Original Article

STATUS OF MATERNAL AND CHILD HEALTH IN AN URBAN SQUATTER SETTLEMENT OF KARACHI, PAKISTAN: RESULTS FROM A ROUND OF SURVEILLANCE

Unaib Rabbani[1], Maryam Huda[2], Aysha Zahidie[3], Fauziah Rabbani[4]

[1]Medical Officer Surveillance, Department of Community Health Sciences, Aga Khan University, Karachi, Pakistan
[2]Senior Instructor, Department of Community Health Sciences, Aga Khan University, Karachi, Pakistan
[3]Senior Instructor, Department of Community Health Sciences, Aga Khan University, Karachi, Pakistan
[4]Professor and Associate Vice Provost Research & Graduate Studies, Department of Community Health Sciences, Aga Khan University, Karachi, Pakistan
Correspondence: Fauziah Rabbani, Email: fauziah.rabbani@aku.edu

Abstract

Background: Rapid urbanization has led to emergence of squatter settlements with poor infrastructure and compromised basic amenities. These conditions expose vulnerable groups like women and children to serious health risks. This paper presents the status of maternal and child health in a squatter settlement of Karachi.
Methods: Health and Demographic Surveillance System was established in Sultanabad, a squatter settlement of Karachi. Households were eligible to be enrolled if there was a married woman of 15-49 years of age. Data on socio-demographic, maternal and child health indicators was collected during a round of surveillance using a structured questionnaire adapted from Measure Demographic and Health Survey Phase III and Pakistan Demographic and Health Survey 2012-13. Analysis was done using SPSS version 19.
Results: A total of 730 women completed the interview. Among them 87% women sought antenatal care during last pregnancy and 79% of the women delivered in a facility. Contraceptive prevalence rate was 32%. Proportion of children exclusively breast fed till six months of age was 63%. Almost 86% children of 12-23 months were fully immunized. Prevalence of stunting among children under five was 40%.
Conclusion: In Sultanabad, maternal and child health indicators were relatively better as compared to national statistics. However in the presence of available health facilities, the low contraceptive prevalence and high proportion of stunted children in the community is alarming. This requires urgent attention primarily addressing social determinants of health within the local context.
Keywords: Maternal and child health, primary health care, squatter settlement, surveillance, Pakistan

Introduction

All over the world, countries are experiencing rapid urbanization and more people are migrating to industrialized urban neighborhoods. Global statistics reveal an estimated urban population of 56% in 2014 as compared to 30% in 1950 (1). However, the pace of urbanization is faster in developing countries where mass migration of people from rural to urban settlements is leading to unplanned expansion of cities into megacities. This rapid growth of cities without parallel development of supporting infrastructure gives rise to squatter settlements putting added pressure on resources and civic services like garbage disposal facilities, water and sanitation, education and healthcare (2, 3). Lack of planned land use policies and basic amenities expose vulnerable groups like women and children to a number of environmental risks with serious implications on health (3-5).

Karachi is the largest city of Pakistan and the 11th largest city in the world (1). It has a population of about 16 million according to recent population census (6). Currently, it is the only functional port of the country and major industries and businesses are located here. Moreover, people from all over the country move to Karachi as there are better earning opportunities which have led to rapid expansion of the city. Karachi is divided into planned and unplanned areas. Unplanned areas are known as kachi abadis or squatter settlements. An estimated 40% of Karachi's 16 million population lives in these squatter settlements (5).

Small scale studies reported from Pakistan and other developing countries have shown that the utilization of maternal and child health (MCH) services including antenatal care (ANC), facility based delivery, postnatal care (PNC) and immunization has been lower than national average among residents of squatter settlements. Studies from slums of South Asia have also been indicating low access to facility based delivery (36%-47%) and low child immunization coverage (14%-48%) (7-13). Most of these findings are attributed to insufficient knowledge and low accessibility, availability and affordability of healthcare services in these areas.

In order to improve health of people living in squatter settlements, timely data is required on population health indicators. The Demographic and Health Surveys, National Nutritional Survey and census constitute the main sources of data as these surveys collect information on nationally representative samples from all the provinces of Pakistan. These sources also provide information on urban and rural differences. However, since urban squatter settlements are not leased legally, they are not independently reported in the national surveys. Other sources of data on health of residents of urban squatter settlement in Pakistan are studies with focus on specific research interests like family planning (14, 15), maternal health (16), child immunization and nutrition (10, 17) and do not provide a holistic picture of MCH status in urban shanty towns.

This paper reports the status of maternal and child health indicators as assessed by a round of surveillance conducted by the Aga Khan University at Sultanabad, Karachi.

Methodology

Health and Demographic Surveillance System (HDSS) was established at Sultanabad which is an urban squatter settlement of Karachi with an estimated population of 70,000. It is located in district south of the city with a total area of 5.9 square km (18) and divided into nine smaller units called sectors. Major ethnic groups living in this locality are Pashtun and Hindko while others include Saraiki, Punjabi, Sindhi and Urdu speaking. Multiple organizations are working in Sultanabad for health and social development of the community. The three non-government organizations (NGOs) are Green Star, HANDS and Marie Stopes with main focus on tuberculosis, water and sanitation and reproductive health respectively.

Given the limited availability of population based data in urban squatter settlements, in 2015 the Department of Community Health Sciences, Aga Khan University established a Health and Demographic Surveillance System in Sultanabad through its Urban Health Program (UHP) to generate population-based statistics related to maternal and child health. This will be a continuous process in which rounds of data collection will be carried out annually. As a first step for establishing a surveillance system, all the households in seven out of nine sectors of Sultanabad were listed and assigned with a unique ID number. The two sectors which were excluded were primarily inhabited by bachelors settled there in search of skilled or manual labor. Data on maternal and child health indicators was collected from eligible households.

Eligibility was defined as a household where at least one married woman of reproductive age (15-49 years) was residing. All the married women in reproductive age group and their children under five years were included in this first round of surveillance.

Data was collected by trained data collectors from August to September 2015 through a structured questionnaire adapted from Measure Demographic and Health Survey Phase III (19) and Pakistan Demographic and Health Survey (PDHS) 2012-13 (20). Information was mainly gathered on (a) socio-demographic profile including housing structure, water and sanitation (b) maternal health and practices related to ANC, child birth, PNC and family planning and (c) immunization and nutritional status of children under five. Information related to ANC and PNC utilization was obtained from women with pregnancy during last three years preceding the round of surveillance. Height and weight of children under five were recorded and interpreted as per WHO guidelines (21, 22).

Data was entered in Epi Data software. Analysis was done in SPSS version 19.0. Descriptive analysis was performed and categorical variables are presented as proportions and frequencies while continuous variables are reported as means with standard deviations (SD). SPSS syntax developed by WHO was run and z scores of height and weight were calculated. Values labeled as flagged were excluded from the analysis. Malnutrition categories defined by WHO were used to classify child nutritional status; underweight (weight for age z-score less than -2), wasting (weight for height z-score less than -2) and stunting (height for age z-score less than -2). Fully immunized children were defined as children between 12-23 months of age who had received BCG, measles and three doses each of DPT and polio vaccine (excluding polio vaccine given at birth and hepatitis vaccine). Written informed consent was taken from all the participants. Participation of women in the survey was completely voluntary.

Results

Data were collected from 652 out of 850 households of Sultanabad (response rate 77%). Main reasons for non-response were unavailability of household members at the time of visit and refusal to participate. A total of 730 married women were interviewed from these households.

Socio-Demographics characteristics

Average household size was 5.9 persons with median family income of PKR 15,000 per month. Major ethnic groups were Pashtun (40%) followed by Hindko (36%) and others (24%). Gender disparity in educational attainment was observed; 82% men compared to 61% women had at least completed primary education (Table 1).

Table 1: Socio-demographic profile of study participants: Sultanabad, Karachi

Variable	%	n
HH members*		
Mean (SD)	5.9 (2.6)	
Range	1-19	
HH income PKR*		
Median (IQR)	15,000 (10,000-20,000)	
Ethnicity (n=652 households)		
Pashto	40	263
Hindko	36	233
Punjabi	8	53
Siraiki	5	36
Urdu	5	30
Others	6	37
No schooling	39	441
Up to primary	16	186
Secondary	12	139
Matriculation	18	207
Intermediate	10	112
Higher than intermediate	5	58
Men's education (15 years and above) (n=1208)		
No schooling	17	214
Up to primary	14	170
Secondary	14	168
Matriculation	28	337
Intermediate	15	179
Higher than intermediate	12	140
Women's employment status (15 years and above) (n=1143)		
Student	14	163
House wife	75	859
Employed	4	44
Unemployed	5	58
Retired	2	19
Men's employment status male (15 years and above) (n=1208)		
Student	17	206
Employed	68	825
Unemployed	11	129
Retired	4	48
Main type of construction of dwelling (n=652 households)		
Cemented	99.7	650
Non-cemented	0.3	2
Number of rooms*		
Mean (SD)	2.0 (1.1)	
Source of water (n=652 households)		
Tap inside house	75	487
Community tap	15	102
Underground well	9	58
Tanker	1	5
Toilet facility (n=652 households)		
Flush toilet	100	652
*Continuous variables		

Maternal Health

Mean age of the participants was 32 ±7.9 years while mean age at marriage was 19.1 ±4.2 years. Average number of children was 3.2 ±1.72. Almost 67% (492) of married women interviewed reported a pregnancy in last three years out of which 88% were live births. A high proportion of married women (87%) had at least one ANC visit during their last pregnancy. The majority of the deliveries took place in a health facility (79%) and attended by a skilled birth attendant (80%). Almost half of these women sought PNC after last delivery; mostly in private sector (68%). About 79% of the women had knowledge about at least one family planning method. Contraceptive prevalence rate (CPR) was calculated as "the percentage of married women of reproductive age or their husbands who were currently using any contraceptive method at the time of data collection" was found to be 32% (20). The most commonly used family planning methods were condoms (38%) followed by withdrawal (15%), injections (14%) and pills (13%). In 43% of the cases, decision for family planning was taken by both spouses. Around 62% women had intention to use some family planning method in future (Table 2).

Table 2: Maternal Health indicators: Sultanabad, Karachi

Variable	%	n
Antenatal Care (ANC) and Delivery: last three years (n=492)		
ANC in last pregnancy		
Yes	87	430
No	13	62
ANC visits (n=430)		
1	16	70
2-3	66	283
4 or more	18	77
ANC provider (n=430)		
Doctor	88	379
Nurse	7	28
LHV/LHW	1	6
TBA	4	17
ANC place (n=430)		
AKU-UHP Centre	5	22
Private provider	67	289
Government Centre	22	95
Home	6	24
Iron supplement (n=492)		
Yes	77	377
No	22	110
Don't know	1	5
Tetanus injections (n=492)		
Yes	77	380
No	23	112
Number of TT injections (n=380)		
One	5	20
Two or more	95	360
Place of delivery (n=492)		
Home	21	104
Facility	79	388
Birth attendant (n=492)		
Skilled[1]	80	394
Unskilled	20	98
Type of delivery (n=492)		
NVD	81	398
C-section	18	89
Forceps/vacuum	1	5
Postnatal Care		
PNC (n=396)		
Yes	50	199
No	50	197
Place of PNC (n=199)		
Private provider	68	135
Government Centre	30	60
Home	2	4
PNC provider (n=199)		
Doctor	91	181
Nurse	2	5
TBA	7	13
Family Planning (FP) practices: married women of reproductive age (n=730)		
Knowledge about any FP method (n=730)		
Yes	79	576
No	21	154
Currently using any FP method (n=730)		
Yes	32	236
No	68	494
Who decided (n=236)		
Self	18	43
Husband	39	91
Both	43	101
Parents	0.4	1
FP in future (n=576)		
Yes	62	358
No	33	192
Don't know	5	26
[1]Skilled provider includes doctor, nurse, midwife, and lady health visitor		

Child Health

A total of 572 children under five years of age were included. Among 396 children who were born in the last three years almost 87% were given mother's milk after birth. Of these 63% were exclusively breast fed for first six months. Approximately 27% of newborns were given pre-lacteal feed. Immunization coverage was high, as 94% children were given BCG vaccine at birth. OPV (oral polio vaccine) III coverage was 88% while pentavalent III and measles were 86% each. Proportion of fully immunized children 12-23 months of age was 86%. Among the children under five years in Sultanabad with birth weights verified by hospital discharge cards, 18% were low birth weight (LBW) (less than 2.5 kg). For 81 children under five for whom card was not available, mothers' perception of birth weight was sought as 'normal birth weight' or 'born weak with less weight than usual'. Among these children 11% were reported as LBW by mothers. Prevalence of underweight, wasting and stunting among children under five was found to be 23%, 16% and 40% respectively (Table 3).

Table 3: Child Health indicators: Sultanabad, Karachi

Variable	%	N
Breast feeding: children born in last three years (n=396)		
Breast fed (n=396)		
Yes	87	343
No	13	53
First breast feed after delivery (n=343)		
Within first hour	83	284
1-24 hours	11	39
24-48 hours	3	11
After 48 hours	3	9
Prelacteal feed in first three days (n=343)		
Yes	27	93
No	73	250
Exclusive breast feeding (n=343)		
1-3 months	14	47
4-5 months	23	81
6 months	58	198
More than 6 months	5	17
Child Immunization status children 12-23 months of age (n=86)*		
BCG	94	81
OPV		
0	99	85
1	93	80
2	94	78
3	88	76
Pentavalent		
1	90	77
2	88	76
3	86	74
Measles	86	74
Nutritional Status of children under 5 years (n=572)		
Birth Weight** (n=446)		
...	82	367
...	18	79
Weight for age*** (n=569)		
Normal	77	436
Moderate underweight	13	72
Severe under weight	10	61
Weight for height*** (n=532)		
Normal	84	447
Moderate wasting	7	39
Severe wasting	9	46
Height for age*** (n=562)		
Normal	60	337
Moderate stunting	21	119
Severe stunting	19	106
*Categories are not mutually exclusive		
**Based on either a written record or the mother's recall		
***Classification of malnutrition based on Z-score;		
• Normal: Values more than -2 standard deviations		
• Moderate: Values between -2 and -3 standard deviations		
• Severe: Values less than -3 standard deviations		

Infant mortality rate (IMR) was calculated by total number of infant (children less than one year) deaths as numerator and live births as denominator and was found to be 30/1000 live births in last one year.

Discussion

This round of surveillance provided population estimates about basic socio-demographic, maternal and child health indicators of a squatter settlement in Karachi.

Sultanabad has lower monthly household income (PKR 15000) as compared to national average (PKR 31000) (23). Literature reveals a direct relationship between health and socioeconomic status (24). Health promotion efforts have to be combined with socio-economic measures in order to have greater improvement in the health status of vulnerable communities living in the urban squatter settlements.

This surveillance also established that compared to women, a higher proportion of men have 'ever attended school'. However, compared to national average (49% women, 72% men), school attendance for both the genders was higher in this community (61% women, 82% men) (25).

Among maternal indicators, health practices were better in Sultanabad as compared to general population of the country. Proportion of women seeking ANC was 87%, which was higher than 76% reported in PDHS 2012-13 (20). These findings are also comparable to urban squatter settlements of other South Asian countries. Studies conducted in urban squatter settlements of India (7) and Bangladesh (8) have reported ANC coverage of 80% and 71% respectively which are similar to Sultanabad. Proportion of deliveries taking place in a health facility was 79% in Sultanabad which was again higher than PDHS figure of 48%. Similarly, births attended by skilled persons were higher (80%) as compared to those reported in PDHS (52%). Facility based delivery (79%) and PNC (50%) were also much higher in Sultanabad as compared to those reported from slums of Bangladesh where facility based delivery was 24% and PNC coverage 21% (8). These better indicators in Sultanabad compared to national averages can partly be explained by long standing presence of UHP over two decades. UHP

has sustainably worked with this community and governmental and non-governmental organizations to strengthen health infrastructure in the locality. Prevailing knowledge, myths and practices related to MCH affect health outcomes and these can be improved by appropriate and targeted health education programs (26). Continuous health education by UHP outreach workers in the community over long period might have changed health related behavior and subsequently the health indicators. A study from India also reported better maternal and child health indicators in Mumbai slums compared to non-slum areas (27).

Knowledge and practices related to family planning however were limited as compared to other indicators. CPR of 32% was lower than 35% reported in PDHS (20). This lower CPR in Sultanabad may be attributed to cultural practices and values of Pashtun and Hindko speaking people who have origins from Khyber Pakhtunkhwa province where CPR is only 28% (20). Knowledge about at least one contraceptive method and CPR was also lower than squatter settlements of other South Asian countries. Literature reveals high CPR of 53% in Indian and 88% in Bangladeshi slums along with high knowledge of contraceptive methods (91%) (8, 28). Sultanabad hence needs focused interventions at the individual and community level to improve knowledge and use of family planning services. Although CPR was lower in Sultanabad, around 62% women intended to use family planning in future which indicates high unmet need for family planning. This would require actions to strengthen family planning services in the community. However, tackling fertility as an isolated service delivery issue will achieve limited success. Contraceptive use requires improvement in current status of women's education, socio-cultural beliefs and practices. Thus, to improve family planning coverage, besides maximizing access, quality and demand of services, broader development goals such as educational attainment and economic opportunities for girls and women are crucial. Ideal family size will decrease only when women and households consider the economic impact of having large families.

Comparison of child health indicators of Sultanabad with national average indicates better health conditions for children in this population. The proportion of exclusively breast fed children was 63% as compared to 38% reported in PDHS (20). Similarly 86% children were fully immunized in comparison to 54% at national level (20). Proportion of fully immunized children in the squatter settlements of India was found to be 14% to 46% (11, 12, 29). Reported proportion of fully immunized children in slums of Dhaka was 54% (13). Keeping in view all these statistics, immunization coverage at Sultanabad was far better which depicts impact of better provision of primary healthcare services in this specific community.

The proportion of low birth weight babies was also lower in this community (17%) compared to estimates for Pakistan (25%). However, malnutrition leading to stunting among children under five was widely prevalent and the pattern was similar to general population of the country in which proportion of stunting has been found to be 44% (30). This shows that although fewer children are born LBW in this community, but with time as these children grow older they become stunted; a sign of chronic malnutrition. It also indicates possible exposure to behaviors that affect health like inadequate feeding and poor (early or late) weaning practices (31). Additionally, poor water and sanitation conditions and unhygienic environment of the slum dwelling harboring frequent water and foodborne infections may also explain stunting in an earlier healthy born child. Overall pattern of malnutrition among children of Sultanabad was also similar to those reported from slums of India where 26% to 58% children under five were reported as stunted (32, 33). Around 47% children under five in squatter settlements of Nairobi (Kenya) have also been found stunted (4). Child malnutrition is deeply embedded in socio-economic factors such as poverty, parental education, sex preference and type of housing (34). Improvements in these indicators require integrated actions on social determinants of health by the policy makers.

Literature has revealed that improving health and living conditions for the urban poor cannot be achieved when government and the private sector work in isolation. Involving private sector and utilizing their strengths to reach the vulnerable population is an effective strategy in resource constrained countries. There are several models of collaboration between public and private sector to upgrade the living conditions in slums of megacities (35). In Sultanabad, there is a disconnect between public and private providers and no formal Public Private Partnership (PPP) arrangements exist. Similar situation has also been observed in slums of Kenya where private sector was larger but its links with public sector policy makers and development planners were weak leading to poor MCH outcomes and other social development indicators (36). Private sector should be appropriately supported through partnerships with government agencies and other NGOs to improve maternal and child health indicators in urban squatter settlements.

Conclusion
The health status of women and children in Sultanabad is better than Pakistan's national average. However, some indicators such as family planning and child nutritional status particularly stunting require interventions targeting socio-cultural values which bar access to family planning and child spacing, along with poverty alleviation strategies. Education and expansion of women health services through strengthened outreach programs in the communities is advocated. Moreover, keeping in view the role of multiple stakeholders involved in shaping the health status of communities, the need for Public Private Partnership cannot be ignored in achieving better health outcomes and eventually better health and wellbeing of the populations.

References
1. Department of Economic and Social Affairs PDUN. World Urbanization Prospects: The 2014 Revision, Highlights (ST/ESA/SER. A/352). United Nations New York, NY, USA; 2014.
2. Kraas F. Megacities and global change: key priorities. The Geographical Journal. 2007;173(1):79-82.
3. Agarwal S, Satyavada A, Kaushik S, Kumar R. Urbanization, urban poverty and health of the urban poor: status, challenges and the way forward. Demography India. 2007;36(1):121.
4. Olack B, Burke H, Cosmas L, Bamrah S, Dooling K, Feikin DR, et al. Nutritional status of under-five children living in an informal urban settlement in Nairobi, Kenya. Journal of Health, Population and Nutrition. 2011:357-63.
5. City District Government Karachi. Karachi Strategic Development Plan 2020. 2007.
6. Pakistan Bureau of Statistics. Provisional summary results of 6th population and housing census-2017. Pakistan Bureau of Statistics, Statistics Division, Government of Pakistan, Islamabad. 2017.
7. Ghosh-Jerath S, Devasenapathy N, Singh A, Shankar A, Zodpey S. Ante natal care (ANC) utilization, dietary practices and nutritional outcomes in pregnant and recently delivered women in urban slums of Delhi, India: an exploratory cross-sectional study. Reproductive health. 2015;12(1):20.
8. Islam MM, Gagnon AJ. Use of reproductive health care services among urban migrant women in Bangladesh. BMC women's health. 2016;16(1):1.
9. Devasenapathy N, George MS, Jerath SG, Singh A, Negandhi H, Alagh G, et al. Why women choose to give birth at home: a situational analysis from urban slums of Delhi. BMJ open. 2014;4(5):e004401.
10. Baig-Ansari N, Rahbar MH, Bhutta ZA, Badruddin SH. Child's gender and household food insecurity are associated with stunting among young Pakistani children residing in urban squatter settlements. Food and Nutrition Bulletin. 2006;27(2):114-27.
11. Ghei K, Agarwal S, Subramanyam MA, Subramanian SV. Association between child immunization and availability of health infrastructure in slums in India. Archives of pediatrics & adolescent medicine. 2010;164(3):243-9.
12. Bhavsar S, Mahajan H, Kulkarni R. Assessment of the Nutritional Status and Immunization Coverage of Anganwadi Children in Rafiq Nagar, Mumbai. Public Health Research. 2012;2(6):229-34.
13. Uddin MJ, Larson CP, Oliveras E, Khan AI, Quaiyum MA, Saha NC. Child immunization coverage in urban slums of Bangladesh: impact of an intervention package. Health policy and planning. 2010;25(1):50-60.
14. Fikree FF, Khan A, Kadir MM, Sajan F, Rahbar MH. What influences contraceptive use among young women in urban squatter settlements of Karachi, Pakistan? International Family Planning Perspectives. 2001:130-6.

15. Stephenson R, Hennik M. Barriers to family planning service use among the urban poor in Pakistan opportunities and choices working. Journal of Advanced Nursing. 2004;61(3):244-60.

16. Rabbani F, Raja FF. The minds of mothers: maternal mental health in an urban squatter settlement of Karachi. J Pak Med Assoc. 2000;50(9):306-12.

17. Mian RMA, Ali M, Ferroni PA, Underwood P. The nutritional status of school-aged children in an urban squatter settlement in Pakistan. Pak J Nutr. 2002;1(3):121-3.

18. Karachi Metropolitan Corporation. Kemari Town Karachi2005 [cited February 3, 2016]. Available from: http://www.kmc.gos.pk/Docs/CMS/image/Town%20Maps/Keamari%20copy.jpg.

19. ICF International. Demographic and Health Surveys Methodology - Questionnaires: Household, Woman's, and Man's. MEASURE DHS Phase III:. Calverton, Maryland, USA. 2011.

20. National Institute of Population Studies (NIPS) [Pakistan] and ICF International. Pakistan Demographic and Health Survey 2012-13.: Islamabad, Pakistan, and Calverton, Maryland, USA: NIPS and ICF International; 2013.

21. World Health Organization. Physical status: The use of and interpretation of anthropometry, Report of a WHO Expert Committee. 1995.

22. De Onis M. WHO child growth standards: length/height-for-age, weight-for-age, weight-for-length, weight-for-height and body mass index-for-age: WHO; 2006.

23. Pakistan Bureau of Statistics. household integrated economic survey 2013-14. Islamabad: Statistics Division, Government of Pakistan, 2015.

24. Wilkinson RG, Pickett KE. Income inequality and population health: a review and explanation of the evidence. Social science & medicine. 2006;62(7):1768-84.

25. Pakistan Bureau of Statistics. Pakistan Social And Living Standards Measurement Survey (Pslm) 2013-14. Islamabad: Government of Pakistan, Statistics Division, 2015.

26. Khadduri R, Marsh DR, Rasmussen B, Bari A, Nazir R, Darmstadt GL. Household knowledge and practices of newborn and maternal health in Haripur district, Pakistan. Journal of Perinatology. 2007;28(3):182-7.

27. Mberu BU, Haregu TN, Kyobutungi C, Ezeh AC. Health and health-related indicators in slum, rural, and urban communities: a comparative analysis. Global Health Action. 2016;9:10.3402/gha.v9.33163.

28. Bandhi G, Bhawani D, Verma N, Soni GP. Assessment of contraceptive knowledge and practices among reproductive age group of women in urban slums of Raipur city, Chattisgarh, India. Nat J Community Med. 2014;5:349-54.

29. Sharma R, Desai VK, Kavishvar A. Assessment of immunization status in the slums of Surat by 15 clusters multi indicators cluster survey technique. Indian Journal of Community Medicine. 2009;34(2):152.

30. Government of Pakistan. National Nutrition Survey 2011. Islamabad: Planning Commission 2011.

31. Shamim S, Naz F, Jamalvi SW, Ali SS. Effect of weaning period on nutritional status of children. J Coll Physicians Surg Pak. 2006;16(8):529-31.

32. Chauhan BG, Navodaya AR. Factors Affecting to the Child Health in Urban India: A Comparative Study Between Two Mega Cities. International Research Journal of Social Sciences. 2015;4(5):43-51.

33. Mamulwar MS, Rathod HK, Jethani S, Dhone A, Bakshi T, Lanjewar B, et al. Nutritional status of under-five children in urban slums of Pune. International Journal of Medicine and Public Health. 2014;4(3):247.

34. Arif GM, Farooq S, Nazir S, Satti MN. Child malnutrition and poverty: the case of Pakistan. Pakistan Development Review. 2014;53(1):29-48.

35. Baker JL, McClain K. Private sector initiatives in slum upgrading. The World Bank Group Washington, DC Urban sector board. 2009.

36. Bakibinga P, Ettarh R, Ziraba AK, Kyobutungi C, Kamande E, Ngomi N, et al. The effect of enhanced public-private partnerships on Maternal, Newborn and child Health Services and outcomes in Nairobi Kenya: the PAMANECH quasi-experimental research protocol. BMJ open. 2014;4(10):e006608.