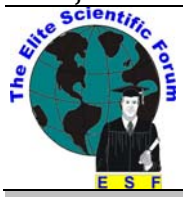
Pak. j. life soc. Sci. (2014), 12(2): 57-63 E-ISSN: 2221-7630;P-ISSN: 1727-4915




**Pakistan Journal of Life and Social Sciences**
www.pjlss.edu.pk

**RESEARCH ARTICLE**

# Social Determinants of Acute Respiratory Infections in Babies and Infants in Pakistan: A Population Based Study

Humaira Maheen[1]* and A. Dharmalingam[2]
[1]School of Health and Social Development, Deakin University, Australia
[2]Centre for Population and Urban Research, Monash University, Melbourne, Australia

***ARTICLE INFO***
Received: Dec 09, 2013
Accepted: Mar 22, 2013
Online: Jul 14, 2014

***Keywords***
Respiratory infection
Culture and ethnicity
Health care utilization
Socio-economic condition
Women's empowerment

***Corresponding Author:**
humairamaheen@gmail.com

**ABSTRACT**

Acute Respiratory Infection (ARI) is a leading cause of infant and child mortality in Pakistan. Studies on respiratory infections in Pakistan have largely been clinical or community based. There is almost no large scale population based study on the socio-economic and cultural aspects of ARI in Pakistan. We used data from Pakistan Demographic Health Survey 2005-06. Children under two years of age were our study sample (n=3135). Logistic regression was used to estimate the effects of factors on the incidence and treatment of ARI. Maternal education and ethnicity had significant impact on the incidence of ARI. The odds of ARI was substantially lower among children of mothers with secondary [OR 0.63, CI 0.41-0.95, p value 0.03] and university level education [OR 0.64, CI 0.36-1.16, p value 0.14] compared to children of mothers without any education. Sindhi, Siraiki and Balochi children had higher odds of incidence and treatment of ARI. Household wealth had no influence on the incidence of ARI. But poor children had lower odds of receiving treatment [OR 0.16, CI 0.08-0.33, p value .001] than children from wealthier families. There is an urgent need for multi-pronged policies and programmes aimed at increasing access to and utilisation of modern education and health care services, betterment of economic conditions of the poor and social and economic empowerment of women to improve the health of children in Pakistan.

## INTRODUCTION

Acute Respiratory Infection (ARI) is a leading cause of child mortality and accounts for over a quarter of deaths (WHO, 2009; Qazi et al., 1996) every year. Maternal education and family economic status are powerful determinants of child health in developing countries (Azad, 2009). About 30% of all patients' consultation and 25% of all paediatric admission are of ARI in developing countries, with limited or no health subsidy provided by government (Green and Stephen, 2013).

In general, children of poor socio-economic and low maternal education levels and mothers with postnatal depression are more vulnerable to ARI (Labout, 2010, Tupasi et al., 1988). The risk is greatest in the first three months after birth (Azad, 2009; Tupasi et al., 1988). Male children experience greater risk (Azad, 2009) and higher birth order increases the risk of infection (Gombojav et al., 2009; Savitha et al., 2007; Rashid et al., 2001).

The treatment seeking behaviour is also strongly associated with the SES index, distance from health facility, and cultural norms that belongs to certain ethnic or religious communities (Gombojav et al., 2009; Shaikh et al., 2008). Mothers of lower SES prefer to provide home treatment in the early stages as the costs associated with travel to health centre, doctor consultation and medications are often unaffordable (Luque et al., 2008). Maternal poor knowledge about detecting early symptoms and overly relying on self-medication put young children in greater risk of facing the adverse outcome associated with the disease (Gombojav et al., 2009; Green and Stephenson, 2013; Ingram et al., 2013). Social norms such as Seclusion (*purdah)*) and lack of permission from husband or mother-in-law to travel long distance to obtain health care also limit mothers' ability to seek appropriate medical treatment for children suffering from ARI (Gombojav et al., 2009; Rashid et al., 2001). Certain ethnic groups show poor maternal and neonatal mortality indicators, and most of them are due to lack

of utilization of health care facilities due to cultural restrictions (Sathar and Kazi 1997; Zubair 2003). This study aims to identify socio demographic indicators that determine the incidence of ARI in young children (from 0-24 months) and also factors that influence treatment seeking attitude of mothers in Pakistan.

## MATERIALS AND METHODS

This research used the relevant information from the second Pakistan Demographic and Health Survey (PDHS) carried out in 2006-7. This was a large-scale national survey covering all four provinces: Punjab, Sindh, Baluchistan and North Western Frontier Province (NWFP) (NIPS, 2008).

The selection of variables for analysis (Table 1) was informed by the literature and their availability in the dataset. The wealth index is a composite socio-economic indicator derived from information on household goods, source of drinking water, toilet facility, and dwelling structure (NIPS, 2008; Rutstein and Johnson, 2004). Children who were breastfed more than six times the day before the survey date were considered to be fully breastfed, whereas those who were breastfed fewer than seven times a day were treated as partially breastfed.

The definition of ARI as used in PDHS was "having experienced at least three of the following four symptoms: cough, fever, rapid or short breathing, and problem in chest or blocked nose during the two weeks preceding the survey" (NIPS, 2008).

We fitted logistic regression models to estimate the net effect of socio-economic and contextual factors on the incidence and treatment of acute respiratory infection. As the outcome variables, incidence and treatment of acute respiratory infection, were dichotomous (1=yes, 0=no), logistic regression models were used. Data analysis was carried out in the statistical package STATA 11. The explanatory variables were added to the models in three broad groups: children related, mother related and contextual.

The analysis of incidence was carried out separately for two groups of children: under 12 months (n=1756) and 12-23 months (n=1379). The treatment model was run for all children in a single group as the sample size was relatively small. The model parameter estimates were adjusted for intra-cluster correlations arising from the particular sampling design implemented in Pakistan Demographic Health Survey. The analysis was weighted according to the age, sex and provincial distribution of population. The model estimates are presented in odds ratios, along with the associated p-values, for ease of interpretation. The 95% confidence intervals for model estimates are given in parentheses in Table 2.

## RESULTS

The percentage distribution of variables included in the analysis is given in Table 1. According to the classification used here, one in five children under two years of age suffered from ARI in Pakistan. The sample is equally divided between male and female children and about 60% of children were of third or higher birth order reflecting the relatively high fertility in Pakistan.

Mean maternal age was 28 years. While about 6% of mothers were below 19 years of age, 17.5% were 35 years and above. Only about one-third of the mothers made at least four antenatal visits in line with the WHO recommendation, and a vast majority of these visits were to doctors or nurses.

The estimated net effects of the covariates are presented in Table 2. A comparison of the results for the two groups of children shows that the importance of a covariate differs by the age of a child. While mother's education and ethnicity are critical determinants of the incidence of ARI among infants aged under one year, they were not so for older children.

Neither the gender nor the birth order of infants had any association with experiencing ARI. Fully breastfed children were not different from those who were not breastfed, but partially breastfed children had lower odds to experience ARI [OR 0.65.70, CI 0.43-.98, p value 0.04].

Maternal age was not found as an important risk factor of ARI incidence irrespective of children's age. Mothers' educational attainment and ethnicity were the two powerful factors in determining the onset of ARI particularly among children aged less than one year. The odds of ARI were substantially lower among children of mothers with secondary [OR 0.63, CI 0.41-.95, p value 0.03] and university level education [OR 0.64, CI 0.36-1.16, p value 0.14] compared to children of mothers without any education.

The ethnic background of mothers had even stronger influence on ARI. Compared to children whose mother tongue was Punjabi, children of all other ethnic/language backgrounds had much higher odds of experiencing acute respiratory infection. Under one year of age, children of Sindhi [OR 2.28, CI1.32-3.96, p value 0.001], Pushto [OR 3.09, CI 1.69-5.65,p value 0.001], and Siraiki [OR2.25, CI 1.59-3.19, p value 0.001] had higher odds than children of Punjabi background to experience ARI. Although Baluchistan and NWFP were socio-economically poorer than Punjab and Sindh provinces, they had lower odds of ARI.

For treatment, what mattered most are the contextual and health infrastructure factors rather than individual attributes. Children's gender and birth order and mother's age did not have any significant influence on the odds of seeking treatment. Although mother's

**Table 1: Classification and distribution of sample characteristics, PDHS 2006-07 (n=3,135)**

| Variables | N (Percent) |
|---|---|
| Children characteristics | |
| *Number of ARI symptoms experienced* | |
| None | 1785 (56.9) |
| Fever | 438 (14.0) |
| Fever and cough | 227 (7.2) |
| Fever, cough, short breadth and/or problem in chest | 685 (21.9) |
| *Treatment given for ARI* | |
| No | 193 (28.2) |
| Yes | 492 (71.8) |
| *Gender* | |
| Male | 1649 (52.6) |
| Female | 1486 (47.4) |
| *Birth order* | |
| First | 623 (19.9) |
| Second | 638 (20.4) |
| Third or above | 1874 (59.8) |
| *Breastfeeding Practices* | |
| Full breastfeeding | 984 (31.4) |
| Partial breastfeeding | 1580 (50.4) |
| Not breastfeeding | 571 (18.2) |
| Maternal characteristics | |
| *Mother's age* | |
| 15-19 | 183 (5.8) |
| 20-24 | 807 (25.7) |
| 25-29 | 968 (30.9) |
| 30-34 | 628 (20.0) |
| 35-39 | 369 (11.8) |
| 40-49 | 180 (5.7) |
| *Mother's Education* | |
| No education | 2048 (65.3) |
| Primary | 454 (14.5) |
| Secondary | 447 (14.3) |
| University | 186 (5.9) |
| *No. of antenatal visits* | |
| No visits | 1069 (34.1) |
| Fewer than 4 visits | 1189 (37.9) |
| Four or more visits | 877 (28.0) |
| *Antenatal care provider* | |
| No care/traditional carer | 1153 (36.8) |
| Doctor/nurse | 1982 (63.2) |
| Contextual factors | |
| *Province* | |
| Punjab | 1259 (58.5) |
| Sindh | 914 (41.5) |
| NWFP | 616 (19.6) |
| Baluchistan | 346 (11.0) |
| *Ethnicity/Language spoken* | |
| Punjabi | 859 (27.4) |
| Siraiki | 477 (15.2) |
| Sindhi | 456 (14.5) |
| Urdu | 190 (6.1) |
| Pushto | 728 (23.2) |
| Balochi | 152 (4.8) |
| Others | 273 (8.7) |
| *Place of residence* | |
| Country side | 2039 (65.0) |
| Small city/Town | 586 (18.7) |
| Capital/Large city | 510 (16.3) |
| *Wealth Index* | |
| Poorer | 679 (21.7) |
| Poor | 696 (22.2) |
| Middle | 640 (20.4) |
| Richer | 1120 (35.7) |
| Richest | 438 (19.3) |

education was important but it mattered only if the mother had more than secondary qualification. Children whose mothers had university level qualifications had 3.26 [CI 0.65-16.30, p value 0.15] higher odds of obtaining treatment than those whose mothers had no schooling or less than university level education (but the results were statistically not significant).

Those who had obtained antenatal care from a doctor or nurse had higher odds of obtaining treatment [OR 1.96, CI .77-4.9, p value 0.16] for their children for ARI than the rest. Two of the four contextual factors were significant for treatment. Children of Siraiki background had not only higher odds for ARI but also for obtaining treatment compared to children of Punjabi background. While material wellbeing was not related to the incidence of ARI, it had a significant influence on treatment. Children in the bottom 20 percent of wealth quintile had lower odds of receiving treatment for ARI than children in the top 40 percent of the wealth distribution [OR 0.16, CI 0.08-0.33, p value <0.001].

## DISCUSSION

ARI among Pakistani children is strongly associated with a number of maternal and child characteristics and socio-economic and socio-cultural contextual factors. The analysis did not provide evidence of gender disparity in relation to the incidence of ARI or parental treatment seeking behaviour although there was evidence to the contrary in other studies (Azad, 2009; Bhan et al., 2005). Similar to other studies, maternal education had a significant effect on obtaining care for ARI of their young children.

Despite the effectiveness of exclusive breastfeeding in reducing the chances of infection during infancy (as long as the mother is not HIV infected), early cessation of breastfeeding is common in Pakistani women (Hiraani and Karmaliani, 2013). Most common reason associated with early cessation of breastfeeding is a false belief that the milk is not sufficient for the baby or formula milk will make the baby healthier. There is a clear gap in maternal knowledge about the benefits of exclusive breastfeeding which needs massive awareness raising. Results of our study also show the protective effect of partial breastfeeding against ARI compared to no breast feeding.

Wealth index was not associated with the incidence of ARI but strongly influenced mothers' treatment seeking behaviour: poor mothers showed the least utilisation of

**Table 2: Logistic regression estimates (odds ratios) for the incidence and treatment of acute respiratory infection (1=yes, 0=no) among children under 2 years of age in Pakistan, PDHS 2006-07**

| Characteristics | Incidence of ARI among children aged | | | | Treatment for children | |
|---|---|---|---|---|---|---|
| | <12 months (n=1756) | | 12-23 months (n=1379) | | <24 months (n=685) | |
| | Odds Ratio (95% CI) | p-value[a] | Odds Ratio (95% CI) | p-value[a] | Odds Ratio (95% CI) | p-value[a] |
| Children characteristics | | | | | | |
| *Gender* | | | | | | |
| Male® | 1.00 | | 1.00 | | 1.00 | |
| Female | 0.88 (.70-1.11) | 0.30 | 0.95 (.73-1.23) | 0.69 | 1.01 (.70-1.47) | 0.95 |
| *Birth order* | | | | | | |
| First ® | 1.00 | | 1.00 | | 1.00 | |
| Second | 0.95 (.65-1.39) | 0.78 | 0.85 (.56-1.30) | 0.44 | 1.19 (.64-2.19) | 0.59 |
| Third or above | 0.96 (.67-1.38) | 0.84 | 0.68 (.45-1.04) | 0.08 | 1.20 (.67-2.16) | 0.55 |
| *Breastfeeding* | | | | | | |
| Not breastfed ® | 1.00 | | 1.00 | | na | |
| Partially breastfed | 0.65 (.43-.98) | 0.04 | 0.78 (.58-1.05) | 0.10 | na | |
| Fully breastfed | 0.75 (.49-1.16) | 0.20 | 1.05 (.73-1.51) | 0.78 | na | |
| Maternal characteristics | | | | | | |
| *Mother's age* | | | | | | |
| 15-19 | 0.93 (.54-1.60) | 0.79 | 1.03 (.49-2.18) | 0.92 | 1.26 (.50-3.20) | 0.62 |
| 20-24 | 1.14 (.83-1.57) | 0.43 | 1.21 (.81-1.79) | 0.35 | 1.14 (.66-1.96) | 0.64 |
| Characteristics | Incidence of ARI among children aged | | | | Treatment for children | |
| | <12 months | | 12-23 months | | <24 months | |
| | Odds Ratio (95% CI) | p-value[a] | Odds Ratio (95% CI) | p-value[a] | Odds Ratio (95% CI) | p-value[a] |
| 25-29® | 1.00 | | 1.00 | | 1.00 | |
| 30-34 | 1.44 (1.03-2.02) | 0.04 | 1.17 (.81-1.70) | 0.40 | 0.82 (.48-1.40) | 0.46 |
| 35-39 | 1.01 (.65-1.57) | 0.97 | 1.45 (93-2.27) | 0.10 | 1.33 (.70-2.54) | 0.39 |
| 40-49 | 1.32 (.76-2.27) | 0.32 | 1.85 (1.01-3.39) | 0.05 | 0.66 (.30-1.43) | 0.29 |
| *Mother's Education* | | | | | | |
| No education® | 1.00 | | 1.00 | | 1.00 | |
| Primary | 0.96 (.68-1.37) | 0.83 | 0.99 (.67-1.47) | 0.97 | 0.75 (.43-1.31) | 0.31 |
| Secondary | 0.63 (.41-0.95) | 0.03 | 1.07 (.69-1.65) | 0.78 | 1.06 (.52-2.18) | 0.87 |
| University | 0.64 (.36-1.16) | 0.14 | 1.00 (.53-1.90) | 1.00 | 3.26 (.65-16.30) | 0.15 |
| *No. of antenatal visits* | | | | | | |
| No visits® | na | | Na | | 1.00 | |
| Fewer than 4 visits | na | | na | | 0.92 (.35-2.40) | 0.87 |
| Four or more visits | na | | na | | 0.83 (.32-2.51) | 0.83 |
| *Antenatal care provider* | | | | | | |
| No care/traditional carer® | na | | na | | 1.00 | |
| Doctor/nurse | na | | na | | 1.96 (.77-4.97) | 0.16 |
| Contextual factors | | | | | | |
| *Province* | | | | | | |
| Punjab® | 1.00 | | 1.00 | | 1.00 | |
| Sindh | 0.75 (.50-1.13) | 0.17 | 1.07 (.67-1.72) | 0.77 | 1.25 (.63-2.49) | 0.52 |
| NWFP | 0.41 (.22-.74) | .001 | 0.83 (.44-1.59) | .58 | 1.05 (.44-2.50) | 0.91 |
| Baluchistan | 0.11 (.04-.32) | .001 | .08 (.02-.39) | .001 | 0.98 (.14-7.15) | 0.99 |
| *Ethnicity* | | | | | | |
| Punjabi® | 1.00 | | 1.00 | | 1.00 | |
| Urdu | 1.62 (.93-2.82) | 0.09 | 1.21 (.67-2.21) | 0.53 | 1.40 (.46-4.31) | 0.56 |
| Sindhi | 2.28 (1.32-3.96) | 0.001 | 1.33 (.71-2.48) | 0.38 | 2.04 (.82-5.08) | 0.13 |
| Pushto | 3.09 (1.69-5.65) | 0.001 | 1.33 (.67-2.60) | 0.41 | 0.58 (.24-1.41) | 0.23 |
| Balochi | 2.10 (.85-5.17) | 0.11 | 0.84 (.30-2.39) | 0.75 | 1.60 (.38-6.81) | 0.53 |
| Siraiki | 2.25 (1.59-3.19) | 0.001 | 1.65 (1.11-2.44) | 0.01 | 2.84 (1.61-5.02) | 0.001 |
| *Residence* | | | | | | |
| Country side® | 1.00 | | 1.00 | | 1.00 | |
| Small city/Town | 1.24 (.87-1.76) | 0.24 | 0.87 (.59-1.30) | 0.51 | 0.92 (.51-1.68) | 0.80 |
| Capital/Large city | 1.23 (.81-1.86) | 0.33 | 0.67 (.42-1.07) | 0.09 | 1.49 (.67-3.28) | 0.33 |
| *Wealth Index* | | | | | | |
| Poorer | 1.02 (.67-1.54) | 0.93 | 1.08 (.69-1.70) | 0.74 | 0.16 (.08-.33) | 0.001 |
| Poor | 0.97 (.66-1.44) | 0.88 | 0.76 (.50-1.17) | 0.21 | 0.44 (.23-.82) | 0.01 |
| Middle | 0.98 (.69-1.40) | 0.91 | 0.89 (.59-1.34) | 0.57 | 0.86 (.46-1.58) | 0.62 |
| Rich® | 1.00 | | 1.00 | | 1.00 | |

a--Adjusted odds ratios from multivariate regression models; na-not included in regression models; ®--reference category

health care services compared to their rich counterparts. This underscores the importance of financial empowerment to obtain maternal and child health care including the treatment of ARI (Jehan et al., 2009; Houwelling et al., 2007; Mumtaz and Salway, 2007; Shaikh and Hatcher, 2004; Thind and Andersen 2003; Navaneetham and Dharmalingam, 2002). The cost of drugs, doctor's fees, and the cost of travel to and from the facility are often unaffordable for the poor in Pakistan, and hence they rely more on home remedies and do not seek medical treatment or at least delay it unless the disease is very severe (Houweling et al., 2007; Shaikh and Hatcher, 2004). Indeed, about 30 per cent of women did not obtain antenatal care for their most recent pregnancy as the financial costs were too high (NIPS, 2008).

Ethnic groups in Pakistan differ from each other in following their respective cultural norms and practices, especially when it concerns children. The incidence of ARI was substantially greater among children of Siraiki, Pushto, and Sindhi mothers compared to Punjabi and Urdu children. Siraiki children also showed higher odds of treatment for ARI. In general, Siraiki women have only limited access to education and are less likely to go out alone (Zubair, 2003). Among the Siraikis, the women of 'landowner' class (as opposed to landless class) are least exposed to the outside world as their prestige is associated with restricted or no movement outside of the house. Although Sindhi women enjoy greater freedom of movement and do not practice strict *purdah* (head to toe covering), their perception of power and control over their lives is minimal (Kadir et al., 2003). This perception seems to stem from their poor economic conditions, low status/paid jobs and higher unemployment among their husbands. The nature of control these women have on their lives somehow effect on the health indicators of their children which is similar to our findings.

Despite their limited autonomy, Siraiki mothers had higher odds of seeking treatment for their children. This may suggest that the much greater likelihood of incidence among these children in itself has a positive influence on the odds for treatment irrespective of their ethnic background. It may be that cultural values and norms that constrain women's mobility in Siraiki community are amenable to modification when children's wellbeing is paramount. Pakistani women of some ethnicities seem adept at successfully using culturally negotiable familial and other resources to seek medical treatment for their children (Mumtaz and Salway, 2005). These resources may not be available to the same extent to avail other health services (e.g. antenatal care) or for their own health care.

Unlike Siraiki , Pushto mothers are 50% less likely as Punjabi mothers to obtain treatment for their children despite higher odds of incidence among their children. Pushto women are confined to the domestic boundaries more than Siraikis due to the strict observance of purdah regardless of their SES and educational level. They have limited access to health facilities and as a result experience excess maternal and neonatal mortality (Fikree et al., 2001; Mumtaz and Salway, 2005; Jejeebhoy and Sathar, 2001; NIPS, 2008). Thus among Pushto children, culture seems to override the impact of the sheer magnitude of incidence of ARI in determining whether treatment is obtained. Pushto women appear to be less successful in negotiating cultural norms and values than/their Siraiki counterparts for the benefit of their children's health.

The marginally greater odds of treatment among those who obtained antenatal care from doctors or nurses may point to the importance of access to quality and affordable health care. Pakistani mothers who were successful in seeking antenatal care tended to use culturally acceptable and available means and resources (e.g. mother-in-law accompanying her to the clinic) (Mumtaz and Salway, 2005, 2007, 2009; Jejeebhoy and Sathar, 2001). If mothers had easier access in the broadest sense (social, geographical and financial access), they were more likely to take better care of their children and provide adequate health care (Mumtaz and Salway, 2005, 2007).

**Conclusion**

This study provides evidence that maternal age, maternal education, province and ethnicity are the key social determinants of the incidence, whereas wealth index and ethnicity are treatment seeking social determinants of ARI amongst children under two years of age in Pakistan. There is a need of local programs for women from Pushto and Balochi ethnic communities as their children are at increased risk of no treatment or delayed treatment of ARI. Programmes that focus on subsidized travel and medication costs and basic education of early warning signs of ARI have the potential to reduce the incidence and increase the likelihood of treatment of ARI.

## REFERENCES

Ahmed F, 1996. Ethnicity, Class and State in Pakistan. Economic and Political Weekly, 31: 3050-3053.

Ahmed S, A Adams, M Chowdhury and A Bhuiya, 2000. Gender, socio-economic development and health-seeking behaviour in Bangladesh. Social Science and Medicine, 51: 361-371.

Anjum Q, 2006. Morbidity pattern and utilization of a primary health care centre in a low socio-economic area of Karachi. Journal of the Pakistan Medical Association, 56: 13-16.

Azad K, 2009. Risk Factors for Acute Respiratory Infections (ARI) among children under five years in Bangladesh. Journal of Scientific Research, 1: 72-81.

Bhan G, N Bhandari, S Taneja, S Mazumder and R Bahl, 2005. The effect of maternal education on gender bias in care-seeking for common childhood illnesses. Social Science and Medicine, 60: 715-724.

Fikree F, S Azam and H Berendes, 2002. Time to focus child survival programmes on the newborn: assessment of levels and causes of infant mortality in rural Pakistan. Bulletin of the World Health Organization, 80: 271-276.

Greene R and R Stephen, 2013. Acute Respiratory Tract Infection among Children Admitted in Paediatric Ward, Govt. Medical College and Hospital, Miraj. European Journal of Medical Sciences, 13: 14-17.

Gombojav N, S Manaseki-Holland, J Pollock, AJ Henderson, 2009. The effects of social variables on symptom recognition and medical care seeking behaviour for acute respiratory infections in infants in urban Mongolia. Arch Dis Child, 94: 849-854.

Hirani SAA and R Karmaliani, 2013. The experiences of urban, professional women when combining breastfeeding with paid employment in Karachi, Pakistan: A qualitative study. Women and Birth, 26: 147-151.

Houweling T, C Ronsmans, O Campbell and A Kunst, 2007. Huge poor-rich inequalities in maternity care: an international comparative study of maternity and child care in developing countries. Bulletin of the World Health Organization, 85: 745-754.

Ingram J, C Cabral, AD Hay, PJ Lucas and J Horwood, 2013. Parents' information needs, self-efficacy and influences on consulting for childhood respiratory tract infections: a qualitative study. BMC Family Practice, 14: 106.

Jehan I, H Harris, S Salat, A Zeb, N Mobeen, O Pasha, E Mcclure, J Moore, L Wright, and R Goldenberg, 2009. Neonatal mortality, risk factors and causes: a prospective population-based cohort study in urban Pakistan. Bulletin of the World Health Organization, 87: 130-138.

Jejeebhoy S and Z Sather, 2001. Women's autonomy in India and Pakistan: the influence of religion and region. Population and Development Review, 27: 687-712.

Kadir M, F Fikree F, A Khan and F Sajan, 2003. Do mothers-in-law matter? Family dynamics and fertility decision-making in urban squatter settlements of Karachi, Pakistan. Journal of Biosocial Science, 35: 545-58.

Labout JA, 2010. Bacterial carriage in infancy: Risk factors and consequences-The Generation R Study. Erasmus University Rotterdam.

Luque J, L Whiteford and G Tobin, 2008. Maternal Recognition and Health Care-seeking Behavior for Acute Respiratory Infection in Children in a Rural Ecuadorian County. Maternal and Child Health Journal, 12: 287-297.

Mumtaz Z and S Salway, 2005. 'I never go anywhere': extricating the links between women's mobility and uptake of reproductive health services in Pakistan. Social Science and Medicine, 60: 1751-65.

Mumtaz Z and S Salway, 2007. Gender, pregnancy and uptake of antenatal care services in Pakistan. Sociology of Health and Illness, 29: 1-26.

Mumtaz Z and S Salway, 2009. Understanding gendered influences on women's reproductive health in Pakistan: Moving beyond the autonomy paradigm. Social Science and Medicine, 68: 1349-56.

NIPS, 2008. Pakistan Demographic Health Survey. Ministry of Population Welfare, Islamabad, Pakistan.

Navaneetham K and A Dharmalingam, 2002. Utilization of maternal health care services in Southern India. Social Science and Medicine, 55: 1849-1869.

Qazi S, G Rehman and M Khan, 1996. Standard management of acute respiratory infections in a children's hospital in Pakistan: impact on antibiotic use and case fatality. Bulletin World Health Organization, 74: 501-507.

Rashid S, A Hadi, K Afsana and S Begum, 2001. Acute respiratory infections in rural Bangladesh: cultural understandings, practices and the role of mothers and community health volunteers. Tropical Medicine and International Health, 6: 249-255.

Rutstein S and K Johnson, 2004. The DHS Wealth Index, DHS Comparative Reports No. 6, ORC Macro, Calverton, Maryland, USA.

Sathar Z and S Kazi, 1997. Women's autonomy, livelihood and fertility: A study of rural Punjab. Islamabad: Pakistan Institute of Development Economics.

Savitha M, S Nandeeshwara, PM Kumar and C Raju, 2007. Modifiable risk factors for acute lower respiratory tract infections. Indian Journal of Paediatrics, 74: 477-482.

Shaikh B, D Haran and J Hatcher, 2008. Women's Social Position and Health-Seeking Behaviours: Is the Health Care System Accessible and Responsive in Pakistan?

Health Care for Women International, 29: 945-959.

Shaikh B and J Hatcher, 2004. Health seeking behaviour and health service utilization in Pakistan: challenging the policy makers. Journal of Public Health, 27: 49-54.

Thind A and R Andersen, 2003. Respiratory illness in the Dominican Republic: what are the predictors for health services utilization of young children. Social Science and Medicine, 56: 1173-1182.

Tupasi TE, MA Velmonte, MEG Sanvictores, L Abraham, LE De Leon, SA Tan, CA Miguel and MC Saniel, 1988. Determinants of morbidity and mortality due to acute respiratory infections: implications for intervention. The Journal of Infectious Diseases, 157: 615-623.

WHO, 2009. World Health Statistics, 2009. Geneva.

Zubair S, 2003. Literacies across Generations: Women's Religious and Secular Identities in Siraiki Villages. South Asia Research, 23: 135-151.