The power of self-rated health for predicting mortality in Canada and the United States

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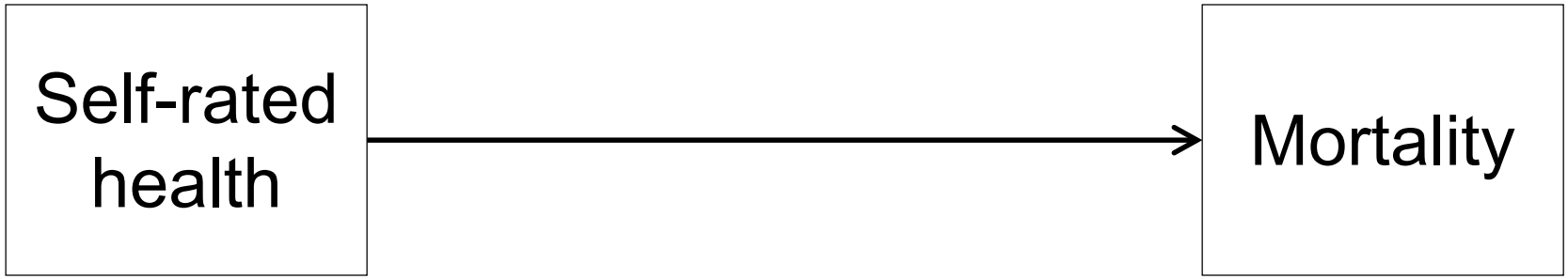
Self-Rated Health

How would you rate your general state of health?

1. Poor
2. Fair
3. Good
4. Very good
5. Excellent

Self-Rated Health has a *predictive power* for mortality



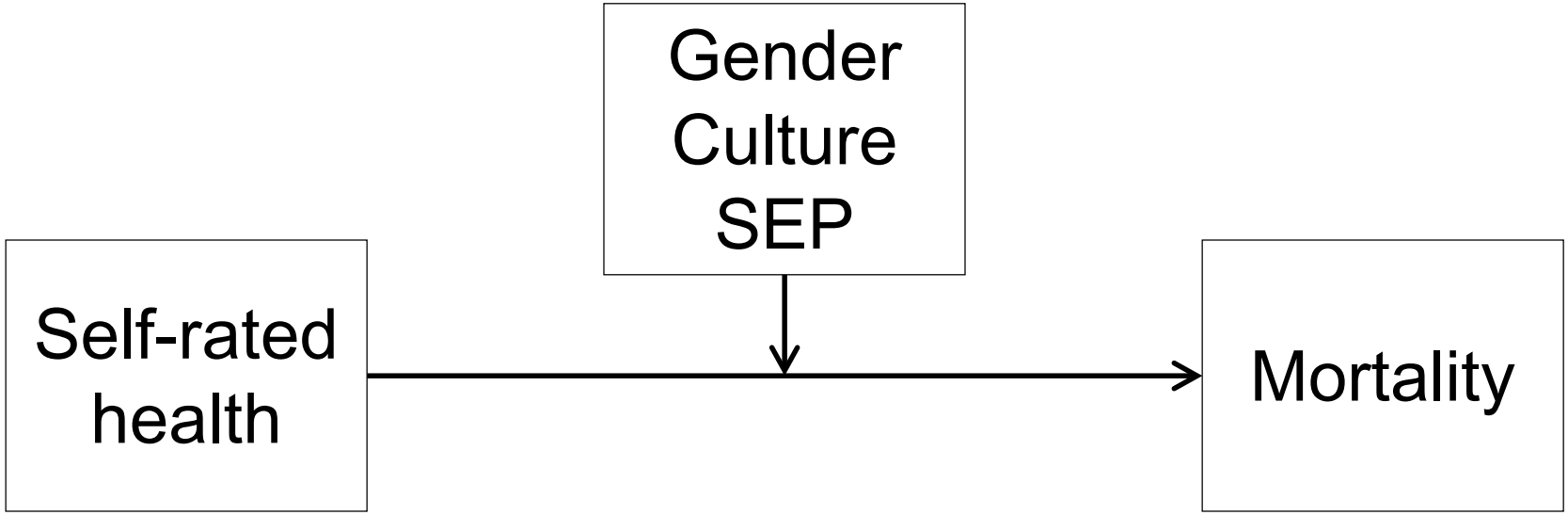
(Idler & Benyamini, 1997)
(Stenholm et al., 2014)

Individual determinants of predictive power

- Use of health care
- Human capital

(Blackwell, Martinez, Gentleman, Sanmartin, & Berthelot, 2009)
(Falconer & Quesnel-Vallée, 2014)

Predictive power is moderated by social covariates



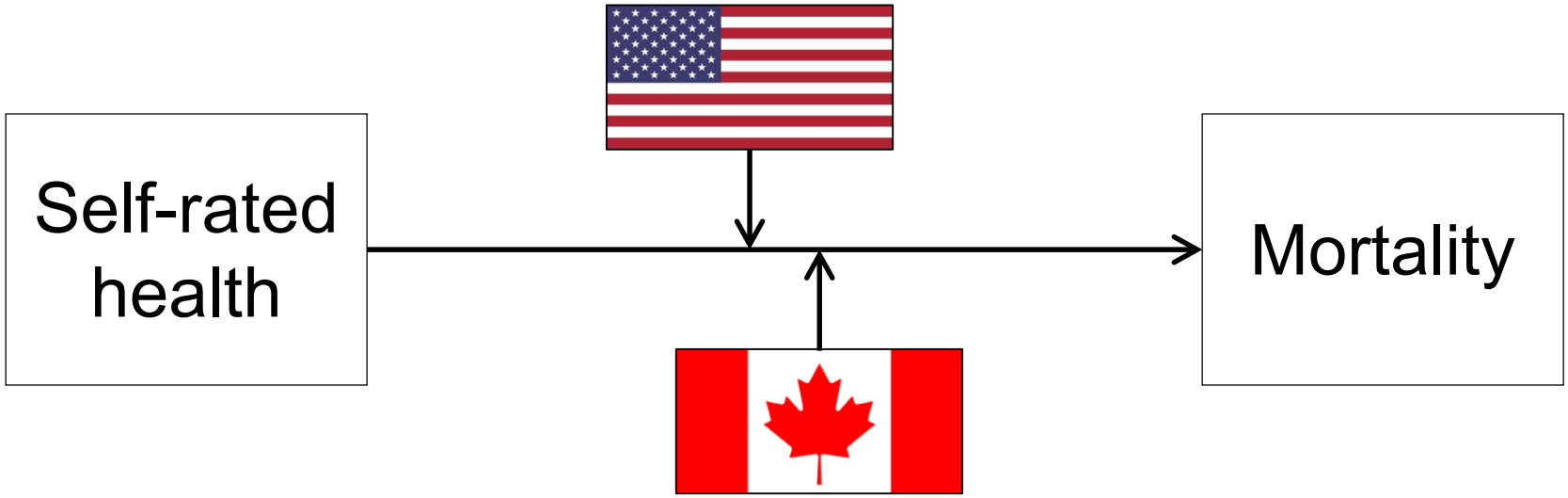
(Case & Paxson, 2005)
(Deeg & Kriegsman, 2003)
(Burström & Fredlund, 2001)
(Van Doorslaer & Gerdtham, 2003)
(Quesnel-Vallée, 2007)
(Sen, 2002)

Social determinants of predictive power

- Socioeconomic stratification
- Poverty rate

(Conference Board of Canada, 2013)
(Congressional Budget Office, 2013)
(Statistics Canada, 2015)

Predictive power varies cross-nationally



(Beckfield, Olafsdottir, & Bakhtiari, 2013)
(Jürges, 2007)
(McDonough, Worts, & Sacker, 2010)
(Salomon, 2004)

Hypotheses

H1: Canadians will report better self-rated health than Americans

H2: Canadian self-rated health will be a better predictor of mortality

Data sources

	HRS	NPHS
Period	1992—2010	1994—2010
Frequency	Biennial	
SRH Measure	Poor, Fair → Poor Health Good, Very Good, Excellent → Good Health	
Mortality Measure	Linked to mortality register in national vital statistics database	
Control variables	Age, Sex, Income, Education, Race, Marital status, Health behaviors, Diagnosed diseases	
Cases / Controls	6,618 / 10,225	1,537 / 2,633

Control variables

Sociodemographic	Health behaviors	Diagnosed diseases
• Sex • Age • Income • Education • Race • Marital status	• Body-mass index • Smoking • Blood pressure	• Heart disease • Stroke • Lung disease • Cancer • Diabetes • Psychiatric disease

Inclusion criteria

- Age 30 and older
- Died 1998-2010
- Minimum 2 previous self-rated health measures
  - 1 proximal (0-6 years prior to death)
  - 1 distal (7-12 years prior to death)

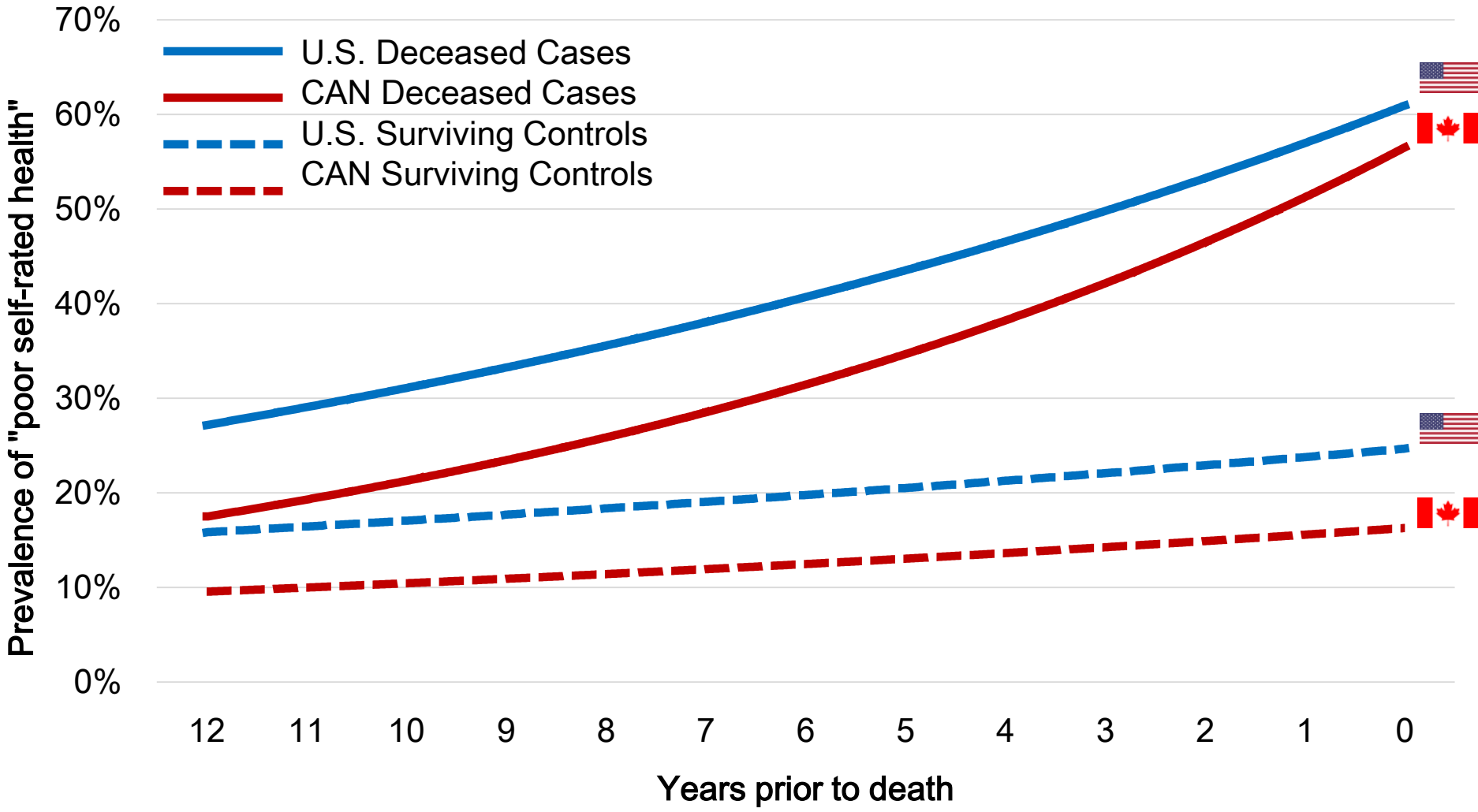
(Stenholm et al., 2014)

Method

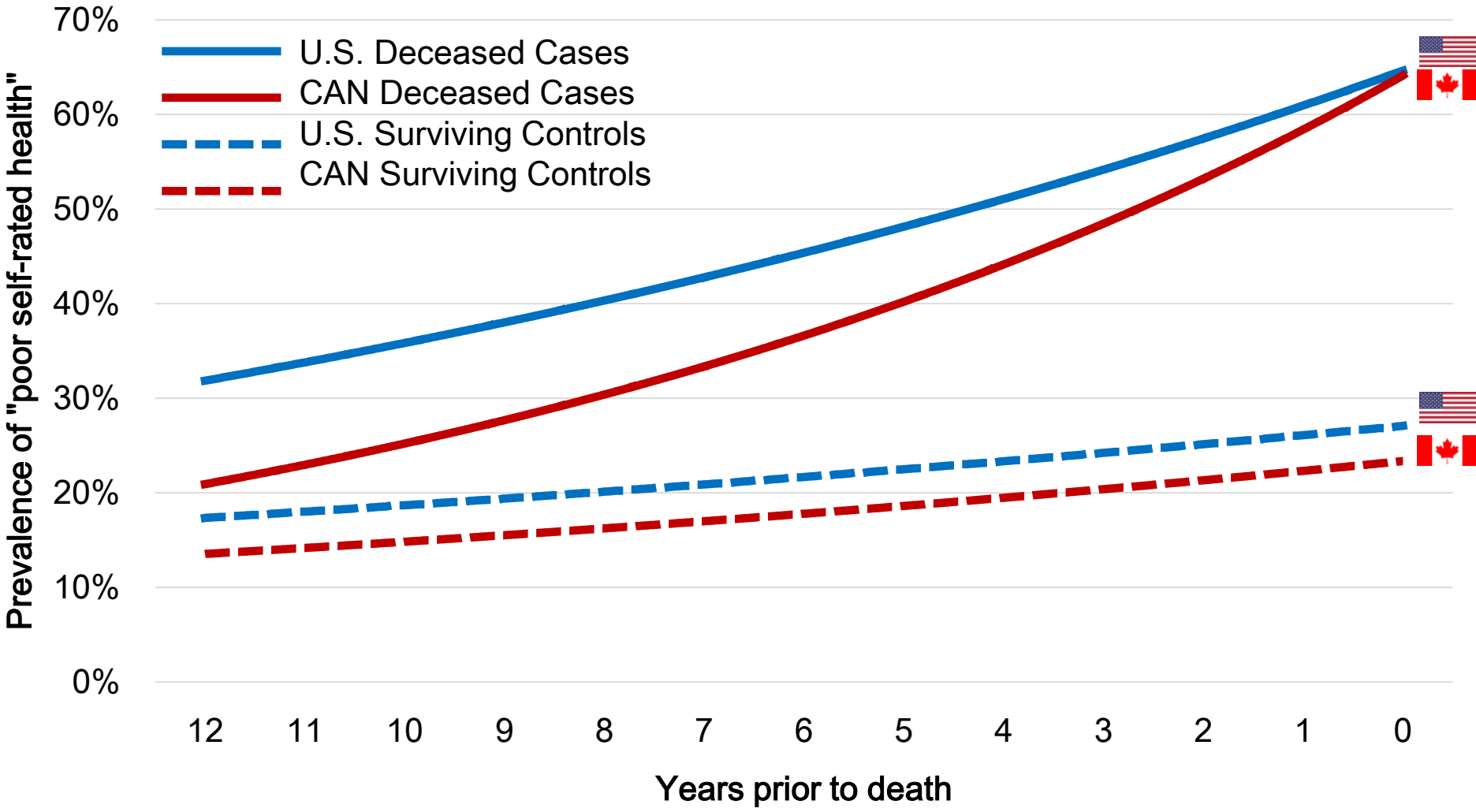
- Nested case-control design
- Deceased cases matched with up to 3 surviving controls (Age, Sex, Race, and Survey cohort)
- *Generalized Estimating Equation* (Logit-binomial, exchangeable correlation)
- Formal hypothesis test for whether U.S. and Canadian effect estimates are statistically distinguishable

(Stenholm et al., 2014)

Prevalence of reporting "poor self-rated health" up to 12 years prior to death, Canada and USA (Men)



Prevalence of reporting "poor self-rated health" up to 12 years prior to death, Canada and USA (Women)



Results

H1: Canadians will report better self-rated health than Americans:

- Canadians reported better health than Americans – whether they died or survived.

Results

H2: Canadian self-rated health will be a better predictor of mortality:

- Canadian predictive power estimates were consistently higher than American estimates.

Results

H2: Canadian self-rated health will be a better predictor of mortality:

- Canadian predictive power estimates were consistently higher than American estimates.
- However, a hypothesis test did not permit us to infer statistically significant differences between U.S. and Canadian self-rated health trajectories, when differences were expected.

Next steps

Validate the presumed mechanisms:

- Access to health care
- Cause of death

Thank you

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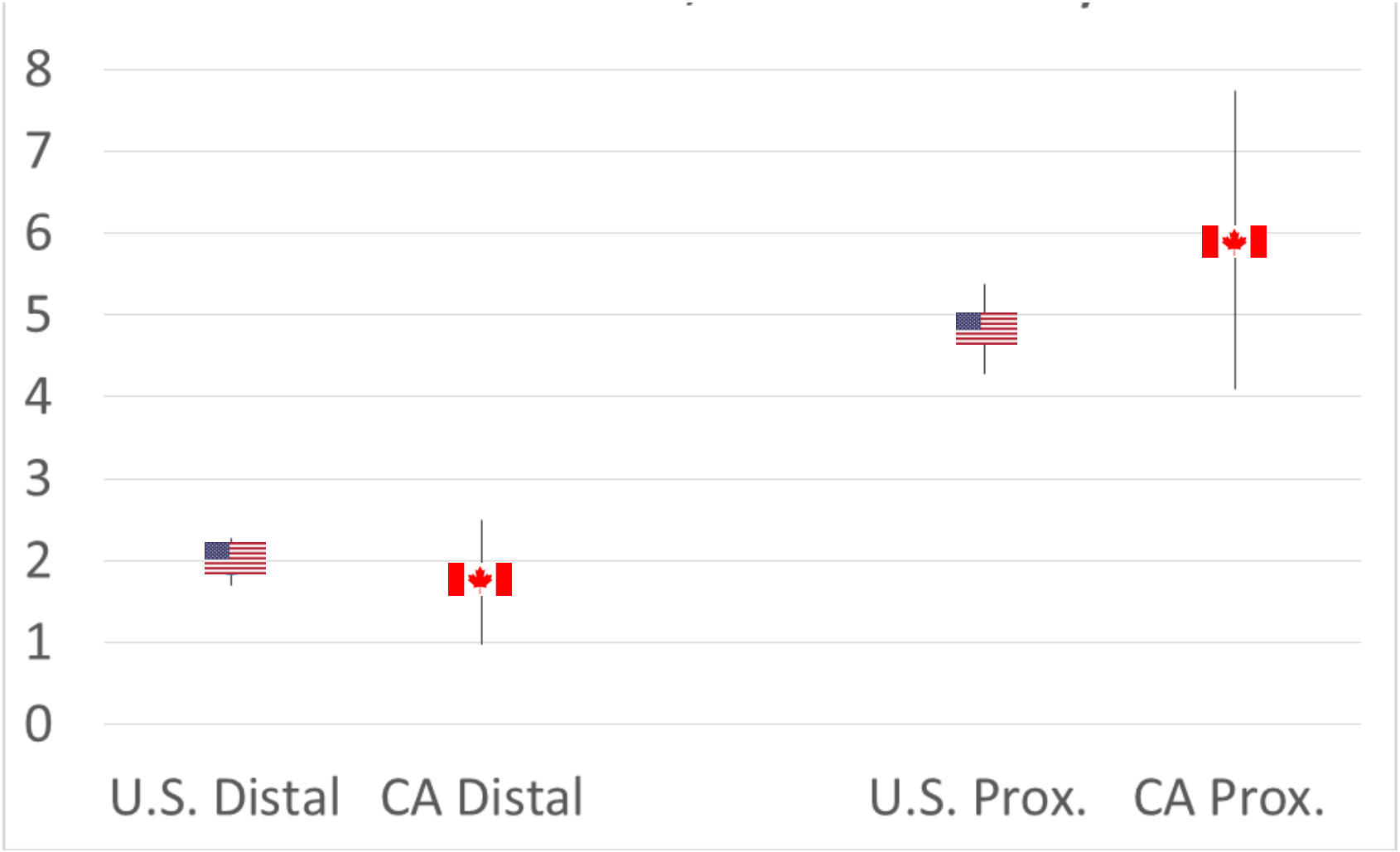
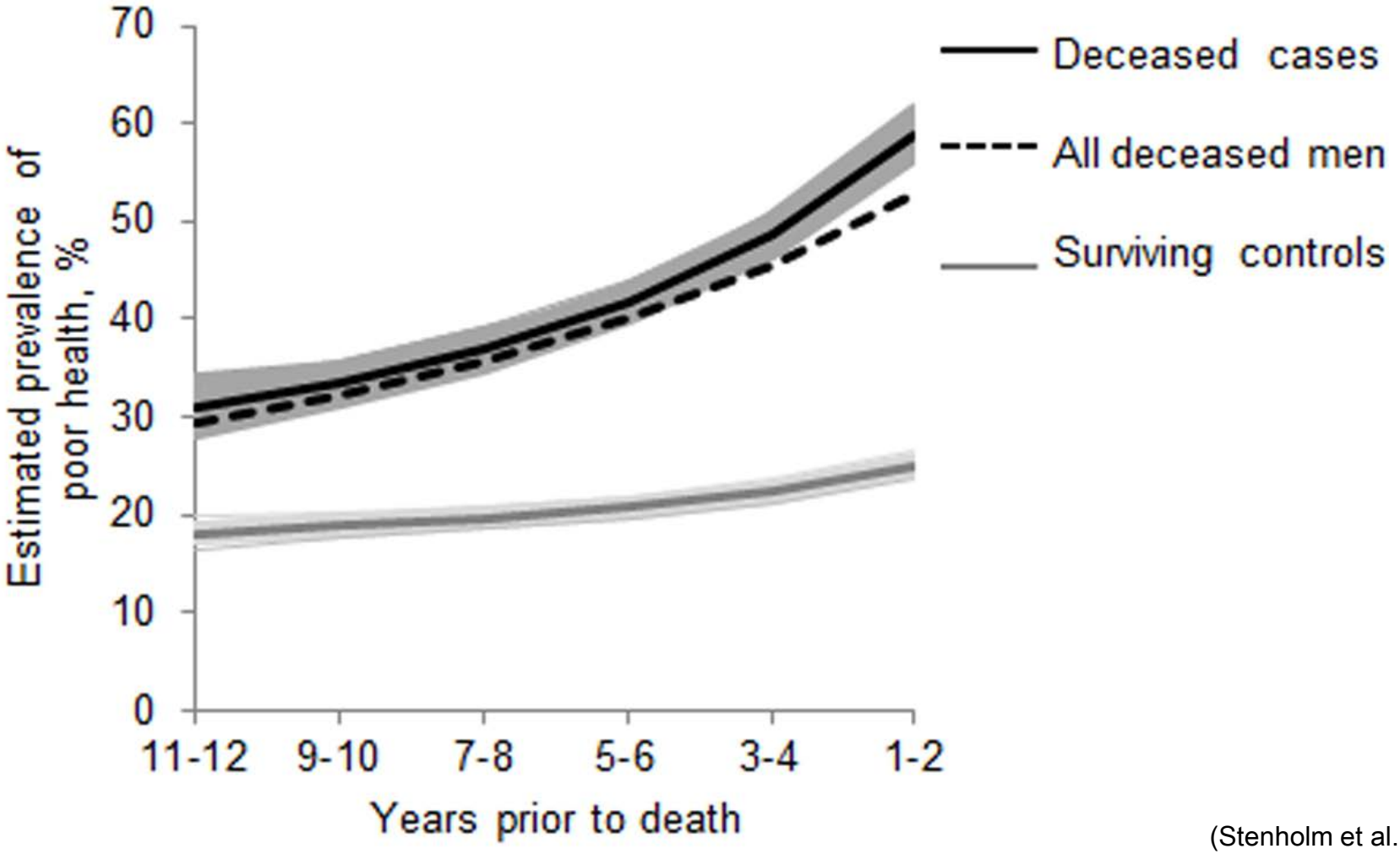
GEE ratios for the likelihood of reporting poor health 11-12 years and 1-2 years prior to death, by sex and age: U.S. vs. CANADA

Canada/U.S. Comparative Table	Model 1: Age		Model 2: + Education, Income, Marital Status		Model 3: + BMI, Smoking, Blood Pressure		Model 4: + Heart disease, Stroke, Lung disease, Cancer, Diabetes, Psychiatric disease	
Men	U.S. HRS	CAN: NPHS	U.S. HRS	CAN: NPHS	U.S. HRS	CAN: NPHS	U.S. HRS	CAN: NPHS
Age 30-65								
Distal	1.943***	5.019***	1.653**	3.550***	1.622**	3.475***	1.569*	3.102***
Proximal	7.494***	6.241***	6.838***	5.384***	6.570***	5.224***	5.972***	5.203***
Age 65-80								
Distal	2.364***	2.219***	2.006***	1.771*	2.040***	1.808**	1.984***	1.738*
Proximal	5.280***	6.606***	4.741***	5.983***	4.845***	6.173***	4.823***	5.913***
Age 80+								
Distal	1.855***	1.501	1.517***	1.419	1.492***	1.344	1.381**	1.238
Proximal	3.823***	3.162***	3.452***	3.225***	3.437***	3.371***	3.400***	3.349***
Women								
Age 30-65								
Distal	4.325***	4.190***	2.828***	2.883***	3.286***	2.780***	3.329***	2.283**
Proximal	7.223***	9.027***	6.122***	8.724***	5.778***	8.483***	5.161***	7.778***
Age 65-80								
Distal	2.112***	2.278***	1.737***	1.852**	1.828***	1.854**	1.83***	1.757**
Proximal	4.912***	5.602***	4.434***	5.254***	4.638***	5.304***	4.603***	5.274***
Age 80+								
Distal	1.881***	2.244***	1.684***	1.999**	1.672***	1.897**	1.565***	1.795*
Proximal	3.605***	3.400***	3.345***	3.306***	3.424***	3.310***	3.432***	3.129***

Relative risk ratios and 95% confidence intervals for reporting poor health, US and Canada, Men 65-79



U.S. replication



(Stenholm et al., 2014)