

# Estimating death rates in complex humanitarian emergencies using the network method

Environmental and Climate Influences on Morbidity and Mortality  
PAA 2024

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July 5, 2024

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- ▶ How do you best estimate death rates in **humanitarian emergencies?**
- ▶ We can't use conventional methods
  - ▶ Civil war, earthquake, etc.

# Overview of Network Method

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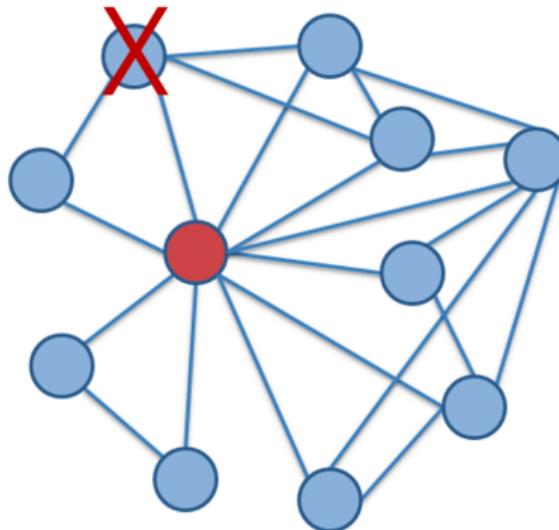
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- ▶  $D_\alpha$  is the number of deaths
- ▶  $N_\alpha$  is the person days of exposure

# Insights from social networks



People can report valuable information about mortality among their social network

# Network method

$$\widehat{M}_\alpha = \frac{D_\alpha}{N_\alpha} \tag{2}$$

$$= \frac{\sum_{i \in s} w_i y_{i,D}}{\sum_{i \in s} w_i d_i E_i} \tag{3}$$

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- ▶  $\sum_{i \in s} w_i y_{i,D}$  is the total number of people in respondents' personal network who have died in time window

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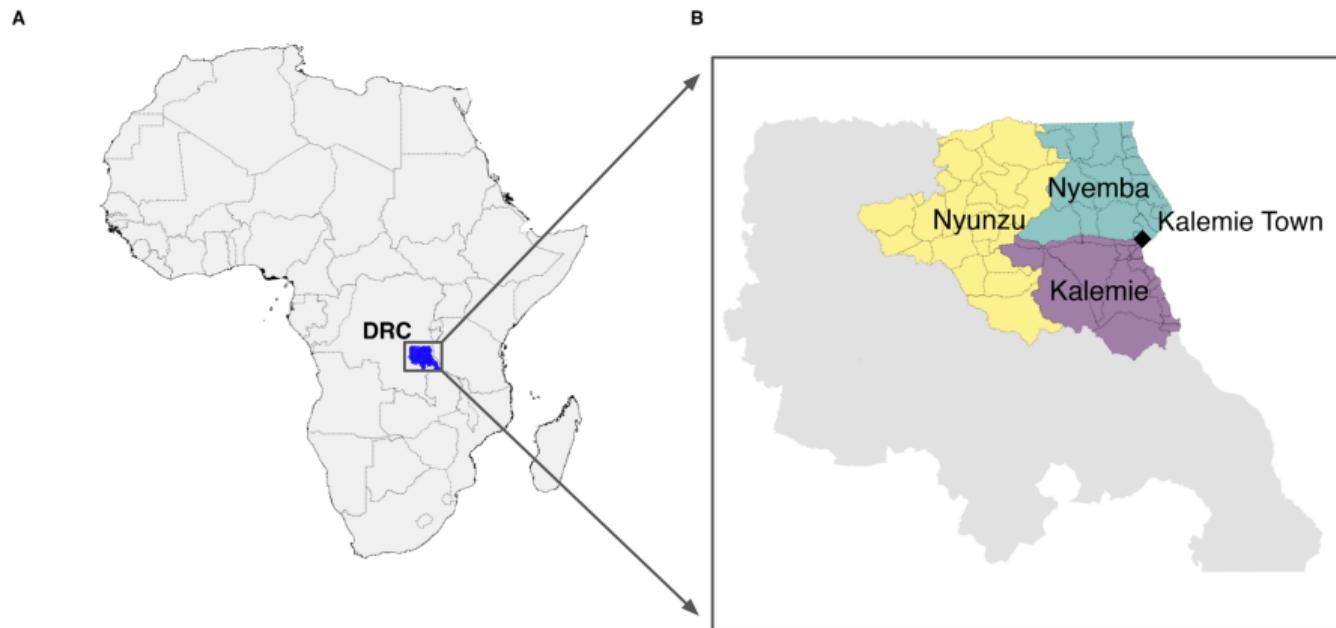
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# Case Study: Democratic Republic of the Congo



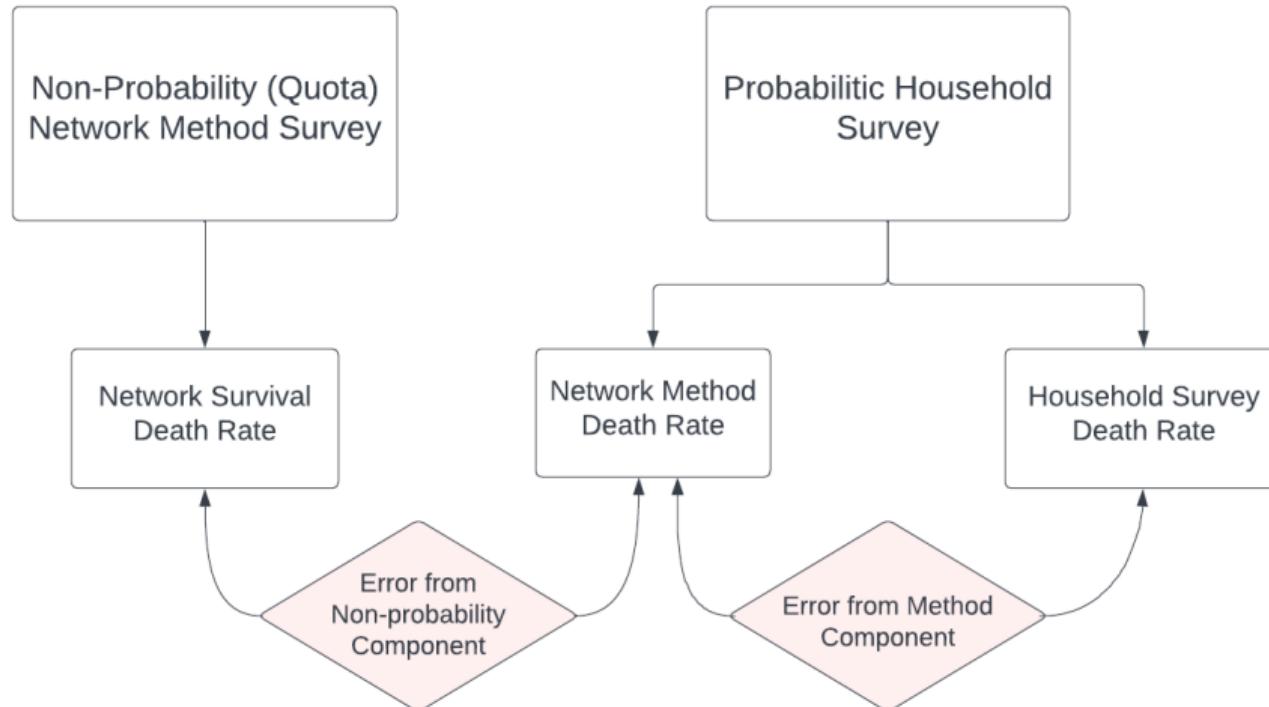
# Case Study: Democratic Republic of the Congo

Tanganyika Province, Three Zone De Santes



Intercept respondents  
in Kalemie Town

# Study design



# Formative research (qualitative)

► **Goal:**

- ▶ What deaths can respondents report on accurately?
- ▶ What reference date and reporting window should we chose?
- ▶ 8 focus groups + 20 individual interviews

<b>Group</b>	<b>Age</b>	<b>Gender</b>	<b>Location</b>
1	<45	Male	Urban
2	<45	Female	Urban
3	<45	Male	Rural
4	<45	Female	Rural
5	45+	Male	Urban
6	45+	Female	Urban
7	45+	Male	Rural
8	45+	Female	Rural

# Best option — kin and neighbor networks

Module	Group	Notes
Neighbor	Respondent's Household	
Neighbor	1st Closest Neighbor Household	
Neighbor	2nd Closest Neighbor Household	
Neighbor	3rd Closest Neighbor Household	
Neighbor	4th Closest Neighbor Household	
Neighbor	5th Closest Neighbor Household	
Kin	Respondent's Grandchildren	
Kin	Respondent's Children	
Kin	Respondent's Siblings	
Kin	Respondent's Cousins	
Kin	Respondent's Aunts/Uncles	
Kin	Respondent's Parents	
Kin	Respondent's Grandparents	

# Data Collection (Partnership with REACH Initiatives)

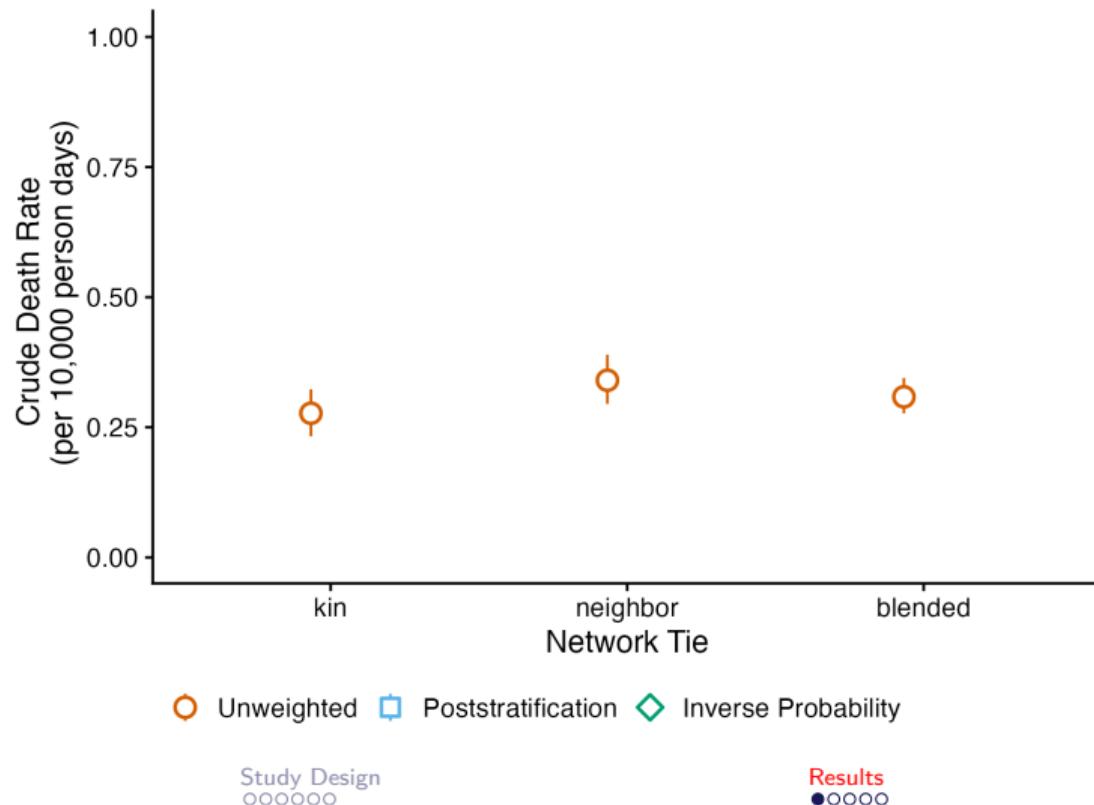


Interviews conducted at transit hubs such as markets, ports, taxi stations, health clinics, etc.

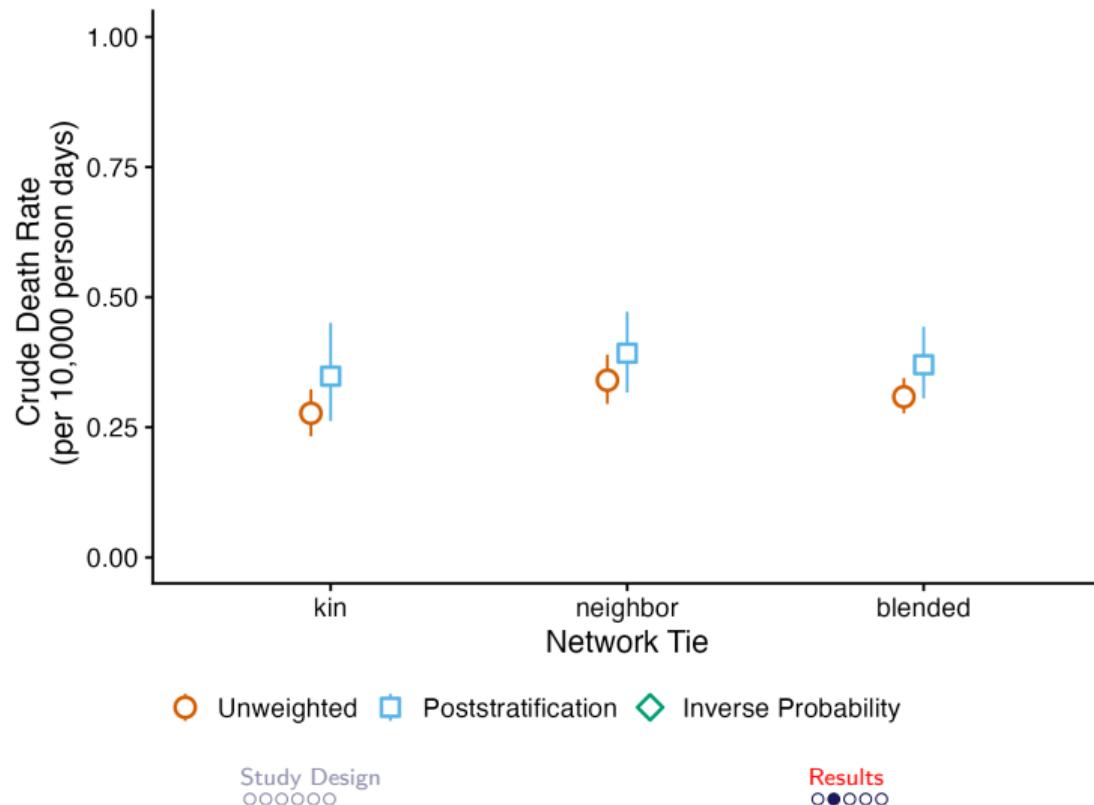
Informed consent on paper form, survey administered on smartphone



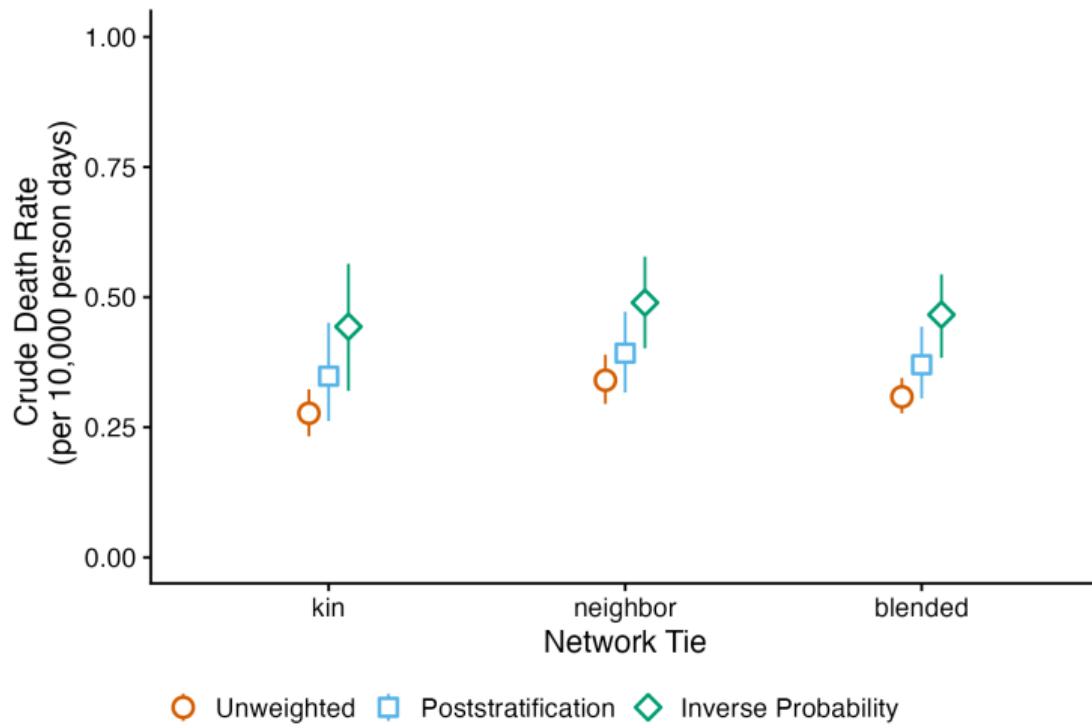
# Non-probability network survival results



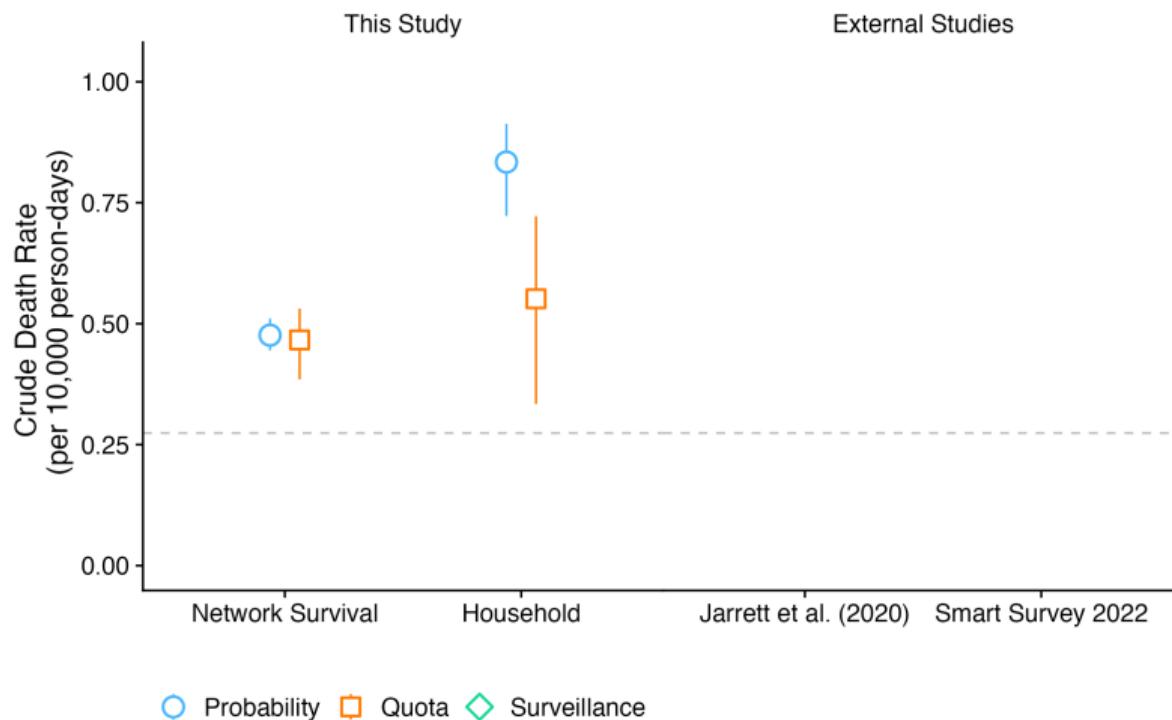
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# Full comparisons



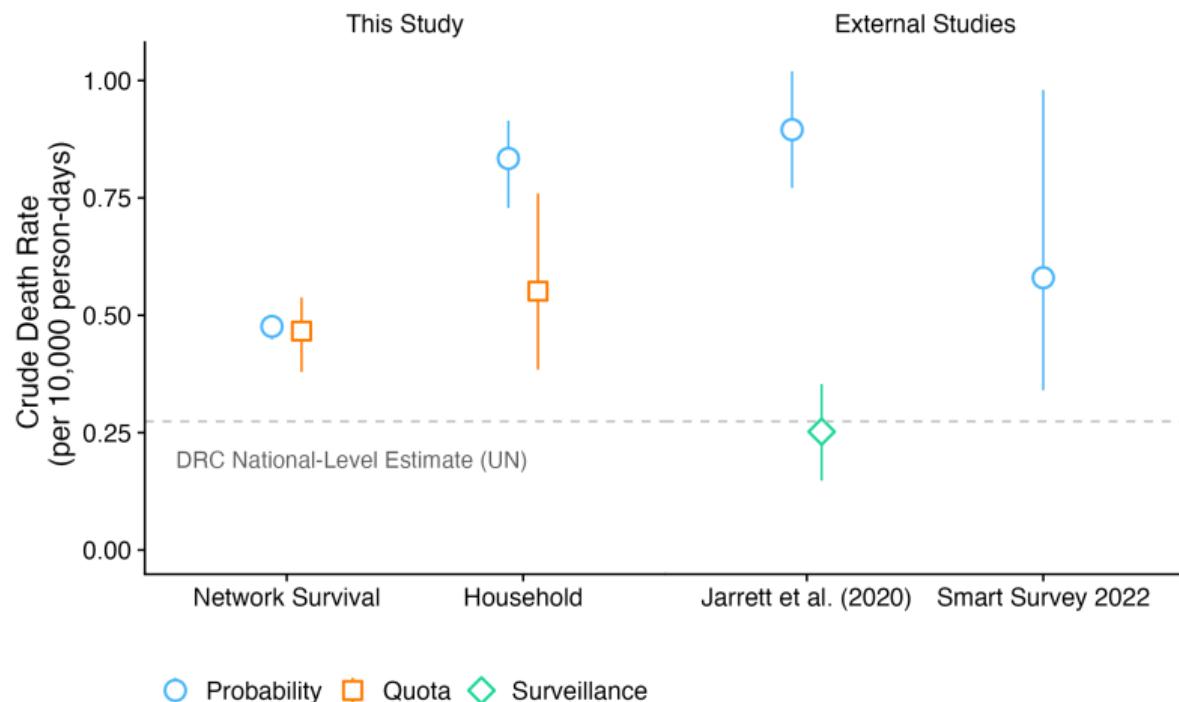
Introduction  
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Study Design  
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Results  
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Conclusions  
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# Full comparisons + external studies



## Summary of study

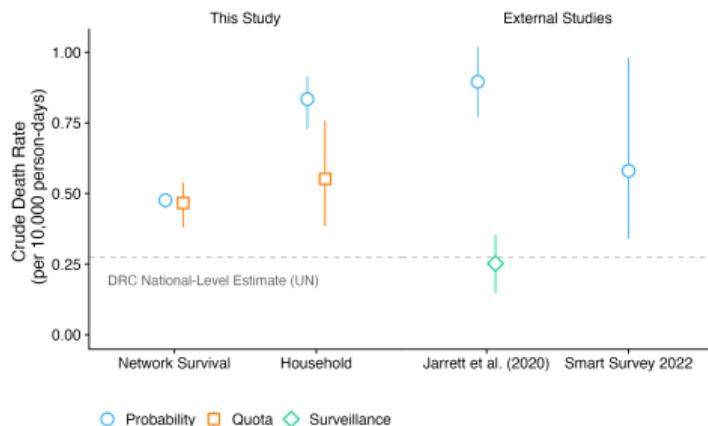
- ▶ Developed and tested a promising **new method** for estimating death rates in humanitarian emergencies

## Summary of study

- ▶ Developed and tested a promising **new method** for estimating death rates in humanitarian emergencies
  - ▶ We need more systematic evaluations
- ▶ Highly contextual – **requires** localized knowledge of social networks, diffusion of info about deaths, etc.

# Thank You

- ▶ Questions?



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