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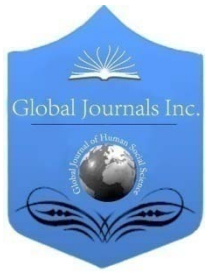

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Distribution of Health and Education Services in the Rural Areas: A Case Study of Aligarh District

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Distribution of Health and Education Services in the Rural Areas: A Case Study of Aligarh District

Shabnam Khan

Abstract- Providing health and education services in the rural areas is one of the biggest challenge that is faced by the government of India. With nearly 70 per cent population living in rural areas have less number of health and education services than their urban counterpart. Health care and education amenities are hardly available in the rural areas, and this is the core reason for migration of the rural people to urban areas. This paper focuses on the distribution of health and education services in the rural areas of Aligarh district taken primary and secondary data under consideration. Methodological principle adopted for the present study is cumulative frequency distribution, mean spacing, Gini's coefficient concentration ratio, and graphical representation of the cumulative frequency curve. Result shows that there is gap in the availability of health and education services in the rural areas in different population size group of settlements.

Keywords: health services, education services, and rural areas.

I. Introduction

The issue of uneven distribution of health and education services in the rural areas of Uttar Pradesh, India is of great concern. As Aligarh district is an integral part of Uttar Pradesh, therefore it also experiences the same problem of uneven distribution of health and education services. Availability of health and education services is necessary for improving the standard of living of rural population. The main reason to focus especially to the rural areas is that these areas are devoid of these services compared to urban areas. There is uneven distribution of these services in rural and urban areas. Between urban and rural areas, urban areas have sufficient number of health and education services but rural areas are devoid of it. Therefore there is a need to focus on the availability of these services to the rural areas for the balanced development. Some of the work related to this study has been done by Dasgupta (2013), Kaur, Bajpai et al. (2008), Bhandari and Siddhartha (2007), Dholakia and Iyengar (2008) etc.

II. Study Area

For the present study Aligarh district has been selected as the study area. It is one of the district of Uttar Pradesh, which is located in the north western part of Ganga Yamuna doab and forms a part of Agra division. It extends from 270 27' N to 280 11' N latitudes and 770 27' E to 780 38' E longitudes (fig. 1). As per census 2011 the district has a population of 3,673,849 persons, out of which 1,958,536 are male and 1,715,313 are female. The district has witnessed 2,127,592 and 864,649 as the rural and urban population respectively. Based on administrative convenience, the district has been divided into divisions i.e. tehsils namely Koil, Khair, Gabhana, Atrauli, and Iglas. These tehsils are further sub- divided into 12 development block namely Atrauli, Gangiri, Bijauli, Jawan Sikanderpur, Chandaus, Khair, Tappal, Dhanipur, Lodha, Akrabad, Iglas, and Gonda.

III. Data Base and Methodology

The study is based on both primary as well as secondary sources of data. A secondary source of data has been collected through census records (2001), district statistical magazine (2001), etc. Primary survey has been done for the verification of secondary data through the field study.

Methodological principle adopted to analyse the distribution of health and education services are:

- numeral distribution,
- Cumulative frequency distribution of rural settlements having facility among the size class of rural settlements,
- Mean spacing of settlements having facility, which is calculated as:

$$D = 1.0746\sqrt{A/N}$$

Where, D = theoretical distance between points or settlements in hexagonal arrangement, or mean spacing in unit length.

A = area of given region
N = number of settlements in a given region
1.0746 = Spacing constant.

- Gini's coefficient of concentration of facilities among the size group of settlements

$$Gi = \frac{1}{10{,}000}\sum_{i=1}^{N}(xi.yi+1)-(xi+1.yi)$$

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Location of Aligarh District Z

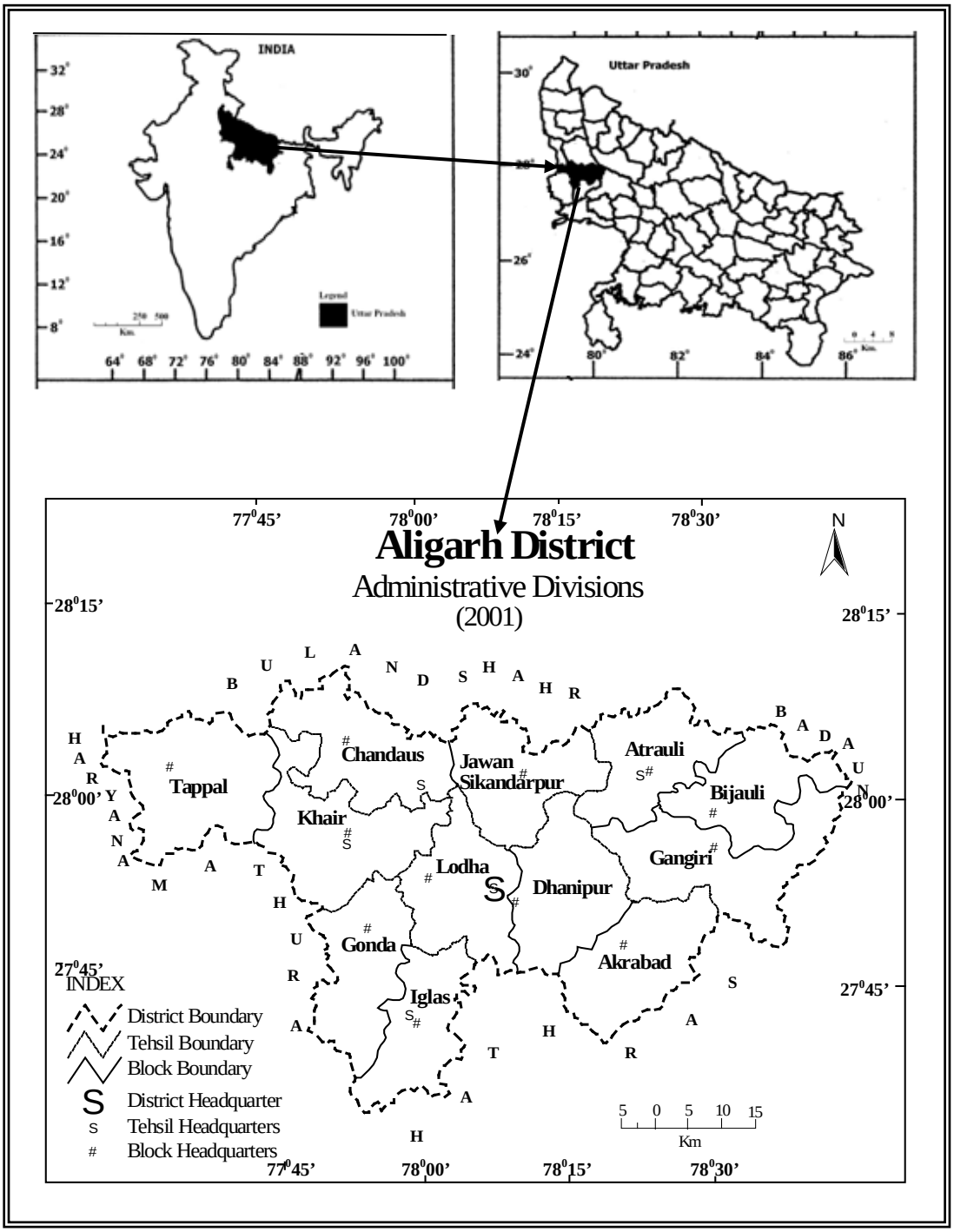

Figure 1

Where,

x_i = the cumulative percentage distribution of attribute x.

y_i = the cumulative percentage distribution of attribute y.

N = the number of observations

Gi = Gini's Coefficient Ratio (the relation between the area of triangle formed between the line of equal distribution and the y axis, and the area lying between the curve and the line of equal distribution).

Scale of Gi Ratio:

Gi = 0, is uniform distribution

Gi = 1.0, is highest concentration.

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- examining the graphical representation of the cumulative frequency curve taking cumulative percentage of inhabited rural settlement and settlement located with facility.

III. Result and Discussion

To analyse the distribution of health services in the district the existing establishment units providing health facilities i.e. hospital, dispensary, maternity and child welfare centre, health centre, primary health centre, primary health sub-centre, and nursing home has been taken under consideration.

a) Distribution of Health Services

i. *Hospital*

A hospital is an Institution, where sick or injured are given medical or surgical care. It includes allopathy, homeopathy, ayurveda, and unani hospital. In the district, there are 45 hospitals distributed in 45 inhabited rural settlements and each hospital serves an average population of 47,280 persons. Table 1 reveals that maximum concentration of rural settlements with hospital facility (42.23 per cent) has been found in the population size group of 5,000-9,999 followed by 33.33 per cent of rural settlements with the same facility in 2,000-4,999 population size group. No hospital has been found in the rural settlements having population less than 1,000 persons. Table 2 shows that mean spacing of settlements located with hospitals is 9.59 km. While Gi value 0.740 reveals its higher concentration at few bigger size of rural settlements while smaller size of settlements are lacking in this facility. The deviation of cumulative frequency curve of rural settlements having hospital facility from that of all rural settlements depicts the same result as above (fig.2).

ii. *Dispensary*

Dispensary is a place where patients are treated and medicines provided but with no in-patient facility. Immunizations, MCH Services and sometimes pathological tests are carried out here. They include allopathic, homeopathic, ayurvedic, and unani dispensary. In the district, there are 49 dispensaries located in 34 inhabited rural settlements. Not a single dispensary is located in the settlements under the size of population of less than 500 persons. Maximum numbers of dispensaries (35.29 per cent) are concentrated in the settlements having population size group of 2,000-4,999 and 5,000-9,999 persons. While minimum concentration (2.94 per cent) has been found in 500-999 population size group. Table 2 shows that on an average 43,420 persons are served by each dispensary. Mean spacing of settlements having dispensary is 11.03 km. While Gi value 0.681 indicates its higher concentration at few bigger sizes of settlements, is also revealed from the fig. 2.

iii. *Maternity and Child Welfare Centre*

It provides pre-natal and post-natal services for both mother and child. The services include regular check-up of pregnant women, giving folic tablets, counseling, delivery, immunization of children with check-up etc. There are 114 maternity and child welfare centre distributed in 114 inhabited rural settlements but none of them has been found in the rural settlements under the size group of population of less than 500 persons. 66.55 per cent of the rural settlements with maternity and child welfare centres have been found in 28.90 per cent of the rural settlements having population size group of more than 2,000 persons (table 1). Each unit serves an average population of 18,663 persons and settlements having maternity and child welfare centre are located at 6.02 km apart from each other (table 2). Gi value 0.511 reveals that distribution of this facility is neither concentrated nor uniformly distributed. Figure 2 depicts that, the frequency curve of settlements by their size group of population having maternity and child welfare centre does not corresponds to that of all settlements in the district.

iv. *Health Centre*

It is a clinic where medicine and medical supplies are dispensed. There are 29 health centres distributed among 28 inhabited rural settlements. No settlements with less than 500 populations and 1,000-1,499 population size group enjoys this facility. Maximum percentage of rural settlements having health centre (35.71 per cent) has been observed in the rural settlement with population size group of 2,000-4,999 and 5,000-9,999 followed by the population size group of 1,500-1,999 with 14.29 per cent of rural settlements with this facility. It serves at an average of 73,365 persons per unit in the district (table 2). Mean spacing of settlements having this facility is 12.15 km. While Gi value is 0.704 which shows its higher concentration at big size of rural settlements. Figure 2 depicts the lack of health centre facility more among small size group of settlements than bigger size.

Table 1 : Aligarh District: Percentage Distribution of Rural Settlements by their Size Group of population Located with Health Facilities (2001)

Population size group (persons)	Rural Settlements		per cent settlements by Health facility						
	No.	%	Hos.	Disp.	MCWC	HC	PHC	PHSC	NH
< 250	23	1.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00
250-499	81	6.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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500-999	312	26.44	0.00	2.94	6.14	3.57	0.00	8.06	0.00
1000-1499	247	20.93	4.44	8.83	12.28	0.00	10.00	9.68	12.50
1500-1999	176	14.92	11.11	5.88	14.03	14.29	20.00	11.29	12.50
2000-4999	290	24.58	33.33	35.29	44.74	35.71	45.00	45.16	12.50
5000-9999	46	3.90	42.23	35.29	19.3	35.71	20.00	22.58	50.00
> 10,000	5	0.42	8.89	11.77	3.51	10.72	5.00	3.23	12.50
Total percent	-	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Total number of settlements	1180	-	45	34	114	28	20	62	8
total number of Health facilities	-	-	45	49	114	29	20	64	10

Source: Computed from District Census Hand Book (Village Directory), 2001

v. *Primary Health Centre*

A Primary Health Centre is the first contact point between a village community and the Government medical officer. In the district, there are 20 units of primary health centre distributed among 20 inhabited rural settlements (table 1). No settlement with less than 1,000 populations is having this facility. Around 70 per cent of the rural settlements having primary health centre facility has been found in the population size group of more than 2,000 persons in each. The health needs of about 106,380 people within a maximum travel distance of 14.38 km are served by the primary health centre (table 2). Gi value is 0.587 indicates that it is disproportionately distributed among the size group of settlements which is clearly observed from the fig. 2.

Table 2 : Aligarh District: Distribution of Health Facilities

S.No.	Name of Facility	Mean Spacing(in km.) of Settlement having Facility	Average Population per Facility	Gi value of Settlement having Facility
1.	Hospital	9.59	47280	0.740
2.	Dispensary	11.03	43420	0.681
3.	Maternity and child welfare centre	6.02	18663	0.511
4.	Health centre	12.15	73365	0.704
5.	Primary health centre	14.38	106380	0.587
6.	Primary health sub centre	8.17	33244	0.526
7.	Nursing home	22.73	212759	0.708

Source: Computed from District Census Hand Book (Village Directory), 2001

vi. *Primary Health Sub-Centre*

A Primary Health Sub-centre is the first contact point between the primary health care system and the community. Total 64 units of primary health sub centres are distributed in 62 inhabited rural settlements. Nearly three fourth of rural settlements with primary health sub-centre are located in population size group of more than 2000 persons in each. No rural settlements with population less than 500 persons posses this facility. Each unit serves an average population of 33,244 persons and settlements having PHSC are located at a distance of 8.17 km apart from each other. Gi value is 0.526 which indicates that distribution of rural settlements with this facility is neither concentrated nor uniformly distributed in each size group of settlements that is clear from the deviation of frequency curve of settlements having this facility from that of all rural settlements (fig. 2).

vii. *Nursing Home*

A nursing home is a long –term care facility licensed by the state that offers 24hour room and board and health care services including basic and skilled nursing care, rehabilitation and a full range of other therapies, treatments and programs to old and sick people. The district has been found with only 10 nursing home distributed in 8 inhabited rural settlements and each nursing home serves an average population of 212,759 persons. No nursing home has been found in the settlements having population less than 1,000 persons. Half of the rural settlements having nursing home facility lie in the population size group of 5,000-9,999 persons (table 1). Mean spacing of settlements having this facility is 22.73 km. Gi value 0.708 indicates its higher concentration at few big sizes of settlements, is also revealed from the figure 2.

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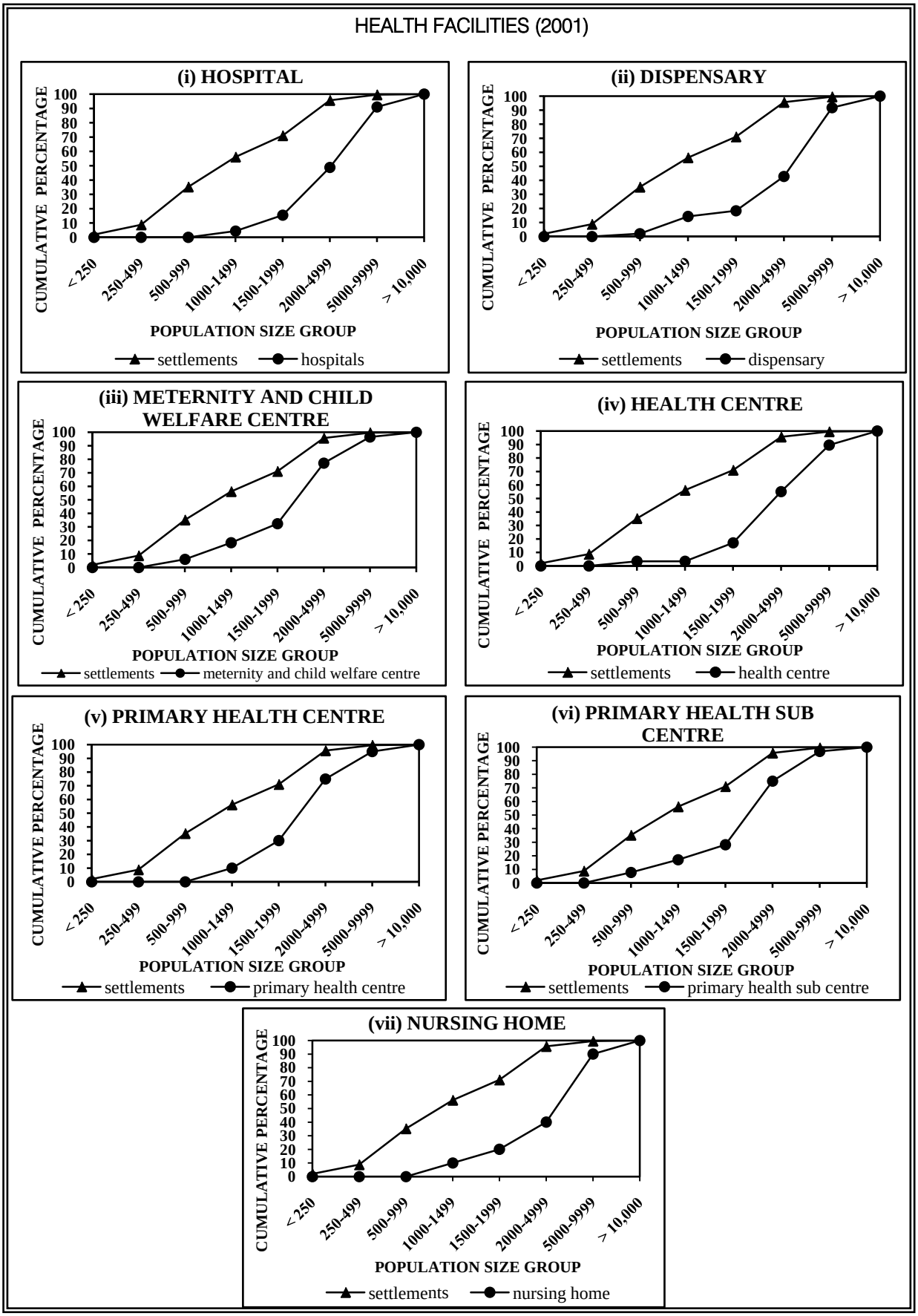

Figure 2

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b) Distribution of Education Services

The existing establishment units providing educational facilities in the district includes primary school, middle school, secondary school, senior secondary school, college, and adult literacy centre.

i. *Primary school*

Primary school is the first stage of compulsory education known as primary or elementary education. The district has 1312 primary schools distributed in 1027 rural settlements, implies 87.03 per cent of villages have primary schools. Out of 1312 primary schools, 758 (57.77 %) are located in the settlements having population of more than 1500 persons. Maximum concentration of primary schools i.e. 28.14 per cent has been observed in 2000-4999 size group of population (table 3).

Table 4 reveals that on an average, population of 1622 persons is served by each primary school. Rural settlements having primary schools are located at mean spacing of 2.01 km. Gi value (Gini's coefficient concentration ratio) of 0.086 shows nearly uniform distribution at each size group of settlements. Figure 3 reveals that the cumulative frequency curve of settlements having primary school is almost corresponding to the frequency curve of all inhabited rural settlements indicates its quite uniform distribution at each size group of settlements in the district.

Table 3 : Aligarh District: Percentage Distribution of Rural Settlements by their Size Group of Population Located with Educational Facilities (2001)

Population size group (persons)	Rural Settlements		per cent settlements by Educational facility					
	No.	%	PS	MS	SS	SSS	Col.	ALC
< 250	23	1.95	0.49	0.56	0.00	0.00	0.00	0.00
250-499	81	6.86	3.80	2.24	1.06	2.13	0.00	6.67
500-999	312	26.44	24.44	9.52	6.38	6.38	20.00	13.33
1000-1499	247	20.93	21.81	12.61	9.57	6.38	20.00	33.33
1500-1999	176	14.92	16.36	17.93	9.57	6.38	0.00	6.67
2000-4999	290	24.58	28.14	45.66	54.26	46.81	20.00	20.00
5000-9999	46	3.90	4.48	10.08	15.96	27.66	40.00	20.00
> 10,000	5	0.42	0.48	1.40	3.20	4.26	0.00	0.00
Total percent	-	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Total number of settlements	1180	-	1027	357	94	47	5	15
Total number of Educational facility	-	-	1312	401	97	49	5	16

Source: Computed from District Census Hand Book (Village Directory), 2001

ii. *Middle school*

As per the education system in Uttar Pradesh middle school provide educational facilities up to the class VIIIth standard. There are 401 middle schools distributed in 357 inhabited rural settlements. Only 2 (0.56 %) middle schools are found in population size group of less than 250 persons. Maximum concentration of middle school i.e. 45.66 per cent has been observed in 2000-4999 size group of population. Table 3 reveals that 75.07 per cent of the rural settlements with middle school are having population more than 1500 persons in each, while it serves 43.82 per cent of all inhabited rural settlements with population more than 1500 persons in each. On an average, 5,319 people are served by each middle school and the settlements having middle school are located at mean spacing of 3.41 km. The Gi value of 0.372 indicates its quite disproportional concentration at bigger size of rural settlements. The deviation of cumulative frequency curve of settlement from that of all inhabited settlements reveals disproportional concentration of this facility at large size group of population (fig.3).

Table 4 : Aligarh District: Distribution of Education Facilities

S.No.	Name of Facility	Mean Spacing(in km.) of Settlement having Facility	Average Population per Facility	Gi value of Settlement having Facility
1.	Primary School	2.01	1622	0.086
2.	Middle School	3.41	5319	0.372
3.	Secondary School	6.63	21934	0.519
4.	Senior Secondary School	9.38	43420	0.576

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5.	College	28.76	425518	0.387
6.	Adult Literacy Centre	16.60	132975	0.180

Source: Computed from District Census Hand Book (Village Directory), 2001

iii. *Secondary School*

Secondary school is an educational institution imparting education upto Xth standard. There are 97 secondary schools distributed in 94 inhabited rural settlements. Table 3 reveals that settlements with population less than 250 persons do not posses this facility and 73.42 per cent of secondary schools are located in 2000 and above size group of settlements of the district with an average population of 21,934 persons. Only single school has been recorded, in less than 500 population size group. Maximum numbers of secondary school has been noticed in 2,000-4,999 size group of population. Table 4 reveals that mean spacing of the settlements with this facility is 6.63 km. Gi value of 0.519 indicates that it is concentrated at big size of settlements. The deviations of frequency curve of settlements having secondary school from that of all rural settlements reveals lack of this facility in the small size group of settlements than the bigger size group of settlements (Fig.3).

iv. *Senior Secondary School*

Senior secondary school provides educational facility up to class XII$^{th.}$ There are 49 senior secondary schools located in 47 inhabited rural settlements in the district. On an average 43,420 persons are served by each senior secondary school. Population size group below 250 persons do not posses this facility. Table 3 reveals that 21.27 per cent of the rural settlements with senior secondary school are having population less than 2,000 persons in each, where as 78.73 per cent of the settlements with this facility are having population more than 2,000 persons in each. The above data clearly shows unequal distribution of this facility among different size group of rural settlements. Table 4 shows mean spacing of settlements with this facility is 9.38 km. Gi value of 0.576 reveals its higher concentration at bigger size of settlements. Figure 3 depicts the disproportional concentration of senior secondary school at big size of settlements than at small size of settlements.

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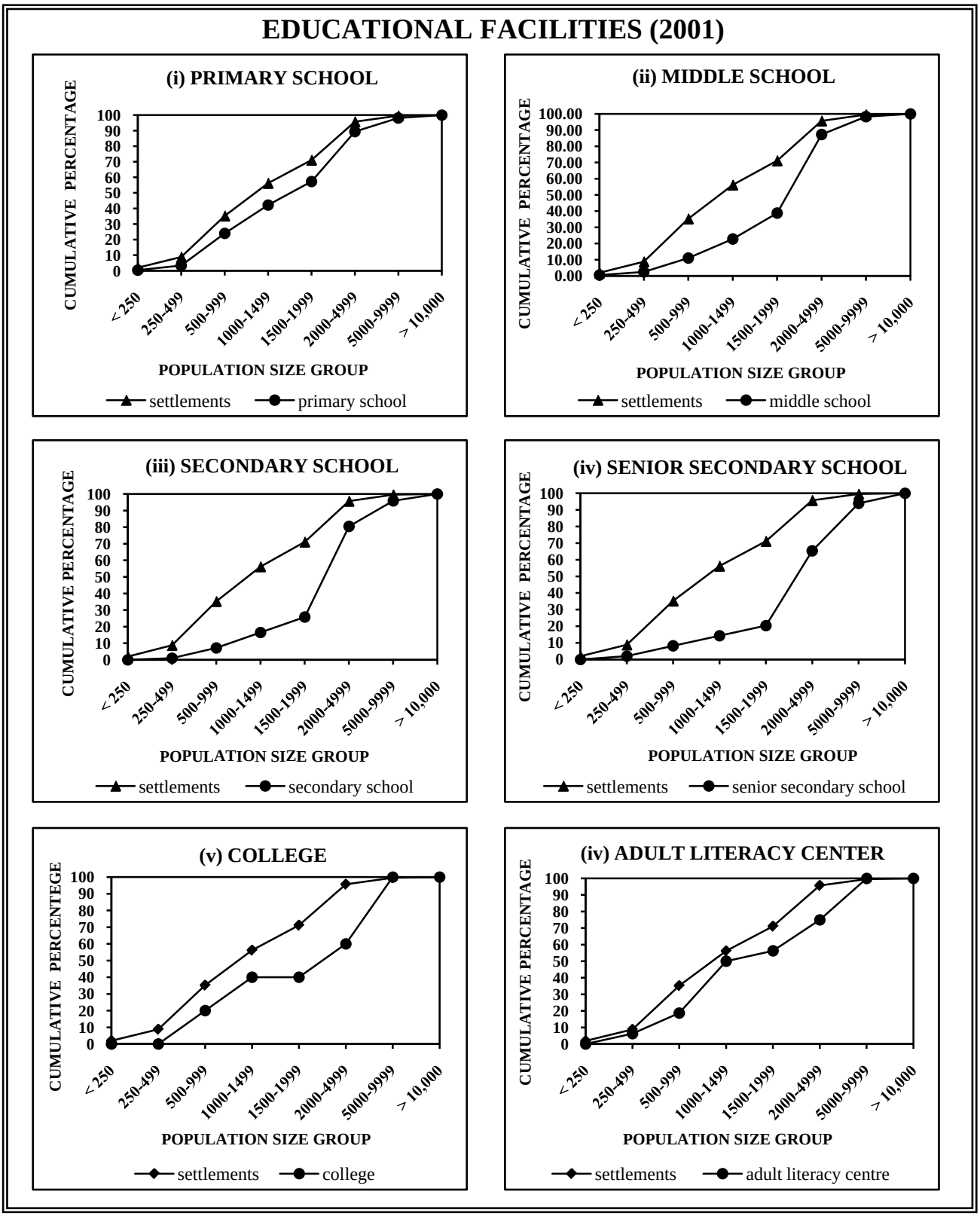

Figure 3

v. *College*

College is an educational institution that provides the graduate level educational facility. Total 5 colleges are located in 5 inhabited rural settlements. They are located at Dhansari village in Gangiri block, Nagla Madho in Khair block, ChaupurHauj in Atrauli block, Sangra in Jawan block and Tochhigarh in Iglas block. One of the interesting feature of its distribution is

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that no college has been found in less than 500, 1500-1999, and above 10,000 population size group of the settlements. 2 colleges exist in 500-1499 population size group and rest 3 colleges exist in 2000-9999 population size group. On an average, population of 425,518 persons is served by each college in the district. Mean spacing of settlements with this facility is 28.76 km. Figure 3 depicts the disproportional concentration of colleges at big size of settlements while small size of settlements are lacking in this facility.

vi. *Adult Literacy Centre*

Out of the total rural settlements in the district, there are 16 Adult literacy centres located in 15 inhabited rural settlements. Table 3 depicts that population size group below 250 and above 10,000 does not possess this facility. All the 16 Adult literacy centres are distributed in the rural settlements having population size group ranging from 250-9999 persons. Each Adult literacy centre provides education facility to an average population of 132,975 persons. Mean spacing of settlements with this facility is 16.60 km.

IV. Conclusion

The above study shows that there is large gap in the availability of education and health facilities in the rural areas in different population size group. Large numbers of these services are found in big settlements whereas small settlements depend on these big settlements to avail these services. Among health facilities, maternity and child welfare centre has low mean spacing whereas nursing home has highest mean spacing. Similarly among education facilities, primary school has lowest mean spacing whereas college has highest mean spacing. Cumulative frequency curve shows that curve of all the settlements having health facilities to that of all inhabited settlement curve among different population size group do not corresponds to each other therefore it may be concluded that health facilities are not uniformly distributed among different size group of population. In terms of education facilities only primary school is uniformly distributed among different population size group whereas all other education facilities are not uniformly distributed.

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