Intimate partner violence and infant morbidity: evidence of an association from a population-based study in eastern Uganda in 2003

Karamagi, Charles AS, James K Tumwine, Thorkild Tylleskar, Kristian Heggenhougen. "Intimate partner violence and infant morbidity: evidence of an association from a population-based study in eastern Uganda in 2003" BMC Pediatrics 7:34. (2007) https://hdl.handle.net/2144/3276

Boston University
Intimate partner violence and infant morbidity: evidence of an association from a population-based study in eastern Uganda in 2003

Charles AS Karamagi*1,2,3, James K Tumwine1, Thorkild Tylleskar3 and Kristian Heggenhougen3,4

Abstract

Background: Although recent studies suggest that there is an association between intimate partner violence and child mortality, the underlying mechanisms are still unknown. It is against this background that as a secondary objective, we set out to explore whether an association exists between intimate partner violence and illness in infants.

Methods: We conducted a population based household survey in Mbale, eastern Uganda in 2003. Participants were 457 women (with 457 infants) who consented to participate in the study. We measured socio-demographics of women and occurrence of intimate partner violence. We measured socio-demographics, immunization, nutritional status, and illness in the previous two weeks of the children.

Results: The mean age of the women was 25 years (SD 5.7) while the mean age of the infants was 6 months (SD 3.5). The prevalence of lifetime intimate partner violence was 54% (95% CI 48%–60%). During the previous two weeks, 50% (95% CI 50%–54%) of the children had illness (fever, diarrhoea, cough and fast breathing). Lifetime intimate partner violence was associated with infant illness (OR 1.8, 95% CI 1.2–2.8) and diarrhoea (OR 2.0, 95% CI 1.2–3.4).

Conclusion: Our findings suggest that infant illnesses (fever, diarrhoea, cough and fast breathing) are associated with intimate partner violence, and provide insights into previous reports that have shown an association between intimate partner violence and child mortality, suggesting possible underlying mechanisms. Our findings also highlight the importance of intimate partner violence on the health of children, and the need for further research in this area.
Background

Intimate partner violence is the most common form of violence against women[1]. Intimate partner violence assumed international recognition initially because of its violation of women's rights. In recent years there has been accumulating evidence of the consequences of intimate partner violence on the health of women including detrimental reproductive health outcomes [2-10]. In Uganda, a hospital-based study reported that 57% of pregnant women experienced intimate partner violence [11].

However, the effect of intimate partner violence on children has received limited attention. Violence prior to or during pregnancy has been associated with premature birth, foetal injury and low birth weight[3,9,10,12]. Studies have shown that children who witness intimate partner violence are at higher risk of emotional and behavioural problems including anxiety, depression, poor school performance, low self-esteem, disobedience, nightmares and physical health complaints. Furthermore such children are likely to be perpetrators or victims of intimate partner violence as adults [13-15]. A study from India showed that women who had been beaten were significantly more likely than non-abused women to have experienced an infant death or pregnancy loss [16]. In Nicaragua, intimate partner violence was associated with an increased risk of infant and under-5 mortality [17].

Although these studies suggest that there is an association between intimate partner violence and child mortality, research on intimate partner violence and infant morbidity is lacking. Is it that intimate partner violence is associated with common childhood illnesses that eventually lead to death? As a secondary objective, we set out to explore any association between intimate partner violence and common childhood illnesses in rural and urban populations in eastern Uganda.

Methods

Site and design

Mbale District is situated in eastern Uganda and borders the Republic of Kenya and Mt Elgon to the east. It has a population of over 720 000 of which 90% is rural and predominantly Bagisu who speak Lumasaba. Children less than 15 years comprise 51.8 percent of the population. The literacy rate is 64 and 49 percent for males and females, respectively. The prevalence of HIV was 5.6 percent in 2003. The main economic activity is subsistence farming. Mbale District consisted of 1,448 villages distributed into 4 counties namely Bubulo, Bungokho, Manjiya, and Mbale town. The major causes of illness in under-5 children were malaria, acute respiratory infections, measles, malnutrition and diarrhoea.

The study was a cross sectional household survey of women with infants carried out during November and December 2003. It was conducted as part of a collaborative research project between the Department of Paediatrics and Child Health, Makerere University and the Centre for International Health, University of Bergen. The field site for the research project was Mbale District. Mbale town and the surrounding Bungokho county were purposely selected because they were in the field site of the project and also to provide a rural and an urban sample. Bungokho county was similar to the other counties of Mbale district except that it had better access to Mbale town and its services.

Population and sampling

Sampling for the household survey was based on the WHO/EPI cluster survey method. We randomly selected 68 villages or wards (urban administrative units) each comprising of about 300 households within the county or town. Mbale town was over-sampled in order to get a good estimate also in the denser urban population. Each village or ward constituted a cluster. With the help of local officials, we identified the centre of each cluster. At the centre of the cluster, a bottle was spun on the ground and the direction in which the top of the bottle pointed was taken to be the direction of the survey. The households between the centre and boundary of the cluster were identified and the first household was randomly selected. The second household was defined as the one nearest the first household moving in the chosen direction. Subsequent households were selected in a similar manner and at the boundary of the cluster, the interviewers turned clockwise and continued to select households until a total of seven households were identified. Only households that fulfilled the selection criteria were selected. The target population was women between 15 and 45 years of age; who resided in the selected households in Mbale town or Bungokho county; and whose youngest child was aged one year or less. After consenting, the women were interviewed in their homes. In case of twins, one child was selected randomly.

Sample size estimation

We based our sample size calculation on estimation of the prevalence of intimate partner violence in rural and urban women in Mbale. We used an expected proportion of intimate partner violence of 0.15 estimated from the study by Koenig et al [6] and the reports from neighbouring Tanzania[8]. We set the degree of precision at the standard of 0.05 and the confidence level at 95%, and incorporated a design effect of 2.0 because of the cluster design. The estimated sample size was 392 but we increased the sample size to 476 to cater for problems that might occur in recruitment. Since some women were not available for
interview, and we failed to get replacements for them, the final sample size was 457 women.

**Variables and instrument**

We used an interviewer-administered questionnaire that included items on socio-demographic characteristics of the woman and her husband and intimate partner violence. Data on age, education and parity was collected on a continuous scale and categorized during analysis. Women were asked about their experience of male against female intimate partner violence involving their husbands over the past 12 months and ever. Women were asked the following questions: Has your husband ever beaten you up? Why did he beat you? Has your husband beaten you up during the past year? Have you ever been threatened by a weapon or had a weapon used against you by your husband? What was the nature of the weapon? Have you ever been kicked, bitten or hit by your husband? Have you ever been raped or otherwise sexually abused by your husband?

Lifetime intimate partner violence was defined as lifetime occurrence of any form of partner violence. A variable of household socio-economic status was developed by use of principal components analysis with variables on asset ownership (bicycle, radio, television, motorcycle, car/truck, land), materials of the dwelling structure (floor, wall, roof) and ownership of poultry and intimate partner animals. We used principal components analysis to divide the households into quintiles of socio-economic status, with (1) poorest and (5) least poor. We categorised quintiles 1–3 as "poorest" and 4–5 as "least poor" which suggests that the population was generally poor.

Women were also interviewed on the characteristics of the youngest child namely age, sex, method of feeding, immunization, history of diarrhoea (two or more loose stools per day), cough with fast breathing or fever in the past two weeks. Children were weighed in their underpants using a hanging Salter scale and their lengths were measured using a stadiometer. We followed guidelines established by the World Health Organization for the collection of sensitive information on intimate partner violence [18].

We recruited 12 research assistants who were fluent in English and the local language Lumasaaba and had experience in data collection. We trained them in sampling interview technique, measurement of child weight and height, and ethical issues, emphasising the importance of safety of the participants and interviewers, minimization of under-reporting of sensitive information particularly on intimate partner violence, and confidentiality. We conducted a pilot survey and used the lessons to revise the procedures and instrument of the survey. The survey was conducted with the support of the local officials who assisted in the sampling procedures and introduction of the survey team to household members. The research assistants worked in pairs of a female and a male, and a pair interviewed seven respondents in one cluster in one day. The lead interviewer was a female and the role of the male was mainly to ensure the privacy of the interviews and also the safety of the participants and interviewers. The interviews were conducted in the privacy of the women's homes but away from husbands, relatives, friends or local officials. The houses were generally close together and interviews were conducted daily between 8 am and 6 pm. The research assistants were in direct communication by mobile telephone with the principal investigator (CASK) who could reach them in less than an hour.

**Data analysis**

Data were entered into EPIDATA and then exported to Stata version 8.0 for analysis that adjusted for the design effect. Data quality was ensured through careful selection and training of the research assistants, supervision, field editing, and by use of the check programme at data entry. We combined the common childhood illnesses (fever, cough, fast breathing, diarrhoea) into one variable called ILL. The variable ILL was dichotomised into not/mildly ILL consisting of 0 or 1 symptom or moderately ILL consisting of 2 to 4 symptoms. This level of categorization was chosen because it had the best combination of sensitivity (57%) and specificity (59%) with intimate partner violence as outcome. The dependent variables were ILL, FEVER, COUGH WITH FAST BREATHING, DIARRHOEA, EXCLUSIVE BREASTFEEDING, COMPLETE VACCINATION, UNDERWEIGHT, WASTING, and STUNTING. A separate analysis was performed for each dependent variable against the independent variables that included the characteristics of the women, their husbands and infants. A bivariate analysis was performed between each dependent variable and the independent variables so as to determine the independent variables that were associated with each dependent variable. The independent variables that were significantly associated with each dependent variable were potential confounders and were entered into a model for logistic regression. When ILL was used as the dependent variable, its component variables (fever, cough, fast breathing, and diarrhea) were not included in the analysis as independent variables so as to avoid interaction. Odds ratios were used to estimate the strength of the associations while 95% confidence intervals were used for significance testing.

**Ethics**

Ethical and institutional approval for the study was obtained from Makerere University Faculty of Medicine.
Table 1: Characteristics of women, husbands and infants in Mbale, Uganda, 2003.

| Variable                          | Frequency | Percentage |
|-----------------------------------|-----------|------------|
| **Age of mother (years)**         |           |            |
| 15 – 24                           | 238       | 52         |
| 25 – 45                           | 219       | 48         |
| **Education of mother (years)**   |           |            |
| 0 – 7                             | 324       | 71         |
| 8 or more                         | 133       | 29         |
| **Marital status**                |           |            |
| Single/widow                      | 191       | 46         |
| Married                           | 227       | 54         |
| **Parity**                        |           |            |
| Primipara                         | 100       | 22         |
| Multipara                         | 357       | 78         |
| Mother works outside the home     |           |            |
| No                                | 123       | 27         |
| Yes                               | 334       | 73         |
| **Residence**                     |           |            |
| Urban                             | 124       | 27         |
| Rural                             | 333       | 73         |
| **Socio-economic status**         |           |            |
| Least poor                        | 122       | 40         |
| Poorest                           | 185       | 60         |
| **Lifetime intimate partner violence** |       |            |
| No                                | 208       | 46         |
| Yes                               | 249       | 54         |
| **Age of husband (years)**        |           |            |
| 15 – 24                           | 69        | 21         |
| 25 – 45                           | 260       | 79         |
| **Education of husband (years)**  |           |            |
| 0 – 7                             | 212       | 57         |
| 8 or more                         | 160       | 43         |
| **Number of people in household** |           |            |
| 5 or less                         | 220       | 48         |
| 6 or more                         | 237       | 52         |
| **Age of child (months)**         |           |            |
| <6                                | 220       | 48         |
| 6–12                              | 237       | 52         |
| **Sex of child**                  |           |            |
| Male                              | 255       | 56         |
| Female                            | 202       | 44         |
| **Is child on exclusive breastfeeding?** |       |            |
| Yes                               | 105       | 23         |
| No                                | 348       | 77         |
| **Complete vaccination for age**  |           |            |
| No                                | 252       | 55         |
| Yes                               | 205       | 45         |
| **Is child wasted?**              |           |            |
| No                                | 427       | 93         |
| Yes                               | 30        | 7          |
| **Is child underweight?**         |           |            |
| No                                | 407       | 89         |
| Yes                               | 50        | 11         |
| **Is child stunted?**             |           |            |
| No                                | 421       | 92         |
| Yes                               | 36        | 8          |
| **Has child had cough with fast breathing in past two weeks?** | |            |
| No                                | 413       | 90         |
| Yes                               | 44        | 10         |
| **Has child had fever in past two weeks?** | |            |
| No                                | 225       | 49         |
| Yes                               | 232       | 51         |
| **Has child had diarrhoea in past two weeks?** | |            |
| No                                | 322       | 70         |
| Yes                               | 135       | 30         |
The stress of intimate partner violence may thus lead to a letdown reflex that facilitates the flow of breast milk [19]. The release of oxytocin, the hormone responsible for the letdown reflex, may create stress, and in a breastfeeding woman, stress inhibits the release of oxytocin. This can inhibit milk letdown and ultimately affect breastfeeding. Intimate partner violence could be due to the potential of not enough milk [20, 21]. Infant illness would result from lack of the protective effect of breastfeeding combined with exposure to other foods that may be contaminated or cause allergy.

It is also plausible that infant illness may be the trigger to intimate partner violence. Women are usually blamed for all kinds of misfortune including illness in the child [22]. Thus the husband may blame his wife when the infant is ill and this situation may explode into intimate partner violence. More likely however, the husband, particularly in a poor family and out of frustration, may respond with violence if his wife asks him for money that he does not have in order to take the child for treatment. A third explanation for the association between illness in infants and intimate partner violence is that both conditions may be the consequences of similar underlying factors. Our sample consisted of mainly the poorest and least educated women. Both illness in infants [23, 24] and intimate partner violence [15, 22, 25] have been associated with poverty and low female education.

Consistent with other studies, our study showed that illness was more frequent in older infants [23, 24, 26, 27]. Older infants are usually on a combination of breastfeeding and locally available foods [28]. In our study, almost all the children aged 6 to 12 months were on a combination of breastfeeding and other foods. In such a situation, the protective effect of breastfeeding is decreased while introduction of other foods further increases the risk of infection [19, 27]. In addition, the child developmental stages including sitting, crawling and putting objects into the mouth increasingly expose the infants to environmental pathogens and thereby increase the risk of illness [19].

Infants residing in rural areas had a three-fold increase in common illnesses. Our study showed that more than 80% of the less educated mothers resided in rural areas. The education of the mother is strongly associated with childhood illness, and low or no education has been shown to increase the risk of childhood illness [23]. The possible mechanisms for the increased risk of childhood illness among uneducated mothers include inappropriate infant feeding practices such as mixed breastfeeding, and poor hygiene [23]. Other factors such as poverty and environmental hygiene may also have played a role in increasing the risk of childhood illness among rural women [24].

In the unadjusted analysis, our study showed that low or no education, multiparity, and non-exclusive breastfeeding were associated with an increased risk of illness in infants. However, this association was lost in the adjusted analysis. This is contrary to previous studies that have demonstrated an association between maternal educa-
Table 2: Bivariate association between illness in infants and characteristics of women, husbands and infants, Mbale, Uganda, 2003.

| Variable                              | Illness n (%) | No Illness n (%) | Unadjusted OR (95% CI) |
|---------------------------------------|---------------|-----------------|-----------------------|
| Age of mother (years)                 |               |                 |                       |
| 15 – 24                               | 122 (51)      | 116 (49)        | 1.1 (0.8–1.6)         |
| 25 – 45                               | 106 (48)      | 113 (52)        | 1.0                   |
| Education of mother (years)           |               |                 |                       |
| 0 – 7                                 | 177 (55)      | 147 (45)        | 1.9 (1.3–2.9)         |
| 8 or more                             | 51 (38)       | 82 (62)         | 1.0                   |
| Marital status                        |               |                 |                       |
| Single/widow                          | 91 (48)       | 100 (52)        | 1.0                   |
| Married                               | 121 (53)      | 106 (47)        | 1.3 (0.9–1.8)         |
| Parity                                |               |                 |                       |
| Primipara                             | 39 (39)       | 61 (61)         | 1.0                   |
| Multipara                             | 189 (53)      | 168 (44)        | 1.8 (1.1–2.8)         |
| Mother works outside the home         |               |                 |                       |
| No                                    | 61 (50)       | 62 (50)         | 1.0                   |
| Yes                                   | 167 (50)      | 167 (50)        | 1.0 (0.7–1.5)         |
| Residence                             |               |                 |                       |
| Urban                                 | 42 (34)       | 82 (66)         | 1.0                   |
| Rural                                 | 186 (56)      | 147 (44)        | 2.5 (1.6–3.8)         |
| Socio-economic status                 |               |                 |                       |
| Least poor                            | 63 (52)       | 59 (48)         | 1.0                   |
| Poorest                               | 100 (54)      | 85 (46)         | 1.1 (0.7–1.7)         |
| Age of husband (years)                |               |                 |                       |
| 15 – 24                               | 39 (57)       | 30 (43)         | 1.5 (0.9–2.5)         |
| 25 – 45                               | 121 (47)      | 139 (53)        | 1.0                   |
| Education of husband (years)          |               |                 |                       |
| 0 – 7                                 | 116 (55)      | 96 (45)         | 1.4 (0.9–2.1)         |
| 8 or more                             | 74 (46)       | 86 (54)         | 1.0                   |
| Number of people in household         |               |                 |                       |
| 5 or less                             | 101 (46)      | 119 (54)        | 1.0                   |
| 6 or more                             | 109 (46)      | 128 (54)        | 1.0 (0.7–1.5)         |
| Age of child (months)                 |               |                 |                       |
| <6                                    | 81 (37)       | 139 (63)        | 1.0                   |
| 6–12                                  | 147 (62)      | 90 (38)         | 2.8 (1.9–4.1)         |
| Sex of child                          |               |                 |                       |
| Male                                  | 121 (47)      | 134 (53)        | 1.0                   |
| Female                                | 107 (53)      | 95 (47)         | 1.2 (0.9–1.8)         |
| Is child on exclusive breastfeeding?   |               |                 |                       |
| Yes                                   | 36 (34)       | 69 (66)         | 1.0                   |
| No                                    | 189 (54)      | 159 (46)        | 2.3 (1.4–3.6)         |
| Complete vaccination for age          |               |                 |                       |
| No                                    | 139 (55)      | 113 (45)        | 1.0                   |
| Yes                                   | 89 (43)       | 116 (57)        | 0.6 (0.4–0.9)         |
| Is child wasted?                      |               |                 |                       |
| No                                    | 211 (49)      | 216 (51)        | 1.0                   |
| Yes                                   | 17 (57)       | 13 (43)         | 1.3 (0.6–2.8)         |
| Is child underweight?                 |               |                 |                       |
| No                                    | 205 (50)      | 202 (50)        | 1.0                   |
| Yes                                   | 23 (46)       | 27 (54)         | 0.8 (0.5–1.5)         |
| Is child stunted?                     |               |                 |                       |
| No                                    | 210 (50)      | 211 (50)        | 1.0                   |
| Yes                                   | 18 (50)       | 18 (50)         | 1.0 (0.5–2.0)         |
| Lifetime intimate partner violence    |               |                 |                       |
| No                                    | 86 (41)       | 122 (59)        | 1.0                   |
| Yes                                   | 142 (57)      | 107 (43)        | 1.9 (1.3–2.7)         |
Table 4: Summary of the associations between intimate partner violence, illness and nutritional status of infants, Mbale, Uganda, 2003.

| Variable | Violence n (%) | No Violence n (%) | Unadjusted OR (95% CI) | Adjusted* OR (95% CI) |
|----------|---------------|-------------------|------------------------|-----------------------|
| Is child on exclusive breastfeeding? | 55 (52) | 50 (48) | 1.0 | 1.0 |
| No | 193 (55) | 155 (45) | 1.1 (0.7–1.8) | 0.8 (0.4–1.5) |
| Complete vaccination for age | 139 (55) | 113 (45) | 1.0 | 1.0 |
| No | 110 (54) | 95 (46) | 0.9 (0.7–1.4) | 1.0 (0.7–1.5) |
| Yes | 236 (55) | 191 (44) | 1.0 | 1.0 |
| Is child wasted? | 13 (43) | 17 (57) | 0.6 (0.3–1.3) | 0.7 (0.3–1.7) |
| No | 229 (56) | 178 (43) | 1.0 | 1.0 |
| Yes | 20 (40) | 30 (60) | 0.5 (0.3–0.9) | 0.7 (0.3–1.5) |
| Is child underweight? | 232 (55) | 189 (45) | 1.0 | 1.0 |
| No | 17 (47) | 19 (53) | 0.7 (0.4–1.4) | 0.9 (0.3–3.3) |
| Has child had cough with fast breathing in past two weeks? | 218 (53) | 195 (47) | 1.0 | 1.0 |
| No | 31 (70) | 13 (30) | 2.1 (1.1–4.2) | 1.7 (0.9–3.5) |
| Has child had fever in past two weeks? | 109 (48) | 116 (52) | 1.0 | 1.0 |
| No | 140 (60) | 92 (40) | 1.6 (1.1–2.3) | 1.3 (0.8–1.9) |
| Has child had diarrhoea in past two weeks? | 161 (50) | 161 (50) | 1.0 | 1.0 |
| No | 88 (65) | 47 (35) | 1.9 (1.2–2.8) | 2.0 (1.2–3.4) |

* Association between lifetime intimate partner violence and illness in infants adjusted for education of mother, parity, residence, age of child, and exclusive breastfeeding.

Note:
Intimate partner violence was the major exposure variable. The child illness and nutrition variables were the dependent variables.
* Odds ratios were adjusted for education of mother, parity, residence, and age of child.
tion, multiparity and non exclusive breastfeeding with illness in children [29-31]. The lack of significant association may be due to inadequate power in our study to examine the relationships and possibly to exclusion of non-significant but important socio-demographic variables from the logistic regression model.

Our study had a number of potential limitations. The study was cross sectional and it was therefore not possible to establish a causal association between intimate partner violence and infant illness. In addition, the study could not establish a significant association between intimate partner violence and fever or cough and fast breathing because of a limited sample size. A further potential limitation of the study was the seasonal variation of childhood illnesses and it is uncertain whether our findings would still be valid over a longer period of study. A final potential limitation of our study was the measurement of intimate partner violence. The cultural definition of intimate partner violence, particularly sexual coercion is ambiguous. Furthermore, intimate partner violence is a sensitive issue that is often hidden by the women. Finally, intimate partner violence was measured as a lifetime experience whereas infant illness was measured over the past two weeks. These factors may either singly or in combination have introduced bias in our study.

Conclusion
Notwithstanding these limitations, our findings suggest that infant illnesses (fever, diarrhoea, cough and fast breathing) are associated with intimate partner violence, and provide insights into previous reports that have shown an association between intimate partner violence and child mortality, suggesting possible underlying mechanisms. Our findings also highlight the importance of intimate partner violence on the health of children, and the need for further research in this area.

Competing interests
The author(s) declare that they have no competing interests.

Authors' contributions
CASK participated in the conception, design, and implementation of the study, statistical analysis, interpretation and drafting of manuscript. IKT participated in study conception, design and implementation of the study. TT participated in study conception, design, statistical analysis, and interpretation. KH participated in study conception, design, and interpretation. All authors read and approved the final manuscript.

Acknowledgements
We would like to thank the women, children and research assistants who participated in this study. The study was conducted as part of the “Essential Child Health and Nutrition Project in Uganda”, a collaboration between the Department of Paediatrics and Child Health, Makerere University and the Centre for International Health, University of Bergen. The study was funded by the Norwegian Council for Higher Education’s Programme for Development Research and Education (NUFU).

References
1. WHO/WHD: World Report on Violence. Geneva, World Health Organization; 1997.
2. Bachus L, Mezey G, Bewley S: Domestic violence: prevalence in pregnant women and associations with physical and psychological health. Eur J Obstet Gynecol Reprod Biol 2004, 113:6-11.
3. Cokkinides VE, Coker AL, Sanderson M, Addy C, Bethea L: Physical violence during pregnancy: maternal complications and outcomes. J Obstet Gynecol Neonatal Nurs 1999, 28:3-20.
4. Martin SL, Kilgallen B, Tsui AO, Maitra K, Singh KK, Kupper LL: Sexual behaviors and reproductive health outcomes: associations with wife abuse in India. JAMA 1999, 282:1967-1972.
5. Fikree FF, Bhatti L: Domestic violence and health of Pakistani women. International Journal of Gynecology and Obstetrics 1999, 65:195-201.
6. Koenig MA, Lutalo T, Zhao F, Nalugoda F, Wabwire-Mangen F, Kiwanuka N, Wagman J, Serwadda D, Wawer M, Gray R: Domestic violence in rural Uganda: evidence from a community-based study. Bull World Health Organ 2003, 81:53-60.
7. van der Straten A, King R, Grinstead T, Vittinghoff E, Seruflira A, Allen S: Sexual coercion, physical violence and HIV infection among women in steady relationships in Kigali, Rwanda. AIDS Behav 1998, 2:61-73.
8. WHO: WHO multi-country study on women’s health and domestic violence (WHO/FCH/GWH/02.01). Geneva, World Health Organization; 1999.
9. Silverman JG, Decker MR, Reed E, Raj A: Intimate partner violence victimization prior to and during pregnancy among women residing in 26 U.S. states: association with maternal and neonatal health. Am J Obstet Gynecol 2006, 195:140-8. Epub 2006 Apr 21.
10. Silverman JG, Decker MR, Reed E, Raj A: Intimate partner violence around the time of pregnancy: association with breastfeeding behavior. J Womens Health (Larchmt) 2006, 15:934-940.
11. Kaye DK, Mirembe FM, Bantebya G, Johansson A, Ekstrom AM: Risk factors, nature and severity of domestic violence among women attending antenatal clinic in Mulago Hospital, Kampala, Uganda. Central African Journal of Medicine 2002, 48:64-68.
12. Curry MA, Perrin N, Wall E: Effects of abuse on maternal complications and birth weight in adult and adolescent women. Obstet Gynecol 1998, 92:530-534.
13. Ellsberg MC, Rena R, Herrera A, Lijeskjaer J, Winkvist A: Wife abuse among women of childbearing age in Nicaragua. American Journal of Public Health 1999, 89:241-244.
14. Martin SL, Moracco KE, Garro J, Tsui AO, Kupper LL, Chase JL, Campbell JC: Domestic violence across generations: findings from Northern India. Int J Epidemiol 2002, 31:560-572.
15. Jewkes RK, Levin J, Perin-Kakana L: Risk factors for domestic violence: findings from a South African cross-sectional study. Soc Sci Med 2002, 55:1603-1617.
16. Jejeebhoy Sj: Associations between wife-beating and fetal and infant death: impressions from a survey in rural India. Stud Fam Plan 1998, 29:300-308.
17. Asling-Monemi K, Pedra R, Ellsberg MC, Persson LA: Violence against women increases the risk of infant and child mortality: a case-referent study in Nicaragua. Bull World Health Organ 2003, 81(1):10-16.
18. WHO: Putting women first: ethical and safety recommendations for research on domestic violence against women (WHO/FCH/GWH/01.01). Geneva, World Health Organization; 2001.
19. Lawrence RA: Breastfeeding: a guide for the medical profession. St. Louis, Missouri, The C.V. Mosby Company; 1989.
20. Sibeko L, Dhansay MA, Charlton KE, Johns T, Gray-Donald K: Beliefs, attitudes, and practices of breastfeeding mothers from a periurban community in South Africa. J Hum Lact 2005, 21:31-38.
21. Wamani H, Astron AN, Peterson S, Tyleksar T, Tumwine JK: Infant and young child feeding in western Uganda: knowledge,
practices and socio-economic correlates. J Trop Pediatr 2005, 51:356-361.

22. Asiimwe D, Kibombo R, Neema S: Focus Group Discussion on Social Cultural Factors Impacting on HIV/AIDS in Uganda. Kampala, Makerere Institute for Social Research and Ministry of Finance, Planning and Economic Development/UNDP. 2003.

23. Hatt LE, Waters HR: Determinants of child morbidity in Latin America: a pooled analysis of interactions between parental education and economic status. Soc Sci Med 2006, 62:375-86 (Epub 2005 Jul 25).

24. Nandy S, Irving M, Gordon D, Subramanian SV, Smith GD: Poverty, child undernutrition and morbidity: new evidence from India. Bull World Health Organ 2005, 83:210-6 (Epub 2005 Mar 16).

25. Jejeebhoy SJ, Cook RJ: State accountability for wife-beating: the Indian challenge. Lancet 1997, 349:110-2.

26. Agtini MD, Soeharno R, Lesmana M, Punjabi NH, Simanjuntak C, Wanggasaputra F, Nurdin D, Pulungshih SP, Rofiq A, Santoso H, Pujarwoto H, Saphirahmen A, Sudarsono P, von Seidlein L, Deen J, Ali M, Lee H, Kim DR, Han O, Park JK, Suvandono A, Ingerani, Oyofo BA, Campbell JR, Beecham HJ, Corwin AL, Clemens JD: The burden of diarrhoeal, shigellosis, and cholera in North Jakarta, Indonesia: findings from 24 months surveillance. BMC Infect Dis 2005, 5:89.

27. Bahl R, Frost C, Kirkwood BR, Edmond K, Martines J, Bhandari N, Arthur P: Infant feeding patterns and risks of death and hospitalization in the first half of infancy: multicentre cohort study. Bull World Health Organ 2005, 83:418-26. Epub 2005 Jun 17.

28. Hatt LE, Waters HR: Determinants of child morbidity in Latin America: a pooled analysis of interactions between parental education and economic status. Soc Sci Med 2006, 62:375-86 (Epub 2005 Jul 25).

29. Van den Broeck J, Eeckels R, Massa G: Maternal determinants of child survival in a rural African community. Int J Epidemiol 1996, 25:998-1004.

30. Pathela P, Zahid Hasan K, Roy E, Huq F, Kasem Siddique A, Bradley Sack R: Diarrheal illness in a cohort of children 0-2 years of age in rural Bangladesh: I. Incidence and risk factors. Acta Paediatr 2006, 95:430-437.

31. Mfenyana K, Griffin M, Yogeswaran P, Modell B, Modell M, Chandia J, Nazareth I: Socio-economic inequalities as a predictor of health in South Africa--the Yenza cross-sectional study. S Afr Med J 2006, 96:323-330.

Pre-publication history
The pre-publication history for this paper can be accessed here:

http://www.biomedcentral.com/1471-2431/7/34/prepub