Mental health disorders among caregivers of preschool children in the Asenze Study in KwaZulu-Natal, South Africa

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Abstract

Objectives—Given the existing evidence linking parental depression with infant and early child development, our aim was to describe the burden of mental health disorders among caregivers of young children aged 4–6 years living in an environment of poverty and high HIV seroprevalence.

Methods—We analyzed baseline data from an epidemiologic study of the health and psychosocial needs of preschool-aged children. Primary caregivers of index children recruited from a household survey were screened for common mental disorders using the Client Diagnostic Questionnaire (CDQ). Sociodemographic, HIV and general health surveys were also conducted.

Results—Many caregivers (449/1434; 31.3%) screened positive for at least one psychiatric disorder on the CDQ, with post-traumatic-stress-disorder being the most common. Caregivers who screened positive for any disorder were more likely to be older, to have no individual sources of income and to have less formal education. Presence of a disorder was also significantly associated with lower employment levels within the household and death of a young child within the household. Known HIV-infected caregivers were more likely to have any mood disorder than caregivers who previously tested negative.

Conclusions—The data support the need for mental health treatment interventions in South Africa, particularly interventions directed at PTSD and depression, and that take into account the high burden of poverty, HIV and childhood mortality. Given the limited formal mental health structure in South Africa to address these highly prevalent disorders; community-based mental health supports, available through decentralized health systems many be critical to delivering accessible interventions.

Keywords

Caregivers; mental health; depression; post-traumatic-stress-disorder; HIV

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Background

Mental health and substance use disorders place a high burden on population health globally, with low income countries reporting highest burdens [1–3]. Globally, neuropsychiatric conditions account for more than 37-percent of years of life lost due to disability, with lifetime prevalence of any depressive disorder ranging from 4.2–17% [2, 3]. South African population-based studies report a twelve-month prevalence of 16.5% for any DSM-IV disorder[4], with high levels of depression, post-traumatic stress disorder (PTSD) and alcohol dependence among HIV-infected and affected individuals[5, 6]. In South Africa, HIV is of special interest, not only because of the potential neuropsychiatric effects of the virus, but also because of the stigma and fear associated with HIV infection which may limit opportunities for treatment, treatment adherence and health outcomes [7, 8].

Research in high income countries has repeatedly documented the deleterious impact of maternal mental health disorders on growth, development, and behavior of their children (both infant and preschool), but in low and middle income countries these issues are inadequately studied [9–12]. In lower income countries such research is equally important given that caregiving behaviors are proximal in the pathway to child growth and development, and these behaviors interact with multiple environmental determinants in influencing children's development [13]. The few studies conducted in South Africa largely focus only on maternal depression and its impact on infants, particularly post-partum depression [14–16]. In South Africa, where many children are not living with their birth mother, or father, due to various reasons including HIV-related orphaning; expanding the enquiry of mental health disorders to cover contexts of non-parental caregivers, in addition to birth parents, and early childhood years beyond infancy, becomes even more critical.

Strong arguments have emerged globally for prioritizing mental health in developing countries, noting the inextricable link with the Millennium Development Goals[17, 18]. In South Africa, a history of apartheid, high current levels of HIV, unemployment, inequality, urban transition, and high rates of violent trauma already demand mental health prioritization [19, 20]. Research that documents the prevalence and determinants of mental health disorders among caregivers of children and documents the impact on children's health and development will further inform mental health priorities and support the development of effective policies.

The aim of the current manuscript is to describe the burden of mental health disorders among caregivers of young children using baseline data from an epidemiologic study of the health and psychosocial needs of preschool age children in high HIV seroprevalence communities. This work is critical for defining the mental health burden as it pertains to the context of taking care of young children, and the public health implications of large-scale screening of adult caregivers.

Methods

Context and recruitment

In *Asenze* (translated from Zulu, is "let us act/make it happen."), an on-going longitudinal epidemiologic study of health and psychosocial needs among preschool children, families of all 4–6 year-old children identified through a door-to-door household survey in the outer-west region of *eThekwini* District, KwaZulu-Natal, South Africa were invited to participate. The study site is located approximately 40km inland from Durban and spans five tribal areas with an estimated population size of 67,000 based on a previous demographic census. The area comprises semirural and peri-urban dwellings, and has high levels of unemployment.

The study location is in a province that has the highest antenatal HIV prevalence in the country of 39.5% [21].

Data for this paper come from the baseline caregiver assessments completed in mid-2010. Trained fieldworkers conducted a door-to-door survey between September 2008 and 2010 to identify households with eligible children. Children ages 4–6 years at the time of this first wave of data collection were eligible. At the household visit, following informed consent from a primary caregiver, socio-demographic information was collected about the household and the index child's parents and/or primary caregiver. The child and preferably the birth mother, or if she was not available, a primary caregiver who was responsible for the child's daily care and well-being, were then invited for assessments at the study premises.

Measurements

Mental health screening was conducted using the Client Diagnostic Questionnaire (CDQ) [22]. The CDQ was developed and validated for populations affected by HIV in the Unites States. This psychiatric screener was adapted from the PRIME-MD, a well-validated screening tool for psychiatric disorders in primary care settings[23]. In the US validation study, a variable, 'any psychiatric disorder' was created if the participant met criteria for at least one disorder on the screener. In the US, for the diagnosis of any psychiatric disorder, the sensitivity, specificity and overall accuracy of the CDQ were 91%, 78% and 85%, respectively[22].

The pilot study for the *Asenze* study found that the Prime-MD depression screener had fair correlation [(40)=0.6, p<0.01] with the WHO Self-reporting Questionnaire (SRQ-20) that was previously validated, translated and adapted to meet cultural and content validity in this population in KwaZulu-Natal [24]. The CDQ was selected for this study because of its origins in the Prime-MD, together with its inclusion of Post-Traumatic Stress Disorder, its validation with populations affected by HIV, and the fact that it can be administered by lay staff [22]. Lay-workers experienced in psychosocial interviews and trained in psychiatric interviewing administered the CDQ. With the exception of the psychosis screen, participants were administered all CDQ modules: Major Depression Syndrome (MDS), Other Depression (ODS), Panic, Generalized Anxiety, and Post-Traumatic-Stress-Disorder (PTSD), each of which uses DSM-IV criteria to determine the presence of a disorder. 'Any mood disorder' was defined as having either MDS or ODS. We did not administer the psychosis screen given the expectation that the prevalence of psychosis would be under 3/1000 and so would identify too small a number of participants to be analyzed in this study.

Caregivers were also administered the SF-36 version-2, a 36-item short-form survey on health-related quality of life. Eight subscales were derived from which two well-validated summary scores were computed, a mental health and a physical health composite score, with higher scores indicating better health[25]. The mental health subscales encompass depression and anxiety symptoms together with impaired social functioning. The SF-36 has been used in South Africa in various ethnic groups with excellent internal consistency for the health and well-being subscales[26]. We used the SF-36 to explore construct validity of the CDQ by comparing differences in mean SF-36 scores between CDQ-positive and negative categories.

All caregivers were asked about prior HIV testing and results. Caregivers were also offered HIV testing as part of approved study procedures, but only after completion of the CDQ. All questionnaires were forward and backward translated into *isiZulu* to conform to the WHO standards for translation and back–translation, and administered by staff who were fluent in English and Zulu languages[27].

Analyses

Data were captured electronically in Epidata version 3.1 and analyzed in SAS 9.2 (SAS Institute, Inc., Cary, North Carolina). We conducted descriptive analyses of characteristics of the cohort and for CDQ modules, using a combination of frequency distributions for categorical variables, means and standard deviations (SD) or medians with interquartile ranges (IQR) for continuous variables. Characteristics of caregivers and households were compared across categories of CDQ symptoms using Pearson's chi-square tests, Student t-test or Wilcoxon sum-rank tests as appropriate. We conducted univariate logistic regression analyses to examine associations between CDQ diagnoses and various covariates of interest, including sociodemographic characteristics. For the latter we used individual level caregiver data and household level factors. These household level factors included household employment and death of a young child (aged below 5 years) to reflect a construct of household vulnerability. We conducted analyses for all caregivers and then restricted to mothers. Results are reported as point estimates with 95% confidence intervals.

Ethics

Study procedures were approved by the Biomedical Research Ethics Committee of the University of KwaZulu-Natal, SA and the Institutional Review Board of Columbia University Medical Center, NY. Permission was also obtained from the local health authority. Caregivers who screened positive for mental health disorders were reviewed by the on-site study doctor, followed by referrals for further assessment and appropriate care.

Results

Characteristics of caregivers, children and households

We identified 2049 children aged 4–6 years during the door- to- door survey within our target geographic area. After obtaining informed consent from an adult primary caregiver/ biological parent, we enrolled 1787 (87%) of these eligible children and their 1636 caregivers. After demographic interviews at the household, all enrolled children and caregivers were invited to a full assessment within 2–3 weeks at the study assessment center. 1581 (89%) of the 1787 enrolled children and 1437 caregivers arrived for baseline assessments. Among the 1437, all but 3 caregivers completed the CDQ. The median age of caregivers who completed the CDQ was 32 years (IQR 25 to 42 years) and 98% were females. Of 1434 adults who completed the CDQ, 936 (70.5%) were the birth mothers of the index child, 18 (1.3%) were birth fathers, 211 (15.9%) were grandmothers and the rest were other primarily female relatives, including older siblings. Of the 1296 CDQ respondents with available information on income source, 145 (11.2%) reported no personal income, 1048 (80.9%) reported income from informal employment or social service grants and only 103 (7.9%) reported regular formal employment.

CDQ findings

Almost a third of caregivers (449; 31.3%) screened positive for at least one psychiatric disorder on the CDQ (Table 1). The highest occurrence was for PTSD (Table 1). The vast majority of caregivers, 1242 of 1434 (86%), reported lifetime exposure to one or more traumatic or violent events; 866 (60.4%) experienced two or more events, and 495 (34.5%) experienced three or more events. Among caregivers who screened positive for PTSD, there was higher exposure to lifetime traumatic or violent events than among caregivers who did not screen positive (Table 2). Other traumatic events included death of parents or partners, onset of poor health or previous diagnosis of HIV infection.

Relationship between CDQ and SF-36

A positive screen for any disorder on the CDQ was associated with lower physical and mental health scores on the SF-36 (Table 3). While the SF-36 scores were significantly lower for all CDQ disorders, the difference was largest for major depression (Table 3). When exploring specific items related to mood on the SF-36, 62% of CDQ-negative caregivers reported being happy all or most of the time, compared to only 44% of CDQ-positives. Similarly only 15% of CDQ-negative caregivers reported feeling 'so down in the dumps that nothing could cheer you up' compared to 27% of CDQ-positives.

Socio-demographic correlates

Comparison across age quartiles revealed that caregivers in the two higher age quartiles were more likely than caregivers aged below 25 years to have a positive CDQ screen (Table 4). The trend of a 2-fold higher odds persisted for the subscales of major depression and PTSD, although with the smaller subgroup numbers, the differences were no longer statistically significant. Among birth mothers of index children 265/916 (28.9%) met criteria for a psychiatric disorder on the CDQ compared to 184/518 (35.5%) among caregivers who were not birth mothers. Because of the small numbers of male caregivers (22 fathers), we did not have sufficient power to examine gender differences.

We found associations between presence of any CDQ disorder and both income and level of education. Caregivers who screened positive for any disorder tended to be more likely to have no individual sources of income compared to caregivers who screened negative (Tables 4 & 5). Similarly, trends for education level were that caregivers with any disorder were more likely to have had no formal education, whereas caregivers without a disorder were more likely to have attained education levels at or above high school level. Presence of disorder in any caregiver was significantly associated with lower employment levels within the household and death of a young child within the household (Tables 4 & 5).

HIV association

Seventy-five percent of caregivers reported their previous HIV-test results yielding 1173 available for analyses. Previously infected caregivers were more likely to have a mood disorder than caregivers who previously tested negative (OR 1.7, 95% CI 1.1; 2.5). We did not observe significant associations between known HIV status and the specific categories of Major Depression (OR 1.39 [95% CI 0.80, 2.41]) or PTSD (OR 0.99 [95% CI 0.73, 1.34]).

Discussion

The large numbers of caregivers screening positive for mental health disorders is striking. While we acknowledge limitations of the CDQ below, these findings nevertheless reveal a need for lay-administered screeners, accessible assessments, and interventions. The varying prevalence of mental health disorders reported among studies within and across geographic areas may be related to factors such as study design, measurement tools and population characteristics, yet the consistent trend is one of high burden in South Africa [6, 28]. Professional resources in the country are limited for appropriate management of this burden [29]. A need for decentralizing mental health services, including screening, both at health facility and community level is evident [30]. In countries where rapid expansion of professional services is currently unattainable, community-based support mechanisms could prove effective given such a high burden of symptoms and traumatic events [30].

Our findings among caregivers are consistent with previous reports of life stresses contributing to mental health disorders [24, 31]. We note the higher PTSD occurrence in

Asenze versus previous studies. In the US, the CDQ demonstrated better sensitivity and specificity for overall positivity rather than for individual disorders, which may explain our higher PTSD and lower major depression occurrence [22]. Mood and anxiety disorders tend to affect females more than males, thus the predominance of females among our primary caregivers, together with their greater vulnerability to traumatic and violent events, may be related to the increased PTSD observed [31]. PTSD and other mental disorders may co-exist or represent a spectrum of responses to major life stresses [32]. Whatever the case, the high level of presumed PTSD and traumatic life experiences are emerging as a consistent finding for mental health epidemiology in South Africa [19]. Of major concern is the extent to which *Asenze* caregivers had experienced interpersonal violence and, more alarming, traumatic experiences in childhood. Strategies to prevent their occurrence, and to minimize the cumulative impact of traumatic experiences on mental health and child development, are needed, potentially through community-based intervention and support mechanisms.

The associations we observed with socio-demographic correlates were similar to previous international and local studies, namely, a higher prevalence among older caregivers and caregivers with lower levels of education [4, 24, 28]. While the age effect may merely reflect cumulative risk over time, it may also reflect a specific cohort effect, namely experiences of a cohort who have lived for many years with discrimination or human rights violations due to Apartheid, and later experienced death of a child. We did not inquire about the former category of experiences in our study, but do show that death of children is related to mental health disorders among adults (Tables 3 & 4). The association between caregiver mental health symptoms and loss of a young child in the household, particularly for birth mothers, is not surprising. Studies among different populations concur on loss of a child being a significant predictor of mental distress and one of the most traumatic life experiences [33, 34]. The high rates of under-five mortality in South Africa may partly contribute to the high rates of caregivers screening positive for a psychiatric disorder. In addition, loss of a young child may also be another indicator of household level vulnerability.

Previous South African studies reported varying associations between mental health and income [4, 24, 28]. We found that caregivers who screened positive for a psychiatric disorder tended to have no personal income. We assessed income from sources that included employment and social service grants. Social service grants were a predominant source of income among caregivers in our study. More significant was our observation that caregivers who screened positive for any psychiatric disorder were from households with lower employment than caregivers who screened negative. This observation reflects the socioeconomic landscape in which impoverished communities live; wherein social grants and shared incomes contribute to household stability and to wellbeing of individuals within a household. This association was even stronger in analyses restricted to caregivers who were the birth mothers of children (Table 4). The association between poverty and common mental disorders varies across studies and reasons have been extensively reviewed [35, 36]. Given that our data analyses were cross-sectional may alternatively suggest that caregivers with mental health disorders are less likely to successfully overcome barriers to accessing social service grants, and hence restrict their source of income. Nonetheless, our findings suggest that poverty, or rather resilience to poverty is highly embedded within social support structures, thus measurement of poverty needs to adequately incorporate these social constructs.

While the burden of HIV in South Africa is well known, our data highlight the added stress imposed on caregivers. Of special concern among HIV-affected orphans is that older caregivers are reporting mental health symptoms more frequently than younger caregivers. Indeed, the burden of mental health symptoms may be high for individuals, but possibly

even more highly concentrated among older less formally educated caregivers of young children living in societies plagued by poverty, HIV and violence.

This study has several limitations, in addition to the cross-sectional analyses that limited determinations of causality. Our findings from this psychiatric screening tool should not be extrapolated as a measure of general population prevalence since they were derived from a relatively homogeneous ethnic and cultural group in a multicultural country with eleven official languages, and many different ethnic groups spanning cosmopolitan and deep rural settings. The prevalence of disorder found among primary caregivers participating in our study may have excluded caregivers with very severe functional impairments and limited caregiving ability and underestimated the true prevalence of mental health disorders among caregivers, either as a result of failure to recruit the most vulnerable during the door-to door survey or to retain their follow-up for the clinical assessment. In addition, caregivers may under-report symptoms for reasons of social desirability, fear of stigma or negative responses from health and social services. However, we had a very high level of participation and our data suggest a higher prevalence of symptomatology than described for the general population in a previous epidemiologic study in South Africa [4]. While direct comparison to these studies may be limited due to use of two different instruments designed for lay interviewers (the CIDI, a far more substantial and detailed instrument than the brief CDQ), and the fact that screeners will over-detect outcomes compared to full psychiatric interviews, it remains worth noting that both studies used a lay-administered interview with DSM-IV diagnostic algorithms.

In addition to our limitations in being able to describe population prevalence, we also acknowledge that the lay-person administered CDQ has not yet been fully validated in South Africa. In this study, the correlation of the CDQ Zulu version with the SF-36 which has been used more frequently in South Africa, including a Zulu version in a population-based study, partially supports the utility and construct validity of the lay-administered CDQ in this context [26]. CDQ-positive caregivers had significantly lower scores on the SF-36 for both physical and mental health components. This finding may be related to higher frequency of somatic manifestations with mental illness in our population, or to co-existence with physical illnesses [37]. Previous studies reported lower scores across all SF-36 domains among South African AIDS sufferers [38]. A formal validation against a professional assessment is needed to fully validate the CDQ as was done in the US [22]. The lay-administered CDQ may over- or under detect positivity rates due to confirmatory bias or failure to assess the extent of impaired functioning. Moreover, there may be linguistic or translation issues. While these factors may affect rates of current diagnoses we argue that we are nevertheless identifying caregivers with a high lifetime risk of mental health disorders.

In conclusion, despite study limitations, the *Asenze* Study provides one of the largest studies of mental health functioning in caregivers of young children in an African country decimated by poverty, HIV, and a history of Apartheid. Our findings support the development of decentralized systems for accessible mental health interventions that are acceptable across age ranges [30]. These interventions involve not only individual level treatment but also household and community level preventive programs directed at PTSD and depression [39]. Furthermore in settings of high HIV prevalence and under-five mortality, the concurrent mental health burden needs urgent recognition and prioritization, given what is known of the impact of maternal depression on child growth and development above and beyond the effect on caregiver functioning. The social or contextual factors contributing to caregiver mental health have important relevance when considering public health policy and interventions in other low and middle-income countries with similar resource constraints.

Acknowledgments

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Table 1

Frequency of mental disorder on Client Diagnostic Questionnaire (CDQ) screening (N=1434)

CDQ module	Number screened positive (n)	Percent screened positive (95% CI)
Major depressive disorder	71	4.9 (3.9, 6.2)
Other depression	59	4.1 (3.2, 5.3)
Any mood disorder (sum of above two)	130	9.1 (7.6, 10.7)
PTSD syndrome	361	25.2 (23.0, 27.5)
Generalized Anxiety	91	6.3 (5.1, 7.7)
Panic syndrome	86	6.0 (4.8, 7.4)
Met criteria for a mental health disorder: a positive screen on any of above modules of the CDQ	449	31.3 (28.9, 33.8)

Table 2

Frequency of caregivers' lifetime exposure to violence and trauma

Description of traumatic event experienced	PTSD negative (n=1072) n (%)	PTSD positive (n=361) n (%)	All caregivers (N=1434) n (%)
Serious accident at home or work	90 (8.4)	50 (13.9)	140 (9.8)
A natural disaster such as hurricane or flood	313 (29.2)	180 (49.9)	493 (34.4)
Physical assault or abuse by a partner at some time in their adult life	136 (12.7)	111 (30.8)	247 (17.2)
Physical assault or abuse by someone other than a partner at some time in their adult life	47 (4.4)	54 (15.0)	101 (7.0)
Physical assault or abuse experienced as a child	86 (8.0)	53 (14.7)	139 (9.7)
Witnessed assault or harm inflicted on family members while growing up	164 (15.3)	100 (27.7)	264 (18.4)
Sexual abuse experienced during their adult life	26 (2.4)	17 (4.7)	43 (3.0)
Sexual abuse experienced as a child	24 (2.2)	23 (6.4)	47 (3.3)
Witnessed physical assault inflicted on another person/s	136 (12.7)	89 (24.7)	225 (15.7)
Witnessed someone being seriously injured or violently killed	64 (6.0)	52 (14.4)	116 (8.1)
Loss of a child through death	175 (16.3)	138 (38.2)	313 (21.8)

Table 3

Relationship between health-related quality of life SF-36 scores and CDQ results

CDQ module	CDQ screen result [*] (number screened)	SF-36 scale	Score on SF-36 scale Mean (95% CI)
Major depressive disorder	No (n=1362)	Physical	85.2 (84.2, 86.1)
		Mental	78.6 (77.7, 79.4)
	Yes (n=71)	Physical	63.5 (57.2, 69.8)
		Mental	56.9 (51.9, 61.9)
PTSD syndrome	No (n=1071)	Physical	86.2 (85.2, 87.3)
		Mental	79.8 (78.8, 80.7)
	Yes (n=361)	Physical	77.6 (75.4, 79.9)
		Mental	70.7 (68.5, 72.7)
Positive screen on any module of the CDQ	No (n=984)	Physical	87.4 (86.4, 88.5)
		Mental	81.3 (80.4, 82.1)
	Yes (n=449)	Physical	76.7 (74.6, 78.8)
		Mental	69.1 (67.3, 71.0)

[*] 'No' refers to screened negative for that module of the CDQ, 'Yes' refers to screened positive

Table 4

Demographic correlates of positive screens for any psychiatric disorder among all caregivers

	CDQ positive n (%)	CDQ negative n (%)	OR (95%CI)
Caregiver income	n=408	n=887	
No reported source of income	55 (13.5)	90 (10.2)	1.64 (0.95, 2.83)
Income from informal employment or social services	326 (79.7)	722 (81.4)	1.21 (0.77, 1.90)
Formal employment	28 (6.9)	75 (8.5)	Ref
Caregiver education	n=315	n=750	
No formal education	63 (20.0)	127 (16.9)	1.26 (0.90, 1.78)
Formal education < Grade 7	46 (14.6)	98 (13.1)	1.20 (0.81, 1.76)
Formal education >= Grade 7	206 (65.4)	525 (70)	Ref
Household level employment	n=407	n=880	
No adults employed in household	225 (55.3)	413 (46.9)	1.82 (1.31, 2.52)
One adult employed in household	120 (29.5)	260 (29.6)	1.54 (1.08, 2.20)
More than one adult employed in household	62 (15.2)	207 (23.5)	Ref
Previous death of an under 5 year-old child in household	n=418	n=906	
Yes	31 (7.4)	43 (4.7)	1.61 (1.0, 2.59)
No	387 (92.6)	863 (95.3)	Ref
Age of caregiver	n=411	n=893	
>= 42 years	134 (32.6)	203 (22.7)	2.01 (1.42, 2.83)
32 to 42 years	102 (24.8)	223 (25.0)	1.39 (0.98, 1.98)
25 to 32 years	103 (25.1)	248 (27.8)	1.26 (0.89, 1.80)
< 25 years	72 (17.5)	219 (24.5)	Ref

*Caregiver refers to the primary caregiver who attended the mental health assessment and who was the primary caregiver of the index child identified at household level.

Table 5

Demographic correlates of positive screens for any psychiatric disorder among birth mothers

	CDQ positive n (%)	CDQ negative n (%)	OR (95%CI)
Maternal income	n=262	n=647	
No reported source of income	39 (14.9)	63 (9.7)	2.12 (1.38, 3.27)
Income from informal employment or social services	200 (76.3)	522 (80.7)	1.67 (1.05, 2.67)
Formal employment	23 (8.8)	62 (9.6)	Ref
Maternal education	n=246	n=617	
No formal education	13 (5.3)	34 (5.5)	0.99 (0.51, 1.92)
Formal education < Grade 7	33 (13.4)	65 (10.5)	1.32 (0.84, 2.06)
Formal education > Grade 7	200 (81.3)	518 (83.9)	Ref
Household level employment	n= 259	n=645	
No adults employed in household	152 (58.7)	311 (48.2)	2.12 (1.38,3.27)
One adult employed in household	75 (29.0)	195 (30.2)	1.67 (1.05, 2.67)
More than one adult employed in household	32 (12.4)	139 (21.6)	Ref
Previous death of an under 5 year-old child in household	n=268	n=664	
Yes	20 (7.5)	25 (3.8)	2.06 (1.13, 3.78)
No	248 (92.5)	639 (96.2)	Ref
Age of mother	n=264	n=657	
>= 42 years	36 (13.6)	68 (10.4)	1.70 (1.03, 2.81)
32 to 42 years	86 (32.6)	190 (28.9)	1.46 (0.98, 2.16)
25 to 32 years	86 (32.6)	219 (33.3)	1.26 (0.89, 1.86)
< 25 years	56 (21.2)	180 (27.4)	Ref