

## **BACKGROUND**

Eight million children under 5 years of age die each year worldwide, and the majority of childhood deaths occur without any contact with the formal health system. In response, the World Health Organization (WHO) and United Nations Children's Fund (UNICEF) developed the Integrated Management of Childhood Illnesses (IMCI), a strategy that utilizes integrated guidelines and simple algorithms at the primary health care level to assess and manage the major contributors to morbidity and mortality of children under 5 years in developing countries, specifically malaria, acute lower respiratory infections, diarrheal illnesses and malnutrition. Emerging evidence has demonstrated that the efficacy of IMCI is strongly linked to community-based service delivery and health promotion. However, efforts to integrate these community approaches, also known as community IMCI or C-IMCI, have been minimal. Key focus areas embedded within C-IMCI include: health promotion, illness prevention, illness recognition, appropriate home management and timely care seeking during acute child illness.

This paper examines patterns for sources of health knowledge, care-seeking and home care practices during child illness in rural northern Nigeria, where child mortality rates are among the highest in the world. Nigeria has recently taken steps to adopt IMCI, and the Partnership for Reviving Routine Immunization in Northern Nigeria- Maternal Newborn and Child Health Initiative (PRRINN-MNCH) has supported its introduction to the primary health care facilities of participating states. Elements of the community-based program, C-IMCI, have been included in the training of Community Health Extension Workers (CHEWs) participating in the pilot studies examining alternative methods of community-based service delivery. Earlier work by other members of the PRRINN-MNCH team has shown the importance of wealth and social status as predictors of child mortality, and we continue this focus on identifying those least likely to use the recommended practices along the same dimensions of wealth and social status, particularly within household social status. The data analysed in this study are from the baseline survey conducted prior to the implementation of the CHEW pilot program. The objectives of this study are to: 1) identify the extent to which current (pre-pilot) patterns of care for sick children are concordant with the IMCI recommendations, and 2) examine the extent to which sources of advice and patterns of care vary with caregiver wealth or social status.

## **METHODS**

### Overview

Since 2008, PRRINN-MNCH has been conducting operational research in 4 northern Nigeria states, Jigawa, Katsina, Zamfara and Yobe, in order to generate evidence on multi-sectoral health system strengthening strategies to improve maternal, newborn and child health outcomes. In accordance with this goal, PRRINN-MNCH has planned a community outreach service delivery program based on C-IMCI, using CHEWs. In order to guide implementation, a baseline survey, the Operations Research Baseline Survey (ORBS), was conducted to explore current health status of mothers and children, as well as, care-seeking behaviors and service utilization.

### Design/ Study Population

During June 2010, the Operations Research Baseline Survey (ORBS) was conducted in selected control and intervention districts within Jigawa, Katsina and Yobe states, located in northern Nigeria. Included districts were all rural and within the catchment area of a primary health facility.

The ORBS utilized a multi-stage cluster sampling design to select households for participation. First, a central location was identified for each district accompanied by a single path from this central point to the outskirts of the district. Houses along the selected path were numbered sequentially and then selected through systematic random sampling and repeated until the optimal sample size was recruited.

Inclusion criteria for participation in the survey included any female, between the ages of 15-49, who served as the primary caregiver of at least one child aged < 60 months. Caregivers were randomly selected from households if they were a local resident in the district and consented to survey participation. Of the 1549 mothers of children under age 5 who were interviewed, 1541 had complete data and were used in this analysis.

### Data Sources and Collection

The ORBS included questions adapted from 2008 Nigeria Demographic and Health Survey and the Nahuche Health and Demographic Survey and the WHO World Health Survey. Questions mainly centered around socio-demographic characteristics of all household members, general household characteristics and possession of durable assets. Further questions focused on antenatal care, labor and delivery experiences,

healthcare seeking behavior and utilization of MNCH services. After piloting the survey in May 2010, interviewers were trained and the field work was conducted in June.

### Measures/ Analysis

We analysed the sources of health care advice for the 698 caregivers indicating any knowledge about how to treat a sick child, while for actual care patterns, we analysed the responses for those with a child who had been sick in the past two weeks (n=391). The key independent variables included caregiver wealth level assessed by possession of durable goods, as well as her social status (age, parity, marital rank, husband-wife age difference). We used the DHW method for calculating the wealth index, while the social status variable was calculated using Cronbach's alpha to identify weights for creation of a social status index, which focuses on the within household social status.

We contrasted sources of advice and home-care patterns by wealth and social status using bivariate and multivariable analyses. Chi-square statistical tests were performed to determine the relationship between wealth and social status with sources of health advice and patterns of care/treatment. Multiple logistic regression was used to estimate predictors of recommended treatment practices across the three main childhood sickness. All analyses were performed using SPSS version 19.0 (SPSS Inc. Chicago, Ill). This analysis was approved by the each state's ethical review process.

### **RESULTS**

Only 698 caregivers (45%) reported knowing what to do when their child was sick. As seen in Figure 1, women learned about caring for sick children from diverse sources, with older women and mothers being the most common source of knowledge for how to care for an ill child. More well-off households were significantly more likely to report skilled health professionals (i.e. CHEWs or nurse/midwives) as a source of knowledge (both:  $p < 0.001$ ), while the less well-off households gained knowledge from untrained sources, such as mothers, other older women and traditional birth attendants (TBAs) (all:  $p < 0.001$ )

Out of the 3138 children < 5 years in the surveyed households, 409 (13%) had been sick in the past month, and of these 391 (12.5%) in the past two weeks. Almost half (44%) did not seek care or advice for their child's illness. Of the 220 women that did seek care, the majority sought care/treatment from nurses, mothers, traditional birth attendants and chemists (pharmacist with rights to dispense medicine without a prescription) Relatively few women, only 10%, consulted a CHEW during their child's illness. Differentials in care seeking by wealth status were also noted. Use of community sources of care, including CHEWs, ( $p < 0.001$ ), chemists ( $p < 0.05$ ) and TBAs ( $p < 0.01$ ) were all significantly associated with higher household poverty level. (See Figure 2) Facility-based sources such as nurses were used more frequently among richer households, but this association was not statistically significant. Alternatively, richer households also were found to use traditional healers more, but it is unclear if costs of such services are prohibitive to poorer households.

Based on the self-report from the child's mother, the most common illness in the past two weeks was fever (76%), generally considered to be malaria, a highly prevalent disease for the time of the fieldwork, after the rainy season. (See Figure 3) The next most common illness in the previous two weeks was diarrhoea (57%) and acute malnutrition, as indicated by weight loss, was also quite common (41%), Almost one-third (31%) of the children were reported to have a cough (probable upper or acute respiratory illness, e.g. cold or pneumonia). Because children could have had 2 or more illnesses either simultaneously or in sequence in the previous two weeks, these totals exceed the number of children. These illness patterns indicate that the children in the study communities experience the patterns of illness for which IMCI is designed to be an effective intervention.

Since the baseline surveys were conducted prior to the implementation of IMCI or C-IMCI, they provide evidence of the extent to which mothers may already be treating their children with recommended practices, independent of any advice from health workers or CHEWs trained in IMCI. The recommended treatments are listed in Table 1 for each of the three most common illnesses in the previous two weeks: fever, diarrhoea and weight loss. Very few of the mothers used the IMCI-recommended home care practices, which emphasize giving fluids, including oral rehydration solution (ORS) and breastfeeding for younger children. For the treatment of fever (possible malaria), only 7% of the mothers gave more fluids. Hardly any sponged their child off to reduce fever. The most common treatment was to give paracetamol to reduce the fever, a treatment provided by 21% of the mothers. Only 19% of caregivers gave anti-malarials to their child with fever, and 74% of these did so without seeking advice from a healthworker. Overall, there was very little treatment of diarrhea: 13% of the mothers gave more fluids, 10% gave ORS, and 14% breastfed their infants or toddlers. Very few

children with diarrhea (8%) were taken to the health post for treatment advice, but they were no more likely to receive ORS than those not seen by a health worker. Very few mothers gave special foods to children who had lost weight. Most (93%) of those purchasing antibiotics from the chemist did so without prior consultation with a health worker. As shown in Figure 4, mothers in richer households more commonly provided antibiotics purchased directly from the chemist (35%, 45% vs. 22%;  $p < 0.01$ ). However, impoverished mothers were more apt to give antimalarials during child illness (24% vs. 5.0%, 5.3%;  $p < 0.001$ ). These drugs tend to be less expensive and also more ubiquitous throughout the population, so are likely more accessible than antibiotics. Giving traditional medicine was also very popular (22%), with the highest proportions among the poorer families. (35%)

Multiple regression results (not reported in this abstract) highlight the resource and social constraints on seeking advice or implementing appropriate home-care for these common childhood illnesses.

## CONCLUSION

A large proportion of mothers in this study did not know how to care for their child during an illness (55%) and did not seek care for recent illnesses (45%). This highlights the need for further efforts to improve caregiver knowledge about appropriate home management and care seeking during acute child illnesses. Additionally, it appears that poorer populations require more community-based resources for care and treatment. CHEWs may be beneficial in providing advice and health services closer to home.

Home-care practices recommended by IMCI are rarely practiced in this population. There appears to be a preference for purchasing medications from the drug vendor or chemist, e.g., paracetamol, antibiotics and anti-malarials and use of traditional medicines/herbs. Efforts to form partnerships and education about C-IMCI to other community providers, such as elder women and TBAs may also be helpful in dissemination of C-IMCI practices as alternative home care practices, since women in the community are currently more likely to seek advice from these resources. Opportunities also exist to work with drug vendors and chemists, such as providing reimbursement for customer referrals to health posts or centers for evaluation by a skilled health professional.

Interventions should target the most vulnerable, due to their decreased use of facility-based resources. Educational strategies should be geared towards improving “danger sign” recognition, what to do if they occur, and appropriate home care strategies. This, in addition to education about timely care-seeking, may successfully halt the rapid, yet preventable, progression from illness to death of children living in northern Nigeria and other African nations with very high rates of child mortality.

FIGURE 1: Source of caregiver knowledge on how to care for ill child by wealth status (N=698)

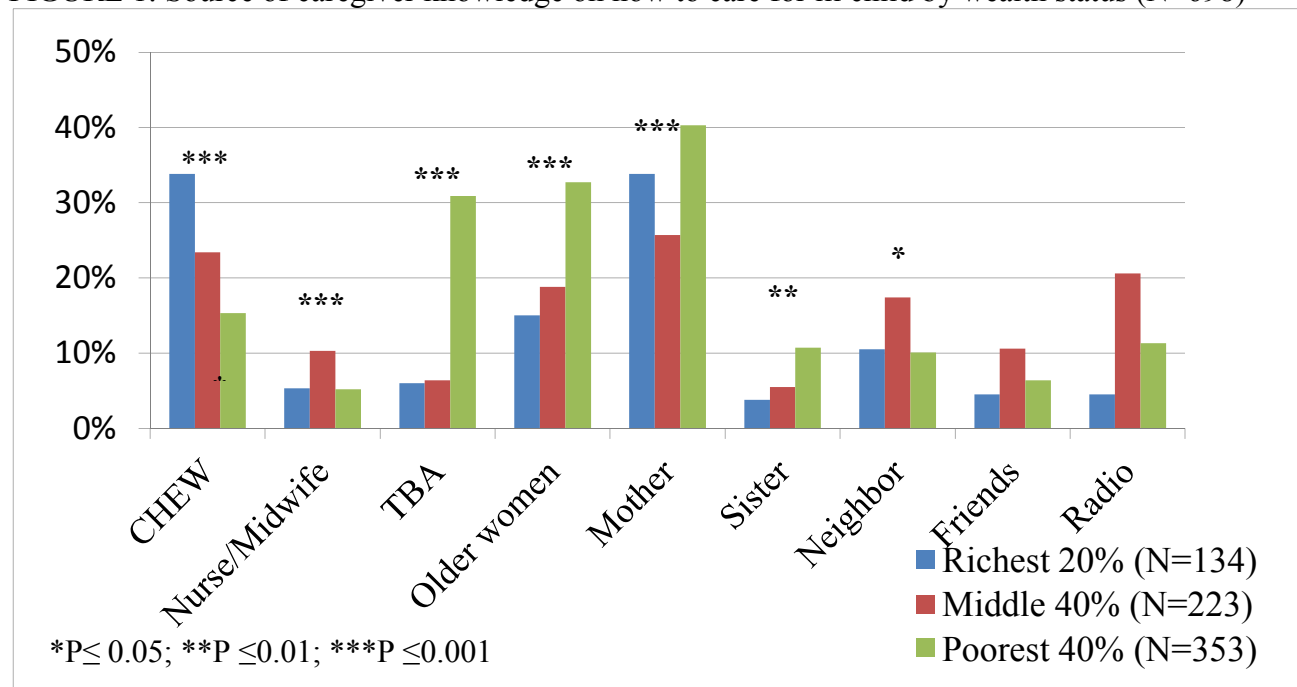


FIGURE 2: Place/person where caregiver sought care/treatment for acute child illness by wealth status (N=220)

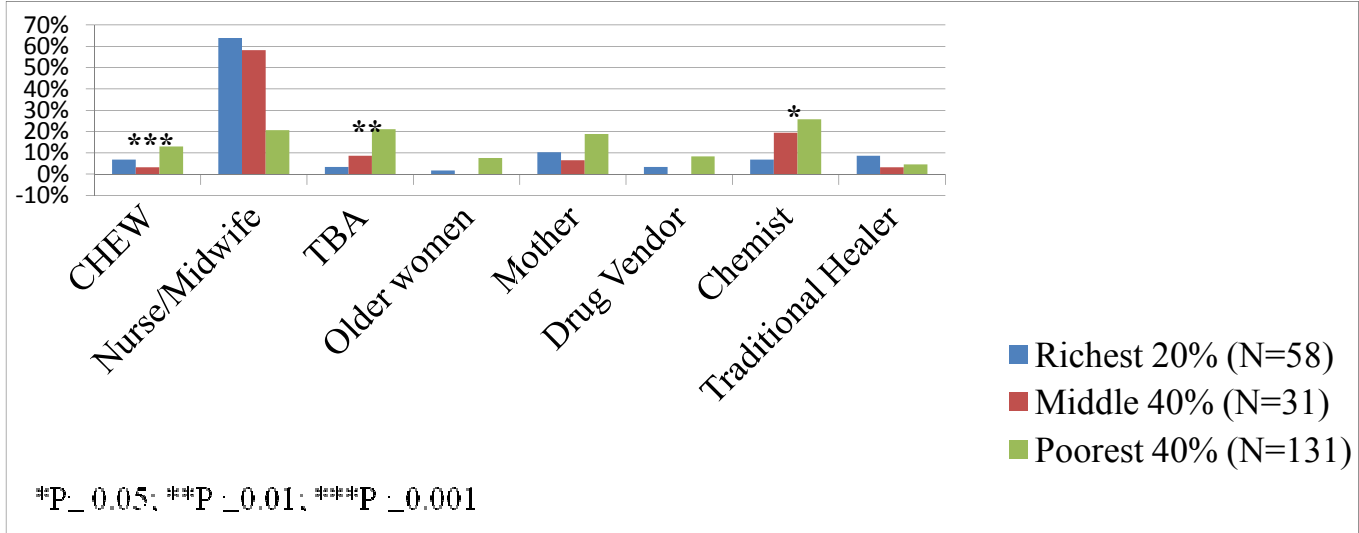


FIGURE 3: Type of illness experienced by children in past 2 weeks (N=391)

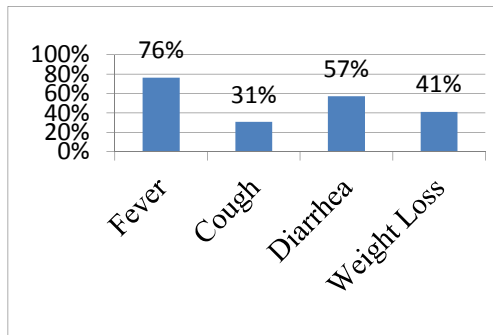


TABLE 1: Prevalence of IMCI recommended key practices by type of child illness

	Treatment for Fever % (n= 309)	Treatment for diarrhea % (n=230)	Treatment for weight loss % (n=167)
Gave Paracetamol	21.0% (65)	---	---
Tepid sponging	0.3% (1)	---	---
Gave more fluids	7.8% (24)	13.0 (30)	---
Gave ORS	---	10.0% (23)	---
Gave special foods	---	---	2.4% (4)
Breastfeeding	11.6% (24)*	13.8% (24)**	12.7%(15)***

\*n=216 , children aged 2 or less with fever in the past 2 weeks.  
 \*\*n =174, children aged 2 or less with diarrhea in the past 2 weeks.  
 \*\*\*n=118, children aged 2 or less with weight loss in the past 2 weeks

FIGURE 4: Prevalence of non-recommended practices for acute child illness by wealth status (N=374)

