Activity-Based Financing and the Health of Seniors: Evidence from Two Reforms

Guy Lacroix[1]

[1]Chairman, Department of Economics
CRREP, Université Laval, Canada
Chairholder, Industrial Alliance Research Chair on Demographic Changes

CRIUGM, Montréal, 7 December 2017

What do economists do ?

Wikipedia:

"Health economics is a branch of economics concerned with issues related to efficiency, effectiveness, value and behaviour in the production and consumption of health and healthcare. In broad terms, health economists study the functioning of healthcare systems and health-affecting behaviours."

What do economists do ?

World Health Organization : What is health economics?

"Health economics is concerned with the connection between health and the resources needed to promote it. Resources here involve not just money, but also people, materials and time, which could have been used in other ways. The underlying issue is that while the needs may be indefinite - for health, food, shelter, etc. - the resources to satisfy them are finite.

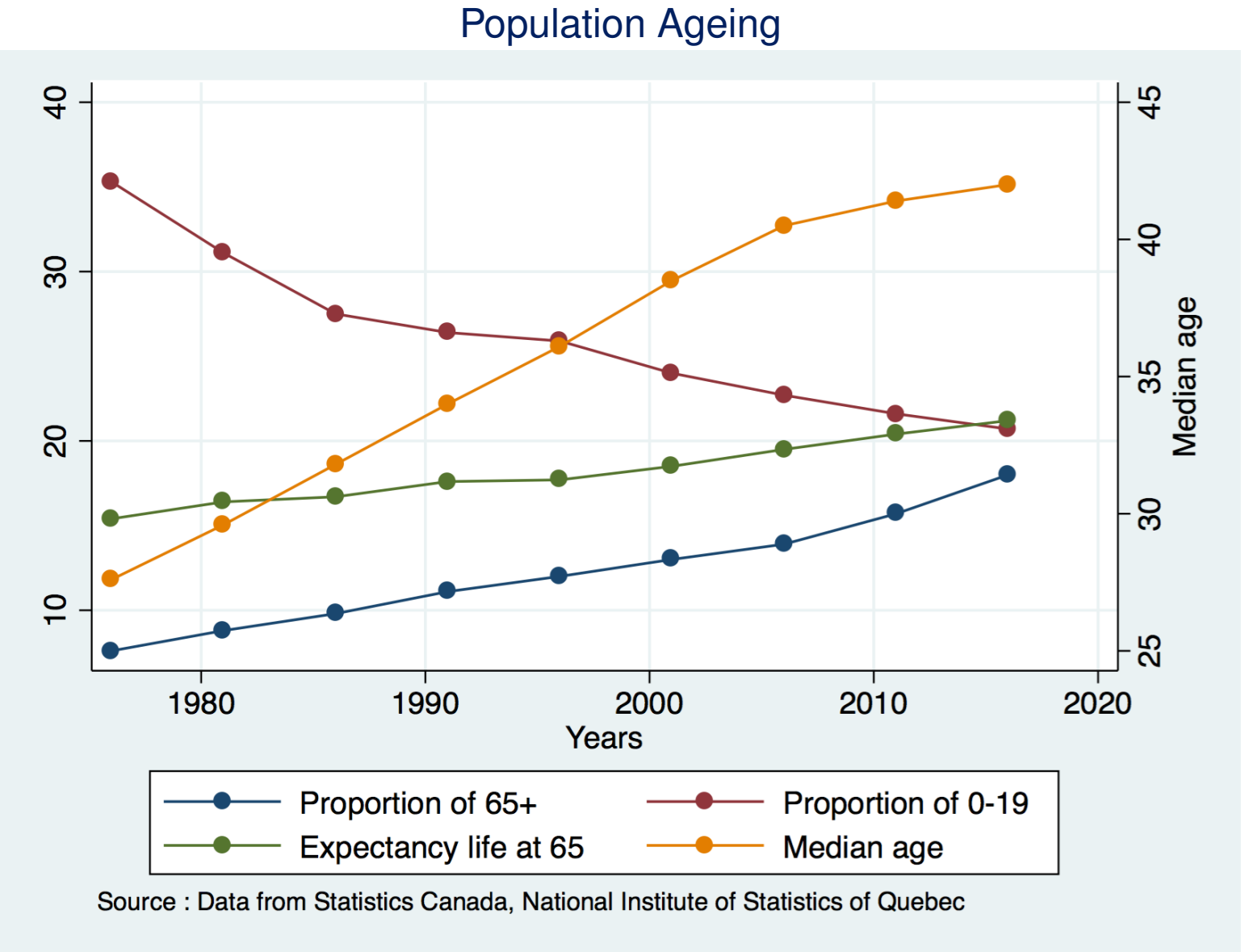
Choices, therefore, have to be made about which needs are most important and how to manage the limited resources."

To choose is to renounce $\Rightarrow$ Opportunity cost

What do economists do ?

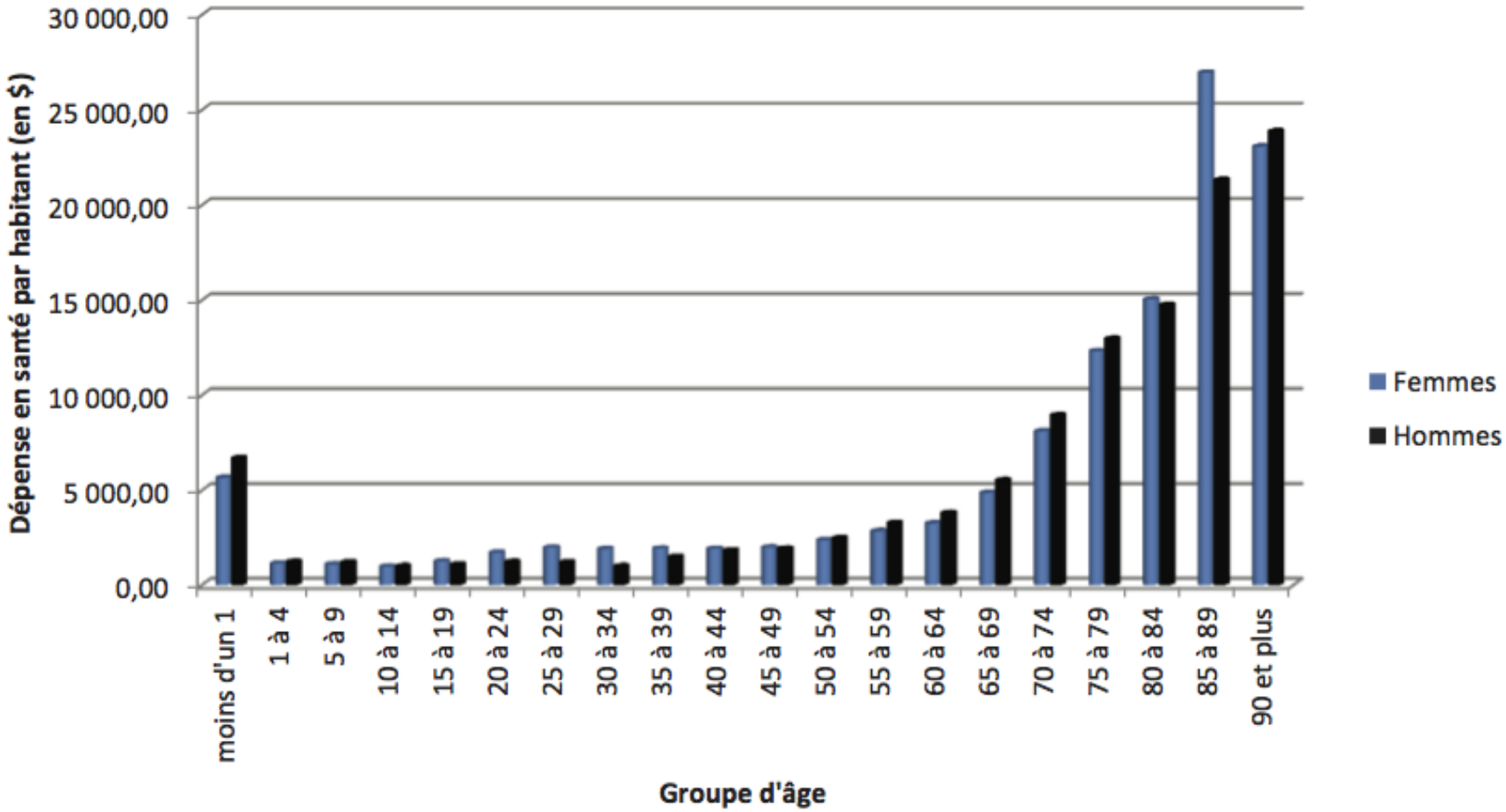
- Impact of Nursing Overtime in the NICU
  - Beltempo, M., Blais, R., Cabot, M., Lacroix, G., Piedboeuf, B. (2017), "Association of Nursing Overtime, Nurse Staffing and Unit Occupancy with Medical Incidents and Outcomes of Very Preterm Infants", *The Journal of Perinatology*
- Determinants of Nursing Overtime in the NICU
  - Beltempo, M., Lacroix, G., Cabot, M., Piedboeuf, B. (2016) , "Factors that Determine the Use of Registered Nurse Overtime in the Neonatal Intensive Care Unit and its Economic Impacts", *Pediatrics and Neonatal Nursing*

Challenges in an ageing society



Challenges in an ageing society

Per capita public health care expenditures, by age group and gender 2010



Source : CIHI 2012

Challenges in an ageing society

Public expenditures on health care in Quebec

	2013	2030
Proportion of GDP	8.4%	13.5%
Proportion of the total budget	42.9%	68.9%

Source: Clavet, 2013

Notes:

1. Public expenditures on health care will increase by $ 29.8 billion, of which ...
2. $ 12.3 billion (41.3%) is due to ageing

Evaluation of Policies or Programs

Impact Evaluation of Two Policy Reforms in Quebec:

1. Access to Surgery Program (ASP)
2. New Guidelines for Colorectal Cancer Screening in Quebec

Evaluation of Policies or Programs

Access to Surgery Program (ASP)

- Introduced in April 2004
- First activity-based funding in the Quebec health care system
- Financial incentives designed to induce hospitals and to improve their organization to enhance their productivity and to optimize the management of their waiting lists (non-price rationing).
- Additional funding to hospitals with an increased volume of surgeries compared to 2002-2003.

Evaluation of Policies or Programs

- Hospital Fees

Surgery with admission

2004-2011	2011-2012	2012-2013	2013-2014
4 200 $	519 $	388 $	388 $
	717 $	536 $	536 $
	1 269 $	949 $	949 $
	1 825 $	1 364 $	1 364 $
	2 514 $	1 879 $	1 879 $
	5 314 $	3 973 $	3 973 $
	9 652 $	7 215 $	7 215 $

Source: Programme d'accès à la chirurgie (PAC) 2014-2015, Cadre de référence, Avril 2015

Impact of ASP (1)

The impact of Activity-Based Financing on Hospital Stays and Health of Seniors

Thomas Kossi Golo & Guy Lacroix

- Difference-in-differences estimator
  - Treatment group : Cardiac and thoracic surgeries
  - Control group : Heart bypass (Counterfactual)
- Use large administrative dataset (MED-ECHO), April 2008 - March 2014
- Outcomes: Hospital stays and time to readmission (proxy for health)

Results

Parameter Estimates: Log Duration

	Home		LCSC		Other	
	Hospital	Read.	Hospital	Read.	Hospital	Read.
DID estimator	-		-		-	
Men	-		-		-	+
Age ($<$ 65)						
65-74	+		+		+	
$\geq$ 75	+	-	+		+	
Severity (Low)						
Moderate	+	-	+	-	+	
High	+	-	+	-	+	-
Extreme	+	-	+	-	+	-
Week-end	+		+		+	
Observations	29 098	29 09	13 879	13 879	9 315	9 315

Include controls for patient regional dummies and hospital dummies.

Impact of ASP (2)

Impact of financial incentives on access to services and quality of care: The Access to Surgery Program

Nizar Ghali, Bernard Fortin & Guy Lacroix

Estimation Strategy:

- Difference-in-differences estimator

  Treatment group : Quebec hip and knee surgeries

  Control group : British Columbia hip and knee surgeries

- Administrative data:

  RAMQ, MED-ECHO, BC PopData, April 2001 - March 2010

- Outcomes: Waiting times and hospital stays

Results

Descriptive Statistics, Hip & Knee Surgeries

Variable	Quebec		BC	
	Knee	Hip	Knee	Hip
Waiting time	154.4	141.2	173.6	160.1
Hospital Stay	8.88	8.25	5.2	5.9
Age	69.9	68	68.1	65.9
Gender (F=1)	0.58	0.56	0.61	0.51
Funding/Hospital	27.5M	26.2M	0	0
Observations	25,420	17,661	20,101	15,511

Results

Fig.1 Waiting times (days) in Qc and BC (Knee

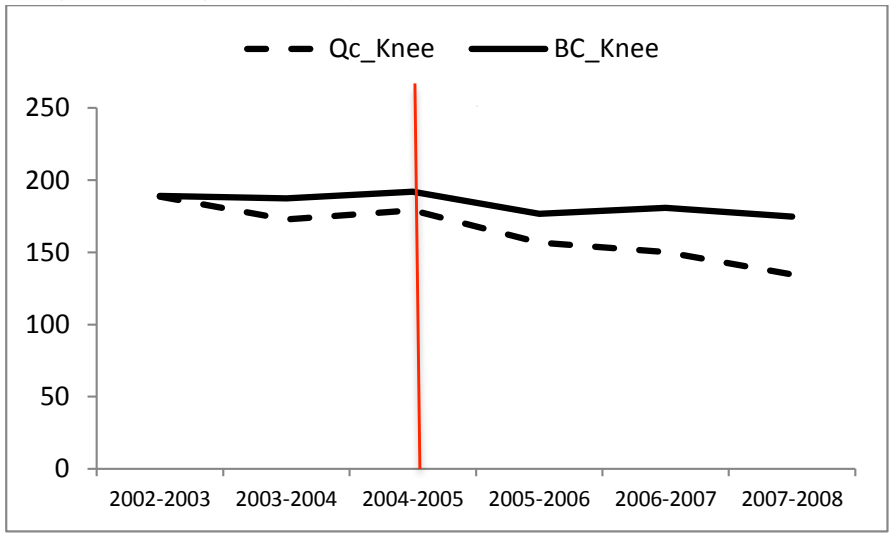
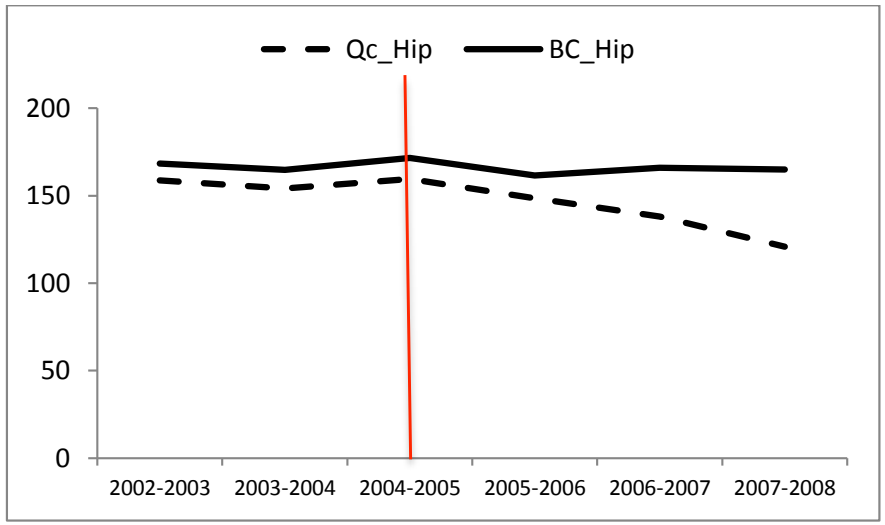


Fig.2 Waiting times (days) in Qc and BC (Hip replacement)



Results

Fig.3. Lengh of stay in Qc and BC (Knee replacement)

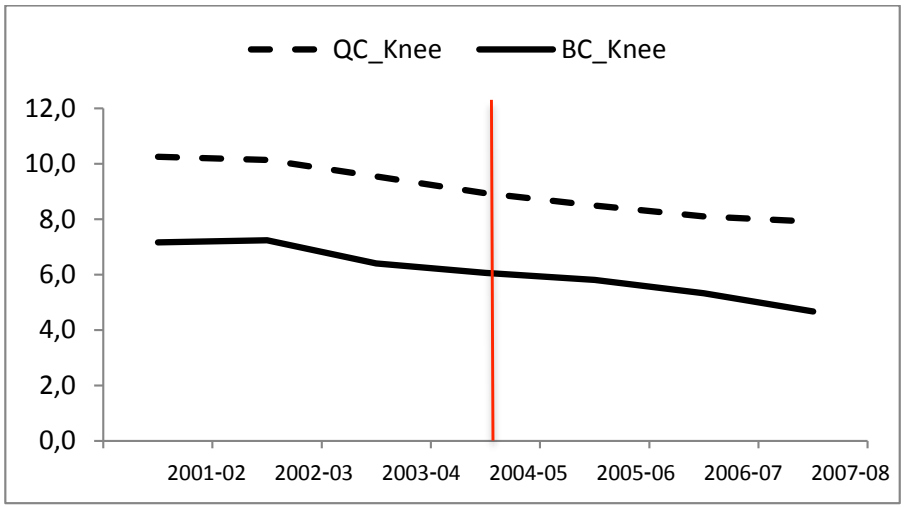
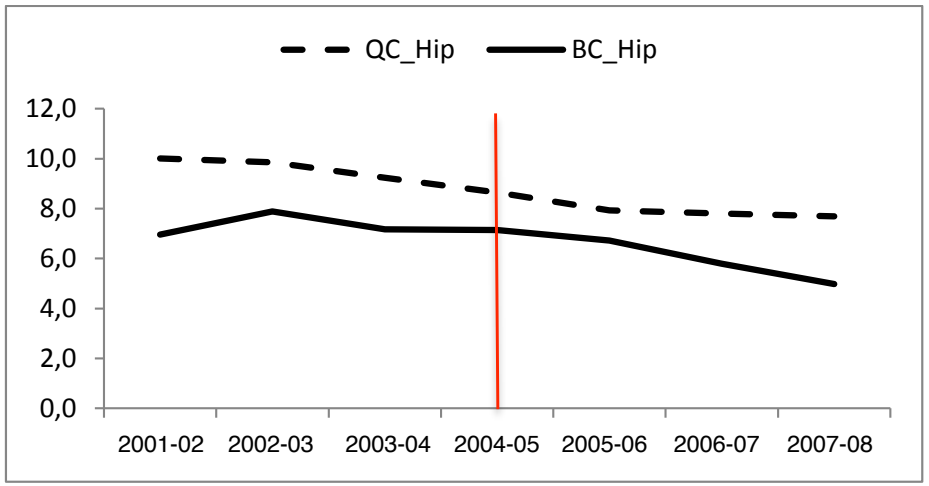


Fig.4. Lengh of stay in Qc and BC (Hip replacement)



Results

Data show that:

1. ASP has significantly reduced waiting times for hip and knee surgeries
2. ASP has significantly reduced hospital stays for knee surgeries
3. But, hospital stays not an outcome indicator *per se*
4. Need to investigate readmissions to get a better idea

Do clinical guidelines affect healthcare quality and population health : The Quebec colorectal cancer screening program

Nizar Ghali & Guy Lacroix

The Quebec Colorectal Cancer Screening Program

- Though the number of colonoscopies has risen considerably in Quebec, many hospitals are still struggling with long waiting lists.
- Most hospitals do not have a mechanism to establish a priority list
- Large geographical variations in colorectal cancer screening, unjustifiable from an equity point of view.

Do clinical guidelines affect healthcare quality and population health : The Quebec colorectal cancer screening program

Nizar Ghali & Guy Lacroix

The Quebec Colorectal Cancer Screening Program

- In November 2010, introduction of a new clinical protocol that:
  - sets standard screening procedures
  - identifies the steps that must be followed by family doctors
  - guarantee the tests are conducted efficiently and in a timely fashion
  - provides guidelines for case management
- Additional financing for participating hospitals (additional 50% of unit cost)

Estimation Strategy:

- Difference-in-differences estimator
  - Treatment group : 9 pilot sites
  - Control group : 75 non-participating hospitals
- Administrative data:

  MED-ECHO, 2006–2013
- Outcomes: Transitions between hospital (length of stay), home (with or without LCSC), readmission, and mortality (in and out of hospital)

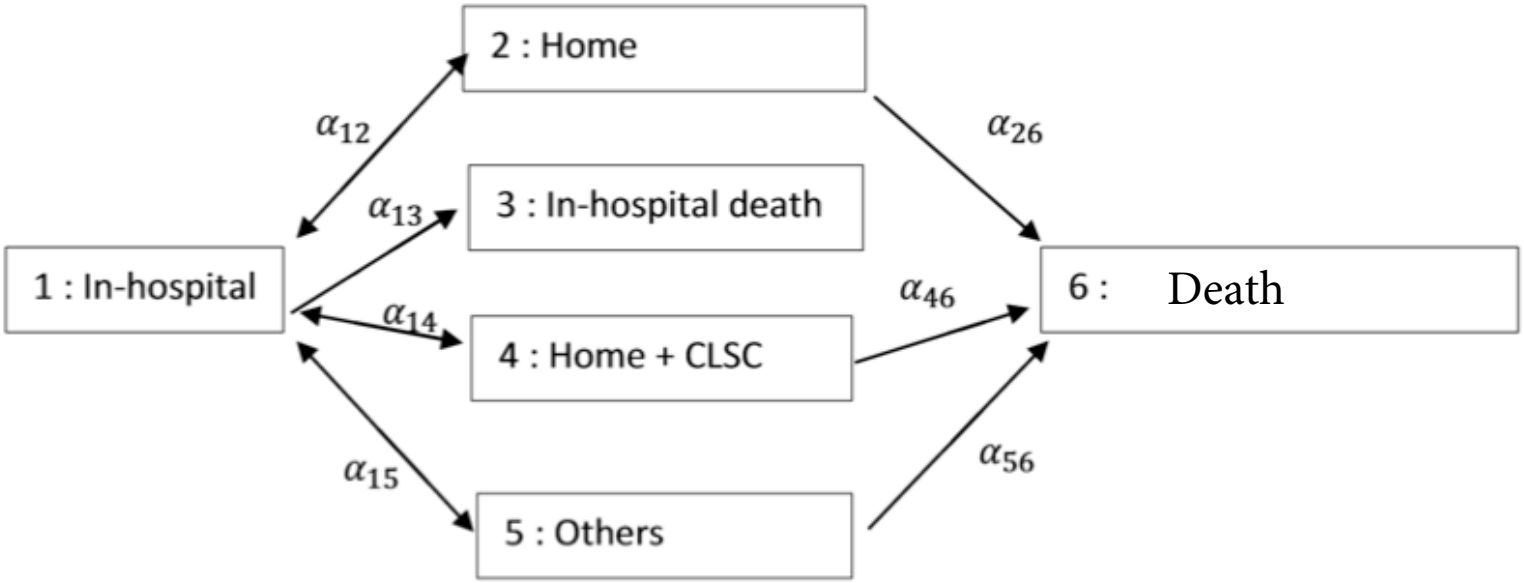
Estimation Strategy:

Descriptive Statistics, Treatment and control hospitals

Variable	Treatment	Control
Age	67.8	68.4
Gender (F=1)	0.44	0.44
Clinical severity	1.89	1.91
Number of beds	373.0	289.9
Length of stay	12.4	13.5
Mortality indicator	1.76	1.77
Number of observations	9,282	29,010

Estimation Strategy:

FIGURE 2.4 – Potential transitions in the model



Results

The data show that:

- The new protocol shortened the average duration of hospital stays by 3.4 days
- Shorter durations in all states, but no evidence of greater (30-day) readmissions
- No evidence of increased mortality
- Program is cost-efficient

Conclusion

1. An ageing population constitutes a significant challenge facing the health-care system
2. Health economics is concerned with the optimal allocation of resources
3. But from which perspective ? Hospital, Government or Society ?
   - Hospital : Reallocate resources between units
   - Government: Reallocate resources between Health, Education, Environment, Infrastructures, *etc.*
   - Society: Reallocate resources so as to maximise positive externalities (less poverty, less pollution, longer life expectancy, *etc.*)