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Health status of children under three years of age residing in the slums of Rajkot city, Gujarat, India

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Abstract

Background: Slums areas of a city are high risk areas for various disease transmissions. Maternal and child heath indicators among slum dwellers show that their health status is two to three times worse than those in the other urban areas. **Aims and Objectives:** This study was designed to assess the health status and utilization of various health services among the children less than three years of age, residing in the slums of Rajkot city. *Study Design:* This was a part of a Multi Indicator Cluster survey conducted in the slums of Rajkot city. *Setting*: This cross sectional study covered 30 slums out of 257 slums designated in the geographical limits of the Rajkot Municipal Corporation. **Materials and Methods:** A 30 cluster sampling technique was employed using participation proportionate to size method. Each slum area was designated as a cluster. In stage one 30 clusters were selected proportionate to their size. In second stage 60 households were selected from each cluster. *Statistics:* The data was analyzed using Epi Info Software Version 3.3.2 **Results:** A total of 344 children less than three years of age were found in the 1800 households surveyed. The under three sex ratio was 965.71. The prevalence of low birth weight was 19.9%. The complete vaccination coverage in children between one to two years of age was 68.2%. Vitamin A coverage among the eligible children during the August 2010 round of the biannual Vitamin A campaign was 44.2%. Exclusive breast feeding in children less than six months of age was 81.8%. Registration of the children in the Mamta Sessions (Health and Nutrition Day) and in the local Anganwadi centre was 41%. There were 13.7% children who had presence of any morbidity during the survey. **Conclusions:** The study found that special focus needs to be given on the increasing the enrollment of the children in the Mamta Divas sessions as well as in the local anganwadis. Focus should also be given on improving the quality of health care offered to the beneficiaries in these centers.

Keywords: Multi Indicator Cluster Survey, Cluster, Households, Mamta sessions, Complete vaccination, Drop-out rate.

INTRODUCTION

Children and women are classically recognized as the vulnerable sections of any society. Slums areas of a city are high risk areas for various disease transmissions. Maternal and child heath indicators among slum dwellers show that their health status is two to three times worse than those in the other urban areas [1]. Recognizing the seriousness of the problem, the 11th Five Year Plan has launched the National Urban Health Mission with special focus on the slums and the urban poor [2]. Located in the center of the Saurashtra region of Gujarat, Rajkot is the headquarters of Rajkot district. It is a bustling industrial city with a large numbers of small scale industries. The city witnesses a steady stream of migrants not just from Saurashtra region but from different districts of the state as well as from the other states like Bihar, Jharkhand, Odisha coming for their livelihood. Being mostly involved in unskilled and semi-skilled labor work in the unorganized set up, they do not get any accommodation from their employers and just tend to conglomerate in the slums distributed across the entire city. This study was formulated to evaluate the health status of children residing in the slum areas of Rajkot city.

MATERIALS AND METHODS

This study was a part of a 'Multi Indicator Cluster Survey' (MICS) undertaken to assess the health status and utilization of various health services by the slum dwellers of Rajkot city.

Each 'slum area' was designated as a cluster. The Rajkot Municipal Corporation (RMC) had identified 257 slum areas within the 23 different wards of the city. A ward-wise list of the slums of Rajkot city was obtained from the health department of the RMC. In stage one, 30 clusters were selected proportionate

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to their size. From each cluster 60 'households' were selected for detailed evaluation. A 'household' was considered as a group of persons who usually lived together and ate from the same kitchen. For adequate representation of the entire cluster, the slum area was divided into four quadrants. From each quadrant 15 households were selected for detailed questioning and examination.

Questions regarding various aspects pertaining to the health status and utilization of health services were asked to the mothers of all the children less than three years of age, who were found in the 1800 households surveyed. The Government of Gujarat had launched the Mamta Abhiyan (Health and Nutrition Day) in 2006 to increase the effective delivery of comprehensive maternal and child care [3]. Various services (antenatal, intranatal, post natal care, early neonatal care, vaccination details, growth monitoring, infant and young child feeding) rendered to the mother and child are documented in a pictorially designed informative card known as the 'Mamta Card'.

Details of the vaccination status of all the children between one to two years of age were obtained by oral recall and verification of Mamta/vaccination cards (when available). Coverage of the booster doses of DPT and OPV was elicited from all the children between two to three years of age. Details of breast feeding were asked for all the children. Various activities of the Mamta Abhiyan (registration, attendance pattern, growth monitoring and counseling) were assessed by looking into the Mamta Cards and specifically asking regarding the same to the mothers of the children. Registration of the children in the Anganwadis was also enquired. All the children who were present during the survey were examined for signs of severe malnutrition and severe palmar pallor as per the guidelines of the Integrated Management of Neonatal and Childhood Illness (IMNCI) modules [4]. The mothers were asked regarding the perception of their child's health. Those mothers who complained of any health related ailment in their children (during the time of the survey) were further asked questions aimed to elicit the treatment seeking pattern as well as the very basic quality of treatment rendered.

A pre-tested structured performa was used to collect the data. The survey was conducted during October and November 2010 by the intern and post graduate students of the department under watchful guidance and observation of the department faculty.

Statistical Analysis

All the data were entered and analyzed using Epi Info software Version 3.3.2 [5]. The basic template for entering all the data was made using the 'create forms' section of the Epi Info. All necessary filters were incorporated right at the creation of the entry form in Epi Info to reduce chances of wrong and inappropriate data entry. The entry of the basic house hold information, details pertaining to children obtained from the various forms of the MICS were all done in the Epi Info software using the 'enter data' section. Subsequently data cleaning was done in order to overwrite any manual errors and omissions made in data entry. All the data thus verified was subject to analysis using the 'analyze data' section of Epi Info. All calculations used in measures of central tendency and measures of dispersion were obtained from 'analyze data' of Epi Info.

RESULTS

A total of 344 children less than three years of age were found in the 1800 households surveyed. The various demographic features of the population and the children are given in Table 1.

Table 1: Demographic features of the population in the slums

Demographic features:	Number/n/N	Percentage
Total Number of households studied	1800	
Total population surveyed	8454	
Total number of children < 3Years age	344	4.1
Average family size*	4.7	
Overall Sex Ratio	906.20	
Under 3 sex ratio	965.71	

*Average family size=Total population surveyed in 30 clusters divided by number of households studied

The prevalence of institutional delivery among the 344 children obtained was 86.6% with 44.8% of these deliveries conducted in a government hospital. The births had been registered in 304 out of 344 children (88.4%). A specific enquiry for the birth certificates was made: birth certificate was shown by 96.7% of those whose birth had been registered.

Birth weight was taken in 84.6% of the 344 children at the time of delivery. The prevalence of Low birth among those children who had been weighed at birth was 19.9%

A Mamta Card or a vaccination card was available in 225 out of 344 (65.4%) of the children.

It is observed in Table 2 that the vaccine with the maximum coverage is BCG (94.4%). The common places of vaccination were Government hospital (Urban Health Centre or Corporation Hospital or the district Hospital) in 46.5% of the children, followed by Anganwadi centers (28.7%) and private hospital (24.8%).

Out of 106 children between two to three years of age, 65 (61.3%) received the booster doses of DPT and OPV between the ages of 16-24 months.

Table 2: Vaccination coverage in one to two year old children (n=107)

Name of Vaccine	Vaccinated (%)
BCG	94.4
BCG Scar Present*	97.0
DPT1	89.7
DPT2	86.9
DPT3	76.6
OPV1	91.6
OPV2	86.9
OPV3	79.4
Measles	74.8
Vitamin A(First dose)	57.0
Full Immunization[†]	68.2
Drop Out Rate[‡]	
Complete Vaccination[§]	19.6
DPT1 to DPT3	13.1
OPV1 to OPV3	12.2

* Base = All children who had received BCG injection. BCG scar was looked for in the left upper arm.
[†] Full Immunization: A child receiving all these vaccines – BCG, 3 doses of DPT, 3 doses of OPV (excluding Polio 0) and 1 dose of Measles.
[‡] Drop Out Rate = Coverage of first dose minus coverage of third dose.
[§] Complete vaccination dropout rate = Highest coverage antigen dose (in our case BCG) minus lowest coverage antigen dose (in our case Measles).

An effort was made to elicit the number of children who had received a dose of Vitamin A during the August 2010 session of the bi-annual round of pulse Vitamin A campaign. It was seen that 68 (44.2%) out of 154 eligible children had received a dose of Vitamin A during August 2010 round.

Table 3 shows the pattern of breast feeding observed in the children. The rate of exclusive breast feeding in children less than six months of age was 81.8%. The prevalence of breast feeding across the children less than one year of age was 99.2%, which reduced to 73.8% among children 1 -2 years of age. 24.5% of the children between 2-3 years of age were continued to be breast fed.

Table 3: Pattern of breast feeding in the under three age group children

Criterion	n/N	(%)
Timing of initiation:		
Within 1 hour	211/344	61.3
Between 1-4 hours	86/344	25.0
Between 4-24 hours	21/344	6.1
Beyond 24 hours	26/344	7.6
Colostrum Offered:		
Yes	272/344	79.1
Exclusive breast feeding* received in children less than 6 months of age:		
Child age		
< 1 month	6/6	100
1 - < 2 months	13/16	81.2
2 - < 3months	10/13	76.9
3 - < 4months	11/12	91.7
4 - < 5 months	7/9	77.7
5 - < 6 months	7/10	70.0
Overall	54/66	81.8

*Exclusive breast feeding: Only those children who were given breast milk, **without** any addition of water or other any other food items (other animal milk, other liquid, soft mushy food etc.) were considered as 'exclusively breast fed'.

Table 4 deals with some of the activities carried out in the Mamta sessions. Weight is noted in 61.9% of all the children who had the Mamta card. However only 25% of all the 144 parents (whose children were registered), had proper understanding of their child's growth pattern.

Table 4: Activities in the Mamta Sessions

Criterion	n/N	%
Registration and attendance:		
Registration of children (In Mamta sessions)	144/344	41.9
Registered children attending Mamta sessions regularly-i.e. every month	98/144	68.1
Growth Monitoring and Counseling:		
Weight noted in Mamta Card (among children visiting the last Mamta session and having the Mamta Card)	73/118	61.9
Parents counseled about the weight gain (in those children whose weight is noted in the Mamta Card)	45/73	61.6
Proper understanding of the weight (among those parents counseled)	36/45	80.0
Mothers counseled regarding infant and young child feeding (among all children registered and reported to be attending the Mamta Sessions in the last 3 months)	99/137	72.3

Out of 344 children surveyed, 141 (41%) were registered in the Anganwadi centers.

Visible severe wasting was noted in nine (2.8%) out of 318 children who were physically present during the survey. Bilateral pedal oedema and severe palmar pallor were noted in one (0.3%) and 13 (4.1%) of the 318 children respectively.

Three hundred and twelve (90.7%) out of the 344 mothers felt that their child was 'healthy'. There was no significant difference in the opinion of the mothers across the different age groups (<1 year, 1-2 years, 2-3 years) of the children ($\chi 2=1.59$, *P*=0.81). Their opinion regarding the health status of the children did not vary significantly across the different sexes of the children ($\chi 2=0.38$, *P*=0.83).

There were 47 mothers (13.7%) of the 344 children who had some complain regarding their children's health during the time of the survey. The common complaints were – common cold (10.2%), fever (5.5%), and diarrhea (1.5%). Forty out of the 47 children (85.1%) who were having some complain were taken for treatment. The commonest place of seeking treatment was private hospitals (82.5%). Out of the 19 children who had fever, two (10.5%) were tested for Malaria parasites; while one out (20.0%) of the five children who had diarrhea was given Oral Rehydration Solution (ORS) during the episode of the illness by the treating doctor.

DISCUSSION

The percentage of children with full vaccination in our study is 68.2%. There has been no increase in the rate from 2006 (68.0%) which was obtained from the MICS undertaken in the Rajkot city slum areas [6]. The rates are higher than that observed for the slum areas of Surat (25.1%), in a similar survey of 2007 [7]. Though Vitamin A (first dose) and Measles are intended to be given at the same age, none the less a vast gap of 17% is observed in this present survey. This has however improved as compared to that of the MICS of 2006 where the gap between Measles and Vitamin A (first dose) was 37% [6].

The low coverage of the bi-annual Vitamin A during August 2010 session (44.2%) leaves a lot of scope of improvement. Bhanderi *et al* reported Vitamin A coverage of 76.9% for August round of 2007 in the rural areas of Anand district of Gujarat [8]. In a survey conducted in the rural areas of Surendranagar district (which happens to be adjacent to Rajkot District) it was found that 59.1% of the eligible children had received the Vitamin A dose in August 2007 round of Vitamin A campaign [9].

In the MICS conducted in the slums of Rajkot city [6] and Bhavnagar city [10] in 2006 it was found that 6.4% and 28.6% respectively of under two years age children had been started on breast feeding within the first hour of birth. Though this has increased to 61% in the present survey, it leaves a lot to be achieved especially considering that fact that initiation of breast feeding within the first hour of birth can reduce 22% of all neonatal mortality [11]. Exclusive breast feeding for the first six months can cut down about 15% of all child deaths [11]. In the MICS conducted in the rural areas of Surendranagar district of Gujarat in 2008, the rate of exclusive breast feeding in children (less than six months of age) was 50% [9].

Bhanderi *et al* found the registration of children in the Mamta Abhiyan of rural areas of Anand district of Gujarat to be 90.5% in 2007 [8]. The registration level of 41.9% in the present survey is compounded by the huge fallout or gap in the rendering of services to those registered in the Mamta Abhiyan sessions: as is evident by the attendance profile of the children and monitoring and counseling of the growth and feeding of the children (Table 4).

The low (41%) registration of the under three children in the local Anganwadi centers is also an issue of concern. The neighboring district of Surendranagar had shown the registration of children (under three years) in the Anganwadi centers as 44.6% in the year 2007-2008 [9].

In spite of so much repeated advertisements in print as well as in the mass media regarding the necessity of blood testing in cases of fever (for Malarial Parasites) and use of ORS in cases of diarrhea, their practice in real life by the doctors has remained abysmally low in the children who had these illnesses during the survey.

The study undertaken in the slums of Rajkot city has highlighted the lacunae existing in the health status of the under three children. However, in any survey of this nature, the fallacy of recall bias should also be kept into consideration. This study elicited data predominantly

of a quantitative nature. The causative factors behind the observations were not a part of the survey.

CONCLUSIONS

Reasons as to why Vitamin A coverage (both with routine vaccination as well as in the bi-annual rounds) remains low need to be identified and addressed on a priority basis. Improvement in the quality of the Mamta Abhiyan sessions undertaken by the government in the Anganwadi centers of the city will help in increasing the overall knowledge of the parents of the children which will ensure more client centered, demand driven quality health care delivery in the future.

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Authors' Contributions

Anupam Banerjee: Was involved in the concept, design (planning of the survey, pre survey workup - questionnaire modeling, selection of clusters, etc.) pre survey training, supervision during the survey, data entry, analysis and manuscript preparation. He stands as the 'guarantor' of the study.
Umed Patel: Was involved in pre survey work up, coordination of the survey activities, financial management, manuscript editing and review.
Pramod Verma: Was involved in the pre survey questionnaire modelling, overall supervision of the entire field activities, manuscript editing and review.
Ankit Viramagmi: Besides being part of the survey team, he was involved in the data entry, data analysis and literature search.
Mayur Vala: Assisted in the field level activities and helped in the data management process.

REFERENCES

1. Rao BT, Thakur JS. Vulnerability assessment in Slums of Union Territory, Chandigarh. Indian J Community Med 2007:32:189.
2. National Urban Health Mission (NUHM). Available from: hhhp://www.uhrc.in/module-Content Express [Accessed on 2011 May 05].
3. Vital Statistics Division, Commissionerate of Health, Medical Services, Medical Education and Research, Gujarat State, Gandhinagar: Health review draft, Gujarat 2007-2008, December 2008. Available from: gujhealth.gov.in/Draft%20Health%20Review.pdf [Accessed on 2008 Dec 30].
4. Integrated Management of Neonatal and Childhood Illness Modules. Ministry of Health and Family Welfare, Government of India, New Delhi 2003.
5. Centers for Disease Control and Prevention. Epi Info version 3.3.2, 2005. Available from: www.cdc.gov/epiinfo/. [Accessed on 2005 Feb 09].
6. Report on Multi Indicator Cluster Sampling survey in slums of Rajkot City conducted by Department of Community Medicine, PDU Medical College, Rajkot 2006.
7. Sharma R, Desai VK, Kavishvar A. Assessment of immunization Status in the Slums of Surat by 15 Clusters Multi Indicators Cluster Survey Technique. Indian J Pub Heath 2009; 34:152-55.
8. Bhanderi DJ, Mukherjee SM, Gohel MK, Christian DK. An Evaluation of the Utilisation of Reproductive and Child Health Services provided by Government to the Rural Community of Anand District, Gujarat. Indian J Pub Heath 2009; 53: 250-52.
9. Report on Multi Indicator Cluster Sampling survey in villages of Surendranagar District conducted by Department of Community Medicine, PDU Medical College, Rajkot 2008.
10. Report on Multi Indicator Cluster Sampling survey in slums of Bhavnagar City conducted by Department of Community Medicine, Government Medical College, Bhavnagar 2006.
11. Kishore J. Reproductive and Child Health Program-II. In National Health Programs of India. 9th ed. New Delhi: Century Publications; 2011. p. 153.