How Does Exposure to War in Early Childhood Affect Adolescent Health and Wellbeing?

Ellen Foley and Ishita Chatterjee

UWA

Introduction: Ethiopian-Eritrean War

- Region has history of conflict
- Eritrea claimed independence from Ethiopia in 1993 after the defeat of Ethiopia's military regime
  - New independence -> tension around flow of goods and border delineation
- War began in May 1998 after Tigrayan security forces killed Eritrean soldiers on patrol in Badme
- During the war 70,000 – 100,000 killed and 1 million displaced
- Fighting ceased in June 2000, with the signing of the Algiers Agreement in December 2000

War and wellbeing

- Good wellbeing is a critical aspect of being considered healthy and is important for child development
- Multiple pathways of the effect of war on wellbeing
  - Exposure to violence and warfare
  - Exacerbation and creation of mental illnesses
  - Poor parental mental health -> poorer child mental health
  - Disruption to daily life and access to essential services
  - Poor physical health -> poor wellbeing

Ethiopian-Eritrean War Literature

- Akresh et al. (2012) estimate the impact of the EEW on Eritrean children using DHS data
  - Children who lived in high war intensity areas have lower HAZ than children in low intensity areas
- Weldeegzie (2017) estimates the impact of the EEW on Ethiopian children's health and education using Young Lives data
  - Exposed children exhibit a 0.3 to 0.38 standard deviation decline in HAZ, are 12 to 15 percentage points more likely to be stunted
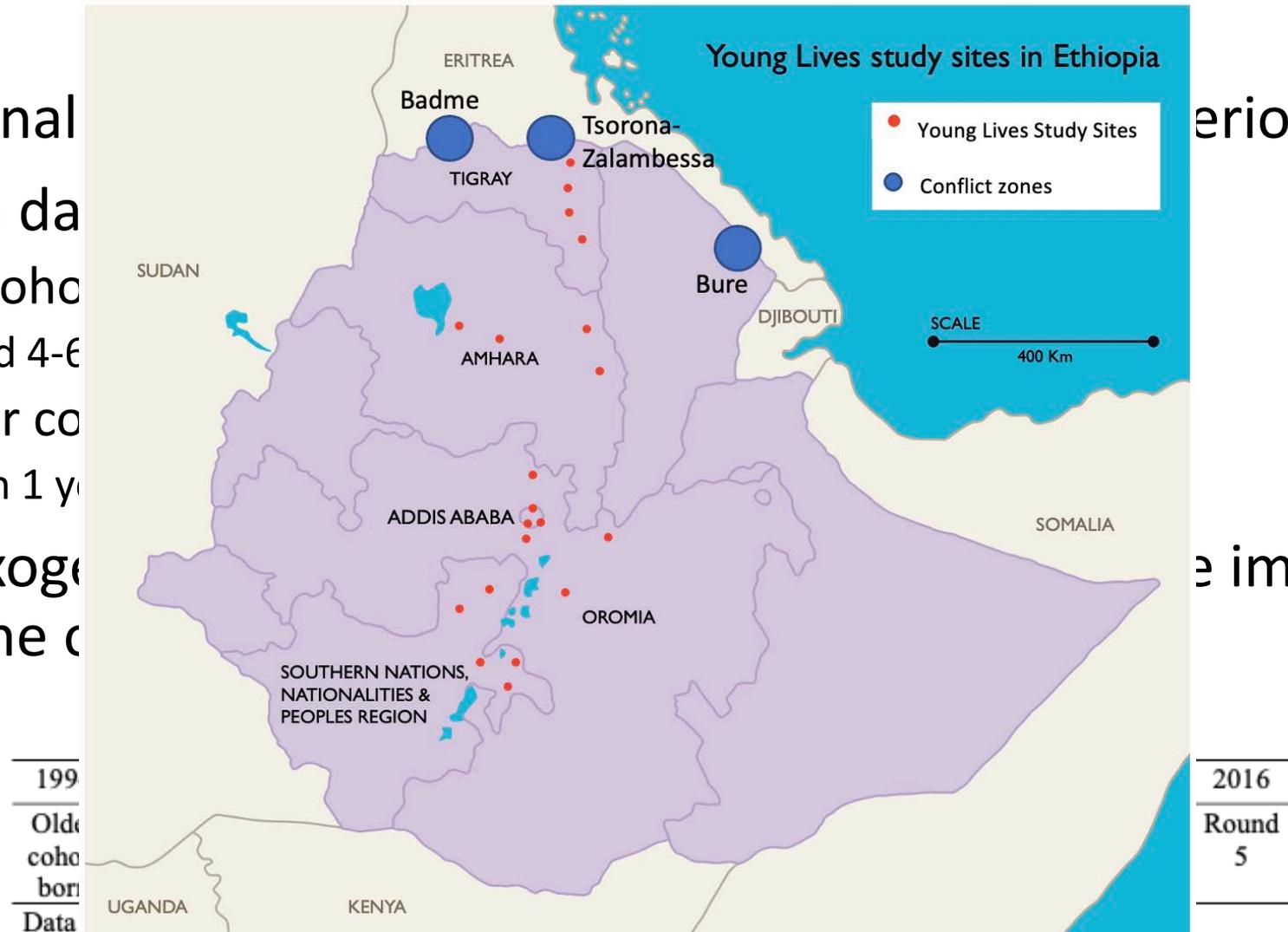- No research on the impact of the EEW on children's wellbeing.

Contribution to literature

- Interaction of physical health and self-reported wellbeing of children in a post-conflict situation

- Long-term effect of exposure to war

- Comparison of objective health and self-reported health in children

Data: Young Lives Study

- Longitudinal ... eriod

- Ethiopian da...
  - Older coho...
    - Aged 4-6...
  - Younger co...
    - Born 1 y...

- Exploit exoge... e impact of the War on the ...

Young Lives study sites in Ethiopia

- Young Lives Study Sites
- Conflict zones

ERITREA
Badme
Tsorona-Zalambessa
TIGRAY
SUDAN
Bure
DJIBOUTI
SCALE
400 Km
AMHARA
ADDIS ABABA
SOMALIA
OROMIA
SOUTHERN NATIONS, NATIONALITIES & PEOPLES REGION
UGANDA   KENYA

199...
Olde...
coho...
bor...
Data

2016
Round 5

Data: Variables

- Height-for-age z-scores
  - Universal measure of long-term health and nutrition
- Chhealth – self-reported health
  - 5-point scale, very poor health to very good health
- Cladder – self-rated wellbeing
  - 9-point scale, "worst possible life" to "best possible life"

# Empirical specification: physical health

- $Y_{ijt} = \beta_0 + \beta_1 * Cohort_t + \sum_i \beta_2 * Region_j + \beta_3\left(Cohort_t * Region_j\right) + \alpha_j + \gamma X_{ijt} + \varepsilon_{ijt}$

  - β_3 is the coefficient of interest, capturing the effect of the War on a child in the older cohort living in a high-intensity region
  - α_j is the community fixed effect
  - X_{ijt} is a set of household and child characteristics

Empirical specification: subjective health/wellbeing

- $y_i^* = x_i'\beta + \varepsilon_i$
  - y^* is a continuous latent variable of wellbeing
  - x_i is a vector of explanatory variables
- $y_i = m \ if \ a_{m-1} < y_i^* \leq a_m \ for \ m = 1 \ to \ j$
- $y_i = \begin{cases} 1 \ if \ y_i = m \\ 0 \ otherwise \end{cases}$
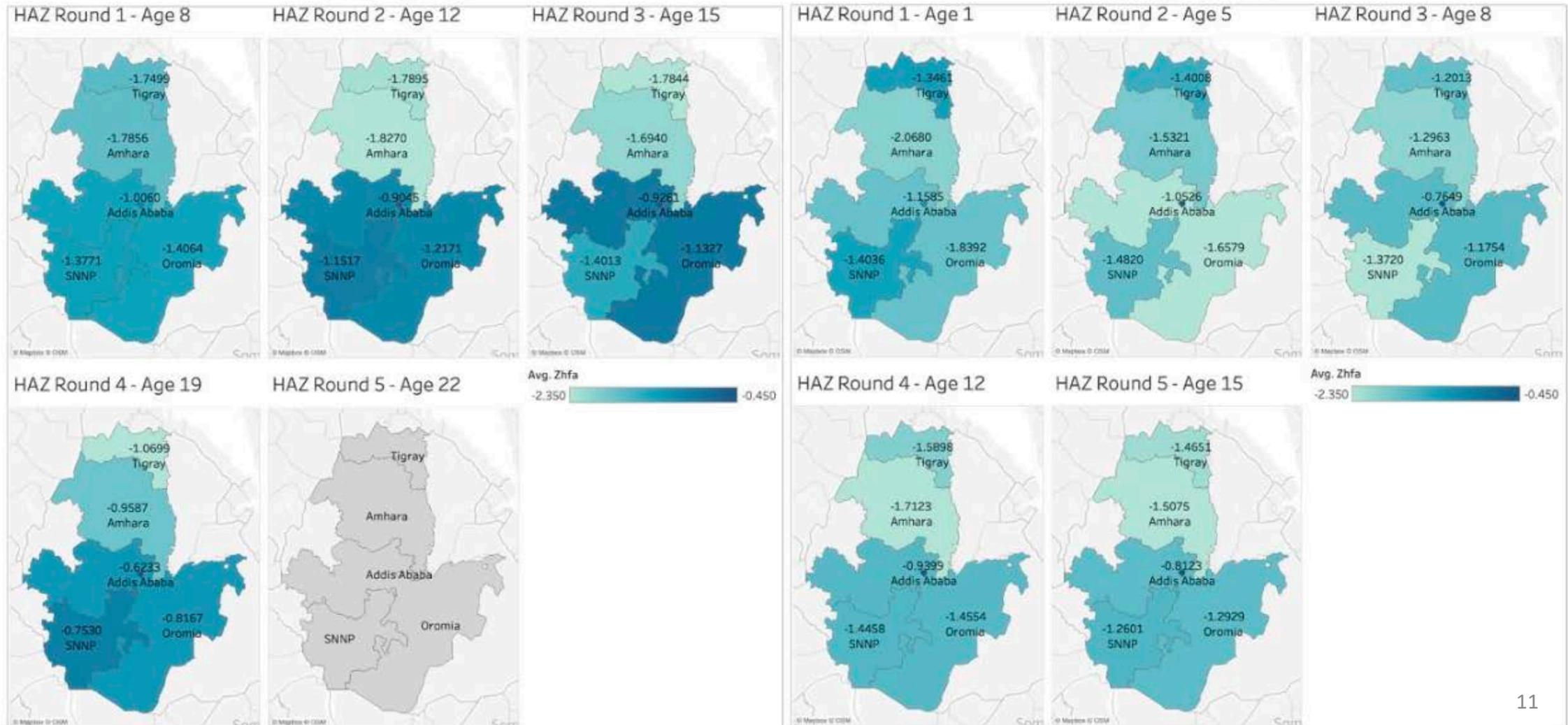
Empirical results: physical health
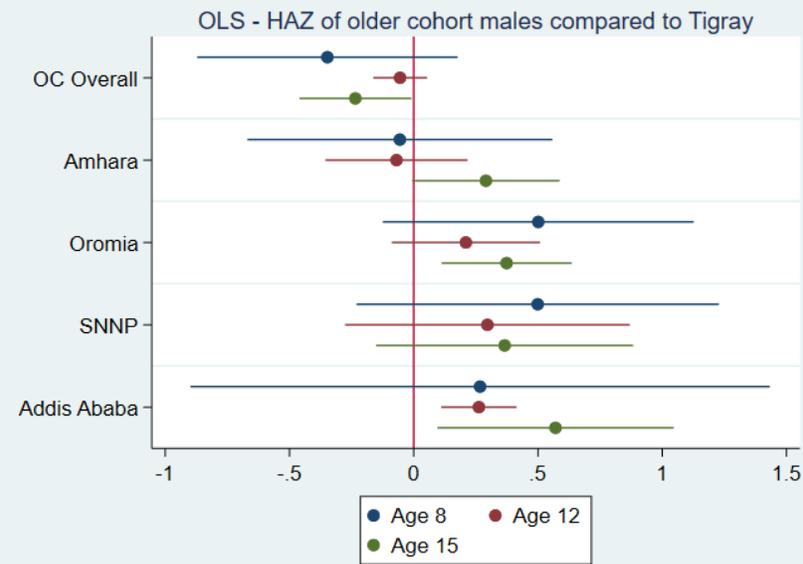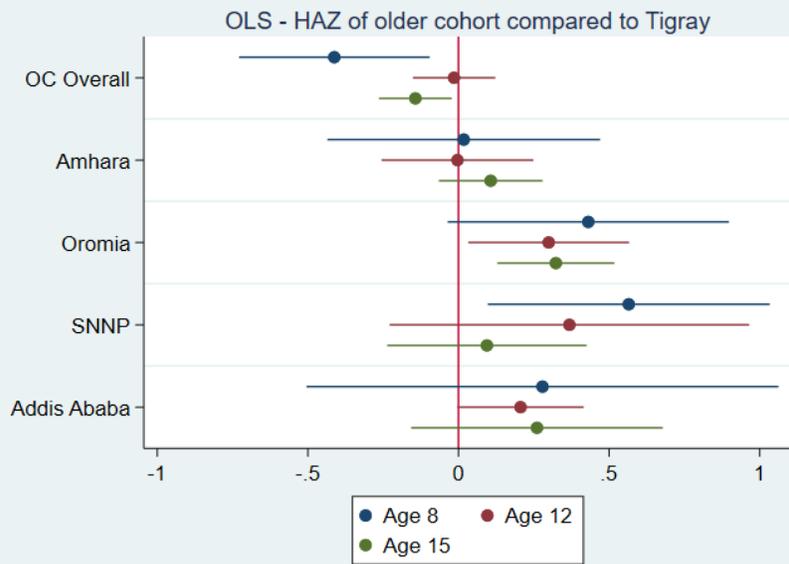
Results table

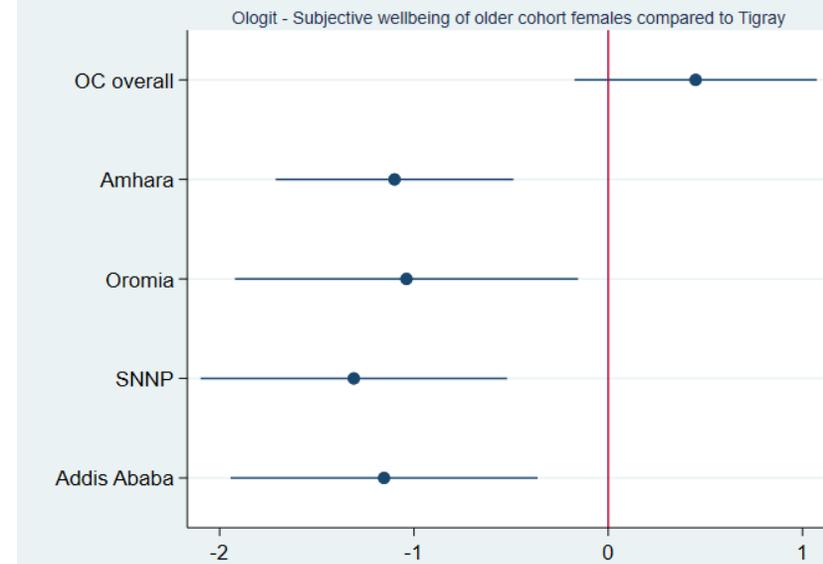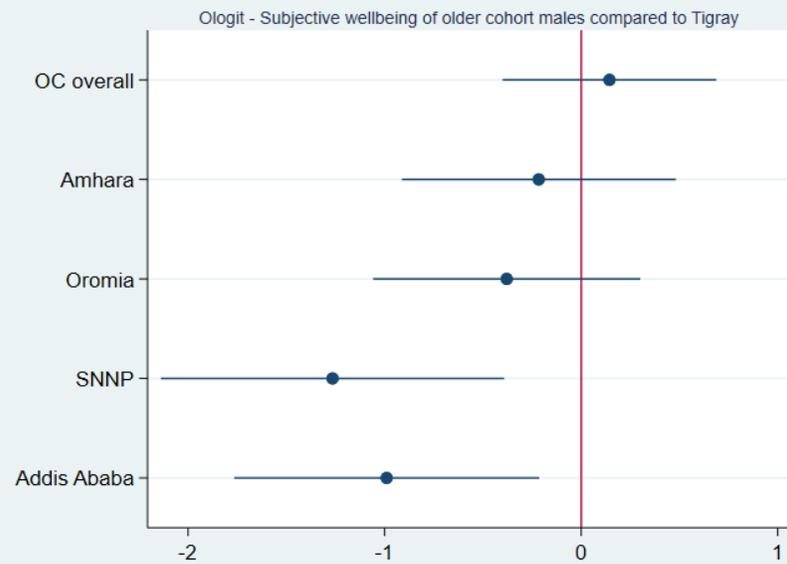# Empirical results: self-reported health
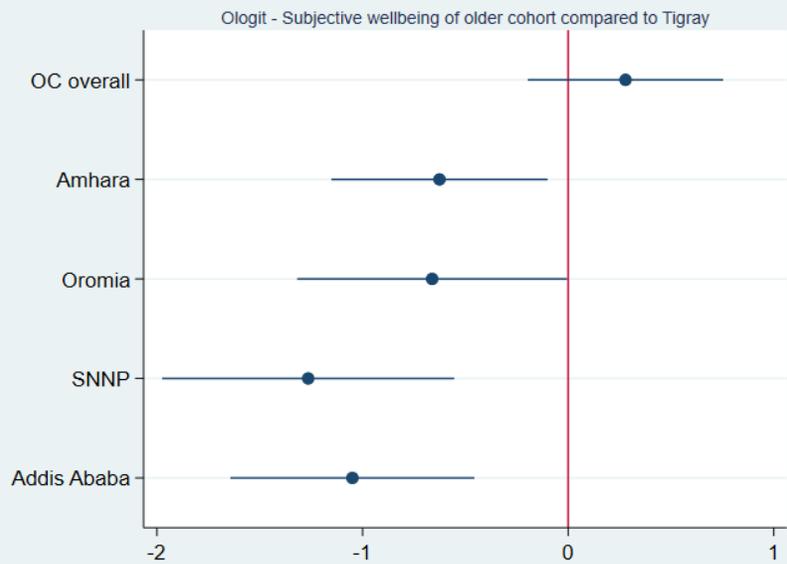
[Results table](#)

Mean self-reported health by age and region
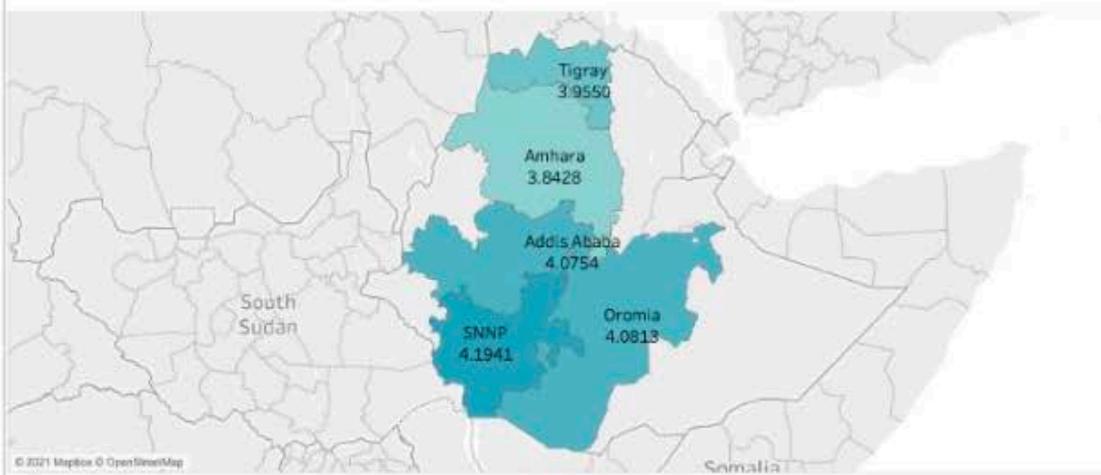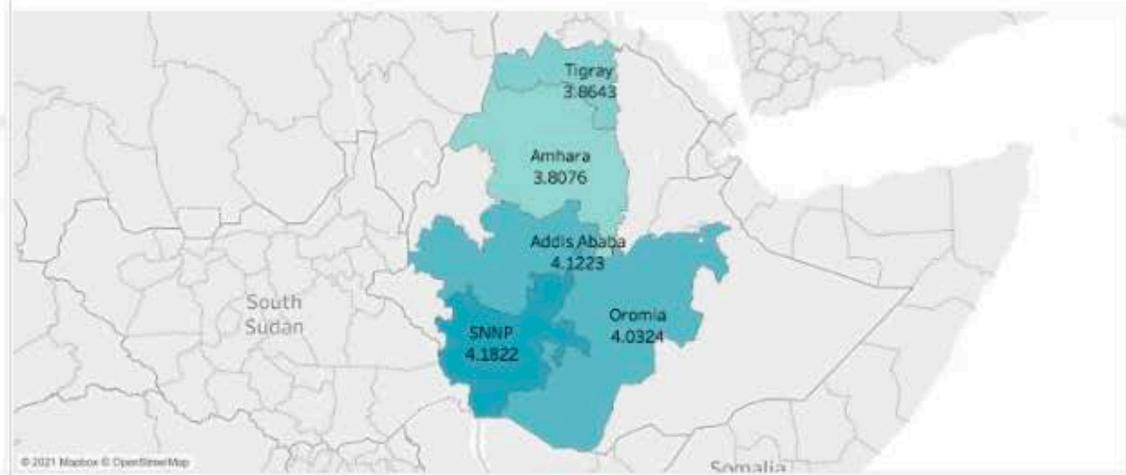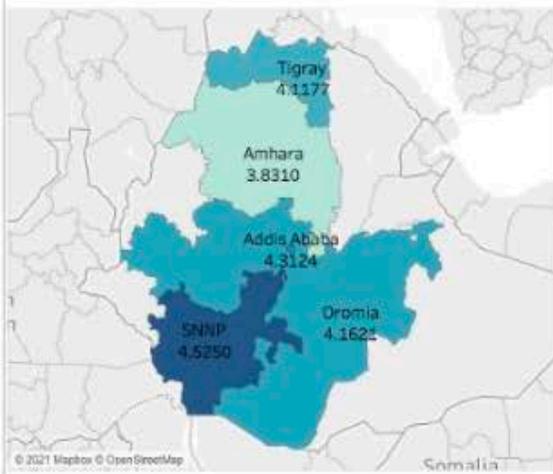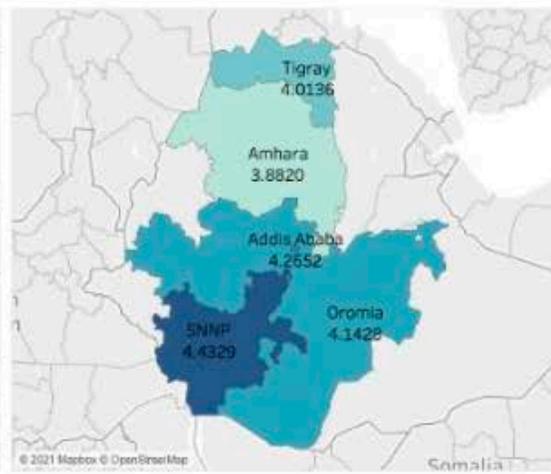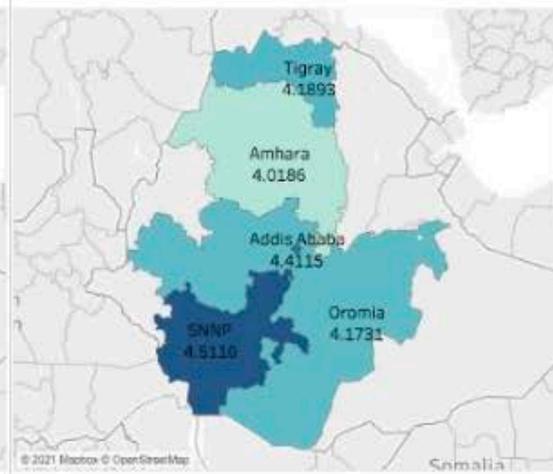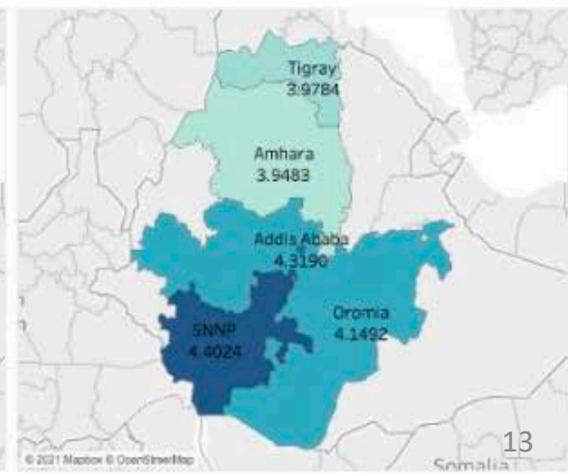
Empirical results: wellbeing
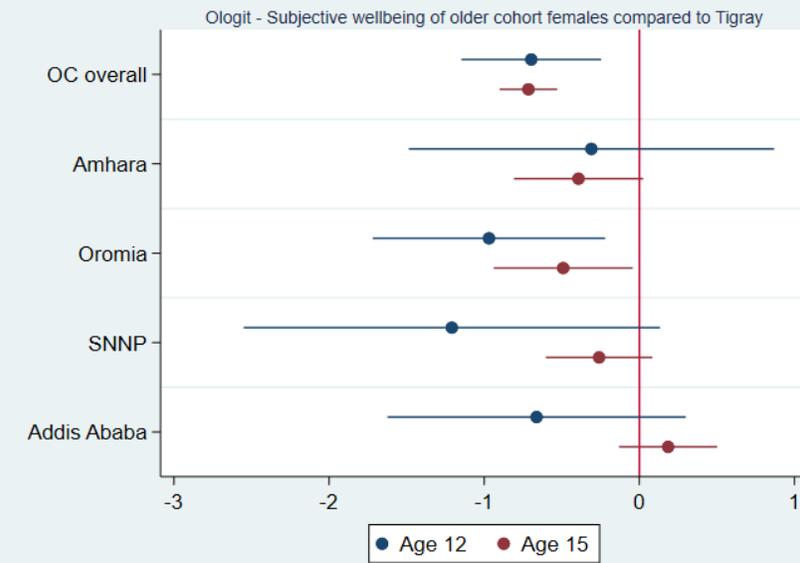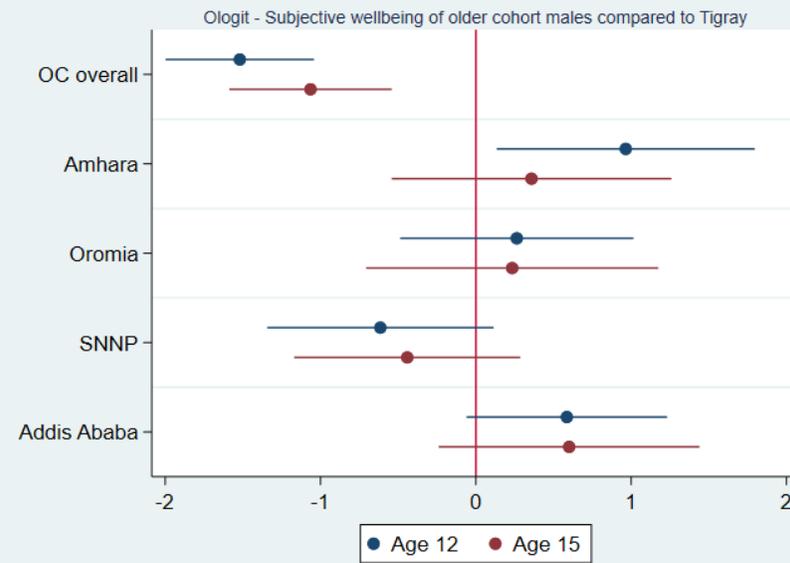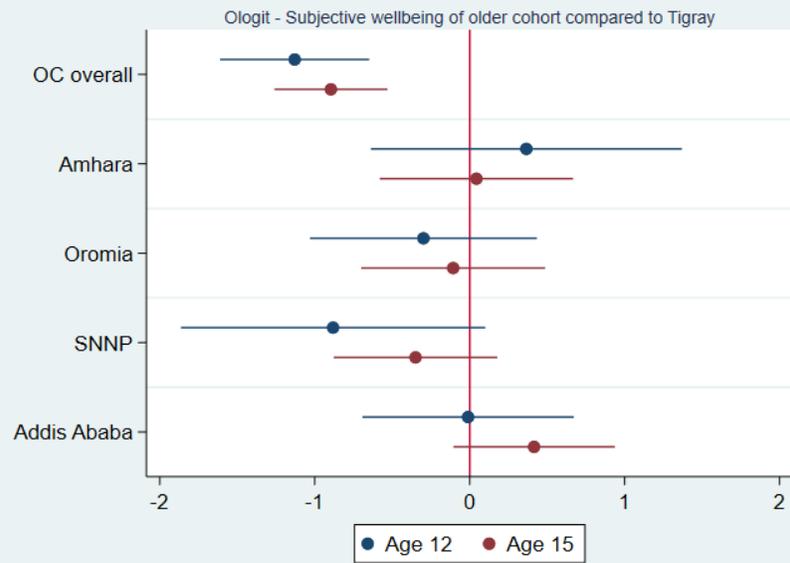
[Results table](#)

Mean wellbeing by age and region
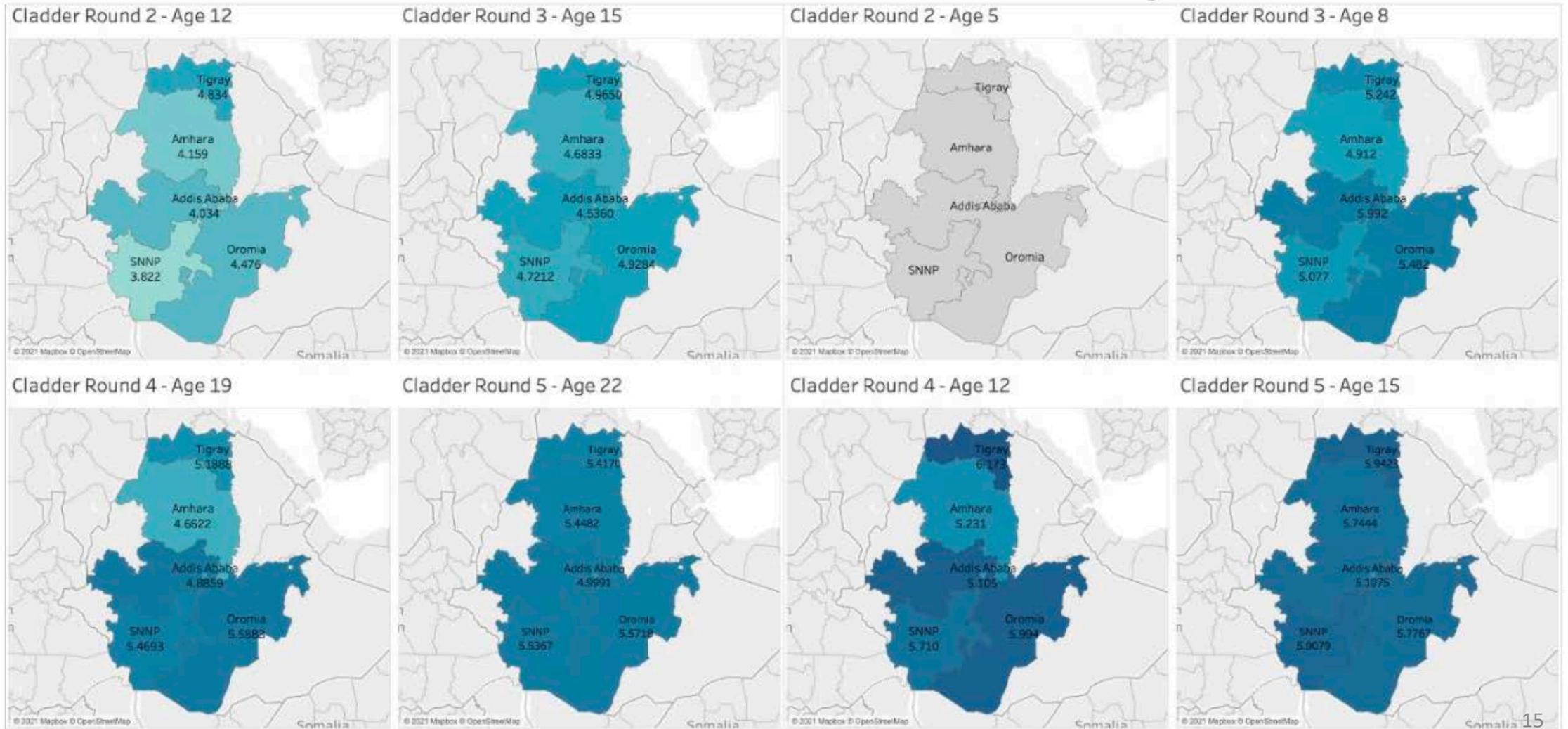
Empirical results: robustness checks

- Impact of other types of conflict with ACLED Data →
- Threat of conflict-induced migration →
- Mortality selection controls →
- Food insecurity controls →
- Endogenous fertility

Mechanisms

- Destruction of household economic assets
  - Increases child vulnerability
  - Impair a household's provision of basic needs -> decreases health and wellbeing
- Destruction of infrastructure and services
  - Impairs basic community functioning
- Destruction of economic assets
  - Increases child vulnerability
  - Impair

Limitations

- Underestimation of war impact -> compounding effect of poor physical health

- Overestimation of war impact-> deficits accumulated by older cohort

- Reliability of self-reported wellbeing

Conclusion and policy implications

- Key findings:
  - EEW had a significant long-term negative impact on physical health
  - War-affected children do not rate their own health or wellbeing lower
  - Wealth is a significant channel for health and wellbeing improvement
  - Convergence of measures – effect of war on wellbeing dissipates over time

- Policy implications: the mitigation of the effects of war on wellbeing should be implemented in childhood rather than in adolescence.

OLS Estimation with height-for-age z-scores

	Age 8				Age 12				Age 15			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Baseline	All controls	Male	Female	Baseline	All controls	Male	Female	Baseline	All controls	Male	Female
Older cohort	-0.493***	-0.412**	-0.347	-0.467**	-0.179*	-0.015	-0.055	0.042	-0.210***	-0.143**	-0.235**	-0.073
	(0.119)	(0.152)	(0.251)	(0.166)	(0.103)	(0.066)	(0.052)	(0.158)	(0.068)	(0.058)	(0.108)	(0.149)
Amhara*OC	0.003	0.018	-0.056	0.068	0.083	-0.003	-0.069	0.079	0.071	0.107	0.290*	-0.109
	(0.186)	(0.217)	(0.294)	(0.242)	(0.132)	(0.121)	(0.137)	(0.207)	(0.090)	(0.083)	(0.142)	(0.195)
Oromia*OC	0.266	0.431*	0.501	0.349	0.407**	0.300**	0.210	0.405**	0.354***	0.323***	0.374***	0.295
	(0.180)	(0.224)	(0.300)	(0.324)	(0.160)	(0.128)	(0.143)	(0.181)	(0.084)	(0.093)	(0.126)	(0.189)
SNNP*OC	0.491**	0.565**	0.499	0.619***	0.470*	0.368	0.297	0.432	0.097	0.094	0.366	-0.172
	(0.208)	(0.224)	(0.349)	(0.198)	(0.270)	(0.286)	(0.274)	(0.341)	(0.147)	(0.159)	(0.248)	(0.222)
Addis Ababa*OC	0.268	0.279	0.267	0.279	0.307**	0.206*	0.262***	0.132	0.229	0.261	0.571**	-0.066
	(0.380)	(0.376)	(0.559)	(0.269)	(0.123)	(0.100)	(0.073)	(0.244)	(0.166)	(0.200)	(0.228)	(0.243)
Wealth index		1.353***	1.274***	1.448***		1.150***	0.936***	1.411***		0.712***	1.014***	0.387*
		(0.148)	(0.217)	(0.297)		(0.181)	(0.217)	(0.320)		(0.212)	(0.266)	(0.216)
Child's sex, 1=male		-0.117**				-0.043				-0.786***		
		(0.051)				(0.054)				(0.065)		
Observations	2,841	2,577	1,374	1,203	2,842	2,573	1,366	1,207	2,755	2,454	1,312	1,142

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Ordered logit estimation with self-reported health

|	(1)	(2)	(3)	(4)
	Baseline	All controls	Male	Female
Older cohort	0.142	0.286	0.144	0.450
	(0.190)	(0.254)	(0.277)	(0.318)
Amhara*OC	-0.491**	-0.639**	-0.216	-1.100***
	(0.215)	(0.278)	(0.356)	(0.312)
Oromia*OC	-0.523*	-0.672**	-0.379	-1.038**
	(0.280)	(0.343)	(0.347)	(0.450)
SNNP*OC	-1.090***	-1.277***	-1.265***	-1.309***
	(0.334)	(0.369)	(0.446)	(0.402)
Addis Ababa*OC	-0.984***	-1.067***	-0.990**	-1.154***
	(0.316)	(0.315)	(0.396)	(0.403)
Wealth index		1.337***	1.257***	1.473**
		(0.518)	(0.451)	(0.669)
Child's sex, 1=male		0.272***		
		(0.084)		
Cut 1	-3.920***	-5.677**	-7.983**	-4.151
	(0.415)	(2.494)	(3.674)	(2.836)
Observations	2,765	2,463	1,316	1,147

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Ordered logit estimation with wellbeing

	Age 12				Age 15			
	(1) Baseline	(2) All controls	(3) Male	(4) Female	(5) Baseline	(6) All controls	(7) Male	(8) Female
Older cohort	-1.077***	-1.132***	-1.065***	-0.715***	-1.355***	-0.896***	-1.520***	-0.697***
	(0.159)	(0.245)	(0.267)	(0.095)	(0.255)	(0.185)	(0.244)	(0.230)
Amhara*OC	-0.061	0.368	0.359	-0.392*	0.243	0.044	0.965**	-0.309
	(0.281)	(0.511)	(0.459)	(0.212)	(0.514)	(0.317)	(0.424)	(0.601)
Oromia*OC	0.207	-0.298	0.234	-0.491**	-0.156	-0.107	0.264	-0.969**
	(0.258)	(0.376)	(0.480)	(0.229)	(0.383)	(0.303)	(0.383)	(0.382)
SNNP*OC	-0.218	-0.877*	-0.442	-0.260	-0.644	-0.349	-0.615*	-1.209*
	(0.202)	(0.502)	(0.372)	(0.175)	(0.461)	(0.269)	(0.372)	(0.685)
Addis Ababa*OC	0.443**	-0.008	0.601	0.185	0.278	0.416	0.586*	-0.663
	(0.183)	(0.346)	(0.428)	(0.161)	(0.313)	(0.265)	(0.329)	(0.490)
Wealth index		2.546***	2.879***	2.595***		2.730***	2.830***	2.332***
		(0.337)	(0.633)	(0.679)		(0.592)	(0.486)	(0.333)
Child's sex, 1=male		-0.092				-0.023		
		(0.078)				(0.095)		
Cut 1	-5.237***	-5.646***	-2.342	-1.616	-5.050***	-2.332	-5.836**	-5.725***
	(0.296)	(1.920)	(2.545)	(2.052)	(0.292)	(1.479)	(2.425)	(2.009)
Observations	2,762	2,566	1,316	1,146	2,835	2,462	1,361	1,205

Robust standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Parallel trends
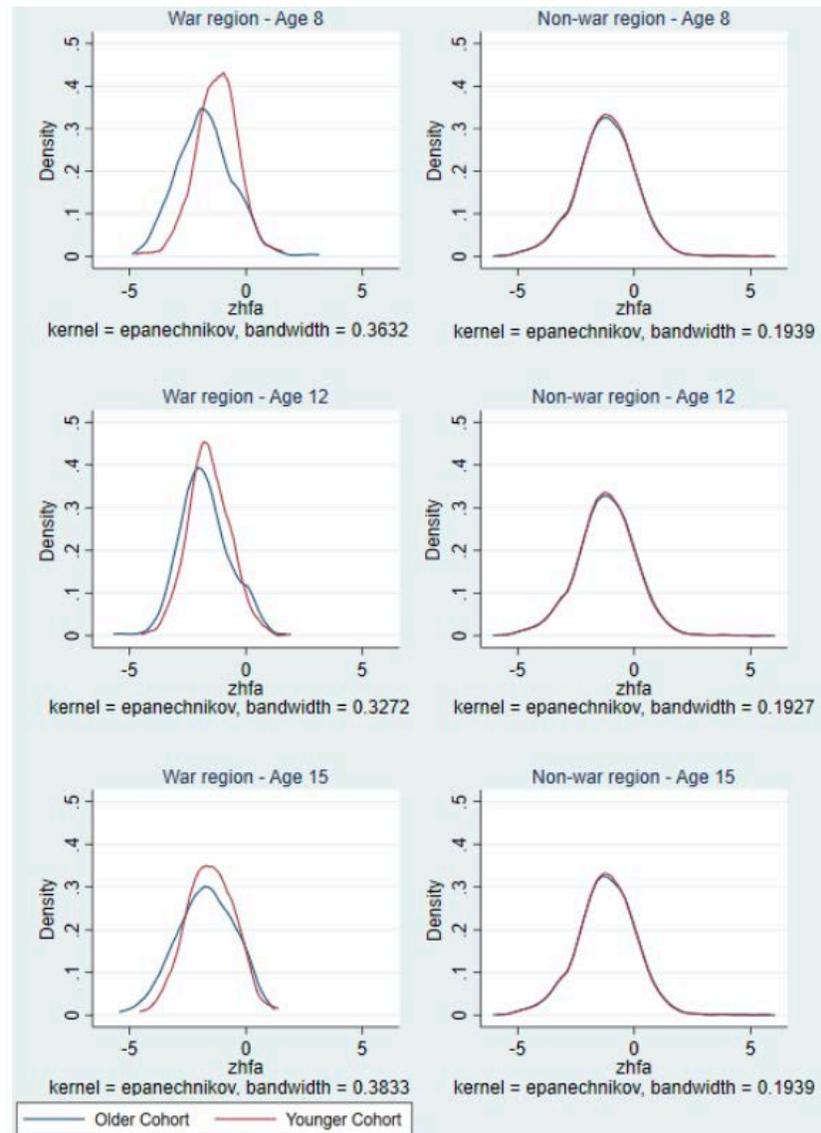
Estimations with ACLED conflict data

VARIABLES	(1) HAZ Age 8	(2) HAZ Age 12	(3) HAZ Age 15	(4) SRH Age 15	(5) WB Age 12	(6) WB Age 15
10 – 19 conflict events	-0.188	-0.045	-0.086	-1.332***	0.465	0.314
	(0.196)	(0.178)	(0.175)	(0.375)	(0.372)	(0.348)
20 – 99 conflict events	-0.021	-0.120	0.042	-0.332*	-0.212	-0.045
	(0.076)	(0.226)	(0.139)	(0.195)	(0.375)	(0.245)
100 – 599 conflict events		0.024			0.340	
		(0.203)			(0.510)	
Older cohort	-0.054	0.168**	0.008	-0.900***	-1.100***	-0.861***
	(0.116)	(0.069)	(0.107)	(0.256)	(0.209)	(0.187)
Wealth index	1.429***	1.369***	0.865***	1.585***	2.322***	2.667***
	(0.134)	(0.196)	(0.272)	(0.492)	(0.514)	(0.683)
Child's sex, 1=male	-0.117**	-0.051	-0.790***	0.253***	-0.078	-0.032
	(0.050)	(0.053)	(0.069)	(0.095)	(0.076)	(0.099)
Cut 1				-7.903***	-5.289**	-1.595
				(2.776)	(2.344)	(1.350)
Observations	2,577	2,573	2,106	2,115	2,566	2,114
R-squared	0.074	0.078	0.170	0.036	0.050	0.045
HH Characteristics	YES	YES	YES	YES	YES	YES

Robust standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.
Data Source: Woldehanna et al., 2002 – 2018 and Raleigh et al., 2019.

Estimations accounting for migration

VARIABLES	(1) HAZ Age 8	(2) HAZ Age 12	(3) HAZ Age 15	(4) SRH Age 15	(5) WB Age 12	(6) WB Age 15
Older cohort	-0.497***	-0.077	-0.194**	0.292	-1.126***	-0.864***
	(0.146)	(0.086)	(0.070)	(0.266)	(0.213)	(0.181)
Amhara*OC	0.082	0.061	0.142	-0.773***	0.393	0.019
	(0.221)	(0.139)	(0.097)	(0.278)	(0.541)	(0.306)
Oromia*OC	0.479**	0.304**	0.345**	-0.709*	-0.247	-0.146
	(0.228)	(0.143)	(0.128)	(0.390)	(0.335)	(0.290)
SNNP*OC	0.637***	0.429	0.150	-1.313***	-0.904*	-0.427
	(0.218)	(0.296)	(0.155)	(0.400)	(0.497)	(0.274)
Addis Ababa*OC	0.346	0.295**	0.334	-0.867***	-0.008	0.304
	(0.407)	(0.122)	(0.222)	(0.319)	(0.299)	(0.269)
Wealth index	1.316***	1.217***	0.667***	1.274**	2.336***	2.691***
	(0.192)	(0.160)	(0.232)	(0.551)	(0.356)	(0.661)
Child's sex, 1=male	-0.110*	-0.052	-0.791***	0.296***	-0.091	0.005
	(0.055)	(0.058)	(0.066)	(0.087)	(0.074)	(0.098)
Cut 1				-5.295**	-5.501***	-2.479
				(2.220)	(1.890)	(1.711)
Observations	2,296	2,293	2,198	2,205	2,288	2,204

Robust standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Estimations with mortality controls

VARIABLES	(1) HAZ Age 8	(2) HAZ Age 12	(3) HAZ Age 15	(4) SRH Age 15	(5) WB Age 12	(6) WB Age 15
Older cohort	-0.407**	-0.014	-0.145**	0.286	-1.121***	-0.884***
	(0.149)	(0.065)	(0.057)	(0.254)	(0.245)	(0.187)
Amhara*OC	0.019	-0.004	0.106	-0.639**	0.367	0.051
	(0.216)	(0.121)	(0.083)	(0.279)	(0.510)	(0.321)
Oromia*OC	0.432*	0.300**	0.322***	-0.672**	-0.294	-0.100
	(0.221)	(0.129)	(0.095)	(0.342)	(0.375)	(0.305)
SNNP*OC	0.570**	0.371	0.093	-1.277***	-0.863*	-0.333
	(0.225)	(0.286)	(0.158)	(0.370)	(0.498)	(0.271)
Addis Ababa*OC	0.282	0.206*	0.259	-1.067***	-0.003	0.425
	(0.376)	(0.101)	(0.200)	(0.315)	(0.342)	(0.268)
Wealth index	1.339***	1.150***	0.718***	1.337***	2.520***	2.685***
	(0.147)	(0.179)	(0.211)	(0.516)	(0.338)	(0.597)
Child's sex, 1=male	-0.058	-0.005	0.020	-0.003	-0.108	-0.223**
	(0.049)	(0.045)	(0.053)	(0.089)	(0.109)	(0.104)
Deceased siblings, 1=deceased	-0.058	-0.005	0.020	-0.003	-0.108	-0.223**
	(0.049)	(0.045)	(0.053)	(0.089)	(0.109)	(0.104)
Cut 1	-0.116**	-0.042	-0.786***	0.272***	-0.090	-0.022
	(0.052)	(0.054)	(0.065)	(0.084)	(0.077)	(0.097)
Observations	2,576	2,572	2,454	2,463	2,565	2,462

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Estimations with food insecurity controls

VARIABLES	(1) HAZ Age 15	(2) SRH Age 15	(3) WB Age 15
Older cohort	-0.120*	0.316	-0.876***
	(0.069)	(0.228)	(0.212)
Amhara*OC	0.078	-0.696***	-0.022
	(0.091)	(0.241)	(0.313)
Oromia*OC	0.284***	-0.729**	-0.233
	(0.099)	(0.314)	(0.319)
SNNP*OC	0.105	-1.216***	-0.217
	(0.158)	(0.324)	(0.261)
Addis Ababa*OC	0.247	-1.080***	0.416
	(0.192)	(0.297)	(0.256)
Wealth index	0.623**	1.040**	2.025***
	(0.236)	(0.513)	(0.590)
Child's sex, 1=male	-0.788***	0.268***	-0.043
	(0.065)	(0.085)	(0.095)
2, we eat enough but not always what we would like	0.018	-0.210	-0.712***
	(0.054)	(0.261)	(0.175)
3, we sometimes do not eat enough	-0.071	-0.379	-1.123***
	(0.057)	(0.273)	(0.216)
4, we frequently do not eat enough	-0.319***	-1.125***	-1.926***
	(0.101)	(0.304)	(0.296)
Cut1		-5.863**	-2.895*
		(2.545)	(1.540)
Observations	2,454	2,463	2,462

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.