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Threats to oral polio vaccine acceptance in Somalia: Polling in an outbreak

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ABSTRACT

Background: Using a survey conducted during the 2013–2014 polio outbreak in Somalia, this study examines attitudinal and knowledge-based threats to oral polio vaccine acceptance and commitment. Findings address a key gap, as most prior research focuses on endemic settings.

Methods: Between November 19 and December 21, 2013, we conducted interviews among 2003 caregivers of children under 5 years in select districts at high risk for polio transmission. Within each district, sample was drawn via a multi-stage cluster design with random route household selection. We calculated the percentage of caregivers who could not confirm recent vaccination and those uncommitted to future vaccination. We compared these percentages among caregivers with varying knowledge and attitudes, focusing on variables identified as threats in endemic settings, using controlled and uncontrolled comparisons. We also examined absolute levels of threat variables.

Results: Only 10% of caregivers could not confirm recent vaccination, but 32% were uncommitted to future vaccination. Being unvaccinated or uncommitted were related to multiple threat variables. For example, compared with relevant counterparts, caregivers were more likely to be unconfirmed and uncommitted if they did not trust vaccinators "a great deal" (unconfirmed: 9% vs. 2%; uncommitted: 49% vs. 28%), which is also true in endemic settings. Unlike endemic settings, symptom knowledge was related to commitment while rumor awareness was low and unrelated to past acceptance or commitment. Levels of trust and perceptions of OPV effectiveness were high, though perceptions of community support and awareness of logistics were lower.

Conclusions: As in endemic settings, outbreak responses will benefit from communications strategies focused on enhancing trust in vaccinators, institutions and the vaccine, alongside making community support visible. Disease facts may help motivate acceptance, and enhanced logistics information may help facilitate caregiver availability at the door. Quelling rumors early may be important to prevent them from becoming threats.

Abbreviations: OPV, Oral Polio Vaccine; HSPH, Harvard T.H. Chan School of Public Health; NMC, Northern Management Consultants; MoPH, Ministry of Public Health; GPEI, Global Polio Eradication Initiative.

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1. Introduction

In 2013–2014, there were outbreaks of poliovirus in seven previously polio-free countries [1]. Such outbreaks pose a critical threat to eradication efforts, and it is essential to learn lessons from these experiences in order to prepare effective response efforts in case of future outbreaks [2,3].

When there is an outbreak, door-to-door provision of oral polio vaccine (OPV) to at-risk children is the cornerstone of response [4]. Multiple rounds of vaccination are required during the outbreak, and after it may appear to be over to the public. Vaccination campaigns require intense operations in areas that are often low-infrastructure and security-compromised, whilst appealing to parents and other caregivers in a way that will motivate vaccine acceptance during the outbreak and continued commitment [4,5]. It is therefore critical to understand attitudinal and knowledge-based threats to caregivers' OPV acceptance and commitment during an outbreak so these learnings can be applied through program design and community engagement in future.

While there is evidence about attitudinal and knowledge-based threats in endemic settings, less is known about them in an outbreak context [6–14]. It is plausible that some threats present in an endemic context are exacerbated during an outbreak. For example, distrust in vaccinators (trained persons or community health workers who deliver OPV) could be higher as caregivers are less familiar with the process [15,16]. Other attitudinal threats - like limited concern - may be reduced because more parents may be concerned about a seemingly new disease [17].

To learn more about these core issues, we consider the 2013–2014 poliovirus outbreak in Somalia. Polio-free for the prior six years, Somalia hosted nearly 200 cases - the largest number among outbreak countries in this time period [3]. Somalia exemplifies the challenges of outbreaks due to its limited health care infrastructure and sizable security issues [18,19].

We examine results from a survey among caregivers of children under 5 living in areas at high risk for polio transmission during the outbreak time period. As far as we are aware, this was the only quantitative survey of caregiver knowledge and attitudes done during this time. We first examine the levels of recent OPV acceptance and commitment to doing so in future. Second, we assess whether previously identified threats to past acceptance and commitment in endemic settings are also threats in an outbreak setting. Third, we examine the levels of these threats. Finally, we discuss implications for communication and community engagement efforts at the time and for future outbreak response.

2. Methods

2.1. Study design and sample

Data come from a poll among a randomly selected sample of caregivers of children under age 5 within research-accessible districts of Somalia at high risk for polio transmission. Caregivers were primarily parents, but also included other adults in a household with responsibility for decisions about the child's health.

Researchers at the Harvard T.H. Chan School of Public Health (HSPH) and UNICEF staff developed the overarching design, questionnaire and analysis of the poll, together with input at all stages from other polio eradication partners. Fieldwork and data entry were completed by InterMedia (Washington, DC, USA), Oxford Research International (Oxford, UK) and Northern Management Consultants (NMC) (Mogadishu, Somalia). InterMedia and Oxford Research provided implementation support, field team training, and independent quality checks on fieldwork and data (Appendix). Data management and weighting were done by SSRS (Glen Mills, PA, USA), with final statistical analyses conducted by a consultant. The Ministry of Public Health (MoPH) in each of the three political-geographic zones that existed at the time (South Central, Somaliland and Puntland) approved the study. Because HSPH researchers were not directly involved in data collection and de-identified datasets were used for analysis, the study was declared "not human subjects research" by HSPH's Office of Human Research Administration.

Given the security risks for collecting data, a set of nine districts were purposefully selected and then randomized selection was utilized to draw the sample in each one. To select districts, UNICEF developed a list of districts with the highest number of cases during the outbreak and/or chronically low polio vaccination rates, using input from other partners in the Global Polio Eradication Initiative (GPEI) working in Somalia and each MoPH. Additionally, these districts met feasibility criteria including: free from immediate, major security concerns; semi-urban or urban; supporting UNICEF work for at least one year prior; and accessible by NMC interviewers. Final districts included: Afgooye, Baidoa, Borama, Bosaso, Burao, Galkayo, Garowe, Hargeisa, and Mogadishu. Within Mogadishu, data on polio transmission allowed focus on two sub-districts: Daynile and Hodan.

In the absence of reliable population census data and in consideration of the security risks of household enumeration, sample was drawn within each district via a multi-stage cluster design with random route household selection [20]. To minimize clustering often associated with random route approaches, starting points were selected randomly using squares (250 m by 250 m) in a grid overlaid on a satellite image of each district. Each starting point led to the selection of between seven and ten households to further minimize the impact of clustering (Appendix). In each selected household, one caregiver and one reference child for whom they have responsibility were randomly selected using Kish grids. Trained interviewers from the local regions conducted interviews between November 19 and December 21, 2013. Interviews were conducted in Somali using pencil and paper rather than with tablets due to security concerns and the desire to minimize respondents' perceptions of any socio-economic differences between interviewers and themselves. Data entry utilized Remark Office software to scan specially formatted response sheets and to provide additional quality assurance and speed in the process.

2.2. Procedures

The questionnaire included 48 questions covering four areas of threats to vaccination identified in endemic settings: knowledge and perceptions of polio [6–9]; perceptions of OPV (polio drops) and awareness of negative rumors [10,11]; perceptions of vaccination experience [12,13]; and awareness of communications related to logistics of delivery [14]. The questionnaire was translated into Somali, back-translated, refined with considerations of cultural norms by NMC staff, and pre-tested with caregivers (question wording in tables).

2.3. Statistical analyses

To compensate for possible non-response biases, data in each district were weighted by sex and age of caregivers using household rosters and by sex of child discussed in the interview using estimates of sex ratios for children under 5 years [21] (Appendix).

For analysis, we first calculated the percentage of caregivers who confirmed their child had received OPV in the last campaign they remembered ("confirmed") and those who could not confirm this ("unconfirmed") because vaccinators came but their child did not receive OPV (or were unsure) or vaccinators did not come (or

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