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## Original Article

# Perceptions of caretakers with different socioeconomic status about the harmful outcomes of fever in under-five children in Dodoma region, central Tanzania: A cross-sectional study

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## ABSTRACT

**Background:** Socioeconomic status can affect health in childhood through many different pathways. Evidence on how households differ with regard to socioeconomic status and the degree to which this difference is associated with investment in child health is essential to the design of appropriate intervention strategies.

**Aim:** This study examines the impact of caretakers' socio-economic characteristics on perceptions about the harmful outcomes of fever among under-five children.

**Material and methods:** The study used a three-stage cluster sample of households with under-five children in Dodoma region, central Tanzania. Multilevel modelling approach was used to model the relationship between the outcome measure and caretakers' socioeconomic characteristics while controlling for other variables.

**Results:** A total of 329 under-five children with fever were studied of which 74.8% were perceived by their caretakers to have some chances for harmful effects of fever to occur when they experienced fever. Secondary school education or above of caretakers was significantly associated with decreased beliefs about the occurrence of harmful effects of fever.

**Conclusion:** Many caretakers are concerned about the occurrence of harmful effects of fever for their under-five children. Study findings suggest that promoting enrolment in secondary education or above and participation in the labour market particularly in non-farm activities of women would be valuable to the health of under-five children in central Tanzania.

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## 1. Introduction

Fever continues to be one of the major public health problems in sub-Saharan Africa.<sup>1</sup> It is one of the most frequent reasons for caretakers of under-five children to visit health care facilities.<sup>2</sup> It is a frequently reported symptom in many childhood illnesses<sup>3</sup> including malaria, diarrhoea, pneumonia, measles, polio, and tuberculosis.<sup>4</sup> In Tanzania, fever remains a major cause of morbidity among under-five children. Results from the 2015–16 Tanzania Demographic and Health Survey and Malaria Indicator Survey

show that 18 percent of under-five children had a fever in the two weeks preceding the survey.<sup>5</sup>

Caretakers often regard fever as detrimental.<sup>6</sup> As a result, parents get worried when their children experience an episode of fever.<sup>7</sup> Caretakers' apprehension about fever arises from concerns over the cause of fever, risk of hospitalization, and occurrence of potential harmful effects of fever in their children.<sup>8</sup> Brain damage, febrile convulsions, and death are among the frequently reported harmful effects of fever in children.<sup>6</sup> Evidence shows that generally, caretakers have a good biomedical understanding of febrile illnesses in terms of both types and symptoms.<sup>9</sup> Nonetheless, literature shows that fever phobia is still common among parents.<sup>10</sup> In this connection, the identification of factors that determine perceived consequences of an illness could increase our understanding of the actual pathways underlying the observed parental responses to situations of a health shock such as malaria

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symptoms among the under-five children. This is especially important in low-income countries where promoting access to and utilization of health services has long been one of the primary policy objectives.<sup>11</sup>

The relationship between socioeconomic status (SES) and health has been widely examined.<sup>12</sup> The focus of attention to socioeconomic factors in health-related research is in part due to their appropriateness to social policy about public health.<sup>13</sup> However, this relationship is complex in that there are many different pathways through which SES can affect health in childhood and that not all SES-related inequalities in health favour individuals of the higher SES strata.<sup>14</sup> Information regarding how households differ with regard to SES and the degree to which this difference is associated with the variables of interest, is essential to the design of appropriate intervention strategies.<sup>15</sup>

The three key indicators of SES are economic status (measured by income); social status (measured by education); and work status (measured by occupation).<sup>16,17</sup> Though interrelated, these three components of SES do not totally coincide<sup>16</sup> and thus, have different policy implications.<sup>18</sup>

This paper examines impact of caretakers' characteristics that are distributed along the socioeconomic hierarchy on perception about the likelihood of occurrence of harmful effects of fever in children under-five in Dodoma region, central Tanzania.

## 2. Materials and methods

### 2.1. Study design and site

This was a cross-sectional study carried out in Dodoma region, central Tanzania. The region features predominantly among the least in Mainland Tanzania in many domains of health as described in details in.<sup>19</sup>

### 2.2. Sampling procedure

The study unit was a household with a child under the age of five years. A three-stage sampling procedure was employed to sample the households. From the region, districts were randomly selected and from the districts, villages (in rural areas) or streets (in urban areas) were also randomly selected, and lastly from the villages or streets, the households were randomly selected. The selection of the *i*th district was done with probability proportional to size using the number of villages or streets in the district as the measure of size. This was achieved by cumulative total method.<sup>20</sup> Similarly, the villages or streets within the sampled districts were selected with probability proportional to size using the number of households in the respective village or street as the measure of size. In each sampled village or street, a complete listing of households with under-five children was done and simple random sampling scheme was used to select the representative households. Within the selected households, all under-five children of permanent members of the household were studied.

### 2.3. Study sample

The calculation of the sample size was based on several variables. These are the key indicator of the study, which was the likelihood that a case of malaria (proxied by fever) in under-five children was expected to be reported by the primary caretakers (mothers or guardians) in the sampled households. According to the 2007–08 Tanzania HIV/AIDS and Malaria Indicator Survey<sup>21</sup>, about 19.5% of children under the age of five in Dodoma region were reported having experienced an illness with a fever in the past two weeks preceding the survey. Accordingly, to calculate

the sample size, the value of the key indicator was taken to be 0.195. The probability of reporting a case of malaria in the study was estimated with a 5% margin of relative error at the 95% level of confidence. Other parameters (value) were sample design effect for the key indicator variable (1.385), average household size (4.5), non-response rate (9.9%), and an estimate of the percentage of the total population accounted for by the target population and for which the key indicator was based (0.18). The resulting estimated sample size for the study was 1073 households. The calculated sample size was rounded up to 1080 households with at least one child under the age of five. The sample was obtained from four (Dodoma Urban, Bahi, Kondoa, and Mpwapwa) out of the six districts of Dodoma region, which were officially recognised at the time of designing this study. In each selected district, 18 villages/streets were sampled resulting into 72 villages/streets. Moreover, in each selected village/street, a sample of 15 households was selected. Due to non-response, 1027 out of 1080 (95% response rate) households were successfully interviewed.

### 2.4. Data collection

Data were collected between October 2010 and January 2011. Face-to-face interviews were conducted by trained research assistants using a structured questionnaire adapted from Tanzania Demographic and Health Surveys, Living Standards Measurement Study, and Tanzania HIV/AIDS and Malaria Indicator Survey. The questionnaire was designed in English, but it was translated into Kiswahili (the language, which is commonly spoken in Tanzania) to facilitate intelligibility during the interviews, thereafter translated back into English in order to ensure that the original meanings of the various items of the questionnaire were maintained. The final version of the questionnaire was pre-tested and where necessary refined.

The questionnaire covered several aspects including age, sex, education and occupation of caretaker and that of heads of households, possession of household-owned assets, housing structure and materials, main source of power for cooking and lighting, household size, community characteristics including approximate distance (in kilometres) to the nearest health facility and marketplace, rural/urban location of household. Distances were measured by involving local leaders and other people in the respective communities who had knowledge about approximate distances from the household to the nearest health facility or marketplace. The child characteristics collected include age (in months), sex, and biological relationship with the head of household. Furthermore, information on illness and health seeking behaviours for each child were collected. Caretakers were asked whether the child under the age of five experienced an episode of fever at any time during the past four weeks preceding the day of the interview. In addition, caretakers were asked how they perceived the fever at the first onset during the past four weeks. That is, whether or not they interpreted the fever as indicative of any illness, perceived severity (with possible responses: severe, moderate or mild) of the fever. Because malaria can present in different forms in under-five children, besides fever, the study also collected information on whether or not the child experienced convulsion, diarrhoea, cough/flu and vomiting.

### 2.5. Research clearance and ethical considerations

The study was approved by the Department of Economics of the College of Social Sciences at the University of Dar es Salaam. The permission to carryout the research in the region was obtained from the Regional Administrative Secretary of Dodoma region, and from district executive directors (DEDs) of the four districts in which the study was conducted. DEDs informed lower level

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