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AVAILABILITY AND ACCESSIBILITY OF HEALTH CARE INFRASTRUCTURE IN HARYANA AND GUJARAT: A COMPARATIVE STUDY

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Abstract

The present paper explores the pattern of availability and accessibility of health care facilities in Haryana and Gujarat, the economically most advanced states of India. Gujarat is industrially developed while Haryana is agriculturally advanced state. Despite this, both the states are not bracketed among the states recording high level in other indicators of social well-being or maternal and child health, witnessed from the National Family Health Surveys and District Level Health Surveys. In this study, the availability of various levels of health care facilities has been studied by taking population facility ratio. This has been examined as per the national health policy norms of the Government of India. Accessibility of health care infrastructure has been measured with reference to area served by particular facility. The availability of manpower, particularly doctors and lady doctors in health care facilities vis-à-vis their requirement has been examined. The study also presents a composite index of health care infrastructure which is a combination of availability, accessibility and manpower in health services in both the states. The paper reveals that both the states though economically prosperous, lag behind in provision of health infrastructure vis-à-vis national health policy norms of its provision. The study also highlights the levels in the provision of health infrastructural facilities at district level in both the states.

Introduction

Availability and accessibility of health care infrastructure is related to well-being of population. Through this infrastructure, the programmes of preventive and curative nature are implemented. It is a well-known fact that prior to advancements in medical technology, even a minor illness used to take a heavy toll of life. The two decades, i.e. 1901 to 1911 and 1911 to 1921 are living example of this phenomena in India, which is evident from the negative growth rate of population due to high death rate of population associated with non-availability of basic curative health care

facilities even during minor illnesses. The availability of health care infrastructure in itself cannot be undermined. Hence, the availability and accessibility of health care infrastructure is crucial in determining the health status of population, particularly of women and children. It may also be noted that India has managed to improve its maternal and child health through its well-developed and thoughtfully structured health care infrastructure only.

Recognizing the significance of health care infrastructure, the Government of India constituted various committees on health like

Bhore Committee (1946), Mudaliar Committee (1969), Shirivastva Committee (1975) which visualized the integration of curative and preventive care through creation of primary health centres. The recommendations of these committees have led to formulation of National Health Policy in 1983 which devised certain norms of spatial provision and organization of health care infrastructure. Later, these norms have been revised from time to time in order to strengthen the rural health care in the country. Though, India has made considerable progress in health care infrastructure under National Rural Health Mission, yet the improvement has been quite uneven across regions with large-scale inter-state variations (Barua et al. 2003; Baru et al. 2010; Kumar et al. 2013). Further, the accessibility of health-care services is also extremely limited in many rural areas and backward regions of the country. A review of studies suggest that only 20 per cent of hospital beds are found in rural areas while 70 per cent of India's population resides there (Bhandari and Dutta, 2007). However, all over the world the studies by notable economists have shown that income is the primary determinant of health in poor and developing countries (Deaton, 2001; 2002; 2003). These studies have also shown that the low qualities of public facilities do have an adverse impact on the health status of population (Deaton and Paxson, 1998; Banerjee et al., 2004).

Gujarat is one of the most industrialized states of India, while Haryana is agriculturally most developed state of country. Both the states too have similarity in demographic parameters such as the birth and death rate, literacy rate and urbanization. The latest National Health and Family Survey (NFHS), however, reveals that these economically developed states are not bracketed among the states having better child and women health. The performance of both the states on these accounts is dismal. Infant

mortality rate (IMR) in both the states hover around 42 per thousand live births, which is quite high as compared to 11 in Kerala. There is also a significant disparity in child nutrition, their immunization, maternal mortality, and other parameters of women and child health across the states. Since these parameters are strongly affected by the availability and accessibility of health care facilities, it would be interesting to study the availability of health care infrastructural facilities (HCFs) in these two economically developed states of India. Hence, the present study relates to two states of India namely Haryana and Gujarat.

Objectives

The major objectives of the present study are:

- To study the levels of availability and accessibility of health care infrastructure in Haryana and Gujarat vis-à-vis national norms.
- To highlight which state is better served in terms of provision of health care facilities.

Study Area

A brief introduction of study area may be helpful in understanding the health care provision in both the states. Haryana has 2.0 per cent of country's population, whereas Gujarat is 10th most populated state with about 5 per cent of India's total population. In Gujarat, about 7.0 per cent population is scheduled caste (SC) and 15 per cent population belongs to scheduled tribe (ST). The significance of describing ST population is due to the fact that the national norm of provision of health care infrastructure is different for plain areas, hilly areas and tribal areas. In Gujarat out of 26 districts, 12 are tribal districts (Fig. 1). Among these 12 tribal districts, three districts namely The Dangs, Tapi and Narmada are where more than 80 per cent

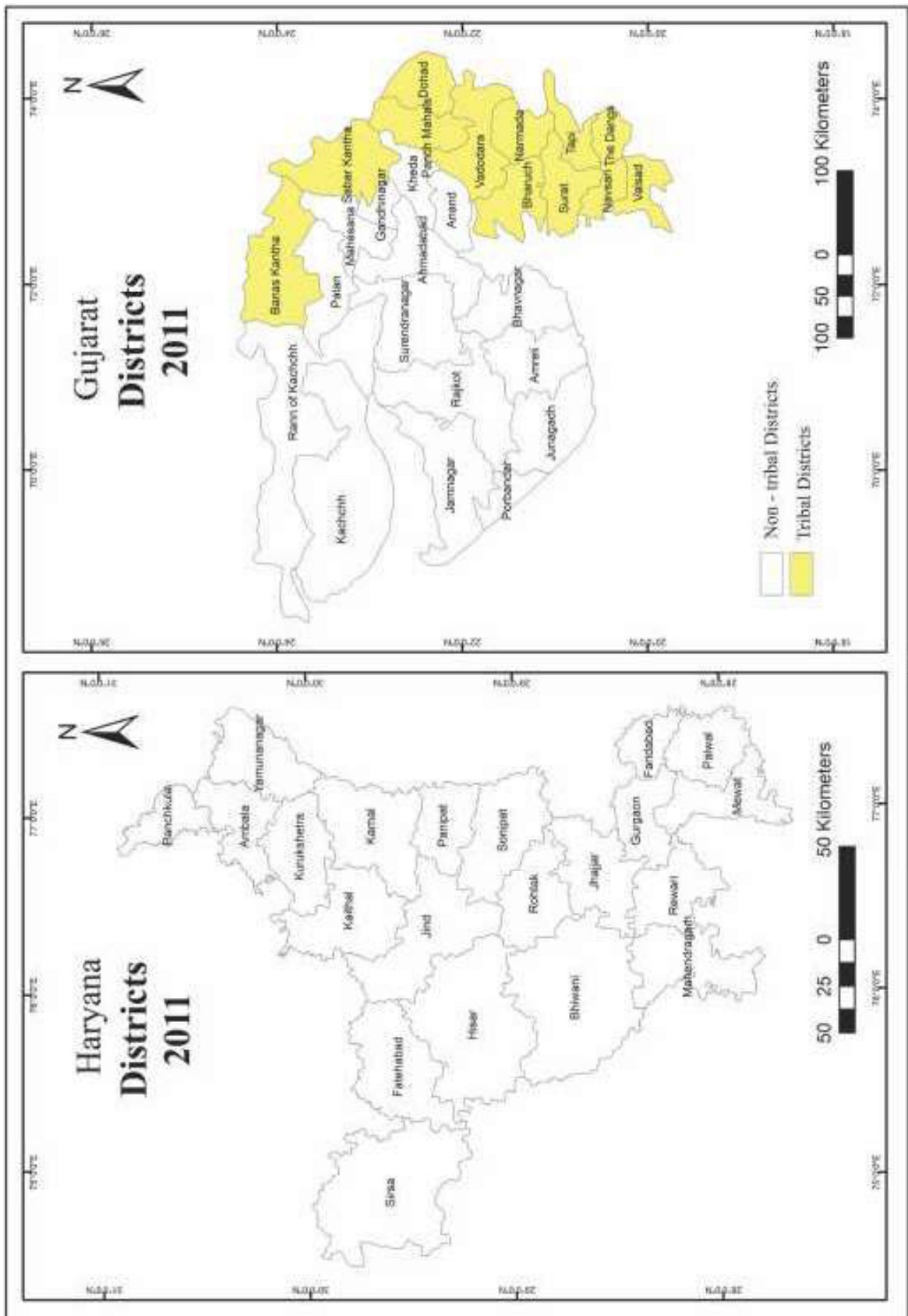


Fig. 1

population is tribal. In remaining districts, proportion of tribal population ranges between 50 to 72 per cent. In Haryana, though the scheduled caste population comprise of 20 per cent of the total, ST population is conspicuous by its absence. As far as literacy is concerned, both the states have almost equal levels of 78 per cent in Gujarat and 76 per cent in Haryana. Likewise, there are similarities in literacy rate in rural and urban areas of both the states. Similarly, in male literacy both the states have equal levels. However, in terms of female literacy, Gujarat is little better placed (69.7 per cent) as compared to Haryana (66.0 per cent).

Database and Methodology

The study is based on secondary sources of data mainly derived from health information statistics of both the states. The reference year is 2011-12. Population data have been obtained from Census of India for the year 2011 for both the states. Other relevant data, for both the states have been obtained from District Level Household and Facility Survey (DLHS-3) for the year 2007-08, conducted by International Institute for Population Science, Mumbai, Ministry of Health and Family Welfare, Government of India, New Delhi, 2010.

The availability of health care infrastructure has been measured as population facility ratio. Population per health sub-center, per Primary Health Center (PHC), per Community Health Center (CHC) and per hospital has been taken as measures for availability of health facilities. The results have been also compared with the norms laid down under National Health Policy 1983. It may be noted that National Health Policy of 1983 has been revised in 2002, but the norms of provision of different health care facilities remained unchanged. Therefore, it has been compared vis-à-vis norms laid down under NHP of 1983. Accessibility has been described

by various authors in three forms i.e. physical accessibility, social accessibility and economic accessibility (Phillips, 1990). Physical accessibility refers to reach of health care facility in terms of distance. Social accessibility may be described as its access to all without any social discrimination, i.e. across various social groups. Economic accessibility relates its reach in terms of affordability. In the present study, physical accessibility of health care infrastructure has been computed i.e. area served per health care facility. Social and economic accessibilities have not been computed due to non-availability of secondary data for both the states.

The inter-district variation among all the above stated variables of availability and accessibility has been studied by coefficient of variation (CV) which describes the spread and amount of variability from mean. The variation has been captured in percentage and hence, has the advantage of comparing different data sets. Mathematically, it is expressed as the standard deviation divided by mean and multiplied by 100. The lower value of CV represents less inter-district variation, while the higher value reveals high inter-district variation from mean.

A composite picture of availability and accessibility of health care infrastructure has been studied by preparing a composite index in terms of rank score of health infrastructure. For computing this index, the variable such as population per PHC, population per CHC, population per health sub-centre, area served per CHC, area served per PHC, per cent medical officers and lady medical officer in PHCs against the required have been taken into account. All the districts have been ranked for each variable individually whereby rank first or one is given to the district where availability is best and the second, third or next higher rank is assigned to the district where population burden per facility is higher. After ranking all

the variables, the rank of each district was added which gave a composite score of that district. Thus, the minimum score represents the best district in terms of provision of health care infrastructure and vice-versa.

Results and Discussion

I. Availability of Health Care Infrastructure in Haryana and Gujarat

(i) Availability of Health Sub-centre vis-a-vis National Norms

In the spatial organization of health infrastructure, health sub-centre is the basic and most peripheral set up. The basic purpose of health sub-centre is largely to provide preventive, promotive and a basic level of curative care. As per National Health Policy (GOI, 1983), all the states have reorganized their health care infrastructure. According to national norms there must be one Health Sub-centre for every 5,000 persons in plain areas and 3,000 persons in tribal/hilly areas of the country. Each sub-centre should be staffed with a male multipurpose health worker (MPW) and a female multipurpose health worker known as the auxiliary nurse midwife (ANM).

It has been found that in Haryana there is one health sub-centre to serve 6,700 persons (Table 1) against one health sub-centre for 4,800 persons in Gujarat (Table 2) indicating Gujarat is better served than Haryana. At aggregated level, Gujarat seems to have achieved the norms. The disaggregated picture however, captures the reality which is marked with large spatial variations as well as the fact that large numbers of districts in both states are nowhere near the national norms of provision of this facility. In Gujarat state though four tribal districts namely Surat, Valsad, Tapi and Navsari have less than 5,000 persons per sub-centre, yet none of the tribal districts meet the national norm of provision of health sub-centre, which is 3000 persons. It may be noted that in

tribal district of Banas Kantha, there are 6,411 persons against the national norms of 3000 persons per sub-centre (Table 2). The spatial pattern of availability of health sub-centre shows that eight non-tribal districts in Gujarat, meet the national norms of provision of health sub-centre which is 5,000 persons (Table 2; Fig. 2). In case of Haryana, there is only one district namely Panchkula which meets the national norm for provision of health sub-centre (Table 1). Further, a comparison of both the states in its availability of health sub-centres shows that all the districts of Haryana are more vulnerable and poorly served as compared to Gujarat state as not even a single district of Haryana surpassed the state average of persons served by one health sub-centre in Gujarat (Table 1 and 2). As far as inter-district variations are concerned, the coefficient of variation is 22 per cent in Haryana as compared to 18 per cent in Gujarat meaning thereby that at health sub-centre level, Haryana has more inter-district variations than Gujarat. Hence, Gujarat has better position than Haryana in base level rural health care infrastructure.

(ii) Availability of Primary Health Centres (PHCs) vis-a-vis National Norms

The PHC is the second tier in rural health care infrastructure. The National norm of its provision is one PHC for every 30,000 persons in plain areas and for every 20,000 persons in hilly areas. A PHC should have one or two general physicians, a Lady Health Visitor (LHV) and one or more Auxiliary Nurse Midwife (ANM). Each primary health centre should also have one medical officer or doctor, 14 para-medical staff and 4 to 6 beds.

In case of study area, the availability of PHC shows poor availability as per national norms. On an average, there are 58,800 persons per PHC in Haryana while in Gujarat it is 52,200 persons per PHC (Table 1 and 2) again

Table 1
Haryana: Availability and Accessibility of Health Care Infrastructure, 2011-12

District	Persons/Health Sub-Centre	Persons/PHC	Persons/CHC	Persons/Hospital	Area/PHC	Area/CHC	Per cent Doctors/PHCs	Per cent Lady Doctors/PHCs
Mahendergarh	7,663	38,420	1,84,418	9,22,088	79	380	58	16
Bhiwani	6,136	41,909	2,72,408	2,04,306	123	796	67	11
Jhajjar	5,814	43,564	2,39,601	3,19,468	83	459	100	08
Kurukshetra	6,406	45,936	2,41,164	9,64,655	73	383	100	36
Kaithal	5,822	48,832	2,14,861	10,74,304	105	463	69	38
Jind	6,510	49,413	2,22,359	4,44,717	100	450	8	08
Hisar	5,952	49,827	2,17,991	2,49,133	114	498	82	35
Sonapat	6,190	50,000	2,41,667	7,25,001	73	354	91	33
Rohtak	5,443	50,534	1,76,867	1,32,651	83	291	92	67
Rewari	6,233	52,961	1,80,066	3,00,111	94	319	100	09
Sirsa	6,685	53,966	3,23,797	4,31,730	178	1,069	86	00
Fatehabad	7,193	58,876	3,14,004	4,71,006	159	846	55	36
Karnal	7,451	60,213	3,01,065	7,52,662	101	504	77	59
Panchkula	4,864	62,366	2,80,647	2,80,647	100	449	89	100
Ambala	6,276	66,374	3,76,117	2,25,670	93	525	100	42
Yamunanagar	6,679	67,459	3,03,551	3,03,551	98	442	92	39
Palwal	10,335	74,479	3,47,569	10,42,708	97	453	78	11
Panipat	7,226	75,340	6,02,719	6,02,719	79	634	69	31
Mewat	11,490	83,790	3,63,088	10,89,263	116	502	50	08
Gurgaon	6,650	1,26,203	5,14,432	2,52,405	105	1,258	78	44
Faridabad	6,507	1,80,973	18,09,733	4,52,433	74	741	78	11
Haryana	6,698	58,820	2,94,784	3,67,413	103	514	77	31
Coefficient of Variation	22.19	49.61	102.82	59.9	26.36	44.24	28.39	82.26

Source: 1. "Statistical Abstract of Haryana 2012-13", Department of Economic and Statistical Analysis Haryana, Chandigarh 2014.
2. DLHS-3: District Level Household and Facility Survey, IIPS, Mumbai, 2007-08.

Table 2
Gujarat: Availability and Accessibility of Health Care Infrastructure, 2011-12

Districts	Persons/Health Sub-Centre	Persons/PHC	Persons/CHC	Persons/Hospital	Area/PHC	Area/CHC	Per cent Doctors/PHCs	Per cent Lady Doctors/PHCs
Mahesana	5,280	39,136	1,27,192	4,07,013	85	275	79	21
Patan	5,060	39,522	95,981	6,71,867	170	414	75	05
Amreli	4,565	39,847	1,08,156	5,04,730	195	528	25	04
Kheda	5,603	45,998	1,91,657	11,49,943	79	329	52	22
Anand	5,320	46,505	1,90,250	20,92,745	71	291	86	14
Junagadh	4,709	48,124	1,61,358	13,71,541	155	520	42	08
Kachhh	5,434	49,818	1,49,455	4,18,474	1,088	3,262	96	09
Surendranagar	6,297	50,179	1,46,356	5,85,423	298	869	55	00
Jamnagar	4,487	54,003	1,96,375	4,32,024	355	1,290	33	00
Gandhinagar	4,627	55,670	1,73,969	6,95,877	86	2,678	88	13
Porbandar	3,527	58,545	1,46,362	5,85,449	232	579	50	00
Bhavnagar	4,717	60,008	1,69,433	9,60,122	209	590	63	25
Rajkot	4,820	82,708	2,00,240	3,17,047	243	589	48	14
Ahmadabad	4,126	1,63,960	6,01,185	8,01,581	184	676	88	13
Total Non-tribal Districts	4943	59,918	1,87,369	6,16,615	761	243	62	12
The Dangs(T)	4,332	25,366	2,28,291	2,28,291	196	1,766	71	00
Narmada (T)	4,555	25,665	1,47,574	5,90,297	123	704	62	00
Tapi(T)	3,219	26,901	1,61,404	8,07,022	105	628	69	15
Dohad (T)	5,830	32,724	1,77,257	10,63,543	56	304	57	10
Navsari(T)	3,276	34,094	1,20,879	6,64,836	58	204	72	12
Panch Mahals(T)	5,140	35,683	1,70,770	7,96,925	78	374	45	17
Sabar Kantha(T)	4,999	35,715	1,21,430	8,09,530	109	370	75	11
Banas Kantha(T)	6,411	39,006	1,56,025	15,60,253	134	537	66	03
Valsad(T)	3,243	40,611	1,55,062	5,68,559	72	274	48	29
Bharuch (T)	5,130	40,816	1,93,877	7,75,510	171	814	81	10
Vadodara (T)	4,516	52,070	2,45,037	8,33,125	94	444	48	17
Surat(T)	3,286	1,19,242	4,34,380	20,27,107	89	325	69	15
Total Tribal Districts	4594	44,807	1,93,620	9,47,353	428	99	62	12
Gujarat	4,770	52,193	1,90,063	7,28,189	170	617	62	12
Coefficient of Variation	18.86	57.94	54.85	56.7	109.87	95.23	28.61	125.73

Source: 1. "Statistical Abstract of Gujarat 2012", Directorate of Economics and Statistics, Gujarat, Gandhinagar.
2. DLHS-3: District Level Household and Facility Survey, IIPS, Mumbai, 2007-08.

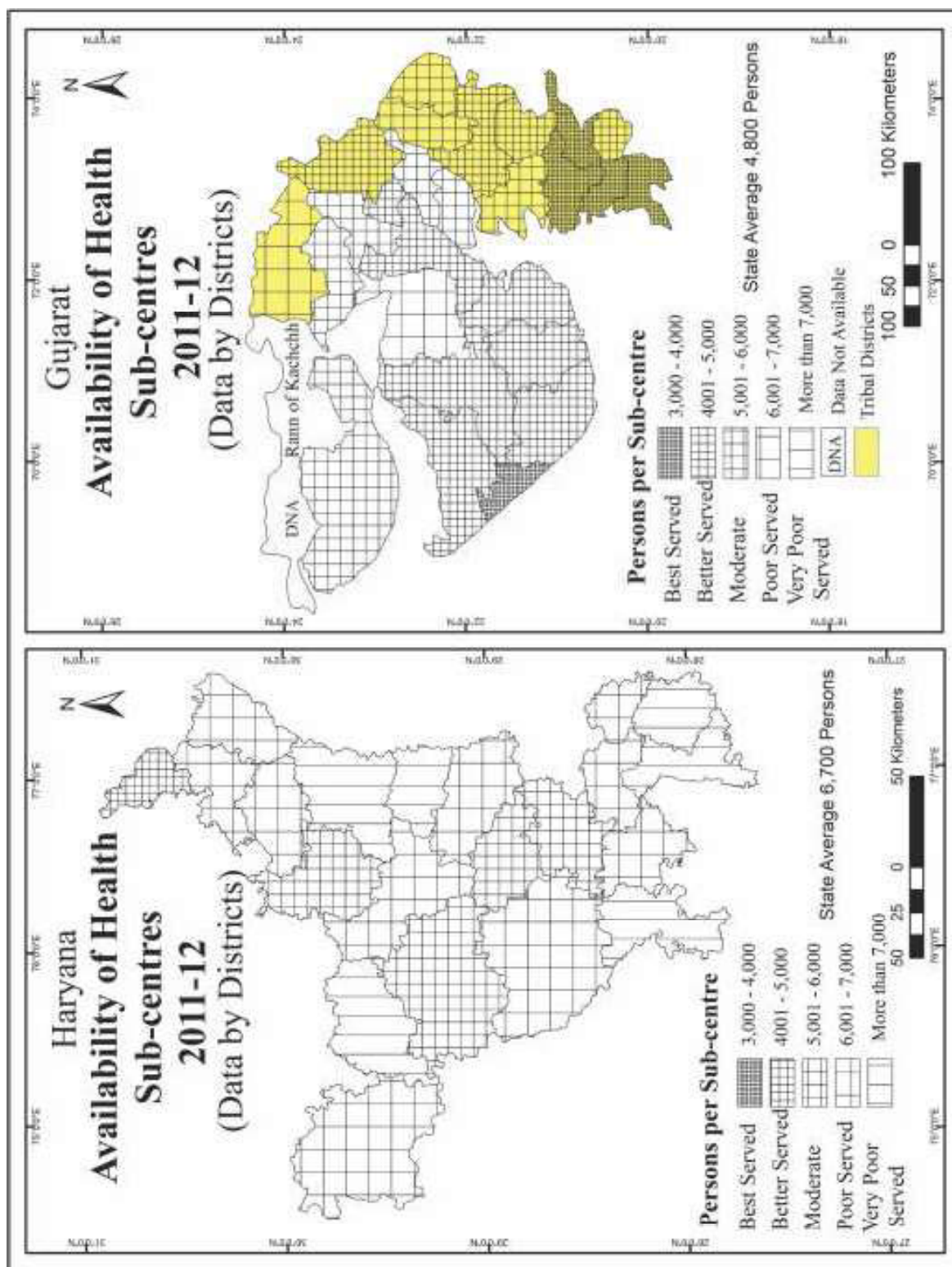


Fig. 2

Source: Computed by authors

suggesting that Gujarat is better placed. The Table 1 shows that none of the districts in Haryana has achieved the national norm of PHC provision. In northern Haryana, the districts like Yamunanagar, Panchkula and Ambala, and in western Haryana the Fatehabad and Sirsa districts, there is one PHC for every 30,000 to 50,000 persons (Fig. 3). The situation in southern districts of Haryana is more deplorable where one PHC is available for 1,81,000 persons in Faridabad.

In Gujarat state also none of the tribal and non-tribal districts have achieved the national norm related to the provision of PHC. In tribal districts, PHC population ratio is 45000 persons, while in non-tribal districts, one PHC serves about 60,000 persons. The low population PHC ratio in tribal districts is largely due to low population density in these districts. In tribal districts also, there are large inter district variations with Surat showing one PHC for more than 1,19,000 persons and in The Dangs and Narmada districts, one PHC is available for 26,000 persons (Table 2). The coefficient of variation (Table 2) in availability of PHC shows that Gujarat has more inter-district variations (58 per cent) as compared to Haryana where coefficient of variation is 50 per cent (Table 1). It suggests that in Gujarat, inter district variations are higher as compared to Haryana.

(iii) Availability of Community Health Centre (CHC)

CHC is at the top in hierarchy of rural health care infrastructure and is supposed to supervise and coordinate the activities of four PHCs. As per the national norms there should be one community health centre for every 1,20,000 persons in plain areas and for every 80,000 persons in tribal and hilly areas. There is a provision of four medical officers (Surgeon, medicine, gynecologist and pediatrician), 21

para medical staff, 30 beds, one operation theatre, X-ray facilities, labour room and lab facilities in each CHC.

The district-wise population CHC ratio of both the states has been presented in Table 1 and 2. At state level, it shows that Haryana is poorly provided with CHCs as compared to Gujarat. In Haryana, there is 2,95,000 population per CHC, while in Gujarat one CHC serves about 1,90,000 persons. None of the district in Haryana has achieved the national norm. In Gujarat, there are two non-tribal districts namely Patan and Amreli where CHC population ratio is as per national norm (Fig. 4). It may be noted that in tribal districts, CHC population ratio is higher than non-tribal districts of the state. Among non-tribal districts, Ahmadabad and Rajkot districts appear to be the most vulnerable (Table 2), while in case of tribal districts, Surat, Vadodra and The Dangs are most vulnerable and poorly served (Fig. 4). As far as inter-district is concerned, the coefficient of variation is 103 per cent in Haryana as compared to 55 per cent in Gujarat. It suggests that in case of CHC provision, there are large inter-district variations in Haryana as compared to Gujarat.

(iv) Availability of Hospitals

Hospital is the apex unit of health care infrastructure. In this paper, total hospitals i.e. all types located in both rural and urban areas are taken into account. The availability of hospitals reveals that Haryana is better placed as compared to Gujarat. On an average, Haryana has 3,70,000 population per hospital while in Gujarat it is 7,30,000 population per hospital (Table 1 and 2). The better served districts do not form any spatial pattern. The politics of location seems to operate in case of Haryana. The four better served districts are Hisar, Bhiwani, Rohtak and Ambala, where there is less than 2,50,000 population per

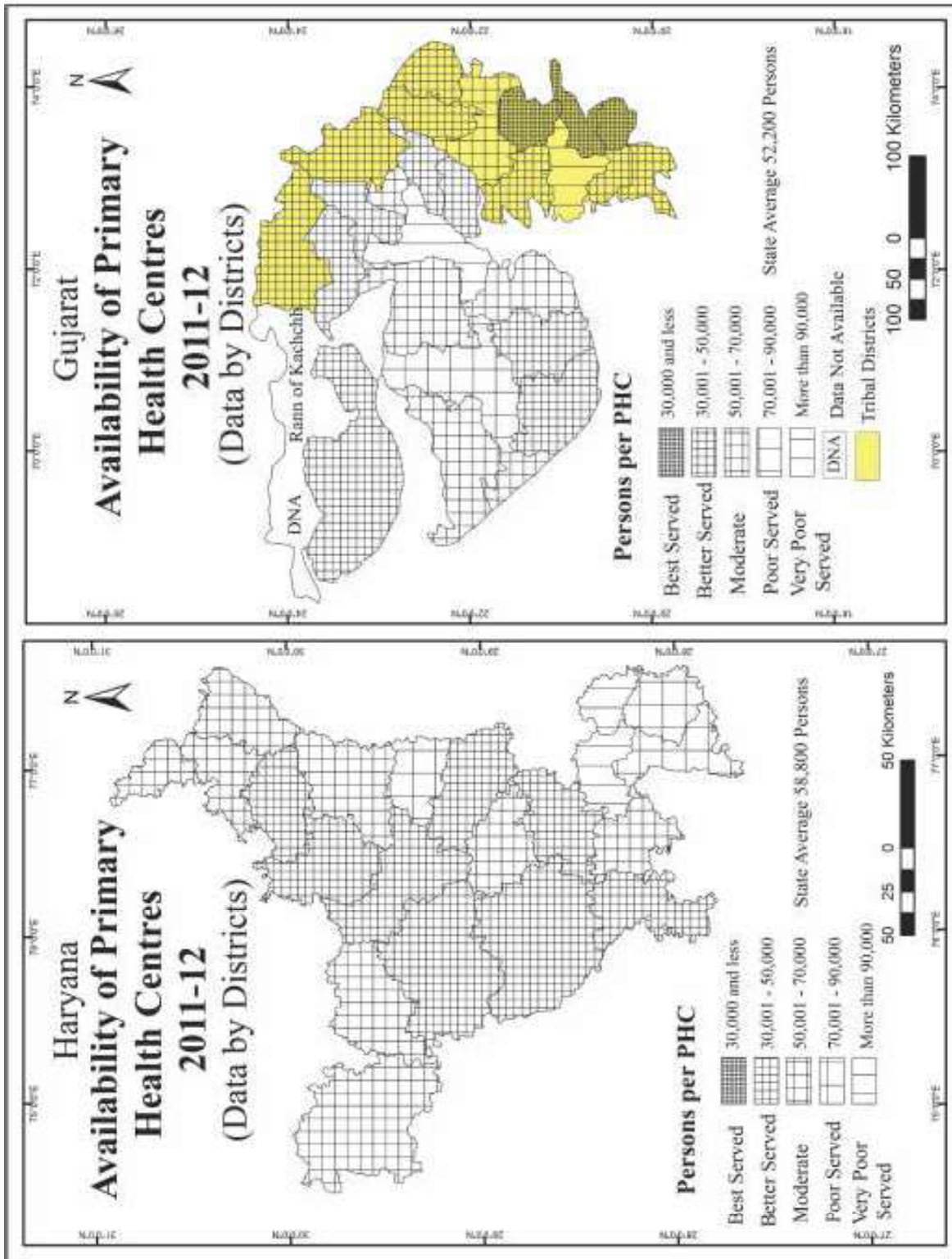


Fig.3

Source: Computed by authors

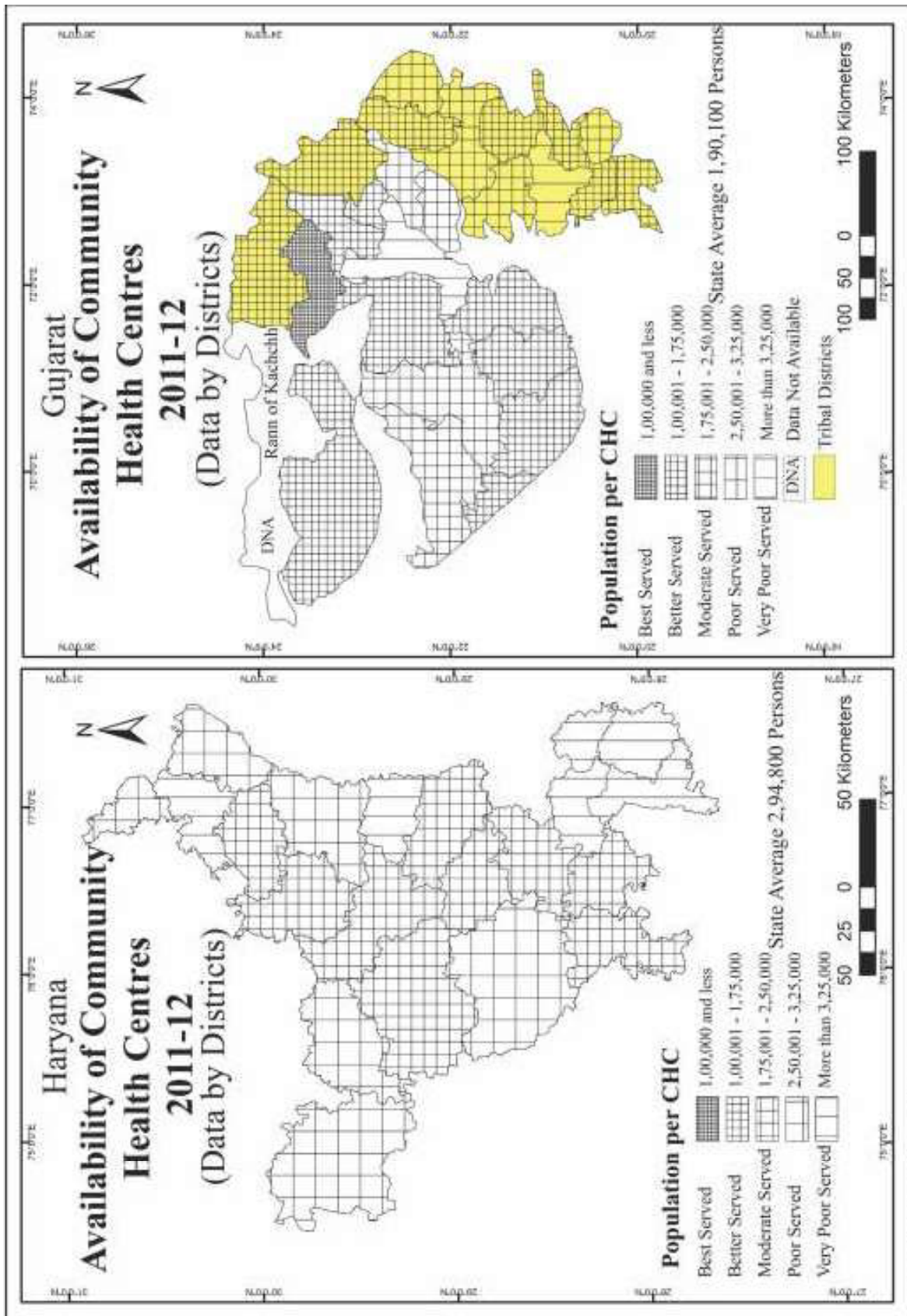


Fig. 4

Source: Computed by authors

hospital. Three of these districts Hisar, Bhiwani and Rohtak have the hometowns of earlier Chief Ministers in the state and thus enjoyed their patronage. In Gujarat state, there is only one tribal district namely The Dangs which has less than 2,50,000 population per hospital. In seven districts of Gujarat which comprise of three tribal districts (namely Banas Kantha, Surat and Dohad) and four non-tribal districts (namely Junagadh, Bhavnagar, Kheda and Anand) the availability of hospital is quite deplorable where one hospital has to cater more than 9,00,000 population (Fig. 5). The coefficient of variation reveals that inter-district variation is 60 per cent in case of Haryana and 57 per cent in case of Gujarat meaning thereby that at hospital level, both the states have almost same level of inter-district variations.

(v) Availability of Doctors

The availability of doctors is one of the important pre-requisite for the efficient functioning of the rural health services. Manpower in PHC includes one medical officer/lady medical officer, one pharmacist with the support by paramedical and other staff. The medical officer/lady medical officer of PHC is responsible to implement all activities related to reproductive and child health (RCH), national rural health mission (NRHM) and other national programs under national rural and family welfare programmes. The availability of doctors reveals that in Haryana 77 per cent doctors are in position against the sanctioned posts. In four districts of Haryana like Jhajjar, Kurukshetra, Rewari and Ambala 100 per cent doctors are in position (Table 1). On the other hand, there are districts like Jind and Mewat in which only 8 and 50 per cent doctors are in position (Table 1; Fig. 6). In case of Gujarat, the availability of doctors in PHCs was 62 per cent (Table 2). There are 7 districts

of the state, where the availability of doctors is less than 50 per cent against their requirement. It may be noted that in Gujarat none of the district has 100 per cent availability of doctors (Table 2).

(vi) Availability of Lady Doctors

The availability of lady doctor in PHCs is very essential in order to carry out the services related to reproductive health of women. The study reveals that the availability of lady doctors in PHCs is only 31 per cent in Haryana and 12 per cent in Gujarat against their requirements (Table 1 and 2). Such a low existence of lady medical officers in PHCs itself reveals pathetic situation of health facilities in the states. The spatial pattern of availability of lady doctors in PHC in both the states has been portrayed in Fig. 7. In case of Haryana, it reveals that, in southern and south-western districts of the state, namely Mahendergarh, Rewari, Mewat, Faridabad, Sirsa, Jhajjar, Bhiwani, Palwal and Jind, less than 20 per cent lady doctors are in position. It is only in Panchkula district where PHCs are 100 per cent staffed with lady doctors followed by Rohtak and Karnal districts where only 67 to 59 per cent lady doctors are serving in PHCs (Table 1). In Gujarat state, none of the district had more than 29 per cent lady doctors in position in PHCs (Table 2). It may be noted that 50 per cent of the districts in the state has 10 per cent or less lady doctors in PHCs against their requirement. In Gujarat there are tribal district like The Dangs and Narmada and non-tribal districts like Surendranagar, Jamnagar and Porbandar where not even a single lady doctor is in position in PHCs (Table 2). It may be noted that in terms of availability of PHCs and CHCs, the state is somehow better placed, but the non-availability of lady doctors suggests a completely different picture.

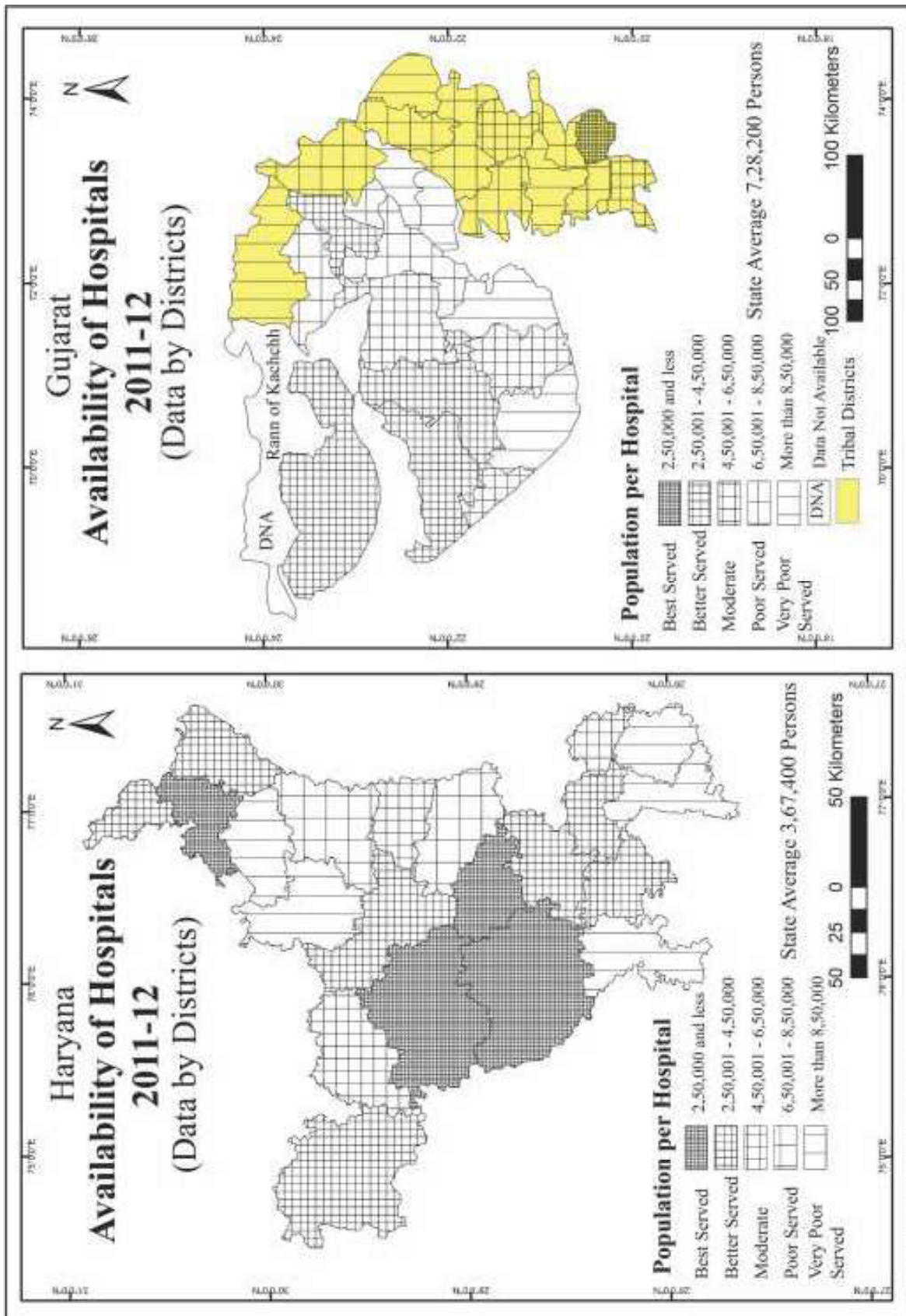


Fig. 5

Source: Computed by authors

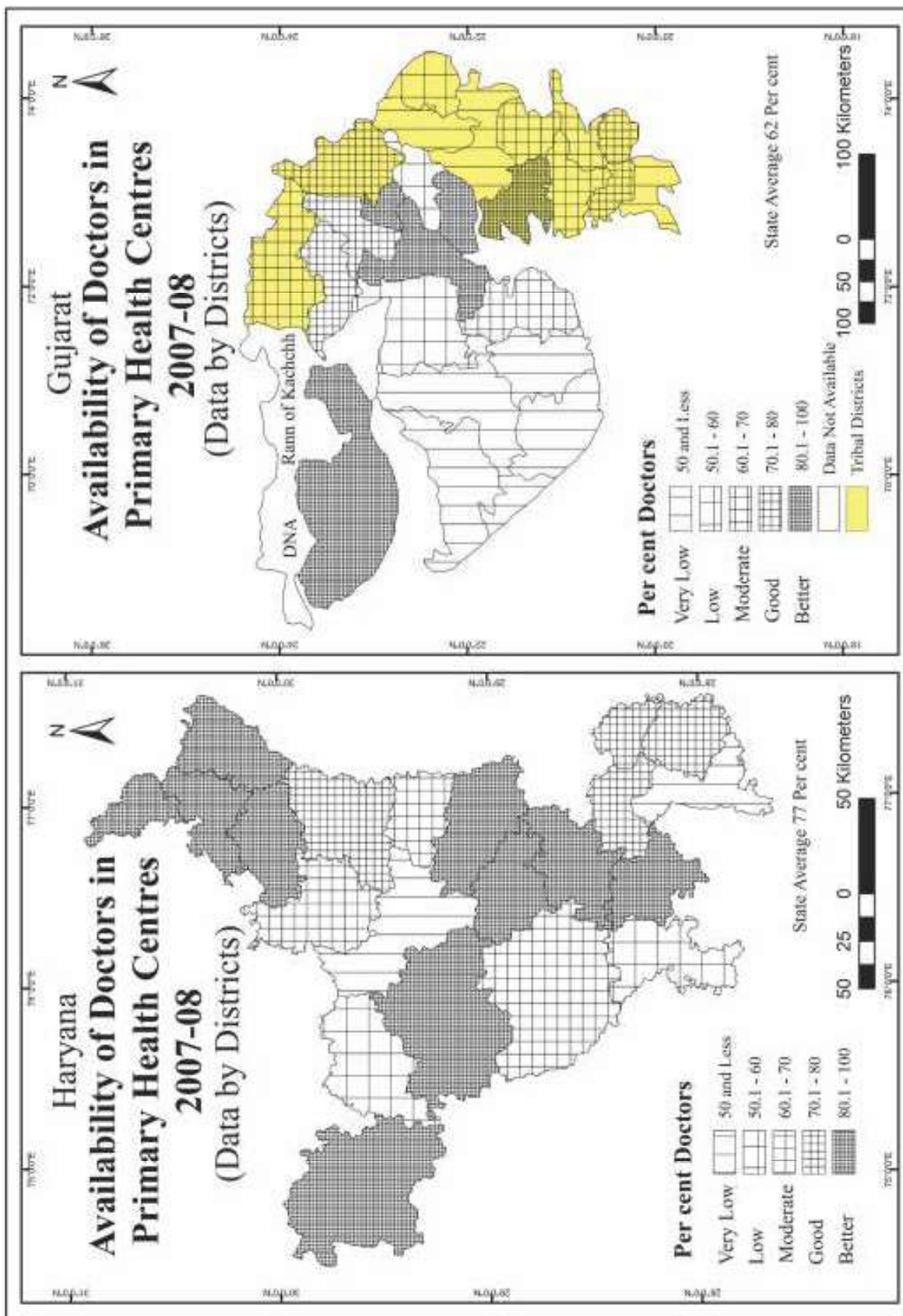


Fig. 6

Source: Computed by authors

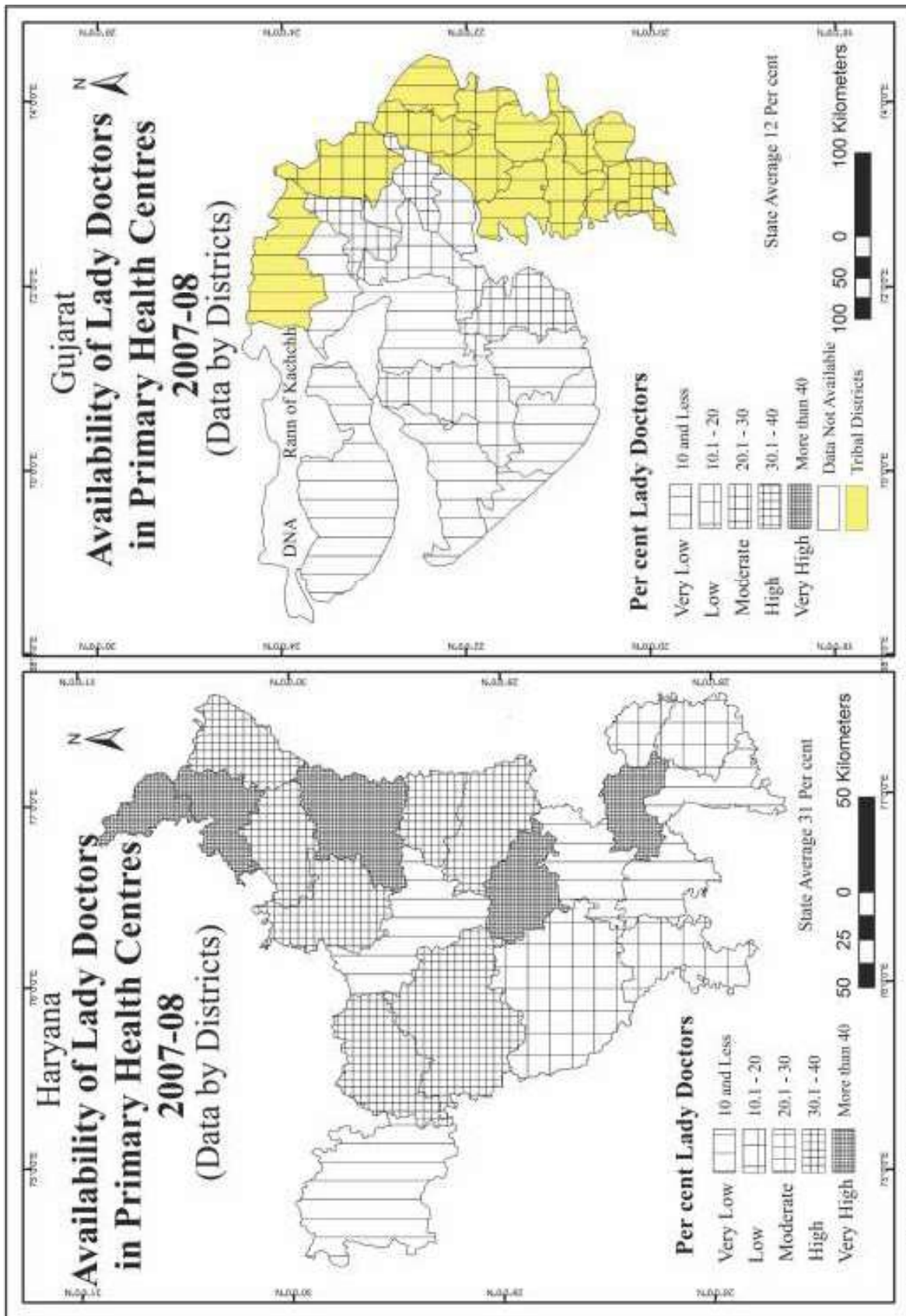


Fig. 7

Source: Computed by authors

(vii) Accessibility of CHCs and PHCs

The physical accessibility of health care facilities has been measured as area served per health care facility. Since, CHC is the major curative health care unit and referral unit of PHC, its location and access is most crucial. The physical accessibility of CHC reveals that Haryana has better physical access of CHC as compared to the state of Gujarat. In Haryana, one CHC has to serve around 514 km² of area as compared to 617 km² in Gujarat. The spatial pattern of access in Haryana reveals that in national capital region districts of Sonipat and Rohtak; in southern districts namely Mahendergarh and Rewari, and Kurukshetra district in the north, one CHC serves around 400 km² of area. In Gurgaon and Sirsa districts physical access to CHCs is very poor, where population living in more than 1,000 km² of area has to depend on single CHC.

On the other hand, six tribal districts and four non-tribal districts in Gujarat show better access with one CHC for 400 km² of area. In tribal district namely The Dangs and in three non-tribal districts of Gandhinagar, Kachchh and Jamnagar, physical access is very poor with more than 1000 km² area per CHC. The coefficient of variation of CHC access is 44 per cent in Haryana, while it is 95 per cent in case of Gujarat, suggesting wide inter-district variations in its access in Gujarat as compared with Haryana. It may be noted that in availability of CHC, Gujarat state is better than Haryana, while in physical access Haryana is far ahead of Gujarat with less inter-district variations.

PHC acts as a referral unit for every 6 health sub-centres, and its major responsibility lies in providing curative, preventive and promotive health care and family welfare services in rural areas. It also includes the delivery of reproductive and child health care services such as antenatal care and

immunization in addition to routine out patient's services. The accessibility of PHC reveals that seven districts in Haryana namely Mahendergarh, Faridabad, Sonipat, Rohtak, Panipat, Jhajjar and Kurukshetra comprising central and Southern Haryana have less than 90 km² area per PHC (Table 1). In Sirsa and Fatehabad, physical access is poor where it has to serve more than 150 km² area (Table 1). On the other hand in Gujarat one PHC serves less than 90 km² area in 4 tribal and 5 non-tribal districts. While, there is one PHC after more than 150 km² of area in 10 non-tribal and 2 tribal districts (Table 2). The coefficient of variation with regard to area per PHC is 110 per cent in Gujarat as compared to 26 per cent in Haryana (Table 1 and 2), suggesting more disparity in the PHCs services in Gujarat than Haryana.

II. Levels of Health Care Infrastructure in Haryana and Gujarat

A composite picture of availability and accessibility of health care infrastructure in Haryana and Gujarat has been computed and presented in Table 3. The composite score of all 47 districts of both the states has been categorized into five quintiles and shown in Fig. 8. The figure reveals that 5 districts of Haryana and 6 of Gujarat are categorized as best served districts. It may be noted that among these 6 districts of Gujarat, 4 are tribal districts like Navsari, Valsad, Panch Mahals and Sabarkantha and two namely Mehsana and Anand are non-tribal districts located in the southern and eastern parts of the state (Fig. 8). In the second quintile, 5 districts of Gujarat (comprising 3 non-tribal and 2 tribal districts) and 4 districts of Haryana are placed in this category. Among the most vulnerable (category of 235-301 scores) list of districts from Haryana are six in number, while three districts of Gujarat fall in this category. The analysis

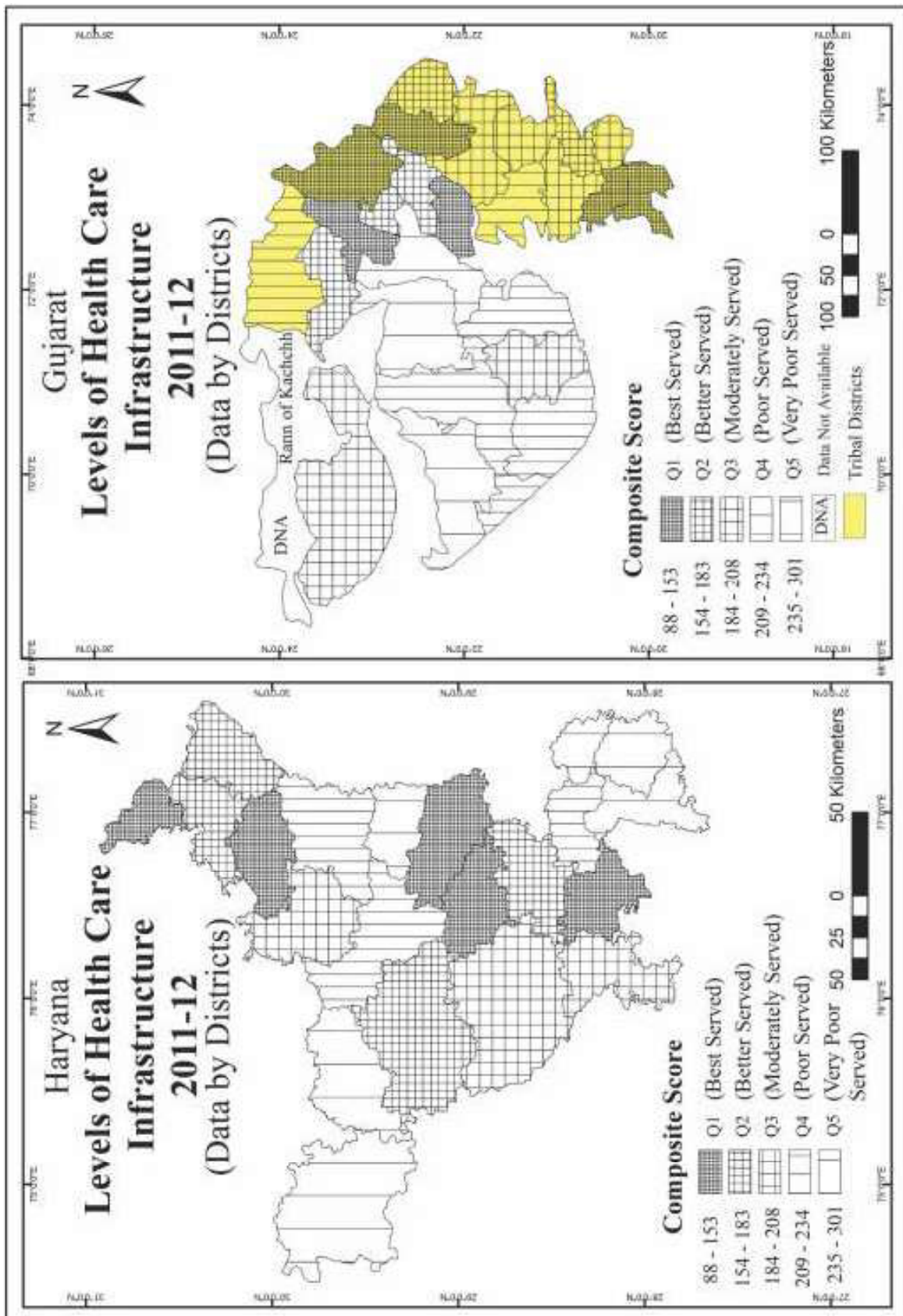


Fig. 8

Source: Computed by authors

Table 3
Haryana and Gujarat: Composite Index of Health Care Infrastructure, 2011-12

Haryana Districts	Composite Index	Gujarat Districts	Composite Index
Rohtak	95	Navsari(T)	88
Panchkula	146	Mahesana	97
Rewari	149	Valsad(T)	106
Sonipat	151	Anand	152
Kurukshetra	152	Panch Mahals(T)	152
Jhajjar	157	Sabar Kantha (T)	153
Hisar	161	Tapi(T)	156
Ambala	168	Dohad (T)	162
Yamunanagar	174	Patan	168
Mahendergarh	184	Kheda	179
Kaithal	198	Gandhinagar	183
Bhiwani	208	Narmada (T)	187
Karnal	217	The Dangs (T)	196
Gurgaon	227	Vadodara (T)	198
Jind	230	Amreli	198
Panipat	235	Kachchh	201
Faridabad	238	Surat(T)	208
Palwal	251	Bharuch (T)	210
Fatehabad	252	Bhavnagar	219
Sirsa	261	Porbandar	223
Mewat	301	Junagadh	229
		Rajkot	231
		Banas Kantha(T)	234
		Ahmadabad	237
		Surendranagar	253
		Jamnagar	258

Source: Computed by Authors

suggests that in both the states, almost 42 per cent districts come under first two categories in terms of provision of health care facilities. The variations across districts are large in both states as the composite score increases to above 200. In case of Haryana, the most vulnerable district is Mewat which stands apart. Two other districts, Sirsa and Fatehabad are located in north-western Haryana and the other forming a cluster in southern Haryana is Palwal, Faridabad, and Panipat (Fig. 8). The analysis also suggests that in case of Gujarat, the overall picture shows better availability, but it is largely due to tribal districts, which masks the vulnerable situation of health care

infrastructure of non-tribal districts. A closer picture of Gujarat reveals that Navsari (tribal district) and Mehsana, (non-tribal) have better availability of health care infrastructure, while Ahmedabad, Junagarh, Jamnagar, Surendernagar and Banas Kantha are the most vulnerable districts in terms of government health care infrastructure.

Conclusions

The analysis on availability of different levels of health care facilities in both the states reveals interesting results. At the macro level, which may be taken as state average of population and that of facility ratio, then at

times, states seems to have achieved the national norms. In case of availability of health sub-centre, the state average of Gujarat is 4,800 persons per sub-centre, yet none of the tribal districts (out of 12 tribal districts in state) is meeting the national norm of sub-centre provision. In these districts, population sub-centre ratio is 4,600. In non-tribal districts however the population sub-centre ratio is almost equal to national norm of its provision. Haryana state average in availability of health sub-centre is 6,700 persons. The spatial variations in health sub-centre availability reveals large inter-district variations in case of Haryana as compared to Gujarat.

In terms of availability of PHCs, it has been noticed that in Gujarat one PHC serves 52,000 persons against 59,000 persons being served by single PHC in Haryana, suggesting that Gujarat is better placed than Haryana in provision of PHC facility. Again, none of the tribal districts in Gujarat is meeting the national norms of PHC provision. Population PHC ratio in tribal districts is 45,000 persons while the norm is 20,000 persons. Again, the non-tribal districts of Gujarat and none of the districts in Haryana is meeting the national norm of PHC provision. The inter-district variation however, is much smaller in case of Haryana as compared to Gujarat. The analysis on availability of CHC reveals that both the states are far behind the national norm of CHC provision. Further, in the availability of CHC, Gujarat is better placed as compared to the state of Haryana with lower inter-district variations. The availability of hospitals however shows that Haryana is better equipped as compared to Gujarat. In Haryana, there is one hospital for every 3,60,000 population while in Gujarat, this ratio is 7,20,000 persons. Both the states reveal similar levels in inter-district variations.

The analysis on physical accessibility of different levels of health facilities reveals Haryana to be in advantageous position as

compared to Gujarat. As far as the availability of doctors in PHCs and CHCs is concerned, Haryana is better placed with 77 per cent medical officers in position as compared to Gujarat where 62 per cent doctors are in position. However, the presence of lady medical officers is quite pathetic in both the states. In case of Haryana only 31 per cent lady doctors are in position as compared to 12 in Gujarat.

On the whole the composite picture of the study reveals that five districts of Haryana are best served against 6 districts of Gujarat, out of which four are tribal districts. While, on account of vulnerability, 6 districts of Haryana are highly vulnerable against only 3 non-tribal districts of Gujarat. Further, the lowest composite score suggesting best served district in both the states is recorded by Navsari, a tribal district of Gujarat, while the poorest served district with highest score is Mewat of Haryana. Moreover, inter-district variations in composite scores are much more pronounced in case of Haryana as compared to Gujarat, suggesting Gujarat is better equipped than Haryana in the provision of health care infrastructure. It may also be noted that out of 6 best served districts of Gujarat, 4 districts are tribal, while no tribal district falls in the category of most vulnerable, indicating that tribal districts are better served in health care infrastructure than non-tribal districts of Gujarat.

References

- Banerjee, A., Deaton, A. and Duflo, E. 2004. Health care delivery in rural Rajasthan. *Economic and Political Weekly*, 39 (9): 944-949.
- Barua, A., Waghmare, R. and Venkiteswaran, S. 2003. Implementing reproductive and child health services in rural Maharashtra, India: a pragmatic approach. *Reproductive Health Matters*, 11 (21): 140-149.

- Baru, R., Acharya, A., Acharya, S., Kumar, A. S., and Nagaraj, K. 2010. Inequities in access to health services in India: caste, class and region. *Economic and Political Weekly*, 45(38): 49-58.
- Bhandari, L. and Dutta, S. 2007. Health infrastructure in rural India. In *India Infrastructure Report 2007*, eds., Kalra, P. and Rastogi, A., Oxford University Press, New Delhi: 265-285.
- Deaton, A. S. and Paxson, C. H. 1998. Aging and inequality in income and health. *The American Economic Review, Papers and Proceedings of the Hundred and Tenth Annual Meeting of the American Economic Association*, 88(2): 248-253.
- Deaton, A. 2001. Inequalities in income and inequality universes in health, In *The Causes and Consequences of Increasing Inequality*, Finnis Welch ed. Chicago University Press, Chicago: 285-313.
- Deaton, A. 2002. Policy implications of the gradient of health and wealth, *Health Affairs*, 21: 13-30.
- Deaton, A. 2003. Health, inequality and economic development, *Journal of Economic Literature*, XL(1):113-158.
- Kumar, C., Singh P K, and Rai, R K. 2013. Coverage gap in maternal and child health services in India: assessing trends and regional deprivation during 1992-2006. *Journal of Public Health*, 35(4): 598-606.
- Phillips, D. R. 1990. *Health and Health Care in the Third World*. Longman Scientific and Technical, New York: 334.
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