

Village Population Density in Desert and its Implications on Community Health and Social Survey

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The present communication makes an attempt to assess the implication of low population density on, 1) the provision of amenities like schools, hospitals/dispensary, post office and telephone, 2) coverage of target population in rural areas for health and nutritional surveys, and 3) to explore the possibility of selecting villages based on their population density and compare the efficiency to those villages which are selected based on their population size, particularly in reference to rural health surveys in desert districts of Rajasthan.

The availability of all the amenities at village level considered as the indicators of the development, were observed to be increasing with the increase in population density, particularly the increase was prominent in availability of medical facilities in higher density (80 person km⁻²) villages (Table 1).

Selection of villages based on their population size have been in use for rural health surveys (NNMB Plan of operation 1972). To compare the representativeness, six trials each a sample of 30 villages was selected in Jodhpur district using the criterion of population density as well as population size. The representativeness of each sample was assessed based on the number of villages with certain amenities in the sample and its deviation from the expected number arrived from the total availability proportion seen in the district. The index scores (sum of deviation squares from the expected values) were calculated and pooled for all the samples. The scores obtained (Table 2) for each of the amenities suggests that when villages are selected based on their population density registered lower values, thereby giving better representation to the sample for transport as well as medical facilities as compared to, when the villages

Table 1 Distribution of villages according to their population density and the availability of different amenities in Jodhpur district

| Population density (person km ⁻²) | Education | Medical | Post and telephone | Transport | Approach Road | Total |
|---|---------------|---------------|--------------------|---------------|---------------|----------------|
| < 20 | 34 (46.6) | 4 (5.5) | 15 (20.5) | 30 (41.1) | 63 (86.3) | 73 (100.0) |
| 20-40 | 101 (77.1) | 20 (15.3) | 46 (35.1) | 67 (51.1) | 103 (78.6) | 131 (100.0) |
| 40-60 | 182 (90.1) | 41 (20.4) | 85 (42.3) | 113 (56.2) | 145 (72.3) | 201 (100.0) |
| 60-80 | 147 (92.4) | 35 (22.0) | 76 (47.8) | 97 (61.0) | 105 (66.0) | 159 (100.0) |
| > 80 | 132 (93.6) | 40 (28.4) | 71 (50.3) | 94 (66.7) | 81 (57.4) | 141 (100.0) |
| Total | 595 (84.5) | 140 (19.3) | 293 (41.6) | 401 (56.9) | 497 (70.5) | 705 (100.0) |
| x ² value | 107.9*** | 18.3** | 22.6*** | 15.8** | 26.2*** | |

Figures in brackets represent percentage of villages with amenities. Derived from district census hand book of Jodhpur

are selected based on their population size. When representativeness of the sample is considered in relation to all the amenities, the population density based selection of villages scored over the selection based on the population size (Table 2).

Table 2 *The index scores according to selection criterion of villages and amenities (Pooled for six samples).*

| Amenities | Population based | Population density based |
|--------------------|------------------|--------------------------|
| School | 88 | 102 |
| Transport | 146 | 138 |
| Post and Telephone | 164 | 164 |
| Medical | 113 | 64 |
| Pooled | 511 | 468 |

Considering the positive relationship between the village population density and the various amenities and the index scores it appears that in desert areas, it is the population density which would serve as a better criterion for selection of the villages as compared to the village population size.

Jaisalmer is known to have a population density of 6 persons km⁻² as against 73 person km⁻² in Jodhpur district. Considering the population density it appears that to cover about 100 infants or

pre-school children, one need to cover almost 12 times relatively more area in Jaisalmer district to that of Jodhpur district. Thus density can be taken as having serious bearing on cost, time and resources in conduction of any health or nutrition survey or action programme like Vitamin-A distribution to pre-school children.

In desert districts population density of the villages do not vary appreciably in the population range of 500-5000 as seen in non desert district (Table 3). Limited resources available in desert area, probably do not support the high density for a given area. Thus, while planning any type of survey in desert areas, there appears to be not much gain in going for villages by their size unlike seen in non-desert areas (Table 3).

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References

NNMB Plan of operation 1972 National Institute of Nutrition, Hyderabad.

Table 3 *Mean Population density according to population size in desert and non-desert areas.*

| village Size (in person) | Desert districts | | | | | | Non-desert district | | | | | |
|-----------------------------|------------------|------|------|-----------|------|------|---------------------|------|------|--------|------|-------|
| | Jodhpur | | | Jaisalmer | | | Barmer | | | Jaipur | | |
| | n | Mean | SD | n | Mean | SD | n | Mean | SD | n | Mean | SD |
| < 200 | 58 | 26 | 17.0 | 197 | 4 | 4.5 | 125 | 20 | 14.7 | 76 | 90 | 85.2 |
| 200-499 | 111 | 46 | 29.4 | 145 | 8 | 6.1 | 153 | 36 | 24.1 | 132 | 150 | 87.7 |
| 500-999 | 159 | 63 | 29.3 | 69 | 12 | 5.8 | 210 | 42 | 19.9 | 110 | 190 | 91.1 |
| 1000-1999 | 193 | 58 | 24.0 | 34 | 15 | 7.4 | 197 | 42 | 15.6 | 84 | 225 | 111.3 |
| 2000-2999 | 80 | 62 | 27.0 | | | | 91 | 46 | 19.6 | 22 | 239 | 118.2 |
| 3000-4999 | 62 | 62 | 28.0 | | | | 47 | 54 | 26.4 | 22 | 276 | 88.6 |
| > 5000 | 22 | 77 | 31.0 | 11 | 14 | 11.0 | 16 | 68 | 39.0 | 6 | 227 | 61.8 |

Includes data related to three tehsils of Jaipur district namely Jaipur, Jamwa Ramgarh and Viratnagar. n--number of villages