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Level of Morbidity and Mortality Reporting in HMIS in Chhattisgarh

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Health Management Information System
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Ministry of Health & Family Welfare, Government of India



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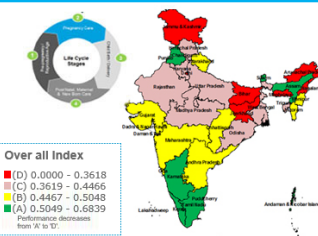
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- HMIS Standard Reports
- HMIS Analytical Reports
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HMIS DASHBOARD*(2015-16)

*Based on a composite index calculated on 16 RMNCH+A indicators covering the following 4 stages of lifecycle:

- Pre-pregnancy/reproductive age
- Pregnancy care
- Child birth / delivery
- Post natal, maternal and new born care



Over all Index

Legend: (D) 0.0000 - 0.3618, (C) 0.3619 - 0.4466, (B) 0.4467 - 0.5048, (A) 0.5049 - 0.6839. Performance decreases from 'A' to 'D'.

Welcome to the **NHM Health Statistics Information Portal**. This portal will be your gateway to a wealth of information regarding the Health Indicators of India. The information available on this portal is being compiled from Health Management Information System (HMIS) and other varied information sources such as National Family Health Survey (NFHS), District Level Household Survey (DLHS), Census, SRS and performance statistics.

What's New

National HMIS Workshop held at Nirman Bhawan, New Delhi in 3 batches from July 2017 to Aug 2017

एचएमआईएस राष्ट्रीय कार्यशाला निर्माण भवन, नई दिल्ली में जुलाई, अगस्त 2017 के दौरान 3 बैच में आयोजित की गयी

Data Reporting Status Report with breakup of "Rural/Urban" and "Public/Private" are now available in Standard Reports Section

The New MIS Monthly Formats are now available for data entry. The offline formats are available under Download section.

Key Demographic Indicators

Total Fertility Rate (TFR) estimates have declined from 2.9 in 2005 to 2.3 in 2015

कुल प्रजनन दर (टीएफआर) के अनुमान में 2005 में 2.9 से 2015 में 2.3 की गिरावट आई है

Maternal Mortality Ratio (MMR) estimates have dropped from 301 maternal deaths per 100,000 live births during 2001-03 to 167 maternal deaths per 100,000 live birth during 2011-13

मातृ मृत्यु दर (एमएमआर) के अनुमान में 2001-03 में 301,000 जीवित जन्मों पर 167 की गिरावट आई है

Infant Mortality Rate (IMR) has declined from 58 in 2005 to 34 in 2016 as per SRS Bulletin 2017 for the Year 2016

शिशु मृत्यु दर (आईएमआर) में एसआरएस बुलेटिन 2017, के अनुसार 2005 में 58 से 2016 में 34 की गिरावट हुई है

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List of Acronyms

AFP	Acute Flaccid Paralysis
ANC	Anti Natal Care
AIDS	Acquired Immuno-Deficiency Syndrome
CG	Chhattisgarh
CHC	Community Health Centre
CRS	Civil Registration System
CRVS	Civil Registration and Vital Statistics
DH	District Hospital
FP	Family Planning
GOI	Government of India
Hb	Haemoglobin
HIV	Human Immuno Deficiency Virus
HMIS	Health Management Information System
ICD	International Classification of Disease
ICTC	Integrated Counselling and Testing Centre
IMR	Infant Mortality Rate
IPD	Indoor Patient Department
IUCD	Copper (T) –Intrauterine Contraceptive Device
JSSK	Janani Shishu Surksha Karyakram
LBW	Low Birth Weight
LTT	Laparoscopy Tubectomy
MC	Medical College
MMR	Maternal Mortality Ratio
MoHFW	Ministry of Health and Family Welfare
NCD	Non Communicable Diseases
NHM	National Health Mission
NMR	Neonatal Mortality Rate
NRC	Nutrition Rehabilitation Centre
NRHM	National Rural Health Mission
NSV	No Scalpel Vasectomy
OPD	Outdoor Patient Department
PF	Plasmodium Falsiperum
PHC	Primary Health Centre
PIP	Programme Implementation Plan
PMU	Programme Management Unit
PRC	Population Research Centre
PV	Plasmodium Vivex
RBSK	Rashtriya Bal Swasthya Karyakram
RGI	Registrar General of India
RHS	Rural Health Statistics
RTI	Reproductive Tract Infection
SDH	Sub-District Hospital
SHC	Sub Health Centre
SRS	Sample Registration System
STI	Sexually Transmitted Infection
T.B.	Tuberculosis
WHO	World Health Organization

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Level of Morbidity and Mortality Reporting in HMIS in Chhattisgarh

1. Introduction

Information on how many people die and from what causes is critical for public health decision-making, resource allocation, and programme planning. Morbidity and mortality statistics are essential for setting health targets, for monitoring health and development programmes, and for tracking health-demographic indicators, such as the prevalence rate of TB, Malaria, expectation of life at birth and the infant mortality rate etc. Morbidity and mortality statistics and cause of death data provide essential epidemiological intelligence to guide policy reforms aimed at reducing premature mortality and improving the efficiency and effectiveness of health systems. Properly and timely recording of such data of prevalent types of various morbidity and deaths by cause can provide early insights into trends in disease prevalence, thus helping to design prevention or intervention strategies. Epidemiologically, untreated morbidity leads to premature mortality. Mortality statistics are needed for multiple purposes –

- Calculating life tables and estimating the probability of dying at various ages by studying deaths, classified by age, sex and location
- Monitoring the health status of a population by directly measuring mortality and analyzing causes of death and other characteristics of the dead
- Monitoring progress towards national and international goals and targets such as the MDGs, non-communicable diseases, and the post-2015 development agenda
- Planning health intervention strategies to address causes of premature mortality
- Measuring important demographic indicators of levels of living or quality of life, such as expectation of life at birth, infant mortality rate, under-5 mortality rate, and maternal mortality rate, among others

Robust information systems and data sources are needed to strengthen morbidity and mortality statistics and other vital events due to following reasons:

1. Increasing demand for improved morbidity and mortality statistics in order to underpin public health decision-making and monitoring of progress towards health and development goals and targets, including communicable and non-communicable diseases as well as external causes of death.
2. The need to broaden the perspective and scope of current mortality data collection efforts, which have hitherto focused mainly on infant, child and maternal mortality and high priority conditions such as HIV/AIDS, TB and NCDs.

3. Growing awareness that disaggregated statistics on levels and patterns of morbidity and mortality are essential for identifying and addressing inequities between population groups and geographic areas.
4. The realization that currently available data sources and data collection tools have significant limitations, particularly representativeness, continuity, and timeliness.

There are a number of potential data sources for generating morbidity and mortality statistics, including:

1. Civil registration and vital statistics systems (CRVS)
2. Vital events enumeration in representative sample areas coupled with verbal autopsy to determine probable cause of death
3. Household surveys (episodic or continuous) using direct or indirect methods of morbidity and mortality estimation; possible follow-on survey to apply verbal autopsy to reported deaths in order to ascertain cause of death
4. Longitudinal health and demographic surveillance in selected sentinel sites (HDSS)
5. Censuses, possible follow-on survey to apply verbal autopsy to reported deaths in order to ascertain cause of death
6. Health care facilities providing service statistics
7. Community-based reporting

These data sources have inherent advantages and limitations. In practice, various permutations and combinations of these different methods is used for producing morbidity and mortality statistics, but there is considerable fragmentation and heavy dependence on factors such as funding, leading to lack of country ownerships, overlap and duplication. These problems could be significantly attenuated through a more systems approach that starts by addressing the need to build country CRVS systems as the basic platform for vital statistics, including mortality, and uses complementary data sources as part of a considered, long-term strategy rather than as stand-alone, disconnected activities. Health Management Information System (HMIS) is a step forward in this direction.

HMIS launched in the year 2008 in India and its states has progressed to a great extent and now it has been covering more than two lakh public health facilities throughout the country. HMIS is also incorporating private health facilities for reporting of vital events and key health services. However, the reporting and recording of health services and health events pertaining to morbidity and mortality is extremely low. In district consolidated HMIS report, out of 326 data elements related to health events, vital events and health care

services, 144 data elements (44%) pertain to morbidity (96 data elements) and mortality (48) reporting. Despite continuous analysis of reported HMIS data, analysis of completeness and quality of morbidity and mortality data reporting is relatively a less explored area. Earlier studies (in Ratlam, Burhanpur, Durg, Rajnandgaon districts) done by PRC, Sagar to assess the quality of HMIS data indicated that majority of data managers, service providers do not recognize the importance of these statistics in planning and management of public health services. Factors such as training of health personnel in identification and proper recording of morbidity and mortality as per International Classification of Deaths (ICD) codes, redefining procedure in recording and reporting need strengthening for improving reporting of morbidity and mortality in HMIS. Growing incidence of chronic and acute health problems and need for effective certification of cause of death makes it even more important to study the morbidity and mortality reporting in HMIS.

2. Objectives

The study aimed to analyse morbidity and mortality reporting in HMIS with following objectives –

1. To analyze the pattern of morbidity and mortality both temporally and category wise.
2. To compare the morbidity and mortality data in HMIS and other sources such as, SRS, CRS etc.
3. To assess the completeness of morbidity and mortality data in district consolidated HMIS reports.
4. To study the health facility level morbidity and mortality reporting in HMIS.

3. Data and Analysis

To accomplish the objectives of the study, primarily HMIS district consolidated report is used. These reports were downloaded from HMIS portal at <https://nrhm-mis.nic.in> as on 11th May 2018. Under HMIS, all the public health facilities of every district in the state upload facility level data of health services on monthly basis. This data is then verified for completeness, consistency and validity checks at the respective district PMU. After verification facility level data is compiled and district consolidated report is generated and uploaded on the portal. After due verification of this district consolidated HMIS monthly report, it is forwarded to the state level. The state then consolidates all the district forwarded reports to arrive at state level data. After due verification, the state level PMU

forwards the district as well as state HMIS monthly report at the central level. Looking into the growing data needs for different health programmes HMIS reporting formats are revised from year 2017-18. In the new HMIS reporting formats 58 data items have been added and 44 data items were removed or modified from old formats. Analyses of mortality reporting pertaining to the duration between years 2014-15 upto 2016-17 has been done at district level only and for 2017-18 analysis is done for individual health facility level along with district consolidated data. Morbidity analysis has been done for district as well as health facility level.

For analysis, 28 morbidity and 29 mortality indicators have been extracted from health facility level HMIS reports. Indicators morbidity covers conditions pertaining to antenatal care, delivery and post-natal care, RTI/STI, family planning, child immunization, child morbidity and other morbidity conditions. Mortality indicators cover deaths by age and causes of deaths. An attempt has been made to compare the death reporting under HMIS and CRS to assess the level of under-reporting of deaths.

Proportion, ratios have been computed and graphical methods have been used to analyse the temporal and district level variation in morbidity and mortality reporting.

4. Indicators of Morbidity and Mortality in HMIS

HMIS provides monthly service statistics compiled from data, reported by each public health facility, on more than 250 data items in 16 sections (Table 1). In HMIS monthly reports, morbidity related to ANC, PNC, RTI/STI, family planning and immunization is reported. Mortality data is reported on institutional deaths, infant and child deaths, young, adult and old age deaths, maternal deaths and cause specific deaths.

Table 1: Data items in district monthly consolidated HMIS report			
Sr	Section	No. of data items	
		Old HMIS	New HMIS
1	Ante Natal Care	12	27
2	Delivery Care including C-Section Delivery	20	9
3	Delivery Outcome and Newborn Care	12	13
4	Post Partum Care	3	4
5	Family Planning Services including Complications due to Family Planning Methods	44	19
6	Child Immunization Services including morbidity due to immunization	40	51
7	Childhood Morbidity	9	12

Table 1: Data items in district monthly consolidated HMIS report

Sr	Section	No. of data items	
		Old HMIS	New HMIS
8	Services under NVBDCP	6	13
9	Patient services	23	57
10	Pathological Services	14	17
11	Stock Position of Drugs and Consumable	28	36
12	Deaths	30	47
13	Pregnancy / Delivery Complications	10	2
14	RTI/STI Services	4	4
15	Adolescent Health	0	6
16	DOTS	0	2
17	RBSK	0	7
Total		255	326

For reporting of morbidity and mortality, every health facility is supposed to maintain service registers specific to the different health care services. Since morbidity and mortality are health and vital events, there should not be any duplication or omission of these health and vital events. During visits to various health facilities it was observed that either these data is not properly recorded in the service registers or if recorded it is not reported under HMIS. For analysing morbidity and mortality reporting patterns, following indicators were extracted from district consolidated HMIS reports.

Morbidity Indicator		Mortality Indicator	
1.6.1	New Cases of Hypertension	17.1	Infant deaths within 24 hrs of birth
1.6.2	New Cases of Eclampsia	17.2.1	Death of Children Age (upto 1 week & 1-4 weeks) due to Sepsis
1.7.2	New Cases of Hb<11 gm/dl	17.2.2	Death of Children Age (upto 1 week & 1-4 weeks) due to Asphyxia
1.7.2	Number of cases having HB<7 treatment initiated	17.2.3	Death of Children Age (upto 1 week & 1-4 weeks) due to LBW
5.1.5	Cases of Obstetric complications attended at public health facilities	17.2.4	Death of Children Age (upto 1 week & 1-4 weeks) due to Others
5.2	Cases of Obstetric complications attended at private health facilities	17.3.1	Death of Children Age (1-11 months and 1-5 years) due to Pneumonia
6.3	Post-natal complications attended at health facilities	17.3.2	Death of Children Age (1-11 months and 1-5 years) due to Diarrhoea
8.1.a	New RTI/STI cases for which treatment initiated – Male	17.3.3	Death of Children Age (1-11 months and 1-5 years) due to Fever related
8.1.b	New RTI/STI cases for which treatment initiated – Female	17.3.4	Death of Children Age (1-11 months and 1-5 years) due to Measles
9.11.1.a	Cases of complications due to male sterilization	17.3.5	Death of Children Age (1-11 months and 1-5 years) due to Others
9.11.1.b	Cases of complications due to female sterilization	17.4.1	No. of Persons age (6-14 year, 15-55 years and above 55 years) died due to Diarrhoeal diseases

Morbidity Indicator			Mortality Indicator	
10.3.5.a	Adverse Event Following Immunization (Abscesses)	17.4.2	No. of Persons age (6-14 year, 15-55 years and above 55 years) died due to Tuberculosis	
10.3.5.c	Adverse Event Following Immunization - Other	17.4.3	No. of Persons age (6-14 year, 15-55 years and above 55 years) died due to Respiratory diseases including infections (other than TB)	
12.1	Children under age 5 years diagnosed with - Diphtheria	17.4.4	No. of Persons age (6-14 year, 15-55 years and above 55 years) died due to Malaria	
12.2	Children under age 5 years diagnosed with – Pertussis	17.4.5	No. of Persons age (6-14 year, 15-55 years and above 55 years) died due to Other Fever Related	
12.3	Children under age 5 years diagnosed with– Tetanus Neonatrum	17.4.6	No. of Persons age (6-14 year, 15-55 years and above 55 years) died due to HIV/AIDS	
12.4	Children under age 5 years diagnosed with – Tetanus other	17.4.7	No. of Persons age (6-14 year, 15-55 years and above 55 years) died due to Heart disease/Hypertension related	
12.5	Children under age 5 years diagnosed with – Polio	17.4.8	No. of Persons age (6-14 year, 15-55 years and above 55 years) died due to Neurological disease including strokes	
12.6	Children under age 5 years diagnosed with – Measles	17.4.9(a)	Maternal Deaths due to Abortion	
12.7	Children under age 5 years diagnosed with – Diarrhoea and Dehydration	17.4.9(b)	Maternal Deaths due to Obstructed/prolonged labour	
12.8	Children under age 5 years diagnosed with – Malaria	17.4.9(c)	Maternal Deaths due to Severe hypertension/fits	
12.9	Children under age 5 years admitted with respiratory infections	17.4.9(d)	Maternal Deaths due to Bleeding	
14.10.1.a	Total In-patients - Male Children (Age < 19 Years) Adult (Age 19 years and above)	17.4.9(e)	Maternal Deaths due to High fever	
14.10.1.b	Total In-patients – Female Children (Age < 19 Years) Adult (Age 19 years and above)	17.4.9(f)	Maternal Deaths due to Other Causes (including causes not known)	
14.2	OPD Attendance (All)	17.4.10	No. of Persons age (6-14 year, 15-55 years and above 55 years) died due to Trauma /Accidents /Burn cases	
15.1.1.b	Hb<7 gm/dl tested cases	17.4.11	No. of Persons age (6-14 year, 15-55 years and above 55 years) died due to Suicide	
14.5.2	Cases of Plasmodium vivex (PV) test positive	17.4.12	No. of Persons age (6-14 year, 15-55 years and above 55 years) died due to Animal bites and stings	
14.5.3	Cases of Plasmodium falciparum (PF) test positive	17.4.13(a)	No. of Persons age (6-14 year, 15-55 years and above 55 years) died due to Known Acute Disease	
		17.4.13(b)	No. of Persons age (6-14 year, 15-55 years and above 55 years) died due to Known Chronic Disease	
		17.4.13(c)	No. of Persons age (6-14 year, 15-55 years and above 55 years) died due to Causes not known	

It is pertinent to mention here that data pertaining to morbidity conditions are recorded in the service registers at various health facilities. Most of the facilities do not have proper registers and these registers are not identical in capturing the morbidity cases as per HMIS reporting formats.

For capturing data on cause specific deaths, all the health facilities reporting under HMIS, are required to prepare a line listing of deaths occurring in the health facility or in the catchment areas on monthly basis. The line listing provides information on deceased person's name, age at death, gender and probable cause of death. The probable cause of death recorded on the basis of either certification by a medical officer or verbal autopsy done by the health worker in case of non-institutional death. The line listing of deaths is then compiled at the district level to arrive at deaths in different categories. Since 2017-18, the line listing of deaths is replaced with direct reporting of number of cause specific deaths.

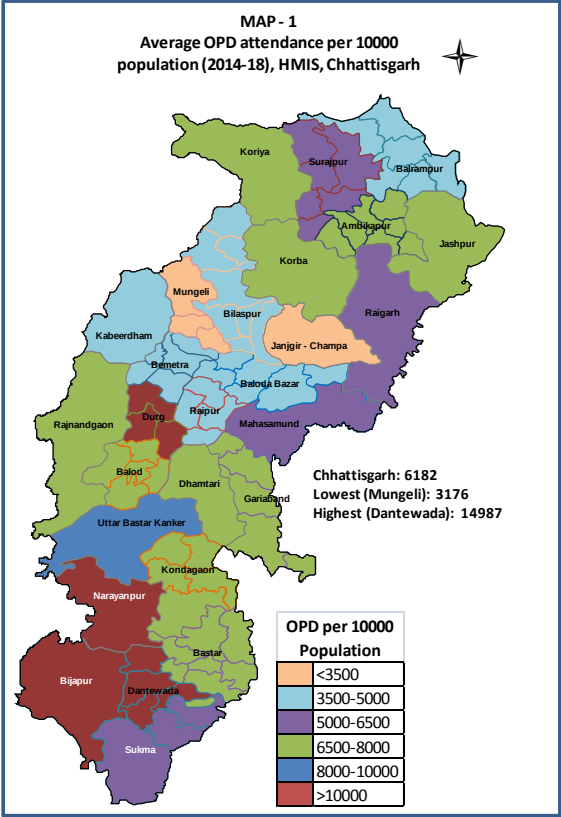
5. Morbidity Reporting in HMIS

Reporting of morbidity is crucial for timely intervention of health care delivery system and to prevent spreading of disease conditions. In HMIS various morbidity conditions reported can be grouped as 1) Overall morbidity—OPD and IPD patients attending health facilities, 2) maternal morbidity, 3) child morbidity and 4) disease specific morbidity.

5.1 OPD and IPD Cases:

Patients visiting various health facilities in Out-Patient Department (OPD) and In-Patient Department (IPD) are recorded and reported in HMIS. During 2014-2018 number of average annual OPD and IPD cases reported were 17318900 and 1296080 respectively in Chhattisgarh. In totality during 2014-18 more than 6.9 crore OPD cases and 51.8 lakh IPD cases were reported in Chhattisgarh. Reported data revealed that nearly half of all the reported OPD cases come from only nine districts and more than half of IPD cases come from only eight districts. Durg district has reported highest number of OPD and IPD cases during this period while Sukma reported least number of cases. Available data on OPD and IPD cases reported gives indication of level of morbidity in the state and across its districts. For comparison of OPD and IPD cases in the districts, number of OPD and IPD cases per 10000 population is computed.

Map 1 depicts district-wise average number of OPD cases reported during 2014 to 2018 per 10000 population in Chhattisgarh. Four districts Dantewada, Narayanpur, Bijapur and Durg have reported more OPD cases than the district population. Plausible reason may be the presence of security personnel in the three LWE districts and Durg being an industrial town may have attracted more floating population for medical services. On an average there were 6128 OPD cases per 10000 population reported in Chhattisgarh. Mungeli district has nearly three out of every 10 person visiting OPD in public health facilities, which is lowest in the state.



In-patient cases are reported separately for males and females as well as in broad age category in HMIS by health facilities. There were 2105613 males and 3078706 female patients admitted in health facilities in the state during 2014-15 to 2017-18. There were 46 percent more female in-patients as males who were admitted in various health facilities. There were slightly more male children than female in-patient children as reported in HMIS (Figure 1).

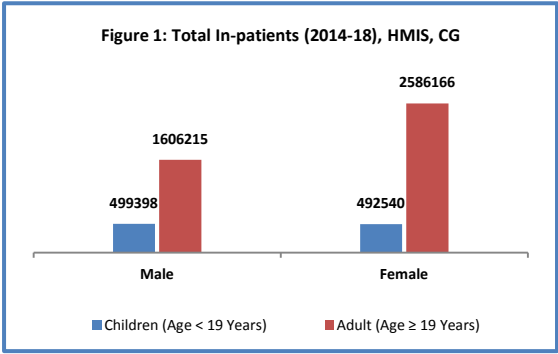


Table 2 provides district wise reported in-patients in Chhattisgarh. It is noted that during 2014-18, each year the gap between male and female in-patients has increased in the state, where female in-patients have out-numbered male patients. During each year, all 27 districts have reported more female in-patients than males. Bastar, Durg, Gariyaband, Kawardha, Mahasamund, Raigarh and Surguja districts have reported more number of female in-patient children than male children during 2014-2018. It is found that Dantewada

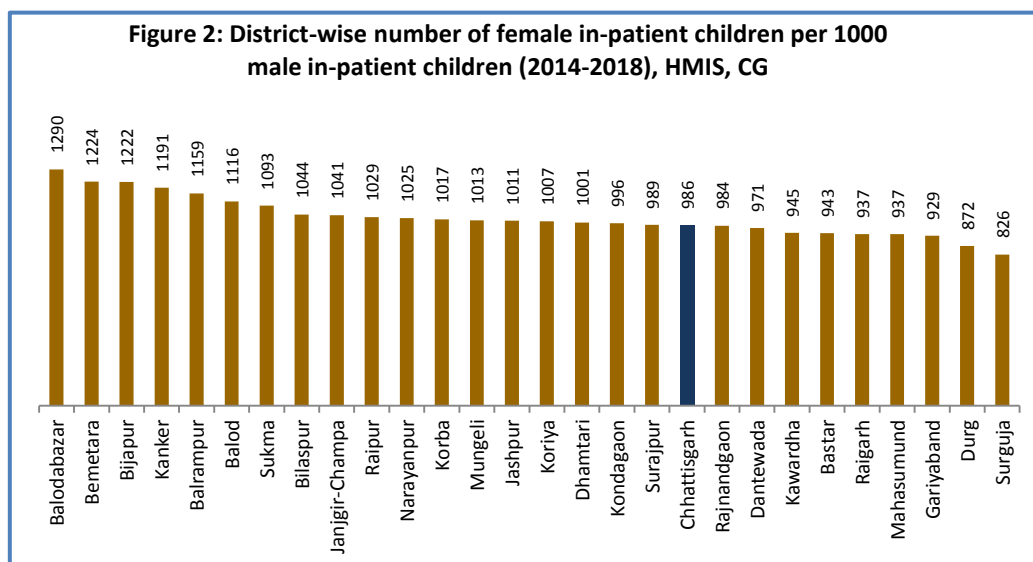
has 1154 IPD cases per 10000 populations which is highest, followed by Sarguja having 1050 IPD cases during 2014-2018 and Balodabazar has only 219 IPD cases per 10000 population during the same period.

Table 2: District-wise number of IPD cases by sex (2014-18), HMIS, CG

District	2014-15		2015-16		2016-17		2017-18	
	Male	Female	Male	Female	Male	Female	Male	Female
Balod	8269	13999	11130	19897	15508	24029	17992	28784
Baloda Bazar	7022	16732	7972	23643	8470	24528	12747	26937
Balrampur	6986	14988	8596	16032	11842	20913	13448	26250
Bastar	32199	36913	34294	41171	35719	44101	32892	38257
Bemetara	6015	14518	5625	17451	4654	19039	5690	18526
Bijapur	8870	10379	10452	12047	10616	16101	14246	16541
Bilaspur	14334	26326	17660	36108	17413	37866	16596	34200
Dantewada	9564	10763	11979	14362	15715	19267	29802	33543
Dhamtari	11074	19079	12437	22941	14342	23201	18500	29277
Durg	82440	95633	88750	120838	95963	116619	39551	59552
Gariyaband	5382	7891	7459	10472	9180	11809	7667	12850
Janjgir-Champa	15576	28964	16413	33260	16590	31952	16451	28253
Jashpur	11719	19251	19295	30382	23453	34454	25962	35021
Kanker	26152	35796	29960	38602	31506	39210	31563	39303
Kawardha	10643	14253	12426	17282	15450	23158	13727	24884
Kondagaon	9843	14451	13628	18367	11554	16666	15427	19392
Korba	16902	23967	18536	30796	17994	26159	19753	29685
Koriya	13571	20413	15023	23160	17659	26416	19950	30687
Mahasamund	10904	18626	13890	25825	14575	28147	14264	27799
Mungeli	4099	7383	5443	8666	7156	13523	7565	16661
Narayanpur	4607	5425	5136	6303	4640	5722	6800	7768
Raigarh	24161	42475	24630	45197	28030	49053	41453	63733
Raipur	7506	17624	28544	47825	34972	50337	36528	55408
Rajnandgaon	31920	42488	31502	42613	30294	42036	51810	65968
Sukma	1523	1913	2306	3309	5164	6219	13627	13996
Surajpur	9232	17485	12659	21304	13446	21453	17869	28113
Surguja	27910	28686	72090	64792	57631	58139	37939	38135
Chhattisgarh	418423	606421	537835	792645	569536	830117	579819	849523

Data shows that Balod, Dantewada, Jashpur, Mungeli and Raipur have recorded more than 100 percent increase in IPD patients from 2014 to 2018. Balodabazar, Bijapur, Dhamtari, Gariyaband, Kawardha, Koriya, Raigarh, Rajnandgaon and Surguja districts have registered an increase of more than 50 percent IPD cases during 2014 to 2018. During this period the number of IPD cases have increased only upto 15 percent in Bastar, Kanker and Champa-Janjgir districts. Durg district has registered a decline of 44 percent in reported IPD cases during 2014 to 2018. Figure 3 shows that there were more female children age less than 18 years as in-patient than male children in 18 districts and nine districts have lesser

female in-patient children compared to male children. Balodabazar district has 1290 female in-patient children for every 1000 male children and Surguja district has only 826 female children for every 1000 male in-patient children admitted to public health institutions.



5.2 Maternal Morbidity:

Maternal morbidity conditions reported in HMIS provides indication of morbidity burden among pregnant women during ante-natal, natal and post-natal period. Most of maternal morbidity conditions are recorded and reported in individual facility level monthly HMIS reports since 2017. Maternal morbidity condition data presented here is taken from consolidated reports prepared from facility level data.

Table 3: Morbidity condition among pregnant women (2014-2018), HMIS, CG

Reporting Year	Hypertension (BP > 140/90) cases at institutions	Number of Eclampsia cases managed during delivery	Number having Hb <11 gm/dl	Number having severe anaemia (Hb<7 gm/dl) treated at institution
2014-15	18311	1829	276142	9759
2015-16	20235	2282	317373	11625
2016-17	24470	2673	380869	12067
2017-18	18087	2331	564475	23733

A total of 2.76 lakh pregnant women are reported suffering from anaemia i.e. Hb<11 gm/dl, during 2014-15. Reporting of number of anaemic pregnant women has increased to 5.64 lakh in 2017-18 (Table 3). Similarly, severely anaemic (Hb<7 mg/dl) pregnant women treated at institutions has increased more than twice from 9759 in 2014-15 to 23733 pregnant women in 2017-18. It is noted that anaemia is the major morbidity condition

reported followed by hypertension, severe anaemia and eclampsia among pregnant women.

Reporting of delivery and post-natal complications is important for their effective management and to elicit causes of maternal deaths. An increasing trend has been observed in number of pregnant women with obstetric complications attended at public health facilities during 2014-18 in Chhattisgarh.

There was more than three-fold increase in obstetric complication cases from 25344 in 2014-15 to 78106 cases in 2017-18. A similar situation was observed for obstetric cases attended at private health institutions during 2014-2017 (Table 4). There were 8980 post-natal complication cases attended during 2016-17 in the state. During 2014-15, eight percent delivery cases reported to have some obstetric or post-natal complications which have increased to 19 percent in 2016-17 and then reduced to 15.7 percent in 2017-18.

Table 4: Obstetric and post-natal complications (2014-2018), HMIS, CG					
Reporting Year	Number of pregnant women with Obstetric Complications attended at Public Health Facilities	Number of pregnant women with Obstetric Complications attended at Pvt. Health Facilities	PNC maternal complications attended	Total Reported Deliveries	Proportion of Obstetric and Post-Natal Complications to total Reported Deliveries
2014-15	25344	10394	5856	503395	8.3
2015-16	32567	21549	8582	488309	12.8
2016-17	44796	34523	8980	469121	18.8
2017-18	78106	--	--	497743	15.7

5.3 Child Morbidity:

HMIS provides crucial indicators for morbidity among children below age of 5 years. These morbidity conditions are associated with leading causes of under-five mortality in the country. Table 5 provides number of children below age 5 years reported to have various morbid conditions.

There were only 10 cases of Diphtheria among children during 2016-17, whereas a ten-fold increase in Diphtheria was reported during 2017-18. Number of cases of measles among children has reduced to more than half in 2017-18 of what it was reported in 2014-15. Similarly 30021 children below age 5 years suffered from malaria in 2015-16 and number has reduced in the following years to 18623 malaria cases in 2017-18. Diarrhoea and dehydration is the most commonly occurring morbid condition in children below 5 years

of age. There was 17 percent increase in reporting of the number of children suffering from diarrhoea during 2014-2018. In 2014-15 there were 1.06 lakh cases of diarrhoea reported which increased to 1.47 lakh cases in 2016-17 and reduced to 1.23 lakh in 2017-18.

Table 5: Number of children (age 0-5) reported of having diseases (2014-2018), HMIS, CG				
Disease Condition	2014-15	2015-16	2016-17	2017-18
Diphtheria	0	20	10	101
Pertussis	0	0	2	1
Tetanus Neonatorum	0	0	6	8
Tetanus others	0	17	7	--
Polio	0	0	0	121*
Measles	844	735	653	325
Diarrhoea and dehydration	105624	117155	147842	123523
Malaria	25032	30021	28777	18623
Respiratory Infections	9538	12736	11860	9695

* Acute Flaccid Paralysis (AFP). Since 2017-18 AFP cases are reported in HMIS instead of polio cases

Number of children admitted with respiratory infections has witnessed slight variation in the successive years during 2014-18. There were 9538 children admitted with respiratory infection in 2014-15, which increased to 12736 in 2015-16 and declined to 9695 in 2017-18.

No polio cases have been reported since 2014-15 in the state. India has achieved the mark of elimination of polio in the year 2014. Since 2017-18 all the public health facilities are required to report Acute Flaccid Paralysis (AFP) cases among children upto age 5 years and below in HMIS. In Chhattisgarh there were 121 AFP cases reported in 2017-18. Highest number of AFP cases reported from Kondagaon (39), followed by Sukma (19), Kawardha (16) and Korba (10) during 2017-18. Eight districts have also reported less than 10 AFP cases during this year.

Table 6: Adverse Event Following Immunization (AEFI) (2014-2018), HMIS, CG

Reporting Year	Abscess	Other
2014-15	894	9985
2015-16	1009	6795
2016-17	1511	4726
2017-18	485	5708

Cases of adverse event following immunization (AEFI) reported in HMIS helps to understand quality of child immunization services. During 2014-15 highest number of cases of AEFI were reported in Chhattisgarh. There were 894 cases of abscesses and 9985 cases of other adverse effects (Table 6). This has gradually

declined during 2015-2018. In comparison to the number of children immunized every year, AEFI is very less but to sustain and improve immunization coverage and its quality such events should be prevented.

5.4 Gender Specific Morbidity Conditions:

Apart from maternal and child morbidity conditions, HMIS also reports gender specific morbidity which includes RTI/STI among males and females and complications due to male and female

sterilization. Table 7 provides number of new RTI/STI cases for which treatment was initiated among males and females. Every district hospital and few sub-district hospital and CHCs have ICTC and STI clinics, which provides RTI/STI counselling and treatment services. During 2014-18, number of RTI/STI cases among male and females have gradually increased. In 2014-15 there were 21757 new cases of RTI/STI among males and 33822 cases of females. During 2017-18 RTI/STI cases increased to 24865 males and 42491 females.

Table 8: number of cases of complication due to sterilization by sex (2014-2018), HMIS, CG

Reporting Year	Male	Female
2014-15	15	171
2015-16	18	98
2016-17	34	331
2017-18	76	227

complications during 2014-15. There were more cases of complications due to sterilization among females than males. Balodabazar has reported 21 cases of complications due to male sterilization in 2017-18, while Bilaspur has reported 80 complication cases due to female sterilization. It may be mentioned that female sterilization is the mainstay of family planning programme in the state. Mass female sterilization camps are a regular phenomenon during winter seasons. Very few health facilities are equipped to provide limiting methods of family planning on daily or weekly basis due to shortage of skilled manpower. In such a situation there could be many more cases of complications/ failures due to sterilization which remained unrecorded or unreported in HMIS.

Table 7: New RTI/STI cases for which treatment initiated by sex (2014-2018), HMIS, CG

Reporting Year	Male	Female
2014-15	21757	33822
2015-16	22305	34497
2016-17	18150	35271
2017-18	24865	42491

Table 8 provides reported cases of complications due to male and female sterilization. There were 15 cases of complication due to male sterilization and 171 cases of female sterilization

5.5 Other Morbidity Conditions:

HMIS provides data on occurrence of severe anaemia and malaria among general population visiting health facilities for treatment. Under-nutrition characterised by severe anaemia is a major health concern especially among girls, women and children of younger ages. It is also common for population living below poverty line. Severe anaemia is also

associated with other morbidity conditions which may act as a precursor for or consequence of chronic and acute morbidity conditions affecting overall health. Population living in forested areas particularly in tribal regions of the state are more prone to malaria.

Severe anaemia cases have shown a two-fold increase during 2017-18 over 2014-15. There were 45431 cases of severe anaemia (Hb<7 gm/dl) reported in 2014-15. In 2015-16 and 2016-17 there were 68 thousand and 61 thousand reported cases of severe anaemia in the HMIS separately (Table 9). During 2014-2018 proportion of severe anaemia among tested cases remained stagnant around 3.5 percent. It may be mentioned that proportion of pregnant women treated for severe anaemia among total severe anaemia cases was about one-fifth during 2014-2017 where it increased to 27 percent in 2017-18.

Table 9: Severe Anaemia and Malaria cases (2014-2018), HMIS, CG

Reporting Year	Severe Anaemia (Hb<7) Cases among tested cases	Cases of Plasmodium Vivax test positive	Cases of Plasmodium Falciparum test positive	Percentage of Severe Anaemia among tested cases	Percentage of Malaria Positive Cases among tested cases
2014-15	45431	35008	76024	3.4	5.2
2015-16	68515	32412	90510	3.4	5.6
2016-17	61590	27272	95770	3.7	5.0
2017-18	86661	41435	133125	3.6	4.7

There were 35008 cases of malaria (PV) positive and 76024 cases of malaria (PF) positive cases in 2014-15. There were 5.2 percent tested cases positive for malaria during 2014-15 which reduced slightly to 4.7 percent during 2017-18.

The district level HMIS data pertaining to various morbidity conditions indicate that Dantewada has registered about 16 percent severe anaemia cases among all tested cases, highest in the state, whereas Raipur has only 1.4 percent severe anaemia cases during 2014-2018. Proportion of malaria positive cases is highest (20 percent) in Sukma, Bijapur and Narayanpur districts, followed by Dantewada (18 percent). It is seen that during 2014-18 all the districts have continuously reported morbidity cases under HMIS. This needs to be sustained for understanding morbidity profile of the state.

6. Mortality Reporting in HMIS

Mortality reporting under HMIS is done at two levels as described earlier – firstly by capturing of death data at individual health facility level in the form of line listing and afterwards consolidation of line listing data from all the health facilities in a district for reporting in monthly HMIS report of the district.

The deaths of individuals is categorised by age, gender and cause of death. Reporting the death data in monthly district HMIS report is given only by age and cause of death. Therefore, gender differentials of deaths could not be ascertained for this study.

6.1 Total Deaths reported in HMIS:

During 2014-2018, there were 266234 deaths reported in HMIS. During 2014-15, there were 64923 deaths. In the following years, there were 66802, 69917 and 64592 deaths reported in 2015-16, 2016-17 and 2017-18 respectively (Figure 3).

It is observed that among all the reported deaths during 2014-2017, majority deaths belong to the category of old age deaths (age above 55 years - 111786), followed by adult deaths (age 15-55 years - 68707) and infant deaths (age 0-1 year - 16232). For the age group (6-14 years) 4917 deaths were reported (Table 10). Since 2017-18 reporting of deaths in HMIS for ages 6 years and above has been clubbed together to form a single category. This has resulted in loss of vital information about the age and cause specific mortality pattern. During 2017-18, there were 8929 deaths among children below age 6 years and 55663 deaths in age 6 years and above.

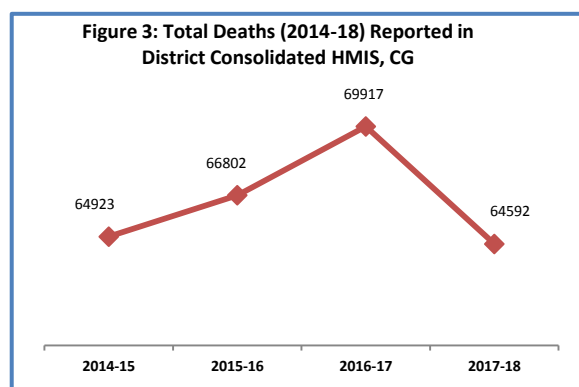
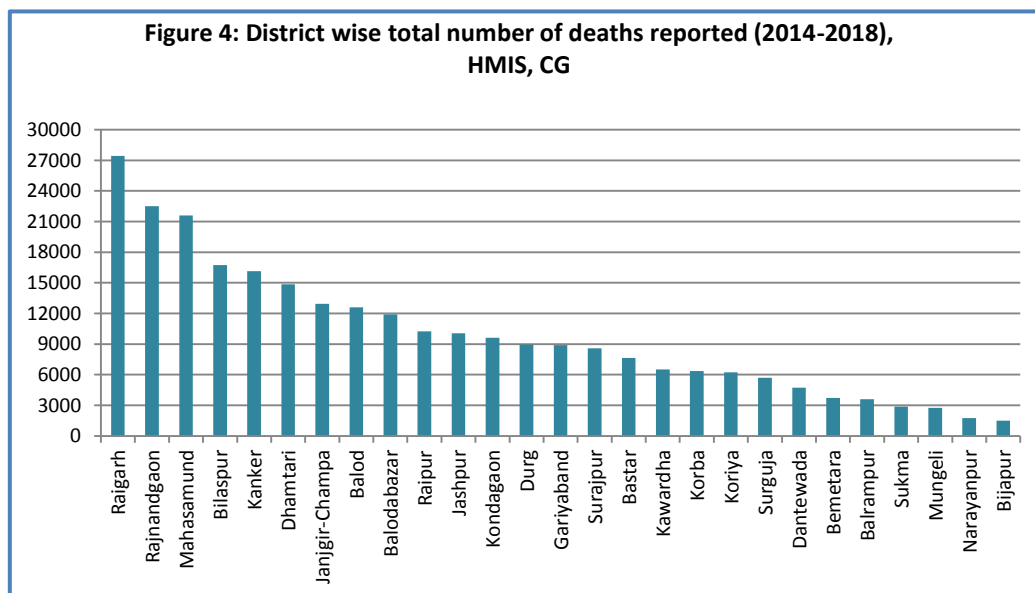


Table 10: Number of deaths by age category reported in district consolidated HMIS, CG

Reporting Year	Child Deaths (Age 0-5 Yrs.)	Young Deaths (Age 6-14 Yrs.)	Adult Deaths (Age 15-55 Yrs.)	Old Deaths (Age > 55 Yrs.)	Total Deaths
2014-15	5355	1691	21899	35978	64923
2015-16	5616	1620	23601	35965	66802
2016-17	5261	1606	23207	39843	69917
2017-18*	8929		55663		64592

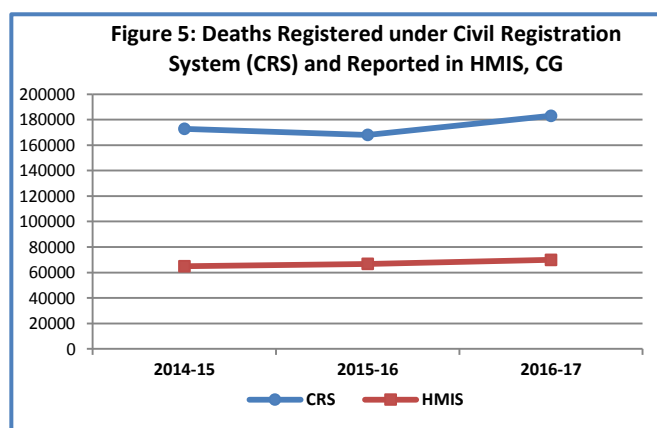
* New HMIS format introduced in 2017. Death reported in totality for ages >5 years

It is observed that Raigarh, Rajnandgaon and Mahasamund each have reported more than 20 thousand deaths during 2014-18. Narayanpur and Bijapur reported a total of 1759 and 1502 deaths respectively during this period (Figure 4).



To assess the level of death reporting in HMIS across districts, a comparison of deaths registered under CRS and HMIS has been made. There were 523824 deaths registered in Chhattisgarh and level of death registration increased from 88 percent to 95 percent during 2014-16 (CRS, 2016).

There were only 265724 deaths reported under HMIS during 2014-2018. The gap in reporting between CRS and HMIS has widened during 2016-17 as seen in Figure 5. Raipur has registered maximum, 45246 deaths under CRS during 2014-2016,



but in HMIS it has reported a total of 10253 deaths during 2014-2018 (Table 11). All the districts have registered more deaths in CRS than HMIS for the years 2014 to 2017.

In Narayanpur, Kanker, Bijapur, Sukma and Mahasamund there is a gap of upto 5000 deaths between these two sources. A gap of more than 15000 deaths was observed in Rajnandgaon, Bastar, Janjgir-Champa, Durg, Bilaspur and Raipur in CRS and HMIS. This indicates large under-reporting of deaths in HMIS.

Table 11: District-wise number of deaths registered in civil registration system (CRS) and reported in HMIS (2014-2017), CG

District	2014-15		2015-16		2016-17	
	CRS	HMIS	CRS	HMIS	CRS	HMIS
Balod	5401	2803	5374	2861	6069	3676
Balodabazar	6374	3257	7242	3240	8154	2998
Balrampur	3907	814	3793	780	4042	1002
Bastar	7650	2107	7597	1717	7720	1842
Bemetara	4008	1906	4025	1048	4139	220
Bijapur	1854	146	1692	233	1389	401
Bilaspur	12638	4257	13805	4013	16630	4716
Dantewada	2988	1124	2747	1232	2920	1132
Dhamtari	6945	3620	6249	3816	6634	3571
Durg	11132	2416	10259	2109	12378	2237
Gariyaband	4756	1947	3572	2081	4241	2387
Janjgir-Champa	11409	2965	11225	3923	12815	2931
Jashpur	6309	2133	6486	3030	6310	2535
Kanker	5101	4134	4935	4063	5466	4460
Kawardha	5476	1862	5245	1753	5604	1896
Kondagaon	4168	2386	4138	2376	4632	2448
Korba	6132	1852	6273	1648	7675	1782
Koriya	3899	1133	3871	1568	4171	1836
Mahasamund	7031	5327	6612	5759	7874	5726
Mungeli	3703	1083	3638	508	3303	312
Narayanpur	1027	527	1036	553	915	374
Raigarh	11124	6305	9895	6809	12033	7887
Raipur	14990	2104	16673	2430	13583	2737
Rajnandgaon	10588	5250	10278	5314	11570	6140
Sukma	2600	613	1902	767	1952	765
Surajpur	4979	1788	4502	1966	5408	2358
Surguja	6616	1064	4970	1204	5358	1548
Chhattisgarh	172805	64923	168034	66802	182985	69917

6.2 Institutional Deaths:

Data on institutional deaths are necessary to ascertain the exact cause of death certified medically. This data helps to know the pattern of causes of death in the population. CRS reports that share of institutional deaths to total registered deaths in the country is 35.6 percent (CRS, 2016). As per SRS, proportion of deaths occurring at public or private health institution has gradually increased from 34.2 percent in 2011 to 46.2 percent in 2016 in India. Percentage of deaths medically attended either at public or private hospital has increased from 26.2 percent in 2011 to 38.6 percent in 2016 (SRS, 2016). HMIS reported proportion of institutional deaths to total reported deaths is 19.4 percent in state which indicate high variation from CRS and SRS data.

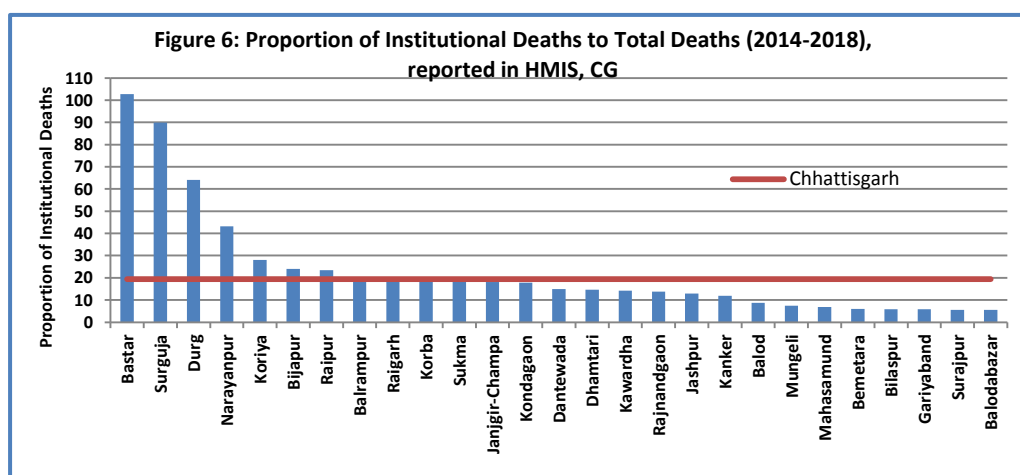
HMIS reports deaths occurring in institutions by their gender. In the district consolidated report these deaths represent the sum of all the deaths in health facilities providing in-patient service. In public health system all the DH, SDH, CHC and PHC have provision of in-patient service. There are few sub-health centres (SHC) having in-patient

Table 12: Number of institutional deaths reported in HMIS, CG

Year	Male	Female
2014-15	7172	5165
2015-16	7902	5819
2016-17	9271	6464
2017-18	5838	4044
Total	30183	21492

services. Each health facility is expected to have a death register to record the in-patient death and cause of death. On the basis of this register institutional deaths are reported in HMIS. The HMIS data shows that there were 51675 institutional deaths during 2014-2018 in Chhattisgarh. Majority of these deaths (15735) were reported in the year 2016-17, followed by 13721 deaths in 2015-16. There were more number of male deaths in institutions than female in all the reporting years (Table 12).

District-wise proportion of institutional deaths in total reported deaths in HMIS shows that all the districts are not validating the data on reported institutional deaths. Bastar and Surguja have reported more than 90 percent institutional deaths compared to total reported deaths in district consolidated HMIS report for combined period of 2014-18.



In Durg more than 50 percent and in Narayanpur 42 percent deaths are institutional, in another 15 districts it is between 10-30 percent. Except Balod and Surajpur, there are more male deaths reported than female in health institutions in all the districts.

6.3 Neonatal and Infant Deaths:

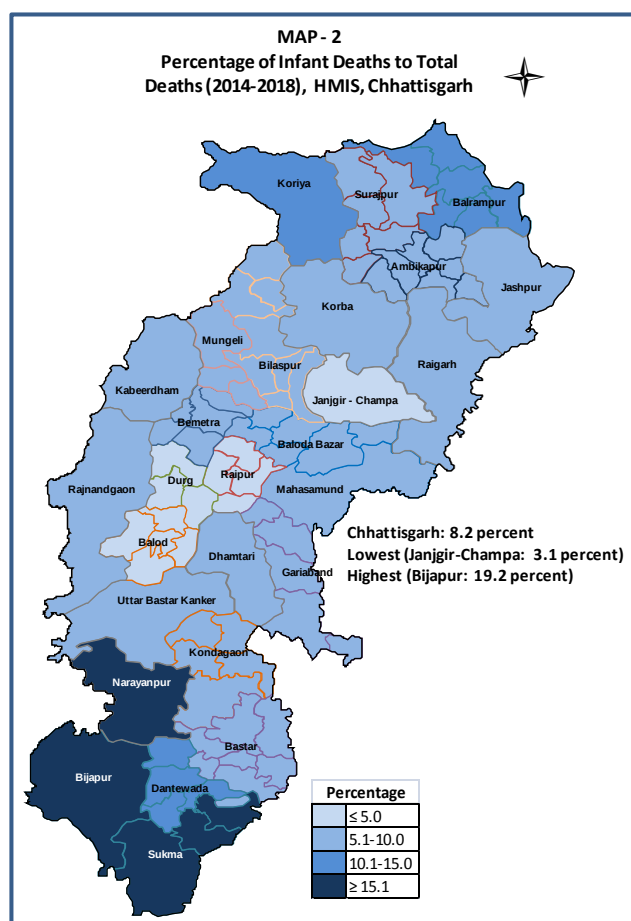
Infant mortality rate is considered as a measure of quality of health care services. Deaths during infancy and particularly in neonatal ages are major public health concerns in Chhattisgarh. The state has been witnessing steady decline in infant mortality rate since its

creation in the year 2000. HMIS captures the death among neonates and infants on monthly basis. All the deaths among neonates and infants are line listed at every health facility and then consolidated at the district level. These deaths are grouped as follows; 1). Deaths within 24 hours of birth, 2) Deaths between 1-7 days of birth (early neonatal deaths), 3) Deaths of children age between 1-4 weeks (late neonatal deaths) and 4) Deaths of children age between 1-11 months (post-neonatal deaths).

HMIS data show that there were 21929 infant deaths in Chhattisgarh during 2014-2018. Highest number of infant deaths was reported in Raigarh (2664), followed by Rajnandgaon (2029), Mahasamund (1388) and Bilaspur (1289) (Table 13). It is observed that Raigarh, Raipur, Rajnandgaon, Koriya and Kondagaon districts have reported more infant deaths in HMIS as compared to number of infant deaths registered in CRS.

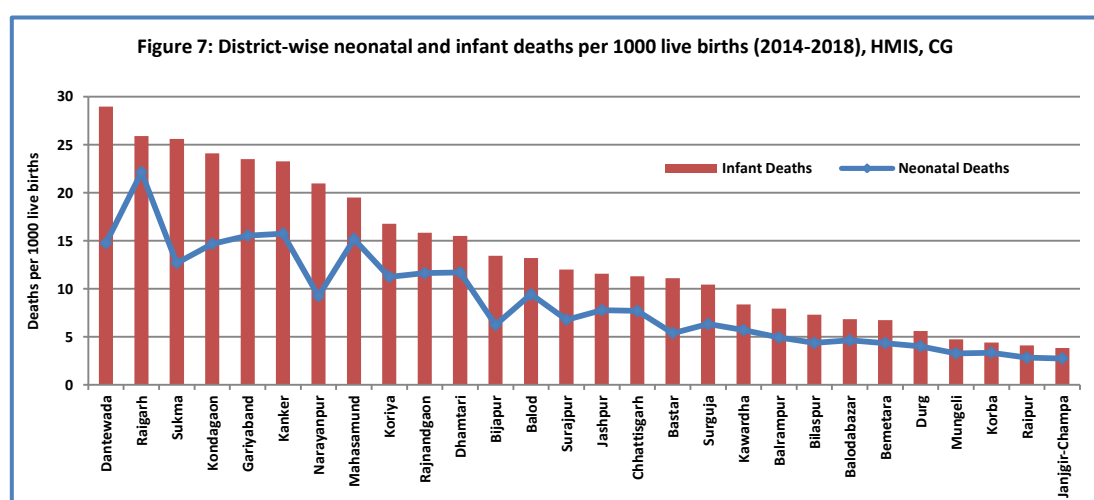
Table 13: Number of infant deaths, its proportion to total Deaths (2014-2018), HMIS and infant deaths registered in CRS 2014-2016, CG

District	Infant Deaths	Total Deaths	Infant Deaths (%)	Infant Deaths, CRS (2014-2016)
Balod	539	12598	4.3	667
Balodabazar	712	11914	6.0	926
Balrampur	535	3592	14.9	853
Bastar	778	7652	10.2	2028
Bemetara	363	3734	9.7	403
Bijapur	289	1502	19.2	647
Bilaspur	1289	16722	7.7	2333
Dantewada	656	4721	13.9	822
Dhamtari	911	14846	6.1	906
Durg	705	8962	7.9	5691
Gariyaband	849	8892	9.5	1013
Janjgir-Champa	395	12941	3.1	587
Jashpur	718	10055	7.1	914
Kanker	1035	16139	6.4	417
Kawardha	577	6519	8.9	1268
Kondagaon	1054	9605	11.0	579
Korba	406	6351	6.4	810
Koriya	815	6219	13.1	520
Mahasamund	1388	21609	6.4	2006
Mungeli	288	2756	10.4	947
Narayanpur	263	1759	15.0	328
Raigarh	2664	27422	9.7	771
Raipur	701	10253	6.8	396
Rajnandgaon	2029	22498	9.0	735
Sukma	480	2861	16.8	403
Surajpur	656	8568	7.7	1538
Surguja	834	5686	14.7	1200
Chhattisgarh	21929	266376	8.2	29708

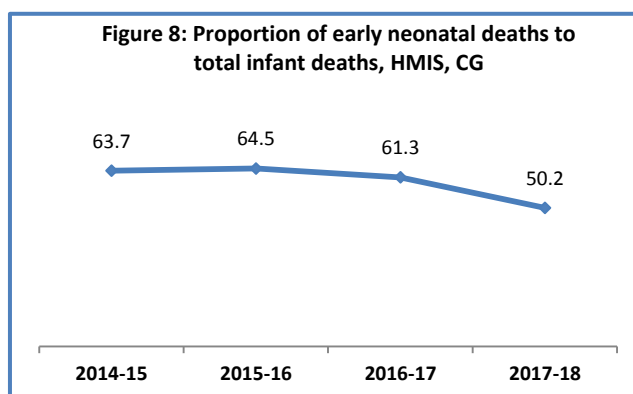


Map-2 shows the proportion of infant deaths to total deaths in districts of Chhattisgarh. The proportion of infant deaths to total reported deaths was 8.2 percent for the state as a whole. In Bijapur district nearly one-fifth of all the deaths are infant deaths, which is highest for any district in the state. In Sukma and Narayanpur more than 15 percent of all the reported deaths are infant deaths. To understand the level of reported neonatal and infant deaths, both are compared with the reported live births in the district. In Chhattisgarh neonatal and infant death rate is 8 and 11 per 1000 live births respectively (Figure 7).

Dantewada has highest infant death rate (29 per thousand live births), followed by Raigarh and Sukma (27/1000 live births). The neonatal death rate is highest in Raigarh (21/1000 live births) followed by Kanker (16/1000 live births) and Gariyaband (15/1000 live births). It was found that share of neonatal deaths in total infant deaths are very high in almost all the districts. For the state as a whole, more than three-fifths of infants die in neonatal period.

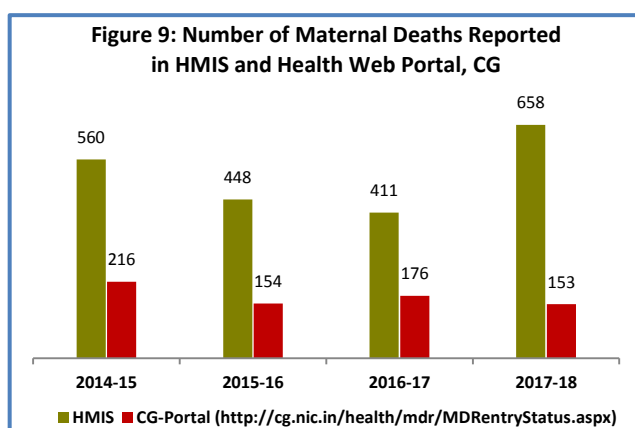


In Raigarh, Mahasamund, Korba and Dhamtari more than 75 percent infants die before completing first month after birth. In Mungeli, Raipur and Champa-Janjgir districts both neonatal and infant death rate is below 5 per 1000 live births. Similarly, share of early neonatal (within 1 week of birth) death in total infant deaths is also found very high. During 2014-15 more than 60 percent infants died during early neonatal period. During 2017-18 this has reduced to 50 percent (Figure 8).



6.4 Maternal Deaths:

India has missed the MDG goal target of 2015 set for reduction of maternal mortality rate upto 100 per lakh live birth. It was mainly due to insufficient maternal health services in the country. SRS estimates for India shows that there has been a continuous reduction in MMR from 301 in 2001 to 254 in 2004 and 212 in 2007 and has further reduced to 167 in 2011 and 130 in 2014. In Chhattisgarh, MMR was estimated at 173 maternal deaths per 100,000 live births during 2014-16. However, there is a limitation to estimating MMR since differentials at district level and below are not available. To eliminate this gap, each district is supposed to report maternal deaths occurring in the community as well as in health institution under monthly HMIS report.



In Chhattisgarh, there were 2077 maternal deaths reported during the 2014-2018. Based on HMIS reported maternal deaths and live births during 2014-18 the MMR is estimated at 107 per 100,000 live births. There were 560 and 658 maternal deaths reported in 2014-15 and 2017-18 respectively.

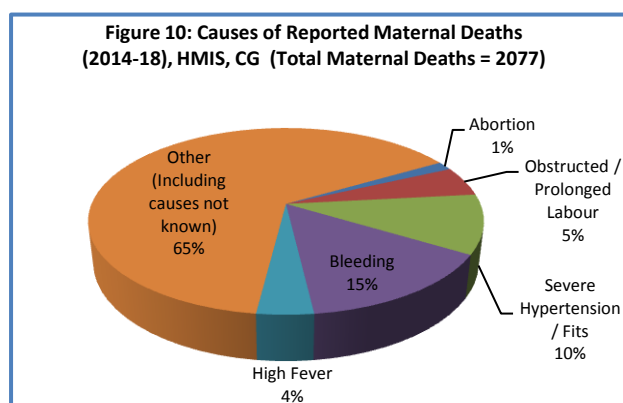
Chhattisgarh has created a dedicated portal for reporting of individual maternal deaths at community level. It is seen that there is no concurrence between maternal deaths reported in HMIS and on the web-portal. There were fewer maternal deaths reported on the web-

portal than HMIS for all the reporting years (Figure 9). It is seen that about one-fourth of all the reported maternal deaths were from three districts – Bilaspur, Raigarh and Rajnandgaon. In all nine districts contributed about half of all maternal deaths in the state. The district level variation in reporting of maternal deaths shows that Bilaspur, Raigarh, Mahasamund, Koriya and Dhamtari each have reported hundred or more maternal deaths during 2014-2018. This is followed by Balodabazar (96), Mahasamund and Kondagaon (92), and Baster (90) maternal deaths during this period.

HMIS also records distribution of these maternal deaths according to the reported cause of maternal deaths. Table 14 shows distribution of reported maternal deaths in different reporting years. Majority deaths falls under other / causes not known category.

Table 14: Number of Maternal Deaths (2014-2018) by cause of death, HMIS, CG

Reporting Year	Abortion	Obstructed / Prolonged Labour	Severe Hypertension / Fits	Bleeding	High Fever	Other (Including causes not known)
2014-15	8	35	60	108	30	319
2015-16	11	29	50	62	17	279
2016-17	5	14	57	53	17	265
2017-18	7	29	46	79	17	480
Total	31	107	213	302	81	1343



Percent distribution of all maternal deaths by cause of death is depicted in Figure 10. There were 302 (15 percent) maternal deaths reported to have occurred due to bleeding (either during natal or post-natal period) followed by 213 (10 percent) deaths due to severe hypertension / fits and 107 (5

percent) deaths due to obstructed / prolonged labour. There were 1343 (65 percent) maternal deaths due to other or unknown causes.

7. Cause of Death Reported in HMIS:

Cause of deaths is an important aspect in analysing mortality. Cause of death for all the deaths occurring in a community or a geographic region over a time period provides

valuable insight into prevailing health condition and epidemiological transition including context and determinants of current changes in mortality. India has witnessed lack of systematic and regular data on medically certified cause of death, as more than 75 percent deaths occur at home. It is estimated that annually 8.1 million deaths occur in India.

HMIS provides data on deaths, categorised into various causes and age. The cause of death changes according to age of deceased person. Accordingly, in HMIS, deaths are categorised by different causes, specific to the age of person at the time of death. Broadly deaths are categorised into different causes as shown in Table 15.

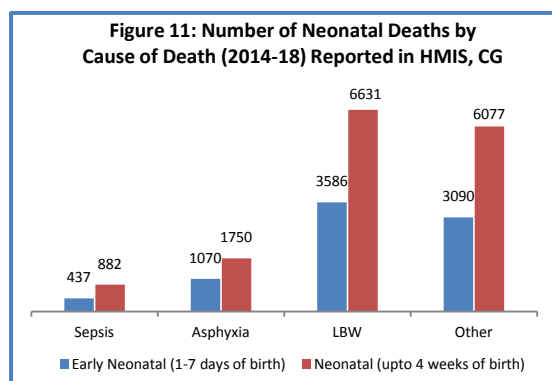
Table 15: Causes of deaths specified for different age category, HMIS		
Sr.	Age Category	Cause of Death Recorded in HMIS
1	Within 24 hours of birth	Not Specified
2	1-7 days	Sepsis, Asphyxia, LBW, Other
3	1-4 weeks	
4	1-11 months	Pneumonia, Diarrhoea, Fever related, Measles, Other
5	1-5 years	
6	6-14 Years	Infection / Communicable Diseases Diarrhoeal Diseases, Tuberculosis, Respiratory infection / Diseases excluding TB, Malaria, Other fever Related, HIV-AIDS
7	15-55 Years	Non-Communicable Diseases Heart Disease / Hypertension related, Neurological Disease including Stroke Accidental Causes Trauma/Accident/Burn Cases, Suicide, Animal Bites / Stings
8	Above 55 years	Acute / Chronic / Unknown Causes Known Acute Diseases, Known Chronic Diseases, Causes not known

For reporting of deaths which have occurred at the individual facility level and its catchments, a line listing for each age category is prepared and cause of death is assigned for each listed death. The recorded line listing of deaths is then consolidated to provide number of deaths and its cause in each age category for all the districts.

7.1 Causes of Neonatal Deaths:

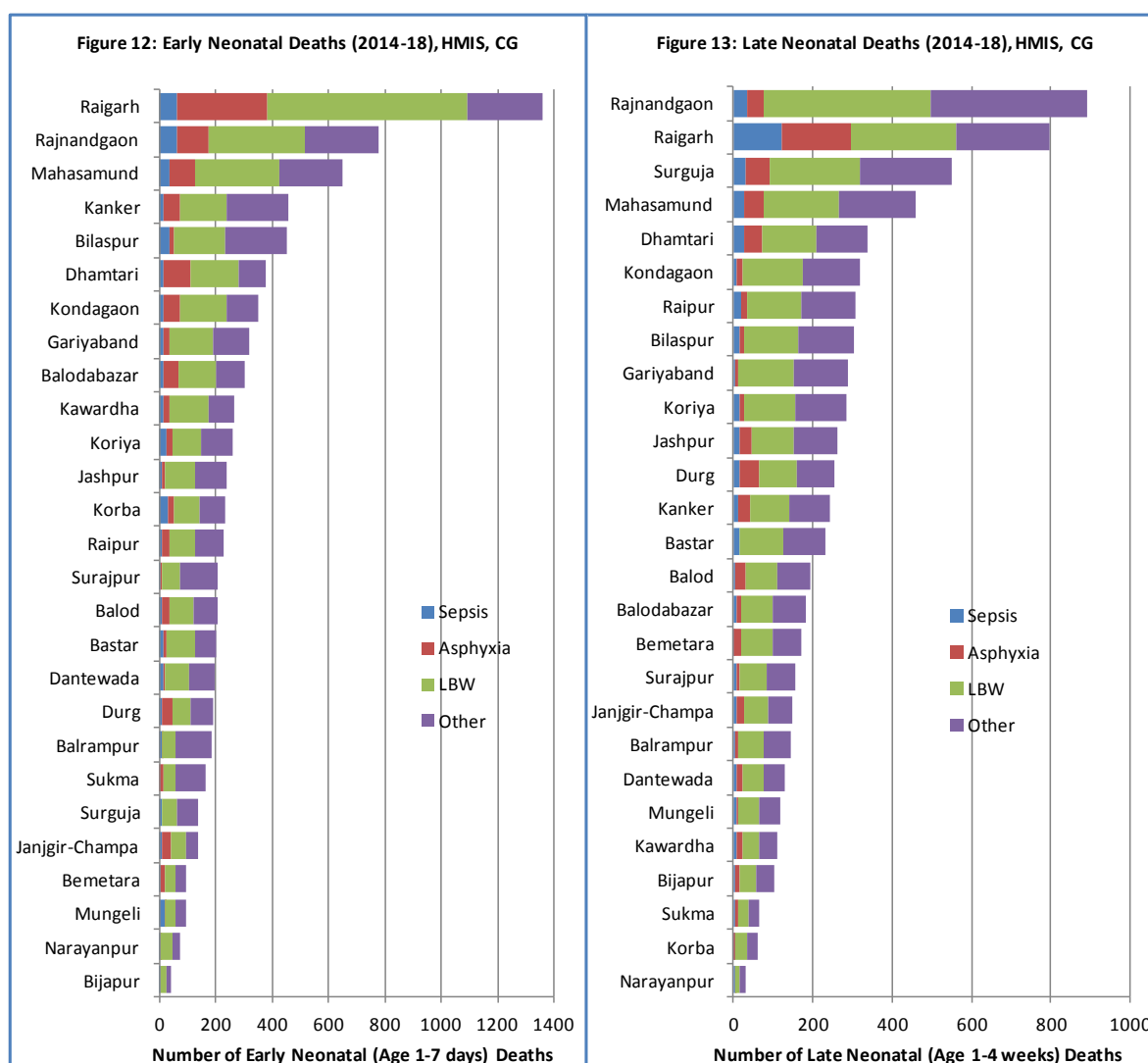
In Chhattisgarh, 15340 deaths were reported during neonatal ages (1-28 days). Out of these, 8183 deaths were in early neonatal period and 7157 deaths in late neonatal period. Major causes assigned to these deaths are Sepsis, Asphyxia, Low Birth Weight (LBW)

and other. Figure 11 shows that 3090 and 6077 deaths were reported due to other causes in early and late neonatal ages among children respectively. It is observed that in early neonatal ages about 44 percent deaths were due to low birth weight, 13 percent due to asphyxia and 5 percent due to sepsis. In late neonatal ages there were 43 percent deaths



due to low birth weight, 10 percent due to asphyxia and 6 percent due to sepsis.

District level variations in causes of deaths in early neonatal and late neonatal ages are shown in Figure 12 and Figure 13 respectively. More than half (1876 out of 3586) of all early neonatal deaths due to LBW were occurred in only six districts – Raigarh (710), Rajnandgaon (343), Mahasamund (299), Bilaspur (181), Dhamtari (175) and Kanker (168).



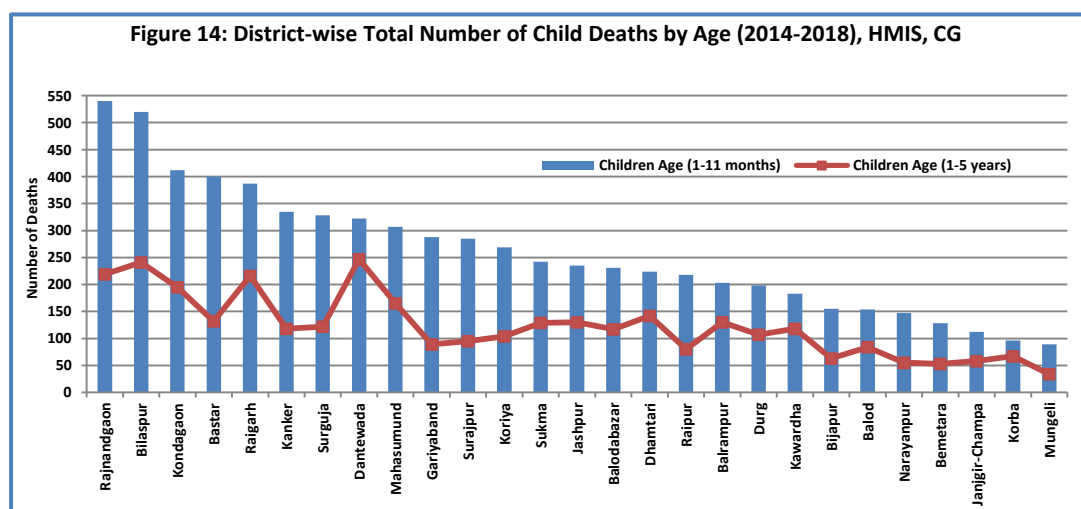
More than half (1539 out of 3045) deaths due to LBW in late neonatal ages were occurred in only seven districts. Raipur (137), Gariyaband (140), Kondagaon (152), Mahasamund (193), Surguja (229), Raigarh (266) and Rajnandgaon (422)

Neonatal deaths due to asphyxia were 1750 and 882 due to sepsis in Chhattisgarh. However, there are variations in the distribution of deaths due to these causes among districts. In late neonatal ages more than half of sepsis deaths were accounted in only five districts. Raigarh alone accounted for one-fourth of all the deaths due to sepsis (27 percent) and Asphyxia (25 percent) in late neonatal ages. In early neonatal ages more than half deaths due to sepsis are accumulated in Rajnandgaon, Raigarh, Mahasamund, Bilaspur and Korba, whereas only three districts Raigarh, Rajnandgaon and Dhamtari account for nearly half of deaths due to Asphyxia. Raigarh alone had 320 deaths due to asphyxia out of total 1070 deaths in early neonatal age reported in the state. More than one-third districts have reported fewer than 200 deaths in early and neonatal period in the state. Despite variation in neonatal deaths reported by districts, there is an indication that death reporting due to 'other causes' among neonates are clustered in few districts.

7.2 Causes of Post-Neonatal and Childhood Deaths:

Deaths among children after neonatal ages or in early and late childhood are mainly caused due to exogenous factors associated with environmental conditions, rearing practices and mostly preventable causes. Burden of various disease conditions on health during childhood ages are enormous. Majority of children die due to infectious and communicable diseases. Cause of Death Statistics (RGI, 2015) reports that more than three-fourths of deaths during childhood occur due to diseases of circulatory system (21.4%), certain infectious and parasitic diseases (21.1%), all forms of heart diseases including pulmonary circulation (20.1%) and respiratory diseases (14.6%) in India. This is followed by deaths due to septicaemia (7.5%) and pneumonia (7.3%).

There were 10318 deaths of children age 1 month to 5 years during 2014-2018. Out of these, 7008 deaths were in the age 1-11 months and 3310 in the age 1-5 years. Distribution of these deaths shows that Mahasamund, Dantewada, Surguja, Kanker, Raigarh, Bastar, Kondagaon, Bilaspur and Rajnandgaon districts account for more than half of post-neonatal deaths (Figure 14). Nearly half of all the child deaths occurred in Bastar, Dhamtari, Mahasamund, Kondagaon, Raigarh, Rajnandgaon, Bilaspur and Dantewada districts.



In HMIS, deaths during childhood were categorised by causes namely, pneumonia, diarrhoea, fever related, measles and other diseases. Majority (64 percent) deaths reported in both the age groups were due to other causes.

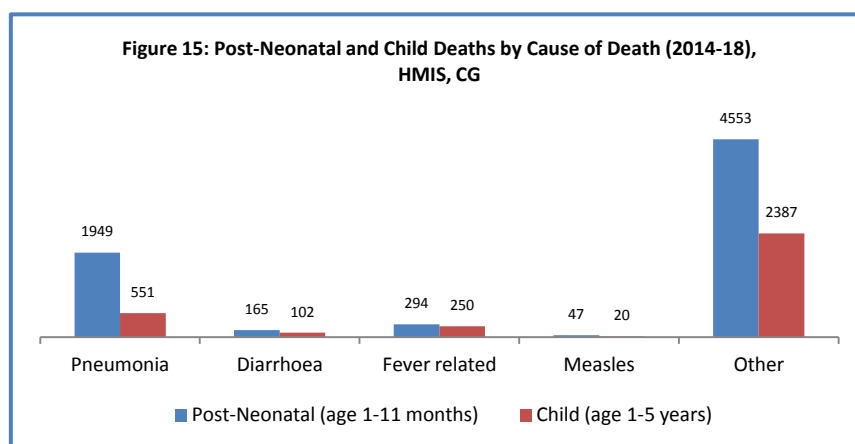
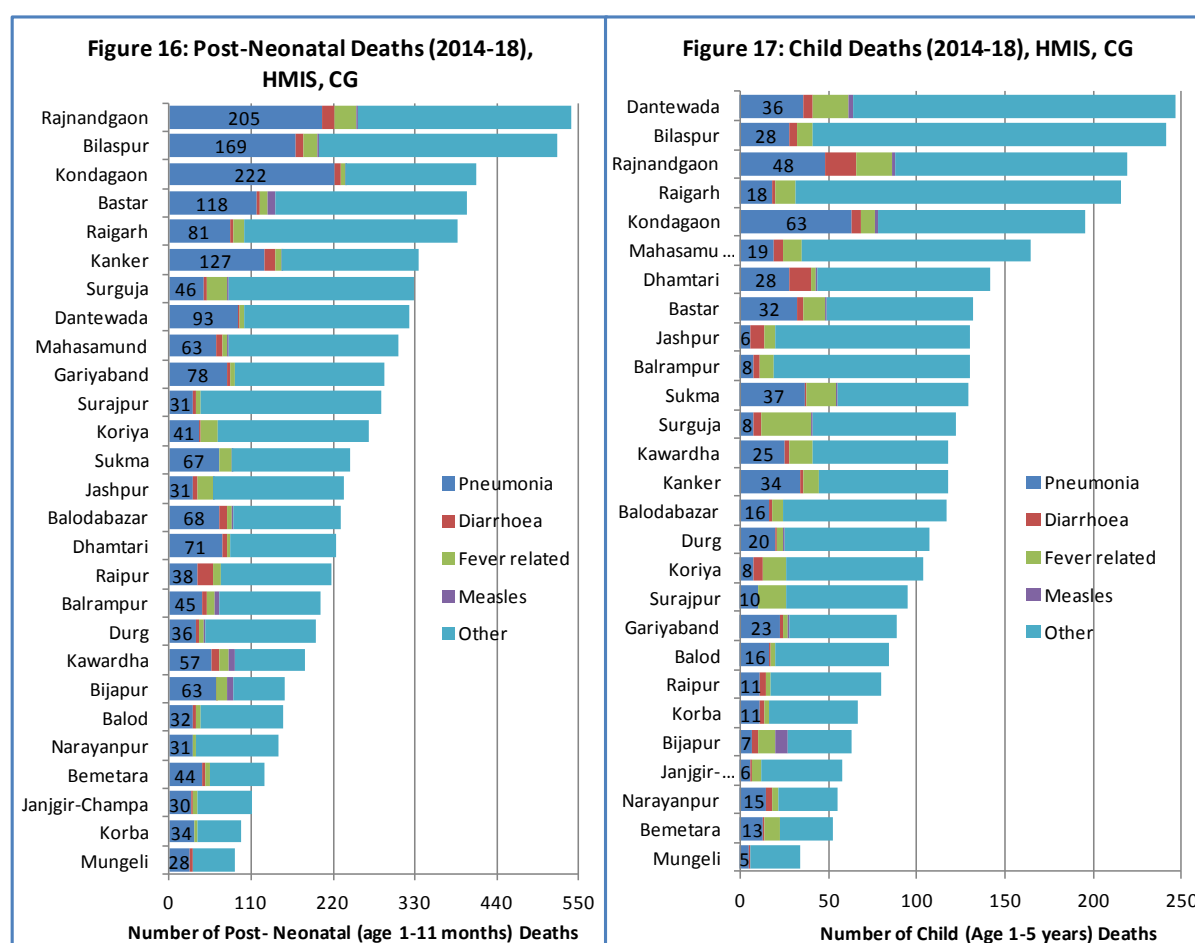


Figure 15 shows that 1949 (28 percent) deaths were caused due to pneumonia among children age 1-11 months. Deaths due to pneumonia among children age 1-5 years is 551 (17 percent). Fever is the next prominent cause of death among children age 1-11 months (4 percent) and for children age 1-5 years (8 percent).

It is observed that seven districts together reported nearly 52 percent of all the deaths due to pneumonia among children age 1-11 months (Figure 16 and 17). Likewise eight districts had 56 percent of deaths caused by pneumonia among children age 1-5 years. Kondagaon has reported highest pneumonia deaths among children in both the age

category. It is found that proportion of deaths due to diarrhoeal diseases is very less in both the age categories across all the districts. It is a welcome sign that majority child deaths due to diarrhoea are averted and this indicates programmatic success. Likewise deaths due to measles are also very less across districts. Balod, Janjgir-Champa, Korba, Koriya, Mungeli, Narayanpur, Raigarh, Raipur, Surajpur districts have not registered any deaths due to measles in both the age groups during 2014-2018 in Chhattisgarh.



7.3 Causes of Deaths in Young, Adult and Old age:

There has been a continuous improvement in health condition in post childhood ages due to which mortality has reduced considerably in India. There were total 485773 deaths registered in age six years and above under CRS during 2014-2016. In HMIS, during 2014-2017 there were 183991 death reported in Chhattisgarh. Distribution of these deaths in HMIS shows 2.7 percent of these deaths in age 6-14 years, 36.6 percent in age 15-55 years and 60.8 percent in age 55 year and above (Table 16). Since 2017-18 all the deaths above age 6 are grouped into one category and hence no age-wise distribution of deaths is

available from HMIS. HMIS provides causes of these deaths which can be categorised as - Infection / Communicable Diseases, Non-Communicable Diseases, Accidental Causes and Acute/Chronic/Unknown causes.

Table 16: number of Deaths in Young, Adult and Old Ages, CRS (2014-16) and HMIS (2014-2017), CG

Age Group	CRS (2014-2016)	HMIS (2014-2017)
Young (6-14 Years)	11337 (2.3%)	4917 (2.7%)
Adult (15-55 Years)	148849 (30.7%)	67288 (36.6%)
Old (55 & Above)	325587 (67.0%)*	111786 (60.8%)
Total	485773 (100.0%)	183991 (100.0%)

* Includes age not stated

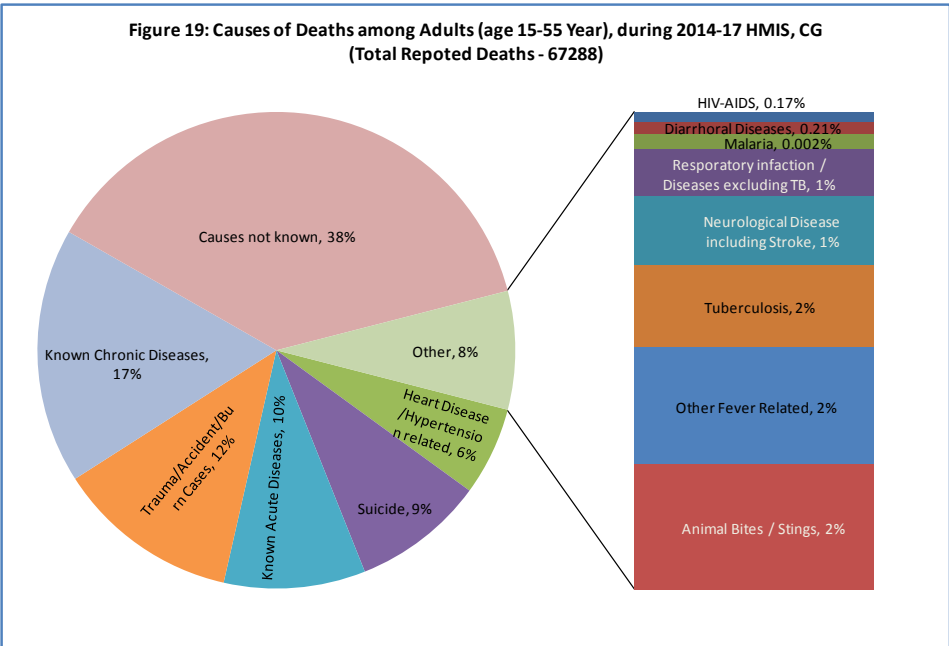
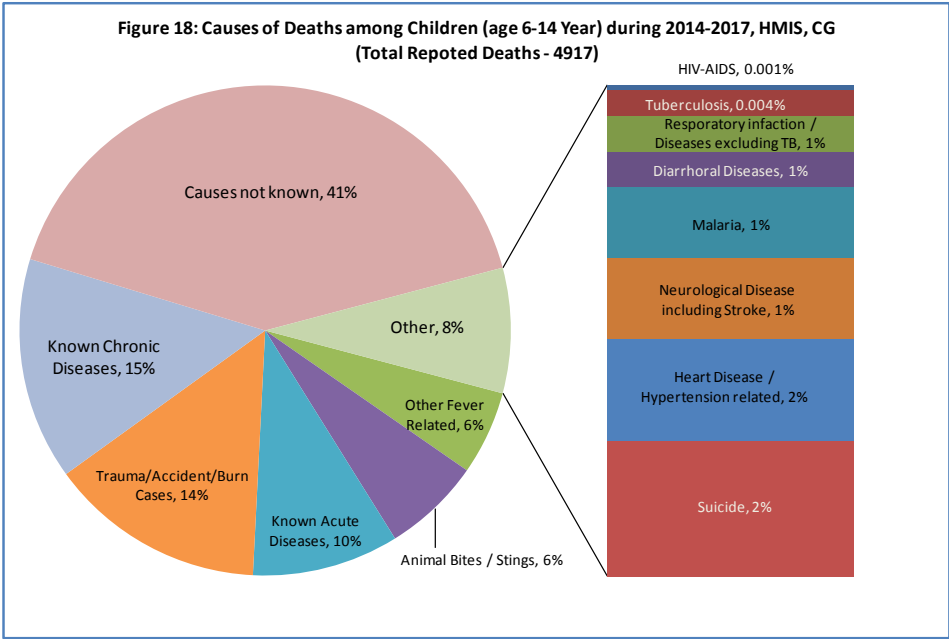
Table 17 provides number of deaths due to various causes in different age categories in Chhattisgarh.

Table 17: Number of cause specific deaths by age (2014-2017) HMIS, CG				
Cause of Death	Age Group (Years)			
	6-14	15-55	Above 55	
Infection / Communicable Diseases				
Diarrhoeal Diseases	30	143	85	
Tuberculosis	21	944	460	
Respiratory infection / Diseases excluding TB	29	536	527	
Malaria	58	164	94	
Other Fever Related	272	1315	789	
HIV-AIDS	5	112	28	
Non-Communicable Diseases				
Heart Disease / Hypertension related	84	4034	4646	
Neurological Disease including Stroke	67	774	591	
Accidental Causes				
Trauma/Accident/Burn Cases	701	8343	1670	
Suicide	111	6020	787	
Animal Bites / Stings	318	1405	767	
Acute / Chronic / Unknown Causes				
Known Acute Diseases	476	6461	7742	
Known Chronic Diseases	720	11643	23092	
Causes not known	2025	25394	70508	

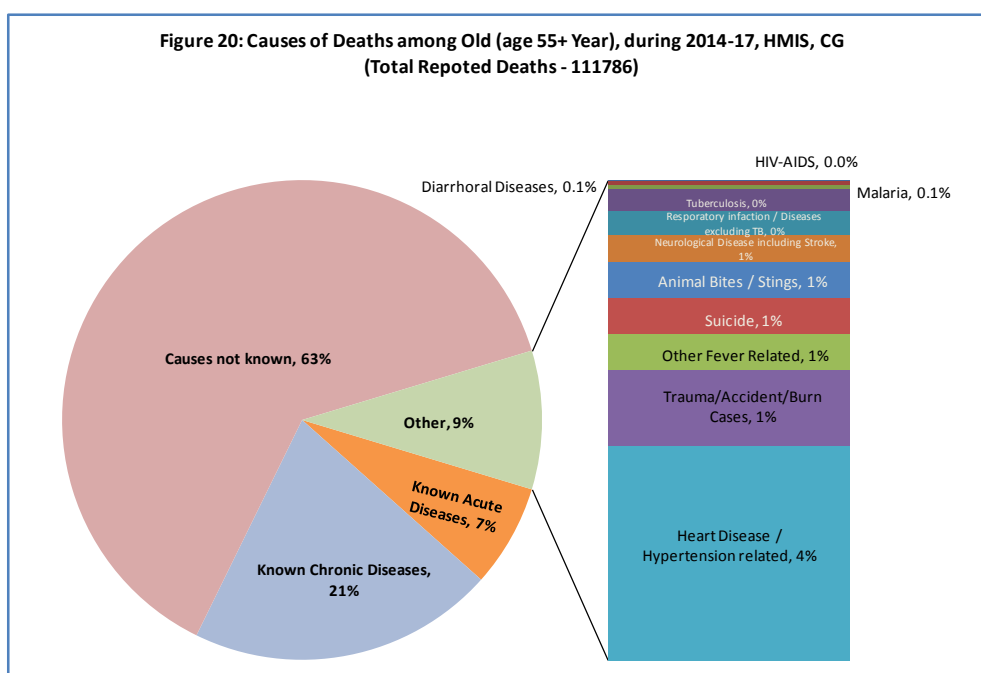
It is observed that deaths reporting due to unknown causes are highest in the entire age category, which reflects inadequate system for medical certification of causes of deaths. Nearly nine percent deaths are due to suicide and 12 deaths are due to trauma accident and burn in the age group of 15-55 years. In the age group of 55 year and above, four percent deaths are attributed to causes related to hypertension / heart disease and one-third deaths

are due to acute chronic diseases. Figures 18, 19 and 20 provide percent distribution of all the deaths due to different causes.

It is observed that in the age group 6-14 years, unknown causes accounts for 41 percent of all the deaths. Proportion of deaths due to unknown causes is 38 percent and 63 percent in 15-55 years and above 55 years age category respectively.



It is noted that apart from unknown causes, known chronic diseases (15 percent), trauma/accident/burns and known acute diseases (10 percent) and animal bites/sting (6 percent) are the major causes of deaths as reported in the young age of 6-14 years. Deaths due other causes are only 8 percent of all the deaths in this age group.



In the age category 15-55 years, majority deaths were due to known chronic diseases – 17%, trauma/accident/burns – 12%, known acute diseases – 10%. In the old age (55 years and above) major causes includes –Known chronic disease – 21%.

District wise variation in causes of death shows that in all the age categories (6-14 years, 15-55 years and 55+ years), each district has reported maximum number of deaths due to unknown causes. In the age group of 15-55 years, Balod, Bilaspur, Dhamtari, Durg, Champi-Janjgir, Mahasamund, Raigarh, Raipur and Rajnandgaon each have reported more than 200 deaths due to Hypertension during 2014-2017. More than two-thirds of deaths due to trauma/burn/accident were reported from only 10 districts in this duration. Raigarh (706), Rajnandgaon (629), Mahasamund (625) and Champa-Janjgir (526) have reported higher number of deaths due to trauma and accident. Rajnandgaon has reported 1068 deaths due to chronic diseases which is highest in the state. In the age group of 55 years and above, more than 300 deaths were reported during 2014-2017 due to hypertension in five districts - Dhamtari, Durg, Mahasamund, Champa-Janjgir and Rajnandgaon. It is seen that

number of deaths due to known acute ranges from a minimum 16 deaths in Narayanpur to Maximum 827 deaths in Rajnandgaon. Similarly deaths due to known chronic diseases in the age of 55 and above years was minimum in Bijapur (101 deaths) and maximum in Rajnandgaon (2540 deaths).

Analysis of HMIS data on causes of deaths indicates that there are large variations in reporting of cause specific deaths among districts. It is observed that more urbanized and districts with high population have reported majority deaths. However, very few deaths in the age group of 6-14 years were reported across all the districts as compared to other two age categories. Further, majority deaths are grouped as causes not known, which shows lack of mechanism to assign cause of death for medical certification.

8. Facility level morbidity and mortality reporting

Since 2017-18, monthly HMIS reporting has been revised with respect to health services, morbidity and mortality. Facility level monthly HMIS data provides valuable information regarding morbidity and mortality at individual health facility. As per HMIS guidelines, all the morbidity and mortality events at DH, SDH and CHC is to be reported for facility only, whereas morbidity and mortality reporting at PHC and SHC need to be reported for respective health facility as well as catchments areas.

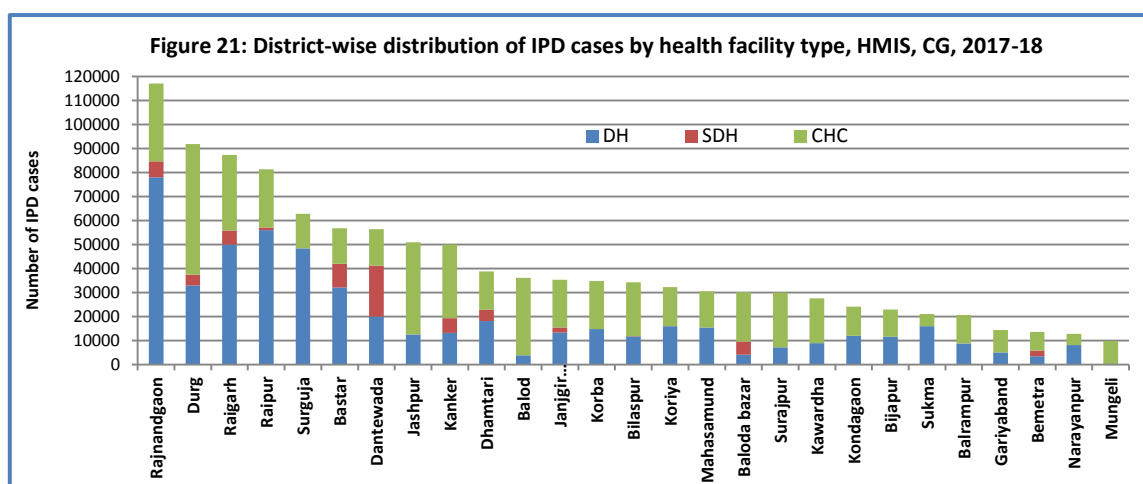
8.1 OPD and IPD reporting at health facility:

In all there were 5342 public health facilities that have reported OPD cases and 258 health facilities have reported IPD cases in the HMIS during 2017-18. SHCs and PHCs have not reported any IPD patients. Table 18 shows district-wise distribution of total number of OPD across facility type. In all 1.36 crore OPD cases reported during 2017-18. Number of OPD cases was highest (13.9 lakh) in Durg district followed by Rajnandgaon (10.2 lakh), while Sukma (1.32 lakh) and Mungeli (1.38 lakh) have reported lowest number of OPD cases. It is seen that in Korba half of all the OPD cases were reported by SHCs, in Durg 69 percent OPD cases were reported by CHCs, in Dantewada 48 percent OPD cases were reported by SDHs and in Surguja 58 percent OPD cases were reported by the DH. In Chhattisgarh there were 1123995 IPD cases reported in HMIS. There were 486760 male and 637235 female IPD cases. Figure 21 shows the district-wise distribution of number of IPD

cases by health facility type. In Surguja and Sukma districts more than three-fourths IPD cases were reported by DH.

Table 18: District wise total number of OPD cases by health facility type (2017-18), HMIS, CG,

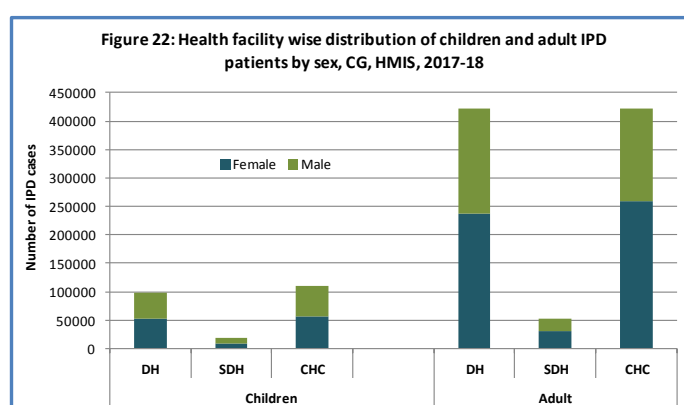
District	SHC	PHC	CHC	SDH	DH	Total
Baloda bazar	86485	8591	186530	92946	80894	455446
Balod	138616	--	268577	--	67664	474857
Balrampur	100483	6002	136928	--	59327	302740
Bastar	164617	3105	108746	65637	200727	542832
Bemetra	30364	811	125223	36716	54483	247597
Bijapur	70576	4538	119687	--	102865	297666
Bilaspur	97738	1558	243771	815	195069	538951
Dantewada	40918	5292	101048	243837	121210	512305
Dhamtari	143789	16849	193557	68305	117451	539951
Durg	65772	3072	962017	142223	219743	1392827
Gariyaband	160952	10750	155443	--	54211	381356
Janjgir champa	65457	15975	225307	21973	76847	405559
Jashpur	131489	9592	310950	--	130829	582860
Kanker	177804	25923	231459	42008	114921	592115
Kawardha	115371	13186	129199	--	80948	338704
Kondagaon	154851	--	112631	0	53995	321477
Korba	403139	46543	243524	--	114729	807935
Koriya	56447	7971	152425	--	122447	339290
Mahasamund	216450	31380	155813	--	95209	498852
Mungeli	47655	1566	88788	0	--	138009
Narayanpur	55569	1991	92117	--	55275	204952
Raigarh	250668	29146	239034	67634	222883	809365
Raipur	135708	--	331930	23924	366050	857612
Rajnandgaon	145848	17871	381124	62531	408503	1015877
Sukma	46924	1274	38052	--	45954	132204
Surajpur	48043	5532	195336	--	117634	366545
Surguja	86719	--	135793	--	305260	527772
Total	3238452	268518	5665009	868549	3585128	13625656



In Balod, Jashpur and Surajpur districts more than three-fourths IPD cases were reported by CHCs. In Mungeli all the IPD cases were reported by CHC.

It was observed that not all the health facilities have reported OPD and IPD in HMIS during 2017-18 in Chhattisgarh. It is noted that 343 health facilities (SHC-289, PHC-37, SDH-9, CHC-8) have not reported any OPD and 17 health facilities (CHC-8, SDH-9) have not reported any IPD cases. In case of OPD, maximum non-reporting health facilities were in Champa-Janjgir (83) followed by Surajpur (55) and Bilaspur (52). It is found that 5481 health facilities have reported allopathic OPD and 378 health facilities have reported AYUSH OPD during 2017-18. It is noted that 346 health facilities have not reported any allopathic OPD, while 4560 health facilities have reported no AYUSH OPD. There were 350589 patient treated in AYUSH OPD and 13275107 allopathic OPD patients were treated at various health facilities in 2017-18.

Figure 22 shows the health-facility wise distribution of IPD patients by gender and age. There were 227501 children below age 18 years and 896494 adults admitted in the health institutions. There were 6333 more female children admitted than male children (110584), whereas for adults, 186808 more females than males (369843) admitted as in-patients. All the districts have reported more female IPD than male IPD cases except Surguja district.



There were 20 health facilities (CHC-9 and SDH-11) who have not reported male IPD cases and 17 health facilities (CHC-8 and SDH-9) who have not reported female IPD during 2017-18 in HMIS.

It is pertinent that majority health institutions have been reporting OPD and IPD cases in Chhattisgarh. However, non-reporting of IPD cases by SHCs and PHCs in HMIS need urgent scrutiny. A number of SHCs and PHCs functioning as delivery point in the state and misreporting or non-reporting of OPD and IPD need to be addressed properly. State and district data officers should monitor completeness of HMIS data reporting.

8.2 Death reporting at facility level:

With the introduction of new HMIS format in 2017, important data about deaths at the health facility level is now available. Data analysed for 2017-18 indicate that there are large variation in the reporting of deaths at health facility level in the state. Table 19 provides distribution of various health facilities by number of deaths reported during 2017-18. Nearly one-fourth of all the health institutions have reported zero deaths in HMIS and 22 percent

Table 19: Distribution of health facilities by number of deaths reported (2017-18), HMIS, CG

Number of deaths	Health Facility Type					Total
	SHC	PHC	CHC	SDH	DH/MC	
0	1261	102	91	24	7	1485
1-5	1124	92	48	2	2	1268
6-10	674	53	17	1	1	746
11-15	575	58	8	1	--	642
16-20	436	47	6	2	--	491
>20	889	117	23	4	21	1054
Total	4959	469	193	34	31	5686

institutions have reported 1-5 deaths during 2017-18. About 25 percent SHCs and 22 percent PHCs have not reported any deaths during this period. It is noteworthy that SHCs and PHCs are expected to report all the deaths occurring in their catchments as well as at the health institution itself. In all

64592 deaths have been reported by the different health institutions across districts. Raigarh has reported maximum 6420 deaths followed by 5784 deaths by Rajnandgaon district. Narayanpur district has reported only 315 deaths during 2017-18. It is seen that almost all the deaths in Raipur have been reported by SHCs. In Balod, Bastar and Bilaspur districts more than 90 percent all deaths were reported by SHCs (Table 20). District Hospital Raigarh has reported maximum 1304 deaths at health facility level amongst all the DHs.

Table 20: Number of deaths reported by facility type and district, HMIS, 2017-18 CG

Districts	Health Facility Type					Total
	SHC	PHC	CHC	SDH	DH	
Balod	3059	--	27	--	107	3193
Balodabazar	1891	414	110	0	1	2416
Balrampur	868	52	25	--	33	978
Bastar	1868	53	34	28	0	1983
Bemetra	388	75	58	16	22	559
Bijapur	441	71	2	--	222	736
Bilaspur	3499	134	84	0	40	3757
Dantewada	779	123	0	41	309	1252
Dhamtari	2910	522	53	31	322	3838
Durg	1451	97	129	1	459	2137
Gariyaband	2107	185	133	--	48	2473
Janjgir champa	2129	590	95	10	292	3116
Jashpur	1652	162	381	--	146	2341
Kanker	2614	466	86	82	227	3475

Table 20: Number of deaths reported by facility type and district, HMIS, 2017-18 CG

Districts	Health Facility Type					Total
	SHC	PHC	CHC	SDH	DH	
Kawardha	725	104	13	--	169	1011
Kondagaon	2049	--	52	0	312	2413
Korba	895	115	52	--	5	1067
Koriya	1059	226	16	--	380	1681
Mahasamund	3668	745	73	--	309	4795
Mungeli	769	62	2	0	--	833
Narayanpur	125	5	2	--	183	315
Raigarh	4243	660	195	16	1304	6418
Raipur	2969	--	15	0	0	2984
Rajnandgaon	4904	744	119	13	2	5782
Sukma	566	40	4	--	104	714
Surajpur	2061	312	29	--	55	2457
Surguja	1207	--	62	--	599	1868
Total	50896	5957	1851	238	5650	64592

It is found that not all the health institutions are reporting deaths. As many as 450 health institutions (SHC-384, PHC-22, CHC-34, SDH-8 and DH-2) have not reported about deaths and have left data items blank in HMIS reporting. Further, it is found that in Jashpur district 65 health institutions and in Durg 61 health institutions have not reported any death at all. In Kanker, Narayanpur, Bastar, Mahasamund, Balodabazar, Dhamtari, Mungeli and Kawardha less than five health facilities did not report about deaths during 2017-18.

Analysis shows variation in reported number of deaths in different age categories by various health institutions in Chhattisgarh. Out of 4959 SHCs two-fifths have reported 1-10 infant deaths and nearly 18 SHCs have reported more than 50 deaths in 5 years and above age category. It is seen that 717 SHCs did not report about infant death while 2187 SHCs reported no infant deaths during 2017-18.

Nearly half of the PHCs have reported 1-10 infant deaths and 30 percent of PHCs have reported 1-10 deaths in 5 years and above age category. It is noted that 31 PHCs have not reported any deaths in 5 years and above age category. Among 193 CHCs, 39 CHCs did not report any deaths and left the data item blank and 71 CHCs reported no deaths in 5 years and above age category (Table 21). Data revealed that four CHCs, Holly Cross Pvt. Hospital (Jashpur), Dongargaon (Rajnandgaon), Bhanupratappur (Kanker) and BSP Sector 9 (Durg) have reported more than 20 infant deaths each during 2017-18 at the institution.

Table 21: Distribution of health facilities by number of deaths reported in different age categories by health facility type, 2017-18, HMIS, CG

	SHC			PHC			CHC			SDH/DH/MC		
	Inf	Ch.	> 5 Yr	Inf	Ch	>5 Yr	Inf	Ch	>5 Yr	Inf	Ch	>5 Yr
No reporting	717	995	486	61	93	31	48	53	39	17	16	13
0	2187	3149	1052	197	301	89	91	121	71	24	28	19
1-10	2040	814	1682	209	75	144	46	19	52	11	17	5
10-20	14	1	995	2	--	111	4	--	11	1	3	3
20-30	1	--	505	--	--	56	2	--	4	3	--	4
30-40	--	--	147	--	--	26	1	--	4	2	--	3
40-50	--	--	74	--	--	10	--	--	5	--	1	1
> 50	--	--	18	--	--	2	1	--	7	7	--	17
	4959	4959	4959	469	469	469	193	193	193	65	65	65

Inf: Infant Death, Ch: Child Death, >5 yr: Age above 5 years death

The distribution of deaths by age and type of institution shows that 4857 infant deaths were reported by SHCs and 1620 infant deaths by DH. Similarly, 1211 child deaths have been reported by SHCs and 118 child deaths by PHCs. More than forty thousand deaths have

Table 22: Number of deaths by age category and health facility type, 2017-18, HMIS, CG

	Infant	Child	Age >5 years
SHC	4857	1211	44828
PHC	539	118	5300
CHC	367	39	1445
SDH	24	9	205
DH	1620	145	3885
Total	7407	1522	55663

been reported by SHCs and 5300 deaths by PHCs of age 5 years and above (Table 22). About 40 percent

of all infant deaths were reported by 169 health facilities (DH-16, SDH-1, CHC-13, PHC-16, SHC-123).

Out of 7404 infant deaths reported in HMIS, 18.6 percent deaths were reported from seven DHs - Raigarh, Surguja, Durg, Mahasamund, Dhamtari,

Koriya and Bijapur each facility reporting more than 50 infant deaths each during 2017-18. It is observed that one-fifth of all the child deaths were reported by 35 health institutions. DH, Surguja has reported 42 child deaths during 2017-18, highest in any health facility. In all, 16 DHs have reported more than 100 deaths each in 5 years and above age category. Highest 841 deaths were reported by DH, Raigarh followed by 301 deaths by DH Durg.

Analysis shows that data on facility based reporting of deaths has many gaps. It depicts lack of medical certification of all deaths, as majority deaths are reported by SHCs and PHCs which also include deaths occurring in their catchments. Further many deaths have been categorized under 'causes not known'. The data also revealed about non-reporting of deaths by various health institutions across all the districts, prompting a thorough review of death reporting by health institutions.

9. Summary and Conclusion

The study ascertains the level of morbidity and mortality reporting in HMIS in Chhattisgarh. After launching of HMIS in 2008, there were many inconsistencies and under-reporting for various health care services at the district level. This was primarily due to lack of trained personnel at periphery level health institutions and lack of understanding about HMIS indicators among district data officers. After repeated training and orientation, reporting of majority of indicators concerning maternal and child health services - antenatal care, delivery, postnatal care, immunization and patient care services have improved. Health facility level HMIS reporting introduced since 2013, has enhanced the importance of HMIS for micro level planning and thus it became crucial to maintain the quality of HMIS reporting at district as well as health facility level.

However, adequate attention was not given to reporting of health events and vital events which are equally important to understand the prevailing health conditions in the population. The present study on morbidity and mortality reporting in HMIS underpins following observations –

- * In district consolidated monthly HMIS report there are more than 200 data items. Out of these 25 are morbidity related data items and 30 data items related to death reporting.
- * During 2014-2018 there were 69275601 OPD and 5184319 IPD cases reported in Chhattisgarh. Nearly half of all OPD cases were reported from nine districts and half of all IPD cases reported during 2014-18 were reported from eight districts. Durg district has reported maximum OPD and IPD, Sukma reported minimum.
- * Average OPD per 10000 population in Chhattisgarh during 2014-2018 was 6182 cases, whereas average number of IPD cases is 463 per 10000 population. Average OPD in Dantewada, Narayanpur, Bijapur and Durg districts is more than the district population. Mungeli has lowest OPD 3176 cases per 10000 population.
- * For every 100 male in-patients there were 146 female in-patients who were admitted in various health facilities. In all there were 2105613 males and 3078706 females admitted in the health facilities during 2014-2018. There was an increase of 38 and 40 percent in IPD cases among males and females respectively from 2014-15 to 2017-18.
- * There were slightly more number of male children than female in-patient children as reported in HMIS. In Kanker, Bijapur, Balodabazar and Balrampur districts there were more female children than male children IPD cases during 2014-18. In these districts gap in IPD cases of female and male children is more than 1000. In Surguja and Durg

districts there were more IPD of male children than female children with a gap of more than 7000 reported cases.

- * There were 2.76 lakh pregnant women suffering from anaemia (Hb<11 gm/dl) during 2014-15 which increased to more than twice (5.64 lakh) in 2017-18. Anaemia is the major morbidity condition reported followed by hypertension, severe anaemia and eclampsia among pregnant women.
- * Diarrhoea and dehydration is the most commonly occurring morbid conditions in children below 5 years of age. There were 4.94 lakh cases of diarrhoea reported during 2014-2018 among children. There were 1.02 lakh cases of reported malaria among children.
- * During 2014-15 there were 21757 new cases of RTI/STI among males and 33822 cases of females. This number has increased during 2017-18 where 24865 males and 42491 females were given treatment for RTI/STI.
- * Fifteen cases of complications due to male sterilization and 171 cases of female sterilization were reported during 2014-15. In 2017-18 there were five-fold increase in cases of complications due to male sterilization, whereas there were 227 cases of complication due to female sterilization. It may be mentioned that female sterilization is the mainstay of family planning programme in the state. Mass female sterilization camps are a regular phenomenon during winter seasons. Very few health facilities are equipped to provide limiting methods of family planning on daily or weekly basis due to shortage of skilled manpower. In such situations there could be many more cases of complications/ failures due to sterilization which is either unrecorded or unreported under HMIS.
- * There were 45431 cases of severe anaemia (Hb < 7 gm / dl) reported in 2014-15. In 2017-18 this has increased to 86661 cases of severe anaemia in Chhattisgarh. However, severe anaemia cases among tested cases has remained stable around 3.4 percent during 2014-2018. Percentage of malaria positive cases among tested cases has decreased from 5.2 in 2014-15 to 4.5 in 2017-18. There were 3.95 lakh PF positive cases of malaria and 1.38 lakh PV positive malaria cases in the state during 2017-18.
- * The HMIS data pertaining to various morbidity conditions indicate that all the districts have been reporting data continuously during 2014-2018 under HMIS. This needs to be sustained for better understanding of morbidity profile of the state and districts.
- * There were 266234 deaths reported by all the districts together during 2014-2018 in Chhattisgarh. Majority deaths were reported in 2016-17 (69917 deaths) followed by 66802 deaths in 2015-16.

- * Age distribution of deaths shows that majority of all the reported death were in the age group – above 55 years (145346 – 54%). One-fourth (89334 - 33%) deaths were in the age category of 15-55 years and about one-tenth among children upto 5 years age. In the age category 6-14 years, there were 6393 or 2.4 percent deaths reported.
- * More than half of the deaths reported in HMIS during 2014-2018 were from eight districts. Raigarh has reported the maximum number of deaths (27422) during this period. Rajnandgaon and Mahasamund have reported more than 20000 deaths each during this period.
- * A comparison of reported number of deaths during 2014-2018 in HMIS with deaths registered under civil registration system (CRS) in during 2014-2016 shows that death registration is much higher in CRS than the deaths reported in HMIS in all the districts.
- * The proportion of institutional deaths to total reported deaths is 18.4 percent in the state. In four districts more than 40 percent deaths are institutional. Bastar and Surguja have reported more than 90 percent deaths as institutional in district consolidated HMIS report for combined period of 2014-2018.
- * The proportion of infant deaths to total reported deaths was 8.2 percent for the state as a whole. In Bijapur district proportion of infant deaths in total reported deaths was 19.2 percent which was highest. In Janjgir-Champa, 3.1 percent deaths were infant deaths. Nearly half of all the infant deaths reported are concentrated in just seven districts. Raigarh has reported 2664 infant deaths. Dantewada, Raigarh and Sukma have reported more than 25 infant deaths per 1000 live births during 2014-18.
- * For the state as a whole, more than three-fifths of infants deaths were reported in neonatal period. Nearly half of all the infants die within first week of birth in the state. It was found that share of neonatal deaths in total infant deaths is very high (> 70 percent) in Raigarh, Mahasamund, Korba, Dhamtari, Rajnandgaon, Durg, Janjgir-Champa and Balod districts.
- * In Chhattisgarh, 2077 maternal deaths were reported during the years 2014-2018. Maternal deaths in Bilaspur (204), Raigarh (188) and Rajnandgaon (147) accounts for nearly one-third of all the maternal deaths reported in the state.
- * There were 15340 deaths reported during neonatal ages (1-28 days). Out of these 8183 deaths were in early neonatal period and 7157 deaths in late neonatal period. In early neonatal ages about 44 percent reported deaths were due to low birth weight, 13 percent due to asphyxia and 5 percent due to sepsis. In late neonatal ages there were 43 percent deaths due to low birth weight, 10 percent due to asphyxia and 6 percent due to sepsis.
- * Three-fifths (2194 out of 3586) of all early neonatal deaths reported were due to LBW which occurred mainly in eight districts - Raigarh (710), Rajnandgaon (343),

Mahasumund (299), Bilaspur (181), Dhamtari (175), Kanker (168), Kondagaon (164), Gariyaband (154).

- * There were 10318 deaths of children age 1 month to 5 years during 2014-2018. Out of these, 7008 deaths were in age 1-11 months and 3310 in age 1-5 years. Bilaspur, Rajnandgaon, Kondagaon and Raigarh account for nearly 26 percent of deaths in both the age groups combined.
- * Seven districts together reported 52 percent of all the deaths due to pneumonia among children age 1-11 months and six districts had 50 percent of deaths caused by pneumonia among children age 1-5 years. Majority of deaths (67 percent) in the age group 1 month to 5 years were categorized as 'other causes', which prompt for close monitoring of assigning cause of deaths in case of children and also to incorporate more causes in the HMIS reporting.
- * In HMIS, during 2014-2017 there were 183991 death reported in Chhattisgarh in age six years and above and in CRS total 485773 deaths were registered during 2014-2016. Distribution of these deaths in HMIS shows 2.7 percent of these deaths in age 6-14 years, 36.6 percent in age 15-55 years and 60.8 percent in age 55 year and above
- * Deaths due to 'unknown causes' were reported highest in the all the age categories, which reflects inadequate mechanism for medical certification of cause of death.
- * Analysis of HMIS data reporting of 5686 health facilities revealed that all the health facilities are not reporting morbidity and mortality data. Out of total health facilities 343 health facilities have not reported any OPD and 17 health facilities have not reported any IPD for 2017-18. Champa-Janjgir, Surajpur and Bilaspur districts have more than 50 health facilities in case non-reporting of OPD.
- * Number of non-reporting institutions for male and female IPD cases was 20 and 17 respectively. None of the PHCs and SHCs has reported any IPD. Number of SHCs and PHCs which are functioning as delivery point and are not reporting OPD and IPD need proper monitoring by state and district data officers.
- * Death reporting by 5686 health facilities were found to be varying across different types of health institutions. One-fourth of all the health facilities have reported no deaths during 2017-18. About 25 percent SHCs and 22 percent PHCs have not reported any death. In Raipur almost all the deaths have been reported by SHCs and in Balod, Bastar and Bilaspur districts nearly 90 of all the deaths have been reported by SHCs.
- * As many as 450 health facilities have not reported about deaths occurring at the health facilities or in their catchment areas and have left data item blank in HMIS reporting.

Analysis of morbidity and mortality reporting at district as well as individual health facility level has found systemic gaps. At one hand many districts and health facilities are not reporting all the morbidity and mortality data and on the other, individual health facilities have been reporting very high cases of morbidity and mortality. Both the situations prompt close monitoring of reporting of data. Many morbidity conditions reported as 'other causes' and deaths due to 'cause not known' also indicate need for inclusion of categories of different morbidity conditions and causes of deaths in the reporting formats.

The study suggests morbidity and mortality data, which constitute nearly half of all the data items, in HMIS reporting needs monitoring and supervision for completeness. State and district data officers and programme managers need to be oriented for analysis and scrutiny of these crucial data.

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