An Assessment of Quality of Civil Registration System Data in Haryana, Himachal Pradesh, Madhya Pradesh, Karnataka, Gujarat and Maharashtra

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Executive Summary

The Civil Registration System (CRS) provides important demographic and health information at the district and below district level. But, the quality of such information needs to be assessed in order to see whether effective use can be made of it. This report assesses the quality of data on registration of births, deaths, infant deaths, still births, sex ratio at birth and sex ratio at death in six selected states (*Gujarat, Haryana, Himachal Pradesh, Karnataka, Madhya Pradesh and Maharashtra*) for the year 2011 for which the data are available at the central level. The methodology used includes comparison with other sources and internal consistency.

The completeness of the data on registration births in CRS is first assessed by comparing the estimates of the crude birth rate implied by the CRS with indirect estimates based on the census 2011 data. The assessment shows that most of the districts in the states of Haryana, Himachal Pradesh, Gujarat and Karnataka have reliable CRS data on births. Contrary to this, half of the districts in Maharashtra and most of the districts in Madhya Pradesh show under registration of births in CRS. Even some of the developed districts of Maharashtra such as Pune show poor coverage. The analysis on sex ratio at birth revealed that there is no sex-selectivity in registration of births in Himachal Pradesh, Karnataka and Gujarat. A fair reporting of female births is observed in most of the districts of Karnataka, Gujarat, Haryana and Himachal Pradesh. Over reporting of female births in CRS is observed in Gulbarga and Yadgir districts of Karnataka compared to the Census estimate though there is some possibility of transfer errors here. The coverage of female births is noticed to be better in most of the districts of Madhya Pradesh compared to the districts in Maharashtra.

Awareness on the requirement of registration of still births seems to be poor in the system as half of the districts in all the selected states show a low level of reporting of still births in CRS compared to SRS estimate. However, unlike the case of birth registration, the reporting of still births in CRS is fairly good in Madhya Pradesh and Maharashtra compared to other selected states.

The assessment of death statistics shows that reporting of deaths is poorer in Madhya Pradesh and relatively better in Karnataka and Himachal Pradesh among the states under consideration. It is interesting to note that all districts of Himachal Pradesh and all but two districts of Haryana have more than 70 per cent reporting of deaths. Karnataka also shows relatively good registration of deaths. In Maharashtra, percentage reporting

of deaths is very low in some districts. In Gujarat, nine districts have below 70 per cent coverage for deaths. In Madhya Pradesh, compared to the AHS data, many districts have very low coverage of deaths, well below 40 per cent.

Infant deaths are nearly universally under reported in CRS irrespective of the states. Even half of the infant deaths do not get registered. In almost all the districts in Haryana and in all but one in Himachal Pradesh, the reporting of infant deaths is quite poor. In Maharashtra too, except a few districts there is very poor registration of infant deaths. All districts of Gujarat and Karnataka (except Mysore and Dharwad) have shown poor registration of infant deaths. In Madhya Pradesh, comparison of CRS data on infant deaths with that of AHS shows very poor coverage of infant deaths in all the districts. Overall, coverage of infant deaths is very poor in all the states under consideration and in particular in Madhya Pradesh.

It is interesting to note that coverage of female deaths is at the same level as male level in Madhya Pradesh though the state shows very poor registration of vital events as such. On the other hand, Gujarat and Haryana are very poor as far as the reporting of female deaths is concerned. Sabarkantha district in Gujarat appears to be an extreme outlier in reporting female deaths. In Himachal Pradesh too, the reporting of female deaths is poor. In Maharashtra and Karnataka, only a few districts have good coverage of female deaths.

Finally, it can be concluded that while the registration of births has improved in almost all the states in India, the registration of deaths is still comparatively poor. The relatively poor reporting of deaths is due to significant under-registration of infant deaths, and to some extent the female deaths, in most states. Further investigation is necessary to identify strategies for the system to be able to achieve universal coverage of all vital events.

Chapter 1

INTRODUCTION

Most countries in the world follow some system of registration of births and deaths. Such registration provides the documentation useful for legal purposes and has an additional advantage that birth and death rates can be obtained over time. However, the coverage of such registration is poor especially in developing countries. In India, civil registration was introduced on voluntary basis long ago and this was made mandatory under the Registration of Births and Deaths Act of 1969. The Civil Registration System (CRS) is responsible for the registration of births and deaths as well as compilation and release of the data on a regular basis. The CRS has made efforts to improve the system so as to ensure universal coverage. Yet the coverage has remained incomplete, preventing computation of birth and death rates. Instead, the Sample Registration System (SRS), that was introduced in the late 1960s and stabilised in the 1970s, has been the principal source of information on birth and death rates for India and for states and Union territories. Though this system was brought in as a temporary measure until the coverage of the CRS reaches a level satisfactory enough to allow accurate estimation of birth and death rates, it has continued for over 40 years. The SRS serves the purpose of assessments of trends at the state level quite well. However, it does not give estimates at lower levels of disaggregation, especially the district, which is a major handicap since the district has been recognised as a planning unit. On the other hand, though the CRS has for long been publishing the registered numbers of births, deaths, infant deaths, and still births for each district, estimates based on these are not considered reliable due to the lack of universal coverage. Demographers and other users of data on vital rates do not, by and large, use the CRS data for estimation of the rates. They have instead relied on the estimates provided by the SRS.

But recent trends indicate a substantial improvement in the level of coverage in the CRS. This has raised expectation from the system of obtaining district-level indicators of fertility and mortality. Moreover, if the coverage reaches near universal level, the possibility of linking the CRS to the National Population Register, in particular, to use it for updating the NPR on a regular basis, can be explored. The system itself provides estimates of coverage in various states

and this shows that the registration of births is approaching universality in some states. There has been an impressive rise in the coverage of deaths as well though this is not true of infant deaths. Besides, there are notable regional variations, across states and within states.

The present study has been undertaken to assess the quality of the CRS data and the feasibility of using CRS-based indicators at the district level. The first part of the study concentrated on three states: Kerala, Rajasthan and Odisha (James *et al*., 2013). One of these, Kerala, was known to have a high degree of coverage, but the other two were not so well placed. The findings showed that while the registration of births has improved substantially, there are variations across the districts within states. Moreover, registration of deaths is far from universal in Rajasthan and Odisha. A large number of infant deaths, in some districts a majority, are not registered. Besides, analysis of sex ratios showed that deaths of women are less likely to be registered than men. A report on the assessment of the districts in these three states has been released.

Subsequently, an assessment of the CRS data was undertaken for six states, namely, Haryana, Himachal Pradesh, Madhya Pradesh, Maharashtra, Karnataka and Gujarat. The purpose of this report is to assess the quality of civil registration system data for these six states. The report considers the following indicators for assessing the quality of data at the district level: Crude birth rate, Crude death rate, Infant mortality rate, Still birth rate, Sex ratio at birth and Sex ratio at death. The methodology developed in the first report has been adopted here and hence is not repeated in this report, which is a continuation of the earlier one.

Registration of births for each district, based on the latest data for 2011, is assessed in Chapter 2 and of deaths in Chapter 3. The next chapter analyses registration of infant deaths and still births. Sex ratios at birth and death are examined in Chapter 5. An adjustment of the crude death rate was proposed in the earlier report; this utilised an independent estimate of the Infant Mortality rate. It must be noted here that while some assessment is possible based on analysis of internal consistency, a detailed examination requires an independent source. For the crude birth rate, the 2011 census-based indirect estimate serves the purpose, however, for crude death rate and infant mortality rate, the only independent source available at this time is the Annual Health Survey (AHS). Since this survey was carried out in only one of the six states covered in this report, namely, Madhya Pradesh, the adjustment of mortality rates has not been done here. A summary of the findings is presented in Chapter 6.

Chapter 2

BIRTH STATISTICS

Assessment at the state level

To begin the assessment, we compare the rates obtained from the CRS to those from the Sample Registration System (SRS) at the state level. As the SRS estimates of the Crude Birth Rate are widely accepted to be valid, and treated as a gold standard, this comparison allows us to comment on the level of coverage of births in the CRS. This is the approach adopted by the Office of the Registrar General in estimating the level of completeness of registration. The state-level estimates of CRS and the corresponding data from Sample Registration System (SRS) for the years 2010 and 2011 are furnished in Table 2.1.

Crude Birth Rate from the SRS is higher than the rate from the CRS for Madhya Pradesh whereas for Himachal Pradesh the reporting of births is higher in CRS than the rate indicated by the SRS. Not much dissimilarity is noticed between SRS and CRS birth rate in Haryana, Gujarat, Karnataka and Maharashtra, indicating good registration of births in these states.

CBR at the district level

Since district-level estimates of the CBR are not available from the SRS, we need another independent estimate of the CBR. For this purpose, the estimate based on the 2011 census obtained by the method of reverse survival

Table 2.1 Estimates of Crude Birth Rate in the Civil Registration System and the Sample Registration System in Six Selected States, 2010 and 2011

States	2010			2011		
	CRS CBR	SRS CBR	Ratio CRS/SRS (Per cent)	CRS CBR	SRS CBR	Ratio CRS/SRS (Percent)
Haryana	21.6	22.3	96.9	22.0	21.8	100.9
Himachal Pradesh	20.0	16.9	118.3	18.9	16.5	114.2
Madhya Pradesh	22.5	27.3	82.4	23.3	26.9	86.8
Gujarat	22.7	21.8	104.1	21.2	21.3	99.5
Karnataka	18.2	19.2	94.8	18.1	18.8	96.4
Maharashtra	17.4	17.1	101.8	17.0	16.7	101.8

Source: CRS: Computed from the reports of CRS for 2010 and 2011 and estimated mid-year populations; Registrar General (2013c, 2014). SRS: Registrar General (2012, 2013a).

(Kumar and Sathyanarayana, 2012) is used here (see Chapter 2 of the first report). Though this refers to a period before the census, it has been used for comparison in the absence of other estimates. Table 2.2 gives the CBR as obtained from the CRS and as estimated from the 2011 census. It should be noted here that while the earlier reports of the CRS gave numbers of births (and deaths) in each district, the recent reports provide the CBR for districts as well. In the CRS reports for 2010 and 2011, these are available for most of the states except Madhya Pradesh. We have also independently computed the CBR from the number of births provided in the report and projected district population at mid-year. In most cases, the published rates match those computed. This is true for almost all the districts of Himachal Pradesh, Gujarat, and Maharashtra. However, in some districts in Karnataka and Haryana there is wide difference and hence both the sets of rates, published in the report and as computed by us are shown in the table. For districts of Madhya Pradesh, only the CBR computed from the numbers of births is shown as the CRS report did not provide estimates for the districts of this state.

The table shows that for most of the districts in Haryana, Himachal Pradesh and Gujarat, the CRS estimates of CBR are slightly higher than Census estimate or close to Census estimate except for two districts in Haryana (*Jhajjar, and Mewat),* two districts in Himachal Pradesh *(Kinnaur and Lahaul & Spiti)* and three districts in Gujarat (*Surat, Dahod and Kutch)*. Hamirpur district in Himachal Pradesh shows 36 per cent higher estimate in CRS as compared to Census estimate. In the case of Karnataka, the percentage reporting of births (in CRS) is fairly good for a majority of districts; the exceptions are: Bangalore Rural, Raichur, Kolar, Gulbarga, Ramnagar and surprisingly, Bangalore Urban. Note that in the CRS report for 2011 some estimates shown seemed to be *prima facie* incorrect (1.0 for Bangalore Rural and 147.2 for Bangalore Urban) due to copying or printing errors and hence the CBR was computed from the numbers of births mentioned in the report and projected populations and the ratios shown are based on these recomputed rates. The percentage reporting of births shows 40% low coverage of births in CRS compared to Census estimate for Bangalore Rural. If this is due to a large number of births from Bangalore rural taking place in the city, the CRS rate for Bangalore Urban must then be higher but this has not occurred. A possibility is that there has been a sharp fall in fertility through the period 2004-10 which is the reference for the census estimate. But on the other hand, in most other districts, the CRS estimates are higher than the census estimates (the ratios are over 100).

The situation is worse in Maharashtra. About half the districts show poor coverage, with the ratio below 90 per cent. Moreover, around 30 per cent low birth coverage was observed in Jalna and Pune districts. As the Pune district includes the Pune city, a metropolis, it's highly unlikely that people move to other places for child birth. The poor coverage under CRS in Pune district is a matter of concern.

In Madhya Pradesh too the percentage reporting of births in CRS is poor in about half of the districts. However, in some districts the CRS estimates are well over the census as the ratio is over 100. However, some of the very wide discrepancies, ratio of 16 per cent in Anuppur and 227 per cent in Balaghat may be due to

Table 2.2 District-Level Estimates of CBR from CRS 2011 Compared to Census 2011 based Estimates

Haryana						Himachal				
Districts	CBR CRS (Estimate) 2011	CBRCRS REPORT 2011	CBR CENSUS 2011	Ratio CRS/CENSUS (2/4)*100	Estimated Births not reported	Districts	CBR CRS (Estimate) 2011	CBR CENSUS 2011	Ratio CRS/CENSUS (8)/(9)*100	Estimated Births not reported
1	2	3	4	5	6	7	8	9	10	11
Ambala	18.9	18.7	17.1	110.5	$	Bilaspur	21.4	17.1	125.2	$
Bhiwani	19.1	18.9	20.3	94.1	1956	Chamba	20.9	21.2	98.6	156
Faridabad	23.9	23.5	22.2	107.7	$	Hamirpur	22.1	16.2	136.4	$
Fatehabad	24.3	24.0	20.7	117.4	$	Kangra	17.4	16.8	103.6	$
Gurgaon	22.8	22.5	24.5	93.1	2576	Kinnaur	10.9	15.4	70.8	378
Hisar	22.7	22.4	19.3	117.6	$	Kullu	16.9	18.6	90.9	725
Jhajjar	16.5	16.3	19.1	86.4	2494	L&Spiti	8.8	14.2	62.0	171
Jind	20.0	19.8	20.0	100.0	$	Mandi	17.2	17.3	99.4	100
Kaithal	22.2	21.9	20.6	107.8	$	Shimla	20.5	16.1	127.3	$
Karnal	21.4	21.1	21.0	101.9	$	Sirmaur	20.0	21.0	95.2	530
Kurukshetra	22.8	22.5	19.3	118.1	$	Solan	19.4	18.3	106.0	$
Mahendragarh	18.5	18.2	19.1	96.9	552	Una	19.0	17.6	108.0	$
Panchkula	24.4	27.9	18.8	129.8	$	**HP**	**18.9**	**17.7**	106.8	$
Panipat	22.9	24.0	22.6	101.3	$					
Rewari	21.8	22.6	20.2	107.9	$					
Rohtak	25.0	21.6	18.8	133.0	$					
Sirsa	20.4	24.7	19.1	106.8	$					
Sonipat	20.0	20.1	20.4	98.0	591					
Yamunanagar	19.1	19.7	19.0	100.5	$					
Mewat	34.5	34.1	38.8	88.9	4687					
Palwal	28.2	-	27.3	103.3	$					
Haryana	**22.2**	**22.0**	**21.3**	104.2	**$**					

$: No evidence of under-registration.

Contd...Table 2.2

Gujarat					Karnataka					
Districts	CBR CRS (Estimate) 2011	CBR CENSUS 2011	Ratio CRS/CENSUS (2)/(3)*100	Estimated Births not reported	Districts	CBR CRS REPORT 2011	CBR CRS (Estimate) 2011	CBR CENSUS 2011	Ratio CRS/CENSUS (8)/(9)*100	Estimated Births not reported
1	2	3	4	5	6	7	8	9	10	11
Ahmedabad	19.0	18.2	104.4	$	Bagalkote	25.7	25.8	22.4	115.1	$
Amreli	21.8	17.3	126.0	$	Bangalore R	1.0	9.4	16.3	57.7	6804
Anand	22.1	18.8	117.6	$	Bangalore U	147.2	15.2	17.3	88.1	19749
Banaskantha	25.1	26.7	94.0	4988	Belgaum	20.0	20.1	20.0	100.6	$
Bharuch	18.0	17.5	102.9	$	Bellary	21.3	21.5	22.9	93.7	3672
Bhavnagar	24.8	20.3	122.2	$	Bidar	23.7	23.8	19.9	119.7	$
Dahod	28.2	32.6	86.5	9357	Bijapur	27.9	28.1	22.6	124.1	$
Gandhinagar	21.2	18.5	114.6	$	Chamrajnagar	13.4	13.5	14.4	93.4	970
Jamnagar	19.5	18.6	104.8	$	Chikkaballapur	14.2	14.3	15.5	92.1	1531
Junagadh	20.9	17.3	120.8	$	Chikmagalur	23.8	15.3	13.3	114.7	$
Kheda	21.2	19.6	108.2	$	Chitradurga	10.8	16.3	17.0	96.1	1$96
Kutch	22.2	25.1	88.4	6071	Dakshina Kannada	18.3	18.4	14.8	124.3	$
Mahesana	21.9	17.7	123.7	$	Davangere	19.0	19.1	16.7	114.3	$
Narmada	22.1	20.6	107.3	$	Dharwad	21.3	21.4	18	118.9	$
Navsari	15.4	15.0	102.7	$	Gadag	21.1	21.2	18.9	112.1	$
Panchmahal	29.5	23.9	123.4	$	Gulbarga	20.7	19.2	22.2	86.5	7670
Patan	25.3	22.2	114.0	$	Hassan	14.9	14.9	13.2	112.8	$
Porbandar	18.6	16.8	110.7	$	Haveri	18.8	18.8	18.6	101.3	$
Rajkot	21.3	18.0	118.3	$	Kodagu	15.0	15.0	14.0	106.9	$
Sabarkantha	26.6	22.5	118.2	$	Kolar	14.0	14.1	16.4	85.8	3588
Surat	15.6	19.8	78.8	25544	Koppal	23.3	23.4	23.0	101.9	$
Surendranagar	22.0	21.6	101.9	$	Mandhya	12.3	12.3	13.7	89.9	2496
Tapi	15.0	16.3	92.0	1048	Mysore	16.8	16.4	15.1	108.6	$
The Dangs	31.4	28.4	110.6	$	Raichur	16.8	16.5	22.7	72.5	12013
Vadodara	18.5	18.2	101.6	$	Ramnagar	12.5	12.5	14.3	87.5	1938
Valsad	20.2	19.4	104.1	$	Shimoga	19.1	19.1	15.3	124.9	$
GUJARAT	**21.2**	**20.1**	**107.5**	**$**	Tumkur	15.4	15.3	14.6	104.9	$
					Udupi	16.9	16.9	12.7	133.2	$
					Uttar Kannada	18.4	18.4	15.5	118.6	$
					Yadgir	27.7	27.9	26.0	107.2	$
					Karnataka	**18.6**	**18.1**	**17.8**	**101.9**	**$**

Contd...Table 2.2

Maharashtra					Madhya Pradesh				
Districts	CBRCRS (Estimate) 2011	CBR CENSUS 2011	Ratio CRS/CENSUS (2)/(3)*100	Estimated Births not reported	Districts	CBRCRS (Estimate) 2011	CBR CENSUS 2011	Ratio CRS/CENSUS (7)/(8)*100	Estimated Births not reported
1	2	3	4	5	6	7	8	9	10
Ahmadnagar	20.9	19.4	107.7	$	Alirajpur	23.7	33.6	70.7	7187
Akola	21.3	18.6	114.5	$	Annuppur	3.7	22.8	16.0	14352
Amrawati	16.8	17.5	96.0	2026	Ashoknagar	22.0	28.2	78.1	5225
Aurangabad	20.7	24.2	85.5	12921	Balaghat	45.3	19.9	227.4	$
Bhandara	18.1	17.1	105.8	$	Barwani	26.8	32.6	82.1	8090
Bid	24.3	22.3	109.0	$	Betul	17.7	21.5	82.1	6070
Buldhana	21.3	21.0	101.9	$	Bhind	19.5	23.0	85.0	5886
Chandrapur	16.3	17.1	95.3	1756	Bhopal	30.0	20.3	148.0	$
Dhule	17.7	21.9	80.8	8586	Burhanpur	21.0	26.6	78.9	4245
Gadchiroli	15.5	18.5	83.8	3211	Chhatarpur	27.9	27.0	103.2	$
Gondia	17.9	17.6	101.7	$	Chhindwara	19.6	20.7	94.4	2406
Hingoli	17.0	23.3	73.0	7415	Damoh	33.9	25.2	134.7	$
Jalgaon	20.2	20.3	99.5	423	Datia	19.0	23.5	80.7	3575
Jalna	16.2	24.7	65.6	16608	Dewas	23.7	24.0	98.5	549
Kolhapur	15.3	16.5	92.7	4651	Dhar	18.2	26.7	68.1	18589
Latur	21.4	21.1	101.4	$	Dindori	16.6	25.8	64.5	6452
Mumbai	13.4	12.8	104.7	$	East Nimar (Khandawa)	15.7	26.1	60.1	13653
Nagpur	14.7	17.4	84.5	12589	Guna	25.3	28.6	88.3	4155
Nanded	18.5	22.5	82.2	13415	Gwalior	24.9	20.4	122.0	$
Nandurbar	21.6	24.7	87.4	5111	Harda	16.7	24.9	66.9	4705
Nashik	17.9	22.5	79.6	28087	Hosangabad	22.5	21.9	102.9	$
Osmanabad	17.2	19.8	86.9	4325	Indore	27.8	20.2	137.5	$
Parbhani	20.2	23.3	86.7	5681	Jabalpur	26.9	19.0	141.7	$
Pune	13.1	19.2	68.2	57461	Jhabua	26.9	35.6	75.4	8955
Raigad	15.7	18.4	85.3	7106	Katni	26.7	26.1	102.3	$
Ratnagiri	15.5	14.2	109.2	$	Mandla	10.5	23.3	45.2	13443
Sangli	18.8	16.8	111.9	$	Mandsaur	18.8	20.9	90.1	2776
Satara	16.7	16.3	102.5	$	Morena	24.9	25.7	96.8	1614
Sindhudurg	12.9	12.5	104.0	$	Narsinghpur	21.5	20.7	103.9	$
Solapur	21.8	19.7	110.7	$	Neemuch	17.4	20.5	84.9	2560
Thane	14.9	19.8	75.3	54318	Panna	28.8	27.6	104.3	$
Wardha	13.9	15.6	89.1	2201	Raisen	25.1	25.3	99.3	232
Washim	16.9	20.8	81.3	4669	Rajgarh	19.7	24.8	79.2	7967
Yavatmal	20.2	19.5	103.6	$	Ratlam	21.8	24.6	88.5	4101
Maharashtra	**17.1**	**19.1**	**89.0**	**237819**	Rewa	18.2	24.3	74.9	14393

Contd. Table 2.2:

Madhya Pradesh				
Districts	CBRCRS (Estimate) 2011	CBR CENSUS 2011	Ratio CRS/CENSUS (7)/(8)*100	Estimated Births not reported
6	7	8	9	10
Sagar	27.7	24.9	111.4	$
Satna	24.9	25.0	99.5	282
Sehore	23.3	25.0	93.2	2215
Seoni	21.5	20.9	102.9	$
Shahdol	27.6	24.4	113.0	$
Shajapur	19.5	23.0	84.8	5277
Sheopur	13.8	28.8	47.9	10332
Shivpuri	21.5	28.2	76.4	11504
Sidhi	25.1	29.3	85.6	4746
Singroli	17.4	30.6	57.0	15504
Tikamgarh	18.9	26.3	71.9	10674
Ujjain	21.2	21.7	97.8	935
Umaria	27.3	27.1	100.7	$
Vidisha	26.9	27.5	97.7	936
West Nimar(Khargone)	20.8	26.0	80.1	9694
Madhya Pradesh	**23.3**	**24.4**	**95.3**	**83335**

$: No evidence of under-registration.
Sources: CRS: Registrar General, India (2014);
Census based: Kumar and Sathyanarayana (2012).

transfer errors. Closer examination of the series of births reported over the years from these districts shows huge irregularities. Formation of new districts (like Anuppur) often creates confusion in tabulation. But in some districts, for instance Mandla and Sheopur, around 50 per cent low reporting of births is observed. On the other hand, in Bhopal and Indore, the birth coverage is higher by 47 and 37 per cent respectively. But this could be due to births from neighbouring districts taking place in the cities of Bhopal and Indore which have many hospitals.

Fig 2.1 Comparison of CBR based on Census and CRS for Haryana, 2011

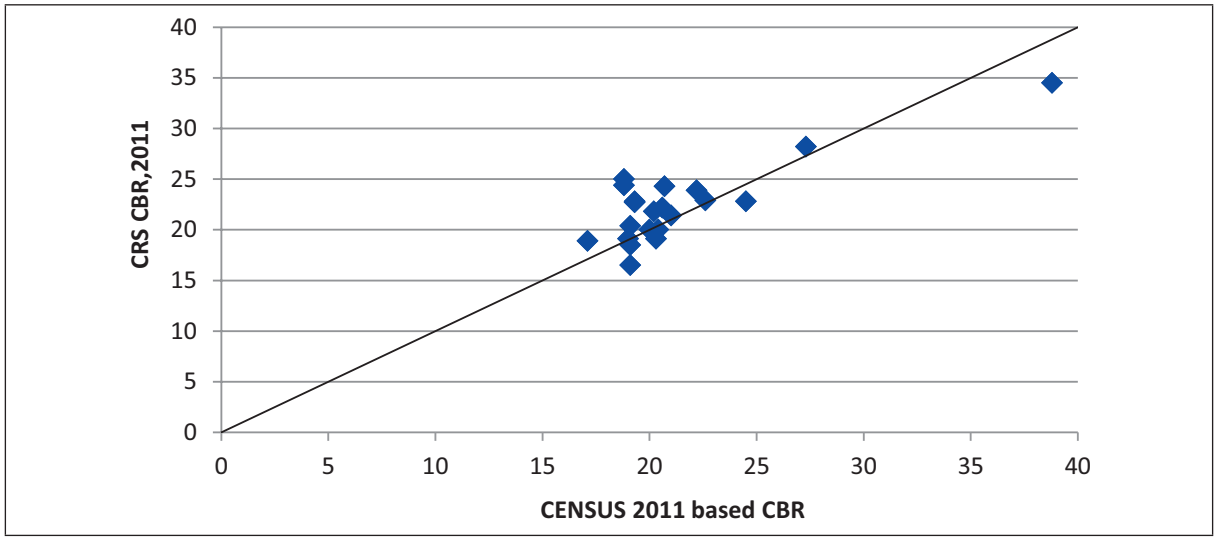


Fig 2.2 Comparison of CBR based on Census and CRS for Himachal Pradesh, 2011

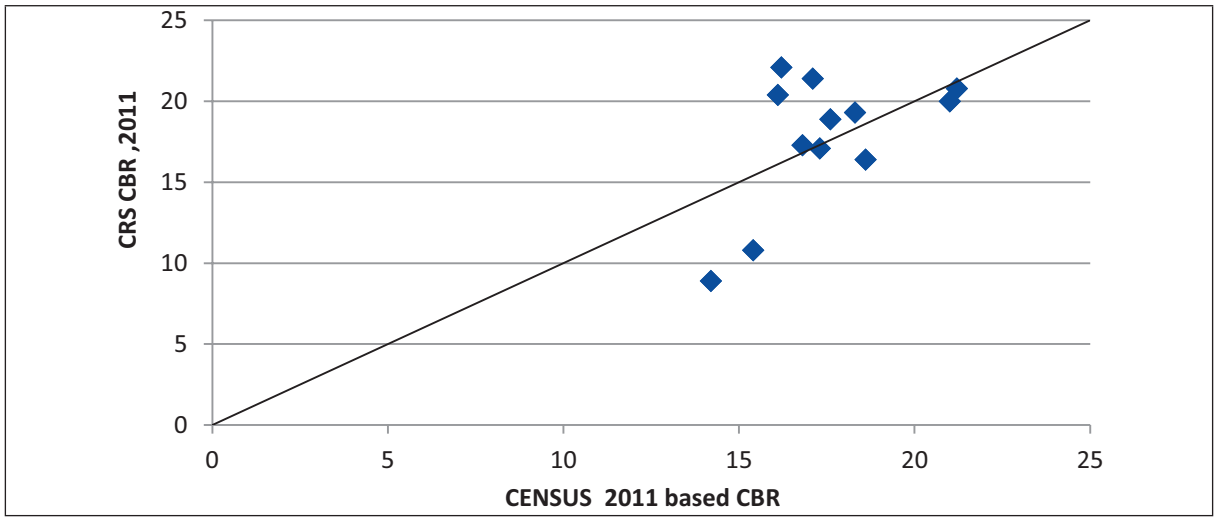


Fig 2.3 Comparison of CBR based on Census and CRS for Gujarat, 2011

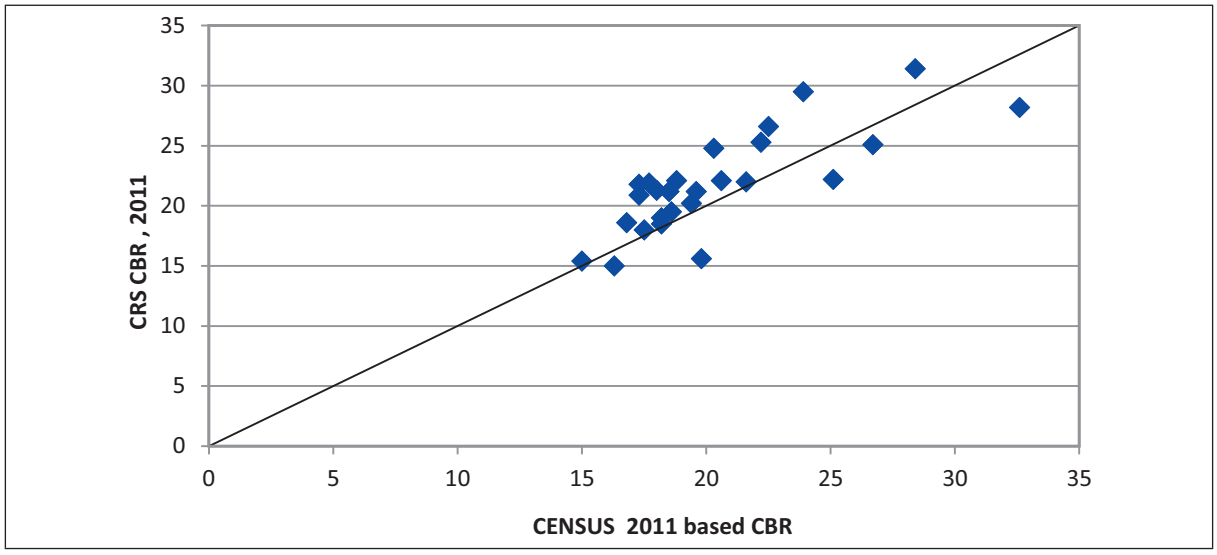


Fig 2.4 Comparison of CBR based on Census and CRS for Karnataka, 2011

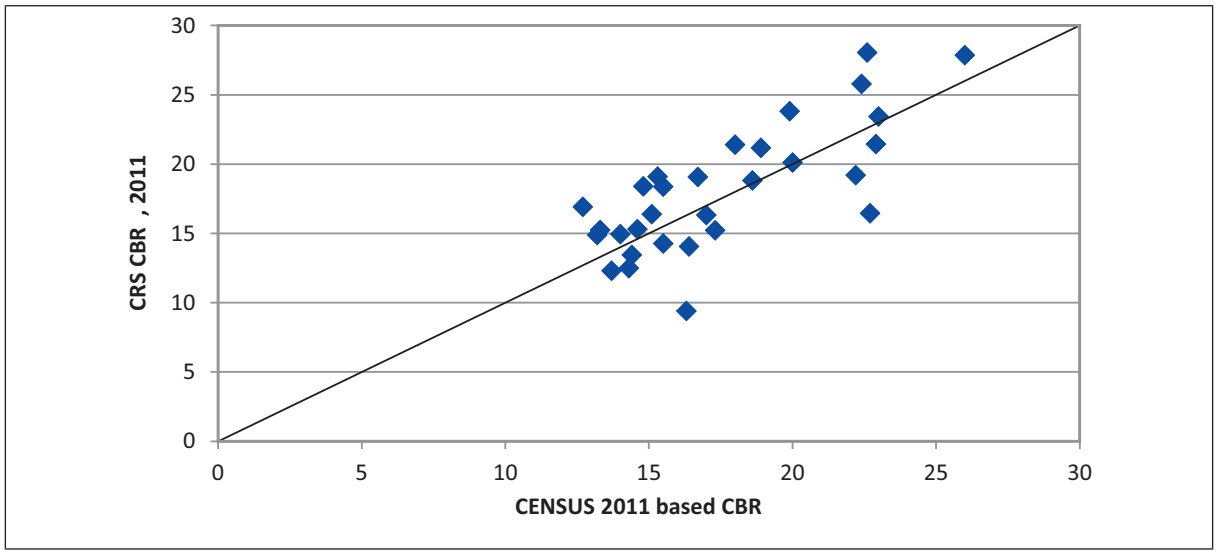


Fig 2.5 Comparison of CBR based on Census and CRS for Maharashtra, 2011

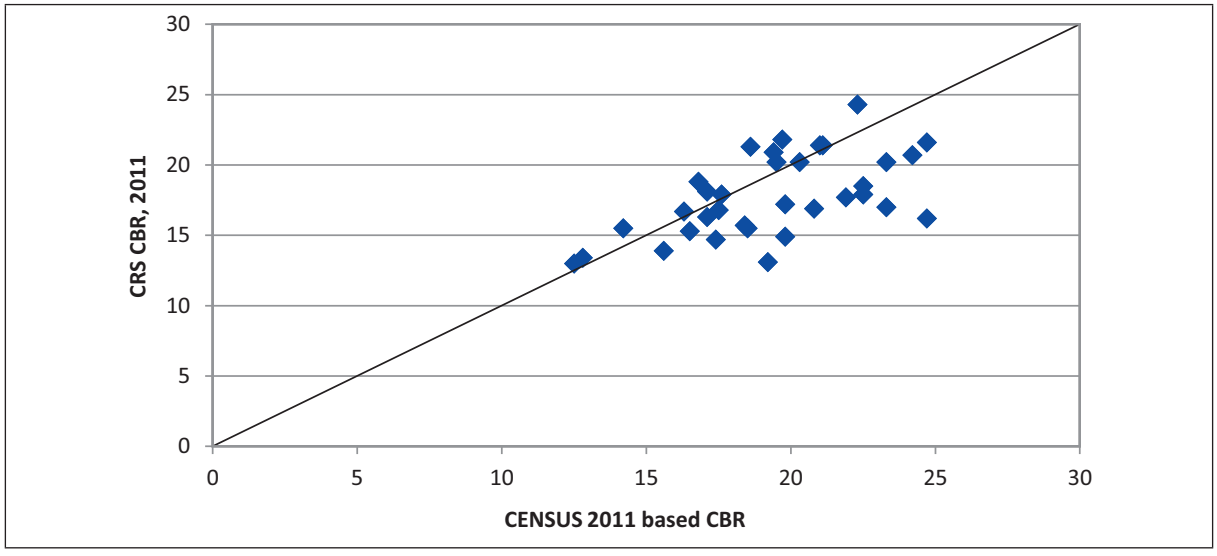
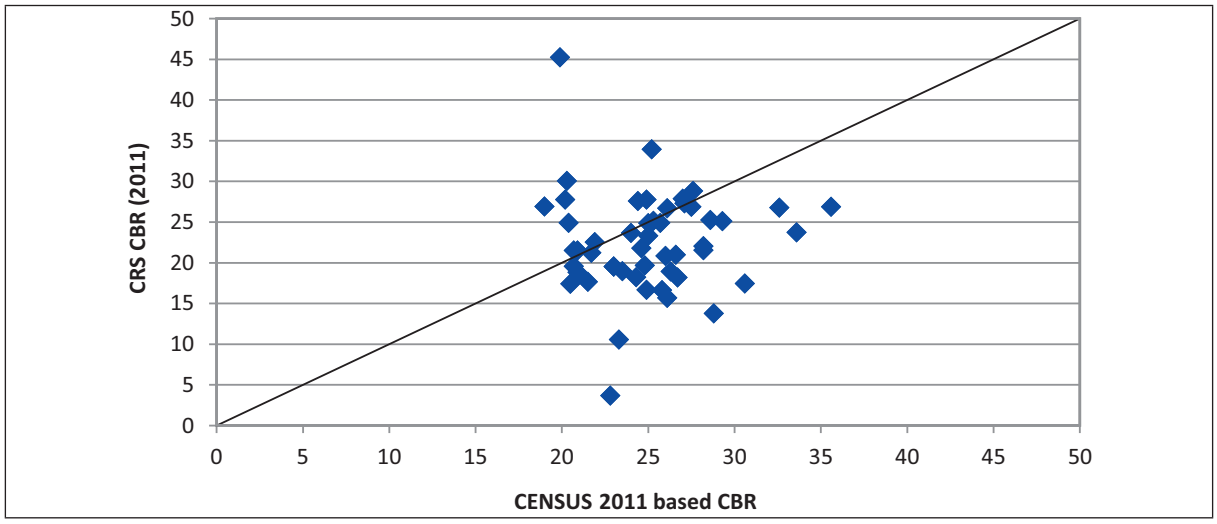


Fig 2.6 Comparison of CBR based on Census and CRS for Madhya Pradesh, 2011



Comparison of CRS Crude birth rate with Census using Scatter Diagram

Based on Census and CRS figures, the CBR is depicted using scatter plot which allows the reader to visually examine the correspondence between the two birth rate values. Figures 2.1 to 2.6 present the scatter plots for Haryana, Himachal Pradesh, Gujarat, Karnataka, Maharashtra and Madhya Pradesh. In the scatter plot, the diagonal **line** shows the line of equality indicating identical values in Census and CRS estimate. Any point below the diagonal represents under-reporting in CRS births in comparison with the census estimates. If the points fall above the diagonal, the census based birth rate is lower than the CRS estimate.

Whenever the figures from the CRS report were doubtful, as was seen in the report for Karnataka for Bangalore Urban (147.2) and Bangalore Rural (1.0), the values estimated from the numbers of births have been used (*see Table 2.2*) for the scatter plot. As mentioned earlier, it is also clear from the scatter plot that in Haryana, Himachal Pradesh, Karnataka and Gujarat many observations fall close to line of equality indicating good quality of CRS data on births at the district level. In the case of Maharashtra, most observations fall below the line of equity pointing out under reporting of births in CRS. Similarly, for Madhya Pradesh too a good number of observations fall far below the line of equality indicating poor registration of births in many districts.

The Completeness of CRS Birth Registration

CRS birth rate as percentage of census-based estimate provides an estimate of completeness of registration of births in the CRS. Percentages below 100 indicate incomplete coverage. Ratios above 100 could be due to transfer of births (births to residents of one district taking place in another and registered in the district of occurrence as per

the Act). This is likely to occur if women from a district with poor medical facilities go to a neighbouring district with good facilities. If this happens, some district might show ratios below 100, while neighbouring districts above 100. Figures 2.7 to 2.12 present the graphical form showing the percentage reporting of births in CRS (2011) across districts of Haryana,

Fig 2.7 Reporting of births in districts of Haryana, CRS, 2011

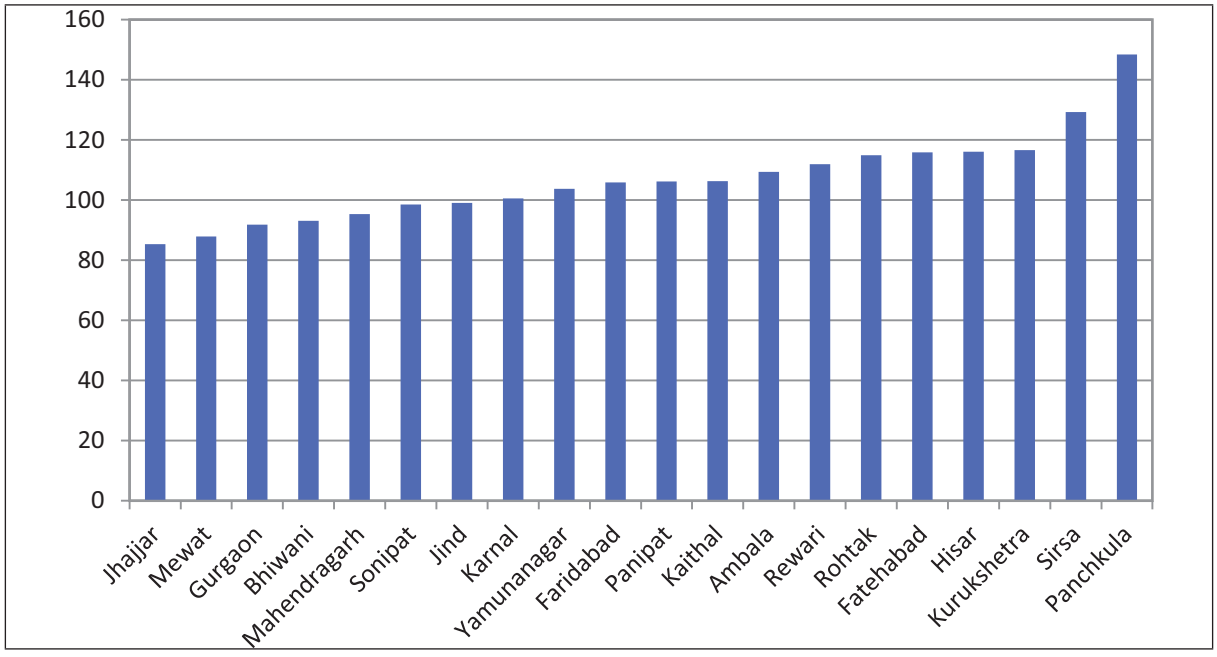


Fig 2.8 Reporting of births in districts of Himachal Pradesh , CRS 2011

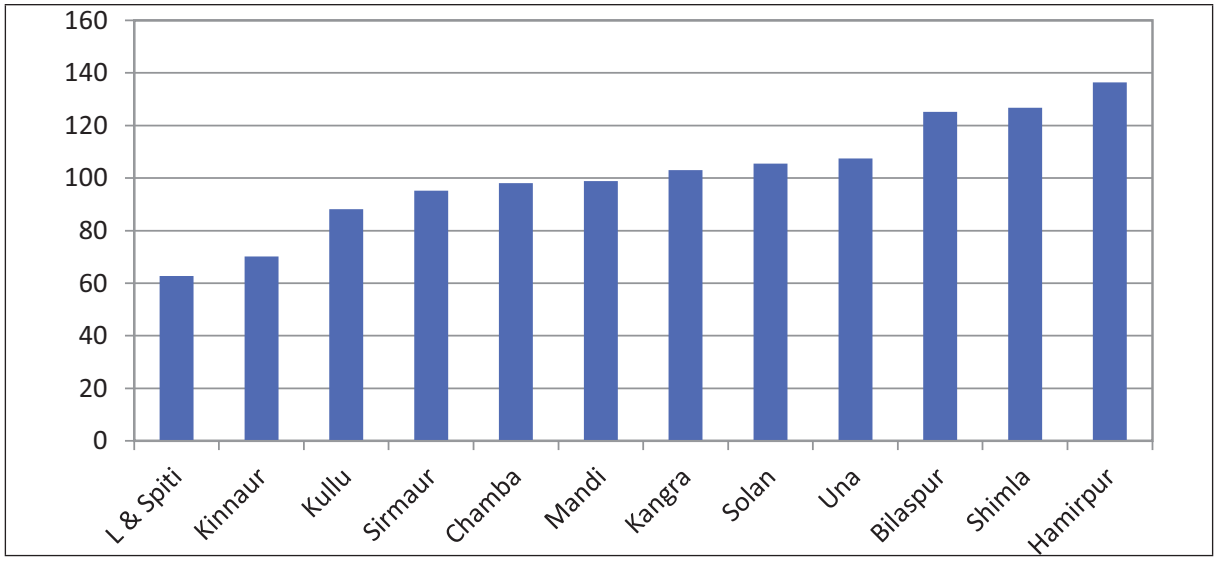


Fig 2.9 Reporting of births in districts of Gujarat, CRS 2011

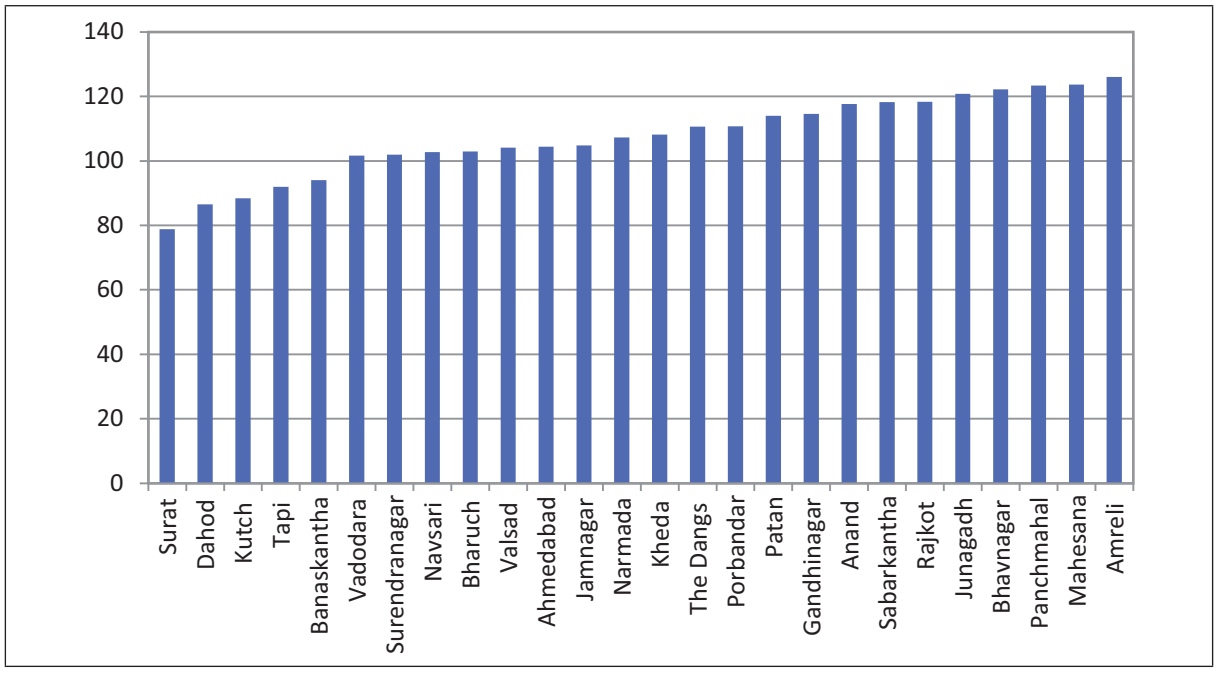


Fig 2.10 Reporting of births in districts of Karnataka, CRS, 2011

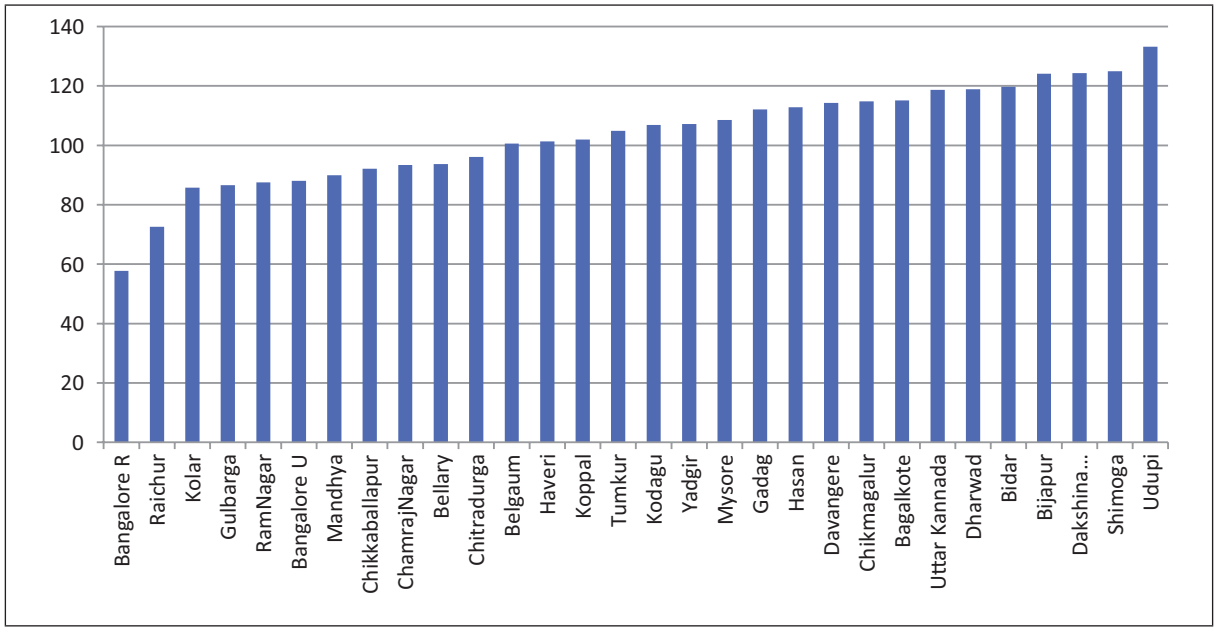


Fig 2.11 Reporting of births in districts of Maharashtra, CRS, 2011

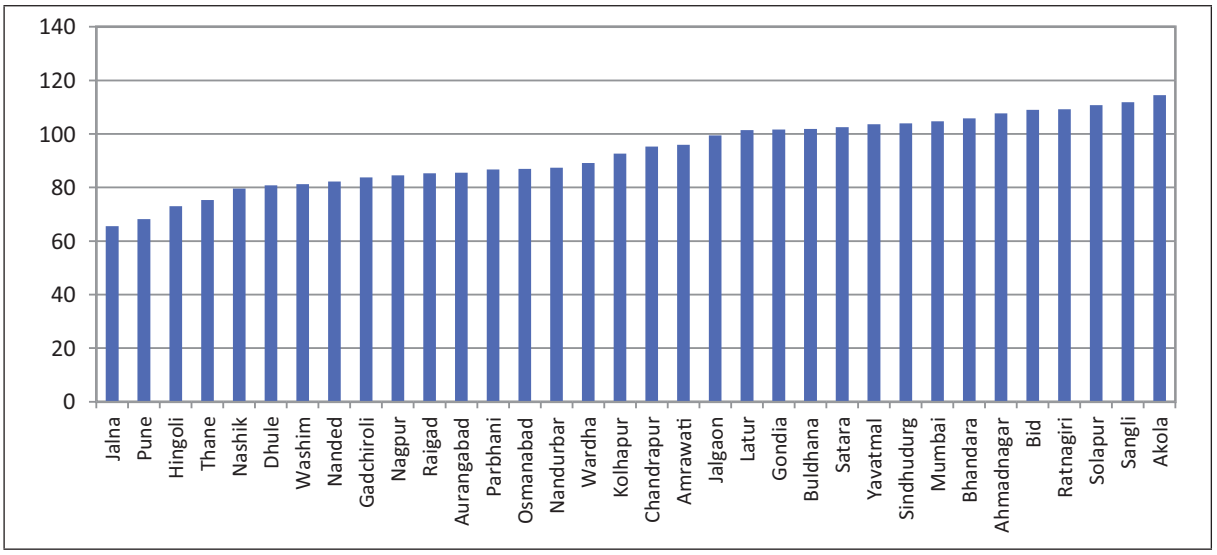


Fig 2.12 Reporting of births in districts of Madhya Pradesh, CRS, 2011

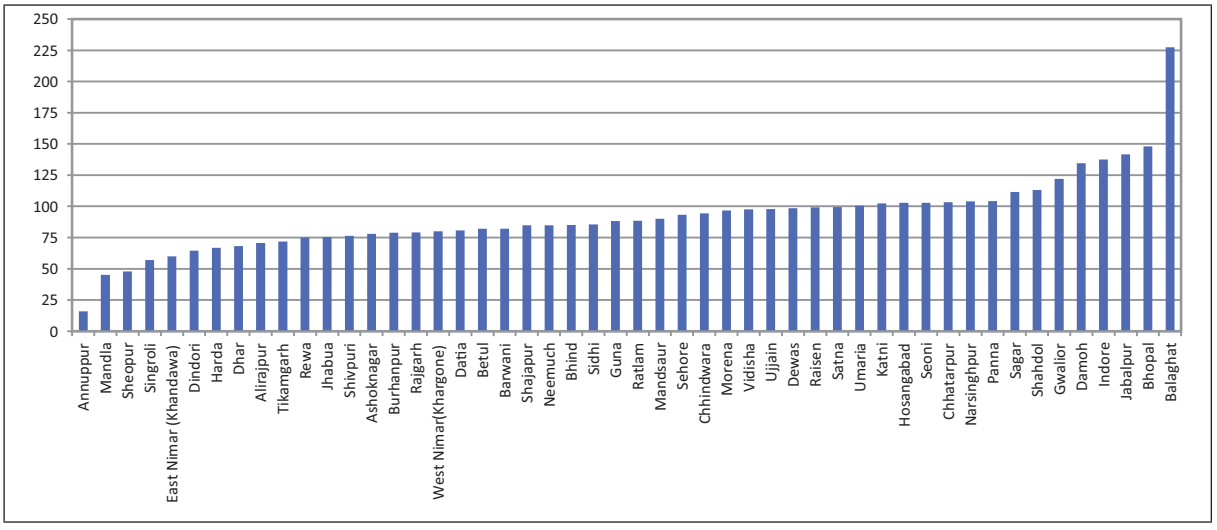


Table 2.3 Distribution of Districts by Level of Registration of Six Selected States, 2011

Percentage of birth registration	Number of Districts					
	Haryana	Himachal Pradesh	Gujarat	Karnataka	Maharashtra	Madhya Pradesh
Less than 20						1
20-30	0	0	0	0	0	0
30-50	0	0	0	0	0	2
50-70	0	1	0	1	2	5
70-90	2	1	3	6	**14**	**18**
90-100	5	4	2	4	4	9
100-120	**12**	**3**	**16**	**15**	**14**	**9**
120-140	2	3	5	4	0	3
140-160	0	0	0	0	0	2
160-180	0	0	0	0	0	0
180-200	0	0	0	0	0	0
200+	0	0	0	0	0	1
Total districts	**21**	**12**	**26**	**30**	**34**	**50**

Source: Table 2.2.

Himachal Pradesh, Gujarat, Karnataka, Maharashtra and Madhya Pradesh. A summary is presented in Table 2.3, which provides the number of districts with the percentage of 'completeness', in different states.

In Haryana, there are 7 districts reporting less than 100 per cent and out of it, 2 districts fall below 90 per cent. But in 12 districts in the state, the reporting of births falls in the range 100-120, indicating good quality of birth registration in CRS. For Himachal Pradesh, the birth coverage in 7 districts (*out of total12 districts*) ranges from 90 to 120. Like Haryana, in most of the districts in Gujarat and Karnataka, the reporting of births is in the range 100-120 showing good birth registration at the district level. In Maharashtra, two districts falls below 70 per cent and 14 districts fall in the range 70-90 per cent, indicating under registration of births. In the case Madhya Pradesh, 26 districts show less than 90 per cent birth coverage, out of these, 8 districts fall below 70 per cent. In 5 districts, percentage reporting of births falls in the range 120 -140 and one district (Balaghat) shows the number of registered births to be very high, more than 200 per cent, but this is probably due to gross errors in transfer of data.

Assessing CRS Crude Birth Rate using SRS Estimates

It is mentioned in the first report that, Census-based estimate of birth rates has its own limitation as the computations are based on 0-6 age group population which would possibly be an undercount. So another method of assessing the quality of CRS estimates is to compare it with the state-level SRS estimate; SRS estimates are well accepted as reliable at the state level and widely used to understand the fertility levels in the state. If there is no under registration of births in CRS, nearly half of the districts will fall below the SRS birth rate and the other half above the SRS rate. If the CRS estimates are better than SRS, it is expected that more districts in the state

would be above the SRS average. Figures 2.13 to 2.18 present the comparison of CRS 2011 CBR with that of the state SRS 2011 estimate in Haryana, Himachal Pradesh, Gujarat, Karnataka, Maharashtra and Madhya Pradesh respectively.

The completeness of CRS birth rate in Himachal Pradesh and Gujarat is further confirmed by comparing CRS and CBR across the districts with SRS estimate**.** In Himachal Pradesh, most of the district birth rates are above the SRS state average. This calls for an explanation since one does not expect more births registered than actual and there is no reason to believe that women from other states go to Himachal Pradesh for deliveries. In the case of Gujarat, out of 26 districts, half of the districts (13) are above the State average and the other half (13) are below the State average, clearly indicating no under registration of births in CRS overall. In the case of Haryana, birth rate of 7 districts is slightly below the state average. In Karnataka, out of 30 districts, only 10 show birth rates above the SRS State average and in 15 districts, the birth rate is well below the SRS level. This shows that in CRS, the reporting of births is far from complete at the district level. A similar pattern can be observed in Maharashtra. But in Madhya Pradesh 70% of the districts fall well below the state average birth rate, showing poor quality of birth reporting at the district level. The analysis reveals that in Himachal Pradesh and Gujarat, the CRS registration is almost complete, while under registration is evident in the other four states. The degree of under registration appears to be small in Haryana and Karnataka as compared to Maharashtra and Madhya Pradesh. The CRS estimates of the latter states also deviate substantially from the census-based estimates, indicating that CRS birth reporting is far from satisfactory and requires intervention to improve the registration of births at the district level of these states.

Assessing CRS based on AHS for Madhya Pradesh

Of the six states under consideration in this report, only one, Madhya Pradesh was covered in the Annual Health Survey (AHS). This provided another independent estimate of the CBR. The CBR for the period 2011-12 from the AHS is 24.8, slightly higher than the CRS estimate for Madhya Pradesh. This indicates about 94 per cent coverage under the CRS. To assess the quality of birth rates at the district level, the CRS estimate is matched with AHS estimate and is presented in Table 2.4. It is seen that in 11 districts CRS estimates of birth rate are higher than AHS estimates, out of these, 3 districts shows much higher birth rate in CRS. Among the remaining districts, four show much lower value in CRS estimate. For instance, the coverage is 58 per cent lower in Mandla district compared to AHS estimate. The Scatter diagram (in Fig 2.19) clearly shows that most of the districts fall below the line of equity indicating under reporting in CRS compared to AHS estimates. Balaghat shows an improbably high value in the CRS as noted earlier.

Overall, the reporting of births in the CRS seems to be quite satisfactory in most districts of Himachal Pradesh, Gujarat and Haryana. It is fairly good in Karnataka with the exception of some districts, but poor in many districts of Maharashtra. This is rather surprising given that

Maharashtra is a relatively developed state. The reporting is generally poor in Madhya Pradesh. A few districts show more births reported in the CRS than expected. But these are districts with hospitals and probably draw women from neighbouring districts for delivery. As the CRS registers births at the place of occurrence rather than the place of usual residence, there is apparent over-registration in districts with hospitals.

Fig 2.13 Crude Birth Rate in districts of Haryana, CRS, 2011

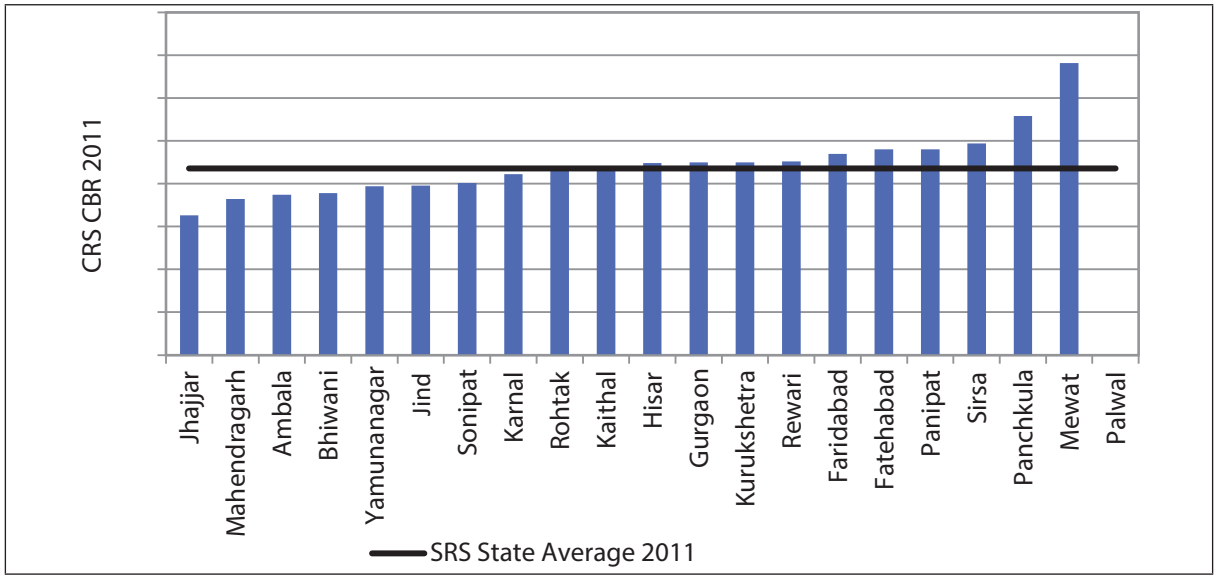


Fig 2.14 Crude Birth Rate in districts of Himachal Pradesh, CRS, 2011

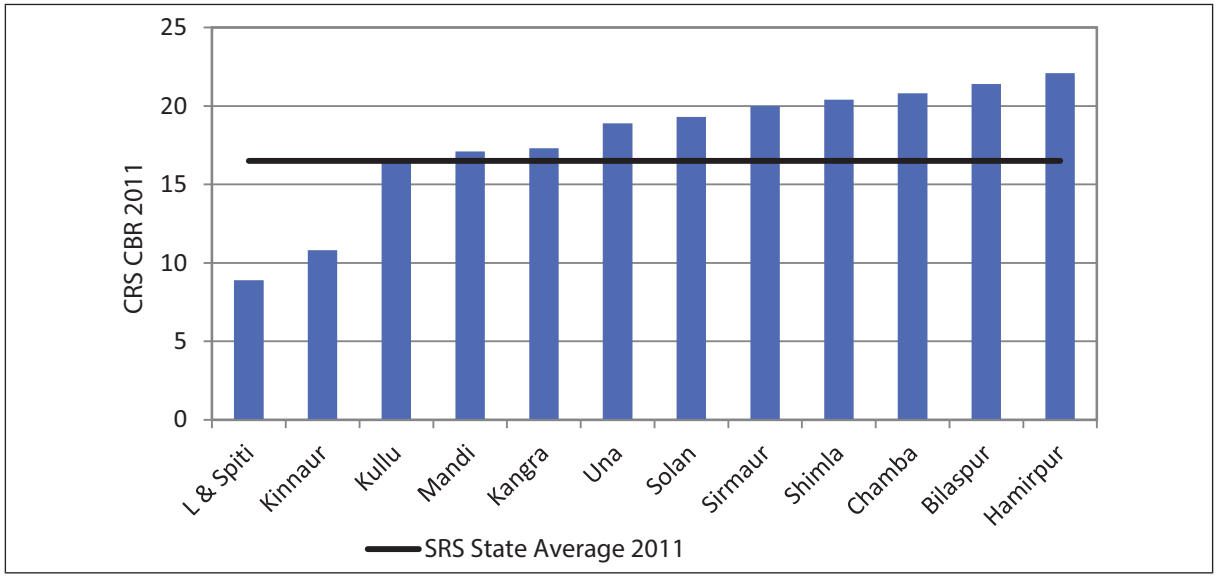


Fig 2.15 Crude Birth Rate in districts of Gujarat, CRS, 2011

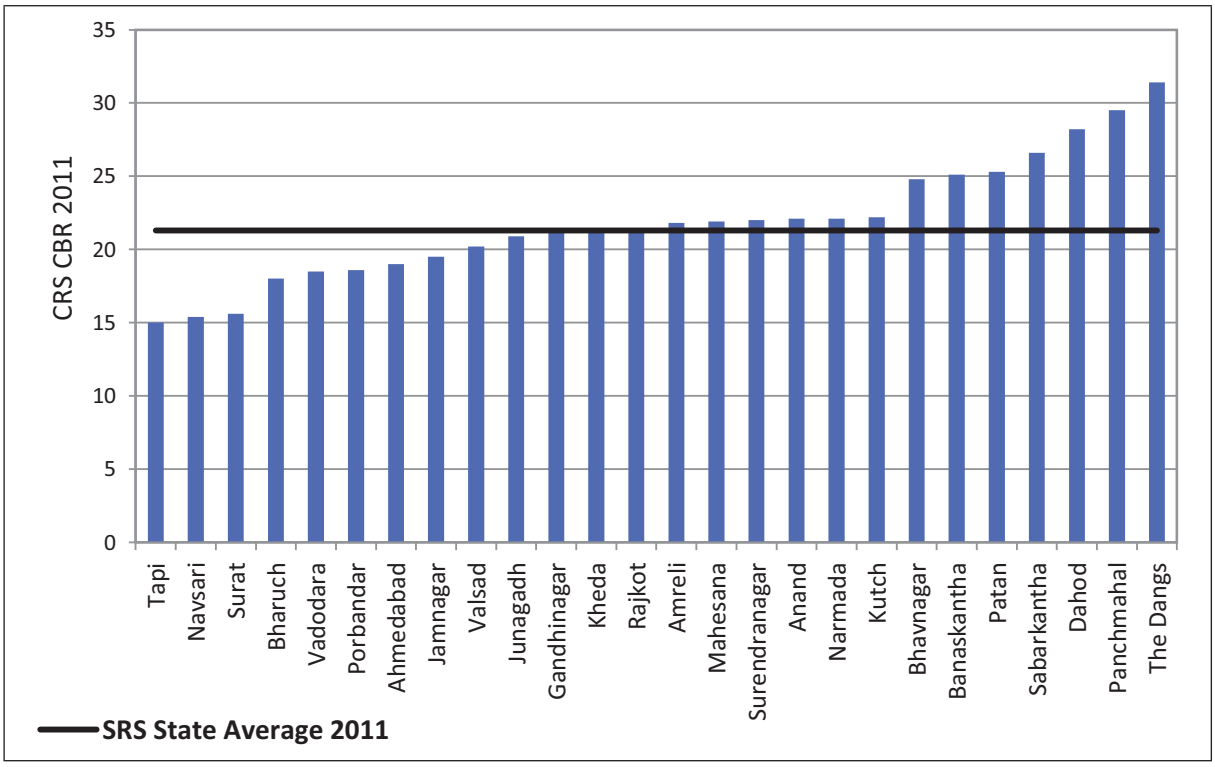


Fig 2.16 Crude Birth Rate in districts of Karnataka, CRS, 2011

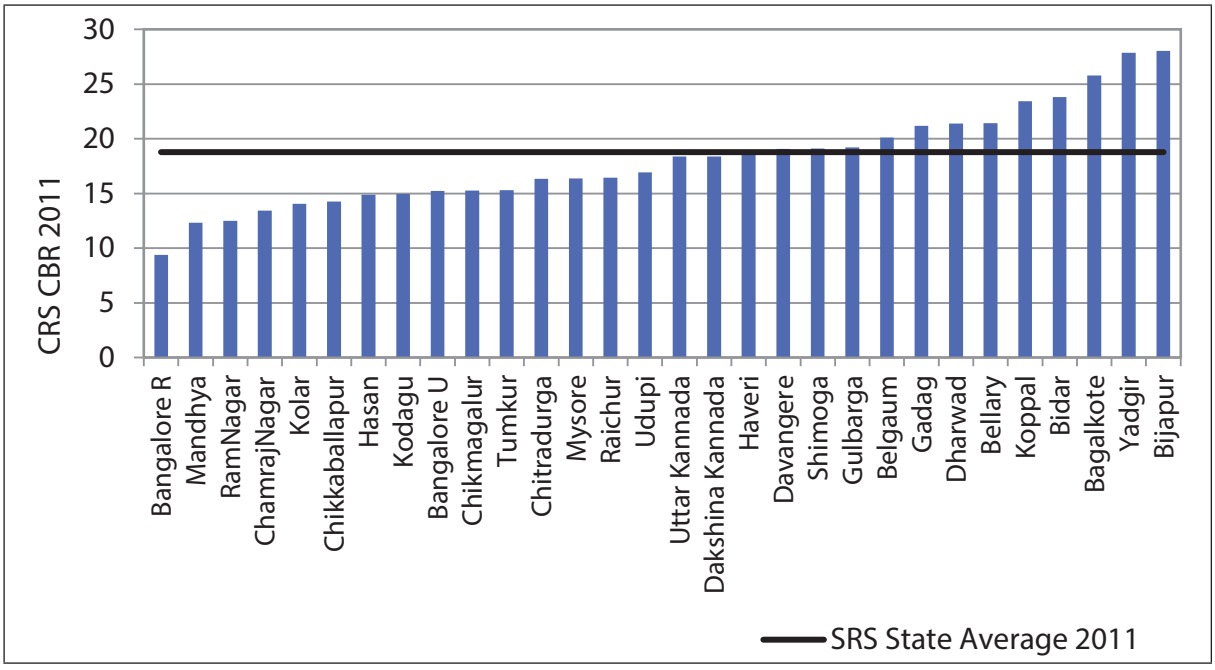


Fig 2.17 Crude Birth Rate in districts of Maharashtra, CRS, 2011

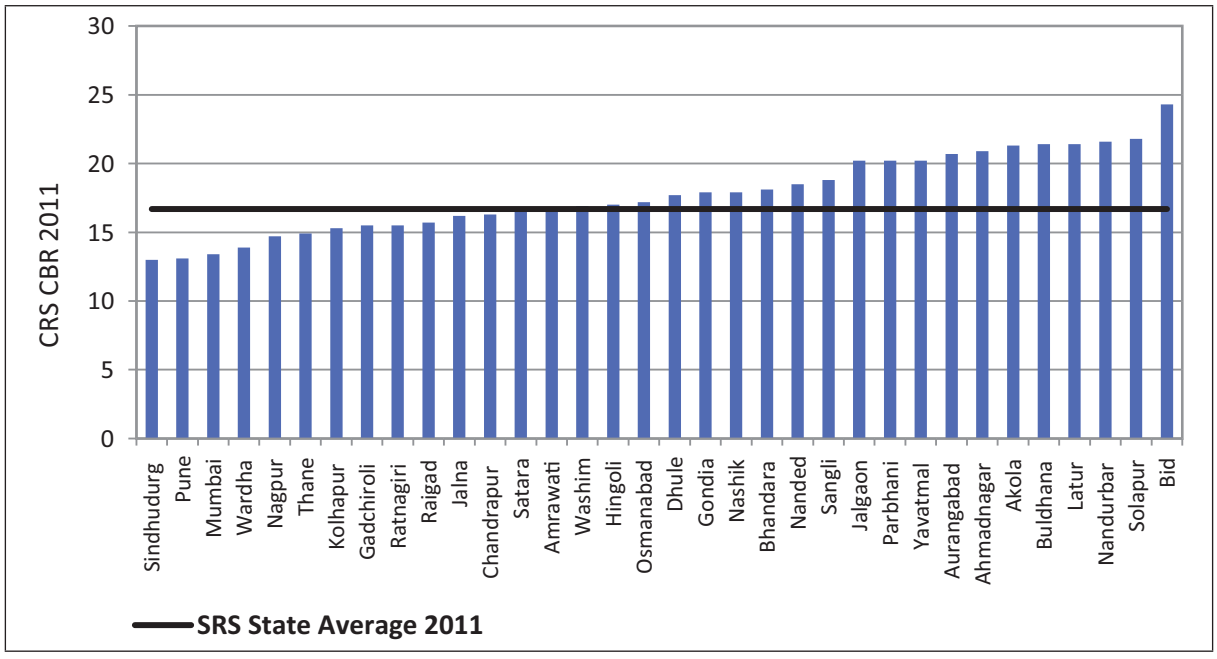


Fig 2.18 Crude Birth Rate in districts of Madhya Pradesh , CRS, 2011

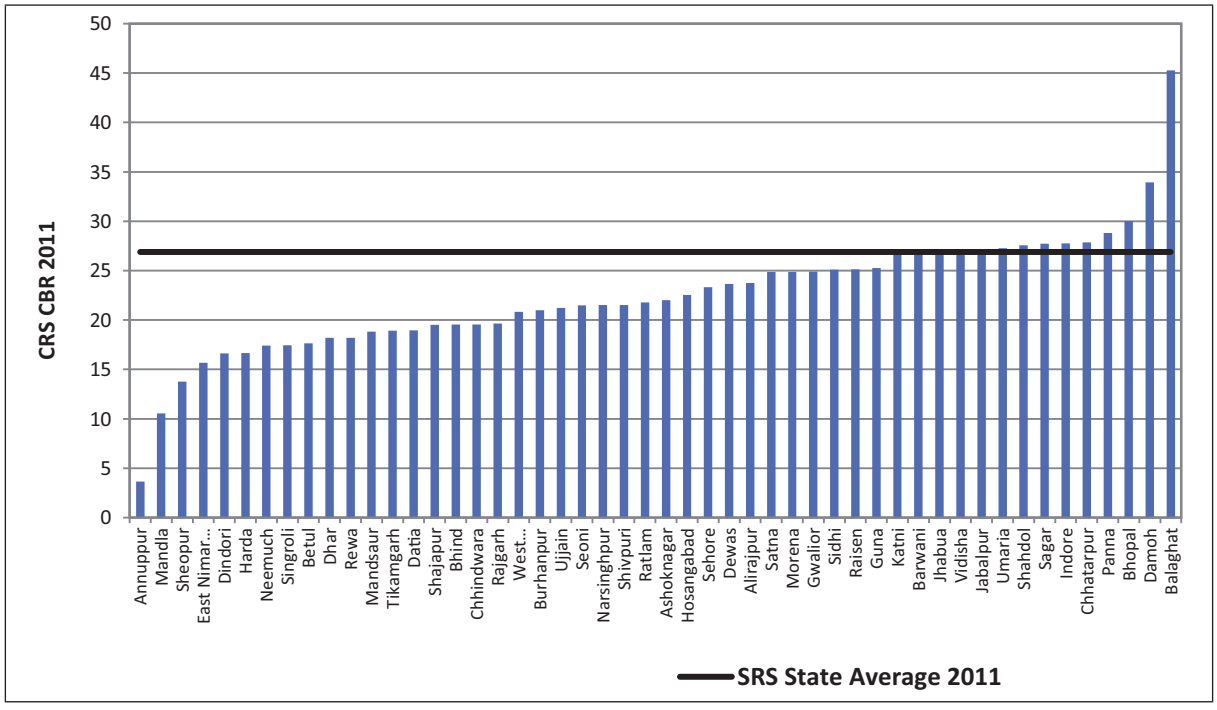
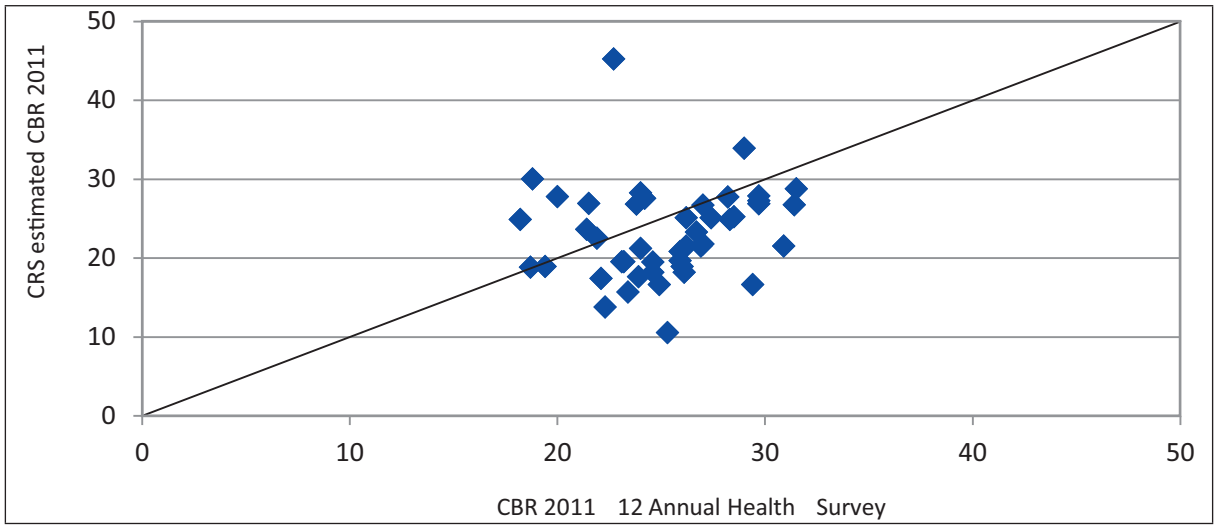


Table 2.4: District-Level Estimates of CBR from the Civil Registration System Compared to the Annual Health Survey for Madhya Pradesh, 2011

Districts	CRS 2011 (CBR)	AHS 2011-12 (CBR)	Ratio CRS/AHS *100
Balaghat	45.3	22.7	199.3
Barwani	26.8	31.4	85.2
Betul	17.7	23.9	73.8
Bhind	19.5	23.2	84.3
Bhopal	30.0	18.8	159.8
Chhatarpur	27.9	29.7	93.8
Chhindwara	19.6	23.1	84.6
Damoh	33.9	29.0	117.0
Datia	19.0	19.4	97.7
Dewas	23.7	21.4	110.5
Dhar	18.2	24.6	74.0
Dindori	16.6	29.4	56.6
Guna	25.3	28.5	88.6
Gwalior	24.9	18.2	136.8
Harda	16.7	24.9	66.9
Hosangabad	22.5	21.9	102.9
Indore	27.8	20.0	138.9
Jabalpur	26.9	21.5	125.2
Jhabua	26.9	23.8	112.8
Katni	26.7	27.0	98.9
Khandawa(East Nimar)	15.7	23.4	67.0
Khargone(West Nimar)	20.8	25.9	80.4
Mandla	10.5	25.3	41.7
Mandsaur	18.8	18.7	100.7
Morena	24.9	24.0	103.7
Narsinghpur	21.5	26.9	80.0
Neemuch	17.4	22.1	78.7
Panna	28.8	31.5	91.4
Raisen	25.1	27.4	91.7
Rajgarh	19.7	25.9	75.9
Ratlam	21.8	27.0	80.7
Rewa	18.2	26.1	69.8
Sagar	27.7	28.2	98.4
Satna	24.9	28.3	87.9
Sehore	23.3	26.7	87.3
Seoni	21.5	26.2	82.1
Shahdol	27.6	24.2	113.9
Shajapur	19.5	24.6	79.3
Sheopur	13.8	22.3	61.8
Shivpuri	21.5	30.9	69.7
Sidhi	25.1	26.2	95.8
Tikamgarh	18.9	26.0	72.7
Ujjain	21.2	24.0	88.5
Umaria	27.3	29.7	91.9
Vidisha	26.9	29.7	90.4

Sources: CRS: Registrar General, India (2014); AHS: Registrar General, India (2013e).

Fig. 3.1: Comparison of CDR based on CRS and AHS for Madhya Pradesh, 2011



Chapter 3

DEATH STATISTICS: CRUDE DEATH RATE

Assessment at the state level

In this chapter, the focus is mainly on the estimation of the crude death rate. It is observed that underreporting of deaths is common in CRS and that the death rate implied by the CRS is lower compared to SRS at the state level. Table 3.1 presents crude death rates for six states from SRS and CRS and the ratio of CRS rates to the SRS rates for the years 2009-2011. The reporting of deaths seems to be poorer in Madhya Pradesh (54-60%) than other states (80-93%). Reporting of deaths is observed to be closer to completeness (ratio more than 90%) in Karnataka and Himachal Pradesh according to CRS, 2011.

Assessment at the District level

Though the comparison of CRS estimates with SRS estimates shows little variation in some states and higher variation in some, it may not be the same when district-level death rates are compared. However, for individual district comparisons, we need independent estimates for each district. The only source for district estimates is the Annual Health Survey. But as noted earlier, only one of the six states, namely Madhya Pradesh, was covered in the AHS. Hence, such a comparison is possible only for Madhya Pradesh. The ratio of the CRS-CDR to the AHS-CDR gives an estimate of the level of coverage. For the other states, in the absence

Table 3.1: Estimates of the Crude Death Rate from the Civil Registration System and the Sample Registration System for Six Selected States, 2010, 2011

State	2010			2011		
	CRS-CDR	SRS-CDR	Ratio CRS/SRS *100	CRS-CDR	SRS-CDR	Ratio CRS/SRS *100
Haryana	5.8	6.6	87.9	6.0	6.5	92.3
Himachal Pradesh	5.9	6.9	85.5	6.2	6.7	92.5
Madhya Pradesh	4.6	8.3	55.4	4.8	8.2	58.5
Gujarat	5.5	6.7	82.1	5.5	6.7	82.1
Maharashtra	5.9	6.5	90.8	5.5	6.3	87.3
Karnataka	6.5	7.1	91.5	6.5	7.1	91.5

Sources: CRS: Registrar General, India (2013c, 2014);
SRS: Registrar General, India (2012, 2013a).

of independent district-level estimates, the ratio of the district CDR based on the CRS to the state CDR based on the SRS is calculated to have a rough idea of coverage. This ratio is certainly not meant to be a precise estimate of the level of coverage since the true CDR could vary from district to district and from the state average. But the district rates are expected to vary around the state rate. Therefore, if the CRS estimates for a vast majority of the districts fall below the state SRS rate, or if some district CDRs are substantially lower than the state CDR, a clear under-registration in the CRS is indicated.

Table 3.2 presents the ratios of CRS based CDR to the SRS-based state CDR for Himachal Pradesh, Haryana and Maharashtra. It is interesting to note that in all the districts of Himachal Pradesh the ratio is more than 70 per cent. The district Hamirpur appears to have higher level of it. In Haryana, the reporting of deaths appears to be comparatively poor in Mewat district (60 per cent); on the other hand, higher ratios are observed in Ambala, Hissar and Rohtak districts.

In Maharashtra, the districts generally have ratios of more than 60 per cent; the exceptions are: Nanded, Hingoli, Jalna, and Parbhani. High ratios are seen in a few districts such as Sangli, Mumbai and Ratnagiri. High ratios in some districts could be due to the availability of hospital facilities in Mumbai district as many from other districts would go there for treatment. But no such reason is seen for Sangli and Ratnagiri. But crude death rate in these districts could, in fact, be higher than the state level due to age distribution in these districts particularly towards older ages.

The CRS estimates of CDR compared to state level SRS estimates for districts of Karnataka, Gujarat and Madhya Pradesh are presented in Table 3.3. It is seen that in Karnataka, the registration of deaths appears to be good except in a few districts such as Kolar, Raichur, and Chikkaballapur. It is also evident that Udupi district appears to have higher level in CRS but this could be attributable to the presence of hospitals in the district. In Gujarat, nine districts (Dahod, Banaskantha, Kachch, Sabarkantha, Surat, Dangs, Surendranagar, Bhavnagar, and Panchamahal) have below 70 per cent reporting of deaths. The low level in Surat, a metropolis, is somewhat a surprise.

In Madhya Pradesh, the CRS death rates are compared with district-level estimates of AHS data. It appears that for many districts in the state, the coverage is as low as below 40 per cent. On the other hand, in Indore district, the level of reporting is very high. Some of the districts, namely, Dewas, Dhar, Ujjain, Bhopal, Chhindwara, Sagar and Balaghat, had more than 80 per cent of the deaths reported. The scatter plot too revealed that the CDRs in many districts of Madhya Pradesh are below the line of equality as compared to AHS estimates (Fig. 3.1). In Indore, the CRS estimate is well above the AHS estimate; this could be due to the medical facilities available in the city which would be receiving people from surrounding districts.

It is clear from the above discussion that the reporting of deaths appears to be relatively better in Haryana, Himachal Pradesh followed by Maharashtra and Karnataka as compared to Gujarat and Madhya Pradesh. In Gujarat, the

Table 3.2: Reporting of Deaths in CRS in Districts of Himachal Pradesh, Haryana and Maharashtra, 2011

Himachal			Haryana			Maharashtra		
District	CRS CDR	Ratio CRS CDR/ State SRS CDR *100)	District	CRS CDR	Ratio CRS CDR/ State SRS CDR *100	District	CRS CDR	Ratio CRS CDR/ State SRS CDR *100
Kullu	4.9	73.8	Mewat	3.9	59.5	Nanded	3.3	51.9
Solan	5.2	77.0	Faridabad	4.6	70.3	Hingoli	3.4	53.4
Sirmaur	5.3	79.0	Panipat	5.1	78.2	Jalna	3.6	57.3
Chamba	5.7	84.4	Palwal	5.2	79.5	Parbhani	3.7	59.5
Kinnaur	5.7	85.0	Gurgaon	5.4	82.8	Latur	3.9	61.7
L &Spiti	5.7	85.7	Jhajjar	5.6	86.3	Washim	4.0	63.8
Mandi	5.8	86.0	Bhiwani	5.7	87.4	Aurangabad	4.2	66.9
Bilaspur	6.3	94.0	Sonipat	5.7	87.5	Thane	4.5	72.2
Shimla	6.5	96.8	Rewari	5.7	87.7	Nashik	4.7	73.9
Kangra	6.9	102.6	Mahendragarh	5.7	88.4	Dhule	4.8	76.5
Una	7.2	107.8	Panchkula	5.8	89.3	Pune	4.8	76.6
Hamirpur	7.6	113.8	Kurukshetra	5.9	90.2	Bid	4.9	77.2
			Fatehabad	5.9	90.6	Buldhana	5.2	82.4
			Jind	6.1	94.1	Osmanabad	5.3	83.7
			Sirsa	6.1	94.3	Yavatmal	5.3	84.1
			Karnal	6.3	97.1	Ahmadnagar	5.3	84.1
			Kaithal	6.4	98.6	Jalgaon	5.4	85.0
			Yamunanagar	6.4	98.7	Gadchiroli	5.6	89.3
			Ambala	7.0	107.6	Akola	5.8	92.1
			Hisar	7.2	110.8	Solapur	5.8	92.4
			Rohtak	12.1	186.2	Nandurbar	5.9	94.3
						Raigad	6.1	97.0
						Satara	6.2	99.0
						Amrawati	6.4	100.8
						Kolhapur	6.5	102.8
						Gondia	6.7	105.8
						Chandrapur	6.7	106.8
						Wardha	6.8	108.5
						Nagpur	6.9	109.3
						Bhandara	7.0	111.3
						Sangli	7.3	116.1
						Mumbai	7.3	116.6
						Ratnagiri	8.4	133.1

Sources: CRS: Registrar General, India (2014); SRS: Registrar General, India (2013a).

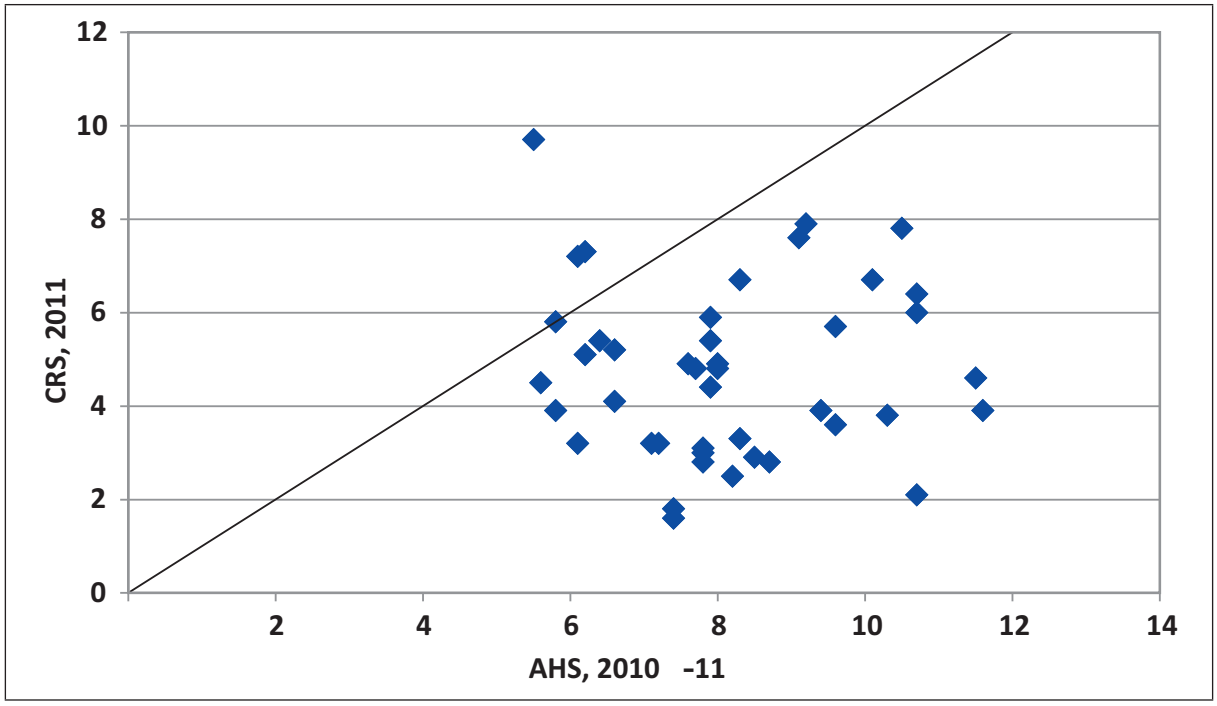
Table 3.3: Reporting of Deaths in CRS in Districts of Karnataka, Gujarat and Madhya Pradesh, 2011

Karnataka			Gujarat			Madhya Pradesh			
District	CRS CDR	Ratio CRS CDR/ State SRS CDR*100	District	CRS CDR	Ratio CRS CDR/State SRS CDR *100	District	CRS CDR	AHS-CDR	Ratio CRS CDR/AHS SRS CDR *100
Kolar	3.9	55.5	Dahod	2.5	37.9	Annuppur	0.9		
Raichur	4.3	60.5	Banaskantha	3.0	45.0	Sheopur	1.6	7.1	22.5
Chikkaballapur	4.7	66.2	Kachch	3.8	57.5	Tikamgarh	1.8	7.2	25.0
Chikmagalur	4.8	66.5	Sabarkantha	4.3	64.4	Khandwa	2.0	7.9	25.3
Bidar	5.0	71.1	Surat	4.5	67.2	Dindori	2.1	10.4	20.2
Gulbarga	5.4	75.5	Dangs	4.5	67.3	Rewa	2.5	7.9	31.6
Bangalore U	5.4	75.5	Surendranagar	4.6	68.0	Ashoknagar	2.7		
Bangalore R	5.7	80.4	Bhavnagar	4.6	68.5	Alirajpur	2.8		
Mandhya	5.8	82.0	Panchmahal	4.6	69.0	Mandla	2.8	8.5	32.9
Mysore	5.8	82.2	Junagadh	4.9	73.7	Rajgarh	2.8	7.6	36.8
Koppal	5.9	83.6	Amreli	5.3	79.2	Guna	2.9	8.4	34.5
Bellary	6.0	84.4	Patan	5.4	80.6	Ratlam	3.0	7.7	39.0
Yadgir	6.1	85.3	Jamnagar	5.4	80.9	Sidhi	3.1	7.6	40.8
Kodagu	6.4	90.2	Narmada	5.6	84.2	Singroli	3.2		
Bijapur	6.5	91.4	Valsad	5.7	85.3	Betul	3.2	8.6	37.2
Ramnagar	6.6	92.3	Porbandhar	5.8	86.8	Neemuch	3.2	5.8	55.2
Haveri	6.7	94.2	Gandhinagar	5.9	88.1	Mandsaur	3.2	6.9	46.4
Uttar Kannada	6.7	94.8	Tapi	6.0	88.8	Harda	3.2	7.1	45.1
Hasan	6.9	96.6	Rajkot	6.1	90.8	Shajapur	3.3	8.2	40.2
Belgaum	6.9	97.4	Kheda	6.2	92.1	Khargone	3.5	11.7	29.9
Chamrajnagar	7.0	97.9	Mahesana	6.5	96.4	Seoni	3.6	9.1	39.6
Shimoga	7.1	99.9	Vadodara	6.5	97.8	Burhanpur	3.7		
Bagalkote	7.1	99.9	Anand	6.6	99.0	Katni	3.8	9.7	39.2
Chitradurga	7.2	101.3	Bharuch	6.7	99.3	Barwani	3.9	11.5	33.9
Tumkur	7.2	101.3	Ahmedabad	6.7	100.6	Shivpuri	3.9	9.5	41.1
Dakshina Kannada	8.0	113.0	Navsari	7.3	109.3	Jhabua	3.9	5.7	68.4
Davangere	8.1	113.7				Datia	4.1	6.5	63.1
Gadag	8.1	114.0				Sehore	4.4	7.2	61.1
Dharwad	8.1	114.2				Dewas	4.5	5.5	81.8
Udupi	9.0	127.2				Panna	4.6	11.3	40.7
						Hosangabad	4.8	7.5	64.0
						Chhatarpur	4.8	7.9	60.8
						Narsinghpur	4.9	7.4	66.2
						Dhar	5.1	6.1	83.6
						Bhind	5.2	6.7	77.6
						Morena	5.4	7.8	69.2
						Ujjain	5.4	6.1	88.5
						Vidisha	5.7	9.1	62.6
						Bhopal	5.8	5.7	101.8
						Raisen	5.9	8.0	73.8
						Umaria	6.0	10.3	58.3
						Damoh	6.4	10.5	61.0
						Chhindwara	6.7	8.3	80.7
						Shahdol	6.7	9.8	68.4
						Jabalpur	7.2	6.0	120.0
						Gwalior	7.3	5.9	123.7
						Sagar	7.6	8.9	85.4
						Satna	7.8	10.1	77.2
						Balaghat	7.9	8.8	89.8
						Indore	9.7	5.4	179.6

Sources: CRS: Registrar General, India (2014); SRS: Registrar General, India (2013a); AHS: Registrar General, India (2013e).

registration of deaths is good except in some districts. However, the picture is different for Madhya Pradesh where the registration of deaths is very poor in most of the districts.

Fig. 3.1: Comparison of CDR based on CRS and AHS for Madhya Pradesh, 2011



Chapter 4

INFANT DEATHS AND STILL BIRTHS

Infant Deaths

It is well known that infant deaths are grossly under reported in the CRS. Table 4.1 presents the infant mortality rate from SRS and CRS for 2010 and 2011. The CRS estimates of infant mortality rate are quite low compared to SRS in all the states under consideration. The CRS estimate is less than half the SRS estimate in all the six states under assessment; Maharashtra shows the highest ratio (40 %) and Madhya Pradesh the lowest among these states. Thus, coverage of infant deaths is quite poor in all the six states.

As the AHS estimates are available for Madhya Pradesh, the comparison is presented using the district-level estimates. For the other states, the assessment is based on comparison of the CRS district estimates with the state-level SRS estimates (Table 4.2 and Table 4.3). As noted in the last chapter in the context of the CDR, the IMR too can vary across districts in a state and deviation from the state average does not necessarily imply poor registration. However, if the values obtained from the CRS for most of the districts are much lower than the SRS estimate for the state, under-registration is clearly indicated. It can be seen from Table

Table 4.1: Estimates of the Infant Mortality Rate (IMR) from the Civil Registration System and the Sample Registration System, Six Selected States, 2010, 2011

State	2010			2011		
	CRS-IMR	SRS-IMR	Ratio CRS/SRS *100	CRS-IMR	SRS-IMR	Ratio CRS/SRS*100
Haryana	10.6	48	22.1	12.2	44	27.7
Himachal Pradesh	7.2	40	18.0	7.8	38	20.5
Madhya Pradesh	8.6	62	13.9	8.0	59	13.5
Gujarat	6.7	44	15.2	6.6	41	16.1
Maharashtra	11.2	28	40.0	10.0	25	40.0
Karnataka	12.3	38	32.3	9.2	35	26.3

Sources: CRS: Registrar General, India (2013c, 2014);
SRS: Registrar General, India (2012, 2013a).

4.2 (and Fig. 4.1) that the reporting of infant deaths is very poor (the ratios being below 30 per cent of the state SRS estimate) in all the districts of Himachal Pradesh, except Shimla. The coverage of infant deaths is observed to be very poor in Haryana too; in all the districts, except Rohtak, the coverage of infant deaths is poor as it's below 40 per cent (Table 4.2).

In Maharashtra, only a few districts such as Chandrapur, Wardha, Gondia, Amravati, Nashik and Nagpur show ratios over 50% (Table 4.2). The reporting level of infant deaths is very low in the districts, Aurangabad, Jalna, Raigad, Nanded, Hingoli, Bid and Gadchiroli (below 20 per cent). In Karnataka too, many districts had less than 20 per cent coverage of infant deaths (Table 4.3). The infant deaths registration is found to be better in Dharwad and Mysore districts.

The reporting of infant deaths is very poor in Gujarat. All the districts except three had ratios less than 25 per cent and in those three districts too, the level is not more than 35 per cent (Table 4.3). In Madhya Pradesh, the reporting of infant deaths is very poor for almost all the districts (Table 4.3). Figures 4.1 to 4.6 clearly show the under reporting of infant deaths in all the states under consideration, compared to SRS state average infant mortality rate.

Fig. 4.1: CRS Estimates of IMR in Districts of Himachal Pradesh, 2011

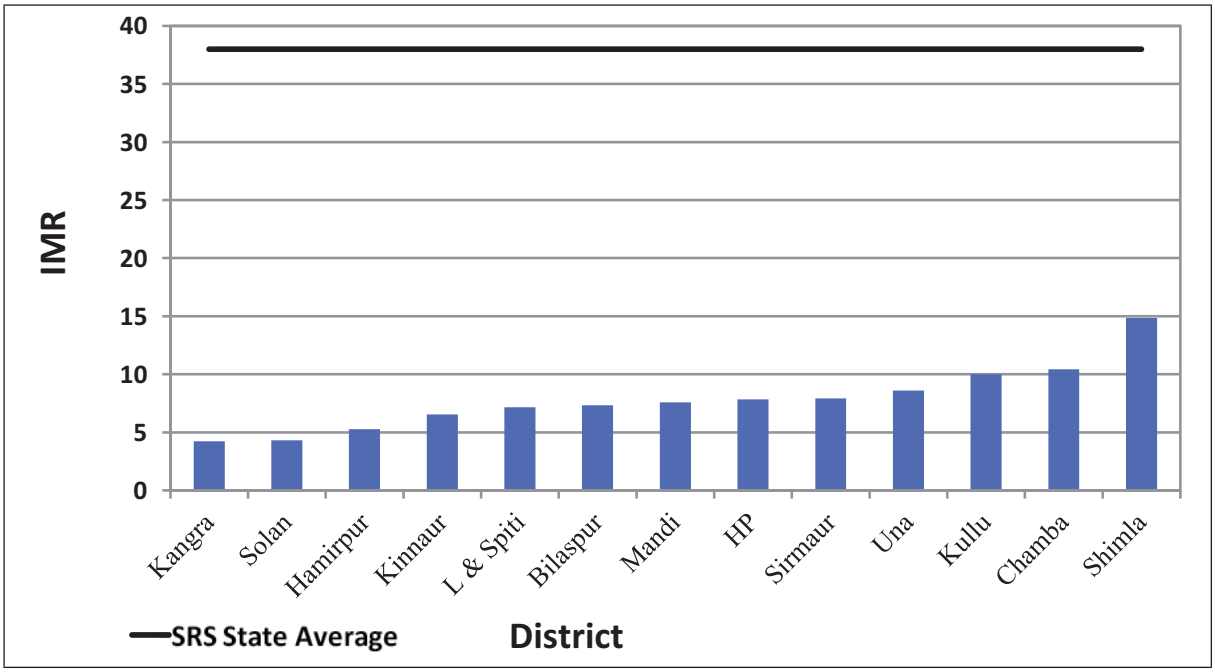


Fig. 4.2: CRS Estimates of IMR in Districts of Haryana, 2011

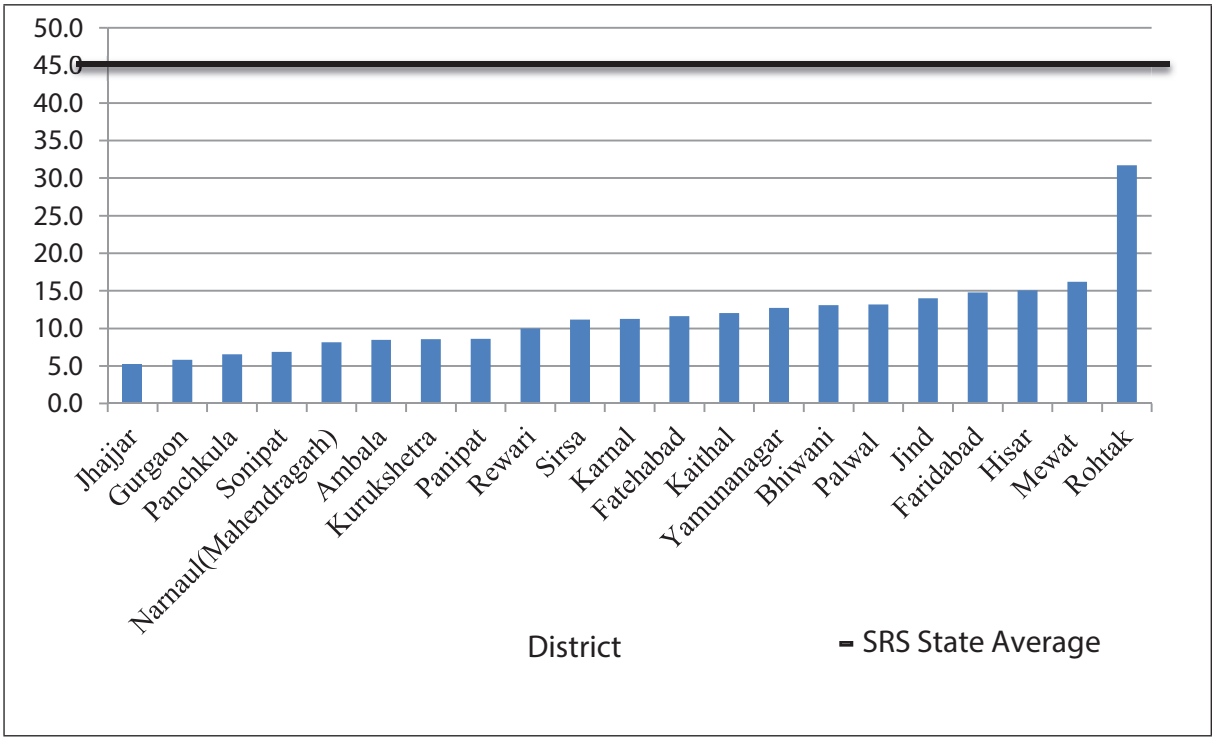


Fig. 4.3: CRS Estimates of IMR in Districts of Madhya Pradesh, 2011

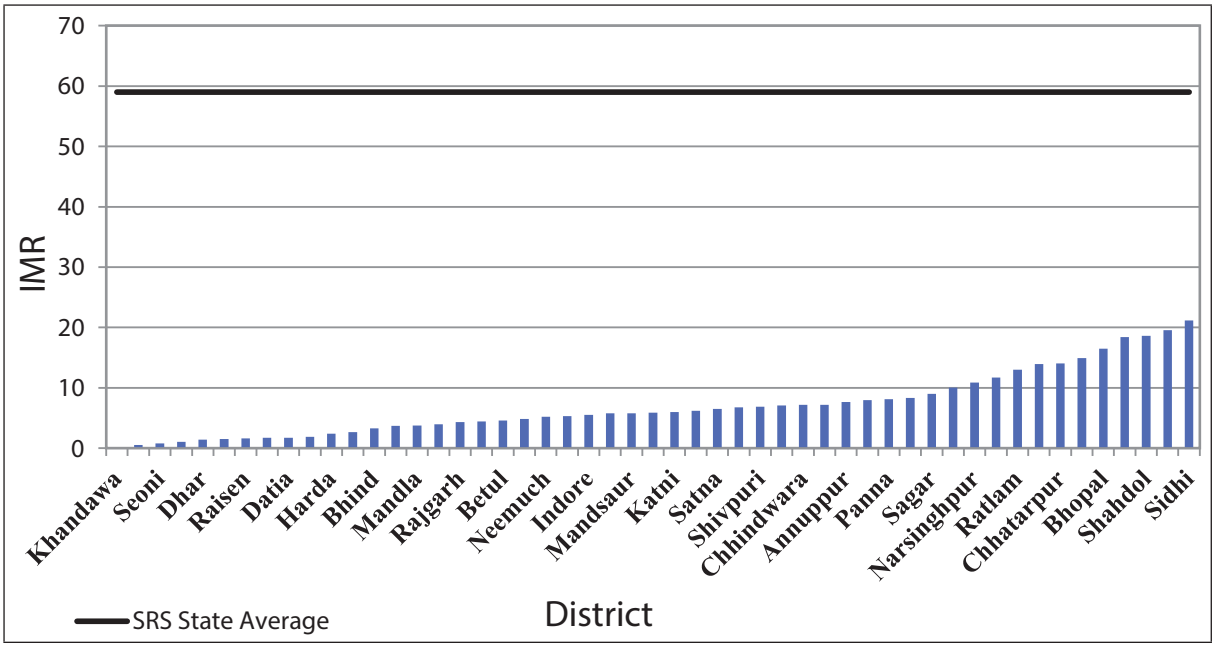


Fig. 4.4: CRS Estimates of IMR in Districts of Gujarat, 2011

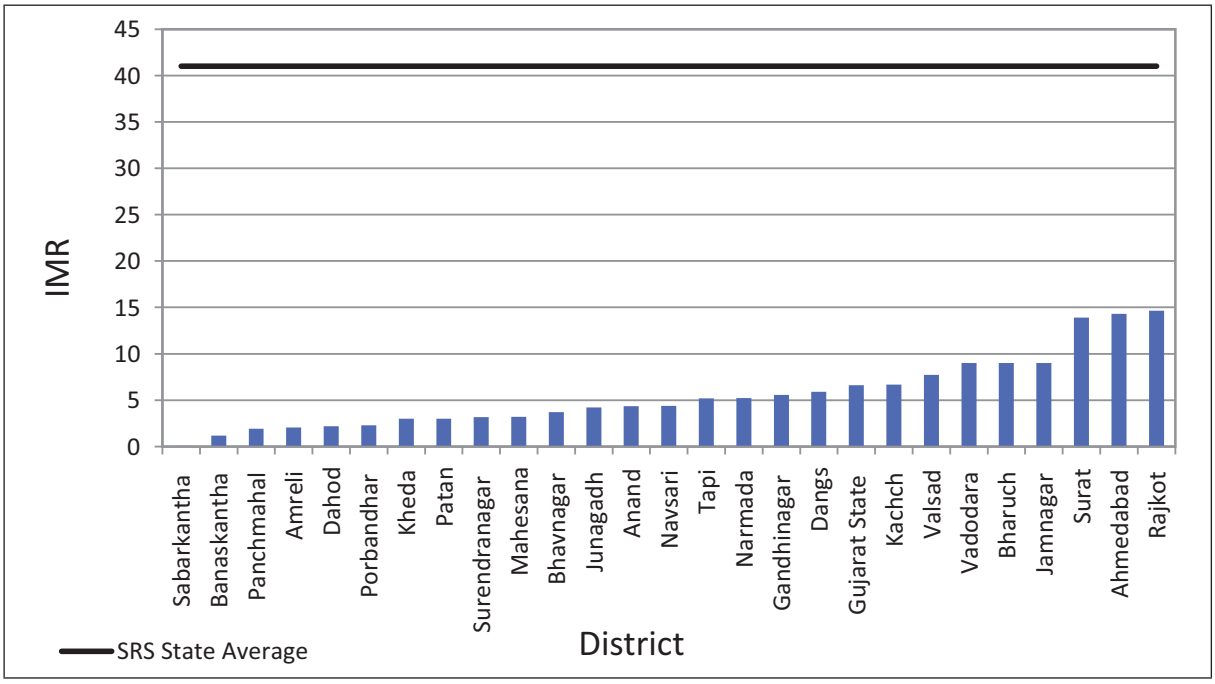


Fig. 4.5: CRS Estimates of IMR in Districts of Karnataka, 2011

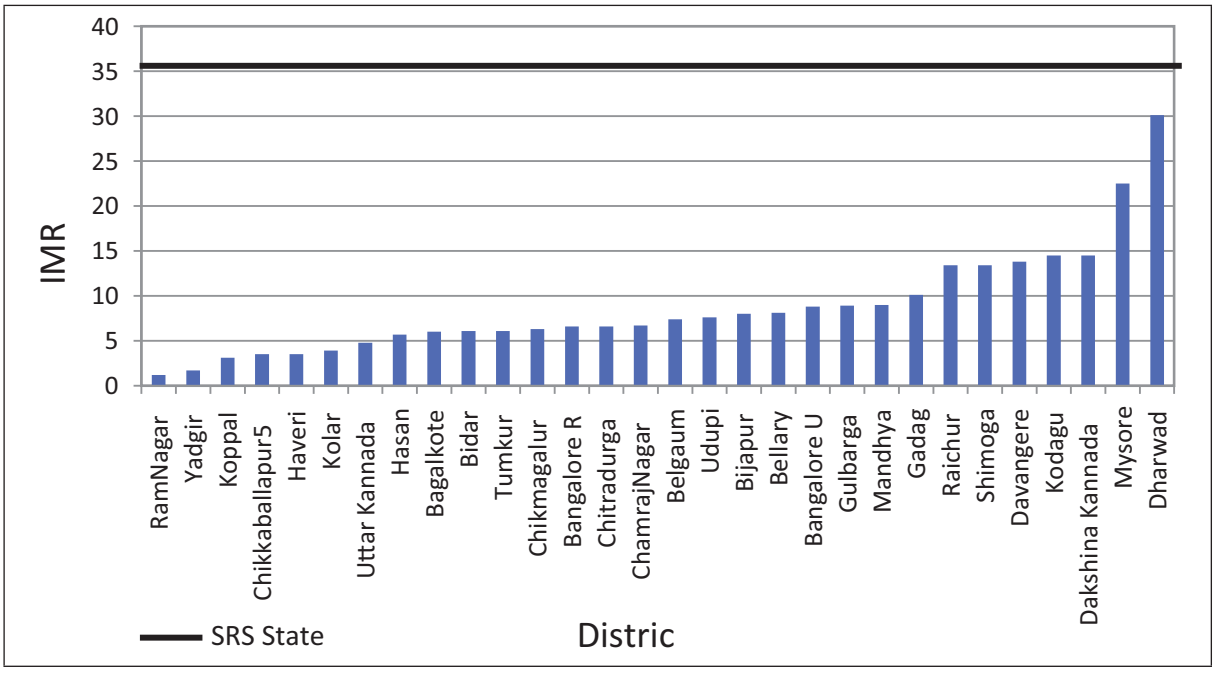


Fig. 4.6: CRS Estimates of IMR in Districts of Maharashtra, 2011

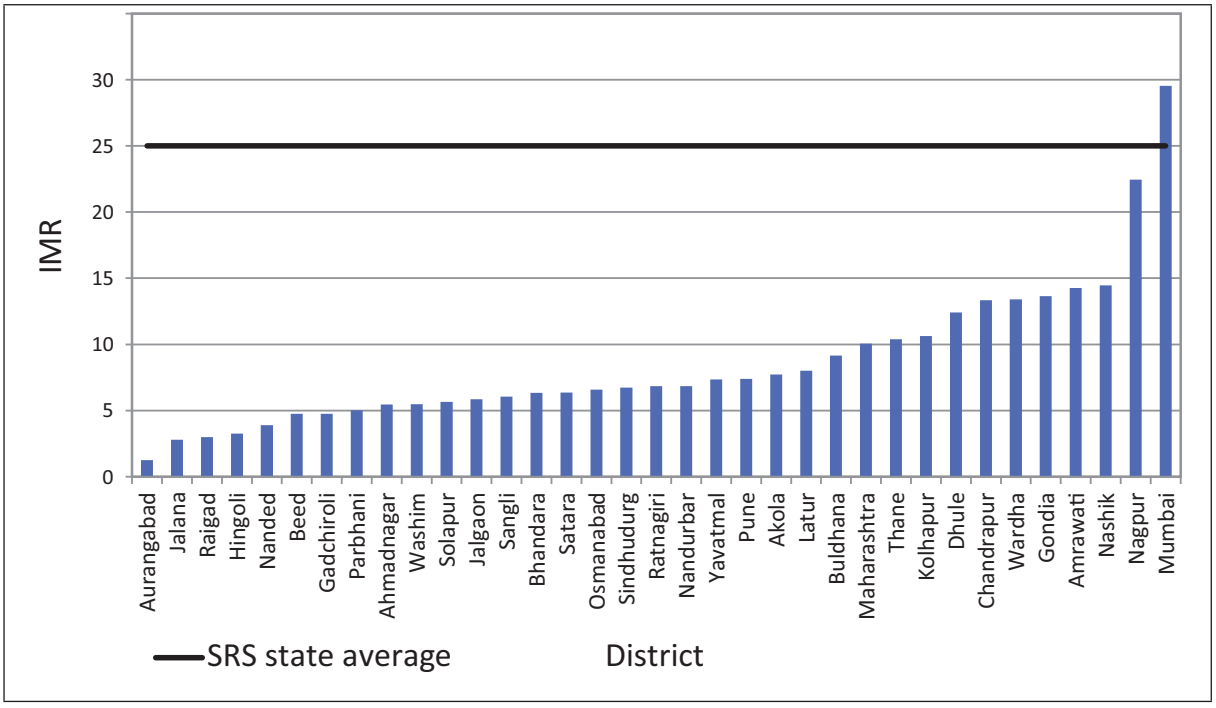


Table 4.2: Reporting of Infant Deaths in CRS in Districts of Himachal Pradesh, Haryana and Maharashtra, 2011

Himachal			Haryana			Maharashtra		
District	IMR	Ratio: District IMR/ State SRS IMR *100	District	IMR	Ratio: District IMR/ State SRS IMR *100	District	IMR	Ratio: District IMR/ State SRS IMR *100
Kangra	4.2	11.1	Jhajjar	5.3	12.1	Aurangabad	1.3	5.0
Solan	4.3	11.3	Gurgaon	5.8	13.2	Jalna	2.8	11.2
Hamirpur	5.3	13.9	Panchkula	6.5	14.9	Raigarh	3.0	12.0
Kinnaur	6.6	17.2	Sonipat	6.9	15.6	Hingoli	3.2	13.0
Lahul&Spiti	7.2	18.9	Narnaul (Mahendragarh)	8.2	18.6	Nanded	3.9	15.5
Bilaspur	7.3	19.3	Ambala	8.5	19.2	Bid	4.7	19.0
Mandi	7.6	19.9	Kurukshetra	8.6	19.5	Gadchiroli	4.8	19.0
Sirmaur	7.9	20.8	Panipat	8.6	19.5	Parbhani	5.0	20.1
Una	8.6	22.6	Rewari	10.0	22.6	Ahmadnagar	5.4	21.8
Kullu	10.0	26.3	Sirsa	11.2	25.4	Washim	5.5	21.9
Chamba	10.4	27.4	Karnal	11.3	25.6	Solapur	5.7	22.6
Shimla	14.9	39.1	Fatehabad	11.6	26.5	Jalgaon	5.8	23.4
Himachal	**7.8**	**20.5**	Kaithal	12.0	27.4	Sangli	6.1	24.2
			Yamunanagar	12.7	29.0	Bhandara	6.3	25.3
			Bhiwani	13.1	29.8	Satara	6.4	25.4
			Palwal	13.2	29.9	Osmanabad	6.6	26.3
			Jind	14.0	31.8	Sindhudurg	6.7	26.9
			Faridabad	14.8	33.6	Ratnagiri	6.8	27.4
			Hisar	15.0	34.2	Nandurbar	6.9	27.4
			Mewat	16.2	36.8	Yavatmal	7.3	29.4

Himachal			Haryana			Maharashtra		
District	IMR	Ratio: District IMR/ State SRS IMR *100	District	IMR	Ratio: District IMR/ State SRS IMR *100	District	IMR	Ratio: District IMR/ State SRS IMR *100
			Rohtak	31.7	72.0	Pune	7.4	29.6
			Haryana	**12.2**	**27.7**	Akola	7.7	30.9
						Latur	8.0	32.0
						Buldana	9.2	36.6
						Thane	10.4	41.6
						Kolhapur	10.6	42.5
						Dhule	12.4	49.6
						Chandrapur	13.3	53.3
						Wardha	13.4	53.6
						Gondiya	13.7	54.6
						Amravati	14.3	57.1
						Nashik	14.5	57.9
						Nagpur	22.5	89.8
						Mumbai	29.5	118.0
						Maharashtra	**10.0**	**40.0**

Sources: CRS: Registrar General, India (2014); SRS: Registrar General, India (2013a).

Table 4.3: Reporting of Infant Deaths in CRS in Districts of Karnataka, Gujarat and Madhya Pradesh, 2011

Karnataka			Gujarat			Madhya Pradesh			
District	CRS-IMR	Ratio: District IMR/State SRS IMR *100	District	CRS-IMR	Ratio: District IMR/State SRS IMR *100	District	CRS-IMR	AHS-IMR	Ratio: CRS IMR/ AHSIMR *100
RamNagar	1.2	3.4	Sabarkantha	0.1	0.2	Khandawa	-	68	
Yadgir	1.7	4.7	Banaskantha	1.2	2.8	Ashoknagar	0.5		
Koppal	3.1	8.9	Panchmahal	1.9	4.7	Seoni	0.8	70	1.1
Chikkaballapur	3.5	9.9	Amreli	2.1	5.0	Umaria	1.1	64	1.7
Haveri	3.5	10.0	Dahod	2.2	5.4	Dhar	1.4	54	2.6
Kolar	3.9	11.1	Porbandhar	2.3	5.6	Dewas	1.5	57	2.6
Uttar Kannada	4.8	13.7	Kheda	3.0	7.3	Raisen	1.6	74	2.2
Hasan	5.7	16.2	Patan	3.0	7.3	Guna	1.7	77	2.2
Bagalkote	6.0	17.2	Surendranagar	3.2	7.7	Datia	1.7	73	2.3
Bidar	6.1	17.3	Mahesana	3.2	7.8	Singroli	1.9		
Tumkur	6.1	17.3	Bhavnagar	3.7	9.0	Harda	2.4	65	3.7
Chikmagalur	6.3	17.9	Junagadh	4.2	10.3	Shajapur	2.7	60	4.5
Bangalore R	6.6	18.8	Anand	4.4	10.6	Bhind	3.3	53	6.2
Chitradurga	6.6	19.0	Navsari	4.4	10.7	Burhanpur	3.7		
ChamrajNagar	6.7	19.1	Tapi	5.2	12.7	Mandla	3.8	70	5.4
Belgaum	7.4	21.2	Narmada	5.2	12.7	Jabalpur	4.0	51	7.8
Udupi	7.6	21.8	Gandhinagar	5.6	13.6	Rajgarh	4.3	61	7.0
Bijapur	8.0	22.9	Dangs	5.9	14.4	Sehore	4.5	67	6.7
Bellary	8.1	23.1	Kachch	6.7	16.3	Betul	4.6	64	7.2
Bangalore U	8.8	25.2	Valsad	7.7	18.9	Jhabua	4.9	66	7.4
Gulbarga	8.9	25.5	Vadodara	9.0	21.9	Neemuch	5.2	56	9.3
Mandhya	9.0	25.6	Bharuch	9.0	21.9	Hosangabad	5.3	63	8.4
Gadag	10.1	28.7	Jamnagar	9.0	21.9	Indore	5.5	39	14.1
Raichur	13.4	38.2	Surat	13.9	33.9	Gwalior	5.8	49	11.8

Karnataka			Gujarat			Madhya Pradesh			
District	CRS-IMR	Ratio: District IMR/State SRS IMR *100	District	CRS-IMR	Ratio: District IMR/State SRS IMR *100	District	CRS-IMR	AHS-IMR	Ratio: CRS IMR/ AHSIMR *100
Shimoga	13.4	38.2	Ahmedabad	14.3	34.9	Mandsaur	5.8	62	9.4
Davangere	13.8	39.5	Rajkot	14.6	35.7	Sheopur	5.9	71	8.3
Kodagu	14.5	41.3	**Gujarat**	**6.6**	**16.1**	Katni	6.0	68	8.8
Dakshina Kannada	14.5	41.4				Vidisha	6.2	68	9.1
Mysore	22.5	64.2				Satna	6.5	87	7.5
Dharwad	30.1	85.9				Damoh	6.8	77	8.8
Karnataka	**9.2**	**26.3**				Shivpuri	6.9	70	9.9
						Alirajpur	7.1		
						Chhindwara	7.2	70	10.3
						Tikamgarh	7.2	65	11.1
						Annuppur	7.7		
						Panna	8.1	90	9.0
						Morena	8.3	60	13.8
						Sagar	9.0	70	12.9
						Khargone	10.0	56	17.9
						Narsinghpur	10.9	67	16.3
						Dindori	11.7	70	16.7
						Ratlam	13.0	66	19.7
						Rewa	14.0	70	20.0
						Chhatarpur	14.0	68	20.6
						Ujjain	14.9	56	26.6
						Bhopal	16.5	49	33.7
						Balaghat	18.4	62	29.7
						Shahdol	18.6	73	25.5
						Barwani	19.6	67	29.3
						Sidhi	21.2	71	29.9

Sources: CRS: Registrar General, India (2014); SRS: Registrar General, India (2013a); AHS: Registrar General, India (2013e).

Table 4.4: Estimates of the Still Birth Rate (SBR) from the Civil Registration System and the Sample Registration System for Six Selected States, 2011

State	CRS (2011)	SRS (2011)	Ratio (CRS SBR/SRS SBR)*100
Haryana	$	9	$
Himachal Pradesh	$	10	$
Gujarat	5.3	7	75.4
Karnataka	6.2	14	44.4
Maharashtra	7.3	6	119.2
Madhya Pradesh	8.8	7	126.0

Source: CRS**:** Registrar General, India (2014***);*** SRS: Registrar General, India (2013a).

$: For the year 2011, no data on still births are available for Haryana and data on only two districts are provided for Himachal Pradesh.

Still Births

Still birth is the death of foetus after completing 28 weeks but before the time of birth. The still birth rate is the number of still births in a given year in a given geographical region per one thousand live births plus still births in the same year and geographical region. The still births rates for the states (Himachal Pradesh, Gujarat, Maharashtra, Madhya Pradesh and Karnataka) and districts are given in Tables 4.4 and 4.5.

Table 4.4 presents the still birth rates from CRS and SRS for Gujarat, Maharashtra, Madhya Pradesh and Karnataka. Since the CRS report for the year 2011 gives no data on still births for Haryana and on only two districts for Himachal Pradesh, the assessment is possible for only for the four states, Gujarat, Karnataka, Madhya Pradesh, and Maharashtra. In two of these (Gujarat and Karnataka), the still birth rate is lower in CRS than the SRS estimate. In Gujarat, 75% of still births are reported in CRS compared to SRS estimate and in Karnataka, less than half of still births seem to have been registered. The reporting of still births in CRS looks fairly good in Madhya Pradesh and Maharashtra. Table 4.5 presents district-wise reporting of still births in these four states. In Gujarat, more than 50% reporting of still births in CRS compared to SRS estimate was observed in Dahod, Bharuch and Panch Mahal. The still birth rate of Banaskantha and Patna is two times higher than the SRS state average. In Karnataka, most of the districts show lower SBR than the SRS state average, except Gadag and Dharwad. The reverse is the case in Madhya Pradesh where most of the districts show much higher SBR than the SRS state average. Half of the districts show still birth coverage more than 150 per cent. In Maharashtra, 17 districts have lower and 15 districts have higher SBR than the SRS state average. Mumbai district shows three times higher still birth rate than the state average. Poor reporting of still birth at the district level is also evident from the charts given below except in Madhya Pradesh (Fig 4.7to 4.10). Overall, no clear pattern is seen in the registration of still births. The total absence of still births in the registration in some districts indicates that some registration authorities are unaware that still births are to be registered. In fact, the information on still births is missing for some states in the CRS reports. Clearly, the reporting of still births is not taken seriously at various levels of the registration system.

Table 4.5: Estimates of the Still Birth Rate (SBR) from the Civil Registration System, Districts of Gujarat, Karnataka, Maharashtra and Madhya Pradesh, 2011

(Districts arranged in ascending order of Still Birth Rate)

District	SBR	District	SBR	District	SBR	District	SBR
Karnataka	**6.2**	**Gujarat**	**5.3**	**Maharashtra**	**7.2**	**Madhya Pradesh**	**8.8**
Yadgir	na	Jamnagar	na	Bid	0.4	Balaghat	na
Gulbarga	0.3	The Dangs	na	Osmanabad	1.1	Burhanpur	na
Bangalore Rural	0.4	Tapi	0.1	Nanded	1.1	Gwalior	na
Ramanagar	0.5	Bhavnagar -	0.4	Hingoli	1.5	Raisen	1.2
Koppal	0.8	Vadodara	0.8	Jalgaon	1.6	Panna	1.4
Hassan	1.1	Surat	1.6	Akola	1.7	Vidisha	2.4
Chikmagalur	1.6	Rajkot -	2.0	Raigarh	2.3	Anooppur	2.6
Bangalore Urban	1.8	Ahmadabad	2.0	Washim	2.5	Guna	3.2
Tumkur	2.5	Anand	2.7	Nagpur	2.7	Sheopur	3.2
Kodagu	2.9	Gandhinagar	3.2	Aurangabad	2.8	Sehore	3.2
Chickballapur	5.1	Navsari - -	3.3	Parbhani	3.4	Sagar	4.0
Mysore	6.1	Surendranagar	4.5	Nandurbar	4.0	Bhind	4.3
Davanagere	6.3	Mahesana	5.6	Gadchiroli	4.3	Umaria	4.3
Bijapur	6.3	SabarKantha	5.8	Solapur	4.7	Khandwa (East Nimar)	4.4
Mandya -	6.5	Junagadh	5.9	Sangli	5.0	Jabalpur	4.5
Uttara Kannada	6.7	Valsad	6.0	Wardha	5.2	Dindori	4.8
Udupi	6.8	Amreli	6.5	Ahmadnagar	5.7	Dhar	5.3
Bellary	6.9	Kheda	7.3	Satara	6.2	Indore	6.1
Chamarajanagar	8.0	Kachchh	8.8	Buldana	6.6	Rewa	6.7
Bidar	8.6	Narmada	8.8	Sindhudurg	7.1	Singroli	7.2
Dakshina Kannada	9.1	Porbandar	9.3	Yavatmal	7.5	Damoh	7.2
Bagalkote	9.2	Bharuch	10.5	Bhandara	8.2	Dewas	8.9
Chitradurga	9.8	Dohad	10.9	Pune	8.4	Barwani	9.0
Belgaum	9.9	PanchMahals	11.1	Ratnagiri	8.6	Tikamgarh	9.6
Shimoga	10.0	BanasKantha	12.9	Chandrapur	9.2	Harda	9.6
Raichur	10.1	Patan	15.0	Latur	9.4	Bhopal	9.8
Kolar	10.1			Jalna	9.5	Morena	10.1
Haveri	10.6			Kolhapur	9.6	Hoshangabad	10.3
Gadag	13.8			Amravati	9.8	Ratlam	10.7
Dharwad	19.3			Thane	10.4	Neemuch	11.4
				Nashik	10.7	Satna	12.4
				Dhule	10.7	Seoni	12.5
				Gondiya	11.3	Sidhi	12.9
				Mumbai	17.0	Katni	12.9
						Alirajpuir	13.0
						Mandsaur	13.0
						Narsimhapur	13.4
						Ashoknagar	13.7
						Jhabua	14.1
						Shajapur	14.2
						Shahdol	14.6
						Betul	14.6
						Mandla	14.9
						Datia	15.0
						Khargone (West Nimar)	15.7
						Chhindwara	15.7
						Rajgarh	16.4
						Ujjain	16.6
						Chhatarpur	17.5
						Shivpuri	17.7

Source: CRS: Registrar General, India (2014).

Note: The data on still births in 2011 are not available for Haryana and for most districts of Himachal Pradesh.

Fig. 4.7: Still Birth Rate in Districts of Gujarat, 2011

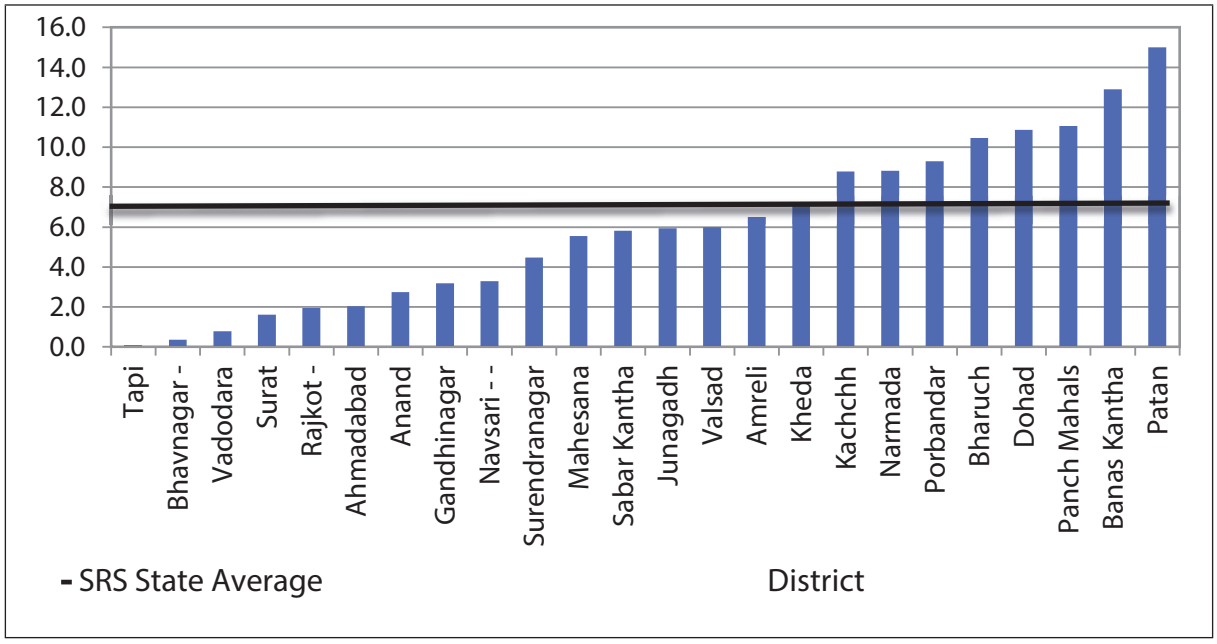


Fig. 4.8: Still Birth Rate in Districts of Karnataka, 2011

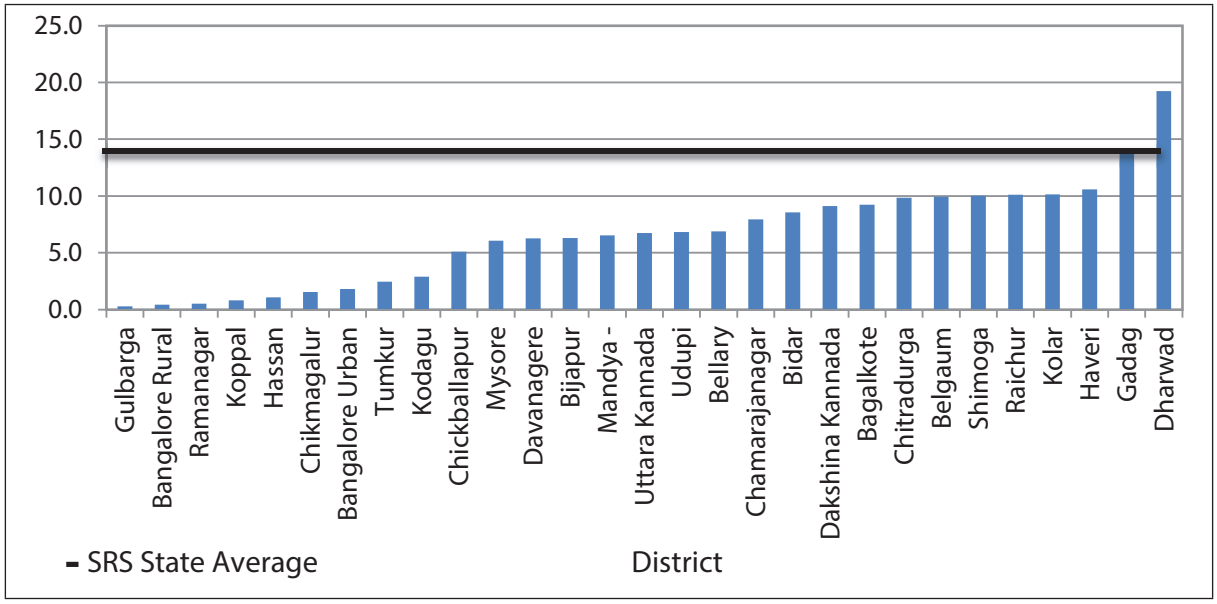
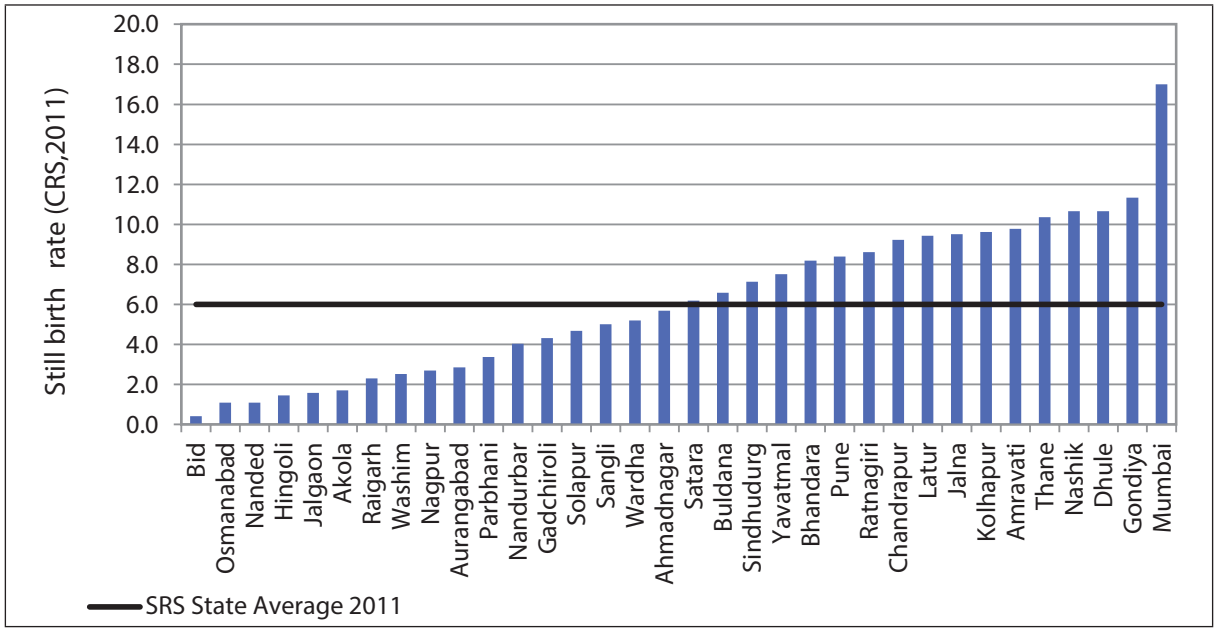


Fig. 4.9: Still Birth Rate in Districts of Maharashtra, 2011



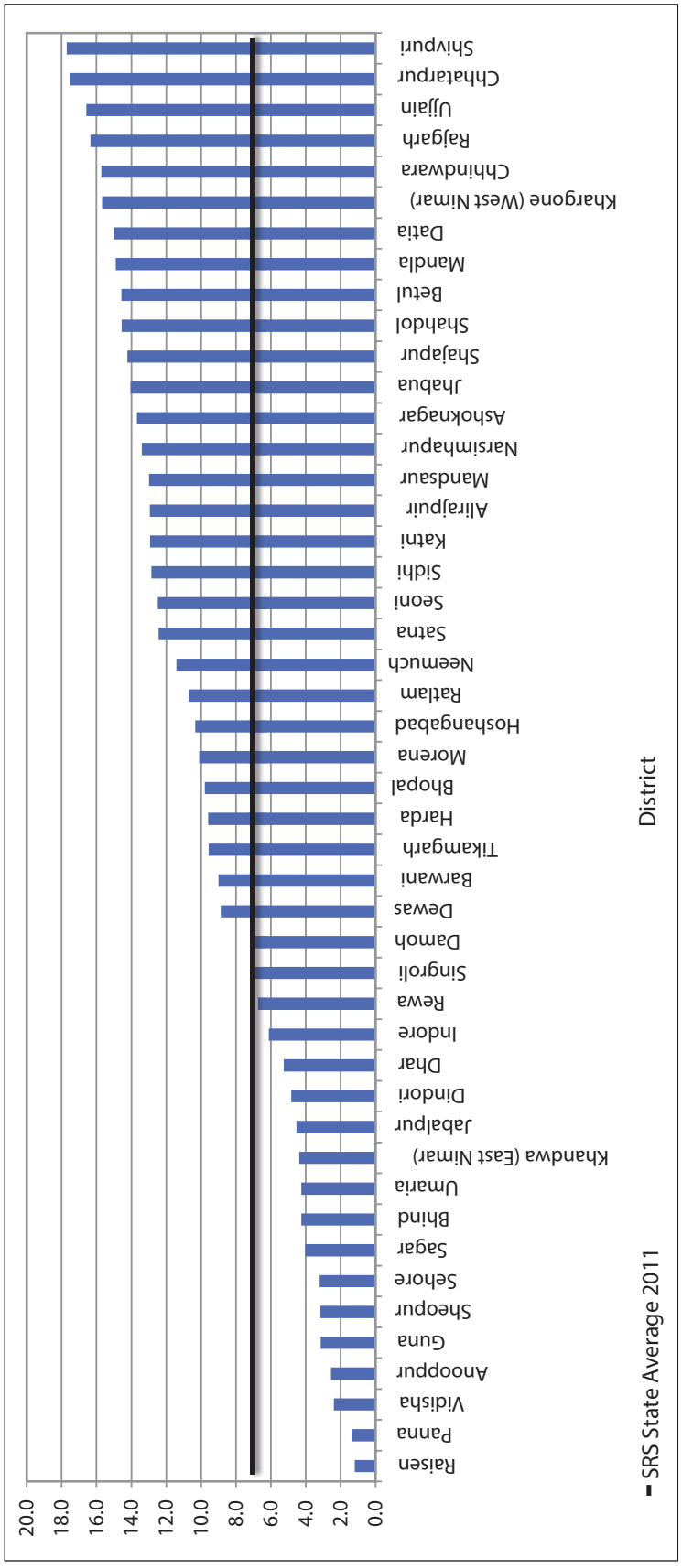


Fig. 4.10: Still Birth Rate in Districts of Madhya Pradesh, 2011

Chapter 5

SEX RATIO AT BIRTH AND SEX RATIO AT DEATH

Sex Ratio at Birth (SRB)

Another method of evaluating the quality of data on registration of births is by analysing the sex ratio at birth (SRB).Globally, the SRB is generally around 952 per thousand expressed as female births per 1000 male births (or 105 male births per 100 female births following the international convention). However, in many states of India, the SRB is much lower than 952 since it is influenced by cultural preferences and social practices that favour the birth or survival of one sex over the other (*more often than not favouring males over females*). This is observed in ratios given by the SRS for various states. Therefore, departure of the SRB from the value of 952 need not necessarily imply poor registration. But large departures from the estimate of the SRB from an independent source such as the SRS suggest sex-selective misreporting, misrecording or under registration of births. Therefore, in order to check the validity of SRB from CRS, it is matched with SRB estimates from the SRS at the state level. At the district level, the comparison is with the SRB, implied by the child sex ratio from the 2011 census and wherever possible, by the AHS.

Table 5.1 presents the estimated sex ratio at birth (SRB) for the selected six states; the sex ratio is expressed here as females per 1000 males following the convention in India. The table compares the CRS sex ratio with the SRS and AHS data wherever possible. It is observed that reporting of female births in Maharashtra is quite low as the SRB from the CRS is even lower than the SRB from the SRS (for Maharashtra, the SRB from the SRS is also much lower than normal). The SRB for Madhya Pradesh in CRS and AHS is approximately the same, but lower than the rate observed in the SRS. In the case of Haryana and Himachal Pradesh too the SRB is slightly higher in SRS compared to CRS estimate. Thus, there seems to be under-registration of female births in these states. The gap is quite narrow in Gujarat. In Karnataka, the CRS shows a higher SRB than the SRS; clearly there does not seem to be any under-registration of female births.

Table 5.1: Estimates of the Sex Ratio at Birth from the Civil Registration System and the Sample Registration System, Six Selected States, 2011

(Sex ratio is expressed as females per 1000 males)

State	CRS 2011	SRS (2009-11)	Ratio CRS/SRS *100	AHS (2011-12)	Ratio CRS/AHS *100
Haryana	833	854	97.5	-	-
Himachal Pradesh	918	938	97.9	-	-
Gujarat	901	909	99.1	-	-
Karnataka	983	945	104.0	-	-
Maharashtra	861	893	96.4	-	-
Madhya Pradesh	897	920	97.5	904	99.23

Sources: CRS: Registrar General, India (2014); SRS: Registrar General, India (2013a); AHS: Registrar General, India (2013e).

Table 5.2: SRB from CRS and Census across districts of Haryana, 2011

(Females per 1000 males)

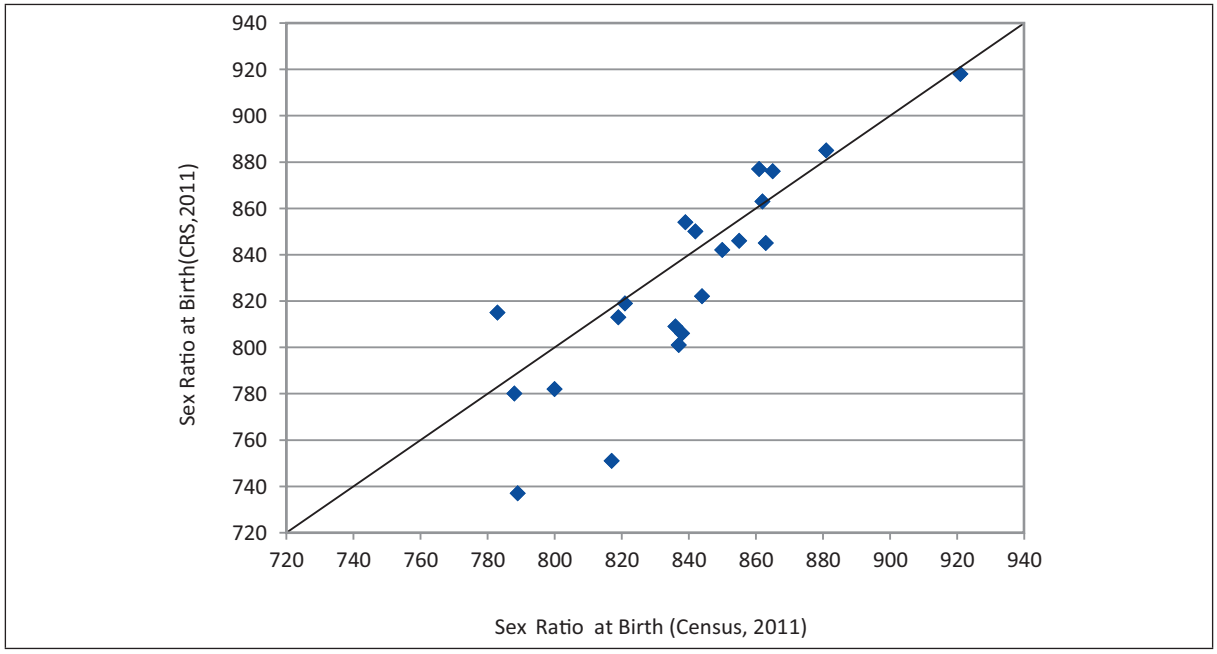
District	SRB CRS 2011	SRB Census-2011 (indirect)	Ratio SRB CRS/ SRB Census *100
Ambala	819	821	99.8
Bhiwani	854	839	101.8
Faridabad	877	861	101.9
Fatehabad	846	855	99.0
Gurgaon	850	842	101.0
Hisar	845	863	97.9
Jhajjar	815	783	104.1
Jind	842	850	99.1
Kaithal	806	838	96.2
Karnal	809	836	96.8
Kurukshetra	751	817	91.9
Mewat	918	921	99.7
Mahendragarh	737	789	93.4
Palwal	885	881	100.5
Panchkula	876	865	101.3
Panipat	822	844	97.4
Rewari	780	788	99.0
Rohtak	813	819	99.3
Sirsa	863	862	100.1
Sonipat	782	800	97.8
Yamunanagar	801	837	95.7
Haryana	**833**	**842**	**98.9**

Sources: CRS: Registrar General, India (2014);
Census Indirect: Kumar and Sathyanarayana (2012).

At the district level, we compare the SRB from the CRS to the SRB obtained from the 2011 census data on the sex distribution of children in the age range 0-6. In this age range, the effect of sex selective age misreporting is known to be small. Based on this ratio and reverse survival by sex, Kumar and Sathyanarayana (2012) have computed the sex ratio at birth for the 7-year period before the census for each district. The SRB obtained from the CRS is compared to these census-based estimates district-wise to assess the quality of registration. It appears that the reporting of sex ratio at birth (SRB) is quite good in CRS for Haryana as the percentage variation is not very high. Seven districts show CRS based SRB is higher than Census SRB. Fig.5.1 presents the scatter plot between CRS and Census-based SRB across districts of Haryana. A high level of underreporting of female births is observed only in Kurukshetra district. In other districts, the underreporting of female births is observed to be marginal.

In the Fig.5.2 the scatter diagram for Himachal Pradesh also shows a good reporting of female births as in Haryana. Half of the districts fall just above the diagonal line and half just below the diagonal, indicating no considerable under registration of female births except in the district of Lahul and Spiti.

Fig 5.1: Comparison of Sex Ratio at Birth based on CRS and Census for Haryana, 2011



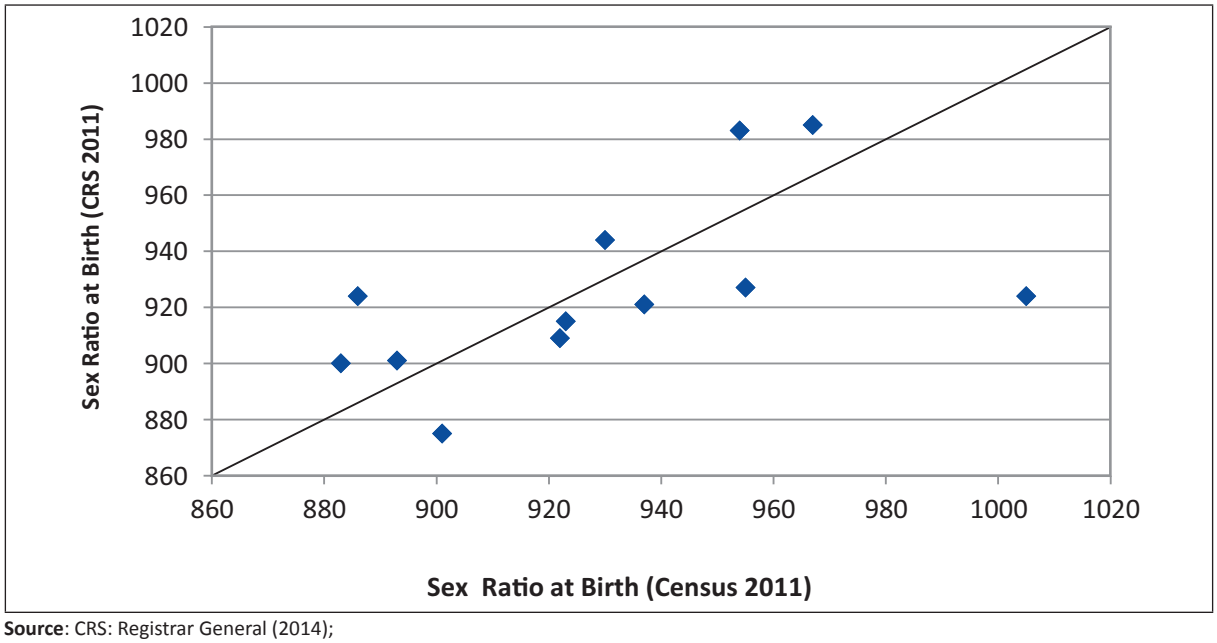
Source: CRS: Registrar General (2014);
Census based SRB: Kumar and Sathyanarayana (2012).

Table 5.3: SRB from CRS and Census across districts of Himachal Pradesh, 2011
(Females per 100 males)

District	SRB CRS	SRB Census-2011 indirect	Ratio: SRB CRS/ SRB Census *100
Bilaspur	875	901	97.1
Chamba	927	955	97.1
Hamirpur	901	893	100.9
Kangra	900	883	101.9
Kinnaur	983	954	103.0
Kullu	985	967	101.9
L &Spiti	924	1005	91.9
Mandi	909	922	98.6
Shimla	944	930	101.5
Sirmaur	921	937	98.3
Solan	915	923	99.1
Una	924	886	104.3
Himachal Pradesh	**918**	**916**	**100.2**

Source: CRS: Registrar General (2014);
Census based SRB: Kumar and Sathyanarayana (2012).

Fig.5.2: Comparison of Sex Ratio at Birth based on CRS and Census for Himachal Pradesh, 2011



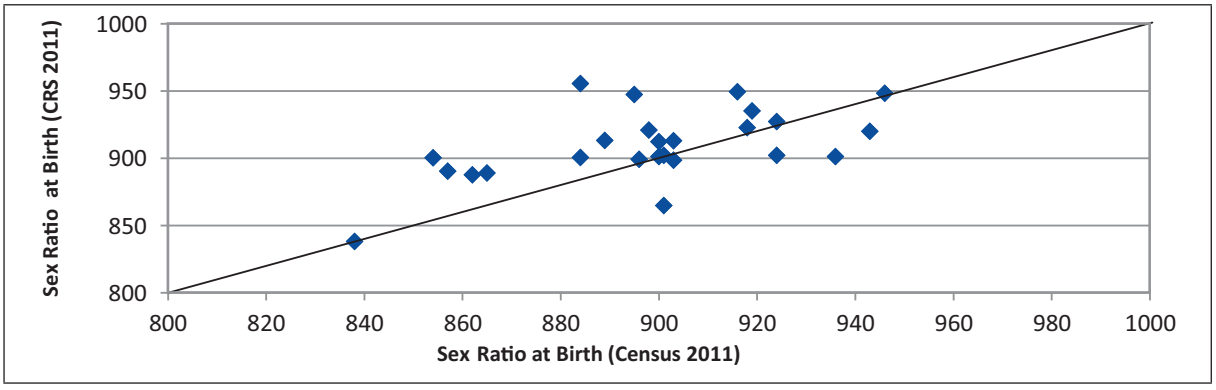
Source: CRS: Registrar General (2014);
Census based SRB: Kumar and Sathyanarayana (2012).

Table 5.4: SRB from CRS and Census across districts of Gujarat, 2011
(Females per 1000 males)

District	SRB CRS	SRB Census-2011 indirect	Ratio: SRB CRS/ SRB Census *100
Kutch	935	919	101.8
Banaskantha	913	900	101.4
Patan	901	900	100.1
Mahesana	900	854	105.4
Sabarkantha	902	901	100.1
Gandhinagar	888	862	103.0
Ahmedabad	889	865	102.8
Surendranagar	921	898	102.6
Rajkot	891	857	103.9
Jamnagar	913	903	101.1
Porbandhar	948	895	105.9
Junagadh	899	903	99.5
Amreli	956	884	108.1
Bhavnagar	913	889	102.7
Anand	901	884	101.9
Kheda	899	896	100.4
Panchmahal	902	924	97.6
Dahod	920	943	97.6
Vadodara	865	901	96.0
Narmada	901	936	96.3
Bharuch	923	918	100.5
Surat	838	838	100.0
Dangs	1032	968	106.6
Navsari	949	916	103.6
Valsad	927	924	100.4
Tapi	948	946	100.2
Gujarat	**901**	**891**	**101.1**

Source: CRS: Registrar General (2014);
Census based SRB: Kumar and Sathyanarayana (2012).

Fig 5.3 Comparison of Sex Ratio at Birth based on CRS and Census for Gujarat, 2011



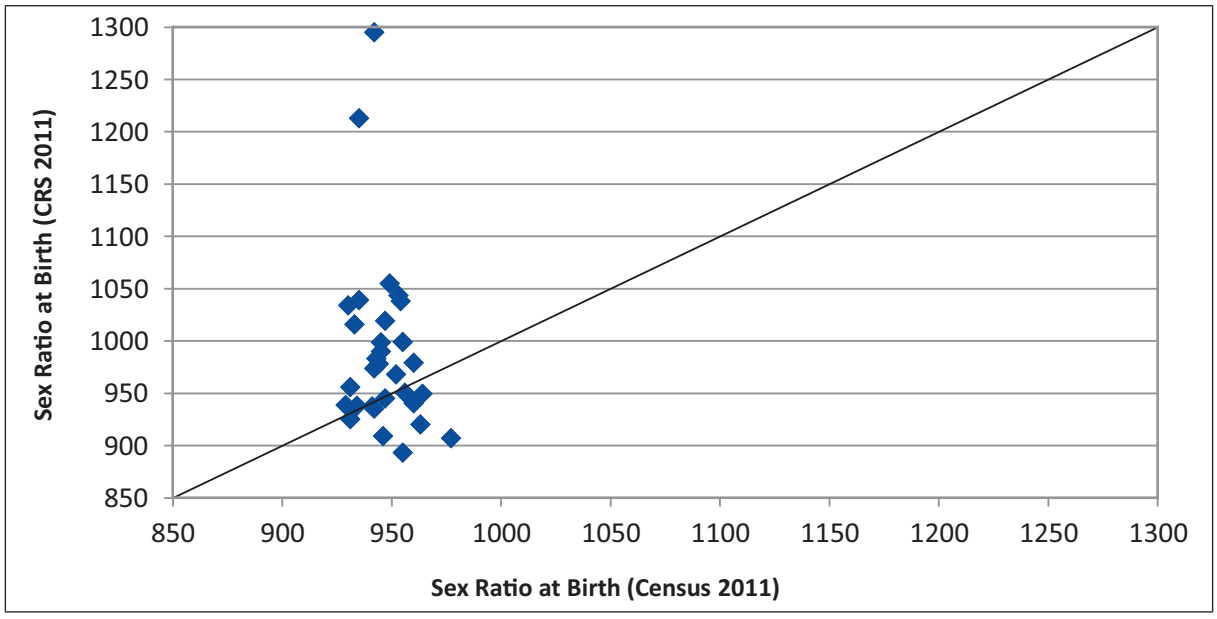
It is clear from Table 5.4 that in most of the districts in Gujarat, the SRB in CRS is higher than estimated Census SRB. Fig 5.3 also shows that most of the districts fall above the diagonal, indicating sex ratio at birth relatively less masculine in the CRS. There is, thus, no evidence of preference for male births in registration in Gujarat.

Table 5.5: SRB from CRS and Census across districts of Karnataka, 2011
(Females per 1000 males)

District	SRB CRS	SRB Census-2011 indirect	Ratio: SRB CRS/SRB Census *100
Bagalkote	939	929	101.1
Bangalore R	1019	947	107.6
Bangalore U	937	941	99.6
Belgaum	925	931	99.4
Bellary	1038	954	108.8
Bidar	1039	935	111.1
Bijapur	1034	930	111.2
Chamarajanagar	974	942	103.4
Chikkaballapur	999	945	105.7
Chikmagalur	920	963	95.5
Chitradurga	1016	933	108.9
Dakshina Kannada	909	946	96.1
Davangere	956	931	102.7
Dharwad	936	942	99.4
Gadag	978	944	103.6
Gulbarga	1213	935	129.7
Hasan	950	964	98.5
Haveri	990	945	104.8
Kodagu	907	977	92.8
Kolar	999	955	104.6
Koppal	1043	953	109.4
Mandhya	938	934	100.4
Mysore	950	956	99.4
Raichur	1055	949	111.2
Ram Nagar	979	960	102.0
Shimoga	940	960	97.9
Tumkur	968	952	101.7
Udupi	893	955	93.5
Uttar Kannada	945	947	99.8
Yadgir	1295	942	137.5
Karnataka	**983**	**943**	**104.2**

Source: CRS: Registrar General, India (2014);
Census based SRB: Kumar and Sathyanarayana (2012).

Fig 5.4 Comparison of Sex Ratio at Birth based on CRS and Census for Karnataka, 2011



Except in Chikmagalur, Dakshina Kannada, Kodugu and Udupi, all other districts of Karnataka shows a higher SRB in CRS compared to Census estimates. A much higher level of reporting of SRB (*favouring females*) is observed in Gulbarga and Yadgir; the percentage recording of female births is more than 30 per cent in these districts. It should be noted here that Yadgir is a new district carved out of Gulbarga and there is some possibility of the returns not being properly collated. Overall, the reporting of female births is reasonably good in CRS, as most of districts fall above the line of equity (Fig 5.4).

Fig 5.5 Comparison of Sex Ratio at Birth based on CRS and Census for Maharashtra, 2011

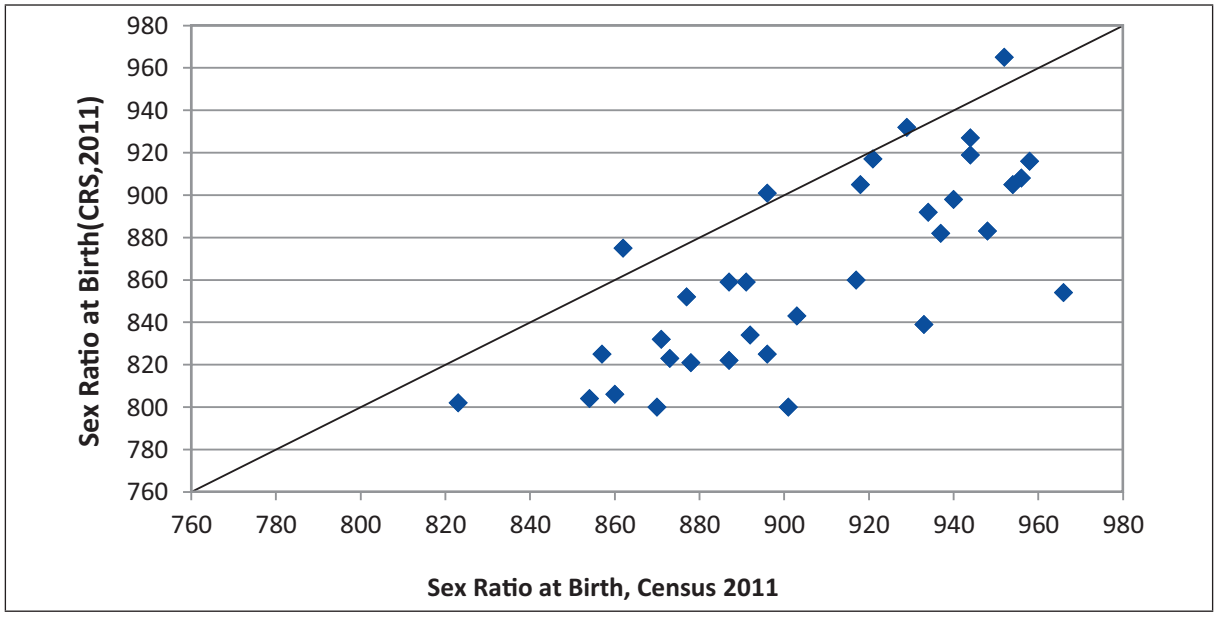


Table 5.6: SRB from CRS and Census across districts of Maharashtra, 2011
(Females per 1000 males)

District	SRB CRS	SRB Census-2011 indirect	Ratio: SRB CRS/SRB Census *100
Ahmadnagar	825	857	96.3
Akola	905	918	98.6
Amrawati	927	944	98.2
Aurangabad	832	871	95.5
Beed	802	823	97.5
Bhandara	965	952	101.4
Buldhana	806	860	93.7
Chandrapur	908	956	95.0
Dhule	800	901	88.8
Gadchiroli	854	966	88.4
Gondia	905	954	94.9
Hingoli	822	887	92.7
Jalgaon	804	854	94.2
Jalna	800	870	92.0
Kolhapur	875	862	101.5
Latur	825	896	92.1
Mumbai	917	921	99.6
Nagpur	919	944	97.4
Nanded	860	917	93.8
Nandurbar	883	948	93.1
Nashik	843	903	93.4
Osmanabad	823	873	94.3
Parbhani	859	887	96.8
Pune	859	891	96.4
Raigad	898	940	95.5
Ratnagiri	916	958	95.6
Sangli	852	877	97.2
Satara	901	896	100.6
Sindhudurg	932	929	100.3
Solapur	834	892	93.5
Thane	882	937	94.1
Wardha	892	934	95.5
Washim	821	878	93.5
Yavatmal	839	933	89.9
Maharashtra	**861**	**902**	**95.5**

Source: CRS: Registrar General, India (2014);
Census based SRB: Kumar and Sathyanarayana (2012).

Fig 5.5 presents the scatter plot of CRS and Census sex ratio at birth across districts of Maharashtra. It is clear that the reporting of female births is very poor in CRS and the magnitude of variation between the two sources is substantial. There is thus a clear evidence of selective under-registration of female births in the state and in most of the districts of Maharashtra.

Fig 5.6 Comparison of Sex Ratio at Birth based on CRS 2011 and AHS 2011-12 for Madhya Pradesh

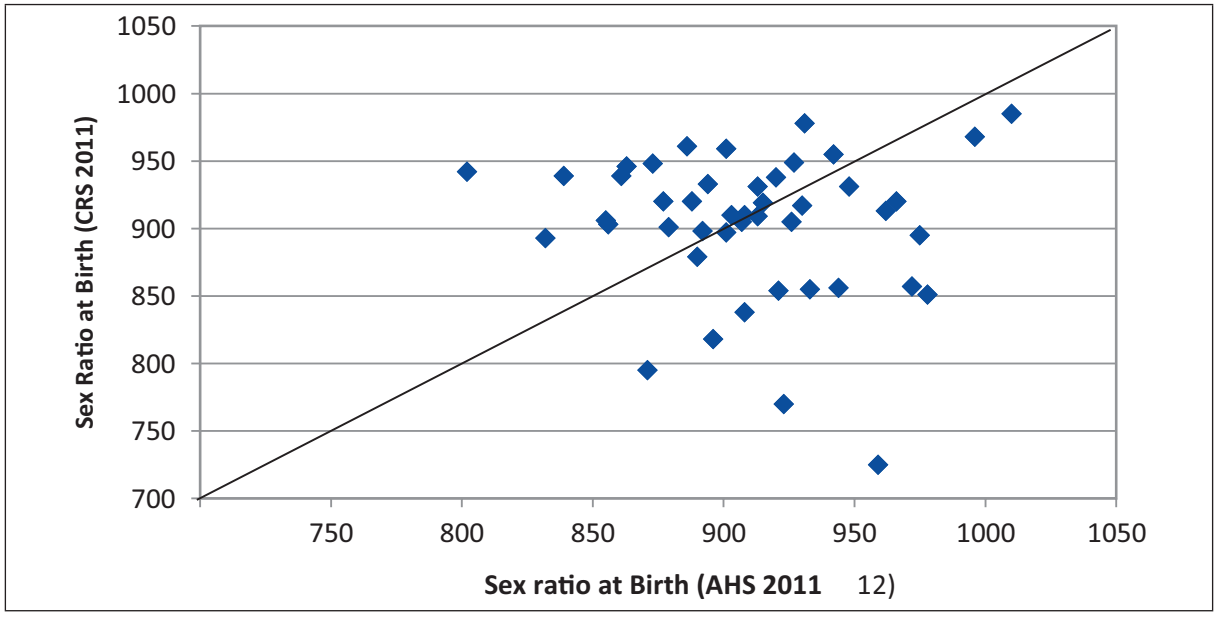


Fig 5.7 Comparison of Sex Ratio at Birth based on CRS and Census for Madhya Pradesh, 2011

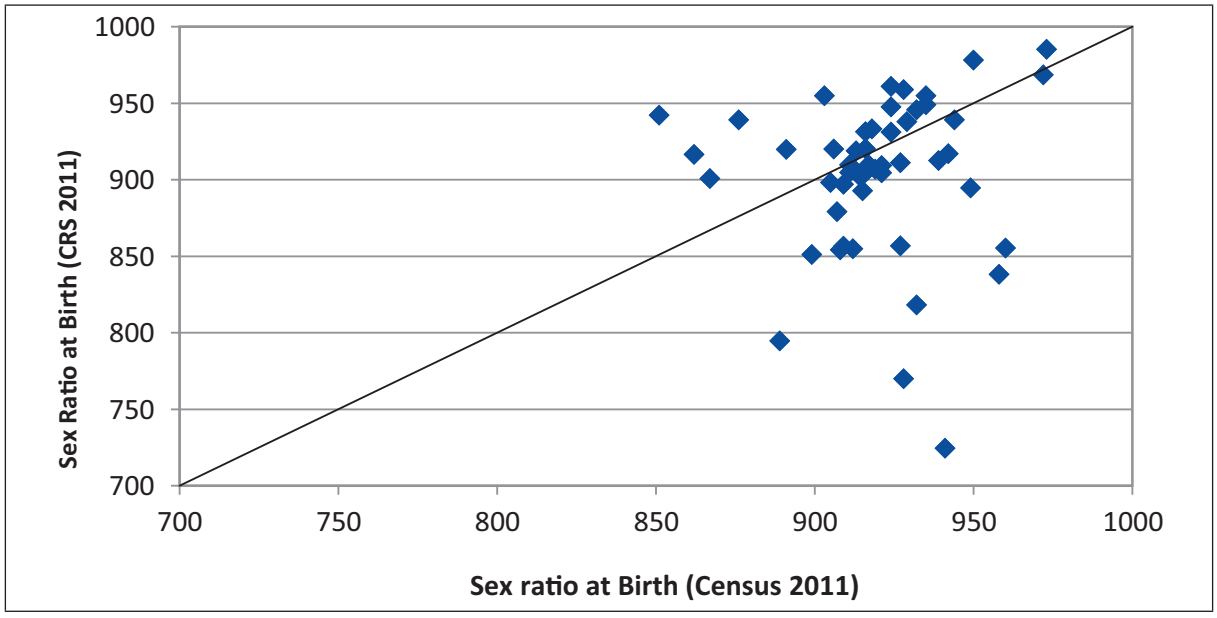


Table 5.7: Estimated SRB from CRS, Census, and AHS across districts of Madhya Pradesh, 2011
(Females per 1000 males)

District	SRB CRS	SRB AHS	Ratio: SRB CRS/ SRB AHS *100	SRB- Census indirect	Ratio: SRB CRS/SRB Census *100
Sheopur	851	978	87.0	899	94.7
Morena	906	855	106.0	862	105.1
Bhind	901	879	102.5	867	103.9
Gwalior	942	802	117.5	851	110.7
Datia	939	839	112.0	876	107.2
Shivpuri	897	901	99.6	909	98.7
Guna	903	856	105.5	914	98.8
Tikamgarh	879	890	98.8	907	96.9
Chhatarpur	898	892	100.7	905	99.2
Panna	955	942	101.4	903	105.8
Sagar	946	863	109.6	932	101.5
Damoh	949	927	102.4	935	101.5
Satna	910	908	100.2	911	99.9
Rewa	920	966	95.2	891	103.3
Umaria	917	930	98.6	942	97.3
Shahdol	913	962	94.9	939	97.2
Sidhi	854	921	92.8	908	94.1
Neemuch	855	933	91.6	912	93.8
Mandsaur	909	913	99.6	921	98.7
Ratlam	961	886	108.5	924	104.0
Ujjain	905	926	97.7	916	98.8
Shajapur	920	888	103.7	916	100.4
Dewas	905	907	99.8	911	99.3
Jhabua	931	948	98.2	924	100.8
Dhar	856	944	90.7	909	94.2
Indore	795	871	91.2	889	89.4
Khargone	948	873	108.6	924	102.6
Barwani	725	959	75.6	941	77.0
Khandawa	818	896	91.3	932	87.8
Rajgarh	933	894	104.4	918	101.6
Vidisha	959	901	106.4	928	103.3
Bhopal	919	915	100.4	913	100.7
Sehore	931	913	102.0	916	101.6
Raisen	770	923	83.4	928	83.0
Betul	939	861	109.1	944	99.5
Harda	938	920	102.0	929	101.0
Hosangabad	910	903	100.8	917	99.2
Katni	857	972	88.2	927	92.4
Jabalpur	893	832	107.3	915	97.6
Narsinghpur	920	877	104.9	906	101.5
Dindori	985	1010	97.6	973	101.2
Mandla	968	996	97.2	972	99.6
Chhindwara	838	908	92.3	958	87.5
Seoni	978	931	105.1	950	102.9
Balaghat	895	975	91.8	949	94.3
Ashoknagar	911	-		927	
Annuppur	955	-		935	
Burhanpur	904	-		921	
Singroli	907	-		919	
Alirajpur	855	-		960	
Madhya Pradesh	**897**	**-**		**917**	

Source: CRS: Registrar General, India (2014); AHS: Registrar General, India (2013e); Census based SRB: Kumar and Sathyanarayana (2012).

The state of Madhya Pradesh is covered by the Annual Health Survey and this gives an opportunity to compare the SRB from the CRS both to the census-based estimates of the SRB and the AHS estimates of the SRB. The districts of Ashoknagar, Annuppur, Burhanpur, Singroli and Alirajpur are not taken into consideration as estimates for these are not available from the AHS. Out of 45 districts, in half of the districts (23) the sex ratio at birth is higher in CRS than in AHS (Table 5.7 and Fig. 5.6). However, some large discrepancies are seen; the reporting of female births in Barwani district is 25 per cent lower in CRS than in AHS and in Raisen, Katni and Sheopur, below 90 percent. In most other districts, the two estimates are close. The comparison between the estimates from the CRS and the indirect ones from the census gives a similar picture (Fig. 5.7). The reporting of female births in CRS is found to be better in Madhya Pradesh compared to Maharashtra in spite of relatively higher level of development in the latter.

Sex Ratio at Death

Unlike the SRB, there is no normal level for the sex ratio at death (SRD). Generally, the number of male deaths in a year is higher than the number of female deaths, and hence the SRD, expressed as female deaths per thousand male deaths, would be lower than 1000 without any sex-selective under-registration. Figures 5.8 to 5.13 provide district-level sex ratio at death for the six states under consideration. Information on deaths by sex is available in CRS, but there are no other sources available to compare the sex ratio at death at the district level. For a state as a whole, the ratio from the SRS can be used. Since the sex ratio at death depends both on the sex differentials in mortality and the age-sex distribution, if variations in these factors are not large across districts of a state, the SRD would not vary much across districts of a state. On this assumption, the SRD of districts in a state may be compared to the ratio for the state as obtained from the SRS and an inference of sex-selective under-registration may be drawn only if the departure is large.

In Haryana, the SRD from the CRS is in the range 500-600 in most of the districts whereas the SRD computed for the state using SRS death rates and 2011 male and female populations is 683. Ambala, Panchkula, Mewat and Yamunanagar show ratios well over 600 but not close to the state level. This shows that there is severe under reporting of female deaths in Haryana. It is also seen that in three districts (Faridabad, Kurukshetra and Mahendragarh)), the SRD from the CRS is close to 500.

In Himachal Pradesh too, registration of female deaths is poor. The ratio of female and male death rates for Himachal Pradesh according to SRS death rates is 719 whereas the SRD from CRS is 700 or less for almost all the districts. The registration of female deaths appears to be particularly poor in the districts of Kinnaur and Lahul and Spiti.

In Madhya Pradesh, the ratio of deaths from the SRS is 793. Most districts show ratios around this value and in eight districts, the SRD is above 800 indicating the absence of large scale sex-selective under-registration in the state in the CRS. But some districts, notably Guna Barwani, Khargone and Tikamgarh, have also shown low level of registration of female deaths.

Fig. 5.8: Estimated CRS Sex Ratio at Death (SRD) for Haryana, 2011

(Females per 1000 males)

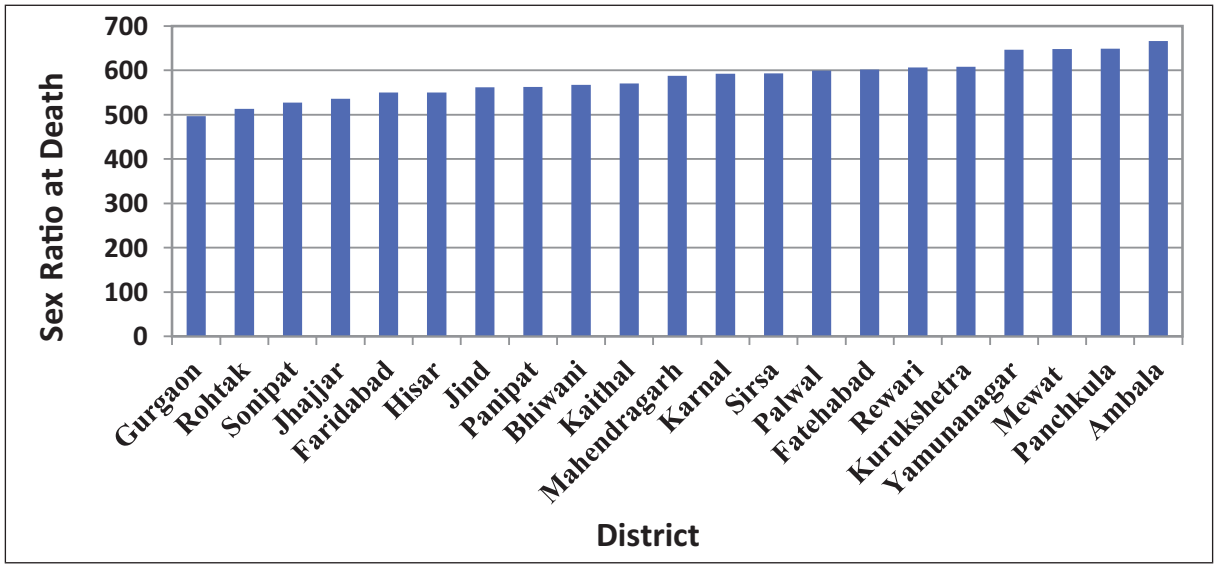


Fig. 5.9: Estimated CRS Sex Ratio at Death (SRD) for Himachal Pradesh, 2011

(Females per 1000 males)

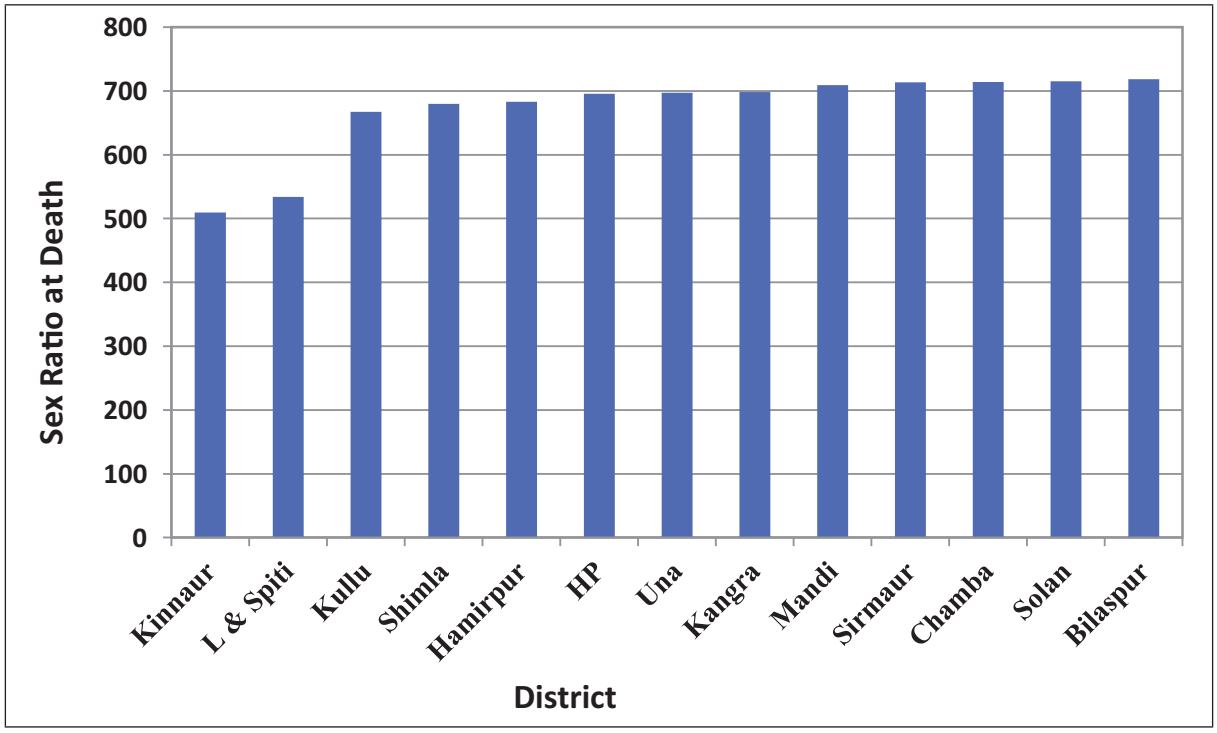


Fig. 5.10: Estimated CRS Sex Ratio at Death (SRD) for Madhya Pradesh, 2011

(Females per 1000 males)

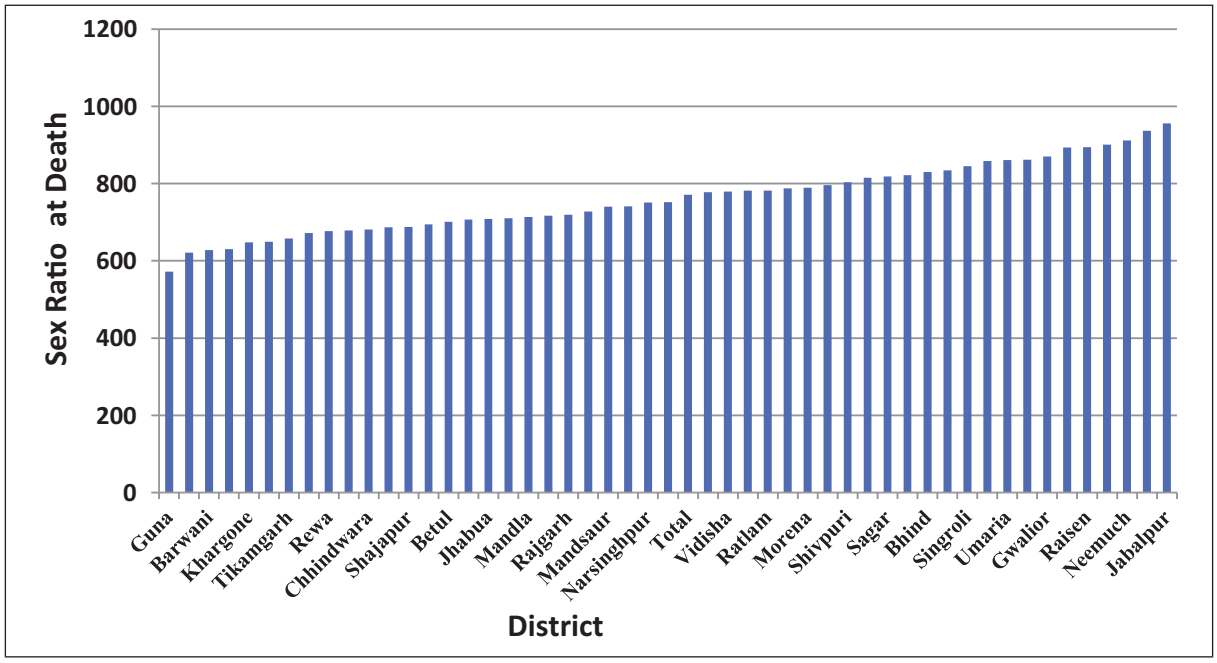


Fig. 5.11: Estimated CRS Sex Ratio at Death (SRD) for Karnataka, 2011

(Females per 1000 males)

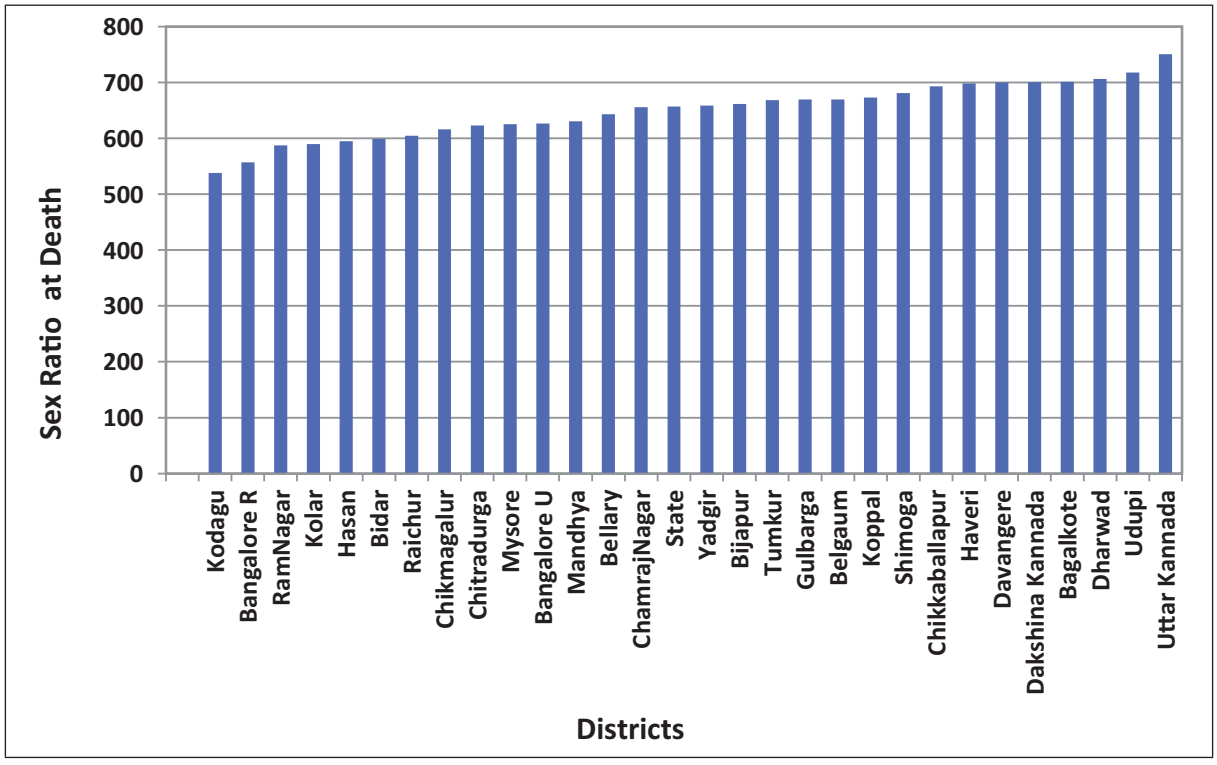
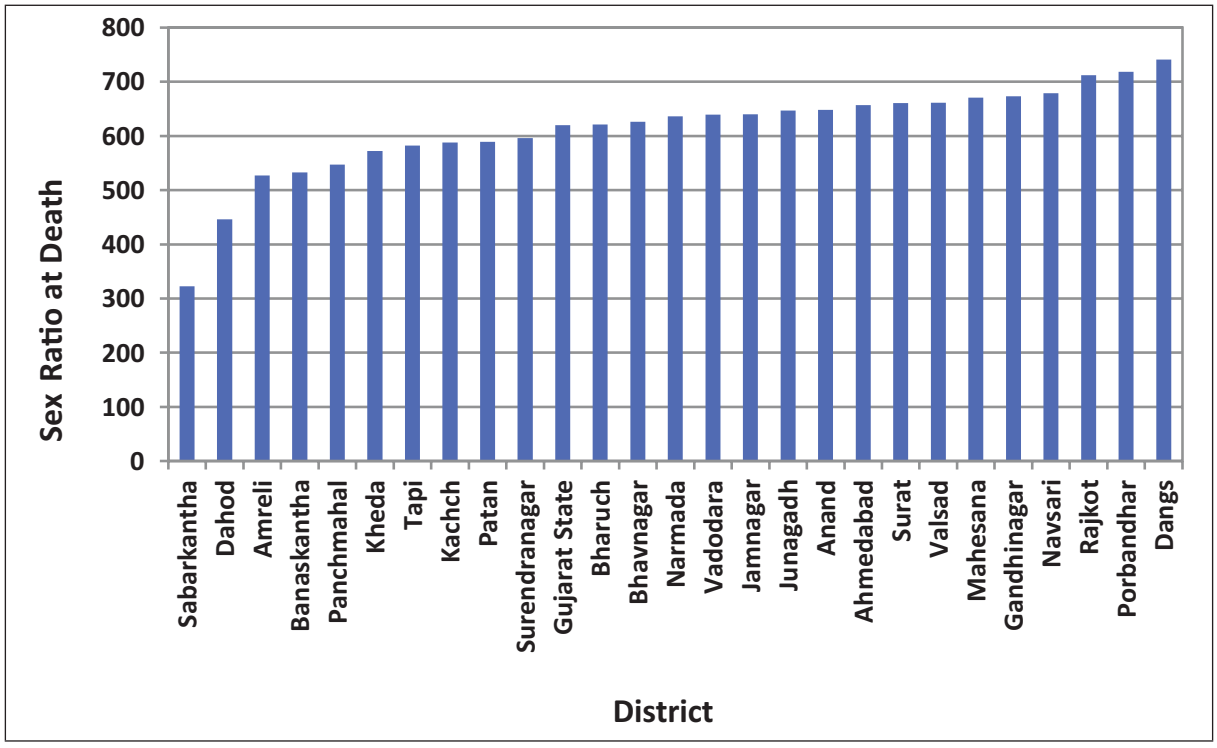


Fig. 5.12: Estimated CRS Sex Ratio at Death (SRD) for Gujarat, 2011

(Females per 1000 males)



The ratio of SRS female and male death rates for Karnataka is 700. Karnataka too recorded a low level of registration of female deaths in the CRS in all the districts. Other than three districts of Dharwad, Udupi and Uttara Kannada, the SRD from CRS is 700 or below. In Kodagu, Bangalore Rural, Ram Nagar, Kolar, Hassan and Bidar districts, the level of female deaths registration is found to be very low.

In Gujarat, in all districts except three (Rajkot, Porbandhar and Dangs), the CRS SRD appears to be below 700 whereas the SRS implies a ratio of 745. The district Sabarkantha is an extreme outlier which has SRD around 300. Nine districts in Gujarat have below 600 level of SRD.

While the ratio of female-to-male deaths from the SRS is 720 in Maharashtra, according to the CRS, many districts are found to have SRD above 700. For four districts, Nashik, Satara, Sindhudurg and Bhandara, it is above 800. By and large, the SRD of the districts seems to be spread on both sides of the state SRS estimate and thus there is no conclusive evidence of sex-selective under-registration.

To sum up, though overall reporting of deaths is good in Haryana, Himachal Pradesh, Karnataka, and Gujarat, there is evidence of sex-selective under-registration of female deaths in these states. On the other hand, in Madhya Pradesh and Maharashtra, the level of reporting of deaths is low, but the degree of sex-selective under-registration is not so large.

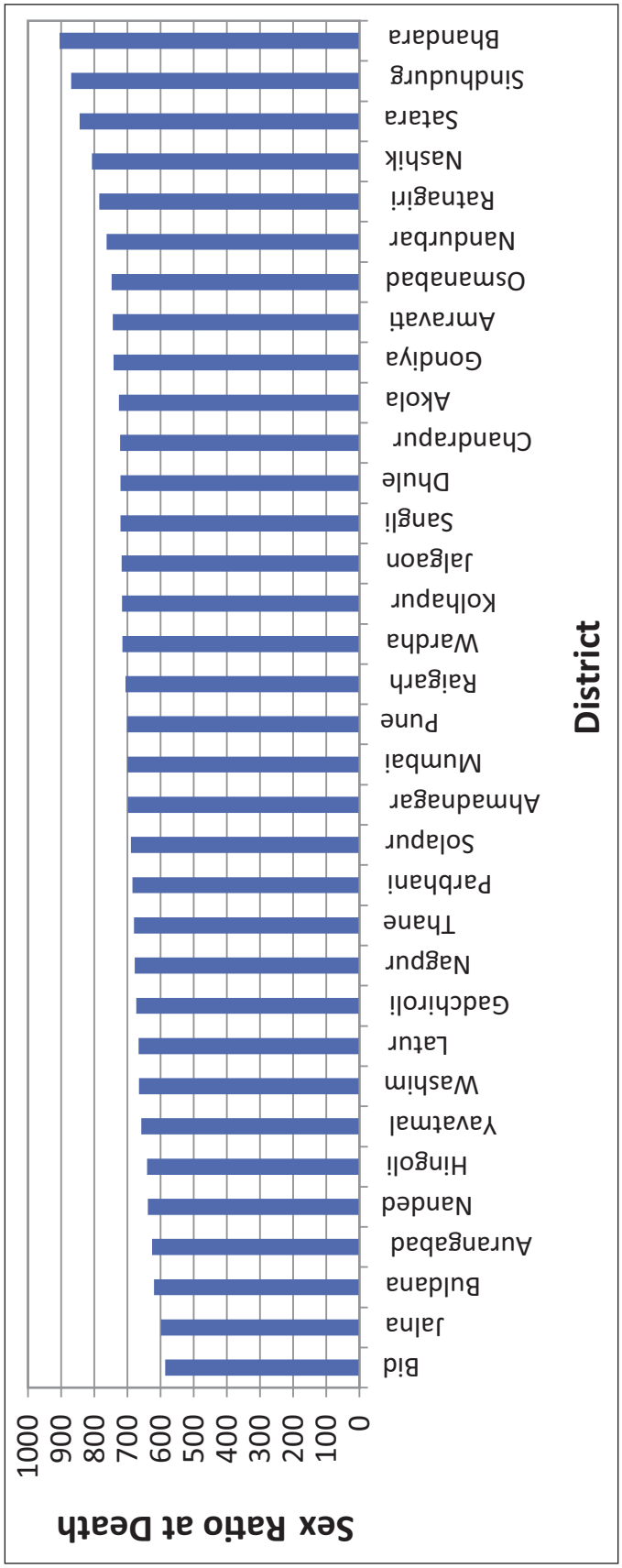


Fig. 5.13: Estimated CRS Sex Ratio at Death (SRD) for Maharashtra, 2011
(Females per 1000 males)

Chapter 6

SUMMARY

The study attempted to understand the quality of vital statistics in selected states in India. Although the Sample Registration System provides information on vital rates on a regular basis at the state level, there has been no regular flow of information below state level to understand the progress of many vital indicators. The CRS has an important function of providing such information at the district or even below district level. Therefore, the quality of this information and its reliability at the district level is of great importance for policy and planning. This report mainly assesses the quality of data on registration of births, deaths, infant deaths, still births, sex ratio at birth and sex ratio at death in six selected states (*Haryana, Himachal Pradesh, Madhya Pradesh, Gujarat, Karnataka and Maharashtra*). The methodology used mainly includes comparison with other sources and internal consistency.

The analysis of birth statistics shows that registration is nearly complete in majority of the districts in four of the selected six states. The CRS birth rates were compared with indirect estimates based on the census 2011 data. Most of the districts in Haryana, Himachal Pradesh, Gujarat and Karnataka have shown reliable data on births. In Rohtak district in Haryana and Hamirpur district in Himachal Pradesh, the number of registered births exceeds the expected number whereas Jhajjar in Haryana, Lahaul & Spiti in Himachal Pradesh and Bangalore Rural in Karnataka show a much lower registration of births in CRS compared to Census estimates. Half of the districts in Maharashtra and most of the districts in Madhya Pradesh show under registration of births in CRS. Contrary to expectation, some of the developed districts of Maharashtra such as Pune show poor coverage. A comparison of the CRS birth rate with the state SRS estimate also shows that more than 70% of districts in Madhya Pradesh fall well below the SRS state average.

The distribution of districts by level of registration shows that only 40% of the districts in Madhya Pradesh and Maharashtra fall in the category 90-120 percentage level (which may be considered satisfactory) in contrast to 70% of the districts in Haryana and more than 60% of districts in other selected states falling in the same range.

The analysis of the sex ratio of registered births revealed that there is no sex-selectivity in registration of births in Himachal Pradesh, Karnataka and Gujarat. District level analysis also shows a fair reporting of female births in most of the districts of Karnataka, Gujarat, Haryana and Himachal Pradesh, while comparing CRS values with Census estimates. The reporting of births of girls in CRS is low in Lahaul & Spiti district of Himachal Pradesh, Kodagu district in Karnataka and Kurukshetra district of Haryana. Over reporting of female births in CRS is observed in Gulbarga and Yadgir districts of Karnataka compared to the Census estimate though there is some possibility of transfer errors here. The coverage of female births is noticed to be better in most of the districts of Madhya Pradesh compared to the districts in Maharashtra.

The reporting of still births in CRS is fairly good in Madhya Pradesh and Maharashtra compared to other selected states. This is rather surprising given that the registration of live births in these two states is unsatisfactory. Half of the districts in all the selected states show a low level of reporting of still births in CRS compared to SRS estimate.

Reporting of deaths seems to be poorer in Madhya Pradesh and better in Karnataka and Himachal Pradesh among the states under consideration. It is interesting to note that all districts of Himachal Pradesh have more than 70 per cent reporting of deaths. In Haryana too, except Mewat and Faridabad districts, the coverage for deaths is more than 70 per cent. In Maharashtra, percentage reporting of deaths is low in some districts (most of these fall in the Marathwada region but the relatively more developed districts of Pune and Nashik also show poor reporting). In Karnataka, except a few districts, percentage reporting of deaths is good. In Gujarat, nine districts have below 70 per cent coverage for deaths. In Madhya Pradesh, compared to the AHS data, many districts have coverage for deaths below 40 per cent. However, in some districts such as Indore, Gwalior, and Jabalpur, the number of registered deaths is much more than expected probably because these districts have large cities with large hospital facilities that draw persons from other areas for treatment of serious illnesses. The same seems to be true for some districts of Karnataka (Udupi), Haryana (Rohtak), and Maharashtra (Mumbai).

Reporting of infant deaths is very low in CRS as compared to SRS in all the six states; not even half of the infant deaths get registered. In almost all the districts in Haryana (Rohtak being an exception) and Himachal Pradesh, reporting of infant deaths is very poor. In Maharashtra too, except a few districts (Amravati, Gondia, Chandrapur, Nagpur, Nashik, and Wardha) there is very poor registration of infant deaths. All districts of Gujarat and Karnataka (except Mysore and Dharwad) have shown poor registration of infant deaths. In Madhya Pradesh, comparison of CRS data on infant deaths with that of AHS shows very poor coverage of infant deaths in all the districts. Overall, coverage for infant deaths is very poor in all the states under consideration and it is observed that it is extremely poor in Madhya Pradesh.

It is interesting to note that coverage of female deaths is at the same level as male deaths in Madhya Pradesh and the sex ratio at death in many districts is close to the SRS state-

level estimate. On the other hand, Gujarat and Haryana are very poor as far as the reporting of female deaths is concerned. Sabarkantha district in Gujarat appears to be an extreme outlier in reporting female deaths. In Himachal Pradesh too, the reporting of female deaths is poor. In Maharashtra and Karnataka, only a few districts have good coverage for female deaths.

Finally, the results of the present study broadly conform to the findings from the earlier study from three states (Kerala, Rajasthan, and Odisha). The registration of births has improved in almost all the states in India. On the contrary, the registration of deaths is still comparatively poor in all the nine states except in Kerala. The relatively poor reporting of deaths is due to significant under-registration of infant deaths, and to some extent the female deaths, in most states. It is important to understand why infant deaths and infant deaths are not registered. An obvious conjecture is that the need to register deaths of women and infants is not as compelling as that for adult men because in former cases no issues of property and succession are involved. However, how the system can capture all events needs further investigation. A field study is currently underway in two states of India, Rajasthan and Madhya Pradesh that looks at the perception of registrars, designated informants and community representatives. This is expected to give some ideas on reasons for non-registration of vital events.

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