

ILPN conference, LSE
September 1st 2014

What is home care policy and how can it be measured? A latent variable model

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Funding: Swiss National Foundation

CONTEXT

- Important to assess effects of home care policy (HCP) on health care use
- HCP unobservable and multidimensional
- Dimensions of HCP not very well understood
- Selection of observable indicators to proxy for HCP seldom motivated
- Results may be sensitive to choice of indicator

HCP MEASURES

- Home care expenditures per elderly individual (e.g. Stabile et al., 2006; Muramatsu et al., 2007)
- Different denominator —e.g. disabled, poor elderly— may change results (Kemper et al. 2008)
- Home care expenditures per beneficiary, number of hours of medically- and non-medically-related home care per capita, ... (Rice et al., 2009; Gonçalves and Weaver, 2014)
- Many studies do not consider multidimensionality of HCP

RESEARCH QUESTIONS

- What are the dimensions of regional HCP?
- Which observable indicators characterize each dimension?
- How are the different dimensions interrelated
 - across regions?
 - within regions over time?

HOME CARE POLICY IN SWITZERLAND

- HCP decentralized in the 26 cantons (i.e. states, regions)
 - Supply regulated at canton level
 - Financing also at canton level

- Home care for the sick or persons with limitations
 - Independent of age

- Medically- (skilled) and non-medically-related (unskilled) home care
 - Compulsory health insurance (CHI) covers medical care at home
 - Various public subsidies to providers and patients

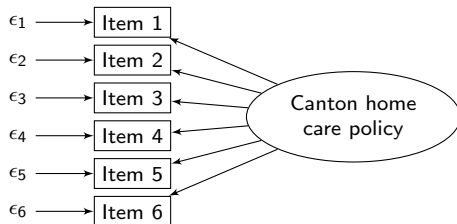
HOME CARE IN SWITZERLAND

	Geneva	Zurich
# providers	3	119
Patients per provider	4,920	220
Population using home care (%)	3.19	1.85
Cases 65+ (%)	76.3	77.5
Medically-related home care hours pc	1.2	0.8
Non-medically-related home care hours pc	0.9	0.4

Notes: 2012 figures. pc = per capita.

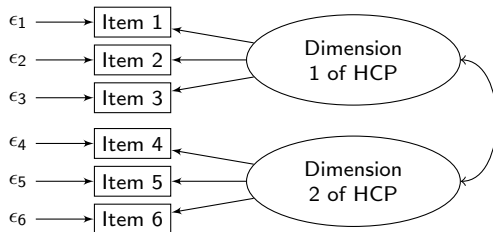
CONCEPTUAL FRAMEWORK I

FIGURE 1: One-dimensional factor model



CONCEPTUAL FRAMEWORK II

FIGURE 2: Two-dimensional factor model



METHODS

- Two-level confirmatory factor analysis (CFA):
 - Two-level data: multiple year observations per canton

$$I_{ct} = \Lambda_B HCP_{Bc} + \epsilon_{Bc} + \Lambda_W HCP_{Wct} + \epsilon_{Wct}$$

- Items are mean-centered
 - Less parameters to estimate
- ML estimator in Mplus, version 7

ITEMS

- Home care hours per case (*hpcse*)
- Home care hours per medically-related case (*mrhpcse*)
- Home care hours per 80+ patient (*hpcse80p*)
- Medically-related cases per population (*mrcsepc*)
- 65+ patients per 65+ population (*cov65p*)
- Home care patients per LTC user (*propltc*)

DATA

- Swiss Home Care Survey
 - Yearly canton-level data
 - All non-for-profit providers

- 26 cantons

- 1997-2012

- 416 observations

SUMMARY STATISTICS

TABLE 1: Values of selected items

Item	Geneva		Zurich	
	1997	2012	1997	2012
Medically-related hours per case	74	49	37	44
65+ patients per 65+ population (%)	29	15	13	9

RESULTS: MODEL FIT

TABLE 2: Model fit

Criterion	Recommendation	Actual value
χ^2/df	< 3	1.66
RMSEA	< 0.06	0.04
CFI	> 0.95	0.97
TLI	> 0.95	0.96
SMSR W	< 0.08	0.05
SMSR B	< 0.08	0.19

RESULTS: WITHIN-LEVEL

TABLE 3: Within-canton results

Factors	Items					
	hpcse	mrhpcse	hpcse80p	mrcsepc	cov65p	propltc
Intensity	0.935	0.672	0.981	—	—	—
Broadness	—	—	—	0.770	0.833	0.904
R^2	0.874	0.451	0.963	0.592	0.693	0.816
Correlation between the factors:						-0.735

Standardized coefficients.

CANTON GROUPS

TABLE 4: Canton grouping according to HCP generosity between 1997 and 2012

		Intensity	
		↗ generosity	↘ generosity
Broadness	↗ generosity	4 cantons: FR, NW, VD, BE	11 cantons: LU, UR, SZ, GL, ZG, SO, SG, GR, AG, TI, JU
	↘ generosity	7 cantons: OW, BS, AR, AI, TG, NE, GE	4 cantons: VS, BL, ZH, SH

RESULTS: BETWEEN-LEVEL

TABLE 5: Between-canton results

Factors	Items					
	hpcse	mrhpcse	hpcse80p	mrcsepc	cov65p	propltc
Intensity	0.907	0.891	0.998	—	—	—
Broadness	—	—	—	0.884	1.000 ^a	0.866
R^2	0.823	0.794	0.995	0.782	1.000	0.750
Correlation between the factors:						0 ^b

Standardized coefficients.

^aThe residual variance of the item is set at zero.

^bThe covariance between the factors is set at zero.

CANTON GROUPS

TABLE 6: Cross-canton comparison of HCP generosity

		Intensity		
		Least generous	Average generosity	Most generous
Broadness	Least generous	3 cantons: GL, AR, AG	3 cantons: SZ, NW, LU	3 cantons: UR, TI, ZG
	Average generosity	3 cantons: AI, TG, ZH	3 cantons: SO, SH, SG	2 cantons: GR, BL
	Most generous	3 cantons: OW, VS, NE	2 cantons: FR, GE	4 cantons: BE, BS, VD, JU

SUMMARY

- Two dimensions of HCP:
 - ‘Intensity’, e.g. home care hours per case
 - ‘Broadness’, e.g. proportion of users among the 65+ population

- Different relationships between two dimensions:
 - Negative correlation within cantons over time
 - No correlation between cantons

- Over time, cantons seem to trade-off between providing a lot of care to few patients and little care to many patients

- Next step: validate the model with US Medicaid data, if available

Thank you

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PROVIDER-RELATED INDICATORS

- Average number of patients per provider
- Average number of staff (FTE) per provider
- Average activity rate (staff / FTE)
- Proportion of management and administration staff
- Average non-staff-related costs per provider
- Proportion of staff with a nursing diploma

CASE-MIX AND FINANCING INDICATORS

- Proportion of 65+ cases
- Proportion of female cases
- Proportion of medically-related cases

- Proportion of public subsidies on total provider revenue

INDICATORS OF HOME CARE INTENSITY

- Home care hours per patient
- Home care hours per case
- Hours per case of age 0-64 / 65-79 / 80+ / 65+
- Hours per medically-related case
- Hours per non-medically-related case
- Staff (FTE)-to-patient ratio
- Costs per hour of home care
- Costs per patient

INDICATORS OF HOME CARE BROADNESS

- Proportion of home care users in the (65+) population
- Home care hours per capita / per 65+ population
- Medically-related home care hours per capita
- Non-medically-related home care hours per capita
- Proportion of medically-related home care users in the population
- Proportion of non-medically-related home care users in the population
- Home care expenditures per capita
- Home care patients per LTC user