INDIAN JOURNAL OF POPULATION AND DEVELOPMENT
ISSN: 2583-4827; Volume 3(2), July 2023: 297-318

Review of the Civil Registration System in Madhya Pradesh, India

Ravendra Singh

Abstract

This paper carries out an analytical review of the civil registration system in Madhya Pradesh based on the births, deaths and infant deaths registered under the system. The analysis highlights the inconsistencies in the registration of births, deaths, and infant deaths in Madhya Pradesh and in its constituent districts as reflected through birth rate, death rate and infant mortality rate derived from the births, deaths and infant deaths registered under the system. There appears to be under registration of births and infant deaths under the system but there are indications of over registration of deaths. The analysis also reveals a high degree of rural-urban and male-female misclassification in the births and deaths registered under the system. The analysis calls for a thorough introspection and a comprehensive reinvigoration of the civil registration system in the state to make the system relevant to the demographic data system.

Background

The organisation of the civil registration activities in Madhya Pradesh is guided by the Birth and Death Registration Act 1969 of the Government of India (Government of India, 1969). This Act lays down an elaborate administrative and structure at different levels of the public administration system in the country and lays down the processes required to ensure that all births and deaths in the country are registered under the civil registration system. The Act mandates that it is the duty of the persons specified in the Act to give or cause to be given, either orally or in writing, according to the best of their knowledge and belief, information related to births and deaths to the competent authority responsible for registering births and deaths within the prescribed time so that this information can be entered in the forms prescribed and maintained for the purpose. The Act envisions that all births and all deaths in the country will be registered under the civil registration system in the due course of time. The Act has been amended recently (Government of India, 2023). At the national level, the responsibility of the implementation of the Act has been entrusted to the Registrar General of India. Establishing the civil registration system and organising the birth and death registration activities under the Act, have, however, been entrusted to the government of the constituent states and Union Territories of the country. The Registrar General of India publishes annual report on the vital statistics of India based on the births and deaths registered under the civil registration system (Government of India, 2022).

In compliance with the Birth and Death Registration Act, 1969, the civil registration activities are organised in Madhya Pradesh under the Madhya Pradesh Birth and Death Registration Rules, 1999 (Government of Madhya Pradesh, 2001). These Rules provide the implementation framework for the registration of live births and deaths. The implementation framework comprises of informants and registrars and sub-registrars. The informants are supposed to provide information about live births, still births and deaths that come to their knowledge to the concerned registrar or sub-registrar while the responsibility of the registrar or the sub-registrar is to register the information according to the formats provided under the rules and issue a certificate of registration of live birth or still birth or death in the prescribed format. The format in which the information about live birth, still birth and death is recorded is in two parts – the legal part and the statistical part. The two parts of the information about live births, still births and deaths serve two essential functions of the civil registration system. The first is the documentation of the family or the household organisation which is also known as the legal function of the civil registration system. The exclusive purpose of the legal function of the civil registration system is to produce official, full, and permanent proof of the occurrence of a live birth or still birth and death, so that the occurrence of the live birth or still birth or death may be easily validated at any time. The statistical part, on the other hand, is directed towards producing vital statistics, which are part of demographic statistics in conjunction with the population census. The registrar or the sub-registrar is also responsible for maintaining a register of all live births, still births and deaths that have occurred in her or his jurisdiction and for the preparation of annual report on vital statistics of the area based on the number of live births, still births and deaths registered.

The Rules framed for the organisation of birth and death registration activities in Madhya Pradesh have been amended and supplemented time to time by the executive orders issued by the Government of Madhya Pradesh. The Government of India has also introduced an online system to facilitate real time registration of live births, still births and deaths in the country in an attempt to improve the efficiency of the civil registration system in the country. In Madhya Pradesh, the online registration of births and deaths has been in operation since 2015. During the year 2020, almost 96 per cent of the births and almost 99 per cent of the deaths registered under the civil registration system in the state were registered through the online system in the state (Government of India, 2022) which means that offline registration of births and deaths in Madhya Pradesh constitute an insignificant proportion of all births and deaths registered in the state.

There has never been a review of the civil registration system in Madhya Pradesh in the context of its performance in terms of its legal function and statistical function. There is only one study in which the quality of civil registration system data in Madhya Pradesh was assessed along with the states of Gujarat, Haryana, Himachal Pradesh, Karnataka, and Maharashtra (James et al, 2014). A review of the civil registration system, specific to Madhya Pradesh, has, however, never been carried out. In the past, Government of India used to provide estimates of the completeness of the registration of births and deaths in different states and Union Territories of the country, but this exercise has been discontinued since 2020. As such, there is now little idea about the performance of the civil registration system in Madhya Pradesh even in terms of the completeness of the registration of births and deaths.

In this paper, we carry out an analytical review of the functioning of the civil registration system in Madhya Pradesh, one of the constituent states of India. The review focusses on both the legal function and the statistical function of the civil registration system in the state. The civil registration system is the only source in Madhya Pradesh which provides data to generate vital statistics at the district level. The Government of India had launched the Annual Health Survey Programme in the past to generate estimates of key vital rates at the district level in the state (Government of India, 2013). This programme has, however, been discontinued after 2013 and the only source of data to calculate vital rates at the district level is the civil registration system. It is in this context, review of the civil registration system in the state important. It may be noted that such a review has never been carried out in the state.

The review of the civil registration system in Madhya Pradesh is, however, hampered by the paucity of the necessary information available through the civil registration system, although collection of statistical information related to every birth or death registered under the system is mandatory under the Birth and Death Registration Act of 1969 of the Government of India and Madhya Pradesh Birth and Death Registration Rules, 1999. The report on the vital statistics of India based on the civil registration system released by the Registrar General of India every year provides information about the number of live births, deaths, infant deaths and still births registered under the system for four mutually exclusive population sub-groups – rural male, rural female, urban male, and urban female (Government of India, 2022). The report also provides the distribution of deaths registered by age, but this information is available for the state but not for districts. We compare state level estimates of birth rate, death rate and infant mortality rate derived from the births and deaths registered under the civil registration system with the corresponding rates available from the sample registration system. At the district level such a comparison is not possible as estimates of birth rate, death rate, and infant mortality rate for the districts are not available from any other source.

The paper is organised as follows. The next section of the paper outlines the analytical framework. State level analysis of the vital statistics data available from the civil registration system is carried out in section. Section four focusses on district level analysis which highlights inter-district variation in the functioning of the civil registration system. Findings of the analytical review are discussed in section five while the last section summarises the findings of the review and puts forward a set of recommendations for strengthening the system.

Analytical Framework

We have calculated the following vital rates based on the number of live births, deaths, infant deaths and still births registered under the civil registration system:

1. Registered birth rate (*Reg*BR) or number of registered live births per 1000 population.
2. Registered death rate (*Reg*DR) or number of registered deaths every 1000 population.

3. Registered infant mortality rate (*Reg*IR) or number of registered infant deaths for every 1000 registered live births.
4. Registered still birth rate (*Reg*SR) or number of registered still births for every 1000 registered births.

The completeness of the events registered under the civil registration system may be measured from the completeness index (CI) which is defined as

$$CI = \frac{Rge\text{VR}}{\text{VR}} \times 100$$

where *Reg*VR is the vital rate – birth rate, death rate, infant mortality rate, and still birth rate – from the civil registration data and VR is the vital rate available from the sample registration system. If the index CI=100 for a given vital event, then the registration of that vital event is complete under the civil registration system. If CI<100, there is under registration which means that a number of vital events have not been registered under the system. On the other hand, if CI>100, there is over registration which implies that there is either duplication in the registration of the vital event or there is error of misclassification during the registration process.

In addition, it is also possible to calculate the sex ratio of registered live births and still births, and mortality sex ratio and infant mortality sex ratio derived from the civil registration system to analyse sex bias, if any, in the registration of births and deaths under the civil registration system by calculating the following indicators:

1. Sex ratio of registered live births is calculated as the number of male live births registered for every 100 female live births registered.
2. Mortality sex ratio is calculated as the ratio of the male death rate derived from the civil registration data to the female death rate derived from the civil registration data.
3. Infant mortality sex ratio is calculated as the ratio of male infant mortality rate derived from the civil registration data to the female infant mortality rate derived from the civil registration data.
4. Still birth sex ratio is calculated as the ratio of male still birth rate derived from the civil registration data to the female still birth rate derived from the civil registration data.
5. Urban-rural ratio of the birth rate as the ratio of the urban birth rate derived from the civil registration data to the rural birth rate derived from the civil registration data.
6. Urban-rural ratio of the death rate as the ratio of the urban death rate derived from the civil registration data to the rural death rate derived from the civil registration data.
7. Urban-rural ratio of the infant mortality rate as the ratio of the urban infant mortality rate derived from the civil registration data to the rural infant mortality rate derived from the civil registration data.
8. Urban-rural ratio of the still birth rate as the ratio of the urban still birth rate derived from the civil registration data to the rural still birth rate derived from the civil registration data.

Estimation of birth and death rates from the civil registration data requires estimate of the population of the state and districts. In the absence of 2021 population census, we have used the population of the state projected by the Government of India (Government of India, 2020). The projected population of the state is available for the total and urban population separately for males and females from which the projected rural population is estimated. However, population of the districts of the state has not been projected by the Government of India. We have, therefore, used population forecast for the districts prepared by Chaurasia (2023). These forecasts are available for male and female population but not for rural and urban population of the district. The forecast is available for 50 districts of the state as they existed at the time of the 2011 population census. After the 2011 population census, the erstwhile district of Shajapur has been divided into existing Agar Malwa and Shajapur districts. We have, therefore, calculated birth and death rates for the erstwhile district of Shajapur and assumed that these rates apply to existing Agar Malwa and Shajapur districts. Estimates of infant mortality rate and still birth rate can be calculated from the registered number of live births, infant deaths and still births four mutually exclusive population sub-groups – rural male, rural female, urban male, and urban female - for each district. Similarly, the sex ratio of registered births, deaths, infant deaths, and still births has been calculated all districts.

It may, however, be pointed out that assessment of the completeness in the registration of births and deaths is possible at the state level only as estimates of birth rate, death rate and infant mortality rate for the districts are not available from the sample registration system. There is no alternative source of data for the estimation of vital rates at the district level to serve the reference for assessing the completeness of the registration of births and deaths at the district level. The health management information system (HMIS) launched by the Government of India under the National Health Mission reports number of live births, number of still births and number of infant deaths in each district but not the number of deaths. Estimates of birth rate and infant mortality rate estimated from HMIS data, however, reveal that these estimates based are substantially lower than estimates from the sample registration system. The only way to assess the completeness of the registration of births and deaths in the districts is, therefore, judgemental, based on the plausibility or implausibility of the estimates.

Data Source

Data for the present analysis have been taken from the database maintained by the Registrar General of India about the number of live births, deaths, infant deaths and still births registered under the civil registration system. This database is available up to the year 2020 only. The present analysis, therefore, is confined to the analysis of the situation that prevailed in Madhya Pradesh during the period 2016-2020. On the other hand, the analysis of the situation in the districts of the state has been carried out for the year 2020 only. District level data about the registration of live births, death, still births and infant deaths is, however, available under the civil registration system for the period 2016-2020.

Under the provisions of both the Birth and Death Registration Act, 1969 (Government of India, 1969) and Madhya Pradesh Birth and Death Registration Rules, 1999

(Government of Madhya Pradesh, 2000), detailed statistical information is also collected for every birth and death registered under the civil registration system. In case of live birth registered, information is collected on 13 points specific to the live birth. These include residence of the mother; religion of the family; level of education of the father and the mother of the newborn; current age of the mother and the age of the mother at the time of marriage; number of children born alive to the mother; type of attention at the time of delivery; method of delivery; birth weight of the newborn; and the duration of pregnancy. Similarly, for each death registered, information on 11 points specific to the death is to be collected under the civil registration system. These include residence and religion of the deceased; occupation of the deceased; type of medical attention received before death; medical certification of the cause of death; name of the disease or the actual cause of death; in case of female death, whether the death was a maternal death (death during pregnancy, at the time of delivery or within 6 weeks after the end of the pregnancy); whether the deceased was habitual smoker or habitual tobacco chewer or habitual chewer of arecanut including pan masala and, if yes, the duration of addition in each case. On the other hand, information on 6 points is collected for each still birth registered under the civil registration system. These include residence, age, and educational status of the mother; type of attention at delivery; duration of pregnancy and cause of foetal death (Government of India, 2012). However, the statistical information associated with each live birth, death and still birth collected at the time of registration is not entered in the relevant registers maintained at the registration units and, therefore, is not reported and analysed. The statistical information that is collected for every live birth, death and still birth registered under the civil registration system can give useful insight into the demographic dynamics that prevails in the state and in the districts of the state. However, this statistical information has not been made available by the Registrar General of India to carry out a deeper analysis of the civil registration data, especially at the local level so that the data available from the civil registration system do not permit analysis of the demographic situation that prevails at the local level. Because of this limitation of the data available from the civil registration system, the present analytical review of the civil registration system in Madhya Pradesh is limited to the analysis of the number of live births, deaths, infant deaths, and sill births registered under the civil registration system in the state.

Table 1 gives the information about the number of live births, deaths, infant deaths, and still births registered under the civil registration system in Madhya Pradesh during the period 2016 through 2020 classified by the place of residence and sex of the vital event. Using data contained in table 1, state level analysis has been carried out for the period 2016 through 2020 to get an idea about the function of the civil registration system in Madhya Pradesh during the period 2016-2020. Data on the number of live births, deaths, infant deaths, and still births are also available for each of the 50 districts of the state as they existed as the time of 2011 population census bur are not presented here. The district level analysis has, however, been carried out for the year 2020 only and not for the previous years as it is the current state of the functioning of the civil registration system at the district level that matters for strengthening the civil registration system at the district level. Improving the functioning of the civil registration system in the district, it may be emphasised, is necessary for improving the functioning of the civil registration system in the state.

Table 1: Number of live births, deaths and infant deaths registered under the civil registration system in Madhya Pradesh, 2016-2020.

Population		Year				
		2020	2019	2018	2017	2016
		Live births registered				
Rural	Male	321190	290500	251926	235960	231727
	Female	288530	250210	225904	218086	209248
	Person	609720	540710	477830	454046	440975
Urban	Male	546548	557358	530170	533788	535898
	Female	497361	503975	478794	480357	488906
	Person	1043909	1061333	1008964	1014145	1024804
Total	Male	867738	847858	782096	769748	767625
	Female	785891	754185	704698	698443	698154
	Person	1653629	1602043	1486794	1468191	1465779
		Deaths registered				
Rural	Male	206715	204602	162458	124340	106925
	Female	123420	114953	94562	80727	74120
	Person	330135	319555	257020	205067	181045
Urban	Male	120200	105117	100533	99160	92849
	Female	74119	68656	66704	66311	64693
	Person	194319	173773	167237	165471	157542
Total	Male	326915	309719	262991	223500	199774
	Female	197539	183609	161266	147038	138813
	Person	524454	493328	424257	370538	338587
		Infant deaths registered				
Rural	Male	1055	949	797	585	939
	Female	878	783	774	538	829
	Person	1933	1732	1571	1123	1768
Urban	Male	5532	5117	5215	5498	4802
	Female	4120	3839	3943	4738	3944
	Person	9652	8956	9158	10236	8746
Total	Male	6587	6066	6012	6083	5741
	Female	4998	4622	4717	5276	4773
	Person	11585	10688	10729	11359	10514
		Still births registered				
Rural	Male	2942	1395	1672	1455	1145
	Female	2518	1246	1373	1250	1184
	Person	5460	2641	3045	2705	2629
Urban	Male	2408	4347	3709	4999	4610
	Female	2149	9728	2974	4048	3939
	Person	4557	6683	6683	9047	6549
Total	Male	5350	4347	4347	6454	6055
	Female	4667	9728	9728	5298	5123
	Person	10017	7294	9728	11752	11178

Source: Government of India (2022).

Vital Rates Based on Civil Registration System

Table 2 gives estimates of birth rate, death rate, infant mortality rate, and still birth rate in Madhya Pradesh derived from the registered births and deaths along with estimates of birth rate, death rate and infant mortality rate obtained from the sample registration system. Estimates of the still birth rate are not available from the sample registration system. The birth rate derived from registered live births (*Reg*BR) is consistently lower than SRS birth rate which indicates under registration of live births in the civil registration system. In 2020, the birth rate derived from the civil registration system was almost 18 per cent lower than the birth rate obtained from SRS. Although, there has been some improvement in the registration of live births in recent years, yet there is a substantial degree of under registration of live births in the civil registration system.

An intriguing observation of table 2 is that the registered birth rate for the urban population is substantially higher than the corresponding birth rate from SRS. Similarly, the registered birth rate for the rural population is substantially lower than the corresponding SRS birth rate. The table also shows that the birth rate in the urban population derived from the civil registration data is substantially higher than the birth rate in the rural population derived from the civil registration data. Under the Birth and Death Registration Act of 1969, all vital events are registered at the place of occurrence or the *de facto* place of residence whereas are based on *de jure* place of residence. The Birth and Death Registration Act, 1969, however, makes no distinction between the *de facto* and *de-jure* place of residence. Because of this reason, the registered birth rate is contrastingly different from SRS birth rate.

A similar situation exists in case of death rate, although the difference between the registered death rate and SRS death rate is not as wide as in case of birth rate. Like the registration of birth, the death is also at the *de-facto* place of residence and not at the *de-jure* place of residence and, therefore, registered death rate reflects higher risk of death in the urban population as compared to that in the rural population. To address this anomaly, it is important that both births and deaths are registered according to the *de-jure* place of residence in addition to the *de-facto* place of residence to obtain meaningful estimates of birth and the death rates from the civil registration system.

Table 2 also indicates that the registered male death rate is higher than the male death rate from the SRS whereas registered female death rate is lower than the female death rate from SRS both rural and urban and hence in total population. This observation indicates that there is either sex-bias in the registration of deaths or a substantial proportion of female deaths is registered as male deaths.

The situation appears to be precarious in case of the registration of infant deaths under. The registered infant mortality rate is incomprehensible when compared with the estimate of infant mortality rate obtained from the sample registration system. It is obvious from table 2 that a large proportion of infant deaths are not being registered under the civil registration system and there appears to be little improvement over time. Interestingly, the registered still birth rate in the state is very similar to the registered infant mortality rate. It appears that a substantial proportion of live births are registered as still births which lowers the registered infant mortality rate.

Table 2: Estimates of birth rate, death rate and infant mortality rate based on civil registration system and sample registration system in Madhya Pradesh, 2016-2020.

Population		Estimates based on civil registration system					Estimates based on sample registration system				
		2020	2019	2018	2017	2016	2020	2019	2018	2017	2016
						Birth rate					
						Number of live births registered per 1000 population					
Rural		10.3	9.2	8.2	7.9	7.8	26.0	26.4	26.6	26.8	27.1
Urban		43.7	45.2	43.8	44.8	46.1	18.8	19.0	19.1	19.4	19.5
Total		19.8	19.5	18.3	18.4	18.6	24.1	24.5	24.6	24.8	25.1
						Death rate					
						Number of deaths registered per 1000 population					
Rural	Male	6.8	6.8	5.4	4.2	3.7	7.4	7.6	7.7	8.0	8.4
	Female	4.3	4.0	3.4	2.9	2.7	6.1	6.3	6.4	6.5	6.8
	Person	5.6	5.4	4.4	3.6	3.2	6.8	7.0	7.1	7.3	7.6
Urban	Male	9.6	8.6	8.4	8.4	8.0	6.4	6.0	5.8	5.9	6.1
	Female	6.5	6.1	6.0	6.1	6.1	5.8	5.1	5.2	5.1	5.4
	Person	8.1	7.4	7.3	7.3	7.1	5.6	5.6	5.5	5.5	5.7
Total	Male	7.6	7.3	6.3	5.4	4.9	7.2	7.8	7.2	7.5	7.8
	Female	4.9	4.6	4.1	3.8	3.6	5.8	6.0	6.1	6.1	6.4
	Person	6.3	6.0	5.2	4.6	4.3	6.5	6.6	6.7	6.8	7.1
						Infant mortality rate					
						Number of infant deaths registered per 1000 live births registered					
Rural	Male	3.3	3.3	3.2	2.5	4.1	47	52	54	52	53
	Female	3.0	3.1	3.4	2.5	4.0	46	47	49	49	47
	Person	3.2	3.2	3.3	2.5	4.0	47	50	52	51	50
Urban	Male	10.1	9.2	9.8	10.3	9.0	30	34	37	34	34
	Female	8.3	7.6	8.2	9.9	8.1	29	30	35	29	31
	Person	9.2	8.4	9.1	10.1	8.5	30	32	36	32	33
Total	Male	7.6	7.2	7.7	7.9	7.5	44	49	51	48	49
	Female	6.4	6.1	6.7	7.6	6.8	43	43	46	45	44
	Person	7.0	6.7	7.2	7.7	7.2	43	46	48	47	47
						Still birth rate					
						Number of still births registered per 1000 births registered					
Rural	Male	9.1	4.8	6.6	6.1	4.9	na	na	na	na	na
	Female	8.7	5.0	6.0	5.7	5.6	na	na	na	na	na
	Person	8.9	4.9	6.3	5.9	5.9	na	na	na	na	na

Population		Estimates based on civil registration system					Estimates based on sample registration system				
		2020	2019	2018	2017	2016	2020	2019	2018	2017	2016
Urban	Male	4.4	7.7	6.9	9.3	8.5	na	na	na	na	na
	Female	4.3	18.9	6.2	8.4	8.0	na	na	na	na	na
	Person	4.3	6.3	6.6	8.8	6.3	na	na	na	na	na
Total	Male	6.1	5.1	5.5	8.3	7.8	na	na	na	na	na
	Female	5.9	12.7	13.6	7.5	7.3	na	na	na	na	na
	Person	6.0	4.5	6.5	7.9	7.6	na	na	na	na	na

Source: Author based on table 1 and Government of India (2017; 2019a; 2020b; 2021a; 2022a).
Remarks: Estimates of still birth rate are not available from the sample registration system.

Table 4: Birth rate and death rate derived from the births and deaths registered under the civil registration system in districts of Madhya Pradesh, 2020.

District		Birth rate (0/00)	Death rate (0/00)		
			Person	Male	Female
1	Alirajpur	37.4	6.0	8.0	3.7
2	Annuppur	4.8	2.2	2.4	1.9
3	Ashoknagar	12.8	2.6	3.3	1.8
4	Balaghat	13.1	6.6	7.1	6.0
5	Barwani	75.2	10.1	13.1	6.8
6	Betul	14.8	5.8	6.7	4.7
7	Bhind	20.2	6.9	8.9	4.7
8	Bhopal	34.9	10.0	12.1	7.5
9	Burhanpur	17.1	5.0	5.8	4.1
10	Chhatarpur	14.9	4.1	5.1	2.9
11	Chhindwara	29.5	10.5	12.2	8.7
12	Damoh	10.6	3.6	4.4	2.7
13	Datia	5.3	1.9	2.3	1.5
14	Dewas	36.1	13.0	15.8	9.9
15	Dhar	41.2	15.3	19.3	11.0
16	Dindori	11.5	4.2	4.9	3.5
17	Guna	18.0	4.2	5.0	3.3
18	Gwalior	26.3	7.4	9.5	5.2
19	Harda	6.3	2.0	2.4	1.6
20	Hoshangabad	12.4	4.7	5.6	3.6
21	Indore	24.5	12.2	14.8	9.5
22	Jabalpur	10.9	6.3	7.4	5.1
23	Jhabua	20.9	2.9	3.8	2.0
24	Katni	27.1	5.7	6.8	4.7
25	Khandwa	14.5	4.9	5.9	3.8
26	Khargone	20.5	7.4	9.1	5.6
27	Mandla	7.8	3.4	3.7	3.0
28	Mandsaur	15.1	6.4	7.4	5.2
29	Morena	26.5	7.4	9.4	5.3
30	Narsimhapur	12.7	4.3	5.2	3.3
31	Neemuch	20.2	9.1	10.6	7.5
32	Panna	15.5	4.4	5.3	3.4
33	Raisen	15.4	4.7	5.8	3.4
34	Rajgarh	10.2	3.5	4.0	3.0
35	Ratlam	30.4	8.9	10.5	7.2
36	Rewa	61.7	18.5	19.8	17.3
37	Sagar	39.3	14.2	18.0	10.4
38	Satna	20.0	6.0	7.4	4.5
39	Sehore	18.6	4.4	5.3	3.5
40	Seoni	12.5	5.6	6.7	4.6
41	Shahdol	16.4	4.9	5.7	3.9
42	Shajapur	30.8	10.5	12.2	8.6
43	Sheopur	9.7	2.5	3.1	1.8
44	Shivpuri	42.3	12.7	17.1	8.2
45	Sidhi	21.9	4.9	6.1	3.6
46	Singroli	23.1	3.9	4.7	3.0
47	Tikamgarh	26.3	7.4	9.7	5.1
48	Ujjain	45.4	18.6	22.8	14.5
49	Umariya	8.2	2.6	3.0	2.1
50	Vidisha	32.8	9.6	12.1	7.1

Source: Author's calculations.

Table 5: Infant mortality rate (per 1000 live births) in the districts of Madhya Pradesh derived from the births and deaths registered under the civil registration system, 2020.

SN	District	Rural			Urban			Total		
		Male	Female	Person	Male	Female	Person	Male	Female	Person
1	Aagar Malwa	0.00	4.69	2.13	1.88	1.33	1.62	1.73	1.58	1.66
2	Alirajpur	0.91	0.62	0.77	0.00	0.51	0.25	0.79	0.60	0.70
3	Annuppur	2.28	6.17	4.22	8.65	6.96	7.82	5.23	6.53	5.88
4	Ashoknagar	0.00	0.00	0.00	9.43	7.55	8.55	4.71	3.79	4.28
5	Balaghat	3.56	3.19	3.38	19.44	15.79	17.63	12.33	10.25	11.31
6	Barwani	0.66	0.99	0.82	0.26	1.58	0.88	0.58	1.12	0.83
7	Betul	1.90	1.75	1.83	1.53	1.79	1.65	1.70	1.77	1.74
8	Bhind	0.00	0.92	0.38	0.00	0.18	0.08	0.00	0.38	0.17
9	Bhopal	1.20	3.79	2.47	3.74	2.90	3.34	3.63	2.94	3.30
10	Burhanpur	1.04	1.43	1.22	1.30	1.31	1.31	1.19	1.36	1.27
11	Chhatarpur	0.62	0.69	0.65	1.12	0.65	0.89	0.97	0.66	0.82
12	Chhindwara	10.06	7.53	8.81	11.40	11.42	11.41	10.91	9.99	10.46
13	Damoh	25.80	21.45	23.74	15.21	11.85	13.59	19.95	16.08	18.10
14	Datia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	Dewas	2.12	2.34	2.23	2.63	1.63	2.14	2.51	1.79	2.16
16	Dhar	15.94	14.67	15.34	22.94	16.10	19.65	19.61	15.43	17.62
17	Dindori	2.20	3.78	2.98	0.00	0.69	0.34	1.85	3.28	2.55
18	Guna	6.53	6.86	6.68	1.18	0.96	1.08	2.05	1.84	1.95
19	Gwalior	0.71	0.73	0.72	33.15	29.13	31.35	27.78	24.83	26.48
20	Harda	2.18	1.51	1.83	5.99	6.34	6.16	4.79	4.59	4.69
21	Hoshangabad	0.47	0.49	0.48	10.18	10.68	10.42	8.45	8.79	8.61
22	Indore	1.53	0.85	1.21	21.63	17.24	19.50	20.06	16.01	18.09
23	Jabalpur	0.00	0.00	0.00	11.93	9.20	10.61	11.45	8.90	10.22
24	Jhabua	0.00	0.31	0.14	0.00	0.34	0.16	0.00	0.32	0.15
25	Katni	0.18	0.75	0.43	0.24	0.00	0.13	0.20	0.49	0.33
26	Khandwa	0.64	2.48	1.51	3.00	1.57	2.34	1.96	1.98	1.97
27	Khargone	2.02	1.29	1.67	21.34	18.36	19.91	11.43	9.66	10.59
28	Mandla	2.04	1.45	1.75	22.23	15.19	18.79	9.60	6.66	8.18
29	Mandsaur	1.90	3.24	2.55	0.70	0.88	0.79	1.07	1.59	1.32
30	Morena	0.29	0.54	0.40	0.06	0.07	0.07	0.13	0.21	0.17
31	Narsimhapur	2.12	2.59	2.35	8.56	8.19	8.38	6.80	6.64	6.72
32	Neemuch	4.77	4.38	4.59	1.19	2.57	1.85	1.82	2.89	2.33
33	Panna	0.33	0.00	0.18	20.28	17.94	19.15	10.10	8.97	9.56
34	Raisen	1.75	1.61	1.68	1.47	2.28	1.86	1.56	2.06	1.80
35	Rajgarh	0.00	0.00	0.00	3.85	2.21	3.04	3.04	1.78	2.43
36	Ratlam	1.10	0.80	0.96	25.90	16.57	21.35	15.72	10.22	13.05
37	Rewa	13.22	13.22	13.22	5.73	6.16	5.93	8.22	8.58	8.38
38	Sagar	3.57	4.16	3.86	18.39	16.49	17.49	14.56	13.22	13.92
39	Satna	1.70	0.97	1.36	13.79	12.04	12.96	9.91	8.56	9.28
40	Sehore	0.65	0.98	0.80	0.19	0.10	0.15	0.33	0.36	0.34
41	Seoni	0.00	0.00	0.00	39.72	18.93	29.49	18.30	8.81	13.65
42	Shahdol	0.00	0.00	0.00	9.12	6.55	7.88	7.62	5.41	6.55
43	Shajapur	0.40	0.91	0.63	0.56	0.30	0.43	0.52	0.45	0.48
44	Sheopur	0.81	0.92	0.86	3.06	3.19	3.12	2.19	2.31	2.25
45	Shivpuri	0.49	0.72	0.60	1.12	3.67	2.32	0.92	2.74	1.78
46	Sidhi	0.81	0.65	0.73	0.35	0.19	0.27	0.64	0.48	0.57
47	Singroli	13.99	9.43	11.82	13.93	11.94	13.01	13.98	9.99	12.09
48	Tikamgarh	1.40	0.83	1.14	12.14	9.26	10.75	9.45	7.29	8.42
49	Ujjain	5.77	4.88	5.34	17.44	13.79	15.68	14.98	11.90	13.49
50	Umariya	1.93	0.00	1.00	0.00	0.77	0.37	1.09	0.33	0.72
51	Vidisha	3.75	2.22	3.01	8.14	7.46	7.82	6.74	5.73	6.26

Source: Author's calculations.

Table 6: Still birth rate (per 1000 births) in the districts of Madhya Pradesh derived from the births and deaths registered under the civil registration system, 2020.

SN	District	Rural			Urban			Total		
		Male	Female	Person	Male	Female	Person	Male	Female	Person
1	Aagar Malwa	0.00	0.00	0.00	11.99	9.95	11.02	11.03	9.21	10.17
2	Alirajpur	0.14	0.15	0.15	0.00	0.00	0.00	0.12	0.13	0.13
3	Annuppur	0.33	0.65	0.49	0.00	0.00	0.00	0.17	0.35	0.26
4	Ashoknagar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	Balaghat	1.91	1.30	1.62	5.63	5.20	5.42	3.97	3.49	3.73
6	Barwani	0.03	0.04	0.04	0.00	0.00	0.00	0.03	0.03	0.03
7	Betul	0.68	1.35	1.01	0.00	0.00	0.00	0.32	0.66	0.48
8	Bhind	214.07	242.02	225.94	4.25	4.29	4.27	82.35	84.01	83.10
9	Bhopal	8.36	4.40	6.43	1.26	2.42	1.82	1.57	2.51	2.02
10	Burhanpur	5.98	4.99	5.52	0.00	0.19	0.09	2.64	2.30	2.48
11	Chhatarpur	0.47	0.69	0.57	0.00	0.00	0.00	0.14	0.20	0.17
12	Chhindwara	2.97	2.29	2.64	13.91	12.24	13.10	9.95	8.59	9.29
13	Damoh	0.76	0.68	0.72	6.63	7.01	6.81	4.01	4.23	4.12
14	Datia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	Dewas	9.60	7.30	8.51	0.00	0.19	0.09	2.23	1.79	2.01
16	Dhar	11.24	11.27	11.26	14.26	17.48	15.81	12.83	14.58	13.67
17	Dindori	0.78	0.67	0.73	0.00	0.00	0.00	0.65	0.56	0.61
18	Guna	7.24	6.36	6.84	0.96	0.88	0.92	1.98	1.70	1.85
19	Gwalior	0.53	0.73	0.61	0.00	0.00	0.00	0.09	0.11	0.10
20	Harda	19.75	16.38	18.00	0.00	0.00	0.00	6.30	6.02	6.16
21	Hoshangabad	0.47	0.00	0.24	12.15	8.92	10.62	10.09	7.28	8.75
22	Indore	63.35	59.71	61.63	0.13	0.10	0.12	5.38	4.84	5.12
23	Jabalpur	0.00	0.00	0.00	0.63	0.72	0.67	0.60	0.70	0.65
24	Jhabua	4.06	4.48	4.26	0.00	0.00	0.00	2.47	2.68	2.57
25	Katni	6.98	7.40	7.16	6.22	6.38	6.29	6.73	7.03	6.87
26	Khandwa	1.59	0.53	1.09	0.00	0.00	0.00	0.70	0.24	0.48
27	Khargone	19.36	19.41	19.39	0.00	0.00	0.00	10.02	9.98	10.00
28	Mandla	1.63	2.32	1.96	29.50	30.39	29.93	12.25	13.15	12.69
29	Mandsaur	3.52	4.11	3.81	0.12	0.00	0.06	1.15	1.23	1.19
30	Morena	4.08	6.24	5.05	0.00	0.00	0.00	1.24	1.82	1.51
31	Narsimhapur	3.03	1.29	2.19	12.62	10.93	11.81	10.01	8.28	9.18
32	Neemuch	4.75	1.75	3.33	2.03	1.47	1.76	2.51	1.52	2.04
33	Panna	12.97	12.72	12.85	27.47	20.14	23.96	20.13	16.44	18.38
34	Raisen	4.48	2.41	3.48	0.00	0.13	0.06	1.48	0.89	1.20
35	Rajgarh	0.00	0.00	0.00	10.84	8.85	9.86	8.58	7.14	7.88
36	Ratlam	2.20	2.12	2.16	17.80	15.87	16.86	11.46	10.38	10.93
37	Rewa	1.80	4.90	3.25	0.56	1.55	1.01	0.97	2.71	1.77
38	Sagar	3.71	2.99	3.36	1.03	0.84	0.94	1.72	1.41	1.57
39	Satna	0.00	0.00	0.00	6.14	7.84	6.94	4.18	5.39	4.75
40	Sehore	0.22	0.98	0.57	2.06	1.40	1.74	1.50	1.28	1.39
41	Seoni	10.83	9.50	10.19	18.36	15.02	16.72	14.31	12.08	13.22
42	Shahdol	0.00	0.00	0.00	8.12	5.52	6.87	6.80	4.57	5.71
43	Shajapur	1.58	0.45	1.06	0.00	0.00	0.00	0.41	0.11	0.27
44	Sheopur	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45	Shivpuri	1.31	0.54	0.94	0.00	0.00	0.00	0.41	0.17	0.30
46	Sidhi	0.30	0.43	0.37	0.00	0.00	0.00	0.19	0.28	0.23
47	Singroli	0.50	0.39	0.45	0.00	0.00	0.00	0.39	0.31	0.35
48	Tikamgarh	8.56	10.91	9.64	17.65	17.05	17.36	15.40	15.62	15.50
49	Ujjain	0.92	1.22	1.07	7.62	8.92	8.25	6.22	7.30	6.74
50	Umariya	8.47	5.27	6.93	0.00	0.00	0.00	4.78	2.99	3.92
51	Vidisha	3.94	5.74	4.81	9.62	9.13	9.39	7.81	8.01	7.91

Source: Author's calculations.

Estimation of birth and death rates for the districts of the state based on the births and deaths registered requires estimates of district population for the year 2020 which are not available. We have, therefore, used district population forecast for the year 2020 produced by Chaurasia (2023) to estimate birth rate and death rate for the districts of the registered births and deaths. The population forecast produced by Chaurasia (2023) are, however, available for 50 districts of the state as they existed at the time of 2011 population census. After the 2011 population census, the erstwhile district of Shajapur of the state has been divided into two districts - district Agar Malwa and district Shajapur. For the present analysis, we have merged the births and deaths registered in district Agar Malwa and in district Shajapur to obtain birth and death rates for the erstwhile district of Shajapur as population forecast of district Agar Malwa and district Shajapur for the year 2020 are not available. The birth rate for the districts has been estimated for the total population whereas the death rate has been estimated for the total population and for male and female populations separately. On the other hand, infant mortality rate and the still birth rate has been estimated for all the four mutually exclusive population sub-groups – rural male, rural female, urban male, and urban female - as estimation of the infant mortality rate and the still birth rate does not require estimate of the population of different population sub-groups.

Table 4 presents estimates of registered birth rate (*Reg*BR) and registered death rate (*Reg*DR) for the districts of the state, derived from the civil registration data. The most revealing feature of table 4 is that both registered birth rate and registered death rate vary widely across the districts of the state. For example, in the year 2020, the registered birth rate estimated from the civil registration data varies from an unacceptably high level of more than 75 registered live births for every 1000 population in district Barwani to an unacceptably low level of less than 5 registered live births for every 1000 population in district Anuppur. In district Rewa also, the registered birth rate derived from the civil registration data is estimated to be more than 60 registered live births for every 1000 population whereas in districts Shivpuri and Ujjain, it is estimated to be around 45 registered live births for every 1000 population. These birth rates are exceptionally high and indicative of a substantial degree of duplication in the registration of live births under the civil registration system. On the other hand, there are 28 districts in the state where the registered birth rate is estimated to be less than 20 registered live births for every 1000 population which shows that there is gross under registration of live births under the civil registration system in these districts. In six districts of the state - Anuppur, Datia, Harda, Mandla, Sheopur and Umaria – the registered birth rate is estimated to be less than 10 registered live births for every 1000 population which suggests that there is gross under-registration of live births in these districts.

Similarly, the death rate derived from the civil registration data also varies widely across districts from an unacceptably low level of less than 2 registered deaths for every 1000 population in district Datia to an unacceptably high level of almost 19 registered deaths for every 1000 population in district Ujjain. In 22 districts of the state, the death rate, derived from the deaths registered under the civil registration system is estimated to be less than 5 registered deaths for every 1000 population which shows that there is gross under registration of deaths under the civil registration system in these districts. On the other hand, there are 11 districts where the death rate based on the deaths registered under the civil registration system is estimated to be more than 10 registered deaths for every 1000 population which is exceptionally high by all standards. These districts are Barwani, Bhopal, Chhindwara, Dewas, Dhar, Indore, Rewa, Sagar, Shajapur, Shivpuri and Ujjain. In Neemuch, Ratlam and Vidisha districts also, the death rate derived from the number of deaths registered under the civil registration system is found to be very high. An exceptionally high registered death rate is an indication of the duplication in the registration of deaths under the civil registration system.

In case of infant mortality rate, there is no district in the state where the registered infant mortality rate derived from the civil registration data is more than 30 infant deaths for every 1000 registered live births (Table 5). District Gwalior is the only district in the state where the infant mortality rate derived from the civil registration data is estimated to be around 26 registered infant deaths for every 1000 registered live births. On the other hand, in districts Datia, no infant death was registered under the civil registration system during the entire year 2020 so that the infant mortality rate based on the civil registration system data in this district is zero which is nearly impossible. There are only 13 districts in the state where the registered infant mortality rate derived from the civil registration data is estimated to be more than 10 registered infant deaths for every 1000 registered live births. According to the sample registration system, the infant mortality rate in Madhya Pradesh is the highest among the states and Union Territories of the country. However, the data from the civil registration system depicts an entirely different picture of the risk of death in the first years of life in all districts of the state.

The inter-district variation in the still birth rate is even more revealing (Table 6). In 16 districts of the state, the still birth rate derived from the civil registration data is higher than the corresponding infant mortality rate. The most astonishing case is that of district Bhind where the still birth rate is estimated to be more than 83 still births for every 1000 live births. In the rural population of district Bhind, the still birth rate derived from the civil registration data is almost 226 still births for every 1000 live births whereas, in the urban areas of the district, the still birth rate derived from the civil registration data is less than 5 still births for every 1000 live births. In districts Agar Malwa and Panna also, the still birth rate based on the civil registration data is found to be markedly higher than the infant mortality rate estimated from the civil registration data. It appears that a substantial proportion of live births, in these districts, is registered as a still births under the civil registration system and this misclassification at the time of registration appears to be very high in the rural areas of district Bhind. This misclassification reflects the poor competency of the staff engaged in the registration of births and deaths in the state.

Completeness of Registration

The index of completess showing the level of registration of different vital events under the civil registration system is presented in table 7. The level of completeness of is different for different vital events and in different population sub-groups. Similarly, the improvement in the level of completeness has also been different for different vital events. Interestingly, compared to the improvement in the level of registration of births, the improvement in the registraion of deaths appears to be relatively more marked in the state. By contrast, there has only a marginal improvement in the registration of infant deaths under the civil registration system in the state. However, the level of completeness is radically different in different sub-groups of the population. For example, the index of completeness of birth registration is more than 200 per cent in the urban areas of the state but less than 40 per cent in the rural areas. On the other hand, while the index of completeness of birth registration has improved in the rural areas, it has virtually remained unchanged in the urban areas.

Table 7: Index of completeness of registration of different vital events under the civil registration system in Madhya Pradesh, 2016-2020.

Population		2020	2019	2018	2017	2016
				Births		
Rural		39.62	34.85	30.83	29.48	28.78
Urban		232.45	237.89	229.32	230.93	236.41
Total		82.16	79.59	74.39	74.19	74.10
				Deaths		
Rural	Male	91.89	89.47	70.13	52.50	44.05
	Female	70.49	63.49	53.13	44.62	39.71
	Total	82.35	77.14	61.97	49.32	42.11
Urban	Male	150.00	143.33	144.83	142.37	131.15
	Female	112.07	119.61	115.38	119.61	112.96
	Total	144.64	132.14	132.73	132.73	124.56
Total	Male	105.56	93.59	87.50	72.00	62.82
	Female	84.48	76.67	67.21	62.30	56.25
	Total	96.92	90.91	77.61	67.65	60.56
				Infant deaths		
Rural	Male	7.02	6.35	5.93	4.81	7.74
	Female	6.52	6.60	6.94	5.10	8.51
	Total	6.81	6.40	6.35	4.90	8.00
Urban	Male	33.67	27.06	26.49	30.29	26.47
	Female	28.62	25.33	23.43	34.14	26.13
	Total	30.67	26.25	25.28	31.56	25.76
Total	Male	17.27	14.69	15.10	16.46	15.31
	Female	14.88	14.19	14.57	16.89	15.45
	Total	16.28	14.57	15.00	16.38	15.32

Source: Author, based on table 1.

Like the index of completeness in birth registration, the index of completeness in death registration is also well above 100 per cent in the state for both male and female deaths. On the other hand, the improvement in the index of completeness of registration of deaths has been faster in case of male deaths as compared to female deaths. The improvement in the index of completeness of death registration in the urban areas of the state has been entirely due to the improvement in the registration of male deaths as the index of completeness of female death registration in the urban areas of the state has virtually remained the same over the last five years. In the rural areas of the state also, the improvement in the index of completeness of registration of male deaths has been relatively faster than the improvement in the index of completeness in the registration of female deaths.

In case of the completeness of the registration of infant deaths, the situation in the state is very poor as may be seen from the index of completeness. For the total population, the index of completeness of registration of infant deaths has virtually remained unchanged since 2016 while the index of completeness of registration of female infant deaths appears to have decreased, instead increased. In the rural areas of the state, the index of completeness of the registration of infant deaths under the vital registration system has always been less than 10 per cent and there is hardly any indication that the index of completeness has improved in the recent past, either in the registration of male infant deaths or in the registration of female infant deaths. A similar situation prevails in the urban areas of the state also, although the index of completeness of the registration of infant deaths in the urban areas is comparatively higher than the in the rural areas.

Table 7 highlights the contrasting difference in the completeness of the registration of vital events in different mutually exclusive population sub-groups within the state. The index of completeness of the registration of both births and deaths in the urban areas is estimated to be more than 100 per cent. This may be because, both births and deaths are registered by *de-facto* pace of residence whereas the population is counted by the *de-jure* place of residence. On the other hand, the index of completeness of the registration of vital events under the civil registration system has been found to be always lower for females than for males. This suggests that there is under registration of female vital events under the civil registration system.

Sex Bias in Civil Registration

The reports released by the Registrar General of India also permits calculation of the sex ratio (males per 100 females) of the births, deaths and infant deaths registered under the civil registration system. This sex ratio reflects the male or female bias in the registration of births, deaths, and infant deaths under the civil registration system. The sex ratio of births registered under the civil registration system is an estimate of the sex ratio at birth and can be compared with the sex ratio at birth estimated from the sample registration system. On the other hand, mortality sex ratio based on registered deaths and infant mortality sex ratio based on registered infant deaths indicates sex bias, in the registration of deaths and infant deaths under the civil registration system.

Table 6 and figure 5 shows the sex ratio of registered births, mortality sex ratio and infant mortality sex ratio based on registered deaths and infant deaths respectively in Madhya Pradesh for the period 2016-2020. The sex ratio of registered births was 110 registered male births for every 100 registered female births with only a marginal difference between rural and urban areas. Another important observation of table 6 is that the sex ratio of the registered births in the state has remained more or less unchanged since 2016. Although, the sex ratio of registered births in Madhya Pradesh is higher than the globally accepted sex ratio at birth of 105 male births for every 100 female births, yet it is nearly the same as the sex ratio at birth reported by the sample registration system for Madhya Pradesh (Government of India, 2022a). As such, it appears that there is no sex bias in the registration of births under the civil registration system in the state.

In case of the mortality sex ratio and infant mortality sex ratio, the situation is strikingly different. Table 8 reveals that mortality sex ratio based on registered deaths is very highly favourable to males as compared to females. This implies that there is gross under registration of female deaths as compared to the registration of male deaths. An even more disturbing observation of table 8 is that the male biasedness in the registration of deaths has increased over time. In 2016, the mortality sex ratio based on registered deaths was 136 registered male deaths for every 100 registered female deaths. This ratio increased to 159 in 2019. Although the mortality sex ratio based on registered deaths decreased marginally to 155 in 2020, yet it was

well above the mortality sex ratio in 2016. By comparison, the mortality sex ratio obtained from the sample registration system is always lower than that derived from the civil registration data. The sample registration system also suggests that the mortality sex ratio has largely remained unchanged in the state during 3016-2020. This shows that a large number of female deaths are not registered under the civil registration system in the state.

A similar situation may be observed in case of the infant mortality sex ratio based on registered infant deaths which has increased over time whereas the infant mortality sex ratio estimated from the sample registration system appears to have decreased in the state. The infant mortality sex ratio based on registered infant deaths was 119 registered male infant deaths for every 100 registered female infant deaths in the year 2020 whereas it was only 110 in 2016. By contrast, the infant mortality sex ratio estimated from the sample registration system was 102 in 2020 compared to 111 in 2016. A similar trend may also be seen in the rural and urban areas of the state. This shows that like the male biasedness in the registration of deaths, the male biasedness in the registration of infant deaths has also increased in the state. This male biasedness may be due to both duplicate registration of male deaths and under registration of female deaths.

The exceptionally high mortality sex ratio and infant mortality sex ratio in the state also implies that once the mortality sex ratio and the infant mortality sex ratio based on registered deaths are adjusted for the male biasedness, the death rate implied by the deaths registered under the civil registration system in the state will become higher than the death rate estimated from the sample registration system. This observation is also supported by the observation that there is gross under registration of infant deaths in the state and there is significant male bias in the registration of infant deaths which has increased over time. It is obvious that if the under-registration of infant deaths is taken into consideration, then the number of registered deaths will also increase, and this will lead to even further increase in the registered death rate, well above the death rate obtained from the sample registration system.

Table 8: Sex ratio (males per 100 females) at birth, mortality sex ratio and infant mortality sex ratio in Madhya Pradesh derived from the civil registration system and obtained from the sample registration system.

Population	Derived from civil registration data					Obtained from sample registration system				
	2020	2019	2018	2017	2016	2020	2019	2018	2017	2016
					Sex ratio at birth					
Total	110	112	111	110	110	Na	109	108	108	109
Rural	111	116	112	108	111	Na	110	109	109	110
urban	110	111	111	111	110	na	104	103	103	105
					Mortality sex ratio					
Total	158	170	159	145	137	121	121	120	123	124
Rural	148	141	140	138	131	110	118	112	116	113
Urban	155	159	154	142	136	124	130	118	123	122
					Infant mortality sex ratio					
Total	110	106	94	100	103	102	111	110	106	113
Rural	122	121	120	104	111	103	113	106	117	110
Urban	119	118	115	104	110	102	114	111	107	111

Source: Author's calculations based on the data given in table 1.

The sex ratio at birth, mortality sex ratio and infant mortality sex ratio obtained from the civil registration data for the districts are presented in table 9. The sex ratio of registered births varies from a low of 101 registered male births for every 100 registered female births in district Anuppur to a high of 126 registered male births for every 100 registered female births in district Gwalior. There are six districts – Anuppur, Balaghat, Betul, Chhindwara, Dindori and Seoni – where sex ratio of registered births is estimated to be less than 105 male births for every 100 female births. In these districts, there appears to be under registration of male deaths relative to female deaths. On the other hand, sex ratio of registered births is estimated to be more than 120 registered male births for every 100 registered female births in three districts - Bhind, Gwalior, and Katni. In these districts, there appears to be substantial under registration of female deaths relative to male deaths. At the state level, the sex ratio of the registered births is very similar to the sex ratio at birth obtained from the civil registration system, but the sex ratio of registered births varies widely across the districts. In some districts, there appears gross under registration of male births while in other districts, there appears to be gross under registration of male births under the civil registration system.

Table 8: Sex ratio (male per 100 female) of births, deaths and infant deaths registered under the civil registration system in the districts of Madhya Pradesh, 2022.

District		Sex ratio at birth			Infant mortality sex ratio				Still birth sex ratio		
		Rural	Urban	Total	Total	Rural	Urban	Total	Rural	Urban	Total
1	Aagar Malwa	120	111	112	142	na	142	109	na	121	120
2	Alirajpur	111	106	110	216	147	na	131	90	na	91
3	Annuppur	100	103	101	126	37	124	80	50	na	49
4	Ashoknagar	113	112	113	184	na	125	124	na	na	na
5	Balaghat	106	102	104	118	112	123	120	147	108	114
6	Barwani	109	111	110	194	67	16	52	91	na	91
7	Betul	99	109	104	142	109	85	96	50	na	48
8	Bhind	140	115	122	190	na	na	na	88	99	98
9	Bhopal	105	110	110	161	32	129	123	190	52	62
10	Burhanpur	115	115	115	143	72	100	87	120	na	115
11	Chhatarpur	110	109	110	176	91	173	147	68	na	68
12	Chhindwara	103	105	104	141	134	100	109	130	114	116
13	Damoh	111	108	109	164	120	128	124	113	95	95
14	Datia	123	111	115	159	na	na	na	na	na	na
15	Dewas	110	106	107	159	91	161	140	131	na	125
16	Dhar	111	108	109	176	109	142	127	100	82	88
17	Dindori	104	103	104	137	58	na	56	115	na	116
18	Guna	119	108	110	151	95	123	111	114	109	117
19	Gwalior	138	124	126	181	97	114	112	72	na	79
20	Harda	93	115	107	151	144	94	105	121	na	105
21	Hoshangabad	106	112	111	155	94	95	96	na	136	139
22	Indore	111	106	106	156	181	125	125	106	126	111
23	Jabalpur	134	107	108	145	na	130	129	na	87	87
24	Jhabua	112	107	110	192	na	na	na	91	na	92
25	Katni	128	113	123	144	23	na	41	94	98	96
26	Khandwa	111	114	113	156	26	191	99	299	na	295
27	Khargone	110	109	110	163	157	116	118	100	na	100
28	Mandla	107	105	106	122	140	146	144	70	97	93
29	Mandsaur	108	107	108	144	59	80	67	86	na	93
30	Morena	123	116	118	178	54	86	64	65	na	68
31	Narsimhapur	107	109	108	155	82	104	102	234	115	121

District		Sex ratio at birth				Infant mortality sex ratio			Still birth sex ratio		
		Rural	Urban	Total	Total	Rural	Urban	Total	Rural	Urban	Total
32	Neemuch	110	108	109	141	109	46	63	271	139	166
33	Panna	112	108	110	154	na	113	113	102	136	122
34	Raisen	107	109	109	169	109	65	76	186	na	166
35	Rajgarh	113	103	105	135	na	174	171	na	122	120
36	Ratlam	108	105	106	146	139	156	154	104	112	110
37	Rewa	115	121	119	115	100	93	96	37	36	36
38	Sagar	107	111	110	173	86	111	110	124	122	122
39	Satna	115	111	112	163	175	115	116	na	78	78
40	Sehore	113	107	109	151	66	187	92	22	147	117
41	Seoni	105	103	104	145	na	210	208	114	122	118
42	Shahdol	100	107	105	145	na	139	141	na	147	149
43	Shajapur	115	107	109	142	44	187	115	348	na	368
44	Sheopur	113	114	113	167	89	96	95	na	na	na
45	Shivpuri	110	112	111	207	68	30	34	241	na	239
46	Sidhi	106	109	107	171	126	183	133	71	na	70
47	Singroli	110	116	111	156	148	117	140	127	na	126
48	Tikamgarh	118	108	111	191	169	131	130	78	104	99
49	Ujjain	106	107	107	158	118	126	126	76	85	85
50	Umariya	107	108	108	144	na	na	326	161	na	160
51	Vidisha	107	112	110	172	169	109	118	69	105	97

Source: Author's calculations.
Remarks: na not available

Unlike the sex ratio of registered births, the mortality sex ratio based on registered deaths is very highly biased towards males and varies from a low of around 114 registered male deaths for every 100 registered female deaths in district Mandla to a high of 240 registered male deaths for every 100 registered female deaths in district Alirajpur. There are only three districts – Balaghat, Mandla and Rewa – where the mortality sex ratio based on registered deaths is less than 140. On the other hand, mortality sex ratio based on registered deaths is exceptionally high in five districts - Alirajpur, Ashoknagar, Barwani, Bhind, and Shivpuri. In these districts, mortality sex ratio based on registered deaths is at least 200 registered male deaths for every 100 registered female deaths which indicates that a large proportion of female deaths in these districts are not registered. Similarly, a high degree of male bias in registered infant deaths is also evident in majority of the districts of the state, although there are 12 districts where infant mortality sex ratio based on registered infant deaths is found to be favourable to females. In Bhind, Datia and Jhabua districts, infant mortality sex ratio based on registered infant deaths could not be calculated as there was either no male infant death or no female infant death registered in these districts in 2020. In district Shivpuri, infant mortality sex ratio based on registered infant deaths was only 38 which is highly improbable in all respect. Similarly, infant mortality sex ratio based on registered infant deaths is estimated to be 350 in district Umaria which is also next to improbable. It may, however, be noted that the number of infant deaths registered under the civil registration system in most of the districts of the state is very small which may be a reason behind the high volatility in infant mortality sex ratio based on registered infant deaths.

The inter-district volatility in the sex ratio of registered still births is even higher. In some districts, there appears very high degree of under registration of female still births whereas in other districts, there is high degree of under registration of male still births. The number of still births registered under the civil registration system, however, is very small in all districts of the state.

Discussion and Conclusions

The civil registration system serves two essential functions – documentation of the family organisation which is termed as the legal function and collection of statistical information which is termed as the statistical function. The exclusive purpose of the legal function of the civil registration system is to produce official, proof of the occurrence of birth or death that is complete and permanent, so that it can be validated at any time. The purpose of the statistical function, on the other hand, is to produce vital statistics, which are part of demographic statistics in conjunction with the population census. The civil registration system, therefore, is internationally recognised as an important component of the demographic data system of any country. The legal and the statistical functions of the civil registration system are closely related as they refer to the same vital event – birth or death. In pursuance of its legal function, civil registration system records the occurrence of events related to the civil status of the persons which, in statistical terminology, are termed as vital events and then collects additional data for the processing of the corresponding vital statistics. The system also serves as the mechanism for effective operation of such institutions as social security, voter registration, personal identification, and social assistance services. It is, therefore, imperative that civil registration system is fully developed and fulfils its own basic legal and statistical functions.

The review of the civil registration system in Madhya Pradesh, however, reflects a sorry state of affairs which requires thorough introspection and serious reinvigoration. The civil registration system in the state contributes little to improving the understanding of the demographic dynamics in the state and is of little help in the operation of welfare institutions, especially, the social protection institutions. Estimates of key vital rates derived from births and deaths registered under the system are of little relevance in analysing the demographic dynamics either at state or district levels. The relevance of the civil registration system is rooted in the fact that it is the only system that can generate basic vital data even up to the grass roots level which is critical for development planning and programming. Viewed from this perspective, the civil registration system in the state remains largely irrelevant.

The present analysis is limited to the analysis of selected outputs of the civil registration system. It does not dwell upon the inputs and processes of the system that ultimately have an impact on system outputs. For a deeper understanding of the malice that plagues the civil registration system in the state, it is pertinent to analyse the inputs and processes of registering births and deaths and linking inputs and processes with system outputs. It is ultimately the outputs that infuse the sense of confidence in the civil registration system

and ensure its relevance to a range of welfare and development institutions. The poor state of the civil registration system implies that Madhya Pradesh continues groping for a black cat in a dark forest that may or may not be there. In the absence of an efficient and effective civil registration system, targeting of welfare and development efforts remains seriously compromised with the result that the poorest and the most marginalised sections of the community suffer the most.

It is not possible, at this stage, to pin point the problems of the civil registration system in the state. The problems that civil registration systems commonly face can be grouped into three broad categories: 1) relatively intractable problems that are due to factors which are exogenous to the system; 2) endogenous problems of the system that can be addressed only through additional technical and financial inputs; and 3) endogenous problems of the system that that be addressed by reorganisation and reorientation of the system with little additional technical and financial resources. The first category of problems can be addressed only through long-range social and economic development efforts. These problems are outside the scope of the changes that the civil registration system itself can bring about. The exogenous factors that have an impact on the working of the civil registration system are many. One important factor is the perception of the people about birth and death registration. People may be lacking the motivation for getting births and deaths registered, may fail to comply with the laws or even be aware of them, or may delay reporting of births and deaths as they may not see any value in registering them. There may even be cultural and political factors that may instigate resistance to registration, and even falsification of the reported information.

The second category of problems are endogenous to the system and can be addressed through additional technical and financial inputs. There is a long list of such problems. These include inadequate staff, lack of proper training and orientation, availability and distribution of essential forms and supplies and other infrastructure facilities, transport for supervisory or training staff, office space, modern record storage, document reproduction equipment, data processing facilities, printing facilities, so on and so forth. A major problem that ails the civil registration system in India is that there is no dedicated staff for civil registration activities. The staff and officials of different government departments have been designated as informants and registrars/sub-registrars in addition to their routine responsibilities. This arrangement poses challenge of motivation and coordination. Addressing these issues are intricate, especially at the local level.

The third category of problems is related to the internal processes of the system. There is currently hardly any system of monitoring civil registration activities at the local level, the interface with the people. Analysis of the civil registration data at the district level can provide directions for improving the system. This and similar other innovations may be incorporated with little additional technical and financial resources but may contribute significantly towards improving civil registration.

There is a need to crystallise the three categories of the problems and to search for operationally feasible interventions to address them. It is expected that the findings of the present analysis may serve as the basis for initiating a process of discussion and debate among different stakeholders to secure lasting improvements in the civil registration system of the state. This is important as a reliable and effective civil registration system is the foremost requirement to ensure that no one is left behind.

References

Chaurasia AR (2023) *Modelling and Forecasting District Population Growth in India*. Bhopal, Mewalal Chaurasia Foundation.

Dhar M (2022) *Projection of District-level Annual Population by Quinquennial Age-group and Sex from 2012 to 2031 in India*. Mumbai, International Institute for Population Sciences.

Government of India (1969) *Registration of Birth and Death Act 1969*. New Delhi, Ministry of Home Affairs, Registrar general.

Government of India (2012) *Training Manual for Civil Registration Functionaries in India*. New Delhi, Ministry of Home Affairs, Registration General, India.

Government of India (2017) *SRS Bulletin* 51(1). New Delhi, Registrar General, India.

Government of India (2018) *Vital Statistics of India Based on the Civil Registration System 2016*. New Delhi, Registrar General, India. Ministry of Home Affairs, Vital Statistics Division.

Government of India (2019) *Vital Statistics of India Based on the Civil Registration System 2017*. New Delhi, Registrar General, India. Ministry of Home Affairs, Vital Statistics Division.

Government of India (2019) *SRS Bulletin* 52(1). New Delhi, Registrar General, India.

Government of India (2020) *Vital Statistics of India Based on the Civil Registration System 2018*. New Delhi, Registrar General, India. Ministry of Home Affairs, Vital Statistics Division.

Government of India (2020a) *Population Projections for India and States 2011-2036. Report of the Technical Group on Population Projections*. New Delhi, Ministry of Health and Family Welfare, National Commission on Population.

Government of India (2020b) *SRS Bulletin* 53(1). New Delhi, Registrar General, India.

Government of India (2021) *Vital Statistics of India Based on the Civil Registration System 2019*. New Delhi, Registrar General, India. Ministry of Home Affairs, Vital Statistics Division.

Government of India (2021a) *SRS Bulletin* 54(1). New Delhi, Registrar General, India.

Government of India (2022) *Vital Statistics of India Based on the Civil Registration System 2020*. New Delhi, Registrar General, India. Ministry of Home Affairs, Vital Statistics Division.

Government of India (2022a) *SRS Bulletin* 55(1). New Delhi, Registrar General, India.

Government of India (2022b) *Sample Registration System Statistical Report 2022*. New Delhi, Ministry of Home Affairs, Office of the Registrar General and Census Commissioner, India.

Government of India (2023) *The Registration of Birth and Death (Amendment) Act 2023*. New Delhi, Ministry of Law and Justice, Legislative Department.

Government of Madhya Pradesh (2000) *Madhya Pradesh Birth and Death Registration Rules 1999*. Bhopal, Department of Economics and Statistics.

James KS, Kavitha N, George A, Kulkarni PM, Prasad S, Kumar S (2014) An Assessment of Quality of Civil Registration System Data in Gujarat, Haryana, Himachal Pradesh, Karnataka, Madhya Pradesh, and Maharashtra. Bengaluru, Institute of Social and Economic Change.