

Research Study Submission

A district level enquiry of pregnancy wastage in Maharashtra

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Abstract

The newborn mortality is a sensitive indicator of the socioeconomic development of any country. It also represents the health system performance and the quality of maternal health services being delivered. The present study tries to access the level and trends of stillbirths and abortions in Maharashtra using HMIS data from 2015-16 to 2022-23. Simple trend analysis has been used for data analysis. Results show that a higher proportion of pregnancies are converted into abortions and stillbirths in the state, with considerable variation across the districts. The prevalence of abortion and still births are higher in urban areas than rural areas across all the districts. Results further show that the rate of abortion has shown increasing trends after 2019-20 in overall and urban areas as well. Based on the results, appropriate strategies to reduce pregnancy wastage are a necessity and must begin in areas with higher rates of wastage. Along with ongoing programmes, the government needs to implement comprehensive and age-appropriate sex education programs in schools to educate individuals about reproductive health, contraception, and responsible sexual behaviour. Further Strengthening of maternal healthcare services, including prenatal and postnatal care, is recommended to monitor and address potential complications during pregnancy to prevent unnecessary abortions and stillbirths in the state.

Background

Newborn mortality is a sensitive indicator for the socioeconomic development of any country; hence better maternal health and pregnancy outcomes are significant public health priorities across the world. Adverse pregnancy outcomes such as miscarriage, abortion, and still-births reflect poor maternal health indicators, and in turn, a poor health care system. Prenatal care and institutional delivery are the most significant strategies to reduce the higher risk of maternal and fetal complications and deaths. The risk of maternal and newborn deaths due to complications of pregnancy and childbirth is higher in the low-middle income countries (Ahmed et al., 2018). In India, nearly 44,000 women die from pregnancy-related complications every year (PMSMA, 2016)). To improve maternal and pregnancy outcomes, the Government of India (GoI) has initiated various programs such as *Janani Suraksha Yojana-2005*, *Dakshata implementation package-2015*, *Pradhan Mantri Surakshit Matritva Abhiyan-2016*, *Pradhan Mantri Matru Vandana Yojna-2017*, and *LaQshya-2017* to provide a quality of free antenatal check-ups and care during delivery, identify high-risk pregnancies and provide cash incentives.

Stillbirth refers to the loss of a pregnancy after the 28th week of gestation period in the Indian context. The consequences of stillbirth can be devastating for the parents, as they have to deal with the loss of their child and the hopes and dreams they had for their future. In addition to the emotional toll, stillbirth can also have physical effects on the mother, such as bleeding, infection, or complications during delivery. The medical cause of stillbirth can vary and may be due to genetic abnormalities, infection, or problems with the placenta or uterus. Abortion refers to the intentional termination of a pregnancy before the fetus is viable. The consequences of abortion can also be emotional, as the decision to terminate a pregnancy can be difficult and may involve feelings of guilt, grief, or relief. Physically, abortion can also have side effects such as cramping, bleeding, or infection.

Health facilities can provide a support system for safe and healthy terminations of pregnancy. Better equipped facilities, services, post-abortion contraception etc., are factors which should be included in healthcare interventions. Research is needed to test interventions that improve knowledge and practice in providing medication abortion, and the Indian Government at the national and state level needs to prioritise improving policies and practice to increase access to comprehensive abortion care and quality contraceptive services that prevent unintended pregnancy. (Singh et al., 2018)

Pathak and Ram (1993) in their study based on Indian census data could observe prevalence of a higher proportion of infant and maternal mortality as a consequence of adolescent motherhood. Thus, better information dissemination, regarding contraception and maternal health is also a key to avoid pregnancy wastage.

Stillbirth is defined as per World Health Organization standards, "delivery of a baby after 28 weeks of gestation, but which did not show any signs of life like crying, respiration, heartbeat or any movements." (Geneva: World Health Organization; 2004:96). Stillbirths use health resources which are more extensive than live births (Heazell et al.), and are thus costlier to healthcare facilities and parents. Indirect and intangible costs such as emotional repercussions are borne by parents and families, and funeral costs created by stillbirths also lead to economic wastage. According to Heazell et al., stillbirths also lead to decreased employment among bereaved parents, with 10% of bereaved parents remaining off work for 6 months, and 38% of mothers and 21% of partners reducing their working hours. Searches of the International Labour Organization database showed that only 12 of 170 countries with maternity benefit policies included specific provision for stillbirths; an average of 11 days leave for mothers (range 28–84 days) and an average of 1 day off for fathers (Heazell et al.).

There are various risk factors such as Maternal age, abnormal parental genetic makeup, infections, hormonal imbalances, uterine dysfunctions, comorbidities, and lifestyle factors that are significantly associated with the incidence of a higher rate of pregnancy loss. (MoHFW, 2017; Patki & Chauhan, 2016).

The burden of stillbirths is disproportionately higher in sub-Saharan Africa and central and southern Asian countries. The greatest number of stillbirths are in India, followed by Pakistan, Nigeria, the Democratic Republic of the Congo, China and Ethiopia. These six countries accounted for half of the estimated global number of stillbirths (UN IGME, 2020).

To reduce the existing stillbirth rate to 10 per 1000 births by 2030, the Indian New-born Action Plan was implemented in 2014. Though there has been a substantial reduction in the stillbirth rate in India from 29.6 to 13.9 per 1000 total births during 2000–2019 (UN IGME, 2020). The prevalence of stillbirth (4.2 to 14.8) was reported to be widely variable across the Indian states (Altijani, et al., 2018).

Rationale of the study

The quality of maternal health services in any community is accessed by the women's reproductive health outcomes. While deliberating newborn mortality, neonatal deaths receive sufficient focus; however, stillbirths are not taken into account adequately. However, estimates of the NFHS show that early neonatal deaths and stillbirths are of equal magnitude in neonatal mortality. Moreover, while measuring the quality of maternal health care, spontaneous abortions are often overlooked, though studies show that spontaneous abortions are significantly associated with prenatal care. Hence the magnitude of and trends in stillbirths and spontaneous abortion can give a better picture of service delivery and the performance of the health system. Therefore, the aim of this study is to provide evidence of pregnancy wastage in the districts of Maharashtra. The other reason for conducting this is that geographic heterogeneity in the prevalence of abortions and stillbirths within the state are unknown. Also, there is no existing study that provides the recent trends in abortions and stillbirths in the state. Moreover, this study is also required to study the impact of the disruption of the health system caused by COVID-19 on the reproductive health outcomes of women.

Objectives

1. To study the level and trends of stillbirths in the district of Maharashtra by place of residence.
2. To study the level and trends of abortion (spontaneous and induced; MTPs) in the district of Maharashtra by place of residence.

Data and method

Data from the Health Management Information System (HMIS) have been extracted to fulfil the study objectives. HMIS data from 2015-16 to 2022-23 have been used. Trend analysis has been used for data analysis.

Operational definition of the outcome variables

Still births and abortion are the main outcome variables of the study. Owing to the data limitation we could not estimate the outcome indicators at disaggregate level. Abortion is the termination of a pregnancy. It is defined as 'the intentional ending of a pregnancy', by the Cambridge Dictionary. India was among the first countries to legalize abortion. Abortion has been legal in India since 1971 under broad criteria, including economic or social necessity,

rape, incest, fetal impairment or contraceptive failure within marriage. For the study, abortion rate is calculated as number of abortions (spontaneous and induced) per 100 ANC registrations. MTP (up to and more than 12 weeks of Pregnancy) rate is also calculated to see the districts wise prevalence of medical termination of pregnancy in the Maharashtra. MTP is defined as number of MTPs per 100 total abortions (spontaneous and induced).

A baby, who dies after 28 weeks of pregnancy, but before or during birth, is classified as a stillbirth. For the study, the Still Birth Rate (SBR) is defined as the number of still births per 1000 total births (live birth + still birth).

Results

Throughout the years, abortions to registered pregnancy ratios in Maharashtra have been high, which indicates that pregnancy wastage in unsafe conditions is high in the state (table 1). In Maharashtra, from 2015 to 2017, 10 out of 100 antenatal care (ANC) registered pregnancies resulted in abortions which were spontaneous or induced, and the rate dropped to three out of 100 after 2017. This drastic change might be attributed to the Medical Termination of Pregnancy Act introduced in 2017 which might have shifted the burden of pregnancy termination towards a safer and more legal channel.

In areas such as Sindhudurg, Raigharh and Satara, more than 20 out of all 100 ANC registered pregnancies resulted in spontaneous or induced abortions in the year 2015-16. In the year 2016-17, Sindhudurg registered an alarming rate of 44.5% of ANC registered pregnancies resulting in spontaneous or induced abortions, and of this, 43.8% were the MTPs. Even though rates of reported abortions and MTPs have declined over the years, the figures are still quite high, with Maharashtra registering a total of 3.3% of ANC registered pregnancies resulting in abortion in the year 2022-23. District like Beed, Sindhudurg, Dhule, Osmanabad, Mumbai and Parbhani reported higher rate of abortion among all the district in 2022-23. The lowest abortion rate was reported in the Jalna (0.5%), followed by Yavatmal (1.1%), Nandurbar (1.4%) and Latur (2.0%) in 2002-23.

Thus, pregnancy is often wasted in Maharashtra, primarily in the form of abortions or MTPs. After 2017, the ratio of medically terminated pregnancies increased to more than 70% and remained so, as observed till the year 2019-20. Thereafter, it has shown declining trends. In the districts of Beed, Kolhapur, Pune, and Solapur, more than 80% of MTP out of total abortion in 2022-23. Whereas, the proportion of MTP to total abortion is least in Gondia, Hingoli, Nanded and Parbhani district in 2022-23 (table 2).

It has been tried to estimate the abortion rate across places of residence across all districts of Maharashtra. Owing to the data limitation, however, owing to the data limitation, the rate has been estimated only from 2020 to 2023 (table 3). Overall, the prevalence of abortion (spontaneous and induced) has been higher in urban areas than in rural areas across all the districts. The state average shows that the prevalence of abortion has increased from 3.1% in 2020-21 to 3.5% in 2022-23 in rural areas and from 12.5% in 2020-21 to 19.4% in 2022-23 in urban areas. For urban area, it has shown the increasing trends across all the districts, except Jalgaon and Nashik and similar patterns has been observed in rural area.

Table 4 present the percentage of MTPs to total abortion in the districts of Maharashtra by place of residence, 2020-21-2023. Overall, the prevalence of MTPs to total abortion has been higher in urban areas than in rural areas across all the districts. The state average shows that the prevalence of MTPs to total abortion has increased from 81.1% in 2020-21 to 81.5% in 2022-23 in urban areas and declined from 46.7% in 2020-21 to 35.9% in 2022-23 in rural areas. It is also observed that highest percentage of MTPs found in the district of Satara, Sindhudurg, Ratnagiri.

The table 5 presents rate of still birth (total still birth per thousand live birth and still births) in the district of Maharashtra from 2015-16 to 2022-23. Data reveals diverse trends and regional performance fluctuations in still births over the year.

The districts such as Gadchiroli and Nandurbar show substantial fluctuations in still birth, with Gadchiroli experiencing a peak in 2016-17 (32.8 still births per thousand births) and subsequent declines. Nandurbar follows a similar pattern with ups and downs but maintains a decreasing trend overall. Other districts, like Akola and Amravati, display a general decline over the years, while Ahmadnagar exhibits variability, but in overall, it demonstrates a decline from 7.4 still birth in 2015-16 to 5.5 still births in 2022-23. The highest still births were reported in 2021-22 (8.5 still births per thousand births). Notably, districts such as Dhule and Nanded experience significant fluctuations, with Dhule showing a remarkable increase in 2021-22 (14 still birth per thousand births). Conversely, Nanded witnesses a notable spike in 2022-23 (12.4 still births per thousand births) after a period of decline.

In overall, Akola, Amravati, Chandrapur, Gadchiroli and Godiya have reported higher still births historically and district such as Jalgaon, Parbhani, Ahmednagar, Wardha and Yavatmal have reported lower still births over the years compared to other district from 2015-16- to 2022-

23. The state average for Maharashtra reflects a gradual decrease from 11 still births per thousand births in 2015-16 to 7.8 still births per thousand births in 2022-23, indicating a broader regional trend.

We have also analysed the data by place of residence to see prevalence of still births across the district of Maharashtra (table 6). The common trends are that, the rate of still births is higher in urban areas than rural areas across the district and time. In overall, the rate of still births has shown the declining trends in the rural areas from 6 still births in 2020-21 to 5.6 still births per 1000 births in 2022-23 in rural area. Whereas, this trends are almost stagnated with 8.8 still births per thousand births in 2020-21 to 8.9 still births per thousand births in 2022-23 in urban area. Total thirteen district have reported more than 10 still births per thousand births in urban areas over the years, in which Gadchiroli, Chnadrapur, Nandurbar, Akola and Amravari are the top five districts which have reported highest still births among all the district. In case of rural area, Gadchiroli, Bandara and Amravati are the districts which have reported more than 10 still-births per thousand births. However, it is crucial to acknowledge the diverse trajectories among districts, emphasizing the need for targeted regional policies and interventions to address specific challenges. Overall, this data highlights the dynamic nature still births across Maharashtra's districts, urging a nuanced approach for comprehensive development strategies.

Summary and discussion

The main objective of the paper was to assess the prevalence of abortion and still births in Maharashtra across place of residence and across district by using the HMIS data from 2015-2023. The study suggests that higher proportion of pregnancies are converted in the abortions and the prevalence of still is exceptionally high in some of the districts of Maharashtra with drastic regional variations. The inheritance regional imbalance in terms of trained health staff, physical infrastructure, etc., might be the root cause of variation in the abortion and still births rate in the Maharashtra. Moreover, according to the guidelines issued by the Ministry of Health and Family Welfare (MoHFW), all public-sector facilities at the primary health centre (PHC) level and higher are allowed to provide induced abortion, as long as they have a certified provider on staff (MoHFW, 2014.). Public facilities are well positioned to be the principal provider of abortions to many groups, including poor women, to whom they offer free services, and women in rural areas, where the public sector's reach is much greater than that of the

private sector. In practice, however, many public facilities do not offer abortion due to lack of infrastructure and trained staff (Singh, et al., 2018).

As per the last census carried out in 2011, the population of Maharashtra is 112.378 million, of which 45.23% resides in urban and 54.77% resides in rural areas. 9.35% of states' population is tribal. They customarily do not socialize with dissimilar urbanity and population. As a result, they are economically weak and have low levels of literacy and health. There are 1,816 Primary Health Centers (PHCs), out of which 320 are located in tribal pockets in these 15 districts (Doke et al., 2012).

The analysis further shows the declining trends in still birth rate across the districts of Maharashtra. However, in urban areas after 2020-21 it shows the increasing trends. Many states have reported the Despite launch of various programs and schemes by the GoI for improving maternal health and outcomes, many state have reported the decline trends in proportion of live births (PMSMA, 2016; JSY, 2016, DAKSHATA 2015). Age at conception, mode of conception and psychological well-being during pregnancy are the major determinants of a livebirth (McMahon, et al., 2011). In addition, other factors such as anemia, infection, hypertension, hyperglycemia, spousal violence, and environmental pollution also contribute to high pregnancy losses (Xue, T., et al., 2021; Padhi, et al., 2015). Further inequality of socioeconomic status in urban and rural areas among the districts might be one of the factors for the higher still birth rate.

Districts such as Akola, Amravati, Bhandara, Chandrapur, Gadchiroli, Nanded and Nandurbar reported higher rate of still births. Still births can be prevented by increasing access to high-quality healthcare services in the public health sector. Although, the WHO recommends at least eight ANC visits during pregnancy, only 58% of Indian mothers received 4 ANC visits during their last childbirth (NFHS, 2019-21). Higher frequency of ANC visits is associated with lower chance of still births (Altijani, et al., 2018). Indian women who had maternal hypertension, antepartum haemorrhage, short gestation age, and asphyxia during labor are reported to experience still births (Goldenberg, et al., 2021). The other risk factors for pregnancy loss were poor nutrition (Marshall et al., 2022) and spousal violence, which may cause anxiety and depression (NFHS, 2021). Apart from medical factors, stillbirth is also associated with various social factors such as vulnerability based on place of residence, and low socioeconomic status (Altijani, et al., 2018; Busch, et al., 2022).

It has also been observed that there is an increased incidence of abortion after 2019-20. It could be the impact of the COVID-19 pandemic, which resulted in the disruption of abortion care services. Many abortions are driven by socioeconomic vulnerability and demographic determinants including wealth quintiles, maternal age, education, and lack of awareness on the use of contraceptive methods. Increase prevalence of miscarriage in both urban and rural areas is a matter of concern. The government may focus in improving the health infrastructure in rural and underprivileged areas.

Policy recommendations

Addressing high stillbirth and abortion rates involves a multifaceted approach that combines medical, social, and policy interventions. It's important to approach this issue with sensitivity to individual rights and choices, while also prioritizing public health and well-being. Appropriate strategies to reduce pregnancy wastage are a necessity, and must begin in areas with higher rates of wastage. Factors associated with pregnancy wastage can be identified by studying districts with high wastage rates. Such factors must be mitigated to improve healthcare in these areas. Along with ongoing programmes, the government needs to implement comprehensive and age-appropriate sex education programs in schools to educate individuals about reproductive health, contraception, and responsible sexual behaviour. Improving access to affordable and effective contraception methods, including long-acting reversible contraceptives (LARCs), is also important to avoid unnecessary pregnancy losses. Strengthen maternal healthcare services further, including prenatal and postnatal care, to monitor and address potential complications during pregnancy.

Tables 1: District-wise percentage of abortion (spontaneous and induced) to total ANC registration n Maharashtra, 2015-16 to 2019-23

State	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Ahmednagar	10.4	10.5	6.0	4.0	3.6	4.1	2.9	2.5
Akola	5.6	5.3	1.9	1.8	1.6	3.2	3.4	3.1
Amravati	14.5	16.0	3.6	3.0	3.9	5.7	5.8	1.8
Aurangabad	10.9	10.4	1.4	3.6	3.1	3.3	4.9	2.9
Bhandara	4.3	4.6	5.1	6.0	3.9	6.4	7.2	5.7
Beed	10.2	7.9	1.9	1.8	2.3	7.3	7.1	23.8
Mumbai	17.8	13.9	3.7	3.4	2.8	2.8	4.6	8.5
Buldana	3.4	4.0	1.4	1.8	1.7	1.7	1.5	2.2
Chandrapur	5.8	13.9	3.1	2.9	8.6	5.4	4.9	2.1
Dhule	4.3	3.4	0.6	1.0	1.1	0.6	1.2	12.6
Gadchiroli	5.9	5.7	4.5	5.1	6.2	8.6	8.4	7.0
Gondiya	6.0	4.5	3.8	4.4	4.4	5.4	5.3	7.4
Hingoli	2.5	2.6	1.8	1.9	1.6	2.3	2.0	2.3
Jalgaon	4.9	5.2	0.7	1.2	1.3	1.4	1.9	4.2
Jalna	2.9	2.7	1.5	1.8	2.2	2.9	2.0	0.5
Kolhapur	7.5	12.3	1.0	0.7	1.3	3.3	2.9	3.1
Latur	4.2	5.9	1.1	1.5	2.6	1.9	1.9	2.0
Nagpur	5.5	3.0	1.8	1.7	1.6	1.7	2.8	2.8
Nanded	3.2	1.0	0.5	0.9	1.0	1.4	1.5	3.4
Nandurbar	2.2	2.2	1.6	1.5	2.0	2.0	2.3	1.4
Nashik	4.0	4.6	2.8	2.1	2.2	2.3	2.1	2.9
Osmanabad	15.4	8.6	6.0	2.0	4.7	4.7	3.9	7.7
Palghar	9.2	8.9	1.8	2.0	1.7	2.0	2.3	2.1
Parbhani	2.0	5.4	2.0	0.3	0.5	1.1	1.2	7.7
Pune	17.9	15.9	4.6	4.1	3.7	4.1	5.5	4.0
Raigarh	37.7	29.2	1.7	1.1	1.4	1.3	1.4	2.8
Ratnagiri	18.4	9.3	2.4	3.1	3.4	4.7	3.8	6.1
Sangli	6.4	7.1	0.8	2.1	2.0	2.3	1.6	3.0
Satara	21.5	22.6	2.4	2.7	2.7	3.4	3.1	2.1
Sindhudurg	28.6	44.5	3.4	3.3	4.0	11.0	9.1	28.7
Solapur	4.4	4.9	2.3	1.6	2.1	3.4	3.2	1.4
Thane	10.1	12.5	4.1	5.0	4.0	2.7	3.5	2.0
Wardha	15.6	14.5	5.4	1.4	1.5	3.5	3.1	6.1
Washim	0.7	4.7	4.8	0.4	0.4	0.2	0.2	4.1
Yavatmal	2.9	3.2	0.9	0.6	0.7	1.2	1.7	1.1
Maharashtra	9.9	9.6	2.8	2.6	2.6	3.0	3.3	3.3

Table 2: Percentage distribution of MTP to total abortion in Maharashtra, 2015-2023

State	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Ahmednagar	24.2	24.8	59.8	49.0	67.6	21.4	24.0	50.2
Akola	53.4	57.4	65.0	62.8	66.3	59.2	49.4	70.8
Amravati	12.9	9.1	41.2	42.0	43.9	14.5	18.8	69.7
Aurangabad	12.1	10.9	87.8	59.4	68.9	32.3	20.6	58.0
Bhandara	75.2	60.4	33.4	36.1	40.1	28.5	21.2	10.3
Beed	92.4	84.8	80.9	86.1	84.4	74.0	71.2	82.2
Mumbai	92.4	47.4	72.9	75.9	79.3	32.0	35.4	56.8
Buldana	14.9	17.6	72.0	52.9	46.2	5.5	9.2	15.8
Chandrapur	20.3	13.2	76.2	81.8	61.0	10.4	10.2	26.0
Dhule	53.7	39.1	69.9	55.3	52.4	26.8	47.7	41.4
Gadchiroli	14.3	15.8	38.9	34.9	34.6	18.4	14.0	21.7
Gondiya	26.6	39.9	32.8	41.2	47.4	23.1	14.3	5.3
Hingoli	20.6	18.2	60.9	52.5	57.2	9.4	12.9	5.2
Jalgaon	12.4	17.1	81.7	54.2	59.0	11.4	20.4	29.7
Jalna	17.3	25.8	54.1	53.5	50.9	22.8	24.6	67.3
Kolhapur	30.6	27.4	92.1	93.9	89.9	59.8	58.8	84.4
Latur	14.2	10.5	69.6	64.6	50.6	12.9	22.1	28.8
Nagpur	29.5	47.7	74.9	75.2	68.9	36.4	28.0	28.8
Nanded	14.5	34.8	64.3	38.7	29.3	9.0	4.0	3.1
Nandurbar	33.7	31.1	18.1	19.7	13.5	12.5	18.7	27.2
Nashik	60.6	51.6	59.9	54.0	54.4	33.9	35.1	33.9
Osmanabad	15.0	12.0	46.0	81.2	67.7	32.8	23.1	20.5
Palghar	5.6	7.2	85.5	86.5	87.6	24.4	30.7	45.6
Parbhani	65.3	32.8	49.5	26.0	10.3	27.2	23.1	5.3
Pune	23.2	34.1	73.3	78.5	79.5	48.6	53.1	88.6
Raigarh	7.8	7.7	93.8	93.2	89.9	33.9	36.5	28.3
Ratnagiri	18.2	37.6	86.6	82.7	80.6	35.0	25.0	21.0
Sangli	20.3	21.6	89.3	74.6	75.0	39.3	43.0	27.2
Satara	12.4	9.3	91.1	90.5	85.1	36.2	44.2	79.3
Sindhudurg	43.8	48.0	87.6	85.4	83.5	73.1	67.2	26.8
Solapur	40.1	30.7	49.7	76.8	67.9	30.9	43.8	89.7
Thane	25.8	14.4	61.4	66.5	69.4	15.8	20.4	46.5
Wardha	16.2	13.6	66.0	78.5	58.1	44.7	40.3	37.6
Washim	0.0	0.8	54.0	92.6	93.1	10.9	51.3	7.1
Yavatmal	3.2	2.9	55.4	14.7	5.8	4.5	24.8	8.3
Maharashtra	35.7	27.7	72.8	74.0	73.0	33.1	34.2	43.9

Table 3: Prevalence of abortion in the districts of Maharashtra by place of residence, 2020-23

District	Rural			Urban		
	2020-21	2021-22	2022-23	2020-21	2021-22	2022-23
Akola	0.6	0.8	0.9	6.2	7.2	7.7
Amravati	4.8	3.9	5.6	10.0	11.9	22.5
Buldhana	1.9	1.5	1.7	7.0	7.4	11.1
Washim	0.2	0.1	0.2	22.9	28.4	31.8
Yavatmal	1.4	1.4	2.5	0.3	51.7	46.5
Aurangabad	1.3	1.8	5.2	14.8	21.9	27.6
Hingoli	1.6	1.1	1.5	16.0	18.8	21.8
Jalna	0.9	0.5	0.5	16.7	17.2	14.7
Parbhani	0.3	0.3	0.6	2.5	3.3	6.2
Kolhapur	4.0	3.3	4.1	26.1	24.4	25.1
Ratnagiri	5.8	6.1	7.9	88.9	62.3	64.4
Sangli	3.1	1.1	1.8	17.2	21.4	18.4
Sindhudurg	28.6	18.0	19.9	161.2	134.7	145.6
Beed	4.5	4.7	4.9	29.9	22.9	32.3
Latur	1.3	1.3	2.1	6.8	13.2	13.8
Nanded	1.3	0.8	2.0	4.1	5.9	6.1
Osmanabad	5.0	3.8	4.9	54.4	50.9	62.9
Mumbai	NA	NA	NA	11.0	16.2	15.7
Bhandara	5.3	8.5	9.7	21.3	25.2	40.7
Chandrapur	5.3	5.1	8.6	44.2	34.3	38.6
Gadchiroli	7.9	8.3	9.9	57.9	50.8	77.8
Gondia	4.4	4.7	6.6	26.5	18.8	26.2
Nagpur	2.4	2.8	3.6	3.7	9.9	11.4
Wardha	1.0	2.7	3.5	10.5	22.5	63.1
Ahmednagar	5.8	3.5	4.7	26.8	27.9	31.4
Dhule	0.4	0.3	0.4	1.4	4.9	10.1
Jalgaon	1.8	1.8	2.3	2.8	6.0	4.5
Nandurbar	1.8	1.7	1.7	3.3	5.6	6.1
Nashik	2.5	2.1	2.3	3.5	3.4	3.3
Pune	1.9	1.9	1.8	17.1	21.1	26.8
Satara	6.0	8.1	8.2	62.9	34.9	43.9
Solapur	4.7	3.6	4.1	12.0	15.6	7.1
Palghar	3.7	2.2	2.1	22.4	22.8	25.1
Raigad	3.5	3.1	3.7	29.7	42.1	78.9
Thane	2.2	1.2	1.0	7.4	13.6	16.1
Maharashtra	3.1	2.7	3.5	12.5	17.0	19.4

Table 4: Percentage of MTPs to total abortion in the districts of Maharashtra by place of residence, 2020-21-2023.

District	Urban			Rural		
	2020-21	2021-22	2022-23	2020-21	2021-22	2022-23
Akola	65.4	57.3	66.9	1.0	0.0	0.0
Amravati	37.9	40.4	46.9	16.4	16.9	14.4
Buldhana	87.1	85.4	86.2	1.5	0.9	0.3
Washim	98.6	99.3	93.5	0.0	45.0	0.0
Yavatmal	52.2	100.0	99.9	2.3	1.3	0.6
Aurangabad	66.9	63.8	67.3	55.2	16.4	4.9
Hingoli	71.5	74.2	80.2	0.0	0.5	0.0
Jalna	52.7	63.4	65.0	3.1	12.6	9.7
Parbhani	39.7	29.8	27.1	0.0	3.1	0.0
Kolhapur	91.9	95.2	92.1	75.1	62.9	46.5
Ratnagiri	83.6	81.9	76.7	83.3	82.8	81.1
Sangli	81.4	90.6	91.0	76.6	53.2	38.7
Sindhudurg	91.1	92.9	94.0	94.6	88.4	86.9
Beed	95.6	96.2	96.5	54.2	50.2	57.1
Latur	60.2	84.8	78.6	6.3	6.0	5.7
Nanded	33.8	15.5	32.2	29.5	6.9	2.9
Osmanabad	80.0	75.6	76.9	65.2	65.0	65.9
Mumbai	82.9	81.6	79.4	NA	NA	NA
Bhandara	67.2	65.9	67.3	20.9	38.9	28.6
Chandrapur	91.7	92.1	91.4	0.0	0.2	1.4
Gadchiroli	87.3	86.0	62.4	11.3	12.7	10.9
Gondia	57.8	52.4	59.2	26.7	13.4	6.7
Nagpur	78.0	81.3	80.7	29.1	16.7	14.1
Wardha	53.5	93.0	93.6	10.6	29.0	23.9
Ahmednagar	91.0	92.2	94.0	41.7	35.2	45.8
Dhule	47.8	60.1	85.1	19.2	5.4	5.6
Jalgaon	77.5	77.4	59.2	13.7	11.5	10.5
Nandurbar	20.9	39.7	35.6	10.8	8.0	7.3
Nashik	68.9	69.8	64.8	29.6	25.0	21.8
Pune	82.6	81.6	83.2	60.2	64.5	54.3
Satara	88.1	86.0	81.0	77.0	84.4	81.5
Solapur	75.4	84.5	78.4	55.1	58.3	52.7
Palghar	92.7	91.5	93.0	63.1	41.9	46.5
Raigad	95.5	96.8	98.6	83.5	83.7	83.8
Thane	66.4	76.6	74.8	50.3	46.8	39.1
Maharashtra	81.1	82.0	81.5	46.7	42.1	35.9

Table 5: Districtwise still birth rate (still births to 1000 total live births + stil births) in Maharashtra, 2015-16 to 2019-23.

District	2015-16	2016-17	2017-18	2018-19	2019-20	2021-22	2022-23
Ahmednagar	7.4	7.3	5.9	6.9	8.0	8.5	5.5
Akola	18.8	19.7	18.9	17.5	16.8	17.6	15.7
Amravati	16.8	17.9	18.3	17.0	16.6	13.0	12.0
Aurangabad	8.9	6.6	6.3	13.2	5.2	8.4	7.5
Bhandara	17.7	13.7	14.6	12.6	13.6	14.9	11.2
Bid	6.6	8.8	4.2	7.0	8.0	5.9	6.0
Mumbai	13.8	12.9	13.1	11.5	11.1	11.3	11.0
Buldana	7.1	8.9	7.3	9.8	7.2	5.4	4.9
Chandrapur	17.2	17.5	16.7	18.0	17.9	17.4	15.6
Dhule	4.1	2.9	3.3	11.7	3.3	14.0	6.2
Gadchiroli	22.4	32.8	21.5	21.3	21.2	22.1	20.7
Gondiya	18.9	13.6	16.0	14.8	14.9	15.1	12.0
Hingoli	14.2	11.3	10.2	10.3	8.5	7.1	6.5
Jalgaon	8.5	8.9	7.0	5.9	5.1	4.1	3.6
Jalna	13.4	12.4	10.5	12.5	9.1	8.3	8.1
Kolhapur	10.4	7.0	5.4	7.2	4.2	4.6	6.0
Latur	4.8	6.7	6.8	5.0	7.5	8.7	5.6
Nagpur	16.5	20.5	13.1	6.0	10.1	6.4	8.2
Nanded	7.0	13.8	8.3	5.9	4.7	5.2	12.4
Nandurbar	17.8	15.8	16.6	15.9	16.3	14.0	12.4
Nashik	12.9	11.9	12.8	10.5	9.9	9.2	8.9
Osmanabad	10.8	9.4	12.4	10.1	8.9	9.6	6.2
Palghar	8.1	7.7	8.4	7.9	7.3	6.9	7.9
Parbhani	6.0	3.0	3.4	4.7	2.7	4.7	3.6
Pune	11.9	11.3	9.7	9.3	5.3	6.2	7.1
Raigarh	10.5	10.2	11.8	7.4	5.6	5.2	4.4
Ratnagiri	8.4	10.3	10.6	8.7	8.3	8.5	8.3
Sangli	7.7	5.4	5.4	8.1	7.0	5.0	6.2
Satara	10.6	10.0	10.3	10.2	8.5	9.5	8.8
Sindhudurg	9.3	9.6	8.6	11.1	8.8	14.4	10.1
Solapur	9.1	8.9	7.7	9.3	6.4	6.8	5.0
Thane	10.5	9.6	6.6	8.8	7.3	6.8	7.1
Wardha	8.2	6.4	5.3	7.3	5.2	4.0	3.9
Washim	10.6	8.2	6.9	6.3	7.4	9.5	9.6
Yavatmal	14.7	7.2	4.4	1.5	4.4	1.8	1.7
Maharashtra	11.0	10.7	9.5	9.5	8.1	8.0	7.8

Table 6: Rate of still births per 1000 births in the district of Maharashtra by place of residence, 2020-21 to 2022-23

District	Rural			Urban		
	2020-21	2021-22	2022-23	2020-21	2021-22	2022-23
Akola	10.9	8.5	7.6	16.9	18.2	16.1
Amravati	16.6	15.2	12.6	17.1	12.0	11.7
Buldhana	6.1	6.0	4.0	6.6	5.3	5.1
Washim	6.4	7.2	7.2	9.4	9.9	10.0
Yavatmal	3.5	3.8	3.3	1.6	1.1	1.3
Aurangabad	11.5	2.8	1.6	9.5	11.2	10.2
Hingoli	10.2	5.9	6.5	10.0	7.4	6.4
Jalna	2.9	1.1	1.8	10.4	13.6	12.2
Parbhani	4.6	4.2	1.2	5.7	4.7	3.8
Kolhapur	4.7	3.0	1.7	4.5	5.4	9.1
Ratnagiri	7.4	6.2	7.1	14.5	9.9	8.7
Sangli	1.5	2.4	2.3	9.7	6.4	8.4
Sindhudurg	5.3	7.8	6.7	10.9	16.4	11.5
Beed	2.4	1.1	2.9	7.5	9.2	8.0
Latur	5.0	2.7	4.2	7.4	10.0	5.9
Nanded	3.9	4.8	19.2	8.1	5.5	6.8
Osmanabad	4.0	5.3	3.6	13.9	11.7	7.5
Mumbai	0.0	0.0	0.0	10.4	28.1	10.6
Bhandara	14.4	15.4	12.4	15.4	14.3	10.2
Chandrapur	12.3	14.0	9.3	20.0	18.3	17.0
Gadchiroli	19.5	21.0	17.7	30.12	23.4	25.2
Gondia	11.5	11.4	8.6	17.8	16.5	13.2
Nagpur	6.1	3.0	1.3	8.5	6.7	9.1
Wardha	3.1	2.9	2.2	7.5	4.8	5.8
Ahmednagar	8.6	8.1	5.3	4.9	9.2	5.7
Dhule	2.6	3.9	3.1	15.7	22.3	9.2
Jalgaon	5.9	3.6	2.1	3.5	4.5	4.7
Nandurbar	8.1	7.5	8.6	31.4	30.5	16.8
Nashik	6.4	5.7	6.2	10.5	11.3	10.5
Pune	1.5	1.6	2.8	5.9	7.7	8.3
Satara	7.0	10.3	10.1	10.3	8.6	7.4
Solapur	3.6	3.1	2.5	4.3	9.8	7.1
Palghar	6.4	5.7	7.1	8.3	7.4	8.3
Raigad	6.1	4.4	4.6	6.8	5.4	4.4
Thane	7.9	4.6	4.6	5.5	7.2	7.5
Maharashtra	6.1	5.5	5.6	8.8	9.5	8.9

References

- Ahmed, I., Ali, S. M., Amenga-Etego, S., Ariff, S., Bahl, R., & Baqui, A. H. (2018). Alliance for Maternal and Newborn Health Improvement (AMANHI) mortality study group. *Population-based rates, timing, and causes of maternal deaths, stillbirths, and neonatal deaths in south Asia and sub-Saharan Africa: a multi-country prospective cohort study. Lancet Glob Health*, 6(12), e1297-308.
- Alexander E P Heazell, Dimitrios Siassakos, Hannah Blencowe, Christy Burden, Zulfi qar A Bhutta, Joanne Cacciatore, Nghia Dang, Jai Das, Vicki Flenady, Katherine J Gold, Olivia K Mensah, Joseph Millum, Daniel Nuzum, Keelin O'Donoghue, Maggie Redshaw, Arjumand Rizvi, Tracy Roberts, H E Toyin Saraki, Claire Storey, Aleena M Wojcieszek, Soo Downe , 'Stillbirths: economic and psychosocial consequences' , for The Lancet Ending Preventable Stillbirths Series study group* with The Lancet Ending Preventable Stillbirths investigator group*
- Altijani, N., Carson, C., Choudhury, S. S., Rani, A., Sarma, U. C., Knight, M., & Nair, M. (2018). Stillbirth among women in nine states in India: rate and risk factors in study of 886,505 women from the annual health survey. *BMJ open*, 8(11), e022583.
- Altijani, N., Carson, C., Choudhury, S. S., Rani, A., Sarma, U. C., Knight, M., & Nair, M. (2018). Stillbirth among women in nine states in India: rate and risk factors in study of 886,505 women from the annual health survey. *BMJ open*, 8(11), e022583.
- Busch, S. L., Houweling, T. A., Pradhan, H., Gope, R., Rath, S., Kumar, A., ... & Nair, N. (2022). Socioeconomic inequalities in stillbirth and neonatal mortality rates: evidence on Particularly Vulnerable Tribal Groups in eastern India. *International Journal for Equity in Health*, 21(1), 61.
- DAKSHATA Implementation Package-2015. National Health Mission. Available from: <https://nhm.gov.in/index1.php?lang=1&level=3&sublinkid=838&lid=449>, accessed on January 29, 2023.
- Goldenberg, R. L., Saleem, S., Goudar, S. S., Silver, R. M., Tikmani, S. S., Guruprasad, G., ... & Goldenberg, R. L. (2021). Preventable stillbirths in India and Pakistan: a prospective, observational study. *BJOG: An International Journal of Obstetrics & Gynaecology*, 128(11), 1762-1773.
- ICD-10: International Classification of Diseases and Related Health Problems. Tenth Revision. Volume 2. 2nd edition. Geneva: World Health Organization; 2004:96.
- Marshall, N. E., Abrams, B., Barbour, L. A., Catalano, P., Christian, P., Friedman, J. E., ... & Thornburg, K. L. (2022). The importance of nutrition in pregnancy and lactation: lifelong consequences. *American journal of obstetrics and gynecology*, 226(5), 607-632.
- McMahon, C. A., Boivin, J., Gibson, F. L., Hammarberg, K., Wynter, K., Saunders, D., & Fisher, J. (2011). Age at first birth, mode of conception and psychological wellbeing in pregnancy: findings from the parental age and transition to parenthood Australia (PATPA) study. *Human Reproduction*, 26(6), 1389-1398.
- Ministry of Health and Family Welfare (2016). Pradhan Mantri Surakshit Matritva Abhiyan (PMSM). Ministry of Health and Family Welfare, Government of India. https://pmsma.nhp.gov.in/wp-content/uploads/2016/09/Pradhan_Mantri_Surakshit_Matritva_Abhiyan-2.pdf, accessed on 4 January 2024. Return to ref 2 in article
- Ministry of Health and Family welfare (2017). Standard Treatment Guidelines. Management of Recurrent Spontaneous Abortion.
- Ministry of Health and Family Welfare (MoHFW;2014). National Health Mission, Comprehensive Abortion Care Services, New Delhi: Maternal Health Division, MoHFW.

- National Health Mission (2005). Janani Suraksha Yojana. National Health Mission. Available from: <https://nhm.gov.in/index1.php?lang=1&level=3&lid=309&sublinkid=841>, accessed on January 5, 2024.
- Ogwulu, C.B., Jackson, L.J., Heazell, A.E. *et al.* Exploring the intangible economic costs of stillbirth. *BMC Pregnancy Childbirth* 15, 188 (2015). <https://doi.org/10.1186/s12884-015-0617-x>
- Patki, A., & Chauhan, N. (2016). An epidemiology study to determine the prevalence and risk factors associated with recurrent spontaneous miscarriage in India. *The Journal of Obstetrics and Gynecology of India*, 66, 310-315.
- Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA) (2016) Ministry of Health and Family Welfare, Government of India, New Delhi
- Satyajeet Nanda and Faujdar Ram (2007), 'Teenage Motherhood, Child Survival and Child Health: Evidences from National Family Health Survey, India', Demography India
- Singh, S., Hussain, R., Shekhar, C., Acharya, R., Moore, A. M., Stillman, M., ... & Ball, H. (2018). Abortion and unintended pregnancy in six Indian states: findings and implications for policies and programs.
- United Nations Inter-agency Group for Child Mortality Estimation (UN IGME) (2020). 'A Neglected Tragedy: The global burden of stillbirths', United Nations Children's Fund, New York.
- Xue, T., Guan, T., Geng, G., Zhang, Q., Zhao, Y., & Zhu, T. (2021). Estimation of pregnancy losses attributable to exposure to ambient fine particles in south Asia: an epidemiological case-control study. *The Lancet Planetary Health*, 5(1), e15-e24.