UNIVERSITÄT BERN

nicer Foundation National Institute for Cancer Epidemiology and Registration

Socioeconomic and demographic disparities in breast cancer stage at presentation and survival in Switzerland

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Background - Switzerland

- small country with about 8.3 million inhabitants
- federal state composed of 26 cantons
- universal health insurance coverage
- high health expenditures
- health care and cancer registration is organized at the cantonal level
- strict data protection laws for health-related data

Biller-Andorno N, Zeltner T. Individual Responsibility and Community Solidarity--The Swiss Health Care System. N Engl J Med. 2015;(23):2193–7.
Daley C, Gubb J, Clarke E, Bidgood E. Healthcare Systems: Switzerland. Available from The Institute for the Study of Civil Society, London, UK website: http://www civitas org uk/nhs/download/switzerland.pdf. 2007.
van Ginneken E, Swartz K, Van der Wees P. Health insurance exchanges in Switzerland and the Netherlands offer five key lessons for the operations of US exchanges. Health Aff (Millwood). 2013;(4):744–52.

Data Source –
The SNC-NICER Cancer Epidemiology Study

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Swiss National Cohort (SNC):

The SNC is a longitudinal cohort based on the Swiss national census of 1990 and 2000 linked to cause-specific mortality data and emigration records up to 2013.

probabilistic linkage

cancer data from

seven Swiss cantonal cancer registries*

46% of the Swiss population

*Data was provided for either all invasive cancers only (4 cantons: NE, JU, TI, VD) or for all invasive cancers plus carcinoma in situ cases (3 cantons: GE, VS, ZH).

Inclusion criteria

Overall:

- first cancer diagnosis = BCs (Cis or invasive BCs)
- diagnosed between Census 2000 and 31st of December 2008.
- age at incidence: 30 – 84 years

Stage at presentation analysis:

- Cis and invasive BC → restricted to CRs providing Cis cases

Survival analysis:

- invasive breast cancers, FU until end of 2013 → all participating CRs

Statistical Analysis

Association SEP and stage at presentation

- Ordered logistic regression model
  (outcome: Cis/localized/regional/distant stage - SEER summary stage)

Association SEP and survival

- competing risk regression models (Fine and Gray)
  (outcome: death due to BC, all underlying causes of death other than BC were classified as competing risks)

Predictors

• SEP (education)	*(low, middle,high)*
• age at presentation	*(30-49, 50-69, 70-84 years)*
• urbanity	*(urban, peri-urban, rural)*
• civil status	*(single, married,widowed, divorced)*
• nationality	*(Swiss, non-Swiss)*
• canton with screening program	*(yes, no)*
• stage at presentation (survival analysis)	*(localized, regional, distant stage)*

SEP and stage at presentation

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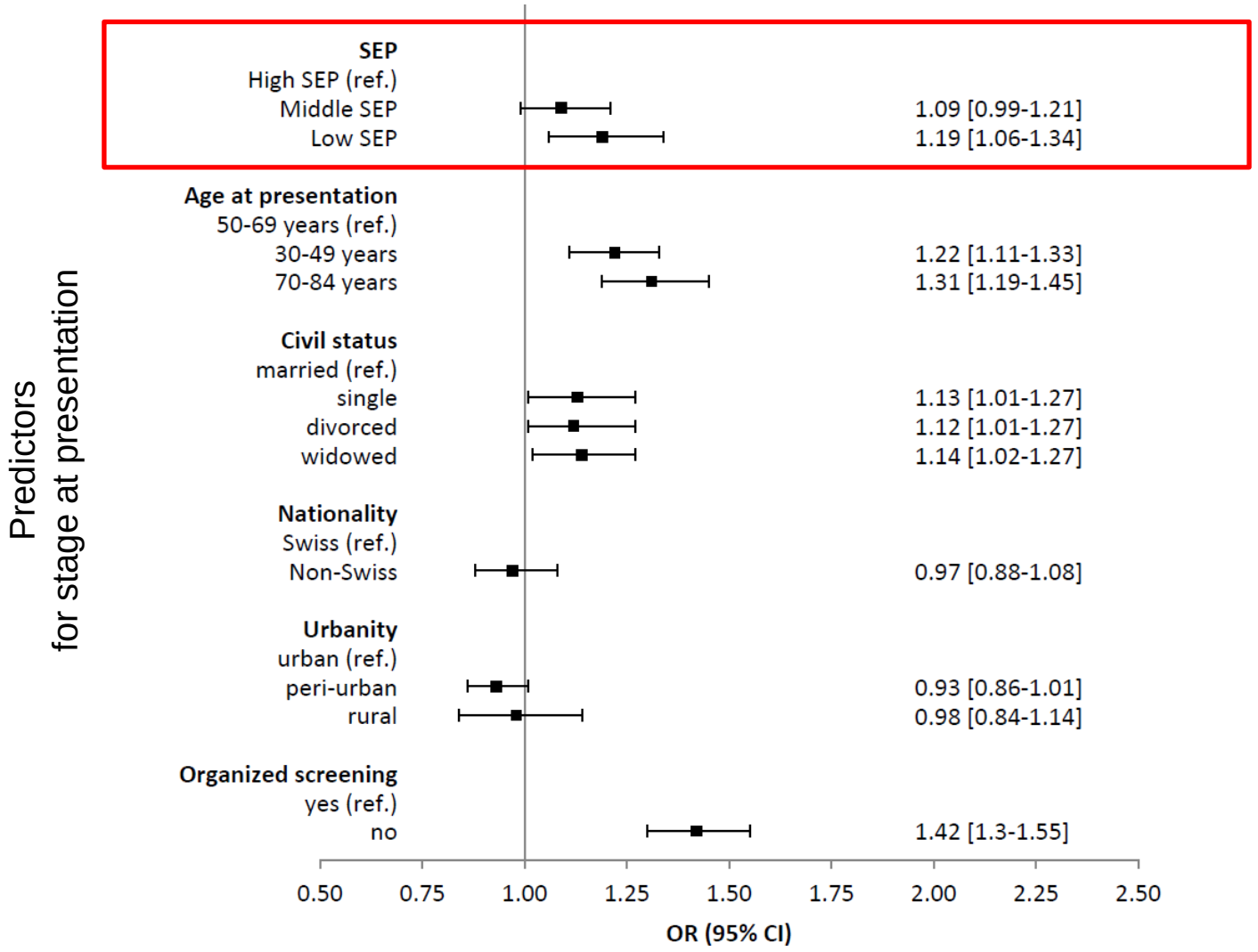

N = 10,915

Adjusted model

SEP and stage at presentation

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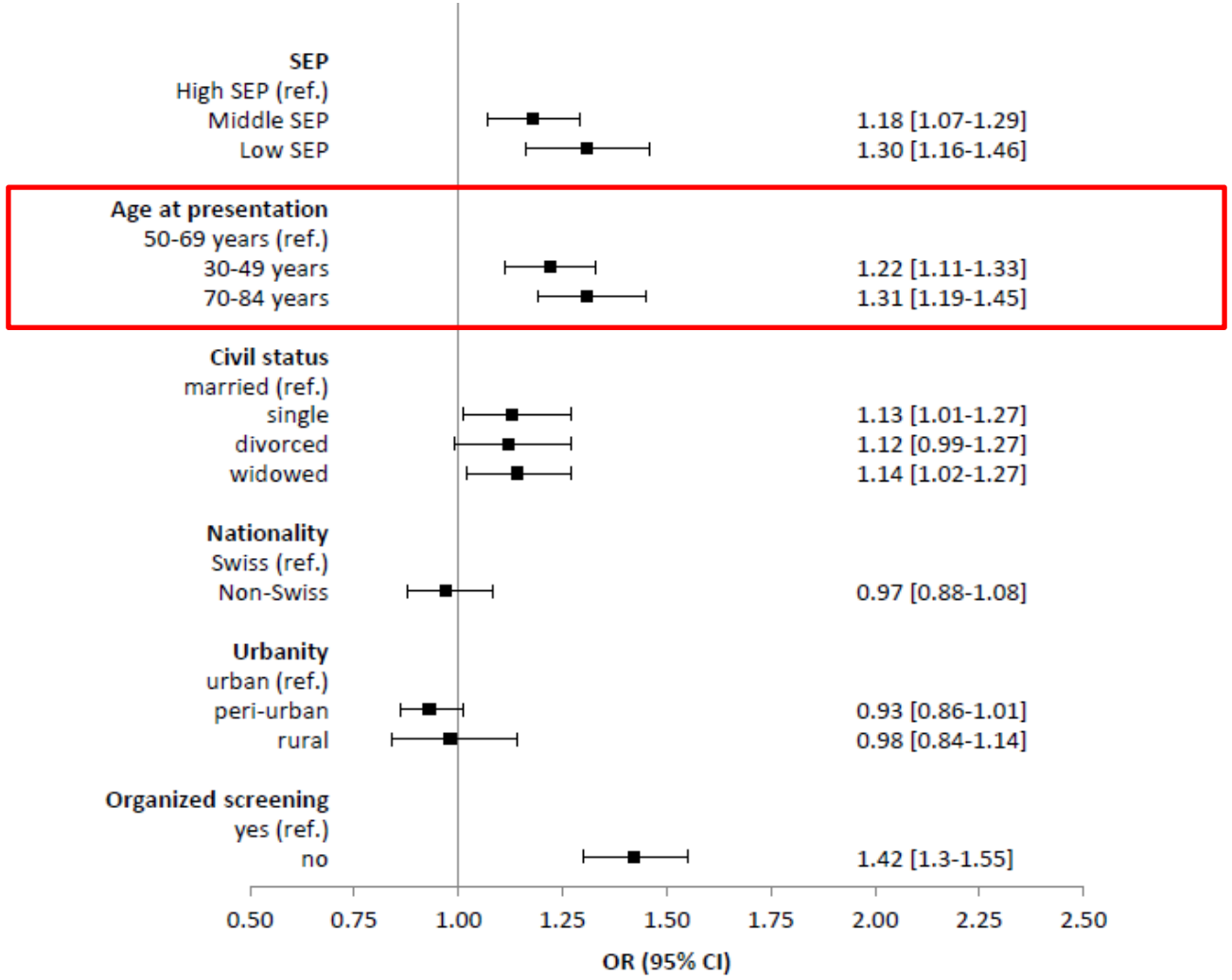
Predictors for stage at presentation



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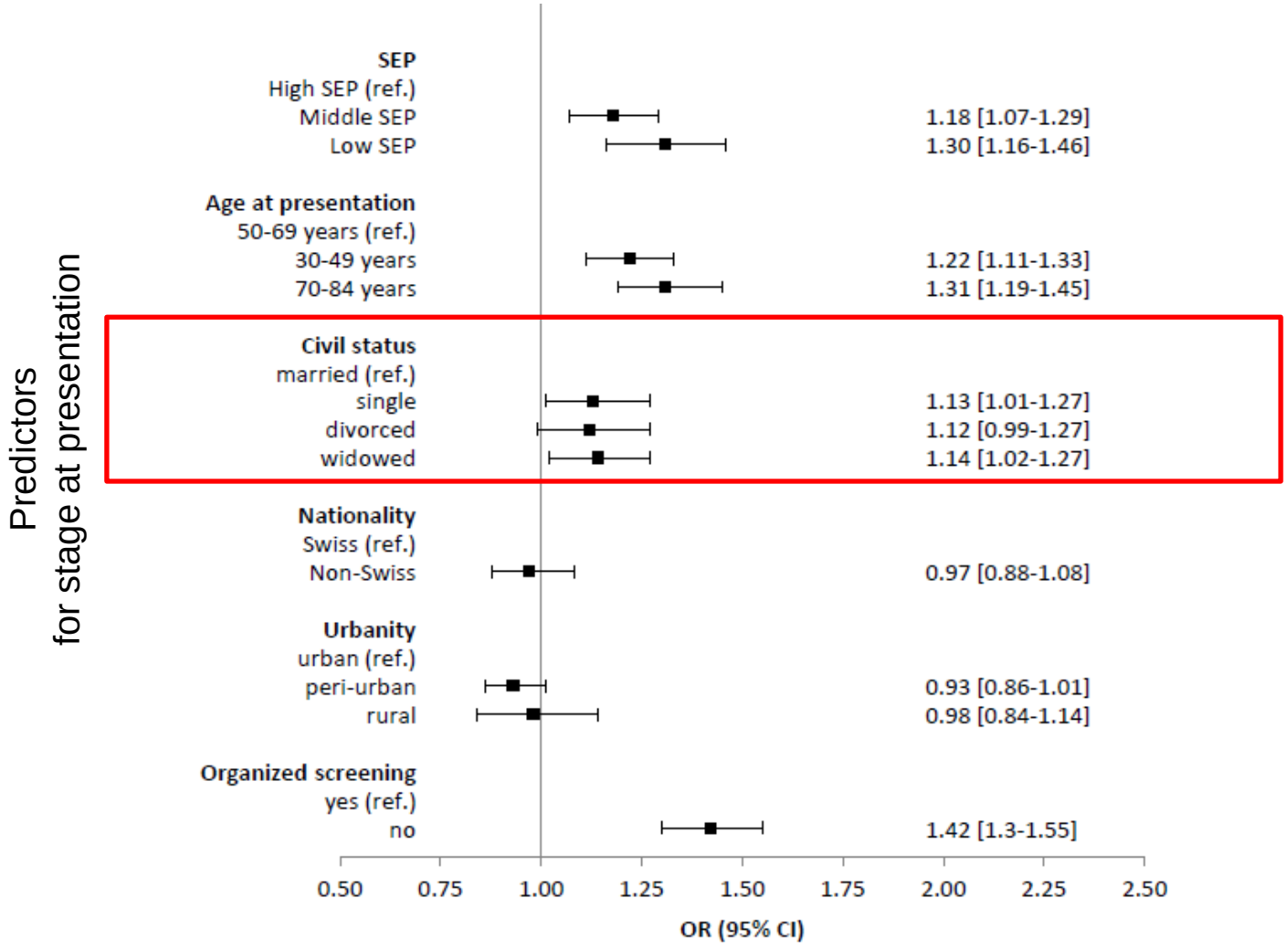

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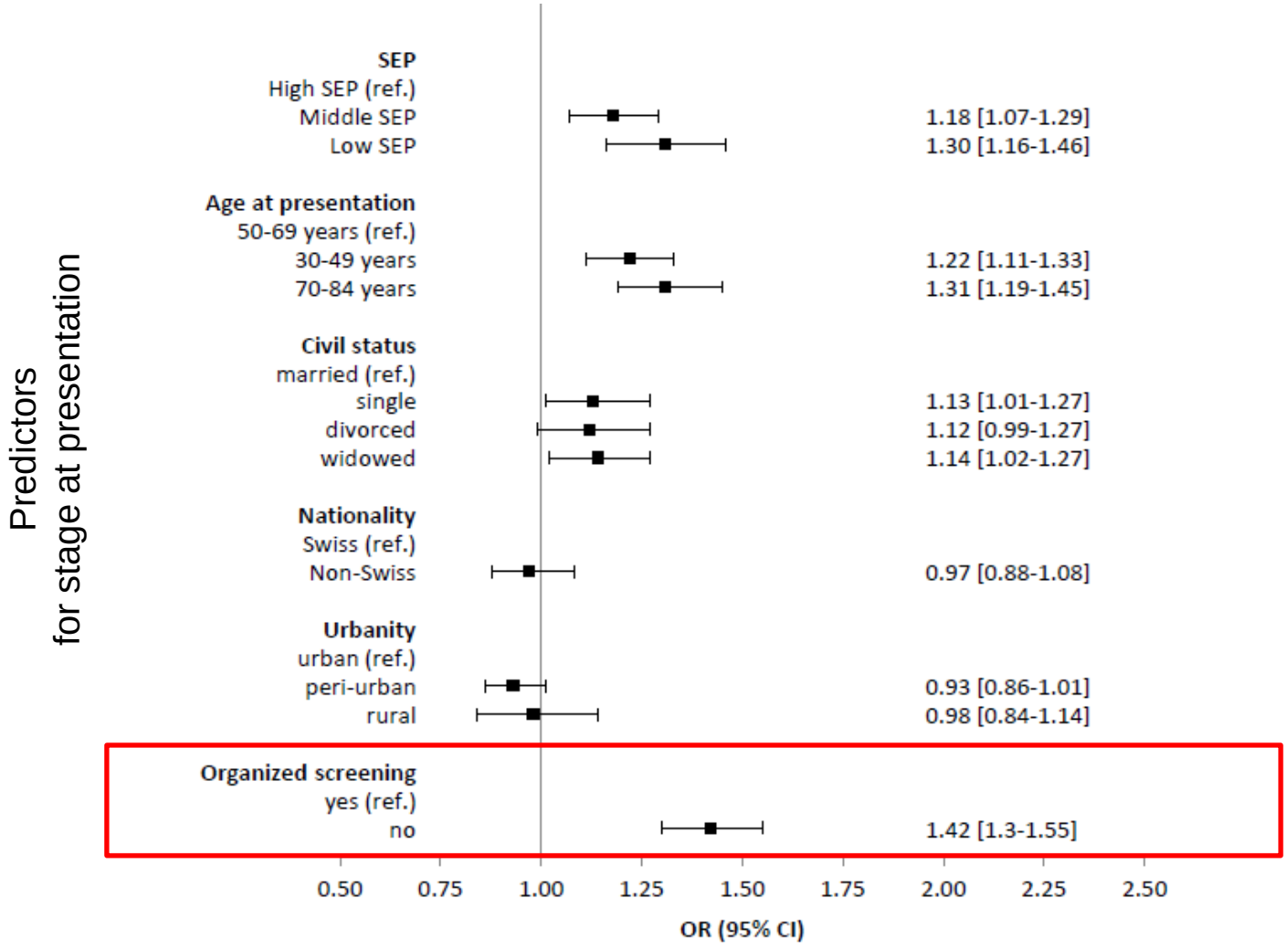

Adjusted model

SEP and risk of dying due to BC

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Predictors for risk of dying due to BC

	Model 1		Model 4	
	SHR	[95%CI]	SHR	[95%CI]
SEP				
High SEP (ref.)				
Middle SEP	**1.20**	**[1.06-1.37]**	1.01	[0.88-1.16]
Low SEP	**1.60**	**[1.40-1.83]**	**1.22**	**[1.05-1.43]**
Age at presentation				
50-69 years (ref.)				
30-49 years			**0.76**	**[0.66-0.86]**
70-84 years			**1.34**	**[1.19.1.50]**
Civil status				
married (ref.)				
single			1.16	[1.00-1.33]
widowed			1.09	[0.94-1.26]
divorced			0.97	[0.83-1.12]
Nationality				
Swiss (ref.)				
Non-Swiss			0.84	[0.73-0.98]
Stage at presentation				
local (ref.)				
regional			**4.12**	**[3.66-4.63]**
distant			**27.27**	**[23.67-31.41]**
Urbanity				
urban (ref.)				
peri-urban			**1.13**	**[1.02-1.26]**
rural			**1.21**	**[1.03-1.41]**
Organized screening				
yes (ref.)				
no			**1.44**	**[1.23-1.68]**

N = 16,296

PY = 127,040

SEP and risk of dying due to BC

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Strengths and limitation of the study

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Strength

- first population-based study investigating socioeconomic inequalities in BC stage at presentation and survival combining data of several cantons

Limitations

- Lack of further tumour characteristics and other prognostic factors
- Variations in proportions of overdiagnosis
- Definition of SEP

Final summary & conclusions

Despite universal health insurance coverage & high health expenditures, high risk groups for later-stage breast cancer and lower breast cancer survival were identified in the Switzerland.

In line with research from outside of Switzerland, our study provides evidence for the existence of socioeconomic inequalities in stage at presentation and cancer survival in Switzerland for female BC.

Further research should focus on underlying mechanisms.

Appropriate intervention strategies are needed to reduce socioeconomic and demographic health inequalities in Switzerland.

Acknowledgements

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