14.9
Mothers who consumed iron-folic acid (IFA) tablets/syrup for 180 days or more during pregnancy (%)	62.9	43.0	+19.9
Registered pregnancies for which the mother received a Mother and Child Protection (MCP) card (%)	98.3	98.7	-0.4
Last birth protected against neonatal tetanus (%)	96.3	90.0	+6.3
Institutional births (%)	91.7	88.2	+3.5
Institutional births in public health facilities (%)	70.6	71.7	-1.1
Births attended by skilled health personnel (%)	92.4	87.1	+5.3
Births delivered by caesarean section (%)	29.9	21.0	+8.9
Births delivered by caesarean section in public health facilities (%)	23.3	17.4	+5.9
Births delivered by caesarean section in private health facilities (%)	63.7	51.4	+12.3

from 1.7-1.8 children per woman. Encouragingly, the proportion of women aged 15-19 years who were already mothers or pregnant at the time of the survey declined from 3.4-2.9%, suggesting a modest reduction in adolescent pregnancy.

Family Planning

Table 3 presents the family planning indicators among currently married women aged 15-49 years in Himachal Pradesh by comparing NFHS-6 (2023-24) with NFHS-5 (2019-21). The overall contraceptive prevalence increased modestly from 74.2% to 76.1%. However, this increase was accompanied by a shift in the pattern of contraceptive use. The prevalence of modern contraceptive methods declined from 63.4-58.3%, whereas the use of traditional methods increased substantially from 10.8-17.8%. Both female sterilization (37.7-32.2%) and male sterilization (3.3-2.3%) showed a decline during the study period. Despite these changes, the overall unmet need for family planning decreased from 7.9-6.3%, with reductions observed in both unmet need for spacing (2.8-2.6%) and unmet need for limiting (5.1-3.7%). These findings suggest improved fulfillment of family planning needs, although the declining use of modern contraceptive methods warrants further attention.

Maternal Health Care

Table 4 presents the maternal health care indicators in Himachal Pradesh by comparing NFHS-6 (2023-24) with NFHS-5 (2019-21). Overall, maternal healthcare utilization improved across most indicators during the study period. The proportion of mothers who had an antenatal check-up during the first trimester increased from 72.4-84.0%, while the proportion receiving at least one antenatal care (ANC) visit increased from 88.2-94.3%. The coverage of four or more ANC visits also improved substantially, increasing from 70.6% to 83.2%. Maternal nutrition indicators showed marked improvement, with the proportion of mothers consuming Iron-Folic Acid (IFA) tablets or syrup for at least 100 days increasing from 67.2-82.1% and those consuming IFA for 180 days or more rising from 43.0-62.9%. The proportion of registered pregnancies receiving a Mother and Child Protection (MCP) card remained consistently high, although it showed a marginal decline from 98.7-98.3%.

Table 5: Child Health, Immunization and Vitamin A Supplementation in Himachal Pradesh: Comparison of NFHS-5 (2019-21) and NFHS-6 (2023-24)

Indicator	NFHS-6 (2023-24)	NFHS-5 (2019-21)	Absolute Change
Children aged 12-23 months fully vaccinated (%)	90.1	89.2	+0.9
Children aged 12-23 months who received any vaccine (%)	98.5	98.2	+0.3
Children aged 12-23 months who received BCG vaccine (%)	97.9	98.2	-0.3
Children aged 12-23 months who received three doses of polio vaccine (%)	92.6	90.1	+2.5
Children aged 12-23 months who received three doses of pentavalent vaccine (%)	95.2	96.1	-0.9
Children aged 12-23 months who received first dose of measles-containing vaccine (MCV) (%)	95.7	95.9	-0.2
Children aged 24-35 months who received second dose of measles-containing vaccine (MCV) (%)	77.2	69.2	+8.0
Children aged 12-23 months who received birth dose of hepatitis B vaccine (%)	91.2	92.4	-1.2
Children aged 12-23 months who received three doses of rotavirus vaccine (%)	90.5	87.9	+2.6
Children aged 9-35 months who received a Vitamin A dose in the last 6 months (%)	82.4	77.3	+5.1
Children aged 12-23 months who received most vaccinations in a public health facility (%)	97.2	97.5	-0.3
Children aged 12-23 months who received most vaccinations in a private health facility (%)	2.0	1.8	+0.2
Children under 5 years with diarrhoea during the preceding 2 weeks (%)	4.6	4.7	-0.1
Children under 5 years with severe diarrhoea during the preceding 2 weeks (%)	0.5	0.2	+0.3
Children under 5 years with symptoms of ARI during the preceding 2 weeks (%)	1.0	1.5	-0.5
Children with fever or symptoms of ARI taken to a health facility/provider (%)	74.6	76.2	-1.6

Table 6: Infant and Young Child Feeding Practices in Himachal Pradesh: Comparison of NFHS-5 (2019-21) and NFHS-6 (2023-24)

Indicator	NFHS-6 (2023-24)	NFHS-5 (2019-21)	Absolute Change
Children breastfed within 1 hour of birth (%)	48.5	45.1	+3.4
Children aged under 6 months exclusively breastfed (%)	60.8	69.9	-9.1
Children aged under 6 months currently breastfeeding (%)	97.2	96.8	+0.4
Children aged under 6 months exclusively breastfed and receiving plain water only (%)	87.8	84.2	+3.6
Children aged 6-8 months receiving solid or semi-solid food and breastmilk (%)	67.3	68.3	-1.0
Children aged 6-23 months receiving a minimum adequate diet (breastfed children) (%)	28.3	17.7	+10.6
Children aged 6-23 months receiving a minimum adequate diet (non-breastfed children) (%)	26.2	20.7	+5.5
Children aged 6-23 months receiving a minimum adequate diet (overall) (%)	27.8	18.5	+9.3

Protection of the last birth against neonatal tetanus improved from 90.0-96.3%. Institutional deliveries increased from 88.2-91.7%, although the proportion of institutional births occurring in public health facilities declined slightly from 71.7-70.6%, suggesting a modest shift towards private-sector facilities. Births attended by skilled health personnel increased from 87.1-92.4%. Caesarean-section deliveries also increased substantially, from 21.0-29.9% overall. Among institutional births, caesarean-section deliveries in public health facilities increased from 17.4-23.3%, while those in private health facilities increased from 51.4-63.7%, indicating a notable rise in operative deliveries, particularly in the private sector.

Child Health, Immunization and Vitamin A Supplementation

Table 5 presents the child health, immunization, vitamin A supplementation and childhood illness indicators in Himachal Pradesh by comparing NFHS-6 (2023-24) with NFHS-5 (2019-21). Overall immunization coverage remained consistently high, with 90.1% of children aged 12-23 months being fully vaccinated. Improvements were observed in the coverage of three doses of polio vaccine (90.1-92.6%), second dose of measles-containing vaccine (69.2-77.2%), three doses of rotavirus vaccine (87.9-90.5%) and vitamin A supplementation (77.3-82.4%). However, slight declines were noted in the coverage of BCG vaccine (98.2-97.9%), three doses of pentavalent vaccine (96.1-95.2%), first dose of measles-containing vaccine (95.9-95.7%), birth dose of hepatitis B vaccine (92.4-91.2%) and the proportion of children receiving most vaccinations in public health facilities (97.5-97.2%). The prevalence of diarrhoea remained largely unchanged (4.7-4.6%), whereas severe diarrhoea increased slightly (0.2-0.5%). The prevalence of Acute Respiratory Infection (ARI) declined from 1.5-1.0%, although healthcare-seeking for children with fever or ARI symptoms decreased marginally from 76.2-74.6%.

Infant and Young Child Feeding (IYCF)

Table 6 presents the Infant and Young Child Feeding (IYCF) indicators in Himachal Pradesh by comparing NFHS-6 (2023-24) with NFHS-5 (2019-21). Early initiation of breastfeeding improved modestly, with the proportion of children breastfed within one hour of birth increasing from 45.1-48.5%. In contrast, exclusive breastfeeding among infants aged below 6 months declined from 69.9-60.8%. The proportion of infants aged below 6 months who were currently breastfeeding remained consistently high, increasing slightly from 96.8-97.2%, while the proportion receiving exclusive breastfeeding and plain water only increased from 84.2-87.8%. Complementary feeding practices showed mixed trends. The proportion of children aged 6-8 months receiving solid or semi-solid food along with breastmilk decreased marginally from 68.3-67.3%. However, dietary adequacy improved considerably among children aged 6-23 months, with the proportion receiving a minimum adequate diet increasing from 17.7-28.3% among breastfed children, from 20.7-26.2% among non-breastfed children and overall from 18.5-27.8%.

Nutritional Status of Children

Table 7 presents the nutritional status of children under five years of age in Himachal Pradesh by comparing NFHS-6

Table 7: Nutritional Status of Children Under Five Years in Himachal Pradesh: Comparison of NFHS-5 (2019-21) and NFHS-6 (2023-24)

Indicator	NFHS-6 (2023-24)	NFHS-5 (2019-21)	Absolute Change
Children under 5 years who are stunted (Height-for-age < -2 SD) (%)	20.6	30.8	-10.2
Children under 5 years who are wasted (Weight-for-height < -2 SD) (%)	10.4	17.4	-7.0
Children under 5 years who are severely wasted (Weight-for-height < -3 SD) (%)	2.4	6.9	-4.5
Children under 5 years who are underweight (Weight-for-age < -2 SD) (%)	16.8	25.5	-8.7
Children under 5 years who are overweight (Weight-for-height > +2 SD) (%)	2.7	5.7	-3.0

Table 8: Adult Nutritional Status and Major Non-Communicable Disease (NCD) Risk Factors in Himachal Pradesh: Comparison of NFHS-5 (2019-21) and NFHS-6 (2023-24)

Indicator	NFHS-6 (2023-24)	NFHS-5 (2019-21)	Absolute Change
Nutritional Status			
Women (15-49 years) with BMI <18.5 kg/m² (%)	15.1	13.9	+1.2
Men (15-49 years) with BMI <18.5 kg/m² (%)	15.0	11.8	+3.2
Women (15-49 years) overweight/obese (BMI ≥25 kg/m²) (%)	38.2	30.4	+7.8
Men (15-49 years) overweight/obese (BMI ≥25 kg/m²) (%)	31.4	30.6	+0.8
Blood Sugar			
Women (15 years and above) with high blood sugar or taking medication to control blood sugar (%)	20.6	13.9	+6.7
Men (15 years and above) with high blood sugar or taking medication to control blood sugar (%)	20.0	14.7	+5.3
Hypertension			
Women (15 years and above) with elevated blood pressure or taking medicine to control blood pressure (%)	24.1	22.2	+1.9
Men (15 years and above) with elevated blood pressure or taking medicine to control blood pressure (%)	31.7	24.4	+7.3

Table 9: Women's Empowerment Indicators in Himachal Pradesh: Comparison of NFHS-5 (2019-21) and NFHS-6 (2023-24)

Indicator	NFHS-6 (2023-24)	NFHS-5 (2019-21)	Absolute Change
Currently married women who usually participate in household decisions (%)	92.3	93.9	-1.6
Women (15-49 years) having a bank or savings account that they themselves use (%)	93.0	83.1	+9.9
Women (15-49 years) owning a mobile phone (%)	84.3	79.5	+4.8
Women (15-24 years) using hygienic methods of menstrual protection (%)	94.9	92.0	+2.9

(2023-24) with NFHS-5 (2019-21). Overall, child nutritional status showed marked improvement during the study period. The prevalence of stunting declined substantially from 30.8-20.6%, indicating a considerable reduction in chronic undernutrition. Similarly, wasting decreased from 17.4-10.4%, while severe wasting declined from 6.9-2.4%, reflecting significant improvement in acute malnutrition. The proportion of underweight children also reduced markedly from 25.5-16.8%. In addition, the prevalence of overweight among children under five years decreased from 5.7-2.7%, suggesting an overall improvement in nutritional status and a reduction in both undernutrition and overnutrition among young children.

Adult Nutritional Status and Non-Communicable Disease (NCD) Risk Factors

Table 8 presents the nutritional status and major Non-Communicable Disease (NCD) risk factors among adults in Himachal Pradesh by comparing NFHS-6 (2023-24) with NFHS-5 (2019-21). The proportion of adults with underweight (BMI <18.5 kg/m^2) increased slightly among both women (13.9-15.1%) and men (11.8-15.0%). In contrast, the prevalence of overweight or obesity (BMI ≥25 kg/m^2) also increased, particularly among women (30.4-38.2%) and modestly among men (30.6-31.4%), reflecting the coexistence of undernutrition and overnutrition in the state. The burden of raised blood sugar increased substantially, with the proportion of adults having high blood sugar or taking medication rising from 13.9-20.6% among women and from 14.7-20.0% among men. Similarly, the prevalence of elevated blood pressure or current use of antihypertensive medication increased from 22.2-24.1% among women and from 24.4-31.7% among men. These findings indicate a continuing epidemiological transition and an increasing burden of non-communicable disease risk factors in Himachal Pradesh.

Women's Empowerment and Decision-Making

Table 9 presents selected indicators of women's empowerment in Himachal Pradesh by comparing NFHS-6 (2023-24) with NFHS-5 (2019-21). Women's empowerment showed mixed trends during the study period. The proportion of currently married women who usually participate in household decisions declined marginally from 93.9-92.3%. In contrast, substantial improvements were observed in financial inclusion, with the proportion of women having a bank or savings account that they themselves use increasing from 83.1-93.0%. Mobile phone ownership also increased from 79.5-84.3%, while the use of hygienic methods of menstrual protection improved from 92.0-94.9%. Overall, the findings indicate continued progress in women's financial empowerment and access to communication resources, despite a slight decline in participation in household decision-making.

Gender-Based Violence Against Women

Table 10 presents the gender-based violence indicators reported in the NFHS-6 (2023-24) Fact Sheet for Himachal Pradesh and compares them with NFHS-5 (2019-21). The proportion of ever-married women who had ever

Table 10: Gender-Based Violence Against Women in Himachal Pradesh: Comparison of NFHS-5 (2019-21) and NFHS-6 (2023-24)

Indicator	NFHS-6 (2023-24)	NFHS-5 (2019-21)	Absolute Change
Women aged 18-49 years who have ever experienced spousal violence (%)	4.3	8.6	-4.3
Women who experienced physical violence during any pregnancy (%)	0.8	0.6	+0.2
Women aged 18-49 years who experienced sexual violence before age 18 years (%)	0.3	0.7	-0.4

Table 11: Tobacco and Alcohol Consumption Among Adults in Himachal Pradesh: Comparison of NFHS-5 (2019-21) and NFHS-6 (2023-24)

Indicator	NFHS-6 (2023-24)	NFHS-5 (2019-21)	Absolute Change
Women (15 years and above) who use any kind of tobacco (%)	1.9	1.7	+0.2
Men (15 years and above) who use any kind of tobacco (%)	28.9	32.2	-3.3
Women (15 years and above) who consume alcohol (%)	0.6	0.6	0.0
Men (15 years and above) who consume alcohol (%)	30.2	31.9	-1.7

experienced spousal violence declined substantially from 8.6-4.3%, indicating an encouraging reduction during the inter-survey period. In contrast, the proportion of women who experienced physical violence during pregnancy increased slightly from 0.6-0.8%, although the overall prevalence remained low. The proportion of women who experienced sexual violence before the age of 18 years decreased from 0.7-0.3%. Overall, the findings suggest improvements in key gender-based violence indicators; however, the continued occurrence of violence against women highlights the need for sustained preventive measures, early identification and accessible support services.

Tobacco and Alcohol Consumption

Table 11 summarizes the prevalence of tobacco and alcohol consumption among adults in Himachal Pradesh by comparing NFHS-6 (2023-24) with NFHS-5 (2019-21). The use of tobacco remained substantially higher among men than women. Tobacco use among women increased marginally from 1.7-1.9%, whereas it declined among men from 32.2-28.9%. Alcohol consumption continued to show marked sex differences, with very low prevalence among women (0.6% in both surveys) compared with men. The proportion of men consuming alcohol decreased slightly from 31.9-30.2%. Overall, the findings indicate persistently higher tobacco and alcohol use among men despite modest reductions over time.

Table 12 summarizes the most notable changes observed between NFHS-5 (2019-21) and NFHS-6 (2023-24) across major public health domains in Himachal Pradesh. Indicators are ranked according to the magnitude of absolute percentage-point change, irrespective of direction and categorized according to their likely public health significance.

DISCUSSION

Population and Household Characteristics

The present analysis indicates that Himachal Pradesh continues to experience an advanced demographic and epidemiological transition. The decline in the proportion of the population aged below 15 years, together with the increasing proportion of older adults, reflects sustained low fertility and progressive population ageing. Nearly universal household electrification and the substantial expansion of health insurance coverage demonstrate continued progress towards Universal Health Coverage (UHC). Improvements in female educational attainment, financial inclusion through bank account ownership and women's ownership of house and/or land further indicate positive socioeconomic development. However, the decline in access to improved drinking-water sources and the marked reduction in preschool attendance among children aged 2-4 years remain important public health concerns that warrant focused policy attention, particularly in the areas of environmental health and early childhood development.

Characteristics of Adults, Marriage and Fertility

Educational attainment and digital connectivity improved substantially among both women and men, reflecting continued investments in education and expanding access to information technology. The remarkable increase in internet use has the potential to enhance health literacy, facilitate digital health interventions and improve access to government welfare programmes. Although the total fertility rate remained below replacement level despite a marginal increase, Himachal Pradesh continues to maintain one of the lowest fertility levels in the country. The decline in adolescent pregnancy is encouraging and may reflect improved reproductive health awareness and adolescent health services. Nevertheless, the increase in early marriage among both women and men suggests that deeply rooted social and cultural factors continue to influence marriage practices despite improvements in educational attainment, highlighting the need for sustained community engagement and effective enforcement of existing legislation.

Family Planning

Although overall contraceptive prevalence increased modestly, the pattern of contraceptive use changed considerably. The decline in modern contraceptive use, accompanied by a substantial increase in traditional contraceptive methods, may reflect changing contraceptive preferences, concerns regarding modern methods or gaps in counselling, method availability or service quality. At the same time, the decline in unmet need for family planning suggests better fulfilment of reproductive intentions among couples. These apparently contrasting findings emphasize the importance of ensuring informed contraceptive choice rather than focusing solely on contraceptive prevalence.

Table 12: Summary of Major Public Health Changes Between NFHS-5 (2019-21) and NFHS-6 (2023-24) in Himachal Pradesh

Rank	Indicator	Domain	NFHS-5	NFHS-6	Absolute Change (Percentage Points)	Trend	Public Health Interpretation	Priority
1	Men who have ever used the Internet	Digital Health	52.7	83	30.3	▲ Improvement	Marked improvement in digital connectivity and access to health information	Moderate
2	Women who have ever used the Internet	Digital Health	49.7	75.4	25.7	▲ Improvement	Improved digital inclusion and health literacy among women	Moderate
3	Population covered under any health insurance scheme	Universal Health Coverage	38.9	61.4	22.5	▲ Improvement	Significant expansion of financial risk protection	High
4	Mothers consuming IFA for ≥180 days	Maternal Nutrition	43	62.9	19.9	▲ Improvement	Major improvement in antenatal nutritional supplementation	High
5	Mothers consuming IFA for ≥100 days	Maternal Nutrition	67.2	82.1	14.9	▲ Improvement	Better compliance with antenatal iron supplementation	High
6	Children aged 2-4 years attending preschool	Early Childhood Development	64.7	50.9	-13.8	▼ Decline	Largest decline; potential impact on child development	Very High
7	Four or more ANC visits	Maternal Health	70.6	83.2	12.6	▲ Improvement	Better utilization of antenatal care services	High
8	Private facility caesarean-section deliveries	Maternal Health	51.4	63.7	12.3	▲ Increase†	Rising operative deliveries in the private sector	High
9	First-trimester ANC registration	Maternal Health	72.4	84	11.6	▲ Improvement	Earlier registration for antenatal care	High
10	Stunting among children	Child Nutrition	30.8	20.6	-10.2	▲ Improvement	Major reduction in chronic undernutrition	High
11	Bank account used by women	Women's Empowerment	83.1	93	9.9	▲ Improvement	Improved financial inclusion and autonomy	Moderate
12	Children receiving minimum adequate diet	Child Nutrition	18.5	27.8	9.3	▲ Improvement	Better complementary feeding practices	High
13	Births delivered by caesarean section	Maternal Health	21	29.9	8.9	▲ Increase†	Increasing caesarean-section rate requiring monitoring	High
14	Underweight among children	Child Nutrition	25.5	16.8	-8.7	▲ Improvement	Significant reduction in childhood undernutrition	High
15	Exclusive breastfeeding (<6 months)	Child Nutrition	69.9	60.8	-9.1	▼ Decline	Reduced optimal infant feeding practices	High
16	Second dose of measles-containing vaccine (MCV2)	Immunization	69.2	77.2	8	▲ Improvement	Strengthened routine immunization	High
17	Women overweight/obese (BMI ≥25 kg/m²)	NCD Risk	30.4	38.2	7.8	▲ Increase†	Growing obesity burden among women	High
18	Population using improved drinking-water source	Environmental Health	96.2	89.5	-6.7	▼ Decline	Reduced access to improved drinking-water sources	Very High
19	Women with high blood sugar/on treatment	NCD Risk	13.9	20.6	6.7	▲ Increase†	Increasing diabetes burden	High
20	Traditional contraceptive use	Family Planning	10.8	17.8	7	▲ Increase†	Shift away from modern contraceptive methods	High

Expanding access to a broader basket of modern contraceptive methods, strengthening counselling services and promoting greater male participation in family planning should remain important programme priorities.

Maternal Health Care

Maternal healthcare indicators demonstrated substantial improvement between NFHS-5 and NFHS-6. Significant increases in first-trimester antenatal registration, coverage of at least one antenatal care visit, four or more antenatal care visits, iron-folic acid supplementation for both 100 days and 180 days or more, institutional deliveries, skilled birth attendance and neonatal tetanus protection indicate strengthening of maternal healthcare services and improved utilization of antenatal care. The consistently high coverage of Mother and Child Protection (MCP) cards further reflects effective implementation of maternal health programmes, although a marginal decline was observed compared with NFHS-5. However, the considerable rise in caesarean-section deliveries, particularly in private health facilities, warrants careful monitoring to ensure that operative deliveries are guided by appropriate clinical indications and evidence-based obstetric practice.

Child Health, Immunization and Vitamin A Supplementation

Immunization coverage remained consistently high in Himachal Pradesh, reflecting the strong performance of the Universal Immunization Programme and primary healthcare services. Improvements in overall full immunization coverage, second-dose measles vaccination, rotavirus vaccination and vitamin A supplementation indicate strengthening of routine immunization services. Nevertheless, slight reductions in coverage of selected vaccines, including BCG, pentavalent vaccine, first-dose measles vaccine and the birth dose of hepatitis B vaccine, highlight the importance of maintaining uniformly high coverage across all antigens. The persistently low prevalence of diarrhoea and acute respiratory infections suggests favourable child health conditions, although the slight increase in severe diarrhoea and the modest decline in healthcare-seeking behaviour for fever or respiratory symptoms warrant continued surveillance and caregiver education.

Infant and Young Child Feeding Practices

Infant and young child feeding practices demonstrated both encouraging improvements and continuing challenges. Early initiation of breastfeeding improved modestly compared with NFHS-5, while the proportion of infants who were currently breastfeeding remained almost universal. Improvements in dietary adequacy among children aged 6-23 months indicate better complementary feeding practices and increasing nutrition awareness. However, the decline in exclusive breastfeeding during the first six months of life remains an important concern because exclusive breastfeeding is fundamental for optimal infant growth, immunity and survival. Strengthening breastfeeding counselling during antenatal care, institutional delivery and postnatal follow-up, together with community-based nutrition education through programmes such as POSHAN Abhiyaan, remains essential for sustaining optimal infant feeding practices.

Nutritional Status of Children

One of the most encouraging findings of the present study is the substantial improvement in the nutritional status of children under five years of age. Significant reductions were observed in stunting, wasting, severe wasting and underweight, indicating improvements in both chronic and acute undernutrition. A decline in childhood overweight was also observed, suggesting overall improvement in nutritional status rather than an emerging double burden among young children. These findings likely reflect the cumulative impact of nutrition-sensitive and nutrition-specific interventions, including improvements in maternal healthcare, infant and young child feeding practices, immunization and primary healthcare services. Nevertheless, approximately one-fifth of children remain stunted and one-sixth remain underweight, indicating that childhood undernutrition continues to be an important public health challenge requiring sustained multisectoral action.

Adult Nutritional Status and Non-Communicable Disease (NCD) Risk Factors

The findings demonstrate that Himachal Pradesh is undergoing an advanced epidemiological transition characterized by the coexistence of undernutrition and increasing non-communicable disease risk factors. The simultaneous increase in underweight and overweight or obesity among adults indicates the persistence of a double burden of malnutrition. Equally concerning is the marked increase in elevated blood glucose and hypertension among both women and men, suggesting a rapidly increasing burden of diabetes and cardiovascular disease. These findings emphasize the need to strengthen population-based screening, early diagnosis, lifestyle modification, risk-factor reduction and long-term management of NCDs through comprehensive primary healthcare and the Ayushman Bharat Health and Wellness Centre framework.

Women's Empowerment and Decision-Making

Women's empowerment indicators showed mixed trends during the study period. Financial inclusion improved substantially, as evidenced by increased ownership and use of bank accounts, while mobile phone ownership and the use of hygienic menstrual protection methods also increased. These improvements have the potential to enhance women's autonomy, access to health information and utilization of healthcare services. However, the slight decline in women's participation in household decision-making indicates that gains in financial and digital inclusion may not necessarily translate into greater decision-making autonomy. Continued

efforts to promote gender equity, women's education, financial literacy and social empowerment remain essential.

Gender-Based Violence Against Women

The prevalence of ever experiencing spousal violence declined substantially compared with NFHS-5, representing an encouraging improvement in women's safety and well-being. Reports of sexual violence before the age of 18 years also declined. However, the slight increase in physical violence during pregnancy, although uncommon, remains clinically important because of its potential adverse consequences for both maternal and neonatal health. These findings reinforce the need for continued multisectoral interventions promoting gender equality, strengthening legal protection, integrating routine screening for domestic violence within healthcare services and ensuring timely psychosocial, medical and legal support for survivors.

Behavioural Risk Factors: Tobacco and Alcohol Consumption

Behavioural risk factors remained strongly gender-specific in Himachal Pradesh. Tobacco use declined among men but increased marginally among women, although the prevalence among women remained very low. Alcohol consumption remained unchanged among women and declined slightly among men. Despite these modest improvements, tobacco and alcohol use continue to be substantially more prevalent among men and remain important contributors to the growing burden of cardiovascular diseases, cancers, chronic respiratory diseases and other non-communicable diseases. Strengthening tobacco and alcohol control policies, expanding cessation services and promoting sustained behaviour change communication should therefore remain important public health priorities.

Overall Public Health Transition in Himachal Pradesh

The comparison of NFHS-5 and NFHS-6 demonstrates that Himachal Pradesh has achieved considerable progress across multiple public health domains, including digital inclusion, health insurance coverage, maternal healthcare utilization, childhood nutrition, immunization, financial inclusion and several dimensions of women's empowerment. At the same time, important challenges remain, including declining preschool attendance, reduced use of modern contraceptive methods, lower exclusive breastfeeding rates and reduced access to improved drinking-water sources. The increasing prevalence of overweight, obesity, hypertension and elevated blood glucose further highlights the state's ongoing epidemiological transition towards chronic non-communicable diseases. Future public health strategies should adopt an integrated life-course approach that simultaneously strengthens maternal and child health services, promotes optimal nutrition and healthy lifestyles, addresses environmental determinants of health, improves reproductive health services and expands prevention, early detection and long-term management of non-communicable diseases. Such an approach will be essential for sustaining recent achievements while addressing emerging health challenges and ensuring equitable health gains across the population.

Strengths and Limitations of the Study

A major strength of this study is the use of the official Himachal Pradesh NFHS-5 (2019-21) and NFHS-6 (2023-24) Fact Sheets, enabling standardized comparison of a wide range of demographic, maternal, child health, nutritional, behavioural, women's empowerment and NCD indicators across two survey rounds. The use of nationally representative data provides robust evidence for programme monitoring and policy formulation. However, the cross-sectional design precludes causal inference, several indicators are self-reported and may be subject to recall or reporting bias and the use of aggregated state-level Fact Sheet data limits detailed subgroup and multivariable analyses. Despite these limitations, the study offers comprehensive and policy-relevant evidence on the evolving public health profile of Himachal Pradesh.

Policy Implications

The findings demonstrate encouraging progress in maternal healthcare, childhood nutrition, immunization, health insurance coverage, digital inclusion and women's financial empowerment. However, declining preschool attendance, reduced modern contraceptive use, lower exclusive breastfeeding, reduced access to improved drinking-water sources and increasing reliance on traditional contraceptive methods require immediate programmatic attention. Simultaneously, the rising burden of obesity, hypertension and elevated blood glucose highlights the need to strengthen preventive healthcare, promote healthy lifestyles, improve reproductive and child health services and integrate NCD prevention and management within comprehensive primary healthcare through coordinated multisectoral action.

Future Research Directions

Future research should investigate the determinants of declining modern contraceptive use, exclusive breastfeeding, preschool attendance and access to improved drinking-water sources using mixed-methods and implementation research. Longitudinal, district-level and equity-focused studies are also needed to better understand the increasing burden of obesity, hypertension and diabetes and to evaluate the effectiveness of ongoing public health programmes. Integrating NFHS findings with routine health information systems would further strengthen evidence-based planning and policy decisions.

CONCLUSIONS

The comparative analysis of NFHS-5 and NFHS-6 demonstrates that Himachal Pradesh has made substantial progress in health insurance coverage, maternal healthcare, childhood nutrition, immunization, digital inclusion, financial empowerment and several indicators of women's

empowerment. Nevertheless, declining preschool attendance, reduced modern contraceptive use, lower exclusive breastfeeding, declining access to improved drinking-water sources and the growing burden of obesity, hypertension and elevated blood glucose indicate emerging public health challenges. Sustaining recent gains while addressing these priorities through integrated, evidence-based and equity-oriented strategies will be essential for improving population health and accelerating progress towards Universal Health Coverage and the Sustainable Development Goals in Himachal Pradesh.

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