

Declining Stroke and Myocardial Infarction Mortality Between 1989 and 2010 in a Country of the African Region

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Background and aim of study

- In LMICs, CVD burden predicted to increase due to aging populations and “expected detrimental lifestyle changes”
 - Few data available on CVD mortality in LMICs because of lack of vital statistics, census data or otherwise reliable information.
 - **No population-based data on CVD trends in the African region.**
- **Aim of study: to examine trends in crude & age-standardized mortality for stroke and MI in Seychelles between 1989-2010**
- Emphasis on stroke/MI that can be ascertained with minimal investigations & reporting likely reliable in 1989-2010.

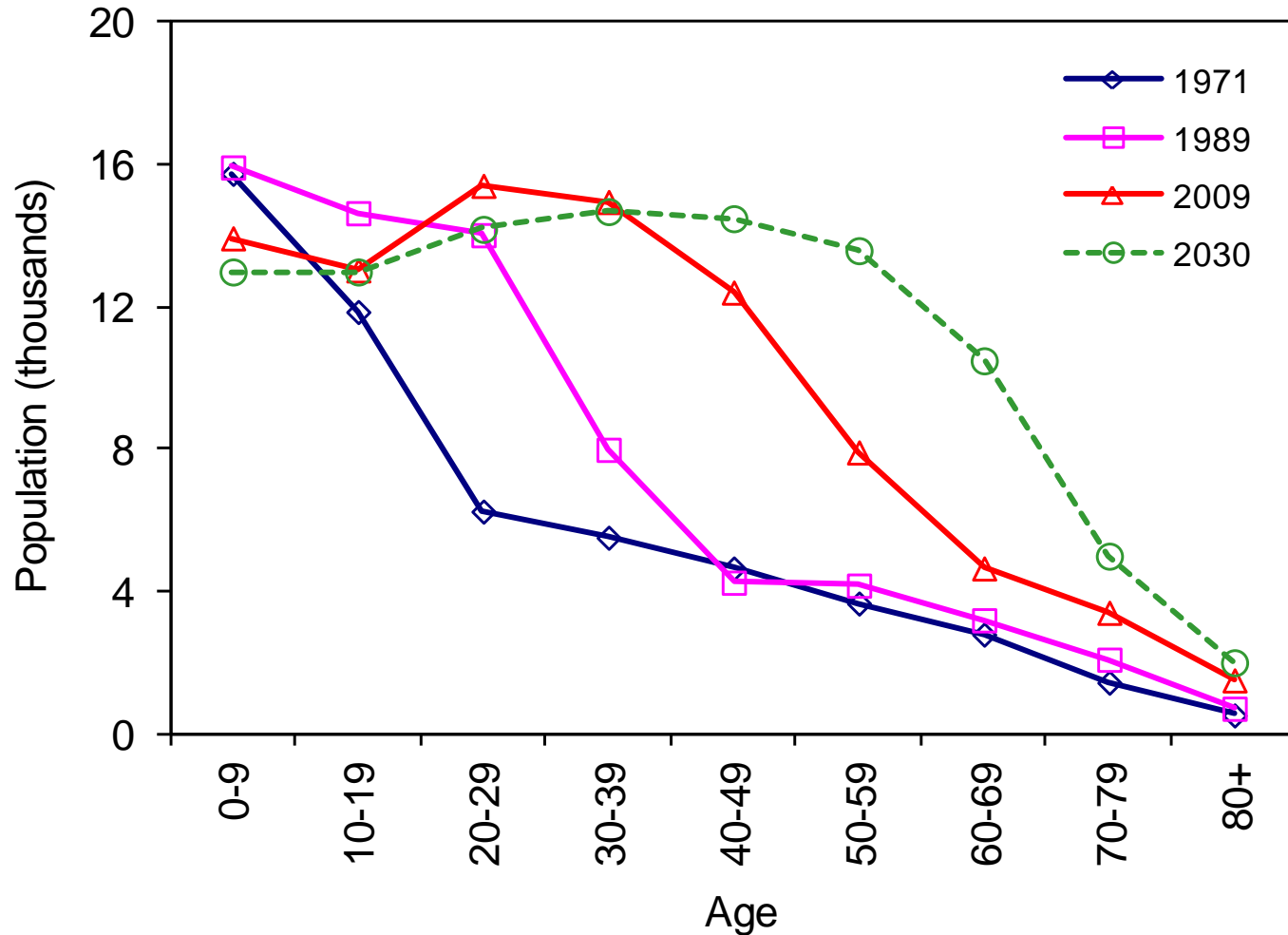
Settings

- East Africa, population of 86'000, mainly on 3 islands
- Population mostly of African descent
- GDP/cap US\$ 700 in 1970s to 8'000 in 2010
- Industrial fishing, tourism and services



- Population data from censuses
- All deaths medically certified (vital statistics)
- National health system (free health care to all inhabitants)

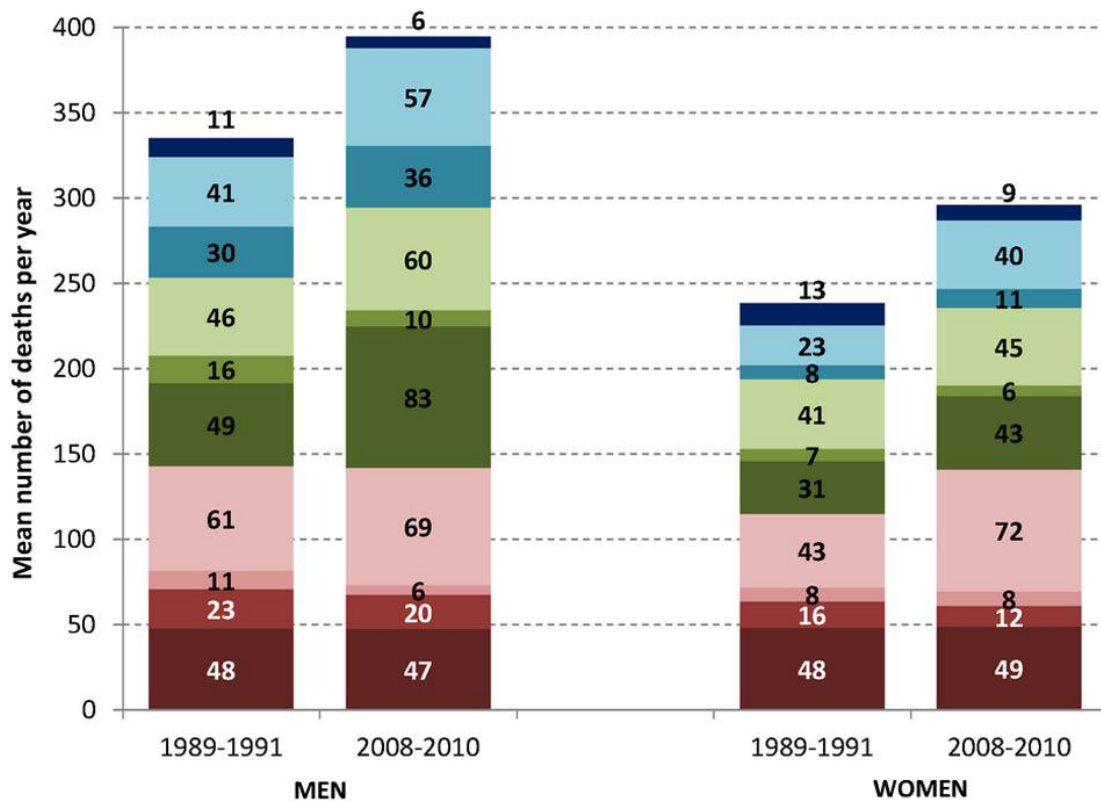
Rapid demographic transition in Seychelles



Methods

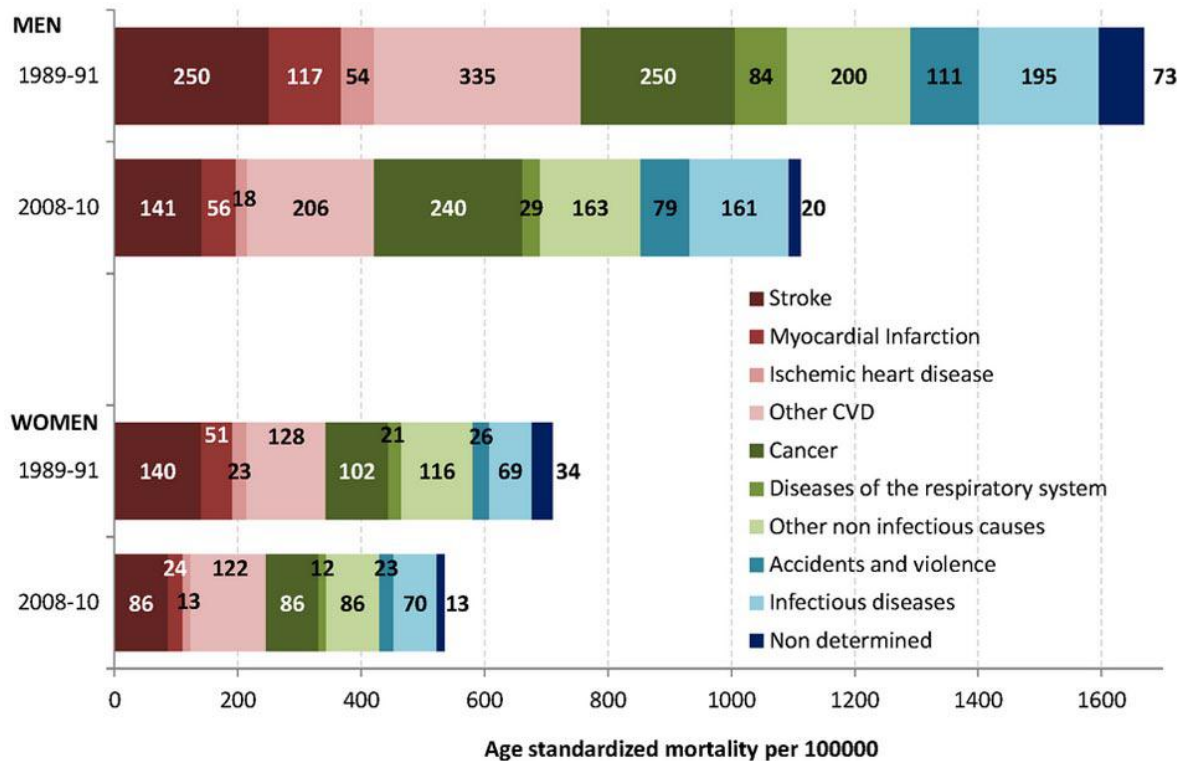
- All **original** death certificates in 1989-2010 (n=13'163) were reviewed and re-coded manually according to ICD-10.
- Deaths certificates are not validated (i.e. sequence appears as written by certifying doctors): stroke and MI considered as causes of death if diagnosis appears **in any of 4 fields** for immediate, intermediate, underlying, and contributory causes of death.
- Yearly distribution of population by age and sex available.
- Age-, sex-, and year-specific mortality rates calculated for each cause of death and directly standardized to the WHO 2001 standard population.
- Secular trends in mortality rates were also analyzed using Poisson regression.

Absolute number of deaths in 1989-91 and 2008-10



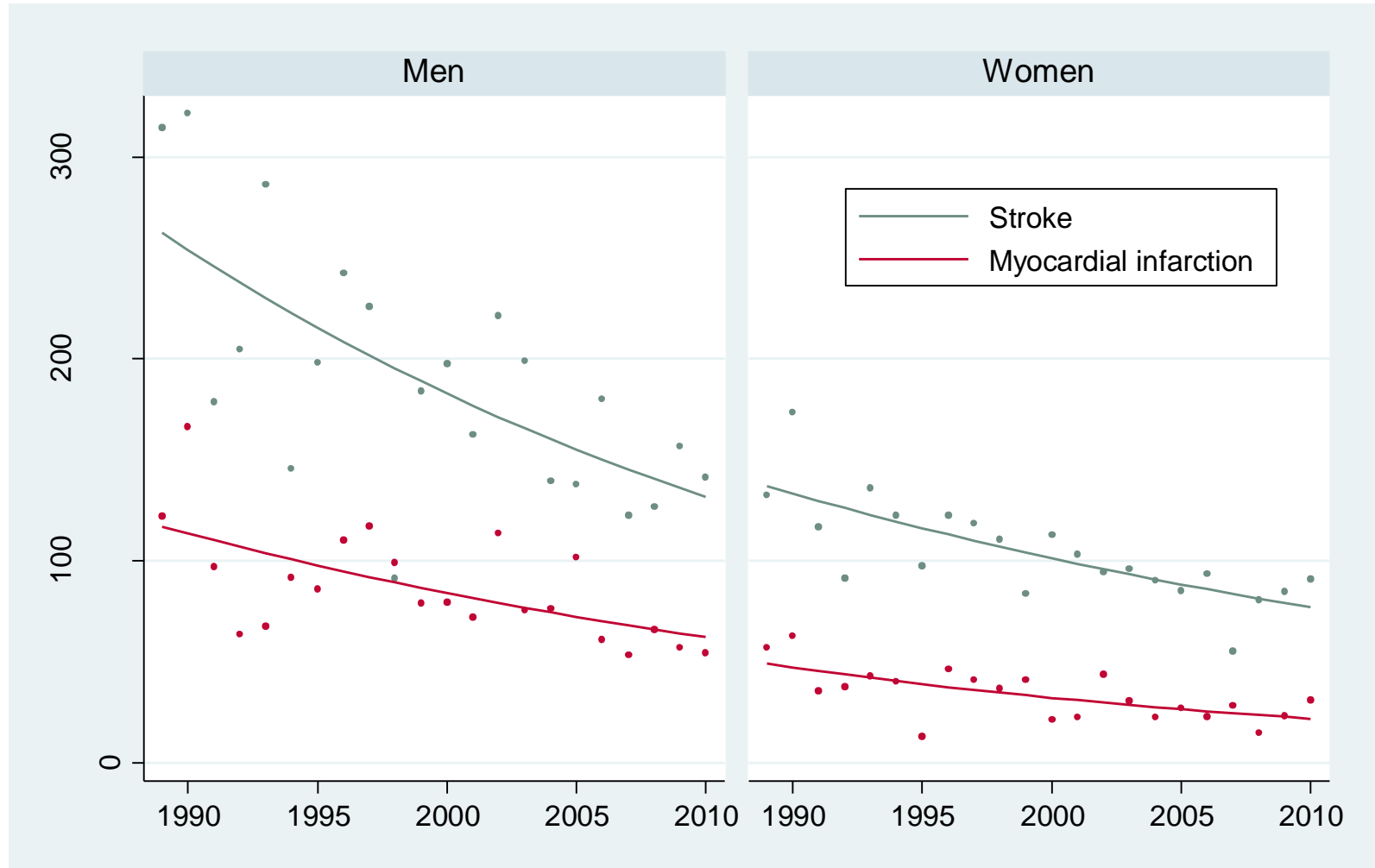
- Total number of deaths increased by 18% in men and by 24% in women.
- Number of CVD deaths increased by 10%.
- Absolute number of stroke and MI deaths did not increase over time.

Age-standardized mortality rates in 1989-91 and 2008-10



- All-cause mortality decreased by 33% in men and by 25% in women.
- CVD mortality decreased by 44% in men and 28% in women.
- Stroke mortality decreased by 44% in men and 39% in women.
- MI mortality decreased by 50% in men and by 53% in women.

Trends in age-standardized stroke and MI mortality between 1989-91 and 2008-10



Change in age-standardized mortality between 1989-91 and in 2008-10

Cause of death	Men				Women			
	1989-91	2008-10	Total change	Yearly change	1989-91	2008-10	Total change	Yearly change
All causes	1669	1113	-33%	-2.4%	710	535	-25%	-1.0%
Stroke	250	141	-44%	-3.3%	140	86	-39%	-2.7%
MI	117	59	-50%	-3.0%	51	24	-53%	-3.8%

Stroke and MI mortality decreased more than all-cause mortality

Change in age-standardized mortality between 1989-91 and in 2008-10, by age category

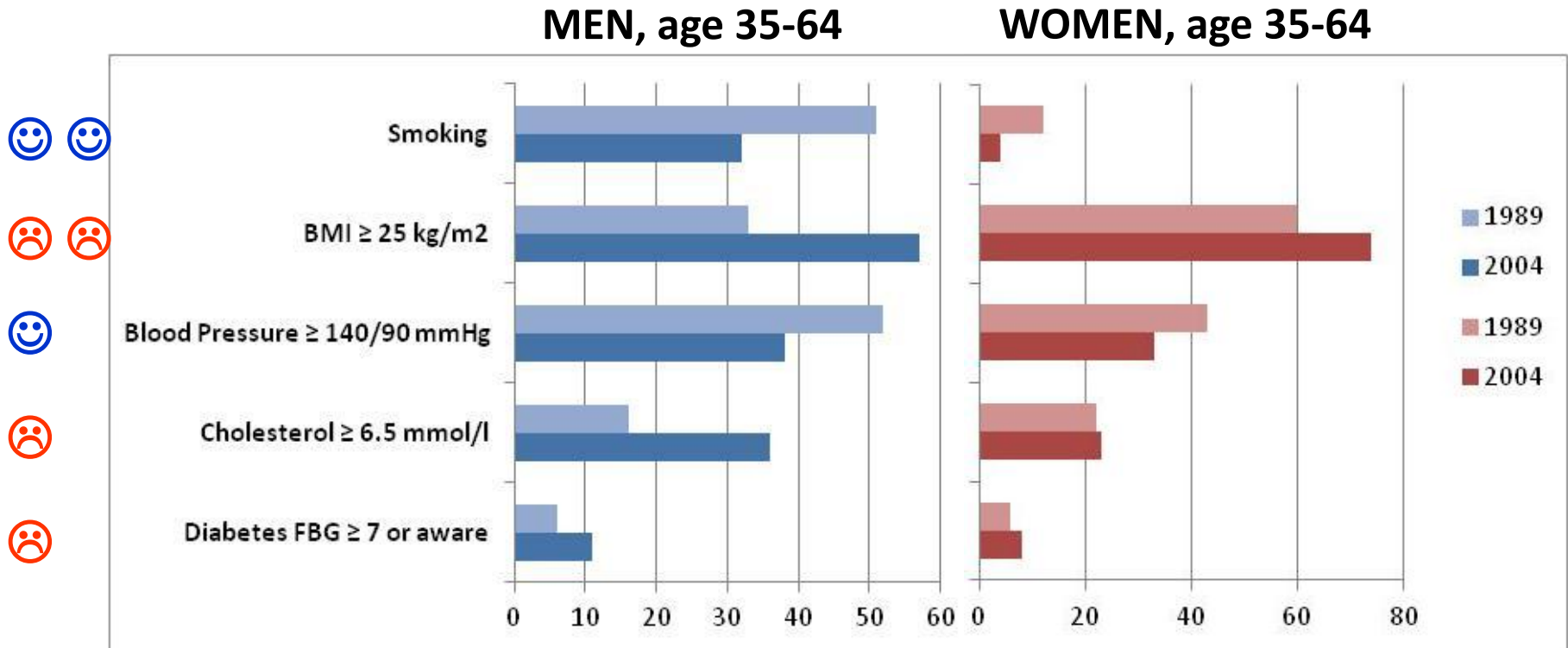
Cause of death	Age	Men				Women			
		1989-91	2008-10	Total change	Yearly change	1989-91	2008-10	Total change	Yearly change
Stroke	<55	22	20	-1%	0.1%	16	13	-2%	-1.0%
	55-75	102	59	-42%	-3.2%	50	25	-50%	-4.1%
	>75	126	63	-50%	-4.5%	75	48	-36%	-2.2%
MI	<55	17	7	-60%	-2.9%	8	5	-37%	-4.3%
	55-75	70	30	-57%	-3.7%	27	11	-24%	-4.2%
	>75	30	21	-30%	-1.9%	15	8	-47%	-3.1%
Other CVD	<55	77	28	-64%	-6.1%	21	14	-33%	-1.1%
	55-75	116	83	-28%	-1.5%	49	37	-67%	-0.3%
	>75	189	111	-41%	-4.6%	78	85	10%	0.8%

Stroke and MI mortality decreased in all age categories

Discussion

- Decline in stroke and MI compatible with substantial decrease of all-cause mortality in Seychelles (likely occurring in most LMICs)
- Yet steeper than overall mortality decline
- Comparable with data from other middle income of similar GDP as Seychelles (e.g. Brazil, Argentina)

Discussion



- *Arterioscl & Thrombosis* 1991;11:1730-36
- *BMC Public Health* 2006;6:9
- *Cardiovasc Diab* 2009, 8:34

Discussion

- Improved living conditions (reduced age-adjusted all-cause mortality)
- National health care system did not change markedly, but possibly some role of larger use of medication (likely modest)
- Population levels of risk factors:
 - BP decreased slightly (including in children)
 - Smoking decreased largely (programs, legislation)
 - Cholesterol, obesity and DM increased
 - Diet: staple diet of rice and fish (~6 g salt/day), but diet increasingly diverse
- National CVD/NCD program since 1989: high awareness of CVD, programs, policies (tobacco)

Conclusions

- **Seychelles provide a good case study in a LMIC: complete vital statistics and population census data**
- **Sharp decline in age-standardized stroke and MI mortality during the past two decades in Seychelles**
- **Decline in CVD is steeper than decline in all-cause mortality**
- **Changes in conventional risk factors explain only part of decline; limited tertiary care; supporting health policies**
- **Favorable role of overall socio-economic development**
- **Suggests that peak of CVD mortality has already occurred in Seychelles and country is in advanced stage of epi transition**
- **Epidemiological transition in LMICs, at least in some MICs and/or in small island states, may progress more rapidly than initially thought**

Thank you for your attention