

*The Contenance Across Continents  
To Upend Stigma and Dependency  
(CACTUS-D) study: A Cost-Effective  
and Cost-Utility Analysis of a  
Contenance Promotion Intervention*

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# Objectives

- Background
  - Urinary incontinence
  - CACTUS-D study
- Methods
  - Cost Effective Analysis
  - Cost Utility Analysis
- Discussion

# Background

## Urinary Incontinence:

- Is **COMMON**
  - 40% of women >65 years old
- Has **CONSEQUENCES**
  - Social isolation/depression
  - Decline in function
  - Falls
  - Admission to nursing home

# Background

- Has **STIGMA**:



Almost **85%** of incontinent older women never talk to a health care practitioner or seek help for their condition

# Pilot Study

## Effectiveness of continence promotion for older women via community organisations: a cluster randomised trial

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Eleanor van den Heuvel<sup>5</sup>

- Study population: Community organizations (UK), women >60yo, urinary incontinence 1x/week
- Intervention: 3 active interventions (continence education, evidence-based self-management, combination) and control intervention (health promotion)
- At 3 month follow-up:
  - Highest rate of improvement in combined intervention (66% vs. 11% in control)
  - NNT= 2 for any improvement (NNT= 5 for significance)

**Contingence Across Continents To  
Uplend Stigma and Dependency  
(CACTUS-D) study**

# Background

- Subak 2006 (293 women,  $56 \pm 11$  years, US) with severe urinary incontinence
  - \$900/year for routine incontinence care
  - Incontinence is associated with a significant decrement in health-related quality of life
- Anger 2006 (Medicare claims- 1992, 1995, 1998, women >65 yo)
  - Costs of urinary incontinence doubled from 1992-1998 (\$128 million to 234 million)
  - Causes- increase in the number of women treated, shift from inpatient to outpatient treatment, increased awareness of treatment options

# Study Design

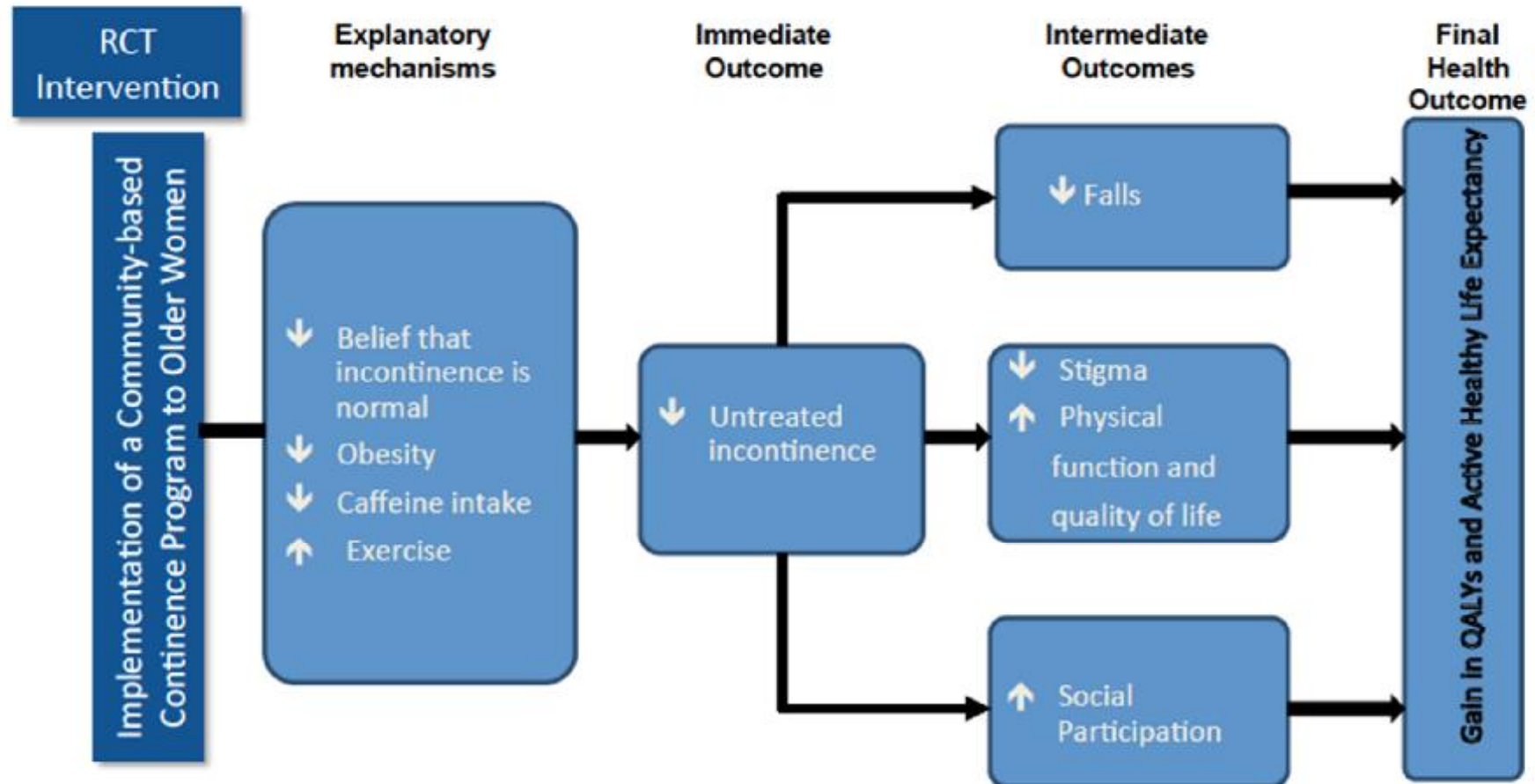
- Open-label, two-arm, parallel group, multinational cluster randomized controlled trial
- 4 sites- Quebec, Western Canada, France, UK



# Objective

Investigate the **effects on quality of life** and ascertain the **cost-effectiveness/cost-utility** of the continence promotion program for senior community-dwelling women.

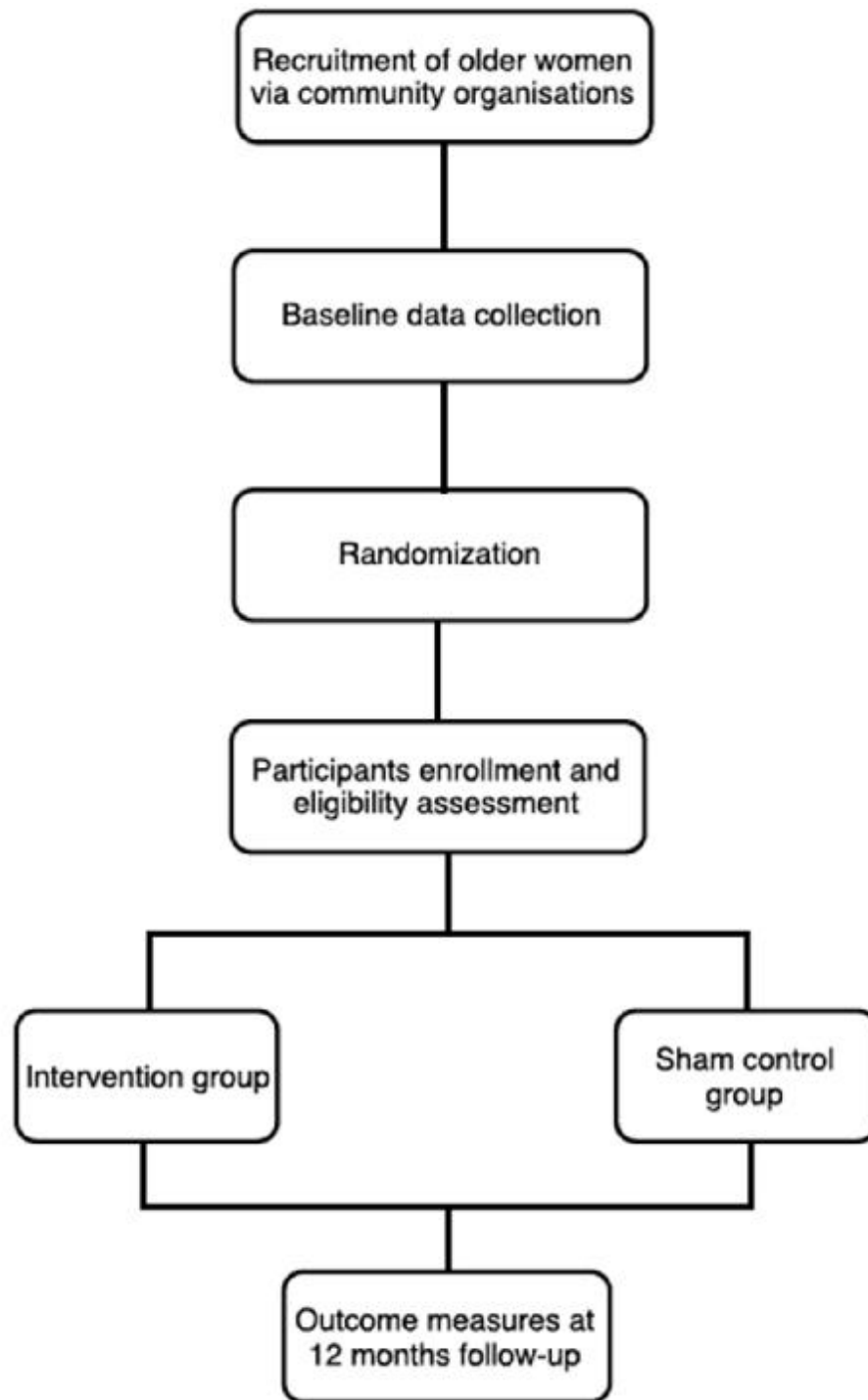
# Hypothesis



Statistically significant improvement= 4.74 on I-QOL, or 0.0126 in SF-6D utility score

# Methods

- Target Population:
  - Community organizations
  - Women >65 years old
  - English or French
  - Urinary incontinence  $\geq 2x/week$
  - Not currently seeing health care professional
  - Exclusion- dementia
- Sample size calculation: 500 participants/group (1000 total)



# Primary Outcomes



Secondary outcomes: self-management, seeking professional help, frequency/severity/bother (ICIQ-FLUTS)

# Cost-Effectiveness Analysis

- Incremental cost-effectiveness ratio (ICER)= the additional cost per participant achieving an improvement in urinary incontinence
- Cost questionnaire
- Administered at 3, 6, 9, 12 month

### T3 - SECTION 3 – Cost Questionnaire

24. On average, how many continence pads/protective undergarments do you use per day for urine leakage?	None	<input type="checkbox"/>
	1	<input type="checkbox"/>
	2	<input type="checkbox"/>
	3	<input type="checkbox"/>
	4 or more	<input type="checkbox"/>
	Does not know	<input type="checkbox"/>

25. Did you visit with your physician (GP) in the last 3 months?	No	<input type="checkbox"/>
	Yes, once	<input type="checkbox"/>
	Yes, twice	<input type="checkbox"/>
	Yes, 3 times	<input type="checkbox"/>
	Yes, 4 or more times	<input type="checkbox"/>
	Does not know	<input type="checkbox"/>
	Not applicable	<input type="checkbox"/>

26. If yes, for what reason? a) bladder problems	Yes	<input type="checkbox"/>
	No	<input type="checkbox"/>
	Does not know	<input type="checkbox"/>
	Not applicable	<input type="checkbox"/>
b) Another reason (Specify)		

27. Were you visited at home by a health professional during the past 3 months? (nurse, physiotherapist)?	No	<input type="checkbox"/>
	Yes, once	<input type="checkbox"/>
	Yes, twice	<input type="checkbox"/>
	Yes, 3 times	<input type="checkbox"/>
	Yes, 4 or more times	<input type="checkbox"/>
	Does not know	<input type="checkbox"/>

28. If yes, for what reason? a) Bladder problems	Yes	<input type="checkbox"/>
	No	<input type="checkbox"/>
	Does not know	<input type="checkbox"/>
	Not applicable	<input type="checkbox"/>
b) Another reason (Specify)		

29. Were you hospitalized in the last 3 months?	No	<input type="checkbox"/>
	Yes, once	<input type="checkbox"/>
	Yes, twice	<input type="checkbox"/>
	Yes, 3 times	<input type="checkbox"/>
	Yes, 4 or more times	<input type="checkbox"/>
	Does not know	<input type="checkbox"/>

30. If yes, for what reason?	Yes	No	Does not know	Not applicable	
	a) Bladder problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	b) Surgery, specify _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	b) Another reason (Specify)				

# Cost Questionnaire (cont'd)

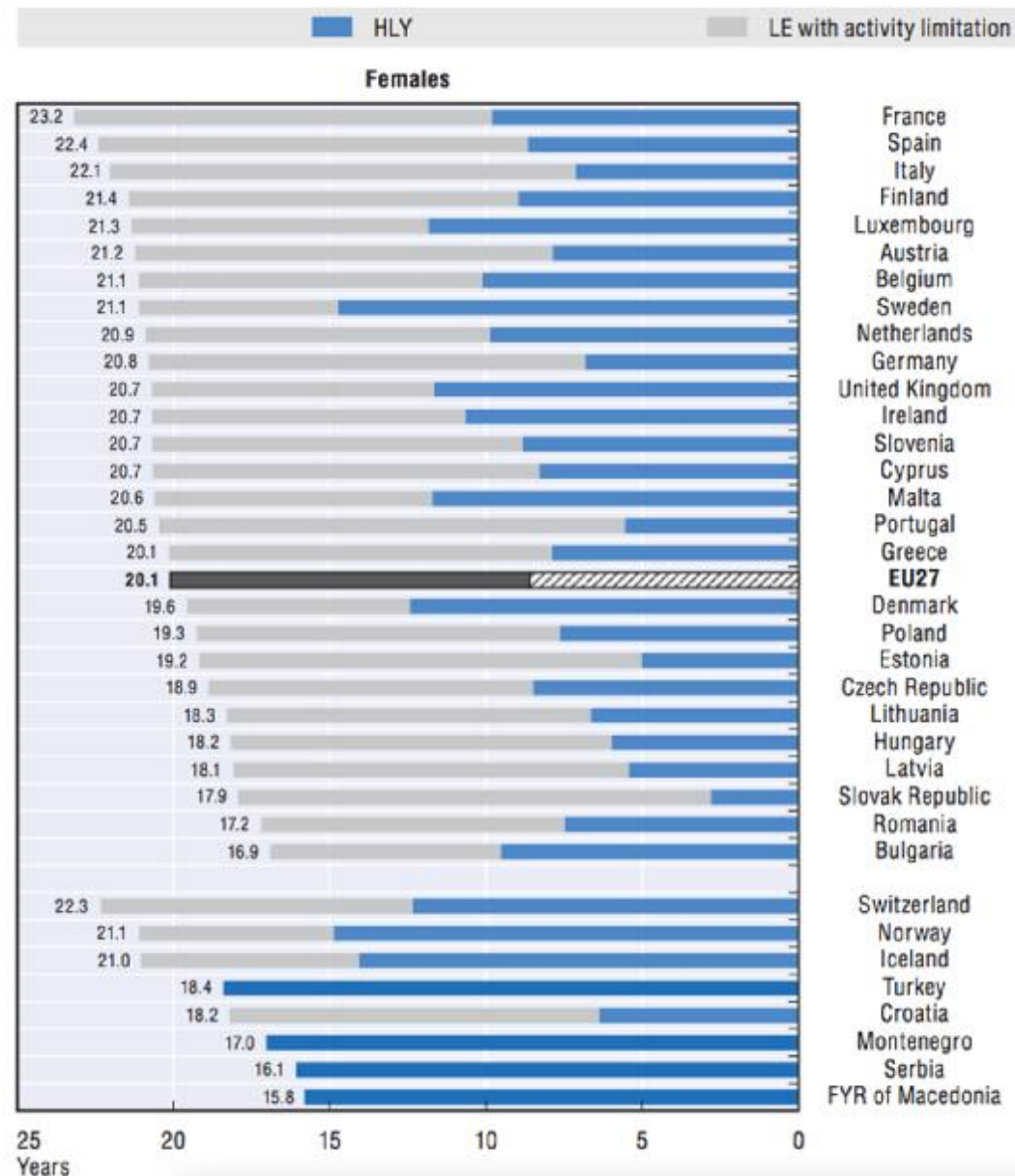
31. Did you have surgery in the last 3 months?	Yes	<input type="checkbox"/> 1
	No	<input type="checkbox"/> 2
	Does not know	<input type="checkbox"/> 3
32. If yes, for what reason? a) Bladder problems	Yes	<input type="checkbox"/> 1
	No	<input type="checkbox"/> 2
	Does not know	<input type="checkbox"/> 3
	Not applicable	<input type="checkbox"/> 4
b) Another reason (Specify)		
33. Did you or someone close to you lose hours of paid work in regards to your visit to the hospital? ( <u>For bladder problems only</u> )	Yes	<input type="checkbox"/> 1
	No	<input type="checkbox"/> 2
	Does not know	<input type="checkbox"/> 3
	Not applicable	<input type="checkbox"/> 4
34. Did you use the services of a specialist in pelvic floor management like a physiotherapist or a <u>kinesiologist</u> in the past 3 months?	No	<input type="checkbox"/> 1
	Yes, once	<input type="checkbox"/> 2
	Yes, twice	<input type="checkbox"/> 3
	Yes, 3 times	<input type="checkbox"/> 4
	Yes, 4 times or more	<input type="checkbox"/> 5
	Does not know	<input type="checkbox"/> 6



# Cost Utility Analysis

- Quality Adjusted Life Years (QALY)= a measure of a person's length of life weighted by a valuation of their health-related quality of life (NICE)
  - 0= dead, 1= perfect health (self-report)
- Quantity of life (survival, life expectancy)- widely accepted, few problems of comparison
- Quality of life (health utilities, surveys)- embrace a range of facets of life, not only health status

# Healthy Life Expectancy vs. Life Expectancy



OECD (2012), "Life expectancy and healthy life expectancy at age 65", in Health at a Glance: Europe 2012 , OECD Publishing.  
<http://dx.doi.org/10.1787/9789264183896-5-en>

# Cost Utility Analysis

- Estimated using the **SF-6D questionnaire**, derived from the SF-12 questionnaire (generic health related quality of life measure)
- Administered at baseline, 6 months, 12 months

**SF-12**

7. In general, would you say your health is:	Excellent	<input type="checkbox"/> 1
	Very good	<input type="checkbox"/> 2
	Good	<input type="checkbox"/> 3
	Fair	<input type="checkbox"/> 4
	Poor	<input type="checkbox"/> 5
	Does not know	<input type="checkbox"/> 6

8. The following items are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?		
Moderate activities, such as moving a table, vacuuming	Yes, limited a lot	<input type="checkbox"/> 1
	Yes, limited a little	<input type="checkbox"/> 2
	No, not limited at all	<input type="checkbox"/> 3
	Does not know	<input type="checkbox"/> 4
Climbing several flights of stairs	Yes, limited a lot	<input type="checkbox"/> 1
	Yes, limited a little	<input type="checkbox"/> 2
	No, not limited at all	<input type="checkbox"/> 3
	Does not know	<input type="checkbox"/> 4

9. During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health?		
Accomplished less than you would like	Yes	<input type="checkbox"/> 1
	No	<input type="checkbox"/> 2
	Does not know	<input type="checkbox"/> 3
Were limited in the kind of work you do or other activities	Yes	<input type="checkbox"/> 1
	No	<input type="checkbox"/> 2
	Does not know	<input type="checkbox"/> 3

<b>10. During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?</b>		
Accomplished less than you would like	Yes	<input type="checkbox"/> 1
	No	<input type="checkbox"/> 2
	Does not know	<input type="checkbox"/> 3
Didn't do work or other activities as carefully as usual	Yes	<input type="checkbox"/> 1
	No	<input type="checkbox"/> 2
	Does not know	<input type="checkbox"/> 3

<b>11. During the past 4 weeks, how much did pain interfere with your normal work (including work outside the home and housework)?</b>	Not at all	<input type="checkbox"/> 1
	A little bit	<input type="checkbox"/> 2
	Moderately	<input type="checkbox"/> 3
	Quite a bit	<input type="checkbox"/> 4
	Extremely	<input type="checkbox"/> 5
	Does not know	<input type="checkbox"/> 6



<b>12. The next questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give the one answer that comes closest to the way you have been feeling. How much of the time during the past 4 weeks –</b>		
Have you felt calm and peaceful?	All the time	<input type="checkbox"/> 1
	Most of the time	<input type="checkbox"/> 2
	A good bit of the time	<input type="checkbox"/> 3
	Some of the time	<input type="checkbox"/> 4
	A little of the time	<input type="checkbox"/> 5
	None of the time	<input type="checkbox"/> 6
	Does not know	<input type="checkbox"/> 7
Did you have a lot of energy?	All the time	<input type="checkbox"/> 1
	Most of the time	<input type="checkbox"/> 2
	A good bit of the time	<input type="checkbox"/> 3
	Some of the time	<input type="checkbox"/> 4
	A little of the time	<input type="checkbox"/> 5
	None of the time	<input type="checkbox"/> 6
	Does not know	<input type="checkbox"/> 7
Have you felt down-hearted and blue?	All the time	<input type="checkbox"/> 1
	Most of the time	<input type="checkbox"/> 2
	A good bit of the time	<input type="checkbox"/> 3
	Some of the time	<input type="checkbox"/> 4
	A little of the time	<input type="checkbox"/> 5
	None of the time	<input type="checkbox"/> 6
	Does not know	<input type="checkbox"/> 7

<b>13. During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting with friends, relatives, etc.)?</b>	All the time	<input type="checkbox"/> 1
	Most of the time	<input type="checkbox"/> 2
	Some of the time	<input type="checkbox"/> 3
	A little of the time	<input type="checkbox"/> 4
	None of the time	<input type="checkbox"/> 5
	Does not know	<input type="checkbox"/> 6

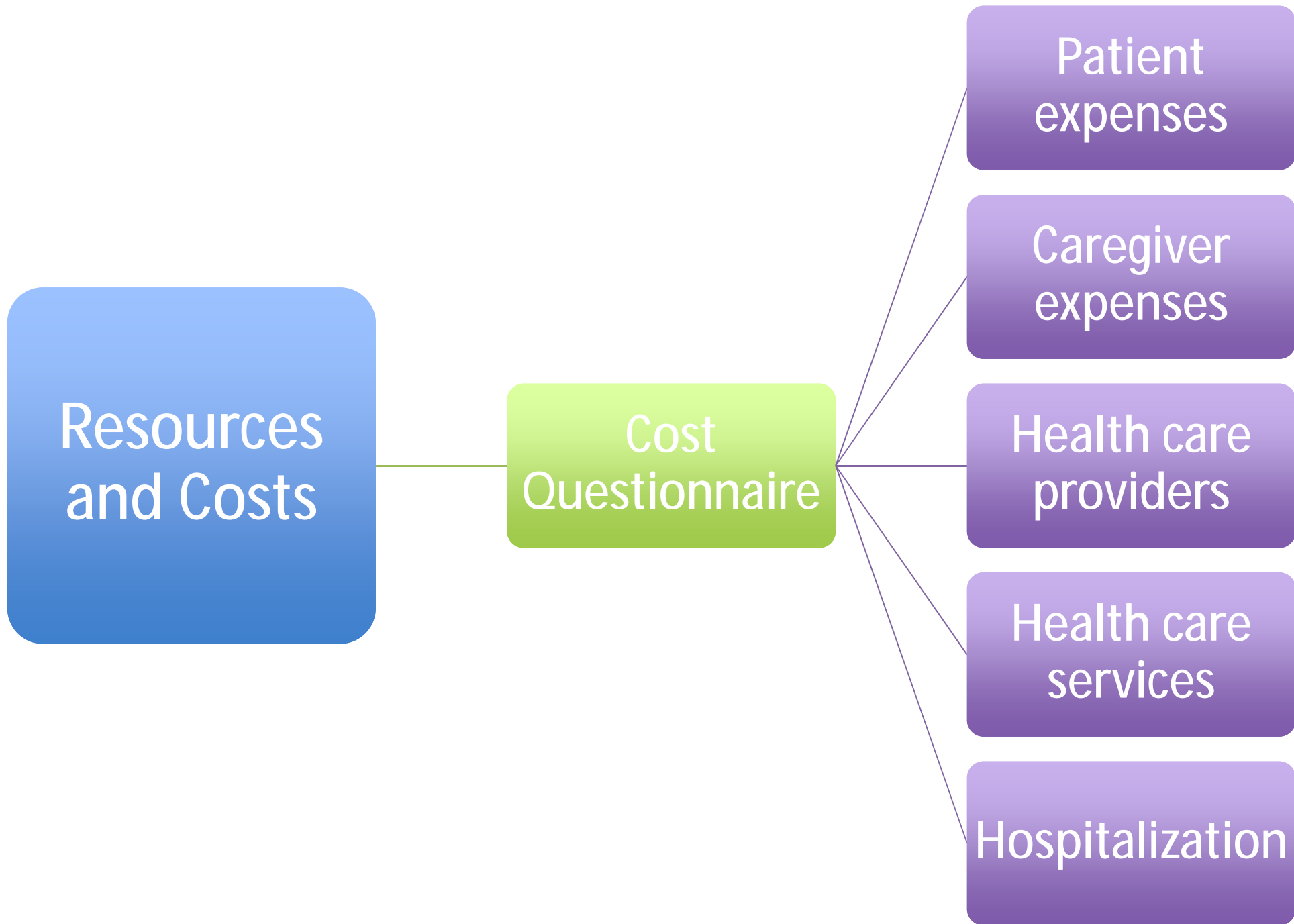
# Generic vs. Disease Specific Measures

- SF-6D= generic measure of quality of life

Advantages	Disadvantages
<ul style="list-style-type: none"><li>• Ready-made questionnaires</li><li>• Broader comparisons (general population, different conditions)</li><li>• Detection of unanticipated consequences</li><li>• Provides information on health status related to comorbidity</li></ul>	<ul style="list-style-type: none"><li>• Less sensitive to change in specific disease contexts</li><li>• Difficult to apply to acute conditions</li><li>• Ceiling/floor effects</li><li>• Generate different estimates for the same condition</li><li>• Lower patient acceptability</li></ul>

# Methods

- Study perspective
  - Health System- \$ saved (resource allocation)
  - Societal- \$ saved (pad/undergarment) AND health-related quality of life
- Time horizon= 1 year
- Discount rate= 0%



Resources  
and Costs

Cost  
Questionnaire

Patient  
expenses

Caregiver  
expenses

Health care  
providers

Health care  
services

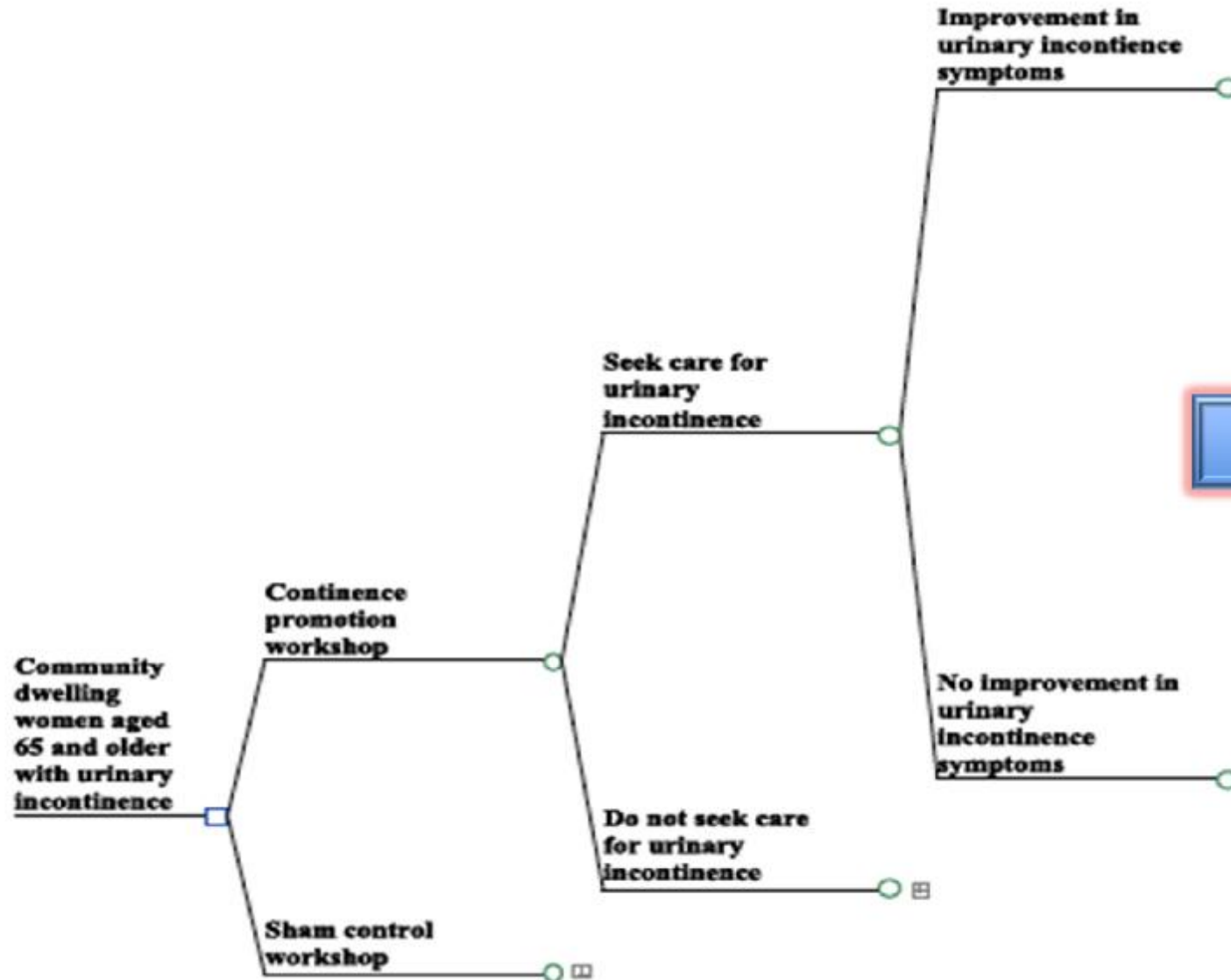
Hospitalization



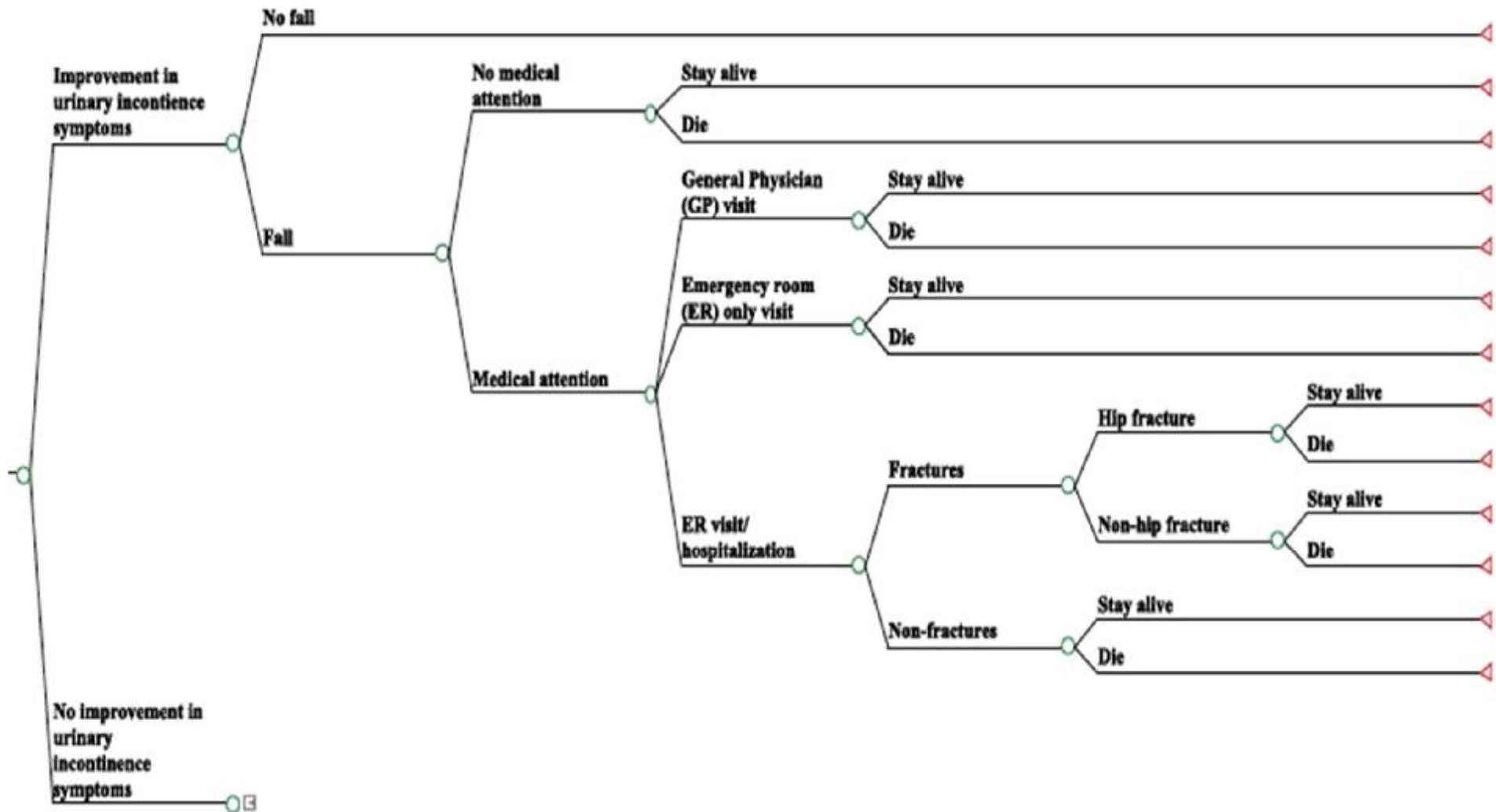
# Resources and Costs

- Costs to be obtained for each study site
  - Quebec (RAMQ)
  - Western Canada (Alberta Health Services)
  - UK (National Health Service)
  - France (Securité Sociale)
- Currency- dollars (Canada), euros (France), pounds (UK)
- Price Date- Consumer Price Index if must estimate costs for subsequent year
- Cost Conversion- not applicable

# Decision Tree Model



# Decision Tree Model (cont'd)



# Statistical Methods

- CEA- cost per % improvement in the prevalence of urinary incontinence (PGI-I)
- CUA- cost per QALY gained
- Base-case analysis, followed by a probabilistic sensitivity analysis
- Cost-effectiveness and cost-utility acceptability curves will be plotted for any uncertainty in results

# Discussion

- Limitations

- Self-report of incontinence

- Selection bias

- Recall bias

- Inability to capture all costs indirectly associated with incontinence (depression, functional limitation, comorbidity)- likely underestimation



# Discussion

- Strengths

- RCT with baseline and long-term follow-up
- International platform (sample size, generalizability)
- 1<sup>st</sup> international study to consider improvements in QALY as a measure of healthy active life expectancy
- 1<sup>st</sup> study to assess the impact of incontinence symptom improvement, fall reduction and quality of life on QALY



**THANK YOU!**



**QUESTIONS?**