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## Research article

# Estimating child separation in emergencies: Results from North Kivu<sup>☆</sup>



Lindsay Stark<sup>a,\*</sup>, Beth L. Rubenstein<sup>a,b</sup>, Hani Mansourian<sup>a</sup>, Craig Spencer<sup>a</sup>,  
Eva Noble<sup>a</sup>, Makini Chisolm-Straker<sup>a</sup>

<sup>a</sup> Program on Forced Migration and Health, Mailman School of Public Health, Columbia University, 60 Haven Ave., New York, NY 10032, USA

<sup>b</sup> Department of Epidemiology, Mailman School of Public Health, Columbia University, 722 W. 168th St., New York, NY 10032, USA

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## ABSTRACT

Children who are separated from their families and usual caregivers in emergencies face a multitude of risks to their health and wellbeing. This study presents findings from the first known population-based estimation of separation in an emergency setting. Point prevalence and basic characteristics were measured to inform programming, policies and funding for affected populations. A household survey was carried out in the Democratic Republic of the Congo to estimate separation subsequent to an attack by the M23 militia group. Separation was tracked in terms of children arriving into the household after the M23 attacks and children who had departed from the household after the recall event without their parent or usual caregiver. Five hundred and twenty-two households were surveyed. In the sample of 2,197 children living in the respondents' homes at the time of data collection, 8.47% ( $n = 186$ ) were separated children who had newly arrived in the household since the M23 attack. In the sample of 2,034 children living in the respondents' homes prior to the M23 attack, 5.31% ( $n = 108$ ) children had since departed from the household, resulting in separation from their parents or usual caregivers. Characteristics of children who arrived and children who departed diverged in terms of age, reasons for separation and frequency of unaccompaniment. The findings indicate the potential for population-based estimation of separation to be replicated in emergency settings to inform funding appeals and programmatic response.

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## Introduction

It is well documented that children who are separated from their families and usual caregivers in natural disasters, conflict and other emergencies face a multitude of risks, including grave threats to their health and well-being (Hepburn, 2006; International Committee of the Red Cross, 2004). Compared to children who are not separated, these children suffer from higher levels of food insecurity, malnutrition and associated infection (Engle et al., 2007; International Committee of

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\* Corresponding author.

the Red Cross, 2004). They are more likely to be exploited for labor and sex than their unseparated peers, and have higher rates of sexually transmitted infections and pregnancy-related complications (Bianchini, 2011; John-Legere & Lorek, 2012; Lay & Papadopoulos, 2009; Mushingeh et al., 2002; United Nations High Commissioner for Refugees (UNHCR), 2007). In addition, separation and lack of social support can lead to anatomical changes in brain structure and function that severely impede children's growth and cognitive development and have long-term mental health impacts, including chronic stress, anxiety and depression (Ajdukovic & Ajdukovic, 1983; Bick et al., 2015; Bronstein, Montgomery, & Ott, 2013; Garbarino & Kostelny, 1996; Reed, Fazel, Jones, Panter-Brick, & Stein, 2012; van Ijzendoorn, Bakermans-Kranenburg, & Juffer, 2007; Vanderwert, Marshall, Nelson, Zeanah, & Fox, 2010).

Recognizing these risks, the humanitarian community has developed a myriad of policies and programs aimed at mitigating the vulnerabilities facing unaccompanied and separated children (UASC). This work dates back to shortly after World War II, when the United Nations (UN) created a Central Tracing Bureau (Shields & Bryan, 2002). Minimum standards exist to guide organizations in establishing family tracing and reunification programming (Child Protection Working Group (CPWG), 2012).

Yet, despite progress on policies and programming, the measurement of unaccompanied and separated children has not achieved the same advances. The construct of separation encompasses many cultural and contextual nuances. Even concepts like 'child' and 'family' are understood differently across contexts, and shape the way in which separation is conceptualized (Boyden, 1997; Desai, 1992; LeVine et al., 1994; Selin, 2014; Stark, Boothby, & Ager, 2009). Existing inter-agency measurement tools, such as the Child Protection Rapid Assessment, help practitioners measure some aspects of separation using definitions of separation agreed by the international humanitarian community (Ager, Blake, Stark, & Daniel, 2011; Global Child Protection Working Group, 2012; International Committee of the Red Cross, 2004). Other methodologies have been developed to capture local definitions of the construct of customary care (Birnbaum, Muhorakeye, Gatete, & Canavera, 2015). Through structured desk review and qualitative methods of inquiry, these tools produce data to describe how separation is understood in a context, why it may be happening and how separated children are cared for by a community. The existing tools also provide an indicative sense of the scale of the problem. Yet there are currently no guidelines for producing representative data on the magnitude of separation and basic characteristics of unaccompanied and separated children in an emergency.

As a result, practitioners and policymakers are left to assess the scope of separation based on gross generalizations and/or selective data. One estimation strategy uses a "rule of thumb" which suggests that UASC typically comprise 3–5% of the displaced population during emergencies (Ressler, Boothby, & Steinbock, 1988). This approach has never been validated. Further, the idea of a one-size-fits-all rule is unrealistic given the diverse circumstances of different emergencies. Another estimation strategy calculates the rate of separated children amongst refugees and asylum seekers in camp settings (United Nations High Commissioner for Refugees (UNHCR), December 2013, November 2013). This population is not representative of the majority of the affected population who has not crossed international borders.

Ultimately, lack of rigorous data on the scale and circumstances of separation in emergencies impedes efforts to fund, design and implement effective programming and policies for affected populations. To address this gap, the Assessment and Measurement Task-Force of the Global Child Protection Working Group initiated an inter-agency project (the Measuring Separation in Emergencies project) in 2014 to devise appropriate methodologies to accompany existing approaches for measuring separation in emergencies. The scope of this project and the primary variables of interest were determined by practitioners, policy makers and donors who are members of the project's advisory panel. On behalf of this interagency initiative, researchers from Columbia University developed and piloted a survey tool intended to provide a population-based estimation of the point prevalence and basic characteristics of UASC in a defined area, affected by the same emergency. This is the first known population-based survey to estimate the prevalence of unaccompanied and separated children in an emergency context (Robinson & Branchini, 2015).

## Methods

### Setting

The tool was piloted in the Nyiragongo and Goma territories in North Kivu, Democratic Republic of the Congo (DRC) in July and August 2014. North Kivu is a region in eastern DRC that has been affected by armed conflict for more than two decades (Stearns, 2012). Children in the region are regularly separated from their families due to violence, displacement, poverty and recruitment to armed forces (Bell, 2006; UNICEF, 2015). In late 2012, a militia group known as M23 attacked the area, overtaking the city of Goma and exacerbating the conditions that lead to separation.

### Sample

Sampling was achieved via a two-stage cluster design. It was estimated that the study would need 20 clusters of 25 households per cluster to detect a 5% prevalence of separation in a population of 10,000, assuming precision of 1.5%. Due to insecurity in many parts of the territories, clusters were randomly selected from those identified as accessible.

To select households within each cluster, systematic random sampling was used. Where clusters included fewer than 200 households, a sampling interval  $m$  was determined by dividing the total number of households by 25 (number of surveys).

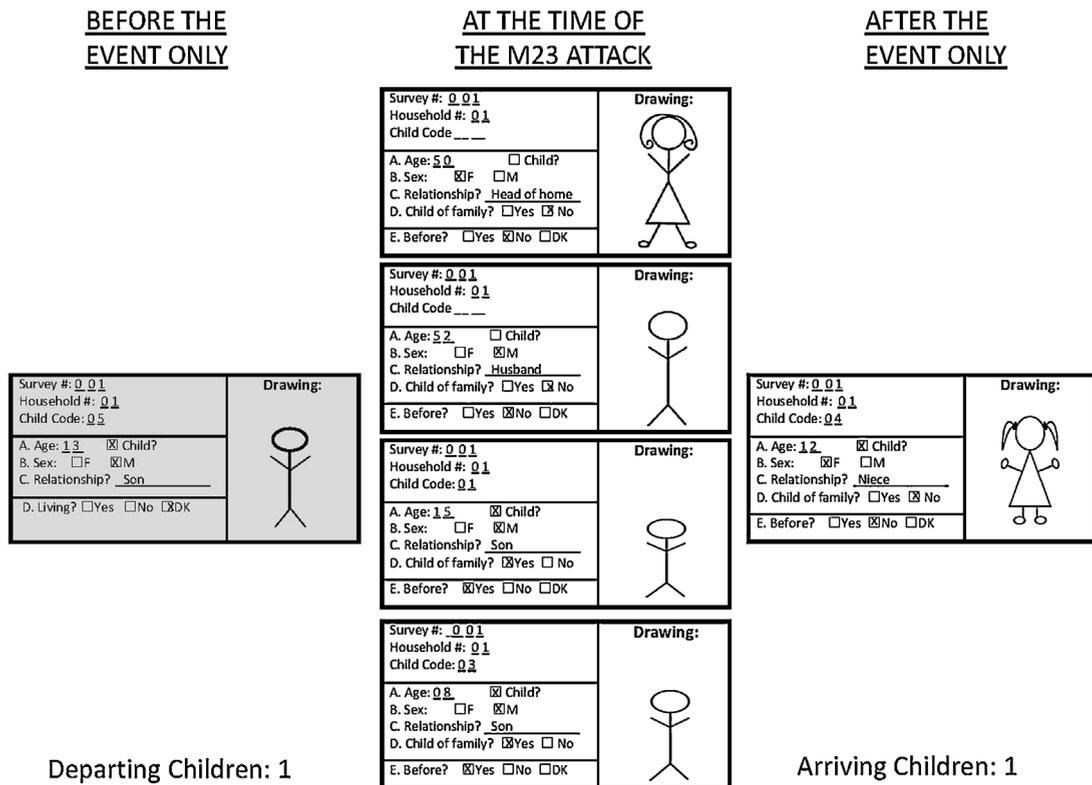


Fig. 1. Household diagram

Where clusters included 200 or more households, the team leader mapped and divided the location into areas of 150–200 households and randomly selected a portion of the site by flipping a coin. A random number between 1 and the interval (*m*) was used to select the first household. Then every *m*th household was selected in a systematic fashion. If no one over the age of 17 years was home, or the household did not contain anyone over the age of 17, the next available house in the pattern was approached.

*Data Collectors*

All interviews were conducted by local data collectors referred to the research team by other organizations working in eastern DRC. Most data collectors had previous experience working on research or monitoring and evaluation activities in the field, and many data collectors had previous child protection work experience. Given that multiple languages are used in the region, all data collectors were fluent in French and multiple local languages. A significant portion of data collector training focused on ensuring all definitions used were consistent across the most commonly used local languages.

*Study Protocol*

Based on formative key informant interviews and focus group discussions, heads of households or other adults were chosen as the primary respondents. As part of the interview schedule, data collectors used hand-drawn cards to reconstruct the respondent’s household composition both before and after the M23 attacks. On each card, a pictograph for one household member was drawn, along with his/her sex, age, relationship to the head of the household and whether s/he was still alive at the time of the interview. Different colored cards were used depending on whether the individual had departed from or arrived in the household after the M23 attacks. The data collector and respondent used these cards to assemble a visual representation of the household at the time of the interview, as well as before the emergency (see Fig. 1). When a child who had arrived in or departed from the household was identified, the data collector asked the respondent additional questions about this child to determine his/her circumstances and whether s/he met criteria for unaccompaniment or separation. By asking about household composition in general before and after the exposure, rather than separated children in particular, the intent was to reduce bias in case respondents had an interest in either over- or under-estimating the true number of UASC.

Informed verbal consent was obtained from all respondents. As part of the informed consent process, before beginning the survey, the data collectors explained to respondents that the study was looking at problems facing children in their communities, and that they would be asked questions about the people – especially the children – who live in their household. The respondents were informed that, although there was no direct benefit for participating in the survey, the information they provided would help organizations to better understand the challenges children face in their community and would hopefully assist in improving services provided to similar children in the future. All interviews were conducted in a language chosen by the respondent. This study was covered under Columbia University Medical Center's IRB reference AAAB7134.

### *Main Outcomes*

The primary outcome of interest was the prevalence of unaccompanied and separated children in Nyiragongo and Goma territories in the period since the M23 attack in December 2012. The secondary outcome of interest was a profile of the characteristics of these children, including age, sex, reasons for separation and current caregiver. The prevalence of separation in villages versus camps was compared using the two-sample test of proportions.

Unaccompanied and separated children were defined per the definitions in the Interagency Guiding Principles on Unaccompanied and Separated Children. Separated children were defined as children who have been separated from both parents, or from their previous legal or customary primary caregiver, but not necessarily from other relatives. Separated children therefore included children under the care of other adult family members. Unaccompanied children were defined as children who have been separated from both parents and other relatives and are not being cared for by any adult who, by law or custom, is responsible for doing so ([International Committee of the Red Cross, 2004](#)).

Because UASC may be living outside of a household (e.g., in a residential care facility, on the street, with an armed group), a traditional household survey will miss a segment of the population of interest. This was partially addressed by capturing information on two distinct populations of children. First, the survey measured arrivals, defined as separated or unaccompanied children who started living in the sampled household at any point following December 2012. Second, the survey measured departures, defined as children who left the sampled household since December 2012 and were separated from their usual caregiver. Departures could include children living outside of households. Births and deaths were not counted as arrivals or departures.

Arrivals and departures were kept separate in data analysis. One reason for maintaining this division was that respondents did not always know where a departed child was residing. A child could be residing in another household within the sampling universe, in which case s/he already would be counted in arrivals. Alternately, a departed child could have left the sampling universe altogether. Additionally, it was acknowledged that separated children arriving in homes likely have different characteristics and require different programmatic responses than those departing from homes.

### *Reliability*

While it was presumed that adults would be most knowledgeable about separated children, it was also hypothesized that youth closer to the age of the population of interest might have relevant proprietary information. To test this hypothesis, a reliability analysis was performed on a subset of 15 households to assess agreement between different respondents. The 15 households were selected across 10 clusters using convenience sampling. When an interviewer came across a household where both an adult and a 13–17 year old adolescent were present, both household members were invited for an interview. Two identical interviews were conducted simultaneously in a given household: one interview with the adult and one interview with the adolescent. Kappa tests were analyzed to determine the level of agreement within the adult-adolescent pairs from the same households. For interviews of minors, verbal consent was first received from the caregiver. Verbal assent was then received from the adolescent.

## **Results**

### *Basic Household Characteristics*

Five hundred and twenty-two households were surveyed, including 414 households in villages and 108 households in camps. On average, households in villages had been living in their current location for 17 years and 9 months, whereas households in camps had been living in their current location for 2 years. The mean age of the respondents was 39.7 years, and 73% of respondents were married. The mean household size at the time of data collection was 6.43 persons, including 4.21 children.

### *Arrivals*

In the sample of all 2,197 children living in the respondents' homes at the time of data collection, 8.47% ( $n = 186$ ) were separated children who had newly arrived in the household since the M23 attack in December 2012. Of the sampled households, 1.87% ( $n = 41$ ) of all children were reported to be unaccompanied. These 41 unaccompanied children represent 22% of

**Table 1**  
Prevalence of separation subsequent to the M23 attack.

	Arrivals			Departures		
	<i>n</i>	Prevalence	95% CI	<i>n</i>	Prevalence	95% CI
Separation (overall)	186/2,197	8.47%	(7.34–9.71)	108/2,034	5.31%	(4.38–6.38)
In villages	164/1,809	9.07%	(7.78–10.48)	60/1,635	3.67%	(2.81–4.70)
In camps	22/388	5.67%	(3.59–8.46)	48/399	12.03%	(9.00–15.63)
Unaccompaniment	41/2,197	1.87%	(1.34–2.52)	11/2,034	0.54%	(0.27–0.97)

the 186 separated arrivals. This figure underestimates the total number of unaccompanied children, because child-headed households, who are by definition unaccompanied, were excluded from the sample.

Amongst the 186 separated arrivals, there were slightly more males than females (53% versus 45%). The largest age group was 5–9 year olds (44%), followed by 10–14 year olds (25%) and under 5 year olds (24%). Most commonly, arriving children were related to the head of the household as nieces or nephews (34%) or grandchildren (28%), with 13% having other familial relationships and 18% having no relationship.

The vast majority of arrivals (76%) were described as unintentional separations, meaning that their usual caregiver had not planned for the separation. Death of parents or family members was by far the most common reason for separation amongst arrivals, with 73% of respondents citing this as one of the factors contributing to separation. Respondents could cite multiple reasons for the separation.

Findings were also disaggregated by camps and non-camps. The prevalence of separated arrivals in camps was significantly lower than the prevalence in non-camps (5.67% versus 9.07%,  $p$ -value = 0.0291). Ability to draw conclusions from the camp data was limited due to the fact that only 388 of the children lived in camps, representing just 18% of the sample. Complete results are reported in [Tables 1 and 2](#).

### Departures

In the sample of all 2,034 children living in the respondents' homes prior to the M23 attack in December 2012, 5.31% ( $n = 108$ ) children had departed from the household, resulting in separation from their parents or usual caregivers. Of all children from the sampled households, 0.54% ( $n = 11$ ) were identified as unaccompanied, representing 10% of the 108 separated departures. Importantly, for nearly a quarter of these 108 children, their care status at the time of data collection was unknown or not reported. Many of these children with unknown care status are likely unaccompanied, but it was not possible to verify this from the data.

Amongst the 108 separated departures, there were slightly more females than males (52% versus 46%). The largest age group was 5–9 year olds (34%), followed by 10–14 year olds (32%) and 15–17 year olds (28%). In other words, compared to separated arrivals, departures tended to be older. Most commonly, departing children were the children of the head of the household from which they were leaving (44%). Only 5% of departures were unrelated to the head of the household from which they were leaving.

Slightly fewer than half of the departures (48%) were described as expected or intentional. The most common reason for separation amongst departures was food insecurity, with 43% of respondents citing this as one of the factors contributing to separation.

At the time of data collection, many departed children were under the care of a grandparent (33%), an aunt or uncle (16%) or another family member (15%). For 24% of the departures, their current care status was unknown.

Findings were also disaggregated by camps and non-camps. The prevalence of separated departures in camps was much higher than the prevalence in non-camps (12.03% versus 3.67%). This difference was statistically significant ( $p$ -value = 0.0000). Again, however, the sample of children living in camps was small ( $n = 399$ ) and the estimates have limited precision. Complete results are reported in [Tables 1 and 2](#).

### Reliability

Kappa coefficients for most of the main numerical variables suggest a moderate level of agreement between what the adults and the adolescents reported about the situation of children in their household (see [Table 3](#)) ([Landis & Koch, 1977](#)). The moderate kappas are likely a reflection of the limited power of the small sample size. Time and resources did not allow for a larger sample size in this pilot. Nonetheless, these results suggest that, in North Kivu, and on the subject of UASC, overall, there is no significant difference between data collected from adult versus adolescent respondents.

While the kappa statistic for departures is 0.000, suggesting no agreement beyond chance alone, this represents a limitation of the kappa statistic where there is no variability in one of the rater's responses. In such instances, the rater contributes nothing to the observed and expected probabilities; the probabilities are the same and the kappa numerator is zero. In fact, adults and adolescents reported the same number of departures in 13 out of 15 cases, supporting our prior claim of no substantial difference between the two reporting audiences.

**Table 2**  
Basic characteristics of separated children ( $n = 186$  arrivals,  $n = 108$  departures).

		Arrivals		Departures		
		<i>n</i>	%	<i>n</i>	%	
Sex	Male	99	53.2%	50	46.3%	
	Female	84	45.2%	56	51.9%	
	Missing data	3	1.6%	2	1.9%	
Age	0–4 years	44	23.7%	6	5.6%	
	5–9 years	81	43.6%	37	34.3%	
	10–14 years	47	25.3%	35	32.4%	
	15–17 years	11	5.9%	30	27.8%	
	Missing data	3	1.6%	0	0.0%	
Relationship to head of household	Child	0	0.0%	47	43.5%	
	Grandchild	53	28.5%	6	5.6%	
	Niece/nephew	64	34.4%	14	13.0%	
	Sibling	11	5.9%	22	20.4%	
	Sibling-in-law	7	3.8%	2	1.9%	
	Cousin	4	2.2%	6	5.6%	
	Step-child	1	0.5%	4	3.7%	
	Family, unspecified	1	0.5%	0	0.0%	
	Neighbor	7	3.8%	1	0.9%	
	No relation	34	18.3%	4	3.7%	
	Missing data	4	2.2%	2	1.9%	
	Type of separation	Intentional	22	11.8%	52	48.2%
		Unintentional	161	86.6%	56	51.9%
Missing data		3	1.6%	0	0.0%	
Reasons for separation	Death of parents/family	135	72.6%	19	17.6%	
	Food insecurity	17	9.1%	46	42.6%	
	Poverty	11	5.9%	25	23.1%	
	Work	2	1.1%	6	5.6%	
	Security	18	9.7%	15	13.9%	
	Running away/escape	12	6.5%	18	16.7%	
	School	1	0.5%	5	4.6%	
	Housing/accommodation	16	8.6%	11	10.2%	
	Conflict	12	6.5%	7	6.5%	
	Illness	2	1.1%	0	0.0%	
	Marriage	1	0.5%	1	0.9%	
	Missing data	12	6.5%	18	16.7%	
	Current caregiver	Grandparent	–	–	36	33.3%
Aunt/uncle		–	–	17	15.7%	
Sibling		–	–	9	8.3%	
Family, unspecified		–	–	7	6.5%	
No relation		–	–	2	1.9%	
Employer		–	–	2	1.9%	
Orphanage		–	–	2	1.9%	
Friend		–	–	7	6.5%	
Don't know		–	–	26	24.1%	
Missing		–	–	0	0.0%	

**Table 3**  
Agreement between adults and adolescents ( $n = 15$ ).

Variable	Kappa (unweighted)	95% CI
Current household size	0.583	(0.309, 0.858)
Number of children	0.595	(0.326, 0.864)
Number of newborns	0.546	(0.168, 0.923)
Number of arrivals	0.773	(0.350, 1.000)
Household size before emergency	0.358	(0.088–0.629)
Number of children	0.556	(0.264, 0.848)
Number of departures	0.000	(0.000, 0.000)

## Discussion

### Programming Implications

In this sample from North Kivu, in the period since December 2012, a greater proportion of unaccompanied and separated children arrived than departed. This pattern was particularly pronounced in villages. However, in camps, the pattern was reversed, with a much larger proportion of departures.

The characteristics of arrivals and departures diverged in a few striking ways. Excluding newborns, a much larger proportion of arrivals were very young (0–4 years), compared to departures. Most arrivals were unintentional and at least partially related to the death of parents or family members. In contrast, departures included a higher proportion of older children (15–17 years) and, in many situations, the departure was part of a deliberate decision-making process. Many reasons appear to have factored into this departure decision, including, most prominently, food insecurity. Poverty and escape were also significant drivers of departure. Death of parents or family members did sometimes play a role in departures, but much less frequently than for arrivals.

These findings have important programming implications. The information about arrivals is particularly relevant for service provision. These children and their caregivers may need specialized economic or psychosocial support services. Further, since so many arrivals were related to death of parents or family members, reunification may be unrealistic for most children. The information about departures suggests a need for a greater focus on prevention, including economic and social support programs. Families are making incredibly difficult choices to send their children away due to lack of resources and security. Family strengthening efforts are needed to support vulnerable families before the separations occur.

Finally, the situation of children in camps may deserve special attention, but because this sample was small, it is difficult to draw conclusions from the data. In future pilots, it would be useful to power the study to evaluate children in camps as a key subpopulation.

### *Methodological Implications*

This pilot was the first known population-based estimation of child separation in an emergency. Although household cluster surveys are regularly used to collect data in humanitarian settings, to our knowledge, this method had never been applied to measurement of UASC. These results demonstrate that, with the aid of an innovative, pictorial survey format, it is feasible to interview households about a potentially sensitive topic. The value of disaggregating data about arrivals and departures was also confirmed.

During qualitative research conducted before the pilot, some key informants had suggested that children might serve as better respondents than adults. The pilot established that adult respondents in the study area had a reliable knowledge of household composition, compared with youth respondents. A similar sub-analysis with a more adequately powered subsample could be repeated in future pilots to determine if the same results hold in different contexts or if results differ based on the gender of the respondent.

Finally, the entire study was completed in one month, suggesting household surveys can be an efficient method for generating population-based estimates of the prevalence and basic characteristics of unaccompanied and separated children in emergencies. In-depth qualitative or mixed methods research may also be valuable to practitioners seeking to appreciate the broader socio-cultural context in which separation occurs, but in settings where time and resources are often limited, household surveys can provide a quick and useful snapshot of separation in a given area.

### *Limitations*

Despite generating many insights for programming and methodological advancement, this study was not without limitations. First, probability-proportionate-to-size sampling was not possible due to security restrictions and accessibility to some villages. As a result, the findings are not representative of Nyiragongo and Goma territories as a whole. Second, the long survey recall period may have limited the precision of the findings. The M23 takeover of Goma was the most universally recognizable reference point for respondents. However, this event happened 18 months prior to data collection, increasing the potential that reported separations were not connected to that particular spike in conflict. This measurement exercise is hypothesized to be more precise if undertaken soon after an acute onset emergency.

Second, as noted above, the methods systematically underestimated prevalence of unaccompanied children due to the fact that all respondents had to be 18 years of age or older, thus excluding child-headed households by design. While information on the caretaker of departed children was intended to partially compensate for the exclusion of child-headed households, respondents were often unaware of who was caring for departed children. This missing data impeded a true estimation of unaccompaniment, even amongst departures.

Finally, this study was designed to produce a quantitative population-based estimate of the point prevalence of separation at a single point in time. A community-based surveillance tool has also been developed to monitor trends in the incidence of separation over time. Findings from that pilot are reported elsewhere (Rubenstein et al., 2015). In situations where separation is thought to be changing rapidly over time, it is recommended to use the ongoing surveillance tool in conjunction with periodic, population-based surveys to generate a more complete understanding of UASC in a given area.

### **Conclusion**

This study fills a critical gap in the measurement of unaccompanied and separated children in emergencies. Each time an emergency occurs, one of the first questions asked by practitioners, policymakers and funders alike is “How many children need help?” The health and well-being of unaccompanied and separated children are at high risk in these settings, but without accurate data on their total magnitude and characteristics, only those children who are receiving services are counted. By

demonstrating that the humanitarian community has the capacity to do better, it is our hope that such estimations will become a standardized part of humanitarian response.

## Contributions

LS, BR, CS, HM conceived and designed the study. CS, HM, EN and MCS led data collection in the field. BR led statistical analysis. LS and BR wrote the report. CS, HM, EN and MCS contributed important revisions to the manuscript. All authors approved the final submitted version of the report.

## Conflict of interest statement

The authors confirm that there are no known conflicts of interest associated with this manuscript.

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