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SPATIAL EFFICIENCY OF PUBLIC HEALTH CARE CENTRES IN MYSURU CITY

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ABSTRACT

This study aimed to identify the spatial efficiencies of distribution of public health care centers in Mysuru city, focusing on the maternal and child healthcare servicesrelated to slum dwellers in Mysuru city. The present study has used both primary and secondary sources of data and used GIS software ArcMap 10 for locational analysis and to map urban primary health care centers in Mysuru city.

All the services delivered under the urban health delivery system through the Urban-PHCs andUrban-CHCs will be universal in nature, whereas the outreach services will be targeted to thetarget groups (slum dwellers and other vulnerable groups). Mysuru city has 21 PHCs and 1CHC. PHCs are providing health care facilities to people which maternal and child healthcare, immunization programs, etc.

In Mysuru city, availability of healthcare services center are unequality distributed. The location of healthcare centers, slums and their distance are influencing on utilization of healthcare services. The present study is an attempt to examine the spatial efficiency of maternal and child health care services especially provided by PHC in different localities of slums of Mysuru city.Therefore, to measure the locational efficiency some of the GIS tools have been used to identify the serviced and non-serviced area and used buffer analysis method. It is better to understand the association between locations of slum to existing health care facilities. Hence, overlap of buffering area indicate that high level serviced obtain while disappear of buffering area show non-serviced area.

Results have shown that availabilities of healthcare service center influence on utilization of healthcare facilities used by public. One of most causing factor of distance which are long distance control the utilization of healthcare center's facilities.

KEYWORDS: *distribution, slum, buffer analysis.*

1.   INTRODUCTION:

The urban context of maternal and child care studies is one of most continuous area of research in the world and in India too. It is the present issue in the field of Medical Geography. The present study aimed to identify the spatial efficiencies of distribution of public health care centers in Mysuru city, focusing on the maternal and child healthcare services related to slum population in Mysuru city.

Maternal health is very important in the context of India and Karnataka too. India has very high maternal morality ratio.Due to the factors such asaccessibility and utilization of maternal and child health care services by women, new born and children. The need for this study arises from the fact that though our country has a constitutional responsibility for promoting maternal and child health; the healthcare delivery services in India are inadequate and often are inaccessible, as can be perceived from the available literature.

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Public health centersareproviding services to people for promotinggood health for all. It is depend on accessibility of healthcare centers. Therefore, availability of the healthcare centersare predominantly effect on utilize of healthcare facilities. It has predict well planned healthcare centers of physical accessibility as good efficiency of served to public. While if unequally spatial distribution of healthcare centers refer to not sustainable of health system.

Physical accessibility of healthcare system refer to location of health centers. It is mainly depend on travelling distance, mode of transport, spending time, travel cost and amount to avail healthcare services.

This study mainly focus on maternal and child healthcare; especially, related to slum dwellers of Mysuru city. Commonly slum people are socio-economically weak. They are living in disadvantageous, no demand spaces of the city. Consequently, the people of such conditionare facing many health problem.They face many health related problems.

2. STUDY AREA:

Mysuru city lies in the southern part of Deccan peninsula and it forms the southernmost of district Karnataka state in India. This area lies between 76°39' east to 76°65' east longitude and 12°18' north to 12°30' north latitude and has average attitude 770 meters.

Figure. 1 Study Area
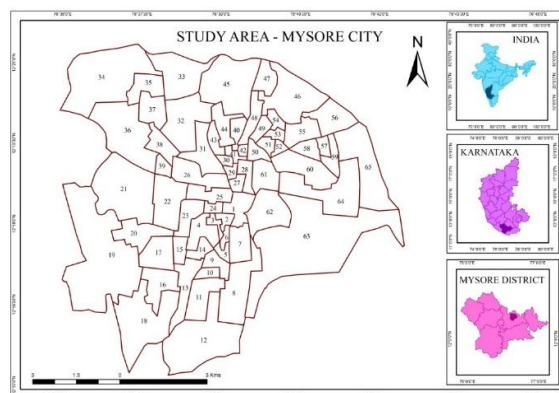
The Mysore city covers an area of 128.422 km. The population is about 887.446 in 2011 census, with male and female are 443.813 and 443.633 respectively. The literacy level in Mysore city is 83.8%, which is much higher than the state's average of 76%. The gender ratio of the city is 967 females to every 1000 males and the population density is 6223.55 persons per 89 km. Among the population 76.70% are Hindus, 19% are Muslim, 2.84% are Christian and remaining belong to other. Mysore city has 65 wards and 172 slums among them and 69 slums are notified. The total Slum population were 235776 during 2011cesuces which accounts 26.5 present of the total population.

3. METHODOLOGY:

This paper analyses to identify the spatial efficiencies of distribution of public health care centers in Mysuru city, focusing on the maternal and child healthcare services related to slum dwellers in Mysuru city. This study is based on both primary and secondary data. Primary data collected from observation of slums and secondary data collected from Mysuru City Corporation and District Health Office. The present study is an attempt to examine the spatial efficiency of maternal and child health care services especially provided by PHCs, CHC and DHC in different localities of slums of Mysuru city. Therefore, to measure the locational efficiency through the GIS tools of buffer analysis have been used to identify the serviced and non-serviced area and used buffer analysis method.

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4. SPATIAL DISTRIBUTION OF SLUMS IN MYSURU CITY.

The slum dwellers live inhospitable place. These slums have extremely unhygienic conditions because of near the drain, sewage are located. This causes disease like blood dysentery, diarrhoea, malaria, typhoid, jaundice and conjunctivitis, which stalk them all the year round.

The overall condition of the slums are very bad and pathetic with respect fresh air, proper sun light, housing water supply, drainage, sewage and road etc. most of them do not have proper water supply, drainage and sewage system and the slum dwellers have to face hardships during rainy season especially the life of slum dwellers situated adjacent to storm water drains and low lying area are critical and the situation is not different in case of dwellers residing below also rampant in slum, affecting their healthy living. Most of the slum dwellers live in shift to one other places with no protection from sunlight rain, wind and other weather condition.

The distribution of slums are quite uneven in the city. The factors which affect the distribution of slums are physical, cultural, and economic. This part mainly concerns with distribution of slum in different parts of the city of Mysuru.

Table 1: Spatial distribution and location of notified slums in Mysuru city (2011)

Sl. No.	Wards No.	Name of slums.	Population
1	4	Madhubana	259
2	4	Gopika gudisalu	102
3	5	Chamundi bettadha padha	444
4	8	Mahadheshwara colony	94
5	9	Nellurushed part a	866
6	9	Nellurushed part b	594
7	9	Ashokapurm	336
8	9	Ashokapurm 13th cross	987
9	10	Sarvajanika hostal behind	308
10	11	D. Devaraja area colony	895
11	11	Dhrmasing colony	374
12	11	Dhrmasing colony b block	221
13	11	Vishvashvaranagara	524
14	12	Nachanahallipalya j p nagara 2nd main	444
15	23	Coffee board behind	547
16	27	Hebbal colony	156
17	28	P. k. syanitoriyam behind	374
18	28	South of kumberkoppalu p.k. synitoriyam behind 2nd main	432
19	28	Mahadheshvara colony	94
20	28	Part of kumbarakopalu	523
21	29	Metagalli harijana colony and adhijambava colony	963
22	29	Metagalli janata colony	1181
23	29	Part of metagalli	465
24	30	Joganakere	94
25	30	Manjunathapura	900
26	31	Gokulam 2nd main	279
27	32	Vanivilasa mohalla 16th cross	558
28	33	Part of paduvarahalli	563

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29	34	Janatha samil behind	267
30	34	Mysore samil front	397
31	34	Yashavanthanagara	218
32	34	Raja rajeshwari rice mil behind	241
33	34	Medhrs block	1091
34	34	Bamboo bajar	447
36	34	Yadhavagiri arasikere railway track near	253
37	35	Women medical college behind k r s road	143
38	42	Raja soap factory	418
39	42	Budabukeri chikkavirnna road	803
40	42	Budabudakeri pulikeshi road	1181
41	42	Jail behind	240
42	44	k.s.r.t.c. behind	560
43	44	Shivarathreshavaranagara bannimantapa	386
44	44	Halim nagara	882
45	45	Hanumanthanagara ambedker colony	120
46	45	Vanthematharm	383
47	45	Ellamma slum	228
48	45	Savith ambedkar colony	173
49	45	Ekalavya nagara	1383
50	46	Kesare near slater house	1258
51	46	Belavatha janata nagara	529
52	46	Kesare 1st main	247
53	47	Kesare 3rd main	98
54	47	Kesare 2nd main	230
55	47	Kesare ambedkara nagara	57
56	47	Kesare bovi colony	95
57	48	Rajendranagara, kesare, kurimandi block	370
58	48	Kesare park	451
59	51	Siddappaji cross road 1,2,3	1038
60	51	Chamundeshvari road gandinagara	967
61	51	Durgamba temple behind	707
62	51	Siddapaji cross block a	881
63	52	Kalyanagiri usmain block	2067
64	56	Sathagalli	2509
65	58	Gousiya form house	1730
66	59	Kyatamaranahalli a.k. colony	693
67	59	Gosiyanagara a block	3657
68	61	Kyatamaranahalli masidi road	693
69	62	Jothinagara	1278

(Source: Mysuru City Corporation 2016)

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Figure. 2 Spatial distribution of slums in Mysuru city:
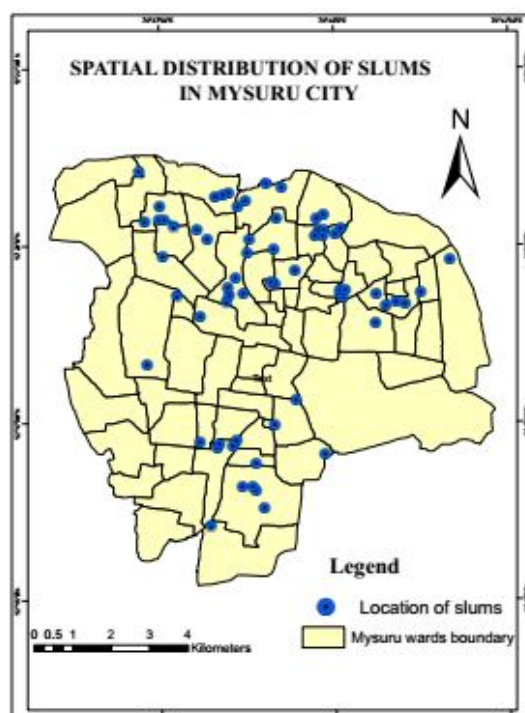
(Source: base map is collected from Mysuru City Corporation 2016)

In Mysuru city, 69 slums are notified. In Mysuru city slums are found dispersed or scattered in nature. Scattered slums are found on low lands like near the drain, sewage where the natural drainage persists. The most number of slums are located on the north eastern direction of the city and remaining slums are scattered in other directions.

5. DISTRIBUTION OF PUBLIC HEALTHCARE CENTERS IN MYSURU CITY:

Spatial distribution of DHC, CHC and PHCs play a significantrole in maintaining the health status of the people, especially, the vulnerable group such as slum dwellers. Hence, healthcare center's distribution and availability have been influencing on utilization of healthcare services. Therefore, distance between slums and public healthcare centers effect on the level of utilization of health facilities. Hence,the increase in the distance resulting in the decrease utilization of in the healthcare services.

In Mysuru city, (Figure. 3 and Table .2)21 PHCs, 1 DHC and 1CHC have been providing maternal and child services like prenatal, postnatal, Delivery care and other facilities to slum dwellers and non-slum dwellers also. As the slum dwellers are socio-economically very backward. Services, they are depending completely on the public healthcare services.

Most of slums dwellers do not utilize the maternal and child healthcare service facilities due to distance, cost of the traveling, lack of awareness about the healthcare services and their facilities available to them.

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Table. 2 Public Urban Primary Health Centers

Sl.No	Facility name	Ward name	Mysuru (Urban) PHC Wise population list	Slum population
		MYSURU CITY UPHCs Details		
1	PHC- Kumbara Koppalu	27,28	41699	8345
2	I.P.P 8- Bannimantap	29,30,44,45	49770	24600
3	I.P.P 8 Rajendra Nagar	46,47,48,52	51568	12719
4	PHC- Shanthi Nagar	53,54	48195	7600
5	PHC Krishnamurth puram	8,16,18,19	51452	4001
6	Corporation lashker-B	41,50,51,62	50064	14400
7	PHC HHMBG	63,56	44911	11800
8	PHC Eernagere	34,38,39,40	49881	9513
9	PHC Chamundipuram	3,4,6,7	49100	10214
10	PHC Nazarbad	37,61,1,2	48708	7256
11	PHC Saraswathipuram	20,21,23	49152	1002
12	PHC Old Agrahara	31,32,33,35,36	50216	24600
13	PHC Visveswaranagara	9,10,11,17	51054	11669
14	PHC N R Mohalla	42,43,49	42400	28400
15	I.P.P 8 Giriyabivipalya	55,57,8,58	49000	8000
16	I.P.P 8 Tonachikoppal	22,21	51200	6336
17	I.P.P.8 Kythamaranahalli	59,60,61	40350	5600
18	Corporation Indiranagara	65,1(11)p5	47000	7440
19	Nachanahalli palya	12	31829	12225
20	Kuvempunagar	13,14,15	38226	4000
21	Subramanya nagar	25,26	42665	4800
	Total	**65**	**9,85,968**	**211482**
22	CHC VV Puram	**65 wards**	**9,85,968**	**211482**
23	DHC Chaluvamba Hosptal	**7 Taluck**	**30,01,127**	

(Source: District Health Office 2016-17)

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Figure.3 and 4 Spatial Distribution of DHC, CHC,UPHCs in Mysuru City:
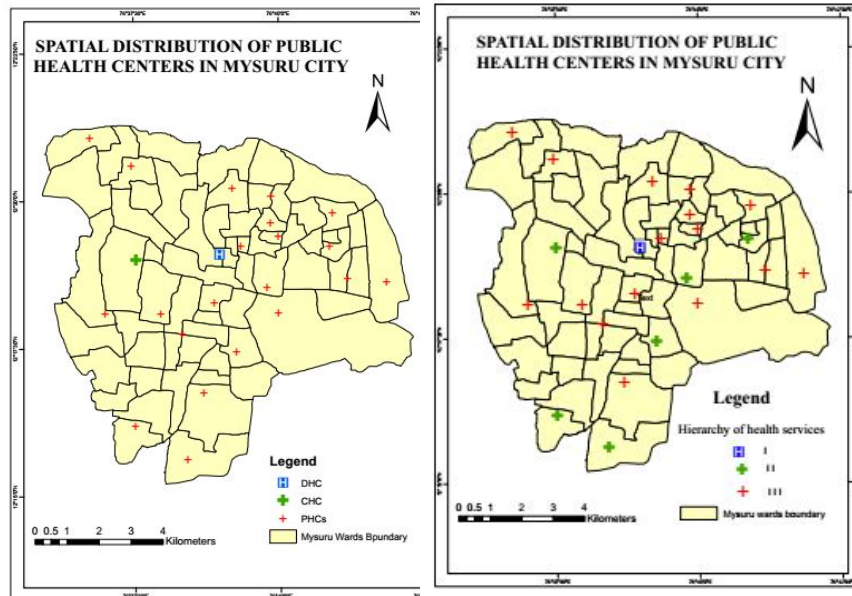
In Mysuru city, 21 PHCs, 1 DHC and 1CHC. Availability spatial distribution of health centers are unevenly distributed, here, most of center found heart of city and remaining centers are dispersed or scattered distributed.Hence, measuring adequacy availability of public health centers to population is a challenge. Each PHCs (21 PHCs) serviced 46950.85 population in the city. While CHC serviced **9, 85, 968** population in enter city of Mysuru and DHC serviced **30, 01, 127 population in enter Mysuru District.**

Table. 3 Hierarchy of health services of public health centers in Mysuru city.

Sl.No.	Hierarchy of health services	Service 1	Service 2	Service 3	Service 4
1	I	Prenatal	Postnatal	Neonatal	Child care (ICU) other service
2	II	Prenatal	Postnatal	Neonatal	
3	III	Prenatal	Postnatal		

Figure.4shows the hierarchy of health services of maternal and child centers in Mysuru city. First hierarchy is District Health Center like cheluvamba hospital which is servicingcenter district of Mysuru, it has a total bed capacity of around 410 beds and this includes 130 beds in Pediatric wards and 280 beds in Obstetrics and Gynecology wards. It also has a designated Neonatal ward and a Diarrhoel Diseases Unit.Besides offering service to the routine obstetric, gynecology and paediatric patients, it has specialized units providing neonatal care, paediatric surgery, diarrhoel diseases treatment and immunizations to mention a few.

Second hierarchy of CHC and some few PHCs are providing prenatal, neonatal and postnatal care of maternal and child health services.Each CHC and PHCs has 2 permanent doctors, one visiting doctor etc, it has a total bed capacity of around 20 to 30.

Third hierarchy of PHCs are each hospital have one doctor, one visiting doctor, other workers, it has a total bed capacity of around 9.

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6. Spatial efficiencies of distribution of PHCs, CHC and DHC in Mysuru city:

Maternal and child healthcare is one of most important of health care services, because of reduce the infant mortality and mother death. Particularly, slum living dweller are that kind of services are essential due to their living environment, poverty, etc. therefore, availability of public maternal and child health centers should be located near the slums, why they are only visit in public centers due to they are socio-economic poor.

a) Prenatal care and postnatal care of maternal and child care centers:

In Mysuru city, 21 PHCs, 1DHC, and 1CHC public health centers; these centers are serviced prenatal and postnatal care of maternal and child includes some of few centers are servingdelivery care also. However, each public health center's spatial efficiencies of distribution shown 0.5 km and 1 km buffering, which slums are located within the buffering, such area consider as high efficiencies of services while whereas no buffers of slums location means non-serviced area.

Table.4 Prenatal care and postnatal care of maternal and child care centers

Spatial efficiencies of distribution of CHC and PHCs in Mysuru city			
Sl.no	Number of slums	% of slums	Physical availability of health serviced area
1	27	39%	0.5 km
2	25	36 %	1 km
2	17	24 %	unserved area
Total	69	100%	

(Source: District Health Office in Mysuru city 2016-17)

Table. 4 presents the number of slums covered within the given Buffers. Around 39 percent of total slums location spread in within the reach of 0.5 km radially from the public Health Centers. Within 1 Km buffers 36 percent of the slums location spread in from the public health centers. Around 24 percent of the slums location remained under unserved area by the services of public health centers in the city.

Figure. 5 Prenatal care and postnatal care of maternal and child care centers
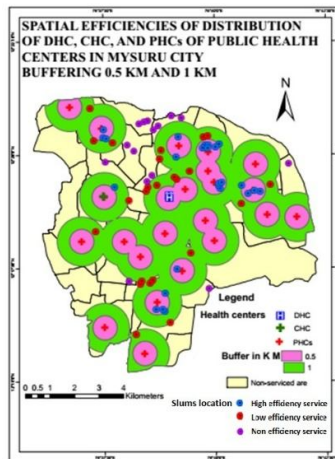
Buffer method, it is easy to understand spatial efficiencies of each public health centers of prenatal and postnatal health care in Mysuru city. Afacility has a service area of 0.5 and 1 Km and for which buffers are drawn and it is pink and light green colour of slums location respectively. The present study area have69

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slums are located, around 27 and 25 slums locationare high and low efficiency serviced location lies within the buffer, it is served efficiently and it is shown (Figure. 5) blue and red colours of slum locationwhile 0.5 km and 1 km of buffering area respectively, if not within the buffer such slums location are underserved and it is shown purple colour of slums location on the map.

Then the number of slums located within the buffer can easily be determined. The Central and northeastern part of the study area seem to be moreabundance of overlapping buffers represent areas of more service concentration, whileareas without any buffer or those with a very few buffers might indicate a shortage ofservice looks in North-Western part of the study area which are of purple colour of location of slums (Fig. 5 on Map).

The slums dweller opinion that pregnant and child are facing many problems due to unavailability of vehicle, cost, long distance of hospitals from their location, especially maternal hospitals, and some of centers are overcrowded patient.

### a) Delivery care of maternal and child health care center

Delivery care or neonatal care of maternal and chlid health is very important who are pregnant in slum living dwellers because of they are economically backward or poor and they can not afford the high cost of health care in provaite hospital.It is diffiuld to go to provaite hospital. Therefore, most of the slum living peoples are depanding on public health centers only. So, spatial efficieces of distribution of public health centers should reach the target popuations or groups.

Table. 5 Delivery care of maternal and child health care center

Spatial efficiencies of distribution of CHC and PHCs in Mysuru city			
Sl.no	Number of slums	% of slums	Physical availability of health served area
1	4	6 %	0.5 km
2	12	12 %	1 km
2	53	76 %	unserved area
Total	69	100%	

(Source: District Health Office in Mysuru city 2016-17)

Table. 5presents the number of slums covered within the given Buffers. Around 6 percent of total slums location spread in within the reach of 0.5 km radially from the public Health Centers. Within 1 Km buffers 12 percent of the slums location spread in from the public health centers. Around 76percent of the slums location remained under unserved area by the services of public health centers in the city.

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Figure. 6 Delivery care of maternal and child health care center
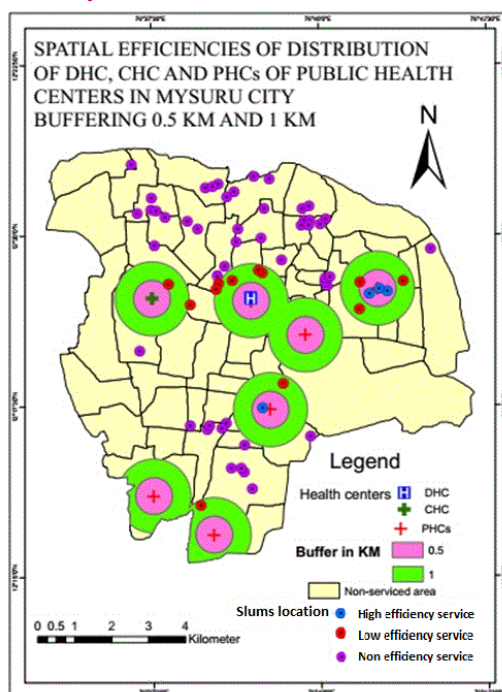
Buffer method, it is easy to understand spatial efficiencies of each public health centers of delivery health care in Mysuru city. A facility has a service area of 0.5 and 1 Km and for which buffers are drawn and it is pink and light green colours respectively. If a69 slums location lies in the buffer, it is served, if not such slums location are underserved.

In the figure. 6 shown that spatial efficiencies of delivery care of health centers, where slums are locatedwithin 0.5 km and 1 km buffer area shows that good spatial efficiencies serviced area, it is blue and red colours of location of slums represented.

Then the number of slums located within the buffer can easily be determined. The Central and south part of the study area seem to be overlapping buffers represent areas of more service concentration, while areas without any buffer or those with a very few buffers might indicate a shortage of service looks in North and south part of the study area.it is purple colour location of slums are shown. (Fig. 6 on Map).

The slums dweller opinion that pregnant are facing many problems at delivery time due to unavailability of vehicle, finance, long distance of hospitals from their place especially maternal hospitals, and some of PHCs does not have delivery care facility like sufficient number of doctor, ICU care, surgery facility, child care etc.

COCLUSTION :

In the present paper prevails that spatial efficiencies of public health centers in Mysuru city. It is better to understand the association between locations of slum to existing health care facilities. Hence, overlap of buffering area indicate that high level serviced obtain while disappear of buffering area shown non-serviced area. It have shown that availabilities of healthcare service center influence on utilization of healthcare facilities used by public. One of most causing factor of distance which are long distance control the utilization of healthcare center's facilities.

From the above analysis it can be concluded that, healthcare centers are unevenly distributed among different wards of Mysuru city. The identification of served and unserved areas of health care centers is the main observation in this study. It also reveals that, there exists the spatial efficiencies are variation in thedistribution of public health centers, which were not evenly distributed across the study area. A large

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proportion of theresidents have to travel a long way to access the health care facilities most importantly in north and south parts of city. Geographical access models haveenormous potential for informing policy development and grounding debate on how to achieve socialequity of hospital access. In the study an attempt has been made to identify the health care centers servedareas reduce the gaps and take into consider this unserved areas and proposing newhealth care centers from temporal point of view.

SUGGESTIONS:

- Government should be providing good spatial efficiencies of health centers that is reduce the variation of health centers distribution in Mysuru city.
- Allocated new maternal and child health center where as non-serviced area of slums location.
- Asha workers should halves help to who are pregnant in slum living women.
- Asha workers should awareness about prenatal, postnatal and neonatal care to who are pregnant in slum living women.

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