

Reproductive and Child Health Inequities in Chandigarh Union Territory of India

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ABSTRACT *Health inequity is an emerging issue all over the world. Some populations living in specific geographic areas may have less access to basic health facilities. Therefore, a sample survey of households was carried out to study access of different population groups to reproductive and child health. Cluster sampling technique was used to select 30 clusters (18 urban, 9 slum, and 3 rural) from Chandigarh Union Territory in India. From each of these clusters, 40 households were selected randomly. Data were collected using a standard questionnaire developed by UNICEF from April to June 2006 by graduate male and female field workers who were specially recruited and trained for this purpose. A total of 5383 individuals were studied in 1200 sample households with proportionate representation from urban (56%), slum (33%), and rural (11%) areas. Literacy rate was higher (94.3%) in urban than the rural (80.6%) and slum (65.3%) areas. About 68% of the deliveries were at home and not assisted by a skilled birth attendant (nurse, midwife, or doctor) in the slums, compared to 21% and 7% in rural and urban areas ($p < 0.001$), respectively. Fully immunized children at the age of 2 years were 30% in slums as compared to 74% and 62.5% in urban and rural areas ($p < 0.001$), respectively. Hib vaccination, which is to be bought at a considerable cost, was nil in slum areas compared to 79% in urban and 45% in rural area. Contraceptive prevalence was significantly more in urban (73%) and rural areas (75%) compared to the slum areas (53.4%) ($p < 0.05$). It was concluded that reproductive and child health service coverage has large differences in various population groups. Special interventions should be undertaken on a priority basis to bridge the gaps so as to achieve millennium development goals in all population groups.*

KEYWORDS *Child health, Inequity, Reproductive health, Slums, Urban.*

INTRODUCTION

Inequities in health may systematically put people at a disadvantage as health is essential for overcoming the effects of other disadvantages because of socioeconomic conditions. Equity supports the operationalization of right to the highest attainable standard of health as is indicated by the health status of the most socially advantaged group. Assessing health equity requires comparing health and its social determinants between more and less advantaged social groups. These comparisons are essential to assess whether national and international policies are leading toward or away from greater social justice in health.¹

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Urbanization is a growing phenomenon worldwide, but response to this situation has been inadequate in low-income countries.² Indian cities have experienced tremendous population growth particularly among the disadvantaged population groups living in the slums.^{3,4} In the last decade, India grew at an average annual growth rate of 2%, but urban population grew at 3%, mega cities at 4%, and slum populations rose by 5 to 6%.⁵ As a proportion of total poverty, the urban component has increased from 15% in the early 1970s to about 25% in the mid 1990s.⁶ However, these estimates do not reflect the true magnitude of urban poverty because of the unrecognized and “unaccounted” squatter settlements and other populations who reside on pavements, construction sites, fringes, etc. Large slums and other urban poor populations have remained unreached by the public health services.⁷⁻⁹ According to a survey by the World Institute of Development Economics Research, compared to developed countries, the health gap between the poor and the rich in India is greater than the economic difference in these groups.¹⁰

A review of existing data suggests that health indicators of different population groups are not the same in most countries.¹¹ Inequity in health poses a major challenge to achieve the millennium development goals, particularly those related to maternal and child health as existing programs are often not able to reach the most needy.¹² Therefore, assessment of the coverage of disadvantaged populations under reproductive and child health programs should receive priority. This study was planned with the objective of estimating access of reproductive and child health service to people living in urban, rural, and slum areas.

MATERIAL AND METHODS

This study was conducted in Chandigarh, which is a Union Territory (UT), located in the northern part of India. A UT, like a state, is a subnational administrative division but unlike a state, which have their own elected governments, union territories are governed directly by the federal government. Chandigarh UT is small and compact with a 114 sq. km. area and 900,635 people; 78% of them live in urban, 12% in slum, and 10% in rural areas. There are 56 city sectors, 15 slums, and 23 villages as per the census of India.¹³ Chandigarh city has a vast network of public health facilities, which include three hospitals, two community health centers, one polyclinic, one employee state insurance hospital, 25 civil dispensaries, seven ayurvedic dispensaries, five homeopathic dispensaries and five urban family welfare centers. Nine dispensaries and 13 sub health centers are serving rural areas.

A household survey was conducted in Chandigarh UT by using standard multiindicator cluster sampling method. Sample size was calculated on the basis of a standard multiindicator cluster sampling (MICS) technique used by UNICEF.^{14,15} The formula for calculating sample size was $n = [4(r)(1-r)(f)(1.1)] / [(0.12r)^2(p)(n_h)]$, where r is the coverage rate of measles vaccine in 12–23 months of children (0.4), f is design effect (1.5), 0.12 is margin of error to be tolerated at the 95% level of confidence interval, p is the proportion of children in 12–23 months of age (0.025), and n_h is average household size (5). Sample size estimate, using this formula, was 5250. All city sectors, slums, and villages were included in the sampling frame. Slums are mainly located in the periphery of the city. Thirty clusters were selected randomly from three strata to proportionately represent urban, slum, and rural population (18 urban, 9 slums, and 3 rural). From each of the sampled clusters, 40 households were selected. The first household in each cluster was selected from the center of the cluster

randomly, and the rest of the households were selected consecutively from the first sampled household starting from the nearest household on the left side. Thus, 1200 households were included in the survey.

Women in the age group of 15–49 years were interviewed using a standard multiindicator cluster sampling questionnaire developed by UNICEF, which was pretested and adapted to local situation.¹⁵ The questionnaire had schedules for the household, adolescent girl, married women (15–49 years), and the child (<5 years). The married women in the 15–45 age group were asked about their contraceptive practices, symptoms, and treatment-seeking behavior for reproductive tract infections/sexually transmitted infections (RTIs/STIs) in the past year. Pregnancy-related information of the last 5 years was inquired. For assessment of the quality of maternity services received, information was obtained for the current and last pregnancy, which had occurred in 2 years preceding the survey. Information on child health was obtained for all children less than 5 years of age.

Before administering the questionnaire to the study participants, the purpose of the study and the nature of questions were explained to them. The data were collected from April to June 2006 after taking informed consent orally from the residents by four graduate field investigators (two male and two female) who had been trained for this study. To ensure the quality of data, 10% of the selected households were randomly cross-checked by the supervisor. Response rate was 80%, 90.2%, and 99.3% in the first, second, and third visits, respectively. The reasons for nonresponse were: the house was found locked or the respondent was not available despite three visits to the household.

After checking the questionnaire for errors, the data were entered into a computer database and analyzed using Epi info 2000 statistical software. The chi-square and Fisher's exact tests were used to test differences in categorical variables. Differences were considered to be statistically significant at the 5% level.

RESULTS

The sampled households had 5383 persons representing urban (56%), slum (33%), and rural (11%) areas. Large environmental and social inequities were observed in the study area (Table 1). Slums had significantly more (40%) socially disadvantaged population (*scheduled caste*) compared to the rural (35%) and urban (8.3%) populations ($p < .001$). The source of drinking water was mainly taps in all the areas; however, 94% of the households in the urban, 10.8% in rural, and only 2% in slum areas treated their water (filtered, boiled, etc.) at the household level to make it safe for drinking.

Coverage of maternal health service was lowest in slums compared to the rural and urban areas (Table 2). Child births in health institutions were significantly low in slums compared to the urban and rural areas ($p < .001$). Among the institutional deliveries, government institutions were preferred by 81.5%. Caesarean section rate was 32.5% in urban, 15% in rural, and 5.5% in slum areas ($p < .001$). Antenatal checkup from a doctor was sought by only 27.8% of the pregnant women in slums as compared to 93.4% and 88.4% in urban and rural areas, respectively. Teenage marriage was higher (13.5%) in slums compared to the urban (7.9%) and rural (4.5%) areas ($p = .05$). Awareness of adolescent girls regarding contraceptives was significantly poor (23%) in slums than in the urban (43.6%) and rural (38.6%) areas ($p < .001$).

Registration of births was lowest (59%) in slums as compared to urban (90%) and rural area (85%) ($p < .001$). Although the initiation of breast feeding within

TABLE 1 Socio-environmental characteristics of study population, Chandigarh, 2006

Parameters	Urban %	Rural %	Slum %	P value
Occupation ^a	N=2199	N=393	N=923	
Unemployed	6.4	13.2	4.6	<.001
Workers	51.7	63.9	83.5	<.001
Clerics and sales persons	30.8	18.6	10.7	<.001
Professionals and managers	11.1	4.3	1.2	<.001
Education ^b	N=2778	N=546	N=1488	
Illiterate	4.6	19.4	34.7	<.001
Below Primary	14.6	25.9	40.9	<.001
Primary to secondary	37.8	45.7	23.5	<.001
Graduate and above	43.0	9.0	0.9	<.001
Water and Sanitation	N=720	N=120	N=360	
Tap water supply	100.0	100.0	99.0	.07
Sewerage system	98.0	92.5	33.4	<.001
Below Poverty Line families ^c	2.3	4.4	7.2	.001

^aConstitute population more than 18 years

^bConstitute population more than 7 years

^cPer capita expenditure on consumption goods below U.S.\$ 15 per month

1 hour was low (48%), exclusively breast feeding until 6 months of age was higher (77%) in slums as compared to the urban and rural areas. Significantly, fewer (36%) mothers had immunization cards of their wards in slum areas, as compared to 81% in the rural and 80.4% in the urban areas ($p<.001$). Fully immunized children at the age of 2 years were 30% in slums compared to 74% and 62.5% in urban and rural areas, respectively ($p<.001$). No child was immunized against Hib in slums as compared to 79% in urban and 45% in the rural area ($p<.001$). Other indicators of child health were also lower in slums than the rural and urban area (Table 3).

The contraceptive prevalence was significantly more in urban (73%) and rural areas (75%) compared to the slums (53.4%) ($p<.01$). In urban areas, most common contraceptive method used was condoms (37.5%) followed by female sterilization (19.3%), intrauterine devices (5.3%) and oral contraceptive pills (4.2%), whereas in rural areas the most common method adopted for contraception was female sterilization (32.5%), followed by condom (23%) and intrauterine devices (9.5%). In slums also, female sterilization (28%) was the most common method followed by condom (11.3%), intrauterine devices (3.9%), and oral contraceptive pills (3.9%). In the urban area, married couples prefer to buy contraceptives from the shops (56.2%), whereas most of the women in slum and rural areas prefer to get these free of cost from government health facilities ($p<.001$). Unmet need for contraception was higher in slums than in urban and rural areas (Table 2).

Prevalence of reproductive tract infections/sexually transmitted infections was similar in all the areas (slum 8%, urban 6.3%, and rural 7.1%). Low backache (71.4%) was the most common symptom, followed by vaginal discharge (17%). Out of the 34 patients of RTIs/STIs, only half (52%) had consulted a doctor for treatment in slums and urban areas compared to rural areas (67%) ($p=.5$). Relief after taking the treatment occurred in only 50% of the cases in both rural and slum areas compared to 80% in urban areas ($p=.1$). Preferred health facility for

TABLE 2 Process indicators related to maternal health, Chandigarh, 2006

Indicators	Urban %	Rural %	Slum %	P value
Pregnancies in the last 5 years	N=166	N=67	N=237	
Three antenatal checkups	93.4	89.5	69.6	<.001
Tetanus toxoid prophylaxis	96.4	98.5	85.2	<.001
Consumed 100 iron and folic acid tablets	91.0	94.0	63.7	<.001
Childbirths in the last 5 years	N=163	N=67	N=235	
Institutional deliveries	93.0	79.0	32.0	<.001
Caesarean sections	32.5	14.9	5.5	<.001
Postnatal care	35	16.4	6.3	<.001
Pregnancies in the last 2 years	N=92	N=21	N=110	
Antenatal checkup by:				<.001
Doctor	93.4	88.4	27.8	
Nurse/Female health worker	6.6	11.6	33.6	
Weight done	99.0	96.0	78.2	<.001
Urine sample tested	97.8	100	76.3	<.001
Blood pressure measured	99.0	100	35.9	<.001
Informed about HIV/AIDS	44.6	73.0	9.3	<.001
HIV testing done and report communicated	76.0	92.0	13.5	<.001
Delivery of the last child assisted by				<.001 ^a
Doctor	94.0	96.0	23.6	
Nurse/midwife	5.0	4.0	20.0	
Untrained birth attendant (<i>dai</i>)	1.0	0	56.4	
Baby weighed at birth	82.0	24.0	54.0	<.001
Unmet need for contraception	15.2	0	22.7	.08 ^a

^aFisher exact test has been applied

taking the treatment was government hospital in urban (50%), slum (71.4%), and rural area (60%). A significantly smaller number (60%) of women in slums were aware that condom use prevents HIV/AIDS compared to 94.2% in urban and 87.2% in rural areas ($p < .001$).

TABLE 3 Process indicators related to child health, Chandigarh, 2006

Indicators	Urban %	Rural %	Slum %	P value
No. of under five children	N=153	N=64	N=191	
Breast fed within the first hour of birth	81.0	71.8	48.0	<0.001
Exclusive breast feeding for 6 months	56.9	50.0	77.0	<0.001
Immunization				
BCG	98.7	100.0	83.2	<0.001
DPT and OPV 3rd dose	88.2	85.9	64.4	<0.001
Measles	80.3	75.0	53.9	<0.001
Hepatitis B	70.0	45.0	7.3	<0.001
Hib	79.0	45.0	0	<0.001 ^a
MMR	1.3	0	0.5	0.5 ^a

^aFisher exact test has been applied

DISCUSSION

To address health inequities, the government of India has made large efforts to develop primary health care in rural areas. The recently launched National Rural Health Mission (NRHM) is one step in this direction.¹⁶ However, only a few urban schemes have been implemented so far. These include the Urban Family Welfare Scheme, Urban Revamping Scheme, and Post Partum Centers.^{17,18} Recently, India Population Projects funded by the World Bank have attempted to provide health care services to the urban poor in the mega cities like Delhi, Mumbai, and Chennai.¹⁹ However, coverage of these schemes has been far from complete and marked inequities in health still continue,²⁰ as is also evident from better maternal and child health indicators in urban and rural area in comparison to the slums in Chandigarh UT (Tables 2 and 3). These findings are similar to the studies from other parts of India.^{11,21,22}

Equitable living conditions and environments did not exist in Chandigarh as evident from the poor sanitary condition of the slums (Table 1). Access to water supply and sanitation facilities among the urban poor is low. It was observed from other studies also that 62% of urban poor households do not receive piped water supply, and 66% do not have any toilet facility.^{9,23} Child mortality and morbidity (diarrhea in particular) have been associated with poor water quantity and quality, lack of sanitation, and poor hygiene practices.²⁴ Slums located adjacent to large open drains have been found to have greater incidence of diarrhea and other water-borne diseases.²⁵

The percentage of pregnant women with three antenatal checkups was found to be more in the present study than the National Family Health Survey (NFHS) 2005–2006.²⁶ However, antenatal care coverage was low in the slums of our study area. Rate of caesareans section was found to be significantly higher in urban and rural areas, which reflects over medicalization of maternal health care as is also observed in other cities in India, China, and Brazil.^{27–30} Preference of public health institutions for childbirth instead of the private services reflects good provision of government health facilities in Chandigarh, but access of these facilities to slum population was poor as they have to buy most of the prescriptions. The overall percentage of women getting postnatal checkups was found to be less in this study compared to the NFHS 2005–06.²⁶ Postnatal checkup was found to be negligible in slum areas because there was no house-to-house health checkup visit by health workers, as is done in other urban and rural areas.

Immunization status of children under 5 years of age was poor in the slums as compared to the rural and urban areas (Table 3), which is also observed in other studies.^{26,31} Whereas majority of children under 5 in urban and rural areas were getting costlier vaccines like Hib and Hepatitis B vaccine, in addition to routine vaccines under national immunization schedule, in slums not even routine vaccines were received by many children. A free market mechanism of delivery of vaccine is likely to further increase inequity. It is a paradox that those who have the highest risk of contracting vaccine-preventable disease are least likely to get them because of the high cost of vaccine and because of less access to public services. Child health indicators in our study were almost similar to UNICEF's evaluation and Rapid Household Survey (RHS), except that the overall dropout rate for vaccination was found to be higher in our study probably because of the inclusion of slum population in our sample.^{32,33} Although no data were collected in this study to assess childhood malnutrition, a review of another study revealed that the prevalence of underweight

children in urban slum areas (56.9%) was higher than in the rural (47.4%) and urban area (37.6%) of Chandigarh ($p=.005$).³⁴

The rate of contraceptive use was higher in this study compared to that in the Rapid Household Survey.³³ However, in the slum population contraception usage was lower than in the urban and rural areas, which needs further investigation. Urbanites usually prefer to buy contraceptives from the market because of their better socioeconomic status. As paying capacity of slum and rural residents is poor, they depend on contraceptives supplied by the public health service free of cost. However, still the unmet need for contraception is quite high in slums reflecting inadequate services. Lower prevalence of RTI/STD-related symptoms as found in this study is in agreement with other Indian studies.³⁵

In spite of the better health facilities in the form of two tertiary care hospitals, one multispecialty hospital and a network of civil dispensaries and private hospitals/clinics in Chandigarh, coverage indicators for reproductive and child health were poor in the slums. Slum dwellers had poor literacy and most were employed in less paying unskilled manual labor, whereas residents of the urban and rural area had better literacy level and had better jobs. Hence, slum populations were an economically and socially disadvantaged group. Our data show that 7% of the slum population in Chandigarh is very poor, i.e., their per capita expenditure on consumption goods is less than U.S.\$ 15 per month.³⁶ Illegality of slums and social exclusion hampers health service development in the slums. Even outreach health services provision in slums is poor. Female health workers were available only in urban and rural areas to do door-to-door health visits, whereas this service is required in slums also.

Rapid growth of urban population and unplanned urbanization is likely to limit urban living spaces, and urban environments may decay further impacting on the quality of life of the urban poor. The Millennium Development Goals (MDGs) have underlined the multidimensional nature of poverty and the connections between health and social conditions. There is a need to move beyond narrow sectoral interventions and to develop comprehensive social responses and participatory processes that address the “root causes” of health inequity.³⁷ This study has identified the environmental, social, and reproductive and child health inequities in a union territory of India, which has implications for planning and fund disbursement. Identifying health disparities can assist public health authorities in India in developing policies and programs targeting persons or communities at greatest risk of adverse health outcomes. Interventions at higher policy levels that will create more sustainable and equitable living conditions and environments include improved city planning and policies that take health aspects into account in every sector.³⁸ It was encouraging to find that on the basis of our survey findings, Chandigarh health authorities have planned a special project under the 11th Five Year Plan for the urban slum population of Chandigarh to redress the existing health inequities. In view of the glaring inequities in urban settings, the Prime Minister of India has recently announced an initiative to improve health services for urban poor on the lines of the National Rural Health Mission.³⁹ Jawaharlal Nehru National Urban Renewal Mission has also been launched to augment basic services for the urban poor.⁴⁰

CONCLUSIONS

Reproductive and child health inequity exist in the Chandigarh Union Territory alongside the social and environmental inequity. Maternal and child health coverage

indicators were poor in slums as compared to urban and rural areas. Reasons for these gaps should be further investigated and every effort made to bridge these gaps.

ACKNOWLEDGMENT

This study was funded by the Health Department, Union Territory, Chandigarh, India.

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