

significant role in the development of the economy, hence it is necessary for men and women to stay healthy. But unfortunately, gender discrimination persists in many areas of life in the whole world. One area of them is also health. Gender discrimination in health is prevailing almost many countries on the globe (Uribe, 2022). India is also one of the countries where gender discrimination in health persists (Tripathi, 2021). Gender inequality has deep impact on our health (Tiwari, Singh, Manar, Mohan, & Pandey, 2020) and especially on women's health. Many previous researches articulated women's inferior situation and their poor health condition in the Indian society. India is one of the few countries in the world where women and men have nearly the same life expectancy at birth. The fact that the typical female advantage in life expectancy is not seen in India suggests there are systematic problems with women's health (Velkoff & Adlakha, 1998).

Objectives of the paper are given below-

- ❖ To analyze the trend in Sex Ratio at Birth in Uttar Pradesh.
- ❖ To assess growth rate in Sex Ratio at Birth in the state.
- ❖ To analyze trend in IMR in the state.
- ❖ To assess growth rate in IMR in the state.
- ❖ To capture gender discrimination in Infant Mortality Rate in the state.

Data Source and Methodology

The present work is an attempt to explore women health condition in the U.P. This paper is also trying to address gender discrimination in health in U.P. To meet out the objectives of the paper, the secondary data has been used. The secondary data are collected from many sources like different round of National Family Health Survey (NFHS), DLHS, Sample Registration Survey (SRS), MMR bulletin and other sources and websites etc. To confer appropriate results, some appropriate statistical tools and techniques like trend analysis, descriptive statistics etc. are used on these data which are collected from various sources. Health is very crucial factor and equally important for men and women. But present scenario decline and fact and portrays gender discrimination in many areas including health also. There are many indicators to address gender discrimination in health, but due to some limitations and to fulfil the objective of the paper, only Infant Mortality Rate (IMR) and Sex Ratio at Birth have been taken in to consideration. For establishing trend lines for various indicators, we use the formula of trend line which is given below-

$$y = a + bx$$

where; y is dependent variable showing different indicators, x is the independent variable showing time periods, b is the slope of the indicators and a is the y - intercept. For calculating year on year basis growth rate of the indicators, the following formula is used-

$$\text{Growth rate} = \frac{\text{Current year value} - \text{previous year value}}{\text{Previous year value of indicator}} \times 100$$

Health Status in Uttar Pradesh

Uttar Pradesh is the most populated state in the country. Its population is about 19 crore (Census, 2011) and almost 25 crores in 2021 (World Population Prospect). When we consider geographical area of U.P. we find that U.P. is the fourth largest state in India in terms of geographical area holding. Despite of highest populated state and having enormous area of land, U.P is facing many challenges on the health and some other fronts. This paper is an attempt to access gender discrimination in the state. Despite of many indicators available to trace gender discrimination in health in the society, only some indicators are discussed below-

Sex Ratio at Birth

Sex ratio¹ is one of the important indices to comprehend women's health and position in any society (Barakade, 2012). Sex ratio is one of the best indicators to trace women health and gender discrimination prevailing in the society. It discloses the attitude of the society towards girls and women (Gupta & Tripathi, 2022). Indian women are treated differently due to the domination of patriarchal thinking and a number of socio - economic and cultural beliefs in Indian society. This patriarchal attitude can be easily traced with indicators like sex ratio (Tripathi, 2021).

According to census 2011, sex ratio of Uttar Pradesh is 912 which was earlier 898 in census 2001. It shows that women are less likely to survive in the state because sex ratio is 912. Sex ratio lower than 1000 shows gender discrimination prevailing in the state. Low sex ratio implies unfavourable live chances for females (Sarap, Das, & Nagla, 2013). Sex ratio addresses female's health situation and their quality of life in the society. Low sex ratio represents poor health condition of women in the society (Gupta & Tripathi, 2022). Sex ratio addresses female's health situation and their quality of life in the society. Low sex ratio represents poor health condition of women in the society (Gupta & Tripathi, 2022). Though sex ratio is the good indicator of gender discrimination but sex ratio at birth is better than sex ratio for exploring gender discrimination in health. Sex ratio at birth is defined as number of girls born alive per 1000 boys born (Warade, Salsarkar, & Bandekar, 2014). Sex ratio at birth is also more accurate and redefined indicator of parental sex selection (Coney & Mackey, 1998). Sex Ratio at Birth (SRB) is given below in the following chart-

¹ Sex ratio is generally defined as number of females per 1000 males in the population.

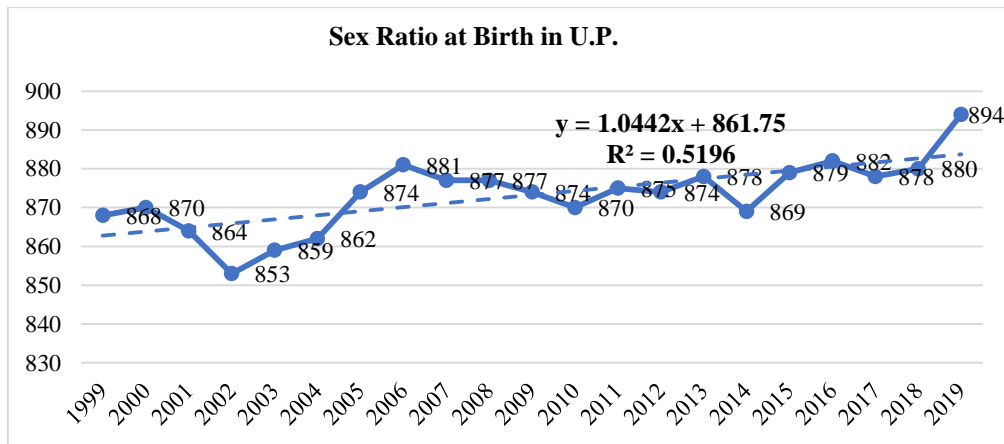


Chart 1: Sex Ratio at Birth trend in U.P. Source: self-created chart using SRS data and www.ceicdata.com website.

The above table reflect sex ratio at birth trend in U.P. The chart shows that SRB was 868 girls per 1000 boys during year 1999 and increased to 870 in the year 2000. After this year SRB started reducing for two consecutive years. SRB had reduced to 853 in the year 2002. From the year 2002, SRB started to increase and reached to 881 in the year 2006 which was the new top level of SRB. After reaching the top, SRB continuously declined to 870 in the year 2010. From the year 2010 to year 2017, SRB had shown very irregular trend and reached to 878 in the year 2017. From the year 2017 onwards, SRB started to increase and reached at all time high level. SRB had been increased to 894 in the year 2019. After analyzing the chart thoroughly, we find that sex ratio at birth has been increased by only 26 points during 21 years. It is not significant growth in sex ratio at birth in the state over the period of 21 years. After going through the chart, we find that SRB is showing irregular increasing trend over the period of time. The equation for trend line of SRB is given below-

$$y = a + bx$$

Where y is dependent variable showing SRB, x is independent variable showing time periods, a & b are constants, b = rate of change in SRB, a = y -intercept.

Chart shows the positive slope of the trend line of SRB in the state over the period of time. Slope of trend line of SRB shows rate of growth in SRB in U.P. over the period of time. The above chart shows that the trend line is upward sloping with the slope magnitude of 1.0442. It reflects that SRB is showing increasing trend at rate of 1.0442 points per year over the period of 1999 to 2019. SRB represents current situation of women health and attitudes of the society towards girl child. It reflects availability, access and use of health facilities by women in the society. Despite of fluctuations in SRB, its increasing trend portrays improved health facilities in the state over the period of time as reflected in National Family Health Survey (NFHS-5). Institutional birth is increased to 83.4% during 2019-21 in NFHS-5 from 67.8% in 2015-16 during NFHS-4 (NFHS-5, 2021). It shows improved health care and delivery care facility in the state resulting increasing SRB in the state. The above graph shows only SRB over the period of time but it is unable to say anything about growth rate of SRB year on year basis. Growth rate in SRB is given below in the following graph-

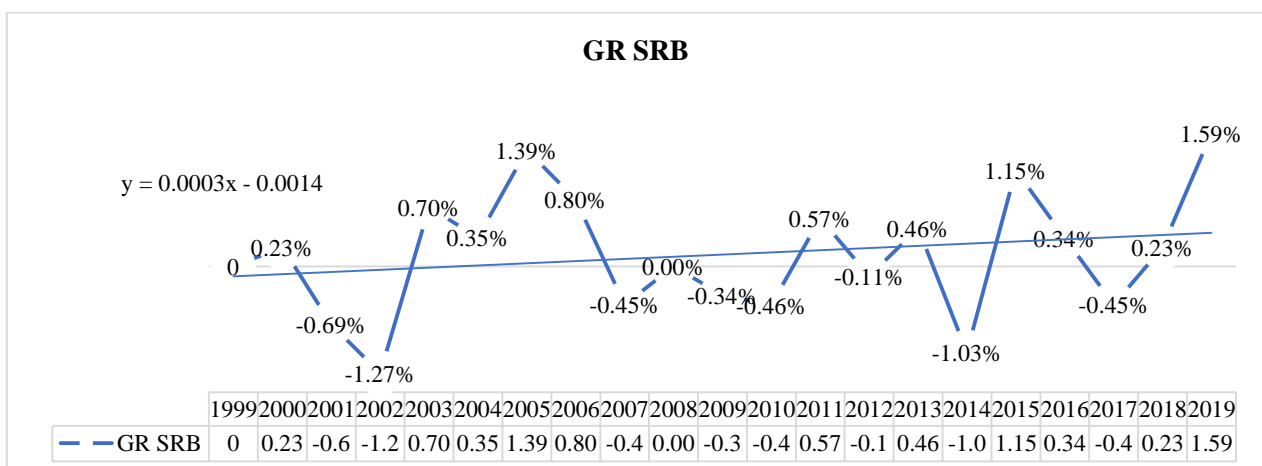


Chart 2: Growth rate in sex ratio at birth in U.P. Source: Self-created graph by scholar

The able chart enables us to depict the growth rate of SRB in the state clearly. The chart shows that 8 years out of 20 years reflect negative growth rate in SRB in the state. these years were 2001, 2002, 2007, 2009, 2010, 2012, 2014, and 2017. Years 2008 reflects zero growth rate in SRB in the state. The rest of 11 years shows positive growth rate of SRB in the state over the period of time. The graph shows highest positive growth rate in year 2019 in the state. The reason behind this may be improved health

situation in the state and better women's health situation in the state as reflected in NFHS- 5 survey. Institutional births, antenatal care, postnatal care and nutritional status etc. are improved in the state as stated in the NFHS-5. According to NFHS-5, "institutional births are increased to 83.4% during 2019-21 in NFHS-5 from 67.8% in 2015-16 during NFHS-4. Antenatal care visits are improved to 62.5% in NFHS-5 which earlier was 45.9% in NFHS-4. Postnatal care visits are also increased to 72% during NFHS-5 in the year 2019-21 from 54% during NFHS-4 in the year 2015-16. The NFHS-5 also reflects improvement in nutritional level in the state. according to NFSH-5, percentage of women suffering from anaemia is reduced to 50.4 in NFHS-5 during 2019-21 from 52.4% in NFHS-4 during 2015-16" (NFHS-5, 2021). The chart also shows that highest negative growth rate of SRB was -1.27% during year 2002 in the state. We also see the highest positive change during 2014 to 2015 by 2.18%. Growth rate of SRB was -1.03% in the year 2014 and increased to 1.15% in the year 2015. Almost all health and public health care facilities are improved in NFHS-4 (NFHS-4, 2017). Despite many fluctuations in SRB over the period of time, it can be seen positive and increasing trend in growth rate of the SRB in the state over the period of year 1999 to year 2019. The equation for trend line of growth rate of SRB is given below-

$$y = a + bx$$

Where y is dependent variable showing growth rate of SRB, x is independent variable showing time periods, a & b are constants, b = rate of change growth rate of in SRB, a = y -intercept.

Trend line of growth of SRB shows positive slope over the period of time. The slope of trend line of growth of SRB in the state is 0.0003 over the period of time. It reflects that growth rate of SRB in the state increased with rate of 0.0003% per year over the period of 1999 to 2019. It also shows improved health situation in the state at present.

Infant Mortality Rate

Assuring public health services is primary duty of every government and as such, the government has taken steps to maintain public health, by opening health centers, hospitals, mobile hospitals, organizing mass awareness camps on health and so on (Krishna, Shashidhar, & Smitha, 2016). Infant mortality is a good indicator to assess public health. Infant mortality is also a proxy indicator of population health. There is a potential association between the causes of infant mortality and factors that are likely to influence health status of the whole population (Crevoiserat & Kim, 2014). IMR is defined as the ratio of infant deaths registered in a given year to the total number of live births registered in the same year; usually expressed as a rate per 1000 live births (Park, 2015). The infant mortality rate (IMR) is the probability of dying before one year of age expressed per 1000 live-births (Sharma, 2008). This is good indicator to trade gender inequality and health condition in the society. To assess gender inequality in U.P. is prime motive of the paper and we have inculcated this indicator to do so. Infant Mortality Rate (IMR) of the state is given below in the following table/ chart-

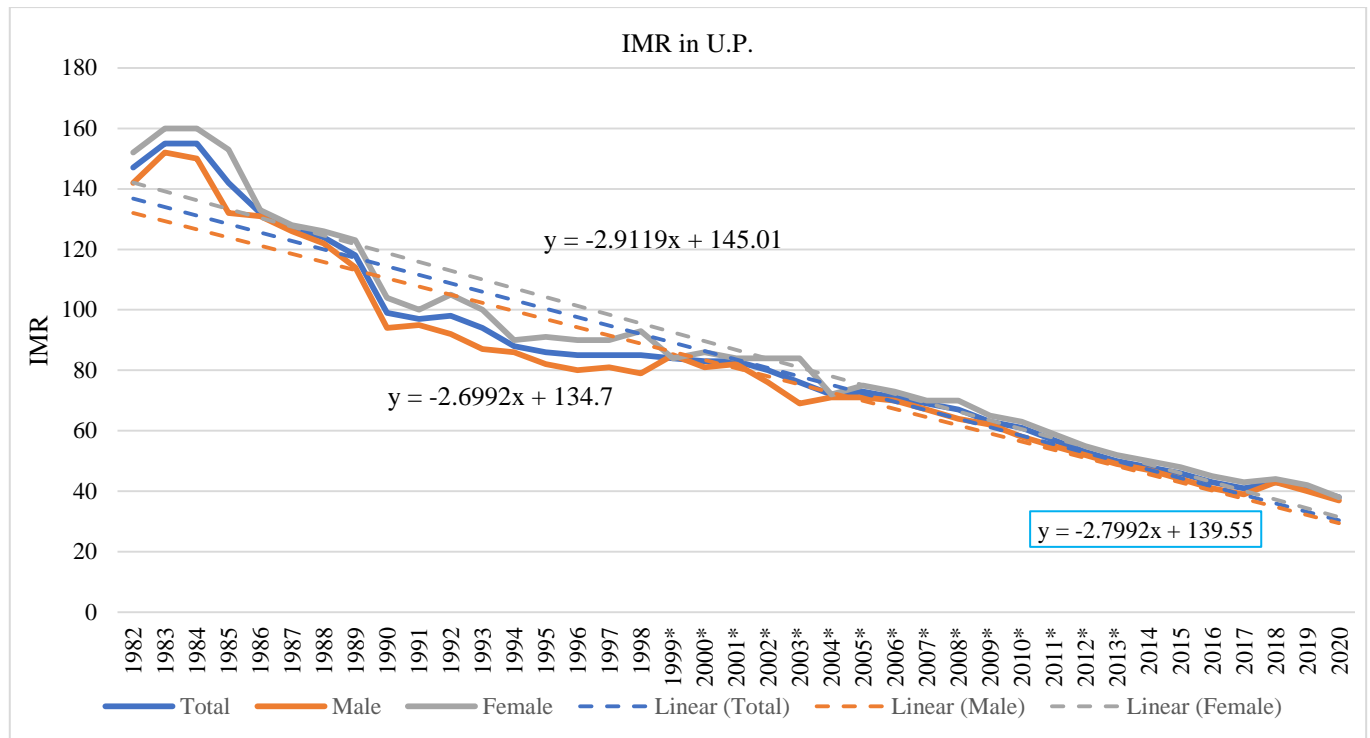


Chart 3: Gender-wise IMR in U.P. Source: Self-created chart by authors

The above chart shows the fluctuation of IMR for male and female along with total IMR of U.P. The figure shows that IMR for female in the U.P. was 152 in year 1982 and increased to 160 in the year 1983. This shows distortion in female IMR between two consecutive years in the state. Female IMR was stuck at 160 for next year in the state. After the year 1984, female IMR started to decline irregularly over the period of time. The female IMR is reduced to 38 in year 2020 in the state. This decline in the female IMR is not smooth and regular but has been shown fluctuation over the period of year 1982 to year 2020. The reason behind this

improvement may be improved health infrastructure in the state (Tripathi, Health Assessment of Women, 2021), and some non-medical factors like pure water, sanitation, nutrition etc. (NFHS-5, 2021). The equation for trend line of female IMR is given below-

$$y = a + bx$$

Where y is dependent variable showing female IMR, x is independent variable showing time periods, a & b are constants, b = rate of change in female IMR, a = y -intercept.

The trend line of female IMR is showing downward slope from left to right. The slope of female IMR is negative over the period of time. The slope of trend line of female IMR is -2.9 which means female IMR is reducing at the rate of 2.9 points per year over the period of time from year 1982 to year 2020. It shows that female IMR is continues declining at the pace of 2.9 points per year. It shows the improved health facilities and non- medical facilities like literacy rate, water, sanitation etc. which ultimately resulted in to lower female IMR in the state over the period of time (Claeson, Bos, Mawji, & Pathmanathan, 2000). The chart also displays the male IMR over the period of 1982 to year 2020. The chart shows that male IMR was 142 in the year 1982 and increased to 152 in the year 1983. It shows that male IMR distorted between year 1982 to year 1983. After the year 1983, male IMR started to decline over the period of year 1983 to year 2020. Male IMR is reduced to 37 in the year 2020 in the state. During these years, male IMR has been decreased with fluctuation. This chart shows the irregular decreasing trend over the period of 1983 to 2020. The male IMR trend line is downward sloping from left to right over the period of time. The chart shows irregular but declining trend of male IMR during the study period in the state.

The magnitude of the slope of the trend line of male IMR shows rate of change in male IMR over the period of time. The chart shows that magnitude of trend line of male IMR is -2.699 which shows that male IMR is decreasing with the rate of 2.99 points per year over the study period in the state. This improved IMR of male is due to improvement in health infrastructure (Tripathi, 2021), female and male literacy rate, nutritional status of male etc (NFHS-5, 2021). After going through the above chart, we find that male IMR is lower than female IMR. It shows that gender inequality in IMR is persists in the state. The equation for trend line of male IMR is given below-

$$y = a + bx$$

Where y is dependent variable showing male IMR, x is independent variable showing time periods, a & b are constants, b = rate of change in male IMR, a = y -intercept.

The trend lines of male IMR and female IMR show that trend line of male IMR is below the trend line of female IMR over the period of 1982 to 2020. It is unfavourable to female child in the state. After reviewing the chart thoroughly, we find that magnitude of the trend line of male IMR is -2.699 while that of female IMR is -2.912. It reflects that female IMR is declining with the higher pace than that of male IMR in the state over the period of time. The figure shows that gap between IMR of male and female is reduced and turn to very close in the year 2020. It is due to reform in health care and increased awareness among the people in the state (NFHS-5, 2021).

Fluctuations in growth rate of male IMR year on year basis is given below in the following figure-

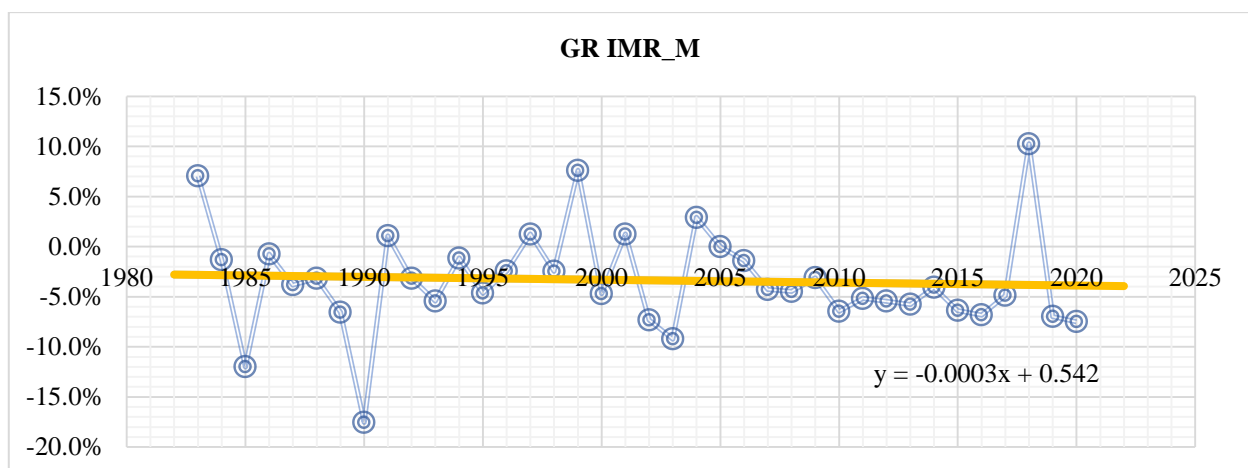


Chart 4: Growth rate of male IMR in U.P Source: self-created chart by the authors

The above figure discusses about year-on-year growth rate of IMR of male in the state. The figure shows that growth rate of male IMR was 0.07% in the year 1983 which is positive. It means bad signal for male infant in health perspective. The figure shows that there are 7 years in which male infant mortality growth rate was positive showing negative health status of male infant in the state during those years. The positive growth rate of male IMR shows inadequate health infrastructure, lower access of health facilities etc. in the state (Krishna, Shashidhar, & Smitha, 2016). The highest male IMR reduction was seen in the year 1989-90. During those years growth rate of male IMR was -0.175%. The negative growth rate in IMR reflects better health condition and improved health facilities in the state (Claeson, Bos, Mawji, & Pathmanathan, 2000). Highest positive growth rate in male IMR

can be seen in the year 2018. Male IMR was 0.102% which shows poor health condition in the state (Krishna, Shashidhar, & Smitha, 2016). The equation for trend line of growth rate of male IMR is given below-

$$y = a + bx$$

Where y is dependent variable showing male IMR growth rate, x is independent variable showing time periods, a & b are constants, b = rate of change in growth rate of female IMR, a = y -intercept.

Over-all trend of growth rate in male IMR is negative and downward sloping from left to right. It shows, despite of many fluctuations occurred in over the period of time, male IMR is reducing over the period of time. The chart also shows that magnitude of male IMR growth rate is -0.0003 which shows that male IMR growth rate declines at the rate of 0.0003% per year over the period of 1982-2020 in the state. This indicates the improvement in health sector in the state. Year on year growth rate of female IMR is given below in the following chart-

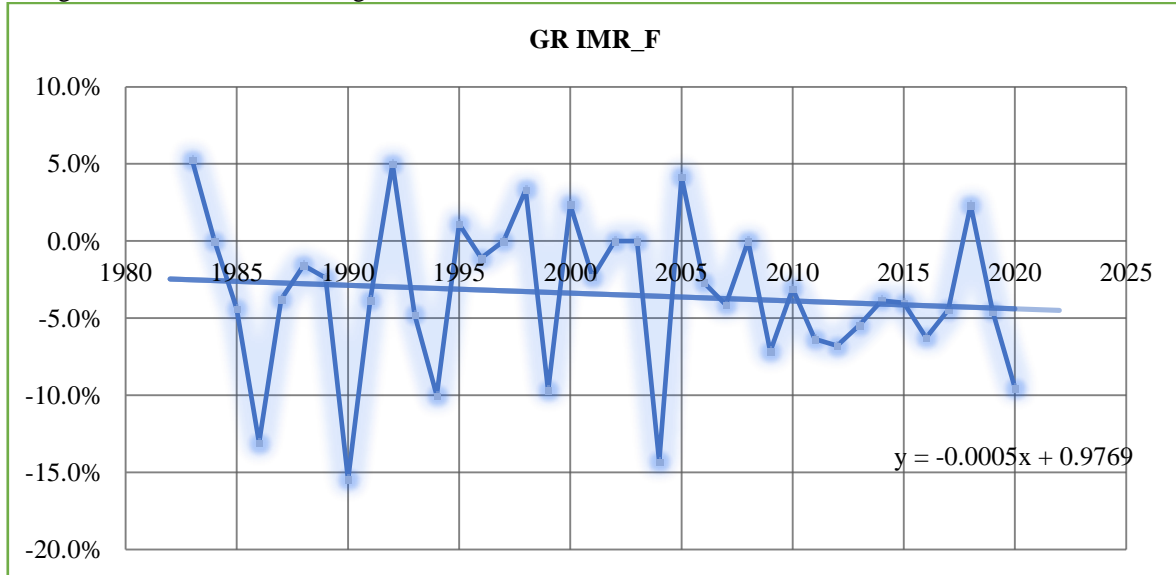


Chart 5: Growth rate of female IMR in the U.P. Source: Self-created figure by authors

The above diagram depicts fluctuation and irregular trend in growth rate of female IMR in the state over the period of time. The figure discloses the fact that growth rate of female IMR was 5.0% in the year 1983 which was much higher. This higher growth rate of female IMR shows poor health status of female as well as insufficient health infrastructure in the state at that time. In coming next years, health status of female and attitudes towards girl child was changed and health infrastructure is improved due to government intervention and this resulted in to improved female IMR and showed negative growth rate of female IMR. The figure shows that growth rate of female IMR was poor in the state for years 1993, 1995, 1998, 2000, and 2018. For these five years, female IMR growth rate was positive which indicates that female IMR is poor and unfavourable in the state during those years. The equation for trend line of growth rate of female IMR is given below-

$$y = a + bx$$

Where y is dependent variable showing female IMR growth rate X is independent variable showing time periods, a & b are constants, b = rate of change in growth rate of female IMR, a = y -intercept.

The trend line of growth rate of female IMR is downward sloping from left to right over the period of time. The slope of the trend line shows rate of change in the growth rate of female IMR over the period of years 1983-2020. The magnitude of slope of trend line is -0.0005 which shows that growth rate of female IMR is continuously decreasing at the rate of -0.0005% per year over the period of years 1993-2000. It shows the improved situation of female health and attitudes of the society toward female children (Gupta & Tripathi, 2022). After analyzing growth rates of female and male IMR, we find that slope of trend line of growth rate of female IMR is greater than that of male IMR. It leads us to the fact that growth rate of female IMR is decreasing more rapidly than that of male. It is good symptoms for gender parity in the state.

Conclusion and Policy Recommendations

The above study had tried to attempt almost every aspect of gender discrimination in sex ratio at birth and IMR in the state. The study is done thoroughly and finds that gender discrimination is prevailing in the state. The sex ratio at birth is lower than 1000 in all the year during the study. This lower SRB is showing number of females is always lower than that of male which is a significant indicator of gender inequality in the state. The present study also concludes that gender inequality in IMR is also persists in the state over the period of time. For improving the present situation of gender inequality and shrinking gender gap in the state the following suggestions are given below-

- To reduce gender gap in the sex ratio at births, educating women will play key role.
- Government should increase their expenditure on health sectors.

- Government and society should aware people to avail prenatal and postnatal care.
- Gender education should be made compulsory for all citizens in the state.
- Access, availability and freedom for job opportunities for female must be easy.

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