
Trends in socio-economic disparities in a rapid under-five mortality transition? Findings from a longitudinal study in rural Tanzania

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Background (1)

- Evidence is emerging that
 - SSA is reducing the disparity in the childhood mortality levels observed in regions of the world.
 - MDG4 progress has yet to show that equity improves as a consequence of mortality decline
- social, demographic and residential disparities in under-five mortality remain high in most developing countries



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Background (2)

- However, less is known about the interaction of these socio-economic disparities with mortality decline
- Tanzania DHS: U5MR declined by 40 percent between 1992-1996 and 2006-2010



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Aims

- Document a mortality transition in rural Tanzania
- Elucidate its covariates as the decline progressed



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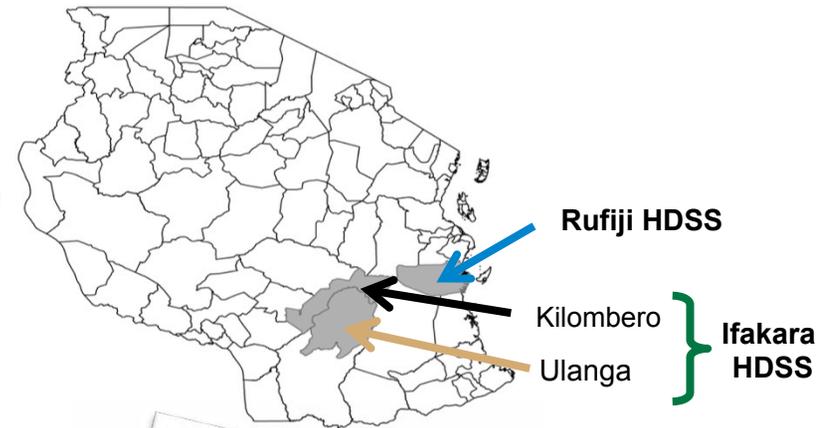


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Methods (1)

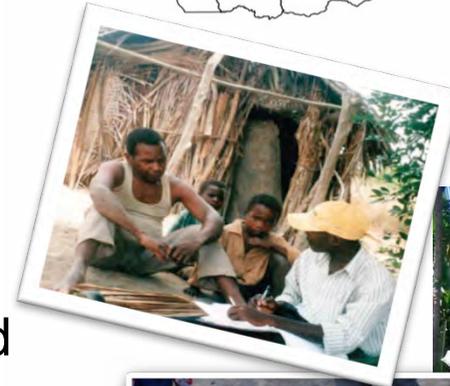
■ Settings

- 2011: 58 villages, 190,000 individuals
 - Rufiji (33), Ifakara (25)



■ Data Collection

- Ifakara (1996) Rufiji (1998)
 - 3 rounds/year till 2013
 - Pregnancies, births, deaths and causes, migrations,...
 - Social and economic indicator data (education, occupation and household wealth, SES)



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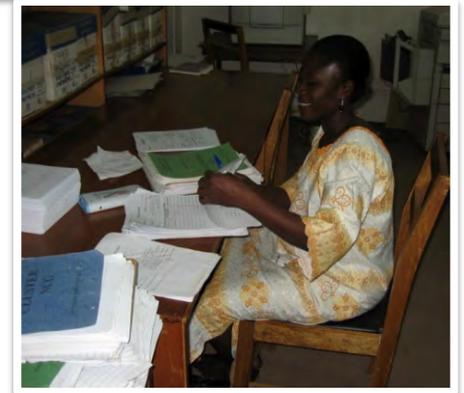


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Methods (2)

■ Data Analysis

- Period: 2000-2011
- Variable definitions
 - Child (gender, birth order)
 - Mother (age, education attainment)
 - Household (wealth quintile)
- Model
 - Kaplan-Meier analysis
 - Cox regression analysis
 - *Efron method*
 - *Interaction between time and variables of interest*



Results



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Population repartition: 2000-2011

Variable	Category	# of children	Ifakara (%)	Rufiji (%)
<i>Overall</i>		140,162	55.7	44.3
Sex of child	Boy	69,953	50.0	49.9
	Girl	70,209	50.0	50.1
Group age of mother (year)	Under 20	38,464	27.9	26.9
	20-34	83,765	60.7	58.7
	35 and plus	17,933	11.5	14.5
Education attainment of mother	No education	56,333	35.2	46.5
	Primary incomplete	20,486	14.6	14.6
	Primary complete	59,038	47.8	35.0
	Secondary and plus	4,305	2.4	3.9
Socioeconomic (SES) of household (Wealth quintile)	First quintile (Poor)	25,084	20.4	17.9
	Second	25,536	20.0	19.2
	Third (Middle)	28,299	21.5	22.1
	Fourth	26,970	19.7	22.1
	Fifth (Least poor)	24,125	18.5	18.7



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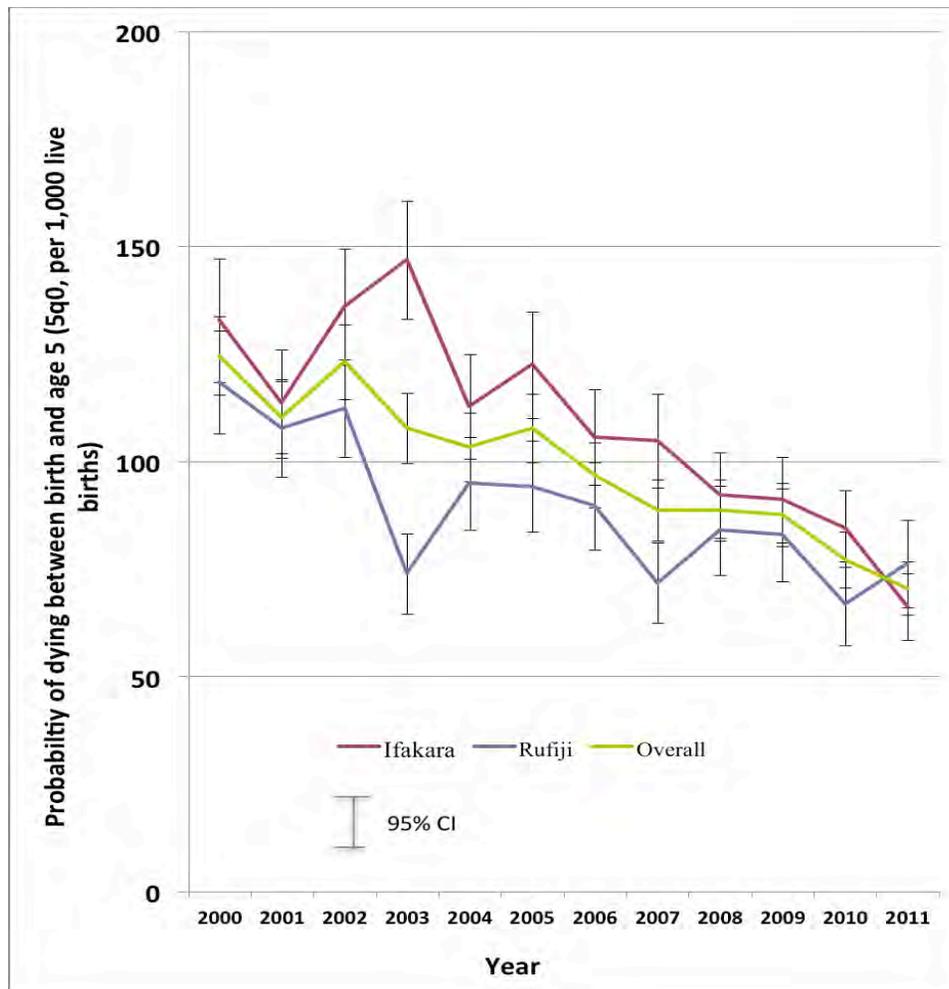


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Under 5 Mortality Rates trends



- 43% in 2000-2011
 - Reduction greater in Ifakara with 50% compared to Rufiji 36%
- Annual rate decrease initially low at 2.2% 2000-2005, then acceleration over the next six years at 4.5%



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Cox model without interactions

Variable	Type	Ifakara	Rufiji
		HR	HR
Education attainment of mother	No education	1.31*	1.29*
	Primary Incomplete	1.56***	1.27*
	Primary complete	1.26*	1.15
	Secondary and plus	<i>Ref.</i>	<i>Ref.</i>
Socioeconomic (SES) of household (Wealth quintile)	First quintile (Poor)	1.23***	1.32***
	Second	1.06	1.18**
	Third (Middle)	1.02	1.08
	Fourth	1.04	1.13*
	Fifth (Least poor)	<i>Ref.</i>	<i>Ref.</i>
Time ^(a)	2-year period	0.90***	0.93*

(a) We used 2-year period averages to stabilize rates differentials due to few numbers of child deaths in some years.

(b) Controlled for sex and birth order of the child and group of age of the mother

*** p<0.001; ** p<0.01; *p<0.05



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Cox model with interactions

Variable	Type	Ifakara	Rufiji
		HR	HR
SES of household*Time	Poor*Time	0.98	1.04[#]
	Second*Time	0.97[*]	1.04[*]
	Middle*Time	0.99	1.04^{**}
	Fourth*Time	1.00	1.02[#]
	Least Poor*Time	<i>Ref.</i>	<i>Ref.</i>
Education of mother* Time	No education*Time	0.97	0.93
	Primary incomp.*Time	0.99	0.97
	Primary compl.*Time	0.99	0.99
	Secondary&plus*Time	<i>Ref.</i>	<i>Ref.</i>

(a) We used 2-year period averages to stabilize rates differentials due to few numbers of child deaths in some years.

(b) Controlled for sex and birth order of the child and group of age of the mother

*** p<0.001; ** p<0.01; *p<0.05; # p<0.10



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Cox model with interactions

Variable	Type	Ifakara	Rufiji
		β	β
SES of household*Time	Poor*Time	-0.02	0.04[#]
	Second*Time	-0.03*	0.04*
	Middle*Time	-0.01	0.04**
	Fourth*Time	-0.00	0.02[#]
	Least Poor*Time	<i>Ref.</i>	<i>Ref.</i>
Education of mother* Time	No education*Time	-0.04	-0.07
	Primary incomp.*Time	-0.01	-0.03
	Primary compl.*Time	-0.01	-0.01
	Secondary&plus*Time	<i>Ref.</i>	<i>Ref.</i>

(a) We used 2-year period averages to stabilize rates differentials due to few numbers of child deaths in some years.

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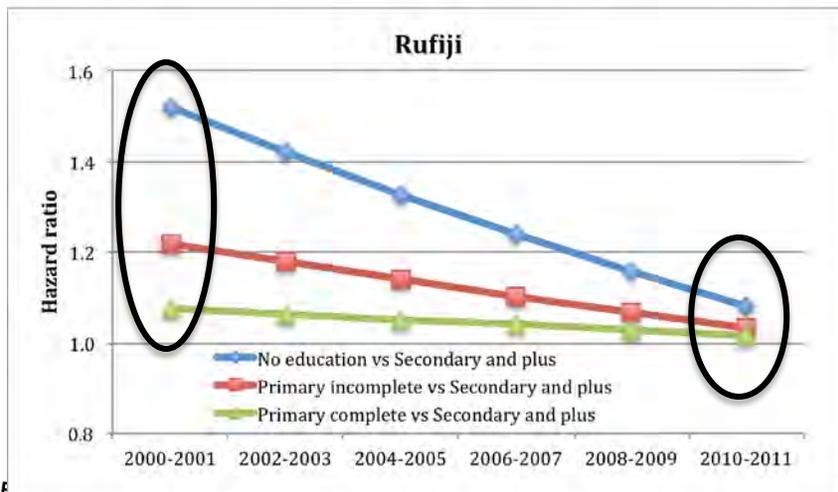
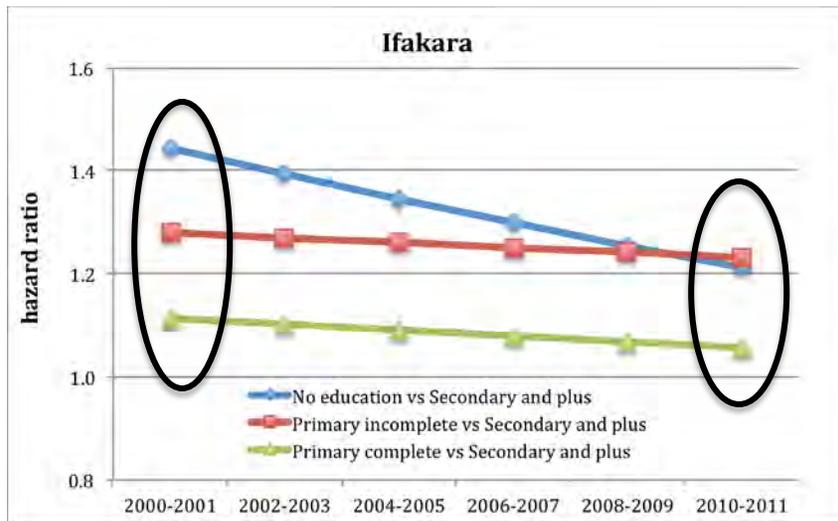


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Lincom Mother Education



- Mortality disparities reduced over time

- The mortality HR in 2000-2001 was high for children of uneducated mothers

- Ifakara: HR=1.44 [0.92-2.27]

- Rufiji: HR=1.52 [1.05-2.21]

- 2010-2011, it was only

- 1.21 [0.81-1.82] for Ifakara

- 1.08 [0.74-1.58] for Rufiji.



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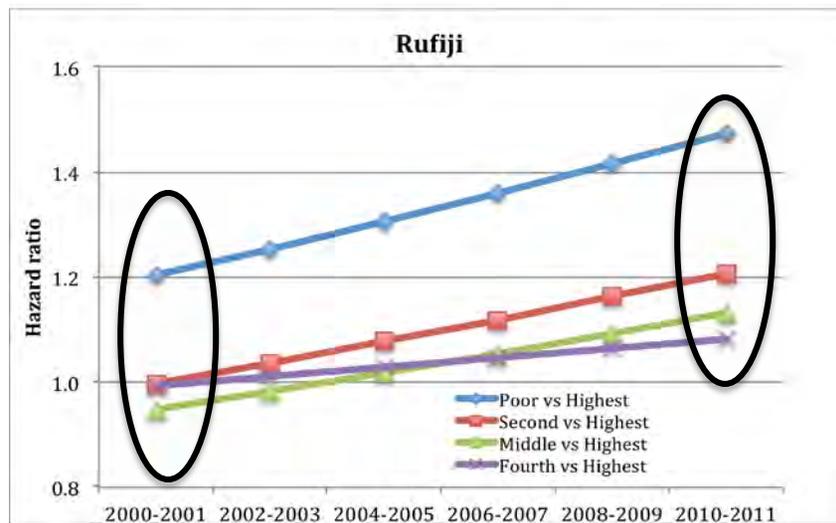
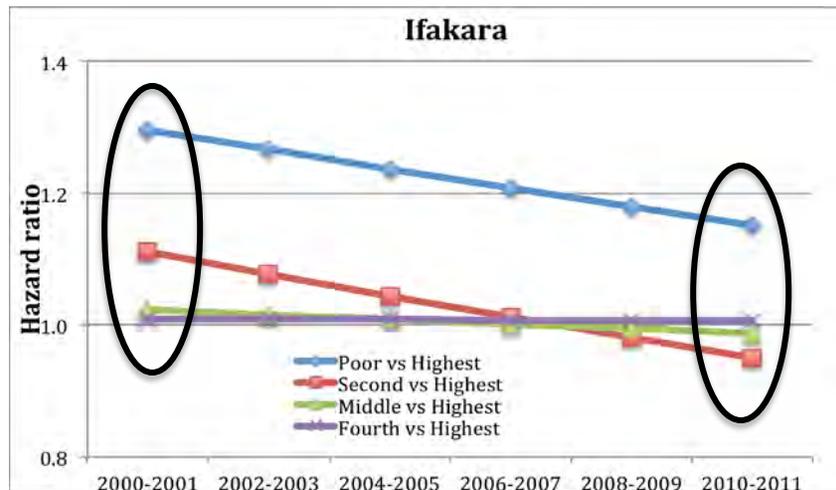


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Lincom household SES



- Mortality disparities worsened in Rufiji and narrowed slightly in Ifakara.
 - Rufiji, the mortality HR
 - 2000-2001: 1.20 times high [0.99-1.47] for children living in poor households
 - 2010-2011: 1.48 times higher [1.15-1.89].
 - in Ifakara
 - 2000-2001: 1.30 [1.09-1.55]
 - 2010-2011: 1.15 [0.95-1.39]



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Discussion

- Findings demonstrate three characteristics of childhood mortality levels and trends:
 - The pronounced **decline in U5MR**
 - The prevailing covariates remain **significant differentials** despite the U5M decline
 - Indicators of social and economic disparities **not significantly narrowed**, despite the progress with mortality transition.



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Limitations

- Household economic data in Rufiji collected only for 2000, 2004 and every year since 2007
- Not control for possible confounding factors
 - Birth type
 - Marital status
 - Geographic remoteness



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Conclusion

- Tanzania is on target to achieve MDG 4
- Evidence suggests that the longstanding equity problems persist despite progress that is being achieved
- Policies and health programs not only to reduce mortality, but also targeted on offsetting social and economic disparities



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Asanteni Sana



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