

## Original Article

# Father's support and literacy — factors associated with child mortality in Gambat, Sindh-Pakistan

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## Abstract

**Objectives:** To determine Under Five Mortality Rate (U5MR) in Gambat and to identify causes of and factors associated with it.

**Methods:** The study was conducted in taluka Gambat of Sindh, Pakistan from December 2002 to August 2003. The sample of at least 510 mothers was needed to capture expected 1020 live births. We interviewed mothers to elicit information about live births in the past five years, under-five mortality and its cause. Additionally, the mothers were also asked about their mobility and availability of husband's support in child's rearing, other than economic support.

Approval was sought from Aga Khan University's Ethical Committee. Pre structured questionnaire was used. Data were double entered, validated and cleaned using Epi-Info 6 and analysed with Statistical Package for Social Sciences (SPSS) version 11.5.

**Results:** We included 647 mothers, who reported 997 births in the past five years. The reported number of deaths was 169, with the estimated U5MR of 170/1000 live births/year. The five major causes of mortality were tetanus (17.8%), diarrhoea (11.8%), measles (6.5%), delivery related morbidities (6.5%) and Acute Respiratory Infections (4.5%). Fever was identified as a cause by 19.1% mothers. About 20% did not know the cause of death.

The regression analysis showed father's literacy level (AOR 1.8, 95% CI 1.1-2.8) and father's support in child rearing (AOR 5.6, 95% CI 3.6-8.6) as factors significantly associated with mortality.

**Conclusion:** Increasing education among parents in rural areas like Gambat is important to reduce child mortality. Father's involvement in child rearing can play a role (JPMA 60:81; 2010).

## Introduction

According to the United Nations Children's Fund (UNICEF), 11 million children of age less than five years die every year from preventable diseases. Most deaths are reported from Sub-Saharan Africa and South Asia.<sup>1</sup> In Pakistan, under five mortality rate (U5MR) is 100 per 1000 live births and Infant Mortality Rate (IMR) is 80 per 1000 live births.<sup>2</sup>

Child mortality has grave social and developmental implications. It is inversely related to economic development,<sup>3,4</sup> which could be corroborated by the fact that seven out of ten children die in the developing countries.<sup>5</sup>

The factors reported to be associated with child mortality in developing countries include parental education, area of residence — rural/urban, number of siblings and gender of the child.<sup>6-9</sup> The other important factors are lack of

immunization<sup>10</sup> and poor hygienic conditions.<sup>11</sup>

There is paucity of data on causes and factors associated with child mortality. Therefore, the current study, will determine U5MR and causes and factors associated with under five mortality in Gambat, Khairpur, Sindh.

## Subjects and Methods

The current study was conducted as part of the main study that focused on the key community practices proposed in Integrated Management of Childhood Illnesses (IMCI) protocol.<sup>12</sup> This was a community based survey, conducted from December 2002 to August 2003 in Gambat, a taluka of district Khairpur, an agrarian district of province Sindh of Pakistan.<sup>13</sup>

To calculate the required sample size, U5MR of 107

per 1000 live births was taken into account as it was the reported rate in the country at the time of study.<sup>14</sup> To capture the aforementioned proportion with bound of error of 3%, design effect of 2.5 and level of confidence of 95%, a sample of at least 1020 live births was required.

The current study intended to capture the live birth and U5MR that occurred during the past five years. It was assumed that on an average a rural woman of age 15-45 years would have had two live births in the past five years; therefore a sample of at least 510 women was required to capture 1020 live births.

Before initiating the field work, we sought and obtained approval from the Ethical Review Committee (ERC) of the Aga Khan University (AKU). Gambat is comprised of nine "Union Councils (UCs)": Gambat I, Gambat II, Kamaldero, Jado, Belharo, Khemtia, Khora, Ripri, and Razidero. To recruit required sample, sub samples proportionate to the population size of each UC were determined.

Three stage cluster sampling was utilized to recruit required number of mothers from each UC. In first stage, a village was randomly selected from each UC; however where the sample size was greater than the size of the village, two adjacent villages were selected. The important landmarks such as shops, schools and mosques were identified in the selected village and a landmark in each of the village was randomly selected as a focal point for the survey. In second stage, a soda bottle was rotated and the first household with a pair of the mother and her child of age less than five was selected. In case of more than one mother-child pair, a pair was randomly chosen. The house nearest to the sampled house with a child-mother pair was visited next and the process was repeated until the required number of houses for that village was enrolled.

A prestructured questionnaire was used to interview mothers. The mothers were asked about the number of live births and mortality of children aged less than five and its cause. In addition, mothers were also asked about if they could visit the health facility alone in case of sickness and if the husband provided support, other than the economic support, in child's rearing.

Double data entry was performed and validated using EPI-Info 6 to check for completeness and consistency. Statistical analysis was done by the Statistical Package for Social Sciences (SPSS-11.5). Frequencies and means were calculated for the categorical and continuous data respectively. Univariate analysis was conducted to determine independent factors associated with child's mortality. Finally, logistic regression analysis was utilized to determine factors that remained significant after controlling the effect of other factors in the model.

## Results

We included 647 mothers, among them 113 reported

**Table-1: Demographics, female support and mobility in Gambat, Sindh.**

Variables	Number of mothers (%) (n=647)
Mother's age	
15-25	195 (30.1)
26-30	234 (36.2)
31-35	140 (21.6)
36 or above	78 (12.1)
Mothers occupation	
Housewife	632 (97.7)
Any other	15 (2.3)
Mother's education	
Literate	113 (17.5)
Illiterate	534 (82.5)
Father's occupation	
Teacher, Government employee,	165 (25.5)
Landlord or businessman	107 (16.5)
Unemployed, farmer, labour, fisherman	375 (58.0)
Father's education	
More than primary	287 (44.4%)
Primary or less	360 (55.6%)
Got husband's support during child rearing	
Yes	159 (75.4)
No	288 (24.6)
Can Visit Facility Alone	
Yes	341 (52.7)
No	306 (47.3)
Number of kids under 5	
1	345 (53.3)
2 or more	255 (39.4)
Number of families	
More than one	113 (17.5)
One	534 (82.5)
House construction	
Pucca	162 (25.0)
Semi-Pucca	214 (33.1)
Katcha	271 (41.9)
Household Members	
More than 10	105 (16.2)
5-10	349 (53.9)
Less than 5	193 (29.8)
Death of at least one child of age less than 5 years in life time	
No	534 (82.5%)
Yes	113 (17.5%)

169 deaths of under five children during the past five years. The number of under five children born during the past five years were 997, and therefore the average under five mortality was 170/1000 live births over the period of five years.

Table-1 presents the descriptive analysis of data on socio-demographic and women support and mobility factors. Table-2 presents number of deaths reported by cause. The five major killers reported were tetanus, diarrhoea, measles, delivery related morbidities and Acute Respiratory Infections (ARI). Fever was identified as a

**Table-2: Number of deaths of children aged less than five by cause.**

Cause	Number of deaths of children under 5 reported by each mother				Total deaths	Percent of total deaths
	1 death	2 deaths	3 deaths	4 deaths		
Unknown	17	5	1	1	34	20.1%
Fever	26	2	1		33	19.5%
Tetanus	16	1		3	30	17.8%
Diarrhoea	11	1	1	1	20	11.8%
Measles	11				11	6.5%
Delivery	3	2		1	11	6.5%
ARI	7				7	4.1%
Others (heart diseases/blood disorders)	5				5	3.0%
Hepatitis	4				4	2.4%
Jaundice	2				2	1.2%
Tuberculosis	2				2	1.2%
Chickenpox		1			2	1.2%
Malnutrition	2				2	1.2%
Anaemia	2				2	1.2%
Malaria	1				1	0.6%
Typhoid	1				1	0.6%
Pertussis	1				1	0.6%
Polio	1				1	0.6%
Total mothers n=133)	112	12	3	6		

**Table-3: Univariate analysis showing association between child mortality and independent variables in Gambat, Sindh.**

Variables	No death n=534 (82.5%)	Death of at least one under 5 child n=113 (17.5%)	Odds Ratio	Confidence interval
Mother's age				
15-25	179 (33.5)	16 (14.2)	1.0	
26-30	197 (36.9)	37 (32.7)	2.1	1.1-3.9
31-35	109 (20.4)	31 (27.4)	3.2	1.7-6.1
36 or above	49 (9.2)	29 (25.7)	6.6	3.3-13.2
Mother's occupation				
Housewife	522 (97.8)	110 (97.3)	1.0	
Any other	12 (2.2)	3 (2.7)	0.8	0.2-3.0
Mother's education				
Literate	102 (19.1)	11 (9.7)	1.0	
Illiterate	432 (80.9)	102 (90.3)	2.2	1.1, 4.2
Father's occupation				
Teacher, Government employee, landlord or businessman	238 (44.6)	34 (30)	1.0	
Unemployed, farmer, labor, fisherman	296 (55.4)	79 (70)	1.9	1.2, 2.9
Father's education				
More than primary	251 (43)	36 (32)	1.0	
Primary or less	283 (53)	77 (68)	1.9	1.2, 2.9
Father's support during child rearing				
Yes	96 (18)	63 (55.8)	1.0	
No	438 (82)	50 (44.2)	5.7	3.7-8.9
Can Visit Facility Alone				
Yes	298 (55.8)	43 (38.1)	1.0	
No	236 (44.2)	70 (67.9)	2.1	1.4-3.1
Number of families				
Nuclear	450 (84.3)	84 (74.3)	1.0	
Extended	84 (15.7)	29 (25.7)	1.9	1.1-3.0
House construction				
Pucca	142 (26.6)	20 (17.7)	1.0	
Semi-Pucca	185 (34.6)	29 (25.7)	1.1	0.6-2.0
Katcha	207 (38.8)	64 (56.6)	2.2	1.3-3.8
Household Members				
Less than 5	167 (31.3)	26 (23.0)	1.0	
5-10	284 (53.2)	65 (57.5)	1.5	0.9-2.4
10 or more	83 (15.5)	22 (19.5)	1.7	0.9-3.2
Number of kids under 5				
0-1	292 (54.7)	53 (46.9)	1.0	
2	204 (38.2)	51 (45.1)	1.4	0.9-2.1
More than 2	38 (7.1)	9 (8.0)	1.3	0.6-2.9

cause by about 18% mothers and about 20% did not know the underlying cause of death.

Table-3 presents independent association of factors with mortality as outcome. All variables showed significant association except mother's occupation, number of household members and number of under five children that mother had.

The multiple logistic regression analysis revealed that two variables, father's literacy level [More than grade 5 vs 5 or less; AOR 1.8, 95% CI 1.1-2.8] and father's support during child rearing [Yes vs No; AOR 5.6, 95% CI 3.6-8.6] showed significant association with under five mortality (U5M) as outcome. However, mother's literacy did not show significant association in the final model.

### Discussion

The focus of the study was to determine the under five mortality among 647 mothers and their risk factors including the father's support in child rearing. The U5MR was 170/1000 live births. Two factors showed significant association with the U5MR, father's literacy level and father's support in child rearing.

The U5MR was found to be higher than the rate prevalent in the country at the time of study. The reason being, Gambat is an impoverished taluka of a poor agrarian district of rural Sindh.<sup>13</sup> Moreover, primary health care facilities are also meager in the taluka.<sup>13</sup>

The study revealed that about 38 percent mothers did not know the specific cause of death of their children. They were either unaware or suggested fever as cause of death. This seems surprising as death of a child is a drastic event in a mother's life. Not knowing the exact cause alludes towards mothers' lack of knowledge and not having control over conditions around her. Studies have shown that in paternalistic societies such as Pakistan women often feel disempowered in many areas of their lives.<sup>15</sup>

Tetanus was the leading cause of mortality. The highly prevalent culture of application of cow dung on umbilical stump and walking and playing barefoot on fields are perhaps the major underlying reasons for that.<sup>11</sup> The number two, three and four causes of mortality were diarrhoea, measles and delivery related morbidities, respectively. These are the most cited causes of mortality among under five children in developing countries.<sup>16</sup>

The reported rate of mortality due to pneumonia and malaria was lower than expected in our study.<sup>17</sup> The two diseases could not be included among the leading causes of death. This is because of the fact that mothers lacked knowledge regarding ARI and pneumonia in Gambat.<sup>12</sup> Malaria, on the other hand, is a disease that is difficult to diagnose, therefore death due to it could easily be classified

as death due to fever.

Our analysis showed that 21 (18.6%) mothers reported death of more than one under five children: 12 reported two deaths, three reported three deaths and six reported four deaths. The diseases that caused more than one death in the same household were tetanus, diarrhoea and chickenpox. The delivery related morbidities were also among such causes. This shows phenomenon of clustering of diseases and deaths in the houses.

We found that the households where mothers reported father's involvement in child rearing were less likely to encounter under five child's death than those where such involvement was not reported.<sup>18</sup> The father's involvement was reported by mother. Therefore we consider this as a proxy indicator for harmony between the couple. The harmony between couple is a key to household's prosperity and health in any society and specifically in a paternalistic society like Pakistan, where decisions are mainly taken by male counterparts of the families.<sup>19,20</sup>

The results revealed that father's literacy was associated with Under 5 mortality. Literature suggests that an educated husband can play a better role both as husband and parent.<sup>18</sup> Educated husband can take better decisions and seek timely and appropriate treatment for their children.<sup>21</sup> Contrary to the past studies, we did not find an association between mother's literacy and the under five mortality.<sup>22</sup> The reason for mother's literacy being insignificant is that majority of the mothers (90.3%) were illiterate in Gambat. Given the homogeneity of the factor and lack of power of study thereby, this key variable was found insignificant.

The major limitation of our study was that we utilized mother's report and not verbal autopsy to classify cause of mortality. This must have misclassified few causes. We think that this was the reason for not having pneumonia and malaria among top causes or child's mortality in our study. However, our results were consistent with the literature for other causes of death. This shows that mother's reporting could be used as a quick and useful tool for ascertaining disease specific mortality for specific diseases even in a rural area like Gambat with high illiteracy rates among women. A study should be done to see the validity of mother's reporting as a screening tool against verbal autopsy used as a gold standard for classification of causes of mortality especially in areas with high illiteracy.

The findings showed that U5MR is still very high in rural settings of Sindh. Our study clearly demonstrated that though mothers are the first level care providers but father's education and support in child rearing has its own importance. The study highlights the much forgotten role of father in child's rearing.

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## Contributions by the Authors:

Dr Agha Ajmal: Led the study and wrote the first draft

Dr Fozia Ajmal: Took active part in reviewing drafts and providing critical inputs

Mr Iqbal Azam reviewed the statistical part of the manuscript

Dr Franklin White supervised Dr Agha Ajmal in development of the study

## References

1. World Health Organization. The Multi-country evaluation of IMCI effectiveness, cost and impact (MCE) Progress Report May 2000-April 2001. The Multi-Country Evaluation-Gates Report 2000.
2. World Health Organization (WHO). WHO Statistical Information System (WHOSIS). Health Status: Mortality 2007. (Online) 2009. (Cited 2008, March 3). Available at URL: <http://www.who.int/whosis/whostats2007/en/html>.
3. UNESCAP. Mortality and Poverty in the ESCAP region: Identifying high-achieving countries Chapter II - Some Macro-Level Correlates of Mortality. Asian Population Studies Series No. 157. (Online) 2009. (Cited 2008, June 1). Available from URL: <http://www.unescap.org/esid/psis/population/popseries/apss157/chap2.asp>.
4. Matera E, Cacciani L, Bugarini G, Cesaroni G, Davoli M, Mirale MP, et al. Income inequality and mortality in Italy. *Eur J Public Health* 2005; 15: 411-7.
5. Countdown Coverage Writing Group; Countdown to 2015 Core Group, Bryce J, Daelmans B, Dwivedi A, Fauveau V, Lawn JE, Mason E, et al. Countdown to 2015 for maternal, newborn, and child survival: the 2008 report on tracking coverage of interventions. *Lancet* 2008; 371: 1247-58.
6. Gustavson KH. Prevalence and aetiology of congenital birth defects, infant mortality and mental retardation in Lahore, Pakistan: a prospective cohort study. *Acta Paediatr* 2005; 94: 769-74.
7. D' Souza RM. Role of health seeking behavior in child mortality in the slums of Karachi, Pakistan. *J Biosoc Sci* 2003; 35: 131-44.
8. Ali SM, Siyal HB, Sultan M. How similar are the determinants of mortality and fertility? *Pak Dev Rev* 1993; 32: 1107-15.
9. Sami S, Baloch SN. Perinatal mortality in relation to gender. *J Coll Physician Surg Pak* 2004; 14: 545-8.
10. Bennett J. Correlates of child mortality in Pakistan: a hazards model analysis. *Pak Dev Rev* 1999; 38: 85-118.
11. Qudus A, Luby S, Rahbar M, Pervaiz Y. Neonatal tetanus: mortality rate and risk factors in Loralai District, Pakistan. *Int J Epidemiol* 2002; 31: 648-53.
12. Agha A, White F, Younus M, Kadir MM, Ali S, Fatmi Z. Eight key household practices of Integrated Management of Childhood Illnesses. *J Pak Med Assoc* 2007; 57: 288-93.
13. Khairpur local government site. Introduction. District Khairpur Sindh: Islamic Republic of Pakistan. (Online) 2000 (Cited 2002, July 1). Available from URL: <http://khairpur.gov.pk/profile/profile.htm>.
14. Government of Pakistan, Planning Commission. Pakistan Millennium Development Goals Report 2004. (Online) Cited 2007, January 12. Available from URL: [www.and.s.gov.af/src/src/MDGs%20from%20other%20countries/Pakistan.pdf](http://www.and.s.gov.af/src/src/MDGs%20from%20other%20countries/Pakistan.pdf).
15. G Pappas, A Agha, G Rafique, KS Khan, SH Badruddin, H Peermohamed. Community-based approaches to combating malnutrition and poor education among girls in resource-poor settings: report of a large scale intervention in Pakistan. *Rural and Remote Health* 8: 820. (Online) 2008. (Cited 2008, December 15). Available from URL: <http://www.rhh.org.au>.
16. Fikree FF, Azam SI, Berendes HW. Time to focus child survival programmes on the newborn: assessment of levels and causes of infant mortality in rural Pakistan. *Bull World Health Organ* 2002; 80: 271-6.
17. Marsh DR, Sdrudin S, Fikree FF, Krishnan C, Darmstadt GI. Validation of verbal autopsy to determine the cause of 137 neonatal deaths in Karachi, Pakistan. *Paediatr Perinatal Epidemiol* 2003; 17: 132-42.
18. Garfield CF, Isacco A. Fathers and the well-child visit. *Pediatrics* 2006; 117: e637-45.
19. Saleem S, Isa MA. Facilitating inter-spousal communication for birth spacing - a feasibility study of Pakistani Couples for policy implications. *J Pak Med Assoc* 2004; 54: 182-6.
20. Mahmood N. Reproductive goals and family planning attitudes in Pakistan: a couple-level analysis. *Pak Dev Rev* 1998; 37: 19-34.
21. Brugha RF, Kevany JP, Swan AV. An investigation of the role of fathers in immunization uptake. *Int J Epidemiol* 1996; 25: 840-5.
22. Majumder AK, Islam SM. Socioeconomic and environmental determinants of child survival in Bangladesh. *J Biosoc Sci* 1993; 25: 311-8.