

Aging, Social Capital, and Health Care Utilization in the Province of Ontario, Canada

Audrey Laporte, Ph.D.*
Eric Nauenberg, Ph.D.*
Leilei Shen, Ph.D.**

*Dept. of Health Policy, Management and Evaluation,
University of Toronto
Affiliated Faculty, Petris Center for Health Care Markets and
Competition

**Dept. of Economics, University of Toronto

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Motivation

- ◆ In 1971 census, avg. Canadian household size = 3.5
 - Avg. declines to 2.6 by 2001 & 22% of population (1/3 seniors) living alone.
- ◆ While isolation may occur at all ages, particular concern for greater health risk among the elderly (Abbot and Sapsford, 2005)
- ◆ Age will become increasingly important as the baby-boom begins to turn 65 in 2011

Context

- ◆ In Canada, we have single payer system without complementary health insurance for publicly insured services
 - i.e., no queue jumping like BUPA in the UK
- ◆ No cost-sharing with respect to hospital and physician services
- ◆ 95% of population covered by public system
- ◆ 10 separate health care systems tied together by the principles of the federal Canada Health Act of 1984.
- ◆ 38% of Canadian population lives in Ontario
12.7 M people

Levels of Social Capital

- ◆ social capital represents transfer of resources from one person or group to another via non-market mechanisms
 - therefore can be understood in context of standard economic models that consider the optimal allocation of resources.
 - Individual level: refers to networks of social relations that may provide individuals & groups with access to resources & supports.
 - Community level: refers to extent of outreach on the part of community-based organizations.

Research Questions

- ◆ Is there an inverse relationship between level of social capital and health care utilization?
- ◆ Does the impact of social capital on health care utilization increase with age?
- ◆ Does community-level social capital exert an independent effect over and above individual-level social capital on health care utilization?

Focus: Direction of Causality

- ◆ One of the prevalent questions in the published literature is whether social capital is endogenous:
 - Does social capital affect health care utilization or does health care utilization affect social capital?

The Data I

- ◆ The Canadian Community Health Survey, (wave 1.2, 2002)
 - Random sample of 13,184 Ontario residents (\geq age 15)
 - Survey period: December 2002
 - Data on economic, social, demographic, occupational, environmental correlates of health
 - ◆ Includes age, income, education, living arrangements, chronic health conditions, health status
- ◆ Merged with Ministry of health hospital & physician records for FY 2006

The Data II

◆ Individual Social capital variables:

1. *Faith-based question*: Freq. of religious service attendance over past year
 - Binary: 1 for at least weekly, 0 otherwise
2. *Tangible social support*: derived variable from respondent answers to questions about whether they have someone to help if they are confined to bed, take them to the doctor, prepare meals or do chores.
 - Scaled from 0 to 16
3. *Affection*: derived variable from respondent answers to questions about whether respondent receives affection, feel wanted or included.
 - Scaled from 0 to 12

Data III

- ◆ Community-level Social Capital: Supply-side employment levels (%) in NAICS industry code series (813): a.k.a, Petris Index
 - ◆ 8131: Religious organizations
 - ◆ 8132: Grant-making and giving services
 - ◆ 8133: Social advocacy organizations
 - ◆ 8134: Civic and social organizations
 - ◆ 8139: Business , Professional, labour & other membership organizations
- 3 specifications tried: per capita, per workforce eligible (i.e., pop. Age > 15), per FTE actually employed.
 - ◆ per FTE actually employed the “most appropriate” denominator because other index specifications influenced by economic conditions
- ◆ 2001 Census data merged with (CCHS data based on census metropolitan area (CMA—equivalent to SMSA in the the U.S. > 100,000 population) 13 CMAs and 18 CAs (10,000 < pop. < 100,000) across the province of Ontario

Control Variables

- ◆ Age (Continuous)
- ◆ Sex
- ◆ Income and Income squared
- ◆ Education (College/University or other)
- ◆ Health Behaviours (e.g., alcohol use- at least one per day or other); no smoking)
- ◆ Immigrant status (recent or not)
- ◆ Region (Census agglomeration area –CAs and CMAs)
- ◆ Labour force participation (full-time or not)
- ◆ Living arrangements (e.g., living alone or not, married or not)
- ◆ Health Status (HDI poor, good, very good, relative to very poor; at least 1 chronic condition)

Interaction Terms

- ◆ CSC(Petris) x age
- ◆ ISC(3 measures) x age

Methods

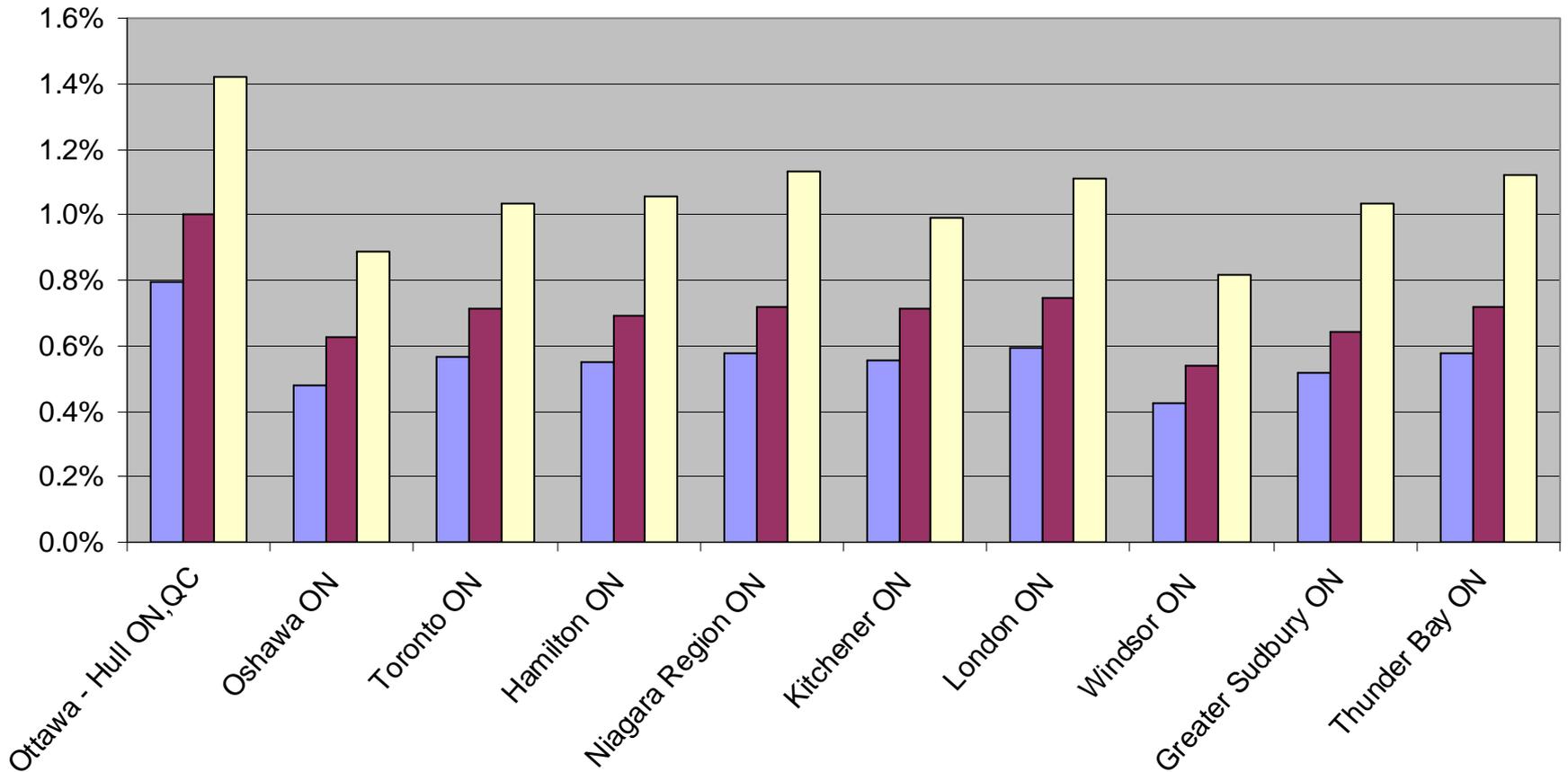
- ◆ Two-part model: controls better for selection effect and allows for different factors to influence each stage of the model.
- ◆ GP physician visits
 - Stage 1: Probit (models probability of utilization: Propensity)
 - Stage 2: conditional utilization OLS equation (models Intensity of Utilization)
- ❖ Quantile Regression for Count data (i.e. Jittering technique): Considers impact of ISC and CSC at each quantile of utilization.

Descriptive Statistics (Weighted to Ontario Population)

	N	Mean / %	Std	5%	95%	99%
GP VISIT	7711	4.208373	4.809366	0	13	21
Petris	7711	1.13%	0.19%	0.87%	1.57%	1.71%
Religious Meetings	7711	25.35%				
Tangible Social Support	7711	13.52491	3.320381	6	16	16
Affection	7711	10.67755	2.219852	6	12	12
Age	7711	46.95962	17.62329	21	79	88
Female	7711	50.71%				
Married	7711	61.87%				
Chronic Condition	7711	68.89%				
Alone	7711	10.00%				
College	7711	57.82%				
Income (in 10,000)	7711	5.047	1.85	0	15	25
Fulltime	7711	60.73%				
Alcohol	7711	7.64%				
Immigrant	7711	33.20%				
HDI Very Poor	7711	10.48%				
HDI Poor	7711	26.81%				
HDI Good	7711	38.77%				
HDI Very Good	7711	23.94%				
Census Agg. (pop < 100	7711	6.83%				

Petris Index by Census Metropolitan Area

per capita per labour force per employed force



Parenthetical Remark

- ◆ Robert Putnam remarks that increasing ethnic diversity in U.S. cities hinders “community cohesion” in short-run as evidenced by membership declines in community-based organizations,
 - Immigration to Canada is 10x per capita greater than in U.S. and >1/2 of immigrants settle in Toronto area.
 - No evidence for Putnam effect in cross-section: Toronto, considered as most diverse city, did not have different levels of employment in community membership organizations than did other, more homogeneous cities.
 - Canadian “Mosaic” vs. American “melting pot” effect?

Propensity—Marginal Effects

Prob(GP>0)	GP Visit		GP Visit		GP Visit	
	ISC		Religious Meetings	Tangible Social Support	Affection	
	Coefficient	Std Error	Coefficient	Std Error	Coefficient	Std Error
Petris	0.00028	0.00050	0.00413	0.01063	0.0043569	0.013265
Petris*age	0.00112	0.00135	0.00049	0.00087	0.0006987	0.001032
ISC	0.03012	0.01280 **	0.00198	0.00105 *	0.0030819	0.001622 *
ISC*age	0.00028	0.00050	-0.00014	0.00008 *	-0.0001024	0.000133
Age	0.00148	0.00044 ***	0.05152	0.0233968 **	0.0439996	0.027747
Female	0.125317	0.00983 ***	0.127182	0.00983 ***	0.1248563	0.00987 ***
Married	0.004022	0.01415	0.000425	0.01423	-0.0002147	0.01427
Chronic Condition	0.098464	0.01231 ***	0.098394	0.01232 ***	0.0977356	0.01232 ***
Alone	-0.074812	0.01687 ***	-0.067574	0.01714 ***	-0.0697066	0.01704 ***
College	-0.021688	0.00998 **	-0.020385	0.00998 **	-0.0207189	0.00998 **
Income (in 10,000)	0.001554	0.001349	0.000688	0.000805	0.000891	0.00099
Fulltime	-0.012643	0.01297	-0.014598	0.01292	-0.0144889	0.01293
Alcohol	0.018574	0.01569	0.014575	0.01586	0.0155111	0.01583
Immigrant	0.009807	0.01122	0.01403	0.01112	0.0145853	0.01113
HDI Poor	0.021447	0.01583	0.021047	0.01592	0.0205354	0.01593
HDI Good	0.046644	0.01555 ***	0.045472	0.01567 ***	0.0448373	0.01571 ***
HDI Very Good	0.014382	0.01707	0.011686	0.01729	0.0116162	0.01735
Census Agg.	-0.044034	0.01651 ***	-0.045709	0.01658 ***	-0.0449155	0.01653 ***

* 10% significant ** 5% significant ***1% significant

Intensity

ISC	GP Visit		GP Visit		GP Visit	
	Religious	Meetings	Tangible	Social Support	Affection	
	Coefficient	Std Error	Coefficient	Std Error	Coefficient	Std Error
Petris	-0.305061	0.147892 **	-0.310745	0.1485301 **	-0.3152686	0.14819 **
Petris*age	0.005283	0.002627 **	0.005391	0.0026367 **	0.0054821	0.002627 **
ISC	-0.083188	0.073218	-0.01	0.0089549	-0.026734	0.014256 *
ISC*age	0.000513	0.001259	0.000193	0.000156	0.0005011	0.000248 **
Age	-0.002265	0.004919	-0.005907	0.0057241	-0.0086603	0.005867
Age^2	4.25E-05	3.91E-05	5.04E-05	0.0000395	0.0000499	3.92E-05
Female	0.117934	0.029113 ***	0.114227	0.0284901 ***	0.1181561	0.029089 ***
Married	0.009632	0.030787	0.006414	0.0310231	0.0066321	0.031
Chronic Condition	0.154025	0.029404 ***	0.15142	0.0289118 ***	0.1530728	0.029259 ***
Alone	0.061002	0.035949 *	0.066477	0.0364128 *	0.0639153	0.036333 *
College	0.018552	0.022143	0.017853	0.0221411	0.0174957	0.022111
Income (in 10,000)	-0.012073	0.004182 ***	-0.011562	0.0042136 ***	-0.0114551	0.004198 ***
Income^2	0.000107	0.000135	0.000102	0.000136	0.0001024	0.000136
Fulltime	-0.041323	0.029103	-0.038578	0.0292089	-0.0386067	0.029119
Alcohol	-0.041421	0.037193	-0.0364	0.0371847	-0.0373114	0.037098
Immigrant	0.136593	0.024342 ***	0.130001	0.0243325 ***	0.1299147	0.024317 ***
HDI Poor	-0.215381	0.03634 ***	-0.219857	0.0364616 ***	-0.2191504	0.036292 ***
HDI Good	-0.309001	0.035845 ***	-0.315189	0.0359301 ***	-0.3140104	0.035926 ***
HDI Very Good	-0.314513	0.039213 ***	-0.321014	0.0394291 ***	-0.3200725	0.039401 ***
Census Agg.	-0.049254	0.035355	-0.046692	0.0354565	-0.0468161	0.035348
constant	1.599972	0.203259 ***	1.765857	0.2520607 ***	1.90861	0.267258 ***
Lambda	-.3746512	.1074331 ***	-.3939026	.0994779 ***	-.3758497	.1066287 ***
N of Obs	6042		6042		6042	
Prob > chi2	0.00000		0.00000		0.00000	

* 10% significant ** 5% significant ***1% significant

Results Summary

- ◆ ISC (regardless of measure) increased the likelihood of having a GP visit (consistent with our previous results)
- ◆ Only 'receives affection' had a statistically significant (negative) relationship to intensity of visits. Works in same direction as CSC in that regard.
- ◆ CSC (Petris index) was associated with a significant decrease in intensity of physician visits independent of ISC variable effects but no impact on propensity to have a visit.
- ◆ CSC (Petris index) had greatest impact in mid-ranges of utilization 40th percentile (and declining to) 80th in reducing number of visits.
- ◆ Consistent with lack of significance in propensity.
- ◆ Only 'receives affection' was found to have a significant negative effect from the 40th to 80th percentiles.

Policy Implications

- ◆ ISC perhaps serves enabling (complement) role by improving access (e.g. transport. services)
 - perhaps network of family/friends help establish initial contact w/ GP?
- ◆ “Receives Affection” seemed to be the aspect of ISC with the strongest link to GP utilization.
- ◆ CSC perhaps serves as substitute for some types of physician visits
 - possibly those that involve mainly counseling/caring services.
 - Biggest impact at mid utilization levels--high & low utilisation are driven primarily by health status.
- ◆ Informal care networks appear to have an important impact on utilization of formal primary care services.

Limitations

- ◆ No link to vital records
 - We estimate that approximately 5% of sample died during the period 2002-2006
- ◆ Undercount of immigrants
 - With 1% annual immigration rate—CCHS 1.2 undercounted total population for 2006 by > 4% mainly made up of immigrants from elsewhere in Canada and internationally
- ◆ Would have liked to have had repeated measures of social capital and past (i.e. prior to 2002) utilization.

Future Work

- ◆ Analyze other Ontario Ministry of Health and Long Term Care (MOHLTC) claims
 - Drugs
 - Home Care
 - Long-Term Care