

# Low social economic status is associated with higher cardiovascular mortality in a country of the African region

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## Background

- Low socioeconomic status (SES) is consistently associated with higher mortality in high income countries.
- This association remains largely unexplored in low and middle income countries (LMIC), largely because of limited availability of reliable mortality data.
- The few studies examining social differences in mortality in LMICs have generally found higher mortality in low SES groups, but some studies found a positive SES gradient.
- **This study explores SES differences in overall and cardiovascular mortality in the Seychelles, a rapidly developing small island state in the African region.**

## Methods

- Three independent population-based examination surveys of persons aged 25-64 conducted with n=1081 participants (86% participation) in 1989; n=1067 (87%) in 1994; and n=1255 (80%) in 2004. Total: 1585 men and 1818 women and 3246 with complete data.
- Vital status of all participants ascertained by linkage with deaths registry in 1989-2012. All deaths are medically certified with certificates as recommended by WHO.
- SES measured by current or last occupation, with similar questions in 3 surveys, summarized along 3 categories "professionals and skilled non manuals", "semi-skilled non-manuals and skilled/semi-skilled manuals" and "unskilled manuals, non-qualified".
- Smoking:  $\geq 1$  cig. per day; heavy drinking:  $>75$ g ethanol per day; obesity: BMI  $\geq 30$  kg/m<sup>2</sup>; diabetes: fasting BG  $\geq 7.0$  mmol/l (126 mg/dl) (1989, 2004) or glycosuria or Hx of diabetes (1994); hypertension: BP  $\geq 140/90$  mmHg or Rx; high cholesterol: total cholesterol  $\geq 6.2$  mmol/l (240 mg/dl).
- Associations between mortality, SES and risk factors using Cox proportional regression with age as the time scale.

## Results

Figure. Survival probability from the age of 25 years by socioeconomic category

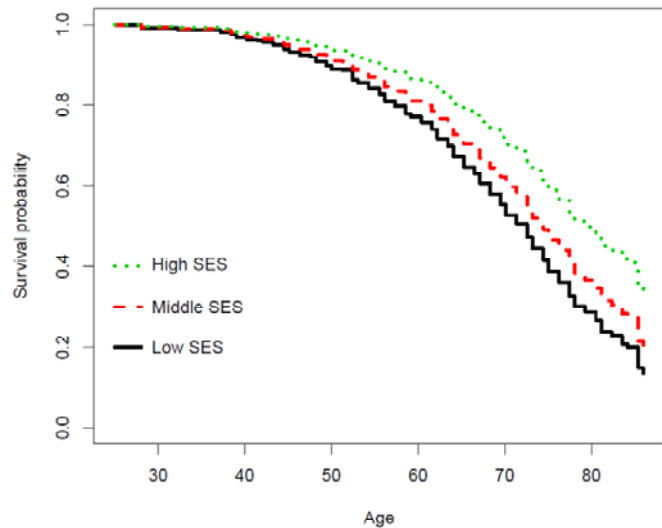


Table. Socioeconomic differences in all-cause and cardiovascular mortality and contribution of modifiable risk factors

	SOCIOECONOMIC STATUS				
	High	Middle	% Δ	Low	% Δ
	HR (95% CI)	HR (95% CI)		HR (95% CI)	
<b>ALL-CAUSE MORTALITY</b>					
Model 1 <sup>a</sup>	1.00	1.45 (1.00-2.10)		1.80 (1.24-2.62)	
Model 1 + smoking	1.00	1.37 (0.94-1.99)	-15	1.64 (1.13-2.39)	-16
Model 1 + heavy drinking	1.00	1.41 (0.97-2.05)	-7	1.68 (1.16-2.44)	-12
Model 1 + obesity	1.00	1.43 (0.94-2.08)	-4	1.81 (1.24-2.62)	0
Model 1 + diabetes	1.00	1.44 (0.99-2.09)	-2	1.83 (1.26-2.66)	3
Model 1 + hypertension	1.00	1.43 (0.99-2.08)	-3	1.81 (1.25-2.63)	1
Model 1 + high cholesterol <sup>b</sup>	1.00	1.45 (1.00-2.10)	0	1.79 (1.23-2.60)	-1
Model 1 + all risk factors	1.00	1.30 (0.89-1.89)	-30	1.57 (1.08-2.28)	-24
<b>CARDIOVASCULAR MORTALITY</b>					
Model 1 <sup>a</sup>	1.00	1.66 (0.88-3.11)		1.95 (1.04-3.65)	
Model 1 + smoking	1.00	1.62 (0.86-3.04)	-5	1.87 (1.00-3.51)	-6
Model 1 + heavy drinking	1.00	1.65 (0.88-3.09)	-2	1.91 (1.02-3.58)	-3
Model 1 + obesity	1.00	1.58 (0.84-3.08)	-10	1.95 (1.04-3.65)	0
Model 1 + diabetes	1.00	1.64 (0.84-2.97)	-2	1.99 (1.07-3.73)	3
Model 1 + hypertension	1.00	1.62 (0.87-3.12)	-4	1.98 (1.05-3.69)	2
Model 1 + high cholesterol	1.00	1.66 (1.00-2.10)	1	1.97 (1.03-3.60)	2
Model 1 + all risk factors	1.00	1.47 (0.78-2.77)	-23	1.82 (0.97-3.42)	-11

CI: Confidence Interval; HR: Hazard ratio; SES: Socioeconomic status; Δ: Difference  
<sup>a</sup> Sex- and year of birth-adjusted.

During a mean follow-up of 15.0 years (range: 0-23 years), 523 participants died (overall mortality rate 10.8 per 1000 person-years). The main causes of death were cardiovascular disease (219 deaths) and cancer (142 deaths). Mortality was larger for all cause mortality (HR=1.80; 95%CI: 1.24-2.62) and CVD mortality (HR=1.95; 1.04-3.65) in low vs. high SES participants. Lifestyle-related risk factors (smoking, drinking, obesity, diabetes, hypertension, hypercholesterolemia) explained a small proportion of associations between SES and all-cause/CVD mortality. A limitation is that risk factors were measured only once at baseline.

## Conclusion

Low SES (measured by occupational position) was strongly associated with overall and CVD mortality in a country of the African region. Our findings support the view that the burden of NCDs may disproportionately affect people of low SES in LMICs.