

Discrete Choice Experiments to Help Inform Policy Makers

Comparison of Preferences for Colorectal Cancer Screening - Physician vs Patient Perspectives

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Thank you !

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Marshall et al. How do physician expectations of patient preferences for colorectal cancer screening tests differ from actual preferences? A comparison in Canada and the United States using a stated choice survey. Health Economics, 2009.

- Funded by US National Institutes of Health and National Cancer Institute (R01 grant)

Marshall et al. Measuring preferences for colorectal cancer screening using choice-format stated preferences. Value in Health, 2007.

- Funded by CIHR Operating Grant

Outline

1. Contextual Overview

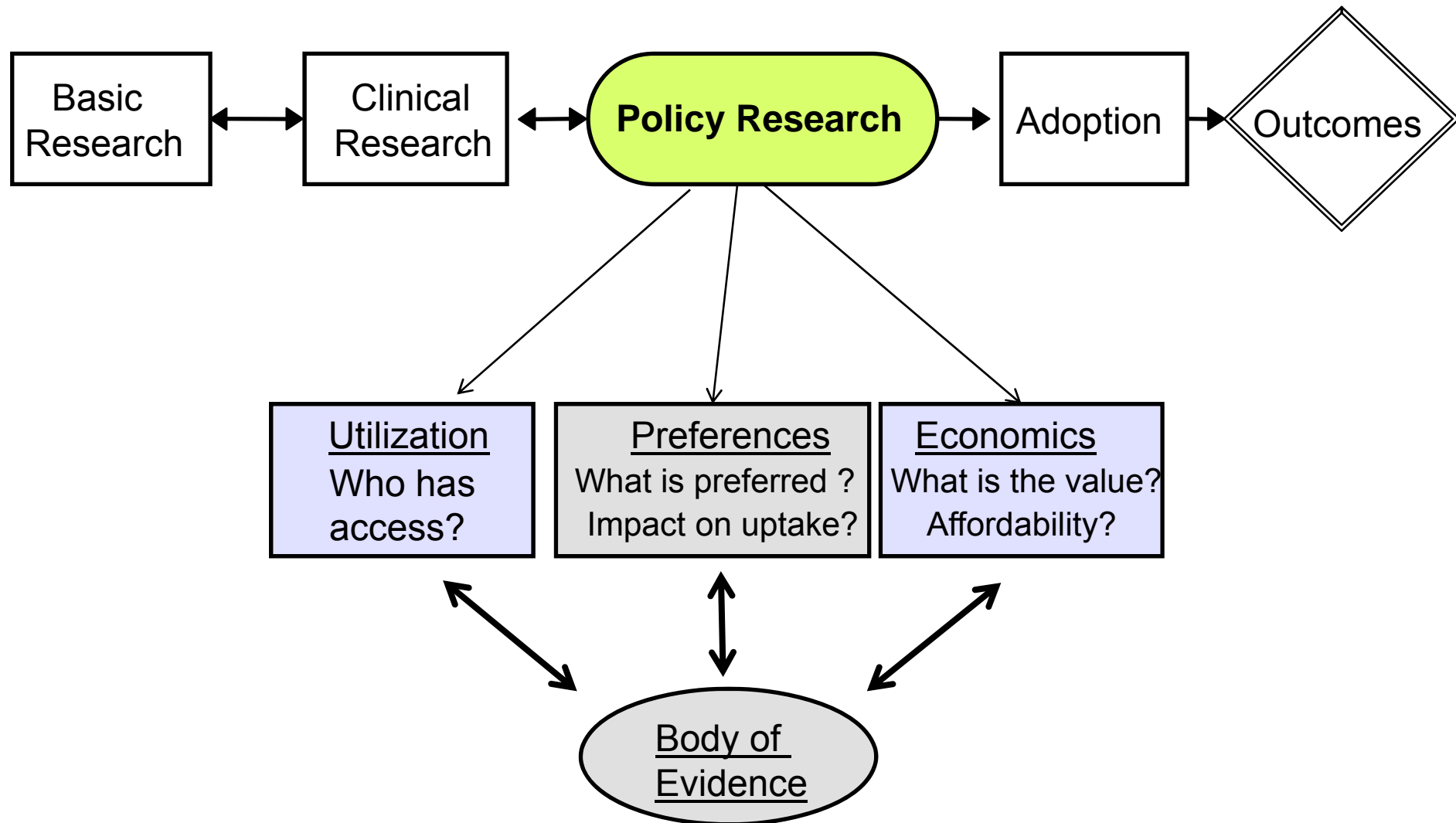
2. Alternative approaches for Valuation of Health

3. Case Example:

Discrete Choice Experiment (DCE) of CRC Screening Tests

- **By respondent - physicians and patients**
- **By geographic location - US and Canada**

Conceptual Framework for Translational Research



Why Preferences?

- Increasing recognition of choice as a key factor in uptake
- New technologies are more likely to be adopted if valued by patients & providers
- Preferences have implications for predicting utilization & determining value

Alternative Approaches for Valuation in Health

- CEA/CUA limited for efficiency in resource allocation by lack of value applied to health.
- CBA requires costs and consequences in monetary units to allow direct comparison and estimate of net benefit.
- CBA grounded in welfare economic theory where objective is to maximise social welfare as the aggregation of individual utilities.

Conjoint Analysis

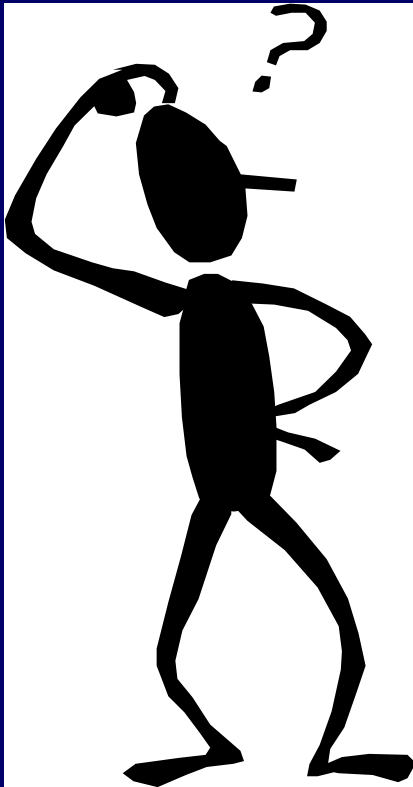
Stated Preferences, Attribute Based

- Multiple approaches (ranking, rating, discrete choice) all using hypothetical scenarios to elicit preferences
- Accounts for other characteristics that may yield utility including 'process' factors
- Permits estimation of trade-offs between attributes, including \$ (to calculate WTP)
- CA questions more closely resembles everyday decisions

Which CRC Screening Test?



Why Consider Preferences in CRC Screening?

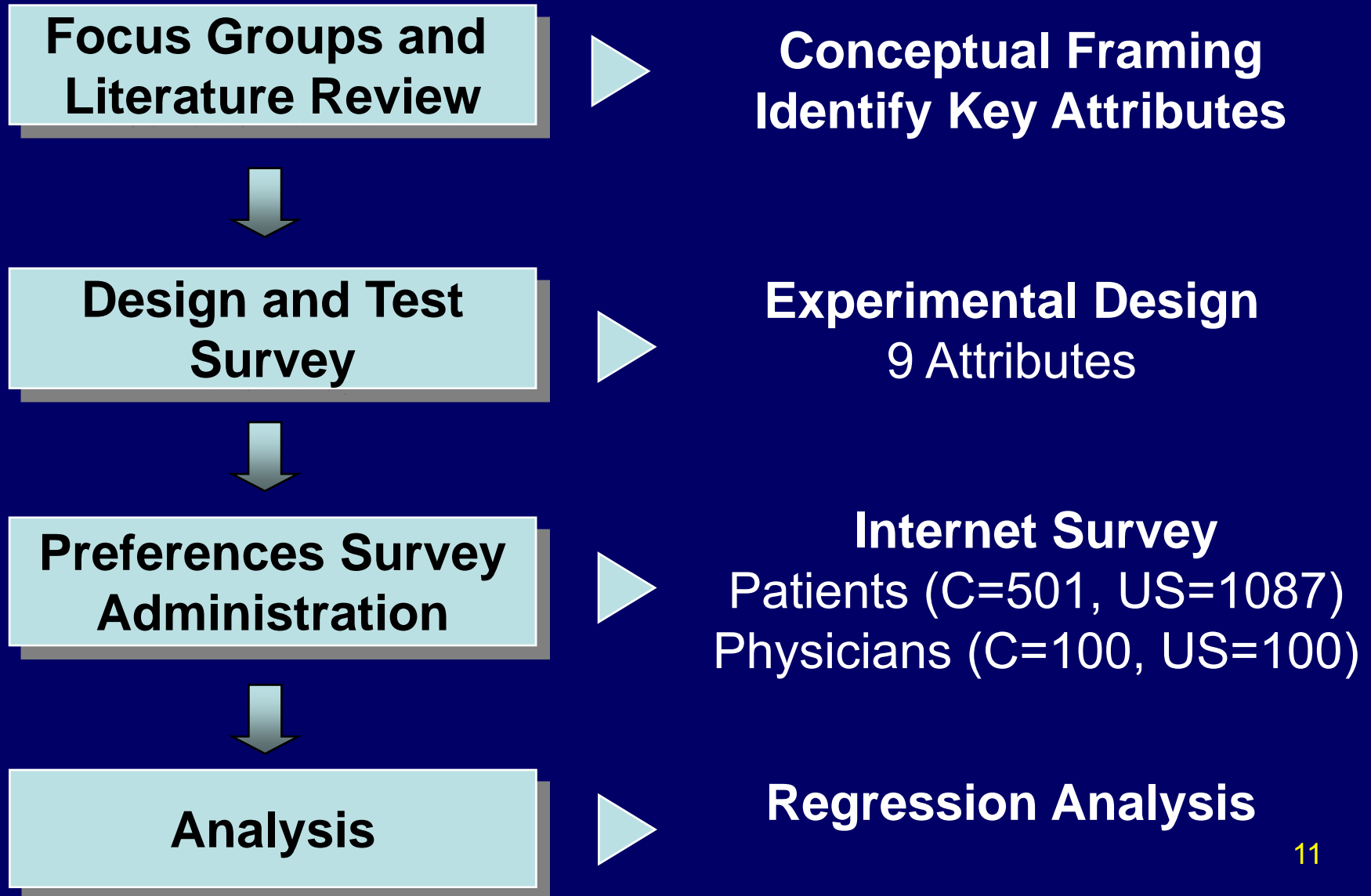


- Choices differ considerably in both process and outcome
- Uptake and compliance with CRC screening is poor
- General recognition of patient preferences in health care decisions

Objectives

1. Measure preferences for CRC screening tests with DCE
2. Compare results in US and Canada
 - Canadian sample provides data on population without organized screening programs & universal health care system
3. Compare results between patients and MDs
 - MD survey aimed at what MDs thought their patients preferred
4. Estimate WTP for CRC Screening Tests

Methods – Qualitative and Quantitative



Survey Attributes

attributes	n levels
process	4
pain/discomfort	3
frequency	4
preparation	4
follow-up	2
specificity	3
sensitivity	3
complication rate	4
cost	4



Key Findings - Attributes

- Key Finding #1: Physicians expected patients to choose 'no screening' more frequently than patients themselves
- Key Finding #2: For all groups, the most important attribute is sensitivity. Other key attributes are those related to the test performance or the testing process.
- Key Finding #3: Physicians' perceptions of their patients' preferences are significantly different from patients' actual preferences.

Key Findings – Group Comparisons

- Key Finding #4: Patient respondents were willing to pay more than physicians predicted.
- Key Finding #5: CRC test preferences for Canadian and US groups were similar.

Key Findings – CRC Tests and WTP

- Key Finding #6: DNA stool testing, colonoscopy, and virtual colonoscopy were the most preferred tests by all groups.
- Key Finding #7: The greatest impact on screening uptake rate estimates would be achieved if all CRC screening modalities were available rather than FOBT alone (30% to 43%).

Views on CV and CA Studies

- Surveyed healthcare decision makers (n=77) & scientists (n=42) to assess knowledge and acceptance of methods
 - Respondents did not show high intention to use methods.
 - Skepticism regarding hypothetical scenarios
 - Majority of scientists considered discrete choice experiments in particular to be an appropriate method for resource allocation.

Summary and Conclusions

1. Preferences for CRC screening tests
 - Similar findings for US and Canada preferences
 - Patients and MDs reported different preferences
2. Measurement of preferences as one component of the health policy translational research agenda.
3. Conjoint analysis to measure preferences may inform policy-makers and providers on the design and promotion of CRC screening programs (including new and emerging technologies) to optimize uptake.

Thank you!

Questions?

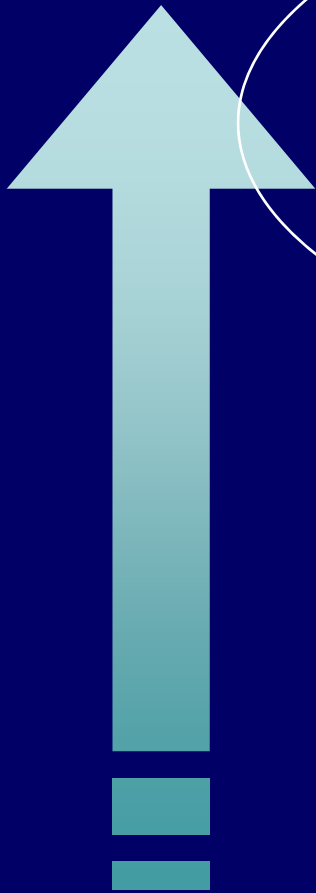
Willingness-to-Pay

Broadly speaking:

The amount someone is willing to pay and thereby sacrifice in terms of other commodities for the described benefits if they were in the marketplace.

Attribute Level Order Summary

increasing
importance



CDN Pts	US Pts	CDN MDs	US MDs
sensitivity	sensitivity	sensitivity	sensitivity
specificity	pain	specificity	specificity
pain	process	frequency	pain
process	specificity	pain	process
risk	risk	risk	preparation
preparation	preparation	preparation	frequency
frequency	frequency	process	risk
follow-up	follow-up	follow-up	follow-up

CRC Test Descriptions

attribute	DNA	FOBT	COL	SIG	DCBE	VCOL
process	stool	stool	tube	tube	xray	CT
frequency	5 yr	1 yr	10 yr	5 yr	5 yr	10 yr
follow-up	yes	yes	no	yes	yes	yes
pain	none	none	sedative	mild	mild	mild
preparation	none	diet	laxative	enema	laxative	laxative
risk	none	none	mid	mid	mid	none
specificity	90%	90%	90%	90%	80%	90%
sensitivity	40%	40%	90%	70%	90%	90%

Respondent Characteristics

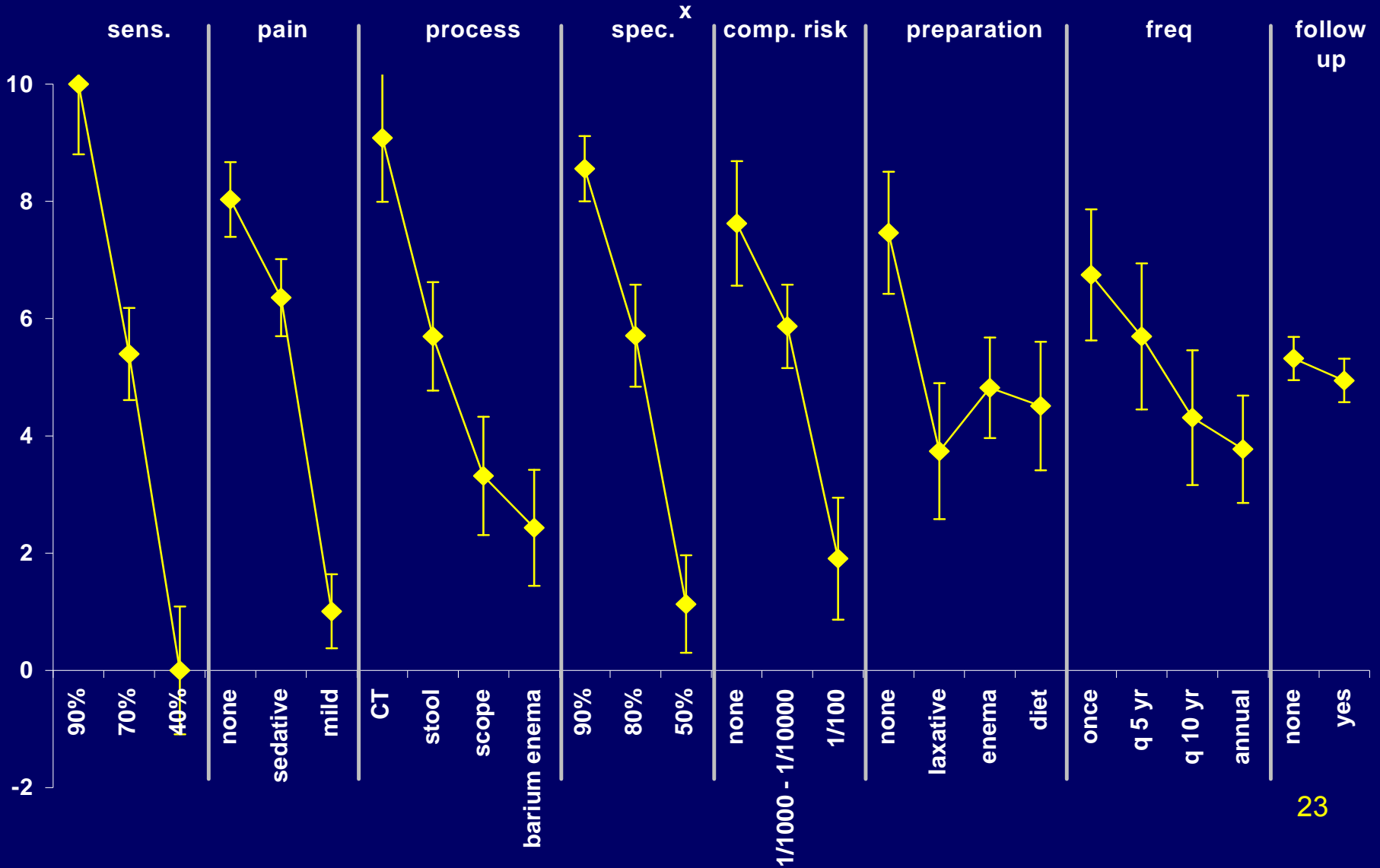
	Pt		MD	
	CDN	US	CDN	US
N	501	1,087	100	100
Race - % white	97%	86%	-	-
Sex - % male	45%	48%	67%	78%
Mean age	55 yrs	57 yrs	42 yrs	44 yrs
Mean yrs education	11 yrs	15 yrs	-	-
Mean annual income*	\$48K	\$ 51K	-	-
n pts ≥ 50 yrs/wk	-	-	64	74

Previous CRC Screening

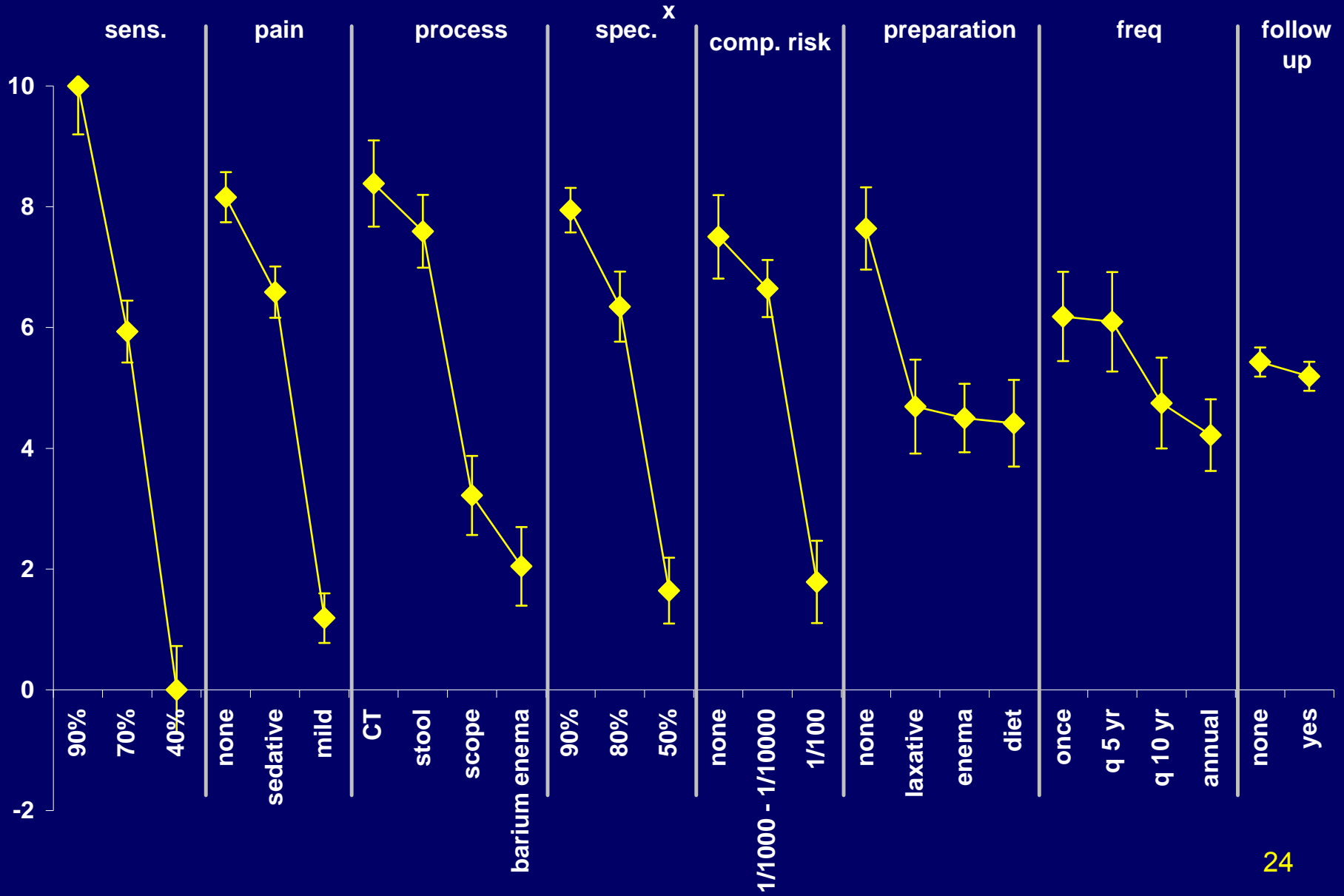
FOBT	31%	50%	-	-
sigmoidoscopy	18%	33%	-	-
colonoscopy	23%	45%	-	-

* In local currency

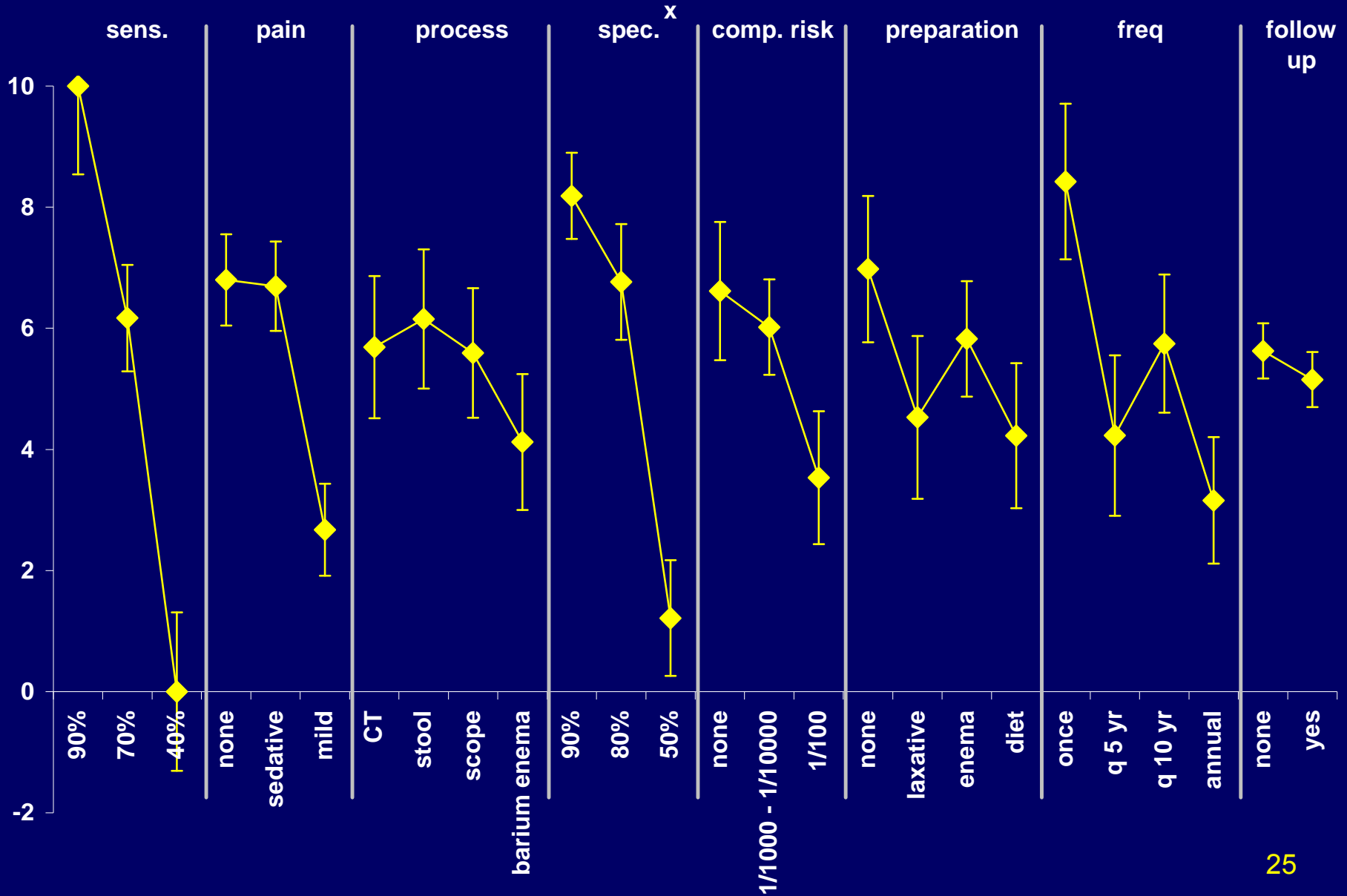
Attributes CDN Pt



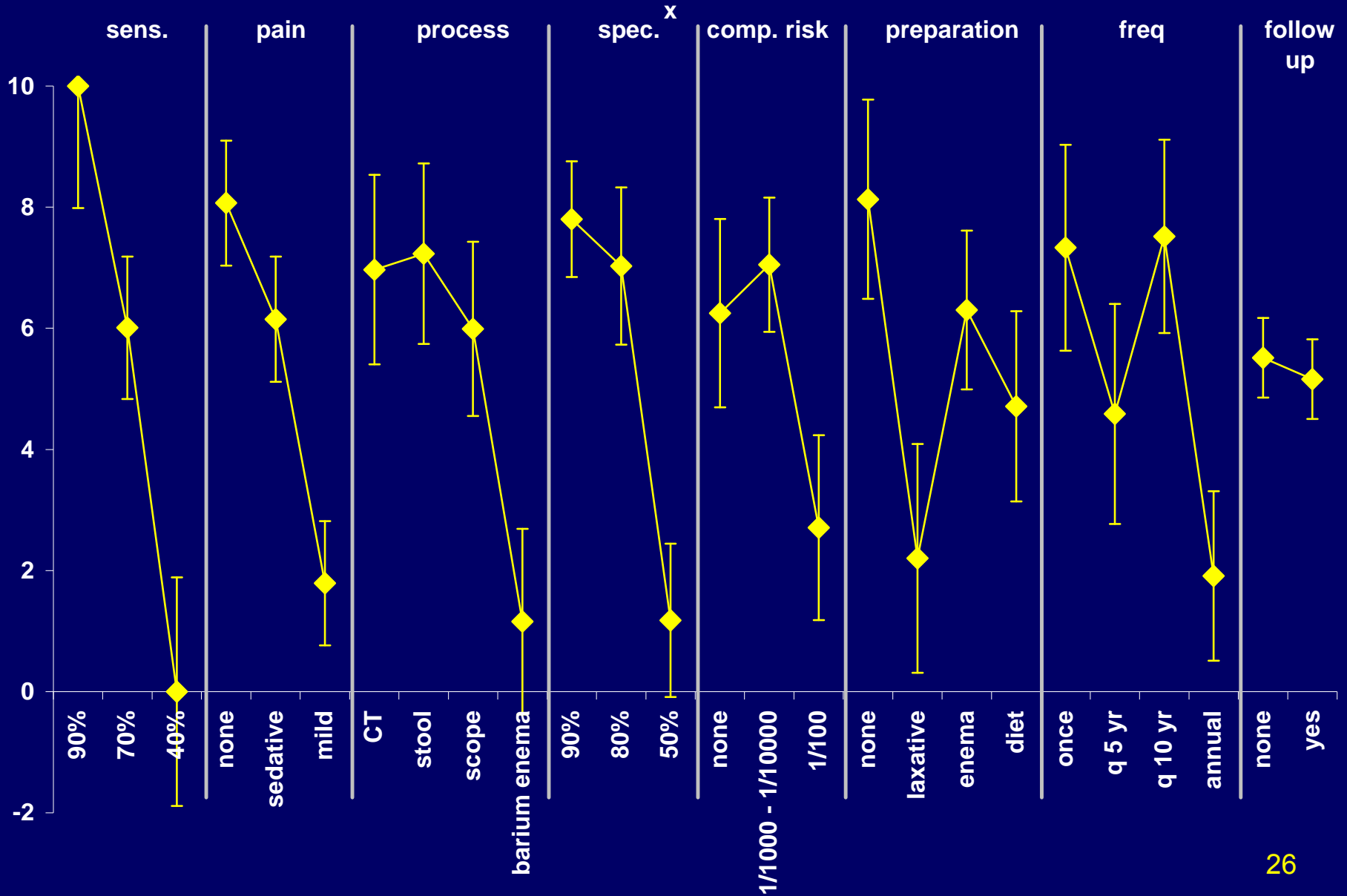
Attributes US Pt



Attributes CDN MD



Attributes US MD



Calculation Ex Post vs Ex Ante

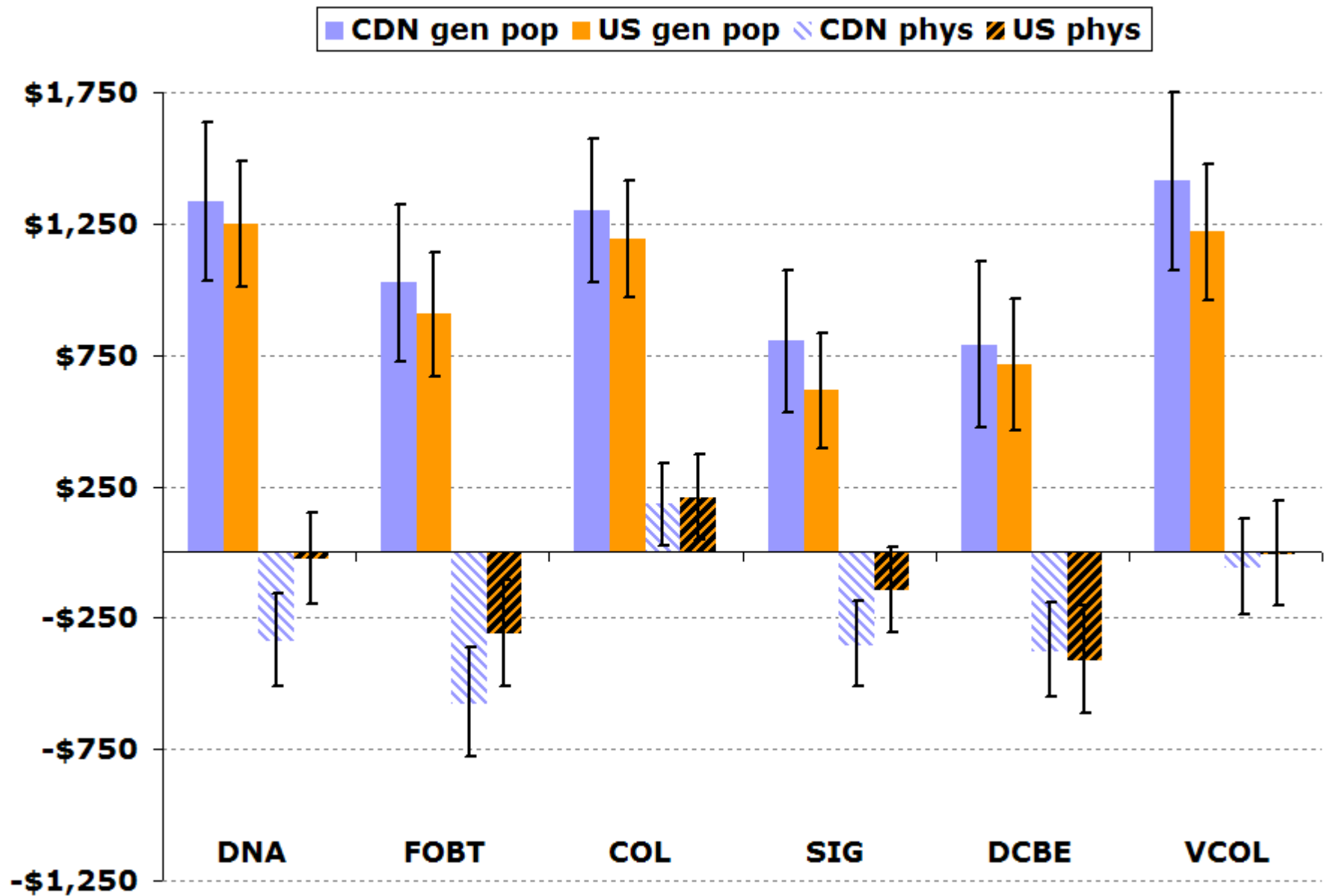
- Ex Post: Value of Test A vs Test B (conditional on a test being chosen)

$$WTP_{ep} = \frac{V_a - V_b}{MUM}$$

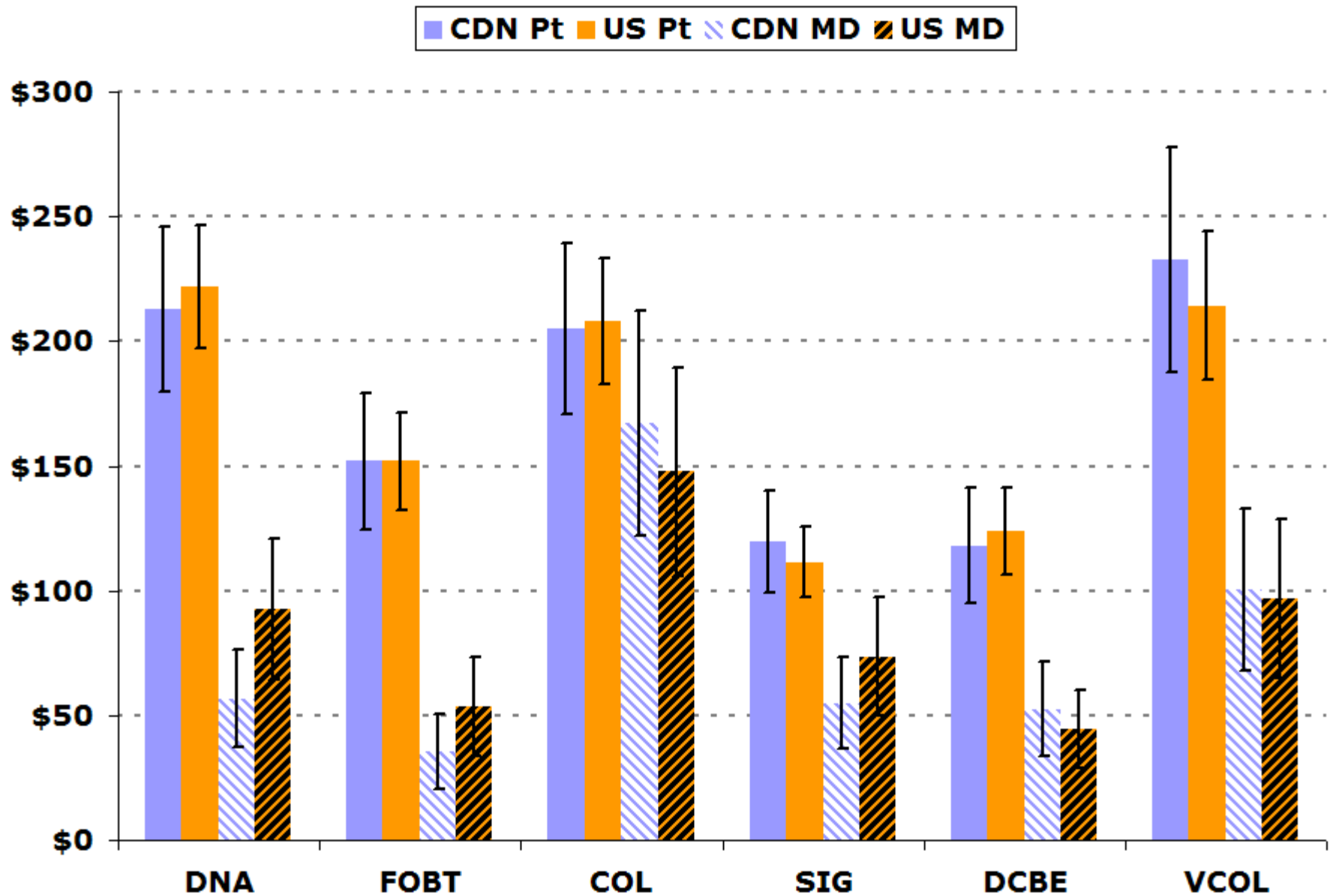
- Ex Ante: WTP for Test A vs Test B adjusted by the probability of choosing the test

$$WTP_{ea} = \frac{\ln\left(\sum_m \exp(V_m)\right) - \ln\left(\sum_n \exp(V_n)\right)}{MUM}$$

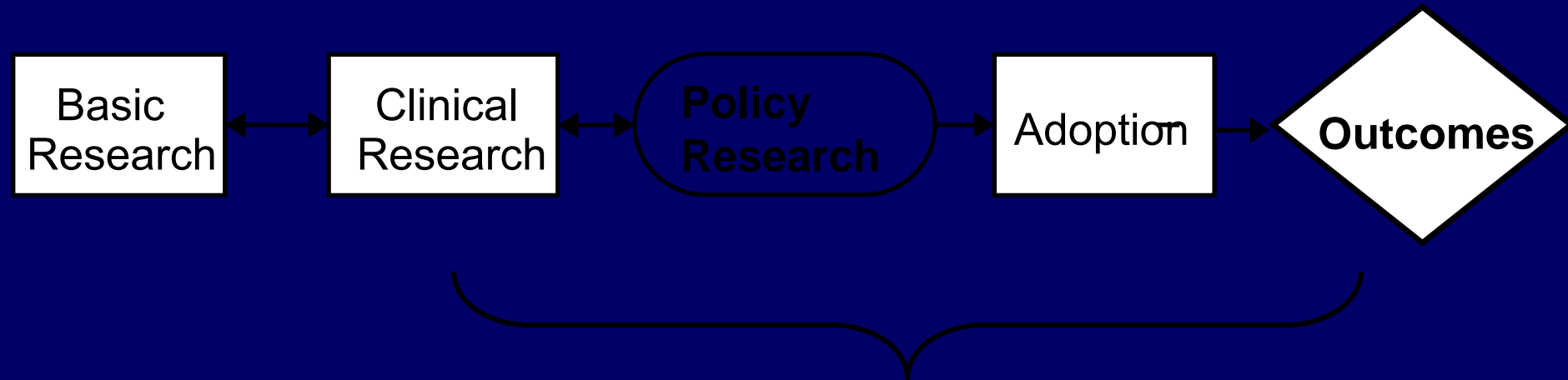
Ex Post WTP for CRC Screening Test



Ex ante WTP for CRC Screening Test



Translational Research Continuum Requires:

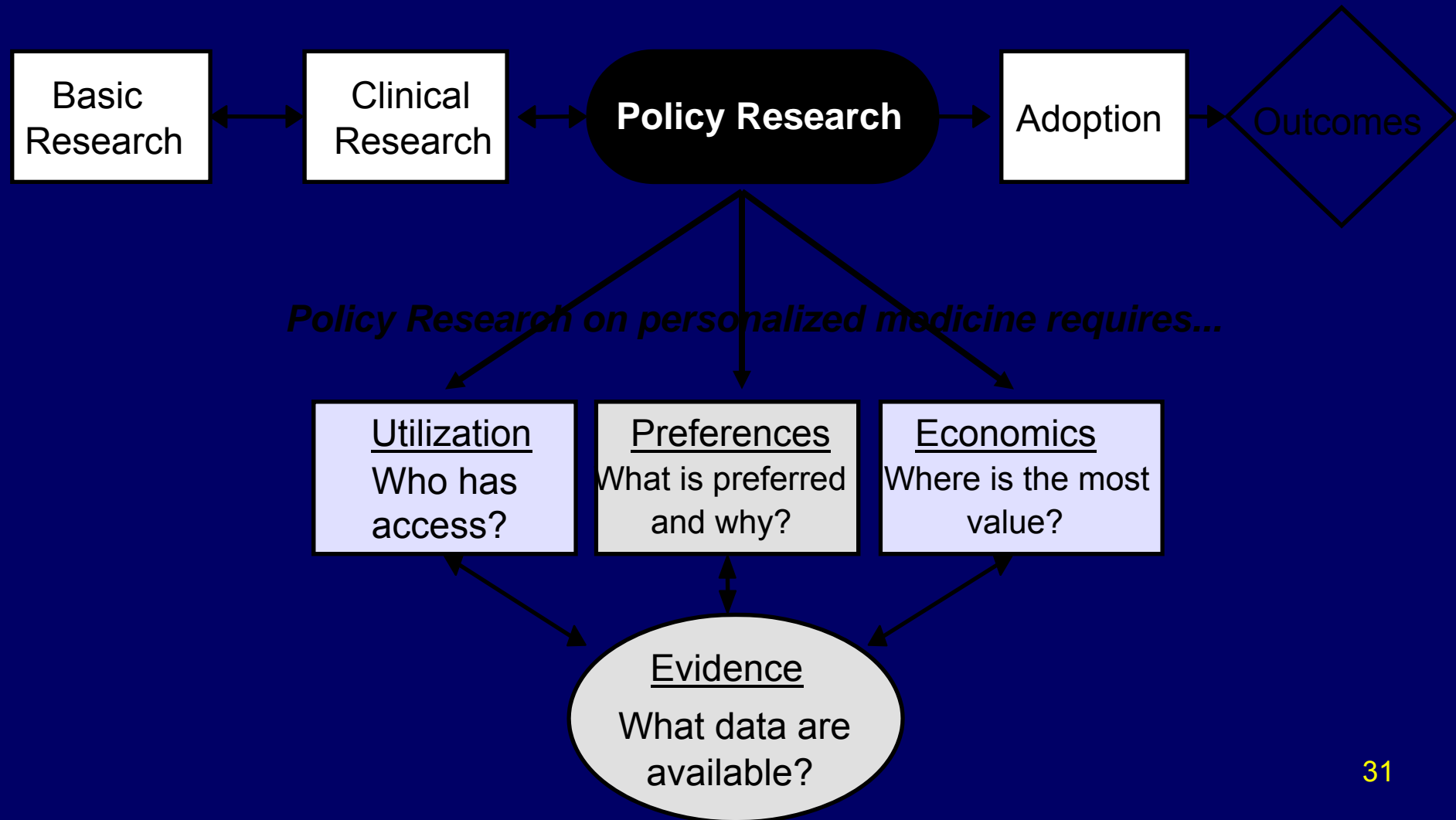


PGx must fill a knowledge gap that is clinically important to the diagnosis, prognosis and treatment of patients

Cancer & Personalized Medicine Research Study (CANPERS)

Objective: Use integrated, interdisciplinary approach to obtain evidence about key aspects of translation of genomic information for breast and colorectal cancer into clinical practice and health policy.

CANPERS Conceptual Framework



Why Utilization?

- Understanding access & utilization are critical to developing appropriate policies
- Glaring gap in available data on diagnostics has implications for growing use & for ability to determine value
- Requires creative approaches to obtaining & analyzing data

Why Preferences?

- New technologies are more likely to be adopted if valued by patients & providers
- Willingness-to-pay can be derived from stated preferences
- Preferences have implications for predicting utilization & determining value
- Requires complex analyses of complex scenarios

Why Economics?

- Limited analyses of value is barrier to appropriate adoption
- Existing methods may need to be adapted to appropriately measure value of personalized medicine
- Particularly relevant to multiple drugs & conditions, diagnostic/drug combinations, & impact on family members

Why Evidence Base?

- Evidence base is needed to assess adoption, impact, and value
 - Particularly critical for reimbursement policy
- Needed data are lacking or widely dispersed
- Requires innovative data sources & analysis

Views on WTP Studies

Günther, 2006

- Surveyed healthcare decision makers (n=77) & scientists (n=42) to assess knowledge and acceptance of WTP methods (contingent valuation & choice experiments)

Views on WTP Studies Results (2)

- % believing method is appropriate method to support decisions about healthcare resource allocation:

	Decision makers	Scientists	p-value
DCE	46.7	65.0	0.04
CV	48.7	51.2	NS

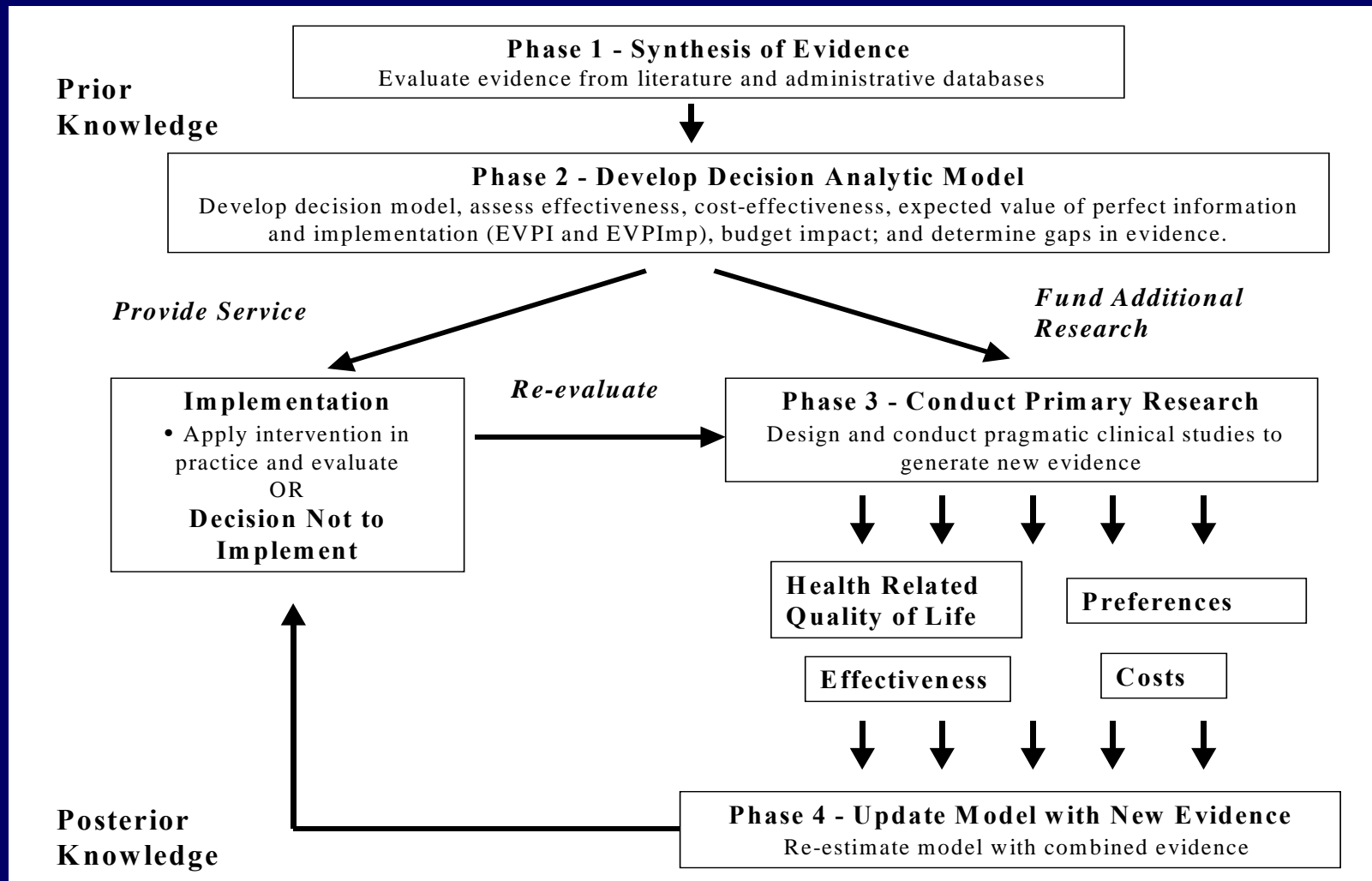
NS = non-significant

Views on WTP Studies

Conclusion

- To increase the acceptance WTP measurement methods, should:
 - Make hypothetical more realistic;
 - Use payment vehicles to help patients relate payment to a real health benefit.

Iterative Framework of Health Technology Assessment (HTA) for Decision Making



Example of Choice Scenario

Characteristic	Screening Test A	Screening Test B
<i>How is it done?</i>	You place 2 stool samples on to special cards for 3 consecutive days and return them to your doctor for testing.	Air and a white liquid are injected into your colon through a tube inserted into your rectum. X-rays are taken as the liquid moves through your colon. This is done at the hospital.
<i>Is there pain or discomfort?</i>	You may feel pain or discomfort like intense cramps.	You will be given a sedative so that you should only feel pressure or mild discomfort, but you will feel sleepy and need to relax for the rest of the day.
<i>How often will the screening test be done?</i>	You will have the screening test every 5 years	
<i>What do I do to prepare?</i>	One hour prior to the test you must have an enema to empty the last part of your colon.	Before the test you must take a laxative to clean your colon. After the laxative, you can only have clear liquids until after your test.
<i>If this screening test result is abnormal, will an additional test be needed to confirm whether I have cancer?</i>	No.	Yes, you will undergo another test on a different day.
<i>If 10 people without cancer get this screening test, how many of them will the test say do have cancer?</i>	The screening test will say that 1 out of 10 people without cancer do have cancer.	The screening test will say that 2 out of 10 people without cancer do have cancer.
<i>If 10 people with cancer get this screening test, how many of them will the test say do not have cancer?</i>	The screening test will say that 6 out of 10 people with cancer do not have cancer.	
<i>How many people who get this screening test have a complication?</i>	1 out of 100 people who get this screening test will have a complication.	1 out of 10,000 people who get this screening test will have a complication.
<i>What is the cost of the screening test to me?</i>	\$500	
Characteristic	Screening Test A	Screening Test B

Respondent Characteristics

	Pt		MD	
	CDN	US	CDN	US
N	501	1,087	100	100
Race - % white	97%	86%	-	-
Sex - % male	45%	48%	67%	78%
Mean age	55 yrs	57 yrs	42 yrs	44 yrs
Mean yrs education	11 yrs	15 yrs	-	-
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* In local currency

Discrete Choice Experimental Design

- Optimised several measures of efficiency :
 - Level balance
 - Utility Balance
 - Orthogonality
 - D-Efficiency
- 9 attributes identified through focus groups and previous survey
- Independent attribute approach; 2 interacted attributes
- Conditional two-step design
- Scenarios based on fractional factorial non-zero design – D-efficiency:
 - 3 blocks of 11 unique scenarios + 1 repeat
 - 2 overlaps per scenario

Tests for CRC Screening

Test	Description
Faecal occult blood test (FOBT)	<ul style="list-style-type: none">▪ 3 stool samples smeared on test card at home and returned▪ detect blood in stool
Sigmoidoscopy (SIG)	<ul style="list-style-type: none">▪ endoscopic study of lower colon▪ enema to cleanse bowel prior
Double contrast barium enema (DCBE)	<ul style="list-style-type: none">▪ x-ray series of entire colon & rectum▪ barium enema to cleanse bowel then air into rectum
Colonoscopy (COL)	<ul style="list-style-type: none">▪ endoscopic examination of entire colon under sedation▪ laxative to cleanse bowel prior▪ remove polyps during procedure

Respondent Sample

Inclusion and Exclusion Criteria

Patients

- 45 – 70 yrs
- fluent in English
- CDN/US resident

MDs

- fluent in English
- current CDN/US general medicine practitioner at least 1 yr
- see ≥ 6 patients/week aged ≥ 50 yrs

Sample size

<u>Patients</u>		<u>MDs</u>	
CDN	US	CDN	US
501	1,087	100	100

Choice Not to Screen

- Key Finding #1: Physicians expected patients to choose 'no screening' more frequently than patients themselves

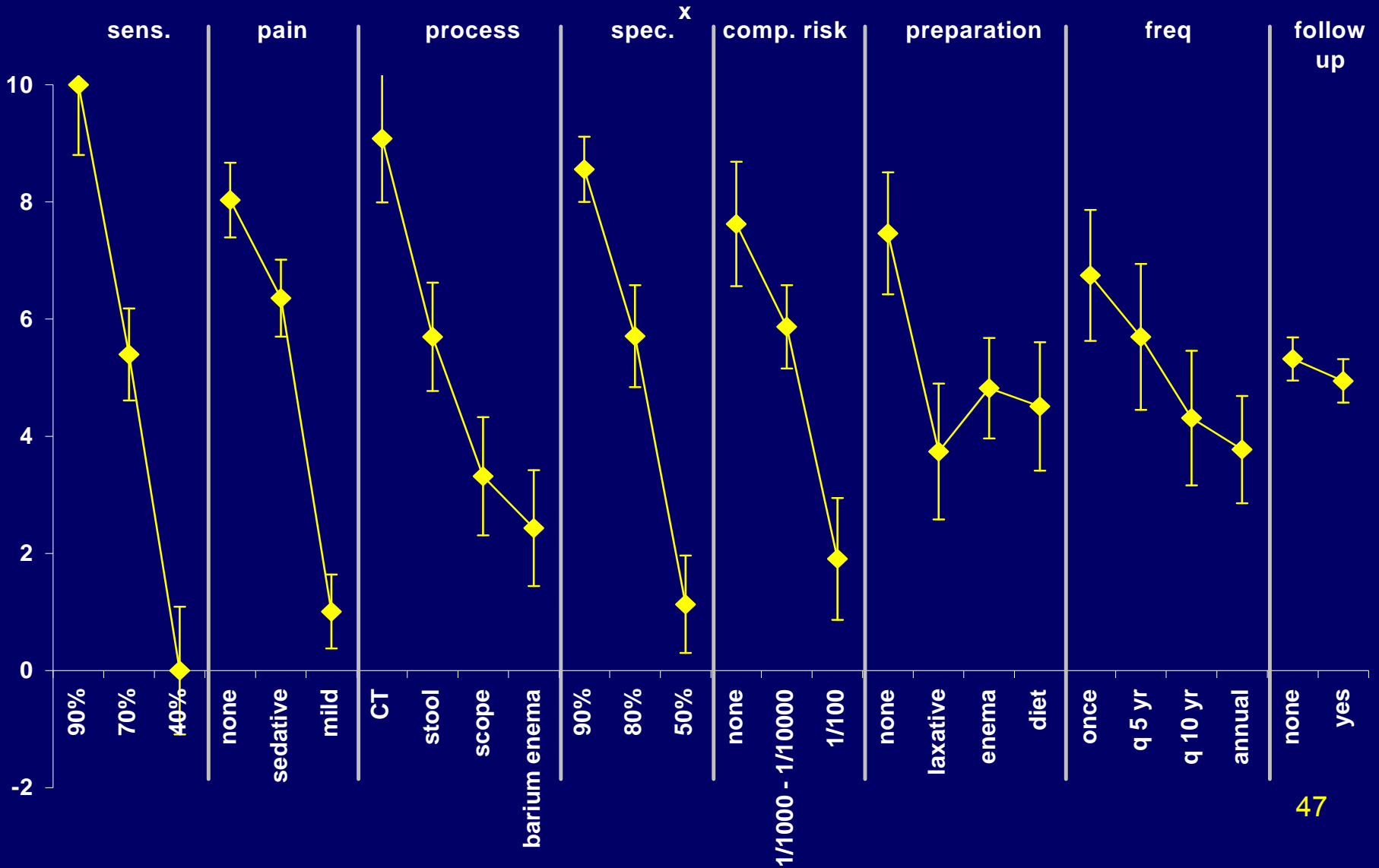
<u>Patients</u>		<u>MDs</u>	
CDN	US	CDN	US
29%	32%	55%	46%

Which test would you prefer (please mark one box only)	Prefer A <input type="checkbox"/>	Prefer B <input type="checkbox"/>
Suppose you now have the option of no screening. What would you prefer now? (please mark one box only)	I would still prefer the test chosen above <input type="checkbox"/>	
	I would prefer no screening <input type="checkbox"/>	

Example of Results

attribute	level	CDN Pts		US Pts	
		β -estimate	SE	β -estimate	SE
specificity	90%	0.2161	p < 0.001	0.1781	p < 0.001
	80%	0.0364		0.0700	p < 0.001
	50%*	-0.2525	p < 0.001	-0.2481	p < 0.001
sensitivity	90%	0.3071	p < 0.001	0.3170	p < 0.001
	70%	0.0167		0.0421	p < 0.10
	40%*	-0.3238	p < 0.001	-0.3591	p < 0.001

Attributes CDN Pt



Ex Post, Ex Ante or Expostulation?

Ex Post WTP	“In the market” value
Ex Ante WTP	“Societal welfare” value
Expostulation	Is there any value to this at all?

WTP—With and Without Uncertainty

WTP under certainty ('ex-post' or 'in-the-market value')

- Respondent knows that they are a consumer and the only uncertainty is for the probability of outcomes
= Value of consuming or experiencing CRC screen relative to no screening (conditional on having screening)

WTP with uncertainty ('ex-ante' or 'societal welfare value')

- Incorporate the probability of sustaining the illness and needing the service. If the person does not get ill, they derive no benefit from the service.
- Ex ante perspective reflects broader social concern with opportunity in the sense of expected value
= Value of potential for screening

WTP for CRC Screening Test

CDN Pt US Pt CDN MD US MD

