

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

Dr. Shabnam Khan<sup>1</sup>

<sup>1</sup> Deen Dayal Upadhyaya Gorakhpur University, Gorakhpur, Uttar Pradesh, India

Received: 13 September 2015 Accepted: 30 September 2015 Published: 15 October 2015

6

## 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.

19

Index terms— health services, education services, and rural areas.

## 1 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), ??aur, Bajpai et al. (2008), ??handari and Siddhartha (2007), Dholakia and Iyengar (2008) etc.

## 2 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 Author: Post Doctoral fellow, Department of Geography Deen Dayal Upadhyay, Gorakhpur University, Gorakhpur, Uttar Pradesh (India). e-mail: shabnamkhan89@gmail.com of Ganga Yamuna doab and forms a part of Agra division. It extends from 27° 27' N to 28° 11' N latitudes and 77° 27' E to 78° 38' E longitudes (fig. ??). 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 Igla. These tehsils are further sub-divided into 12 development block namely Atrauli, Gangiri, Bijauli, Jawan Sikanderpur, Chandaus, Khair, Tappal, Dhanipur, Lodha, Akrabad, Igla, and Gonda.

**43 3 III.**

**44 4 Data Base and Methodology**

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

48 Methodological principle adopted to analyse the distribution of health and education services are:? numeral  
49 distribution,

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

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

**54 5 A = area of given region N**

55 = number of settlements in a given region 1.0746 = Spacing constant.

56 ? Gini's coefficient of concentration of facilities among the size group of settlements  $T N A D 0746 . 1 = ? =$

57 + ? + =  $N i y i x i y i x i G i 1 ) . 1 ( ) 1 . ( 000 , 10$

58 Location of Aligarh District Z

**59 6 Figure 1**

60 Where, x i = the cumulative percentage distribution of attribute x. y i = the cumulative percentage distribution  
61 of attribute y. N = the number of observations Gi=Gini's Coefficient Ratio (the relation between the area of  
62 triangle formed between the line of equal distribution and the y axis, and the area lying between the curve and  
63 the line of equal distribution).

64 Scale of Gi Ratio: Gi = 0, is uniform distribution Gi = 1.0, is highest concentration. ? examining the graphical  
65 representation of the cumulative frequency curve taking cumulative percentage of inhabited rural settlement and  
66 settlement located with facility.

**67 7 III.**

**68 8 Result and Discussion**

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

**72 9 a) Distribution of Health Services i. Hospital**

73 A hospital is an Institution, where sick or injured are given medical or surgical care. It includes allopathy,  
74 homeopathy, ayurveda, and unani hospital. In the district, there are 45 hospitals distributed in 45 inhabited  
75 rural settlements and each hospital serves an average population of 47,280 persons. Table 1 reveals that maximum  
76 concentration of rural settlements with hospital facility (42.23 per cent) has been found in the population size  
77 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  
78 size group. No hospital has been found in the rural settlements having population less than 1,000 persons. Table  
79 2 shows that mean spacing of settlements located with hospitals is 9.59 km. While Gi value 0.740 reveals its  
80 higher concentration at few bigger size of rural settlements while smaller size of settlements are lacking in this  
81 facility. The deviation of cumulative frequency curve of rural settlements having hospital facility from that of all  
82 rural settlements depicts the same result as above (fig. ??).

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

**92 10 iii. Maternity and Child Welfare Centre**

93 It provides pre-natal and post-natal services for both mother and child. The services include regular check-up  
94 of pregnant women, giving folic tablets, counseling, delivery, immunization of children with check-up etc. There  
95 are 114 maternity and child welfare centre distributed in 114 inhabited rural settlements but none of them has  
96 been found in the rural settlements under the size group of population of less than 500 persons. 66.55 per cent

97 of the rural settlements with maternity and child welfare centres have been found in 28.90 per cent of the rural  
98 settlements having population size group of more than 2,000 persons (table 1). Each unit serves an average  
99 population of 18,663 persons and settlements having maternity and child welfare centre are located at 6.02 km  
100 apart from each other (table 2). Gi value 0.511 reveals that distribution of this facility is neither concentrated nor  
101 uniformly distributed. Figure ?? depicts that, the frequency curve of settlements by their size group of population  
102 having maternity and child welfare centre does not corresponds to that of all settlements in the district.

## 103 **11 iv. Health Centre**

104 It is a clinic where medicine and medical supplies are dispensed. There are 29 health centres distributed among  
105 28 inhabited rural settlements. No settlements with less than 500 populations and 1,000-1,499 population size  
106 group enjoys this facility. Maximum percentage of rural settlements having health centre (35.71 per cent) has  
107 been observed in the rural settlement with population size group of 2,000-4,999 and 5,000-9,999 followed by the  
108 population size group of 1,500-1,999 with 14.29 per cent of rural settlements with this facility. It serves at an  
109 average of 73,365 persons per unit in the district (table 2). Mean spacing of settlements having this facility is  
110 12.15 km. While Gi value is 0.704 which shows its higher concentration at big size of rural settlements. Figure  
111 ?? depicts the lack of health centre facility more among small size group of settlements than bigger size. v.  
112 Primary Health Centre A Primary Health Centre is the first contact point between a village community and  
113 the Government medical officer. In the district, there are 20 units of primary health centre distributed among  
114 20 inhabited rural settlements (table 1). No settlement with less than 1,000 populations is having this facility.  
115 Around 70 per cent of the rural settlements having primary health centre facility has been found in the population  
116 size group of more than 2,000 persons in each. The health needs of about 106,380 people within a maximum  
117 travel distance of 14.38 km are served by the primary health centre (table 2). Gi value is 0.587 indicates that it is  
118 disproportionately distributed among the size group of settlements which is clearly observed from the fig. ???. vi.  
119 Primary Health Sub-Centre A Primary Health Sub-centre is the first contact point between the primary health  
120 care system and the community. Total 64 units of primary health sub centres are distributed in 62 inhabited rural  
121 settlements. Nearly three fourth of rural settlements with primary health subcentre are located in population size  
122 group of more than 2000 persons in each. No rural settlements with population less than 500 persons posses this  
123 facility. Each unit serves an average population of 33,244 persons and settlements having PHSC are located at a  
124 distance of 8.17 km apart from each other. Gi value is 0.526 which indicates that distribution of rural settlements  
125 with this facility is neither concentrated nor uniformly distributed in each size group of settlements that is clear  
126 from the deviation of frequency curve of settlements having this facility from that of all rural settlements (fig. ??

## 127 **12 ). vii. Nursing Home**

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

## 136 **13 b) Distribution of Education Services**

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

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

144 Table 4 reveals that on an average, population of 1622 persons is served by each primary school. Rural  
145 settlements having primary schools are located at mean spacing of 2.01 km. Gi value (Gini's coefficient  
146 concentration ratio) of 0.086 shows nearly uniform distribution at each size group of settlements. Figure ??  
147 reveals that the cumulative frequency curve of settlements having primary school is almost corresponding to  
148 the frequency curve of all inhabited rural settlements indicates its quite uniform distribution at each size group  
149 of settlements in the district. ii. Middle school As per the education system in Uttar Pradesh middle school  
150 provide educational facilities up to the class VIII th standard. There are 401 middle schools distributed in 357  
151 inhabited rural settlements. Only 2 (0.56 %) middle schools are found in population size group of less than  
152 250 persons. Maximum concentration of middle school i.e. 45.66 per cent has been observed in 2000-4999 size  
153 group of population. Table 3 reveals that 75.07 per cent of the rural settlements with middle school are having  
154 population more than 1500 persons in each, while it serves 43.82 per cent of all inhabited rural settlements with  
155 population more than 1500 persons in each. On an average, 5,319 people are served by each middle school and

## 15 CONCLUSION

---

156 the settlements having middle school are located at mean spacing of 3.41 km. The Gi value of 0.372 indicates  
157 its quite disproportional concentration at bigger size of rural settlements. The deviation of cumulative frequency  
158 curve of settlement from that of all inhabited settlements reveals disproportional concentration of this facility  
159 at large size group of population (fig. ??). iii. Secondary School Secondary school is an educational institution  
160 imparting education upto X th standard. There are 97 secondary schools distributed in 94 inhabited rural  
161 settlements. Table 3 reveals that settlements with population less than 250 persons do not posses this facility  
162 and 73.42 per cent of secondary schools are located in 2000 and above size group of settlements of the district  
163 with an average population of 21,934 persons. Only single school has been recorded, in less than 500 population  
164 size group. Maximum numbers of secondary school has been noticed in 2,000-4,999 size group of population.  
165 Table 4 reveals that mean spacing of the settlements with this facility is 6.63 km. Gi value of 0.519 indicates that  
166 it is concentrated at big size of settlements. The deviations of frequency curve of settlements having secondary  
167 school from that of all rural settlements reveals lack of this facility in the small size group of settlements than  
168 the bigger size group of settlements (Fig. ??).

### 169 14 iv. Senior Secondary School

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

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

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

189 IV.

## 190 15 Conclusion

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



Figure 1:

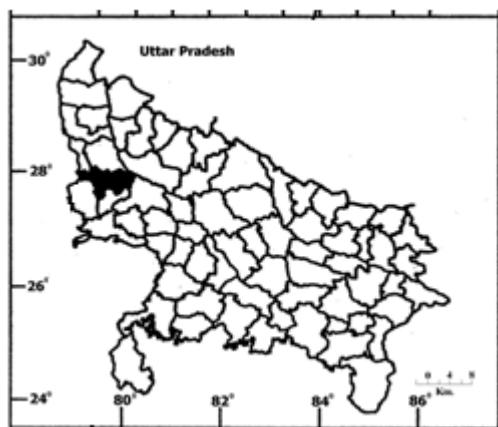


Figure 2:

1

Population size group (persons)	Rural Settlements No.	% Hos. Disp. MCWC	per cent settlements by Health facility HC PHCPHS CNH
---------------------------------	-----------------------	-------------------	---

Figure 3: Table 1 :

## 15 CONCLUSION

---

**2**

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

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

Figure 4: Table 2 :

**3**

Population size group (persons)	Rural Settlements		per cent settlements by Educational facility					A
	No.	%	PS	MS	SS	SSS	Col.	
< 250	23	1.95	0.49	0.56	0.00	0.00	0.00	0.0
250-499	81	6.86	3.80	2.24	1.06	2.13	0.00	6.6
500-999	312	26.44	24.44	9.52	6.38	6.38	20.00	13
1000-1499	247	20.93	21.81	12.61	9.57	6.38	20.00	33
1500-1999	176	14.92	16.36	17.93	9.57	6.38	0.00	6.6
2000-4999	290	24.58	28.14	45.66	54.26	46.81	20.00	20
5000-9999	46	3.90	4.48	10.08	15.96	27.66	40.00	20
> 10,000	5	0.42	0.48	1.40	3.20	4.26	0.00	0.0
Total percent	-	100.00	100.00	100.00	100.00	100.00	100.00	100
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

Figure 5: Table 3 :

---

**4**

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

Figure 6: Table 4 :

## **15 CONCLUSION**

---

- 
- 201 [Dholakia and Iyengar (2008)] *Access of poor households to primary education in rural India*, H Dholakia , S  
202 Iyengar . 2008. 2008-02-02. February 2008. Ahmedabad, India. p. . Indian Institute of Management
- 203 [Bhandari and Dutta ()] *Health Infrastructure in Rural India*, L Bhandari , S Dutta . 2007. 2007. p. . (India  
204 Infrastructure Report)
- 205 [Kaur] *Rural Education in India*, R Kaur . <http://WWW.mapsofindia.com>
- 206 [Bajpai et al. (2008)] *Scaling up primary education services in Rural India: Public investment requirements and  
207 policy reform, case studies of Andhra Pradesh and Karnataka*, N Bajpai , Ravindra , H Dholakia , J D Sachs  
208 . 2008. January 2008.
- 209 [Dasgupta (2013)] ‘The shameful frailty of the Rural Healthcare System in India’. P Dasgupta . *sickness and in  
210 Health on Asia*, (India) Feb. 2, 2013.