

# Are droughts bigger drivers of child undernutrition than conflicts? A meta-analysis of 231 small-scale operational surveys from Ethiopia, 2000–2013

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# Background

- MDG era saw a huge progress in reducing hunger, but still
  - 815m food-insecure people in the world in 2016, up from 777m in 2015 (93% in Africa & Asia) (FAO 2017)
  - 155m U5 children stunted & 52m wasted globally in 2016 (94% in Africa & d Asia) (UNICEF et.al 2017)
- Undernutrition is critical public health challenge:
  - 35% disease burden annually & 45% child deaths globally (Black et.al 2013)
  - 11% GDP losses in Asia & Africa (IFPRI 2016); 7-16% primary school repetition in Africa (AU et.al 2014)

# Background

- In Ethiopia malnutrition is responsible for: 28% child deaths; 16.5% GDP losses; 16% primary school repetitions; 8% reduction in the workforce (Cost of hunger study 2013)
- Considerable improvement in different sectors (GDP growth, MDGs), but undernutrition is still & deep-rooted problem in Ethiopia: 38% children stunted & 10% wasted (EDHS 2016)
- This problem is worse in crises-affected areas (natural disasters and violent conflicts)

# Background

- Epidemiological data is central to improve public health response during humanitarian crises
- But, field conditions make obtaining data extremely difficult (national health data systems non-functional and untimely, lack of baselines, no surveillance systems)
- Promising option! Using small-scale operational survey data regularly undertaken by UN, health NGOs

# Objectives

- 1 to provide summary estimates of the prevalence of wasting among children aged 6-59 months, 2000-2013;
- 2 to investigate the effects of drought and conflict on child undernutrition in emergency settings in Ethiopia.

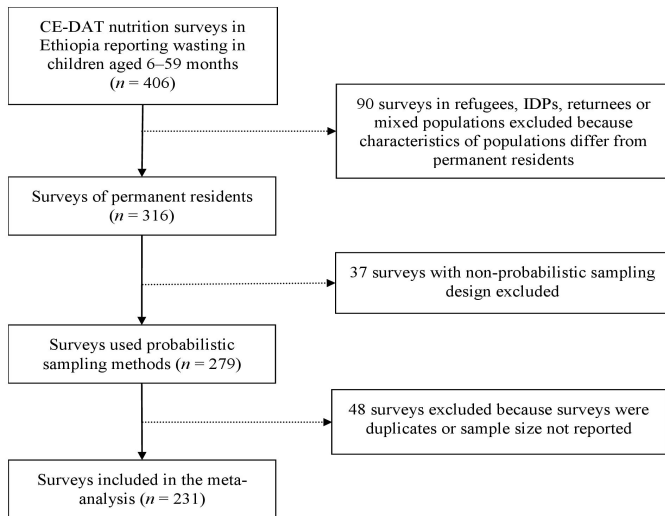
# Data: Opensource databases

Variable	Database		
	Complex Emergency Database (CE-DAT)	SPEI Global Drought Monitoring	Armed Conflict Location & Event Dataset (ACLED) and Uppsala Conflict Data Program (UCDP)
Data compiled	Nutrition, mortality & vaccination indicators	Intensity, duration & drought extent	Georeferenced data on violent events
Data source	NGOs; UN, ministry of health; academic inst., CSA, and peer-reviewed journals	Climate water balance using precipitation and temp.	Media, UN and NGO reports
Data used	Prevalence of GAM, MCV coverage from 237 CE-DAT surveys 2000-2014	3-month SPEI (short-term) & 12-month SPEI (long-term) droughts	A binary variable: conflict occurred or not

# Statistical analysis

- Datasets merged across space and time, based on GPS locations
- Random-effects meta-analysis:
  - $\tau^2$  statistic: estimate the variability across the surveys
  - Subgroup meta-analysis and meta-regression: explain the variability
- Bayesian regression for meta-analysis with non-informative priors

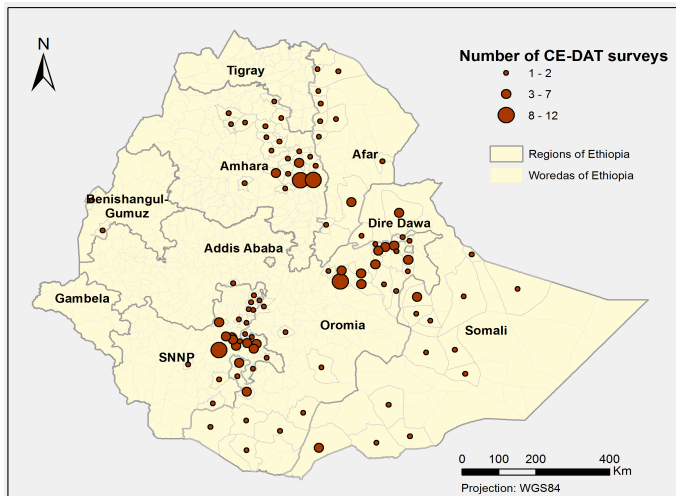
# Flow chart of surveys included in the meta-analysis



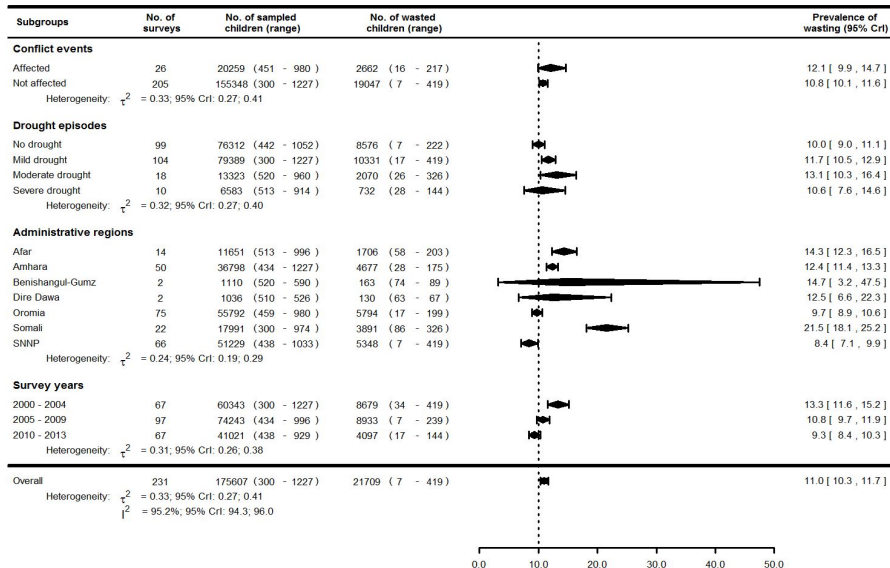


## Surveys by *woreda*

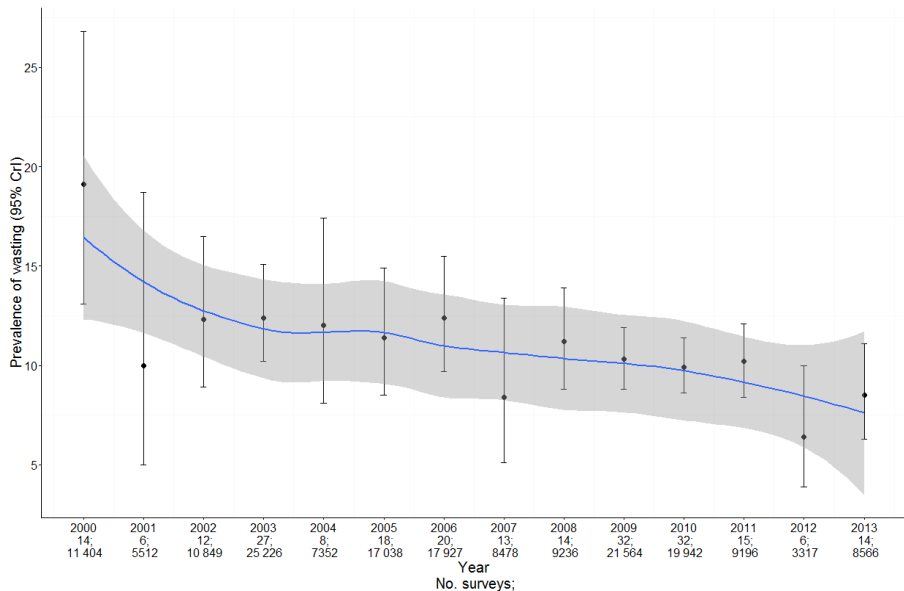
- Oromia (72; 32.5%), SNNP (66; 28.6%) & Amhara (50; 21.6%) surveys; 175,607 children



# Summary of the pooled prevalence of child wasting



# Trends in the prevalence of child wasting



# Results of meta-regression

Characteristics	Posterior OR	95% CrI
<b>Conflict status</b>		
Affected vs. Not affected	1.02	[0.82–1.26]
<b>Drought exposure</b>		
Mild vs. No drought	1.04	[0.91–1.19]
Moderate vs. No drought	1.34	[1.05–1.72]
Severe vs. No drought	0.96	[0.68–1.35]
<b>Survey year</b>	0.96	[0.94–0.98]
<b>Regions</b>		
Afar vs. Oromia	1.51	[1.15–2.00]
Amhara vs. Oromia	1.29	[1.08–1.54]
Benishangul-Gumuz vs. Oromia	1.61	[0.80–3.26]
Dire Dawa vs. Oromia	1.53	[0.75–3.13]
SNNP vs. Oromia	0.82	[0.69–0.97]
Somali vs. Oromia	2.21	[1.74–2.81]

# Conclusions

- Declining trend, but still persistent undernutrition problem in Ethiopia, particularly in Somali, Afar and Amhara regions
- Exposure to moderate drought increased the odds of child wasting by 34%

# Thank You!