How to measure what people prefer: Health preference research to optimize health-related interventions

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Session 1
Welcome and introductions

www.hope-endhiv.com

Head of Countries

JASON J. ONG
— AUSTRALIA

NITTAYA PHANUPHAK
— THAILAND

NINA T. CASTILLO-CARANDANG
— PHILIPPINES

HOPE Project Manager

WARITTHA TIEOSAPJAROEN
— AUSTRALIA

www.hope-endhiv.com

- Aim to **reduce HIV transmission** in East Asia by optimizing the roll-out, implementation, and real-world effectiveness of pre-exposure prophylaxis (**PrEP**) in **Australia, Thailand, and the Philippines**

www.hope-endhiv.com

- Establish a **network of regional experts** from **research, communities and policymakers**, we will co-design intervention strategies with key populations to **improve PrEP care adherence and persistence among key populations**.

www.hope-endhiv.com

- These strategies will be informed by **socially innovative methods** (e.g., **crowdsourcing**, **discrete choice experiments**) and implemented in each country site.
- (2024 – economic evaluations alongside trials)

Overall aims of the workshop

1) Introduce health preference research with a focus on DCE
2) Describe the steps of conducting a DCE
3) Share examples of DCEs in health research

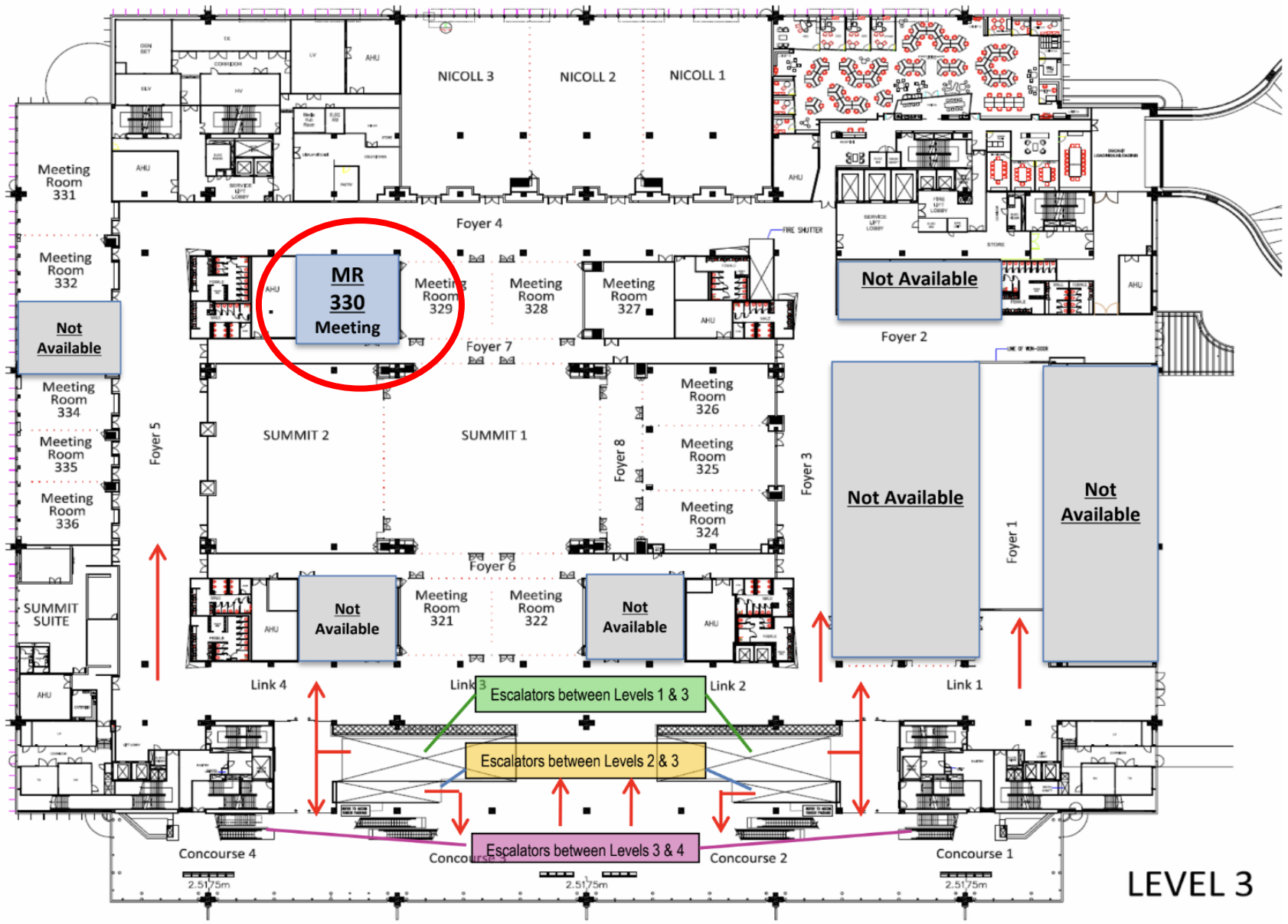
Program

- Each session
  - ~30 minutes of lectures
  - ~30 minutes of group work

Logistics

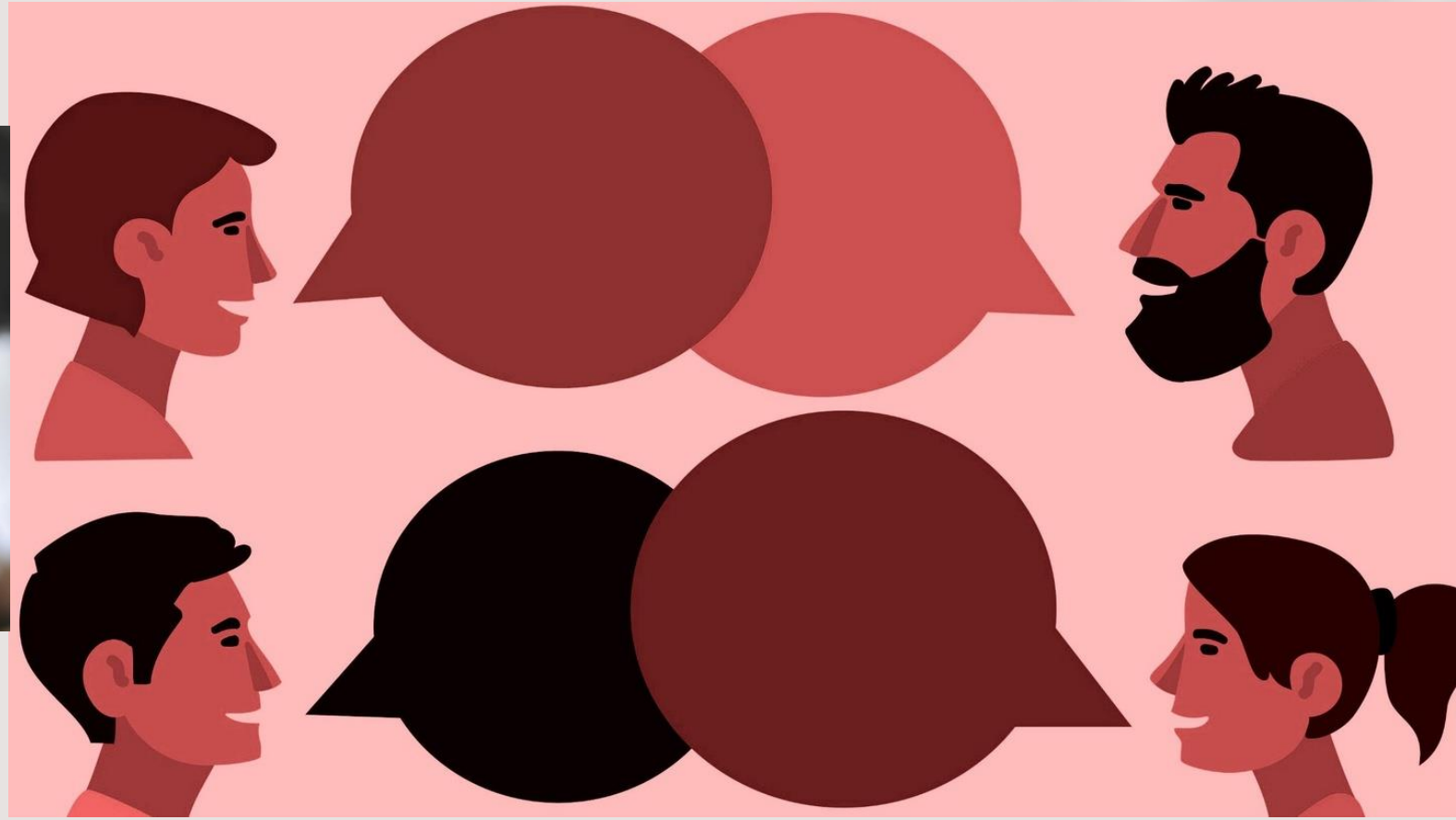
- Toilets
- Food
- Emergency Exit

Suntec Singapore - Level 3



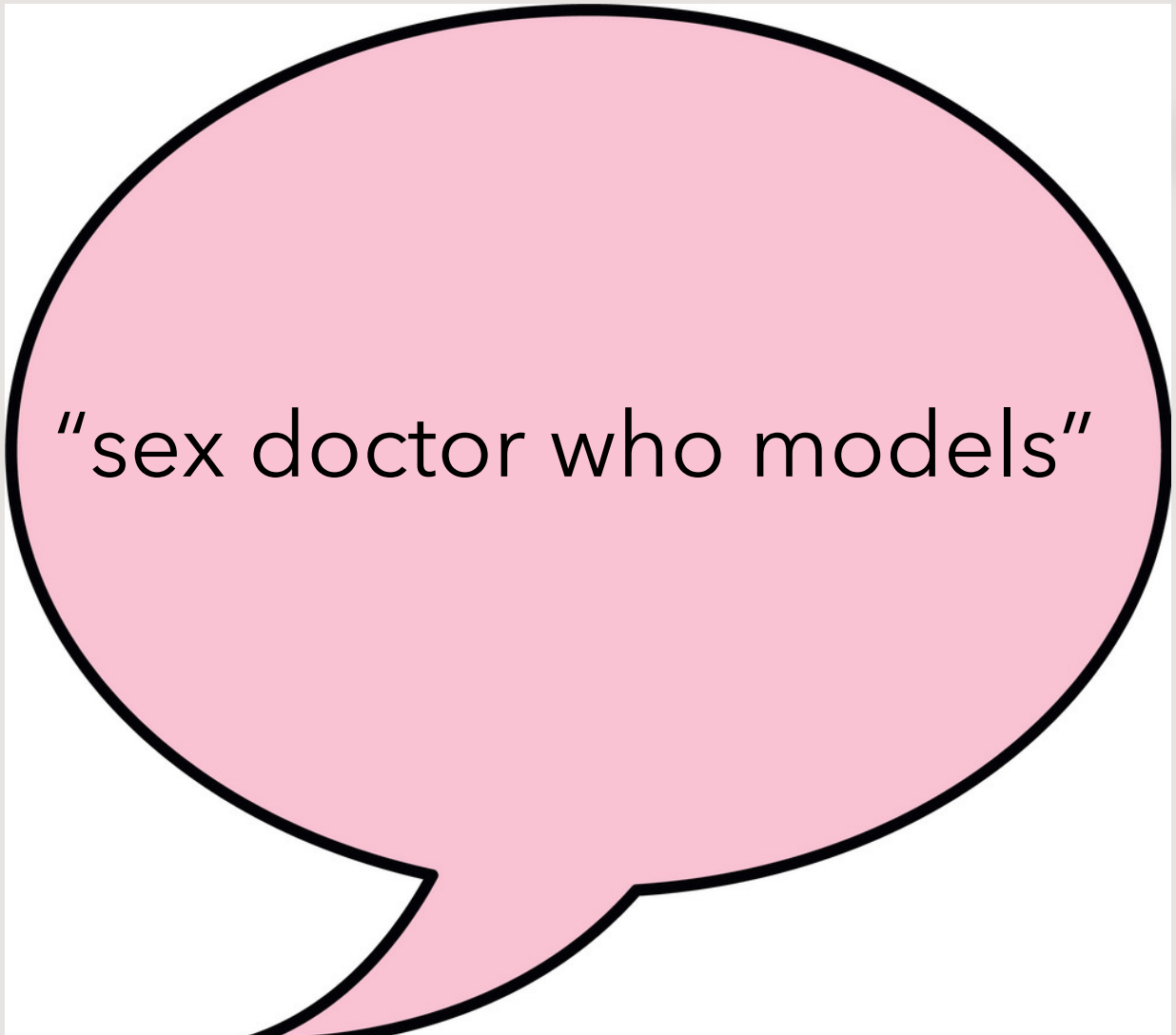
- Seek first to understand, then to be understood
- Maintain curiosity
- Share the floor and let others speak
- Respect different views, needs and priorities
- Use “I” statements – own your experience and opinions
- Maintain confidentiality – de-identify stories where necessary
- Assume good intentions
- Be supportive and collaborative
- Enjoy the process

Learn from one another




GETTING
TO
KNOW
YOU

Who am I?



- **Sexual health physician**
  - Melbourne Sexual Health Centre
  - Clients with HIV/STI
- **Researcher that models**
  - Understanding epidemics and human behaviors/preferences to improve health services (and outcomes)
    - Infectious disease and statistical models
    - Decision modelling

Join at

slido.com

#8942 967

https://admin.sli.do/event/1zLjSiS7yFeFaBoBCJDo8T/polls

Session 2. Overview of how to conduct discrete choice experiments

Objectives

- Describe the motivation for conducting DCEs
- Describe limitations of DCEs
- Present the steps for conducting a DCE

Outline

Motivation

What is a DCE?

Steps of conducting a DCE

Motivation

Motivation

- A **one-size-fits-all models** does not work for all people.
- People-centred care = Gold standard
  - **Precision public health**
  - **Differentiated service delivery**
    - responsive, client-centred approach that simplifies and adapts services to better serve individual needs and reduce unnecessary burdens on the health system.
  - **Preference sensitive care**
    - Incorporate patient preferences and values – “patient voice”

WHEN

Monthly
Every 2 months
Every 3 months
Every 6 months

WHERE

HIV clinic / hospital
Primary care clinic
Drop-in centre
Community
Home

WHO

Physician
Clinical officer
Nurse
Pharmacist
Community health worker
Patient / peer / family

WHAT

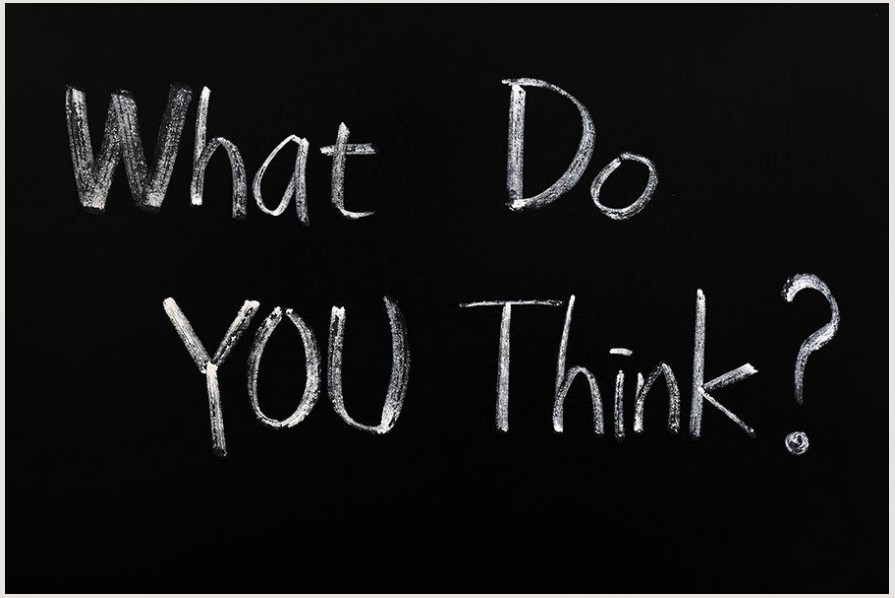
ART initiation / refills
Clinical monitoring
Adherence support
Laboratory tests
Opportunistic infections treatment
Psychosocial support

YOU CAN AFFORD

ANYTHING.

YOU JUST CAN'T

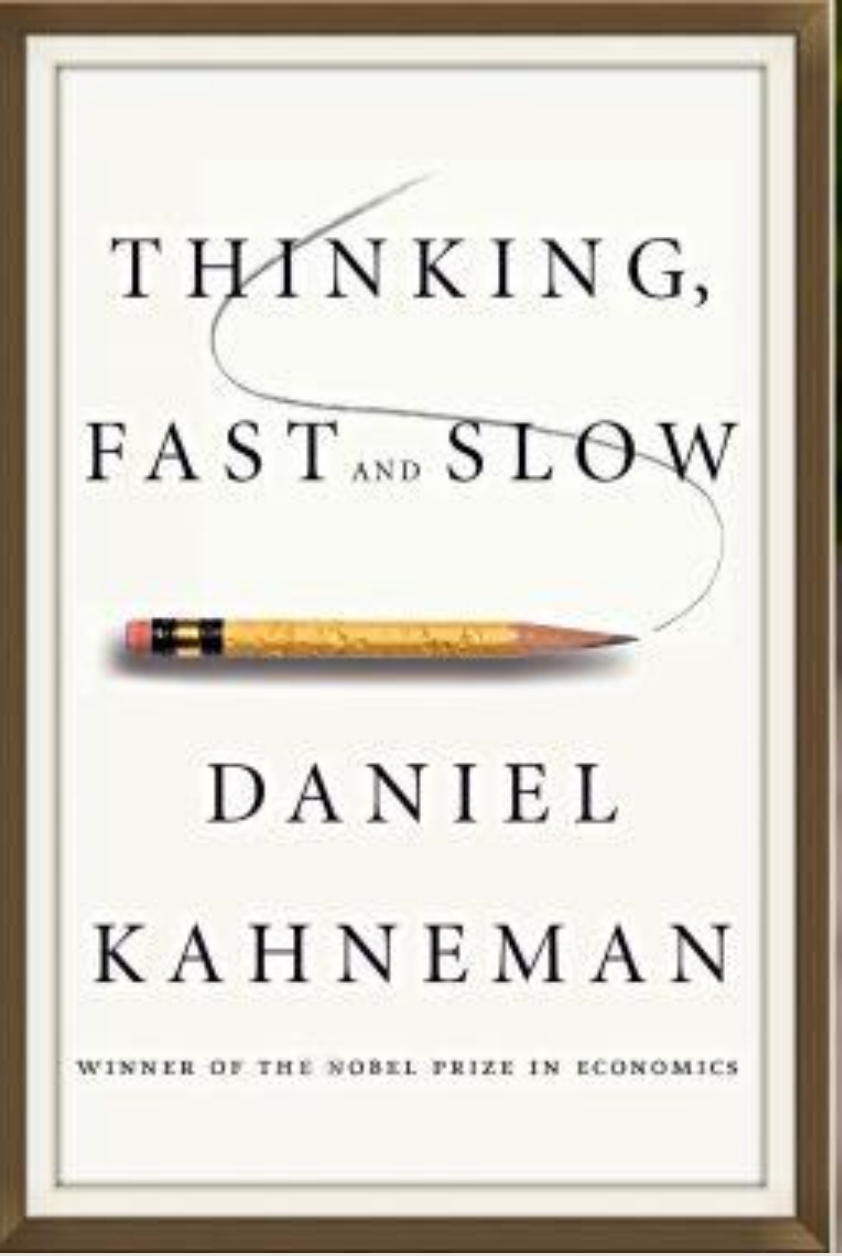
AFFORD EVERYTHING.

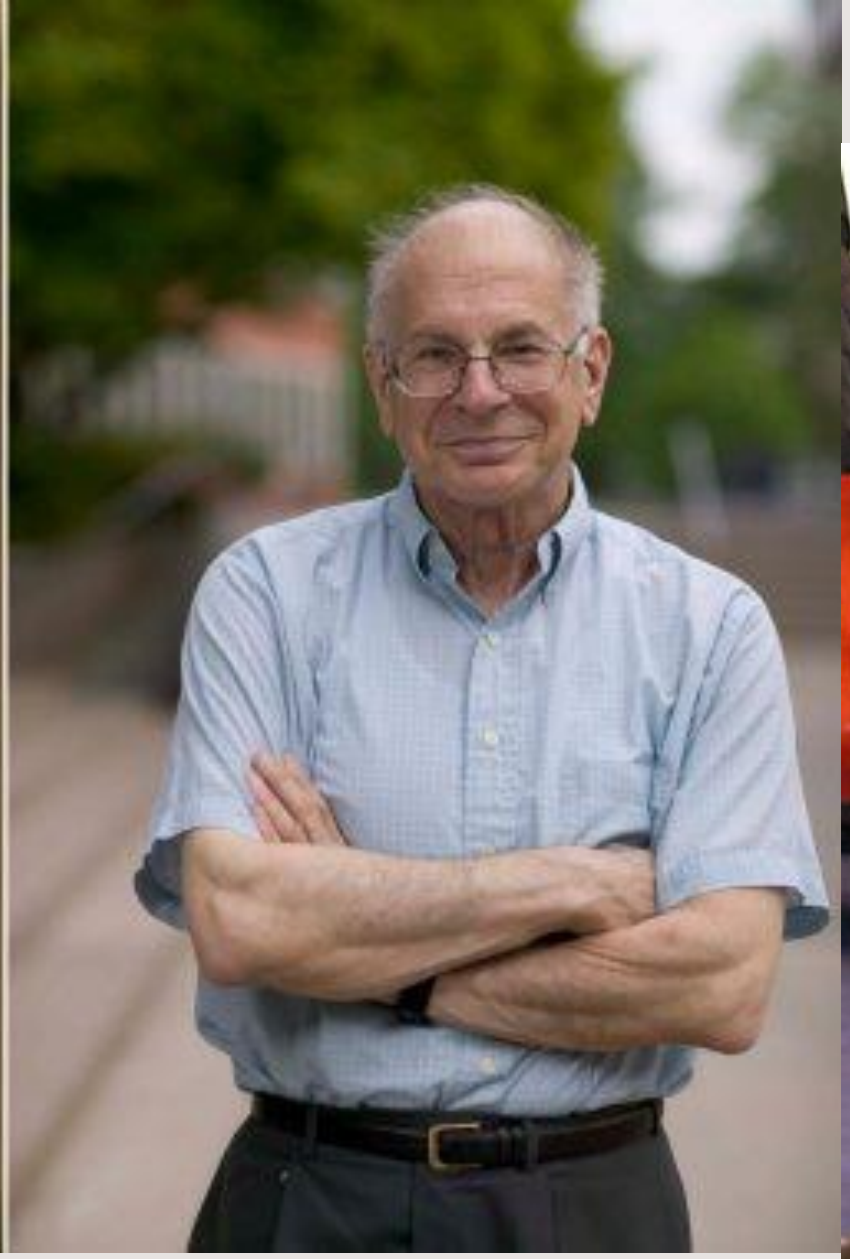


How do YOU evaluate people's values and preferences?

How do we make choices?

Economic theory: humans make rational decisions


THINKING,
FAST AND SLOW
DANIEL
KAHNEMAN
WINNER OF THE NOBEL PRIZE IN ECONOMICS



System 1

Intuitive and instinctive

Unconscious

Fast

Associative

Automatic - you have no control over it

System 2

Rational and logical

Effortful

Slow

Logical

Deliberate - you control yourself

Daniel McFadden's Nobel prize speech

- https://www.nobelprize.org/prizes/economic-sciences/2000/mcfadden/lecture/
  - Discrete choice modeling

Health preference research

- "Choice defines value".
- Determine the type of goods and services most valued by a target population
- With a better understanding of what patients want, providers, regulators, and policy makers can better meet the patient's needs
- Resources are allocated efficiently and to where they are most valued and needed.

Health preference research

- **Revealed preference**
  - Observe choices of consumers in the market
  - No information on potential demand for new products

Health preference research

- **Stated preference**
  - Hypothetical choices
  - When market information is not available (e.g. new products)
    - Potential impact of proposed changes or design of products, policies or programs

Health preference research

Systematically identify what people want so that providers, regulators, policy makers can better meet their needs.

“Preference sensitive” goods and services

What is a DCE?


Discrete choice experiment?
Choice set?
Attributes?
Multinomial logit models?

What is a DCE?

- Stated preference method
  - Quantitative measurement of relative preference
  - How do people trade-off between attributes?
- Goods/Services described as combination of attributes
- People rationally choose the combination that maximizes their utility

What is a DCE?

- **"Choice set"**
  - Choices made from a set of mutually exclusive and collectively exhaustive alternatives
- **Choice modelling**
  - Parameters are estimated from a sample of observed choices made by decision makers when confronted with a choice situation
  - Identifying most influential parameters that led to observed choices and accounting for sources of unobserved influence

Choice set


Best Buy introduces the Microsoft Premium Collection
Windows 7
GIVE THE GIFT OF MOBILITY AND POWER
2ND GENERATION INTEL® CORE™ PROCESSORS LET YOU DO MORE THINGS AT ONCE WITH SPEED WHEN YOU NEED IT.
BACK TO DEMO
899.99
1049.99
24.99
Targus
BANKER
SLEEVE
13.3"

If these were your only options, which of the following laptops would you choose to purchase?

Brand	Microsoft	Apple	Google	
Operating System	Windows 10	OS X	Chrome OS	
Screen Size	13.5"	13"	12"	
Battery Life	12 hours	10 hours	12 hours	
Front Camera	Yes	Yes	No	
Rear Camera	Yes	No	No	
Stylus	Yes	No	No	I would not choose any of these.
Removable Keyboard	Yes	No	No	
Price	$1,499	$1,299	$999	
	o	o	o	o

Alternatives

If these were your only options, which of the following laptops would you choose to purchase?

Brand	Microsoft	Apple	Google	
Operating System	Windows 10	OS X	Chrome OS	
Screen Size	13.5"	13"	12"	
Battery Life	12 hours	10 hours	12 hours	
Front Camera	Yes	Yes	No	
Rear Camera	Yes	No	No	
Stylus	Yes	No	No	I would not choose any of these.
Removable Keyboard	Yes	No	No	
Price	$1,499	$1,299	$999	
	○	○	○	○

Attributes

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	o	o	o	o

Levels

Choice modelling

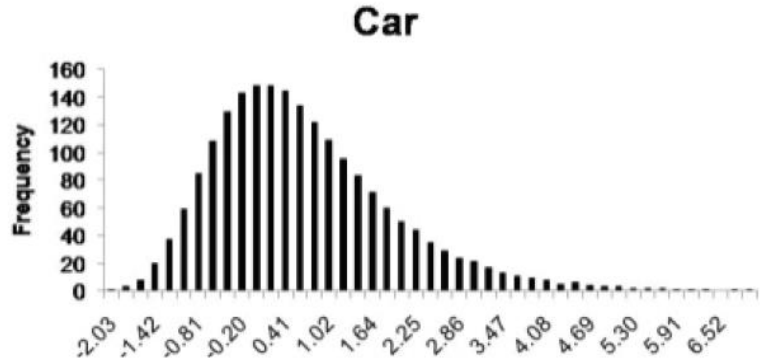
Consumer theory

- People choose goods/services to maximise their utility
- Utility
  - Satisfaction, value
- Assume goods/services can be described by series of attributes and respondent will consider all attributes before choosing one that gives the best utility

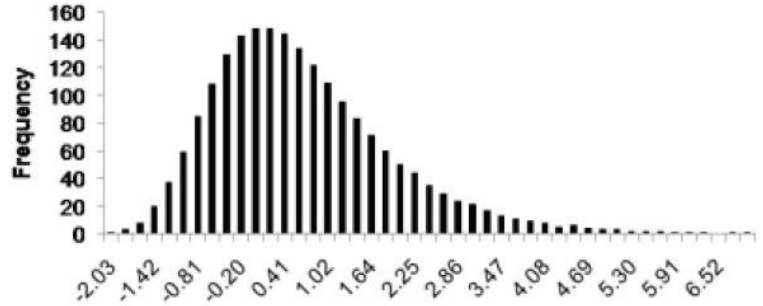
Utility (U) = observed component (V) + unobserved component (ε)

$$U_{nj} = V_{nj} + \varepsilon_{nj}$$

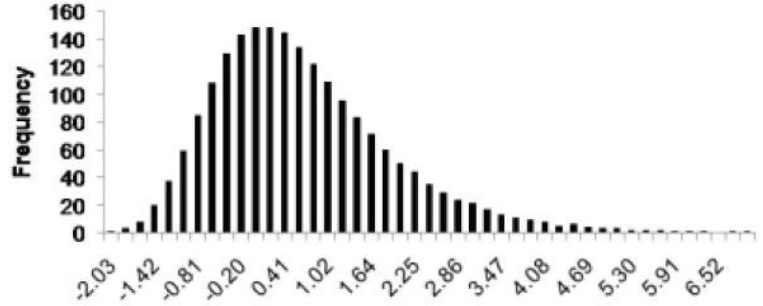
$$U_{n,car} = V_{n,car} +$$



$$U_{n,bus} = V_{n,bus} +$$

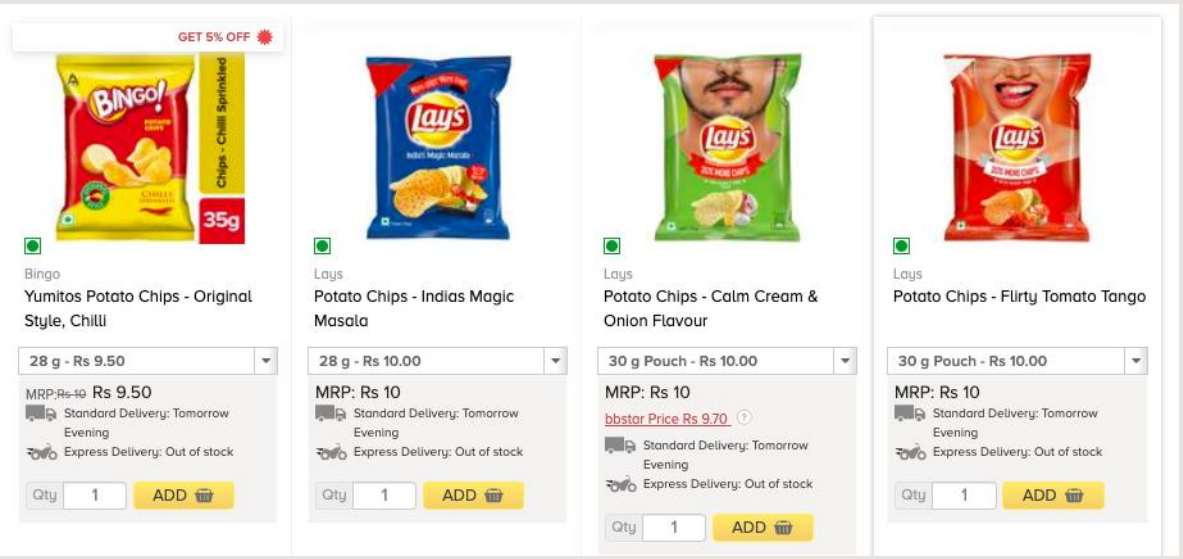


$$U_{n,train} = V_{n,train} +$$



- $U^*(\text{choice } 1) > U^*(\text{choice } 0) \rightarrow$ Choose 1
- $U^*(\text{choice } 1) \leq U^*(\text{choice } 0) \rightarrow$ Choose 0

Used in many disciplines



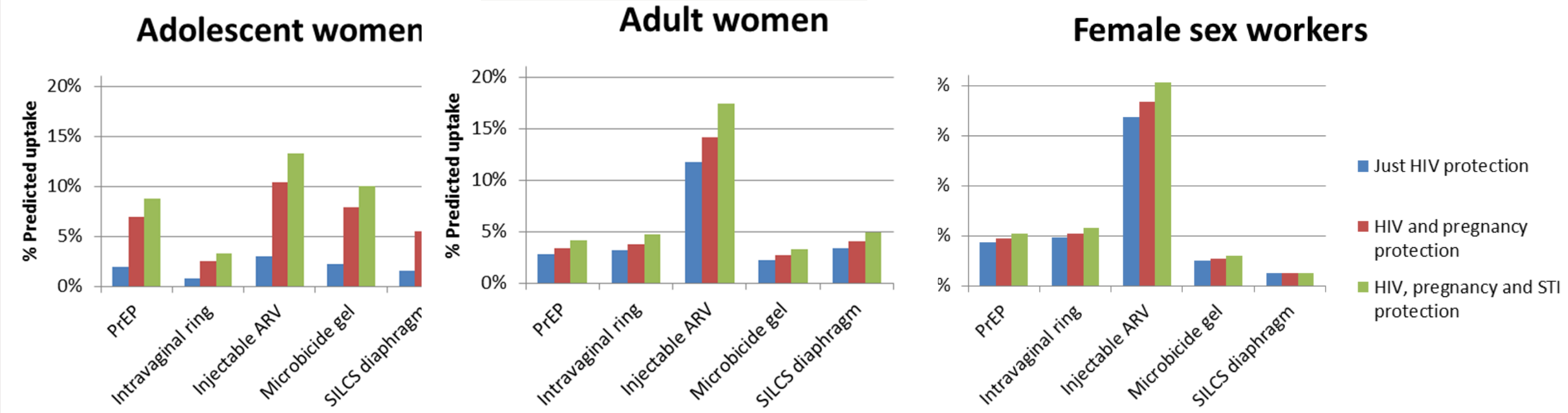
Attribute	Situation A	Situation B
Re-opening schools	In 4 weeks 	Immediately 
Re-opening restaurants and bars	Immediately 	In 4 weeks 
Tracing app	Voluntary 	Mandatory 
Quarantine for persons above 70 years	No 	Yes 
Available ICU capacities	Sufficient 	Temporarily overloaded 
Unemployment rate	10 % 	5 % 
I decide for…	☐	☐

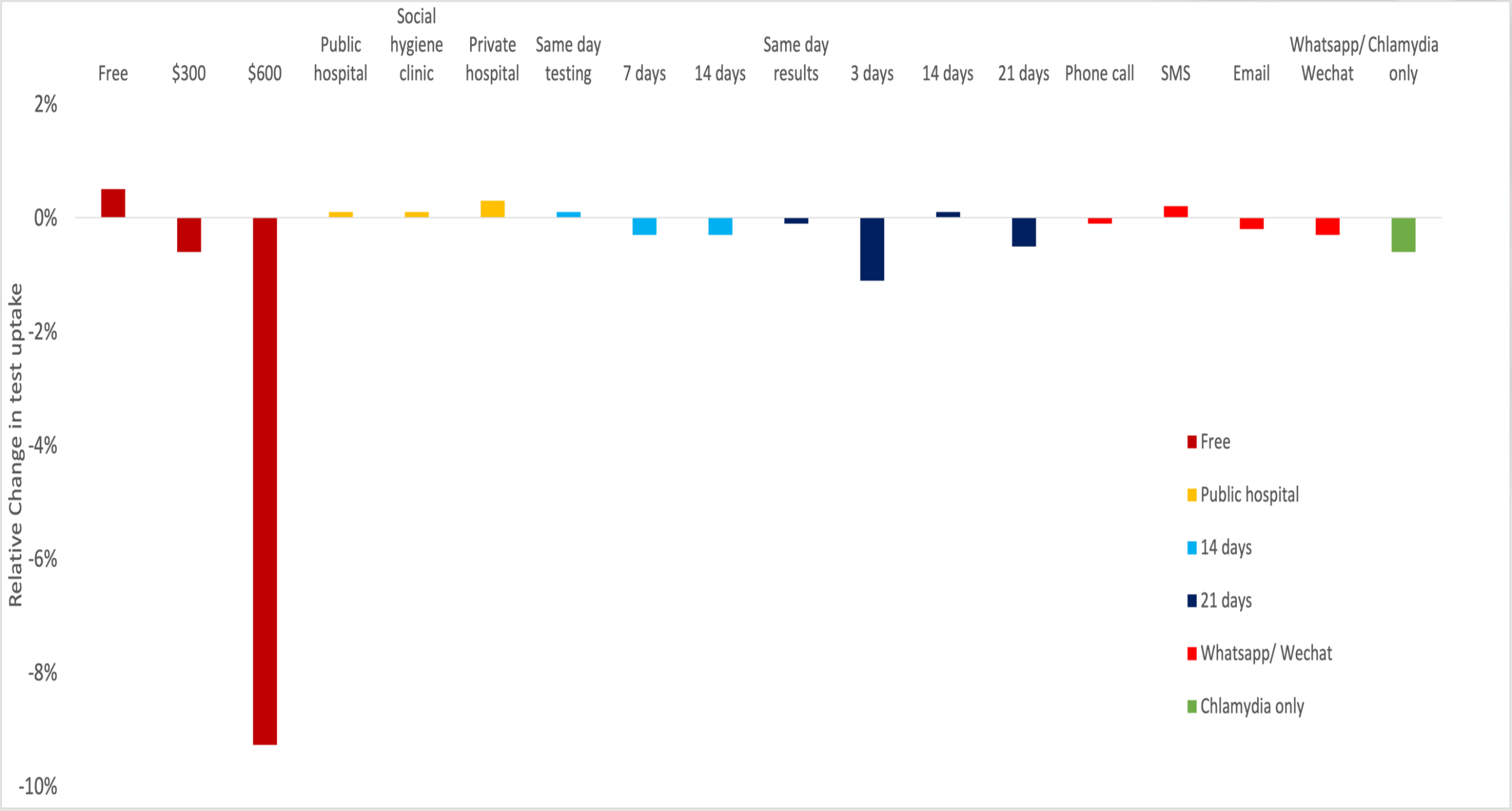
Useful outputs

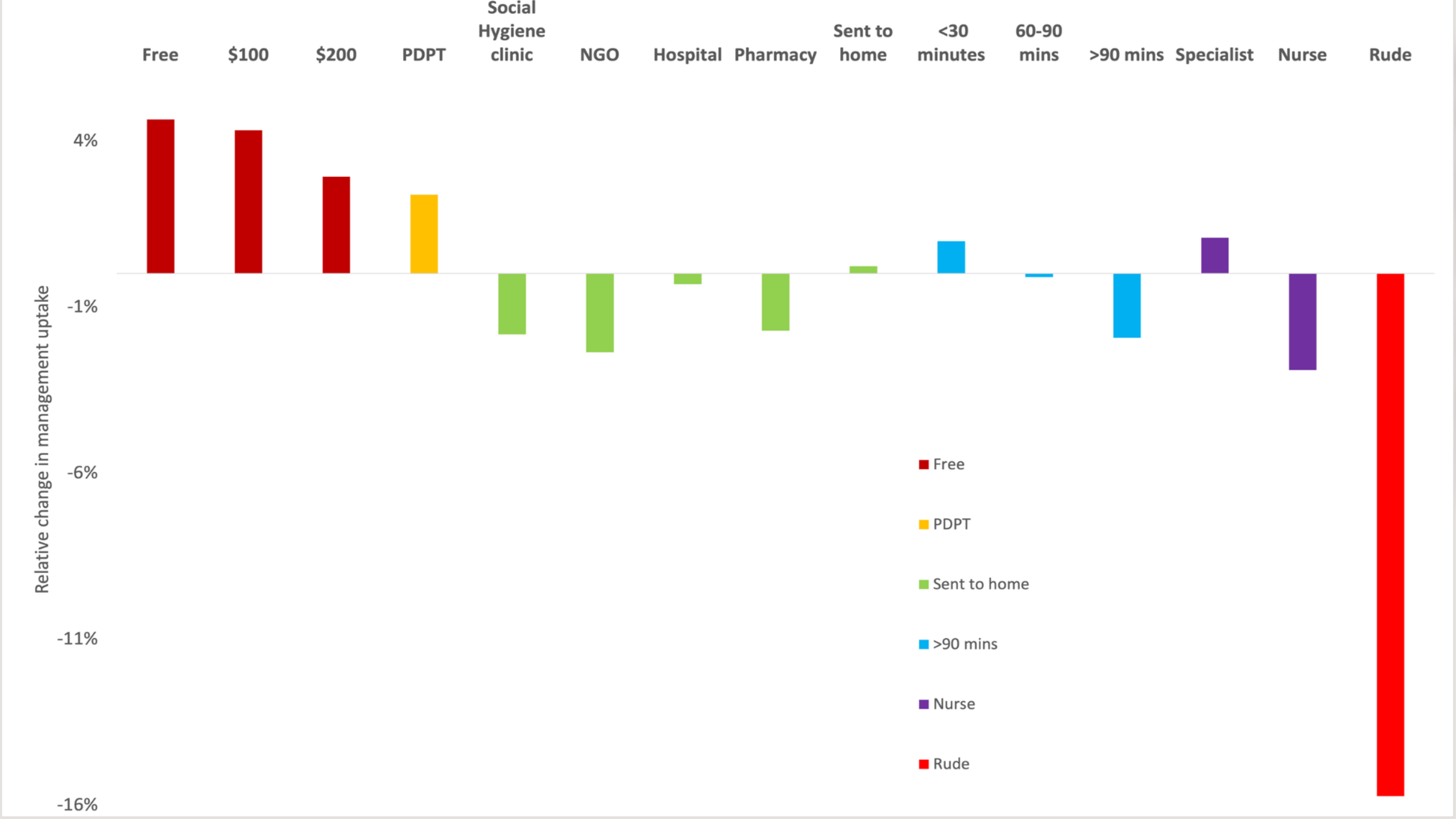
- Valuation of individual components and overall valuation
  - Exploring heterogeneity
    - Subpopulations
  - Willingness to pay

- Forecasting of choices/demand in specific scenarios
  - Predicted market shares

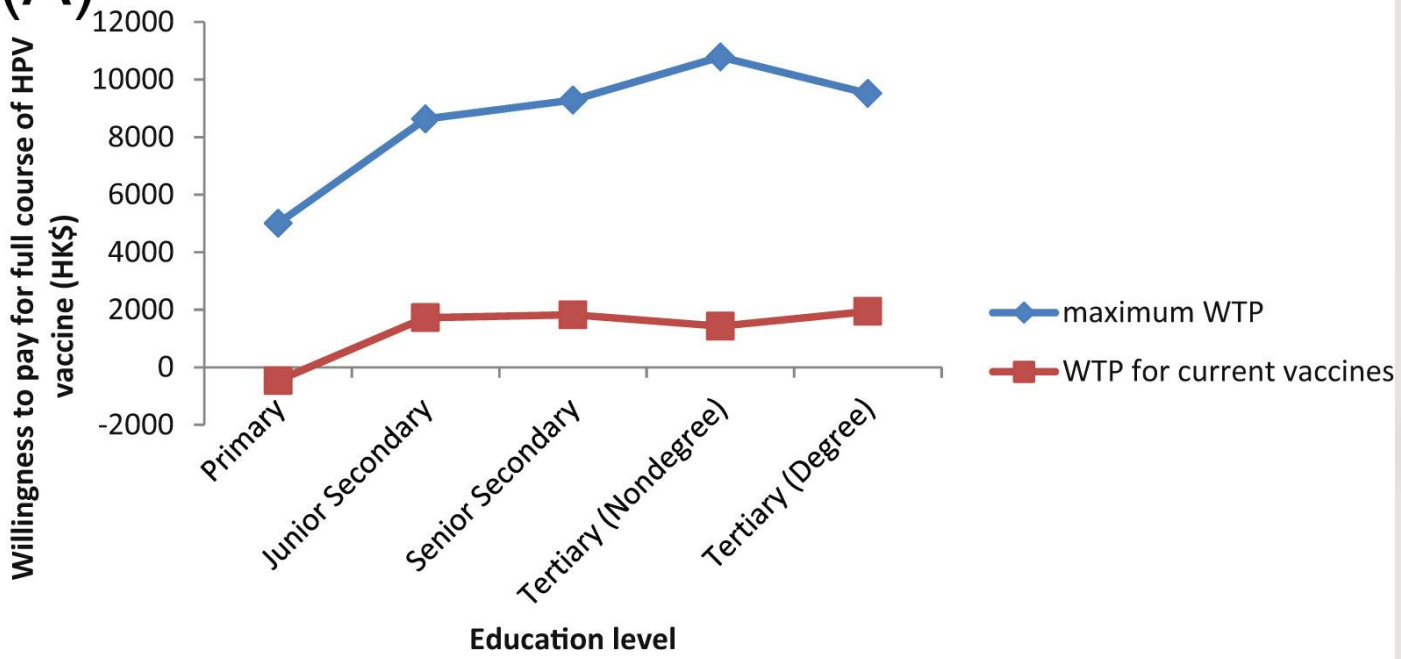
Uptake Predictions: scenario 5 *all products*



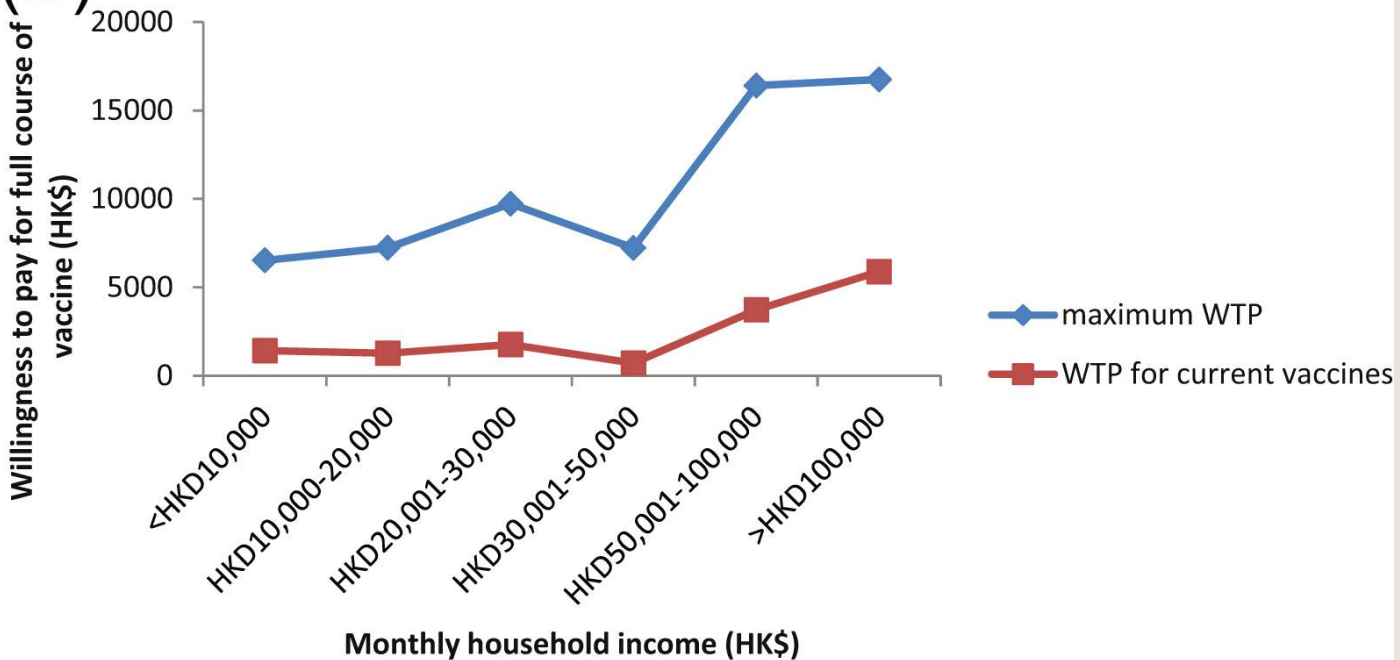

Free
$300
$600
Public hospital
Social hygiene clinic
Private hospital
Same day testing
7 days
14 days
Same day results
3 days
14 days
21 days
Phone call
SMS
Email
Whatsapp/ Wechat
Chlamydia only
2%
0%
-2%
-4%
-6%
-8%
-10%
Relative Change in test uptake
Free
Public hospital
14 days
21 days
Whatsapp/ Wechat
Chlamydia only


Free
$100
$200
PDPT
Social Hygiene clinic
NGO
Hospital
Pharmacy
Sent to home
<30 minutes
60-90 mins
>90 mins
Specialist
Nurse
Rude
4%
-1%
-6%
-11%
-16%
Relative change in management uptake
Free
PDPT
Sent to home
>90 mins
Nurse
Rude

(A)


Willingness to pay for full course of HPV vaccine (HK$)
12000
10000
8000
6000
4000
2000
0
-2000
Primary
Junior Secondary
Senior Secondary
Tertiary (Nondegree)
Tertiary (Degree)
Education level
maximum WTP
WTP for current vaccines

(B)


Willingness to pay for full course of vaccine (HK$)
20000
15000
10000
5000
0
<HKD10,000
HKD10,000-20,000
HKD20,001-30,000
HKD30,001-50,000
HKD50,001-100,000
>HKD100,000
Monthly household income (HK$)
maximum WTP
WTP for current vaccines

Limitations

- Hypothetical bias
  - Framing
  - Providing enough information
- External validity
  - Capturing right attributes/levels – need good inputs
  - Stability of preferences over time
- Assumption of utility maximization
  - Reality can be more complicated … emotions, social norms (?)
  - Predicting how you will act …

But do DCEs generate valid uptake predictions?

The European Journal of Health Economics
https://doi.org/10.1007/s10198-018-0954-6

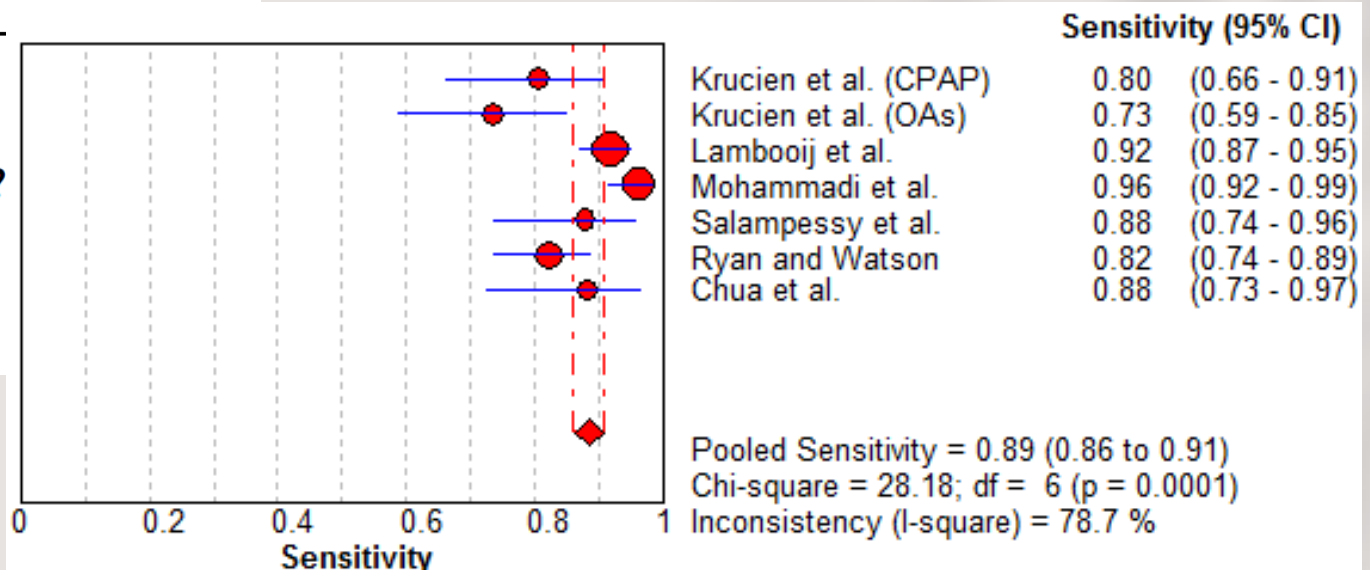
ORIGINAL PAPER

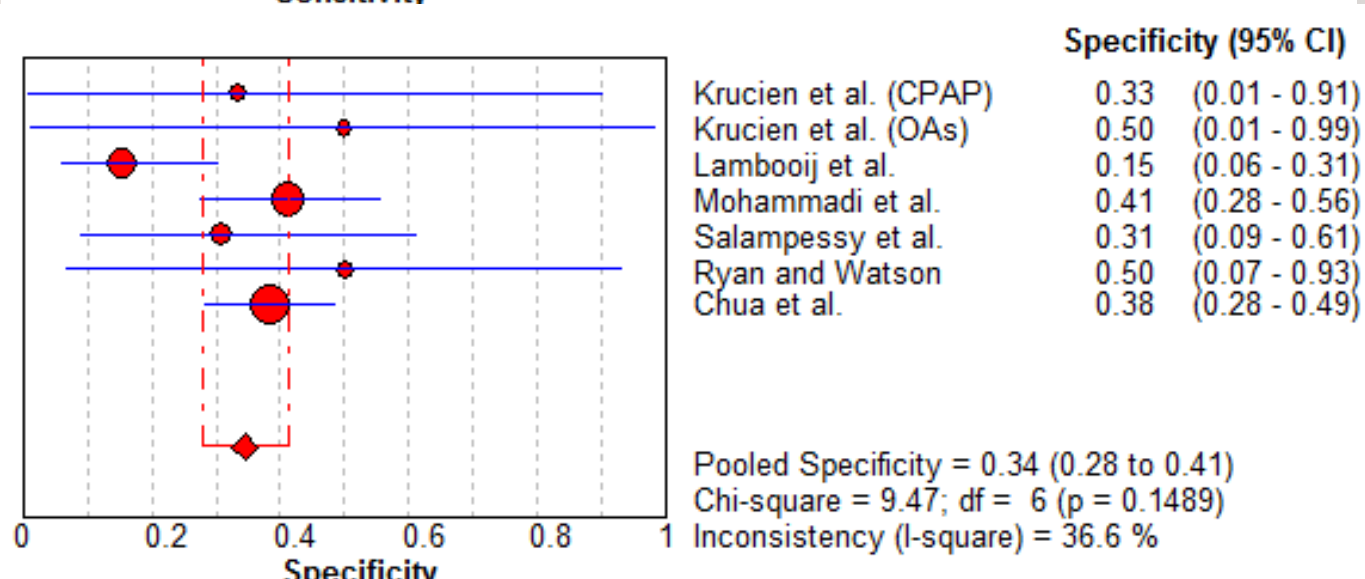
How well do discrete choice experiments predict health choices? A systematic review and meta-analysis of external validity

Matthew Quaife[1] · Fern Terris-Prestholt[1] · Gian Luca Di Tanna[2] · Peter Vickerman[3]

- Few studies estimate DCE prediction validity (7)
- Pooled sensitivity and specificity estimates were 88% and 34%, respectively.
- *DCEs are better at predicting who would opt-in to a health-related decision rather than who would not"*

Figure 3: Synthesis of Sensitivity and Specificity of DCE predictions





- Approach to quantitatively estimate preferences for product/service characteristics
- Choice sets built from qualitative phase
- Survey with repeated scenario responses with varying characteristics
- Force trade offs between attributes allowing quantitative estimation relative values (utilities).
- *Can also be used to value health states, estimate societal preferences and WTP*

Definitions

A. Discrete choices

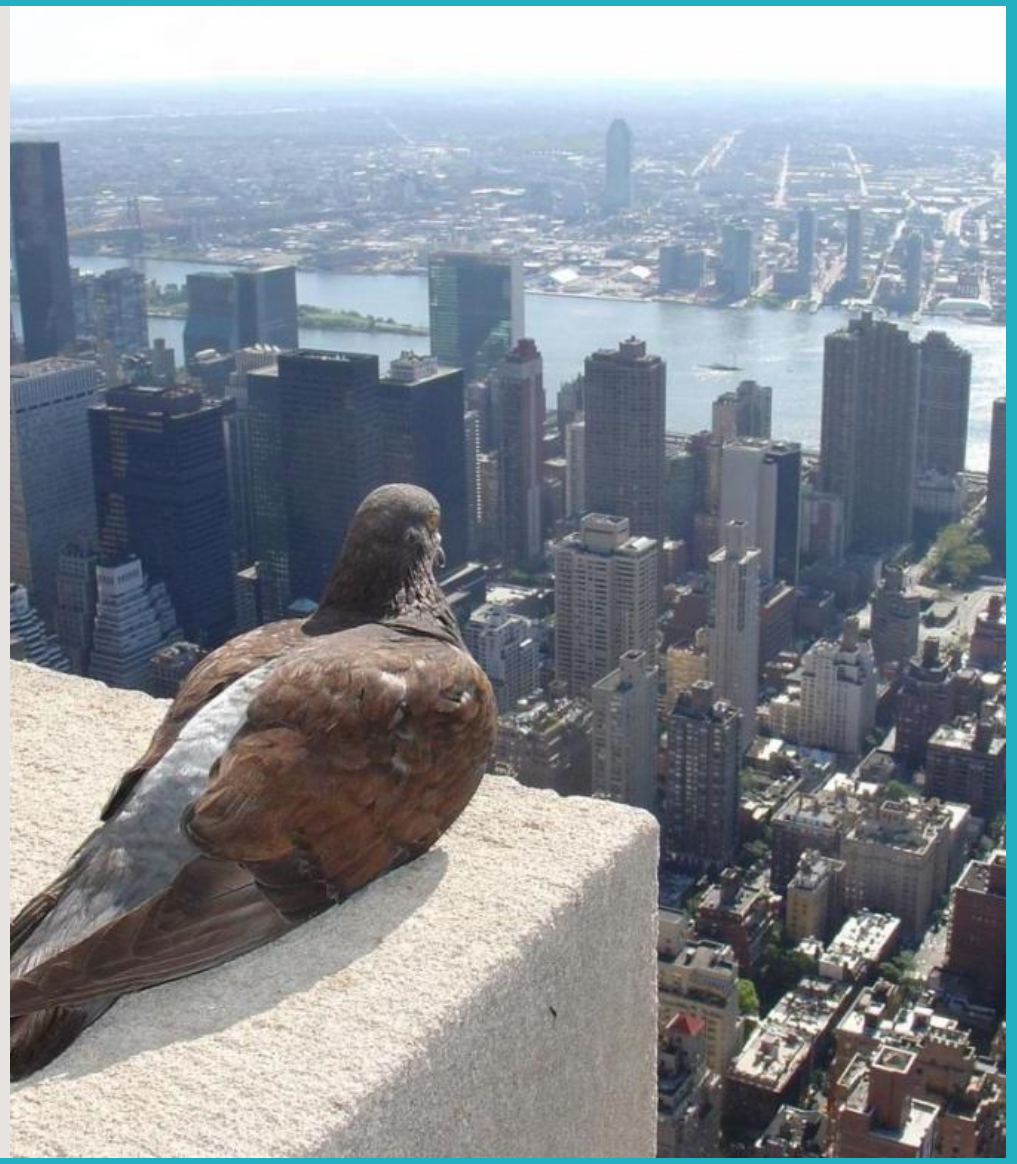
B. Choice sets

C. Alternatives defined by combination of attributes

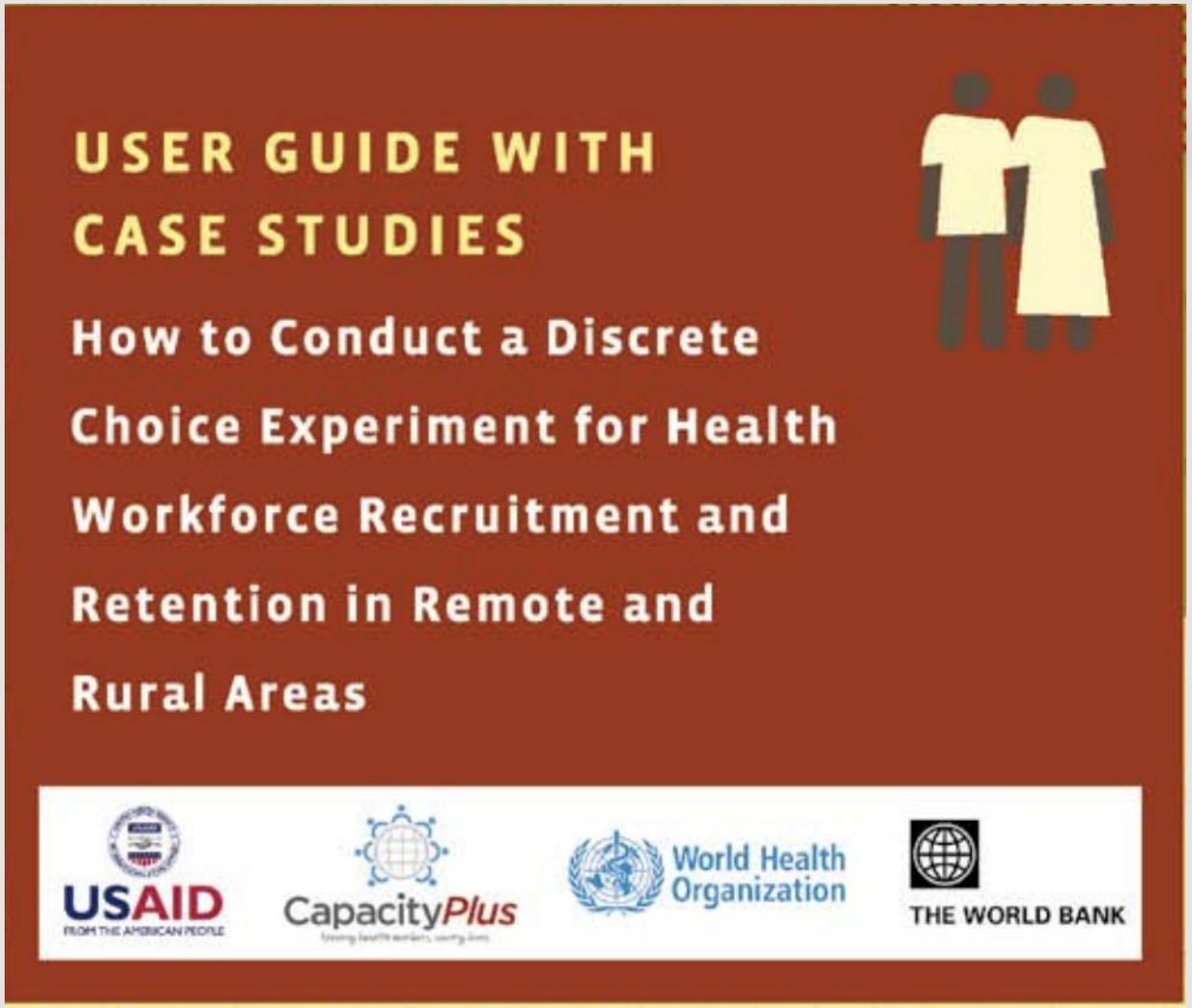
D. Survey with multiple choice sets

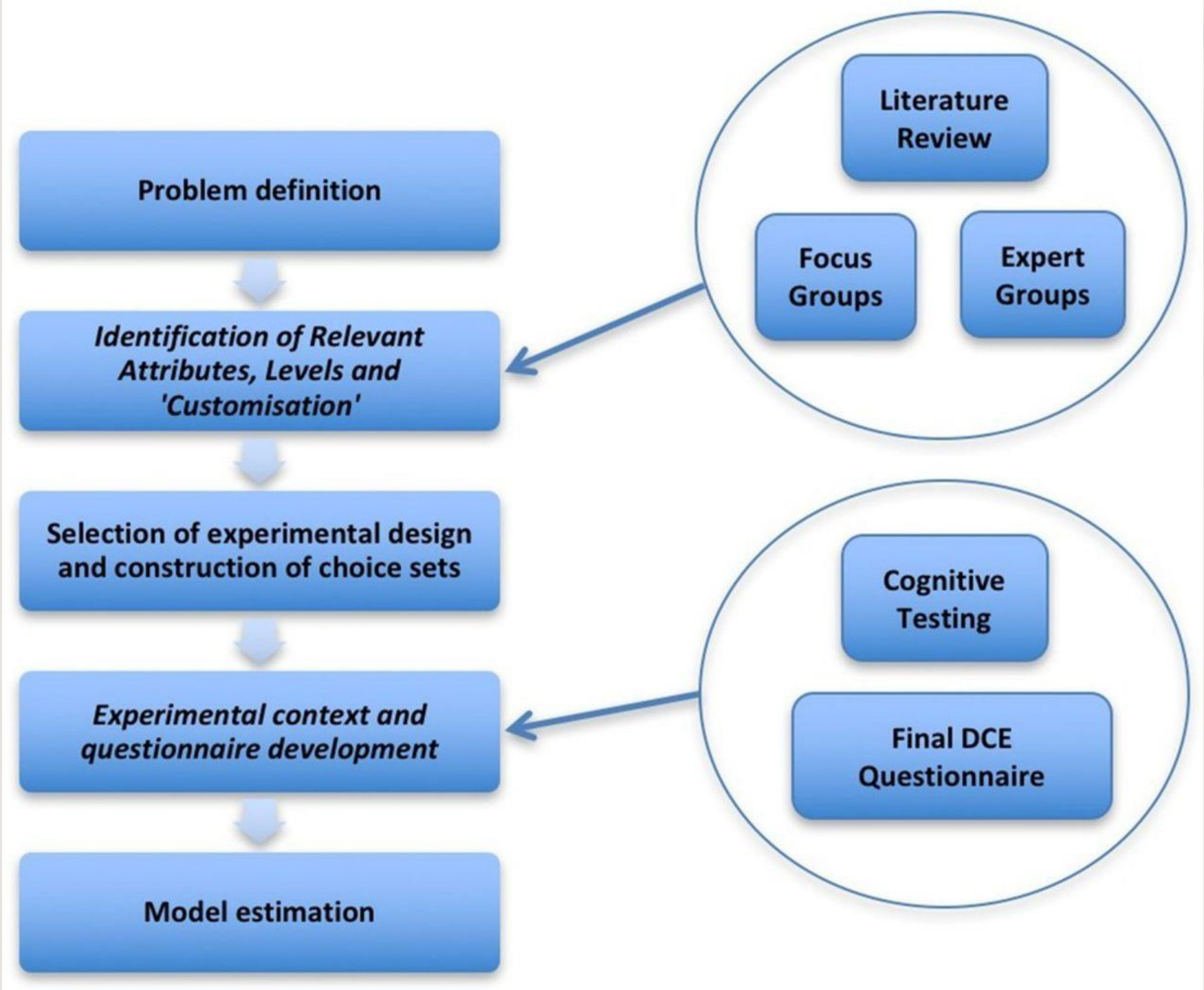
E. Respondent characteristics

Steps for conducting a DCE



Steps of a DCE




Problem definition
Identification of Relevant Attributes, Levels and 'Customisation'
Selection of experimental design and construction of choice sets
Experimental context and questionnaire development
Model estimation
Literature Review
Focus Groups
Expert Groups
Cognitive Testing
Final DCE Questionnaire

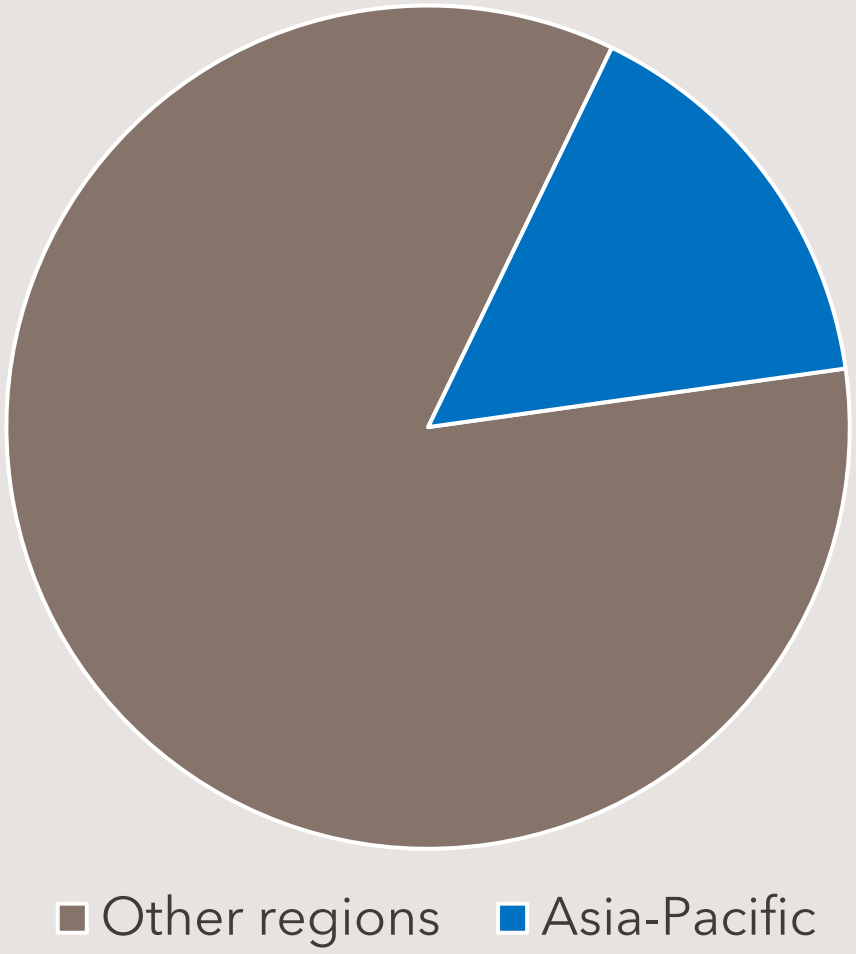
Questions?

Session 2 – small group discussion

Introduction to the scenario of HIV in East Asia

- **Tasks**
  - Name your group
  - Which population(s) do you want to focus on?
  - How do you identify relevant attributes / levels?
    - What methods can you use?
  - List all likely attributes that would influence someone using PrEP

38.4 million people living with HIV in 2021



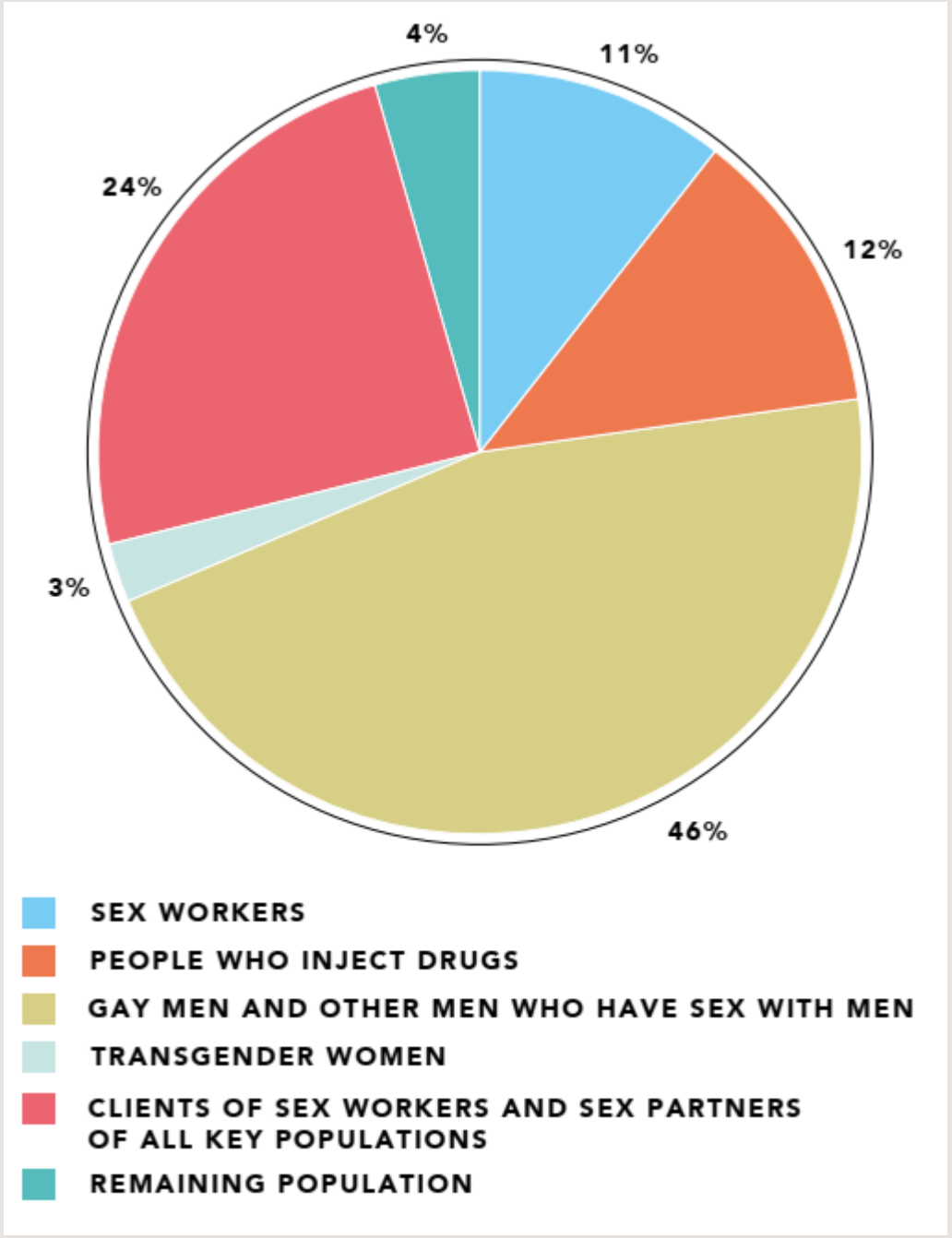
15.6 %

or about 6 million PLWH lived in the Asia-Pacific region

~140 k

AIDS-related deaths in the Asia-Pacific region

UNAIDS DATA BOOK 2022



Among 260k new HIV infections in the Asia-Pacific region in 2021,

46%

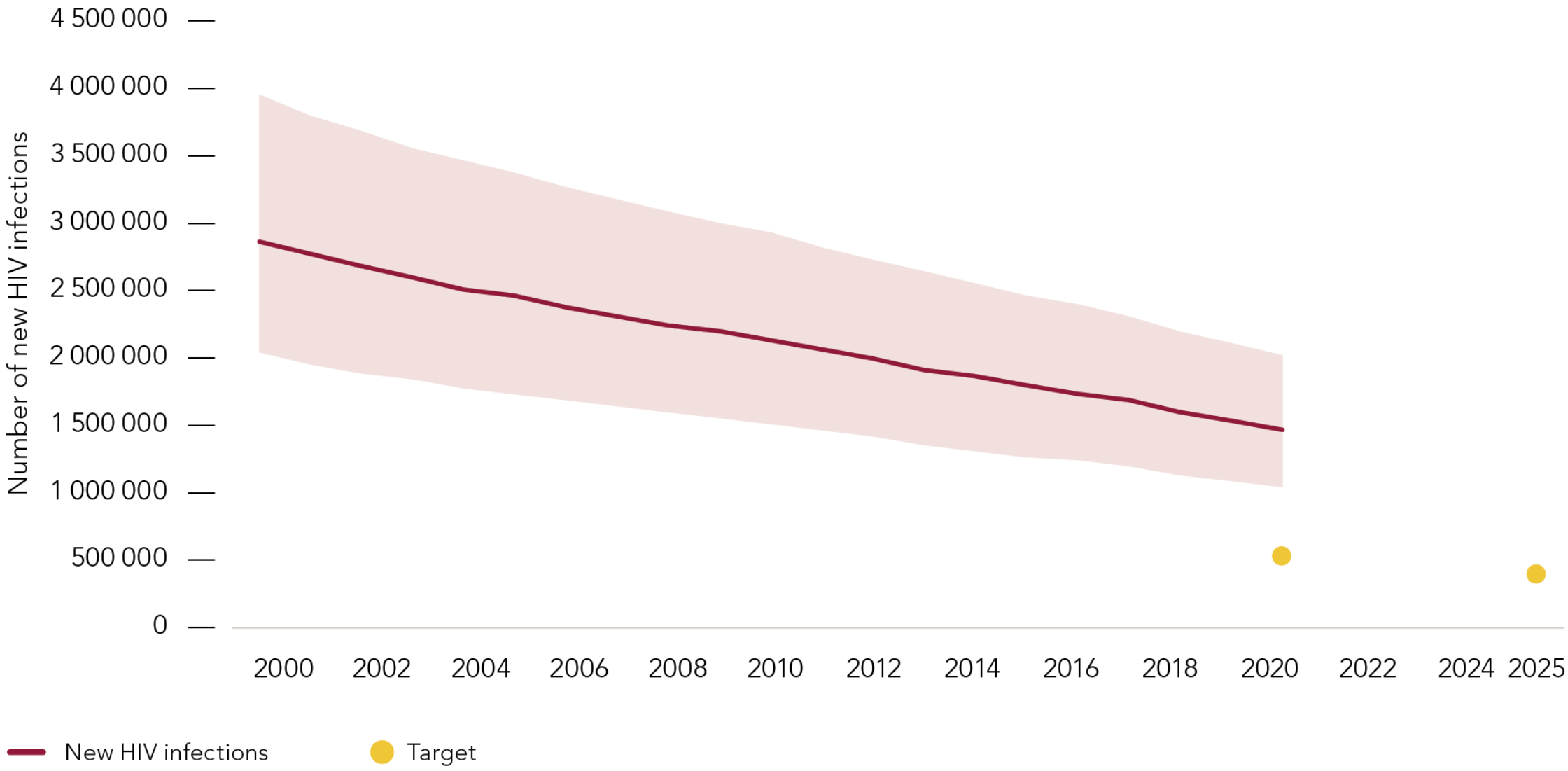
Gay men and other men who have sex with men

UNAIDS DATA BOOK 2022

UNAIDS
Fast-Track Targets

by 2020	by 2030
90-90-90	**95-95-95**
HIV treatment	HIV treatment
500 000	**200 000**
New HIV infections or fewer	New HIV infections or fewer
ZERO	**ZERO**
Discrimination	Discrimination

New HIV infections, global, 2000–2025, and 2020 and 2025 targets



Source: UNAIDS epidemiological estimates, 2021 (https://aidsinfo.unaids.org/).


Monthly Pill
Extra long Injectable
Vaginal Ring
PrEP Implant
LA injectables
MABs
Daily pill
On demand Pill

PrEP is included in the national HIV respor

- Thailand
- Vietnam
- Australia

ACCESS PrEP

FINANCIAL CONSTRAINTS

STIGMA

STRUCTURAL BARRIERS

PrEP PREFERENCE

Tiffany 2022, Budi 2022

WHEN

Monthly
Every 2 months
Every 3 months
Every 6 months

WHERE

HIV clinic / hospital
Primary care clinic
Drop-in centre
Community
Home

WHO

Physician
Clinical officer
Nurse
Pharmacist
Community health worker
Patient / peer / family

WHAT

ART initiation / refills
Clinical monitoring
Adherence support
Laboratory tests
Opportunistic infections treatment
Psychosocial support

Tips about attributes

- Should be independent of one another
  - Gender of provider
  - Cost of consultation
- Objective, unambiguous, precise
  - “Cost” vs. “monthly cost of medication”
- One concept
  - Try to avoid compounded descriptions
    - “Injection that requires you to visit every 2 months”

Make sure everyone understands the terms in the same way

- "Nausea"

Mild to moderate nausea, diarrhea, and/or vomiting 3-4 times / week[1]	3 Days of nausea a month for first 3 months[2]	Nausea[3]	Risk of GI problems[4]
• None • Resolves after taking medicine for 2 weeks • Continues as long as patient takes medicine	• None • Mild • Moderate	• None • 30 min/d • 90 min/d	• 0% (no risk of GI problems) • 100 of 1000 people (10%) have GI problems • 200 of 1000 people (20%) have GI problems • 300 of 1000 people (30%) have GI problems

Small group discussion

- **Tasks**
  - Name your group
  - Which population(s) do you want to focus on?
  - How do you identify relevant attributes / levels?
    - What methods can you use?
  - List all likely attributes that would influence someone using PrEP

Session 3. How to identify the right attributes / levels

Not as easy as you think!

Objectives

- Discuss the various methods to choose attributes and levels
- Describe ways to prioritize attributes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Windows 7
GIVE THE GIFT OF MOBILITY AND POWER
2ND GENERATION INTEL® CORE™ PROCESSORS LET YOU DO MORE THINGS AT ONCE WITH SPEED WHEN YOU NEED IT.
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Stylus	Yes	No	No	I would not choose any of these.
Removable Keyboard	Yes	No	No	
Price	$1,499	$1,299	$999	
	o	o	o	o

Attributes

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	o	o	o	o

Levels

Attributes	Attribute Levels
PrEP modality	• Daily oral pill (1) • On-demand oral pill (2) • Long-acting injectable PrEP (3) • PrEP Implant (4)
PrEP prescription	• Same-day prescription (1) • 2-visit prescription (2) • Telehealth prescription (3)
Medication pick-up	• Clinics/hospitals (1) • Primary community health center (2) • Pharmacy (3) • MSM-focus CBOs (4) • Home delivery (5)
Enhance support (for medical adherence and follow-up visit reminder)	• Physical or e-calendar (1) • Smartphone application (2) • Text reminder (3) • Anonymous peer support group (4)
Cost (out-of-pocket)	• Free (1) • 65% off (350 RMB) (2) • 30% off (700 RMB) (3) • Full price (1000 RMB) (4)

How to choose your attributes/levels?

1. Specify the choice scenario
2. What are drivers of choice?
3. Prioritise what to include in your choice set

1) Specify your choice scenario

VERY CAREFULLY!!!

What decision point are you interested in?

I am sexually active.	I want to test for HIV.	I have tested for HIV.
Should I test?	What service should I use?	What type of follow-up / supports do I need after testing?

If these were your only options, which of the following laptops would you choose to purchase?

Brand	Microsoft	Apple	Google	
Operating System	Windows 10	OS X	Chrome OS	
Screen Size	13.5"	13"	12"	
Battery Life	12 hours	10 hours	12 hours	
Front Camera	Yes	Yes	No	
Rear Camera	Yes	No	No	
Stylus	Yes	No	No	I would not choose any of these.
Removable Keyboard	Yes	No	No	
Price	$1,499	$1,299	$999	
	○	○	○	○

Choice scenario –
Any problems with these statements?

"Choose the service you prefer"

"Imagine you want to see a doctor. Which service would you prefer to attend?"

"Imagine you have a flu-like illness. Which service would you prefer to attend?"

“Ideal” number of attributes / levels?

How many things
can you hold in your
head at once?

Imagine you have a minor symptom, such as getting a cold, coughing and so on...

There are two facilities, each with different characteristics. If you have a choice, which option would you choose from below?

Characteristics	**Facility A**	**Facility B**
Type of service	General service	Specialized service
Treatment measures	Traditional Chinese Medicine	Modern Medicine
Cost (CNY)	300CNY	100CNY
Travel time	>30mins	≤30mins
Care provider	Senior medical practitioner	Junior medical practitioner
Which facility would you choose? (Please tick only one box at the right)	☐	☐

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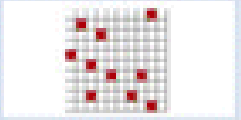
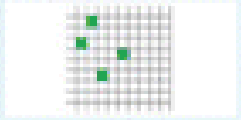
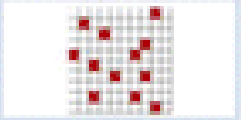
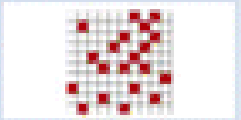
3.1 You have been diagnosed with diabetes type 2. Your doctor asks you to decide between therapy A and therapy B. Which therapy would you choose?

Attribute	Therapy A	Therapy B
Additional healthy life years	+3 Years 	+1 Years 
Risk of urinary tract infection	Low 5 out of 100 (5%) 	High 10 out of 100 (10%) 
Risk of gastrointestinal problems	Low 4 out of 100 (4%) 	High 12 out of 100 (12%) 
Adjustment of long term blood glucose level (HbA1c)	Good (7,0 - 7,5%) 	Very good (6,5 - 7,0%) 
Risk of genital infection	Low 10 out of 100 (10%) 	High 20 out of 100 (20%) 
Possible weight change	+4 kg 	+/- 0 kg 
Possible hypoglycemia	Severe (severe symptoms) 	Mild (without symptoms) 

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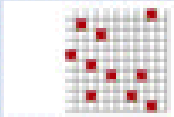
Risk of urinary tract infection	Low 5 out of 100 (5%) 	High 10 out of 100 (10%) 
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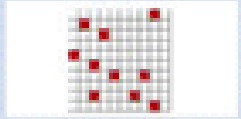
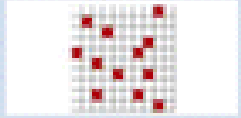
Risk of urinary tract infection	Low 5 out of 100 (5%) 	High 10 out of 100 (10%) 
Risk of gastrointestinal problems	Low 4 out of 100 (4%) 	High 12 out of 100 (12%) 
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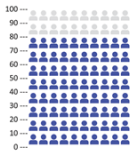
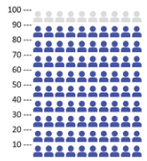
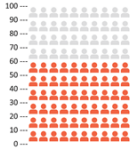
	○	○

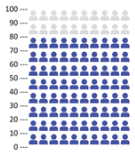
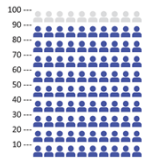
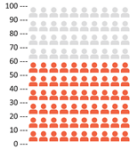
Which vaccination against COVID-19 would you select from those below?

Vaccine efficacy in preventing COVID-19	 80% vaccine efficacy, i.e. out of 100 people were vaccinated against COVID-19 80 will be protected	 90% vaccine efficacy, i.e. out of 100 people were vaccinated against COVID-19 90 will be protected
Risk of mild side-effects	 60% chance that you will have flu-like symptoms after vaccination (headaches, chills, muscle and joint pain)	 20% chance that you will have flu-like symptoms after vaccination (headaches, chills, muscle and joint pain)
Protection duration	 The protective effect against COVID-19 lasts approximately 6 months after the end of vaccination	 The protective effect against COVID-19 lasts approximately 1 year after the end of vaccination
Vaccine administration route	 Two injections into the shoulder	 Oral route (e.g. tablet or solution)
Recommender of the vaccine	 Vaccination is recommended by your friends or co-workers	 Vaccination is recommended by your primary care provider
Expected travel time	 The travel to the vaccination site will take you about 15 minutes	 The travel to the vaccination site will take you about 30 minutes

Go back

I choose neither

Which vaccination against COVID-19 would you select from those below?

Vaccine efficacy in preventing COVID-19	 80% vaccine efficacy, i.e. out of 100 people were vaccinated against COVID-19 80 will be protected	 90% vaccine efficacy, i.e. out of 100 people were vaccinated against COVID-19 90 will be protected
Risk of mild side-effects	 60% chance that you will have flu-like symptoms after vaccination (headaches, chills, muscle and joint pain)	 20% chance that you will have flu-like symptoms after vaccination (headaches, chills, muscle and joint pain)
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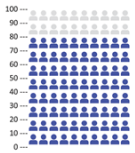
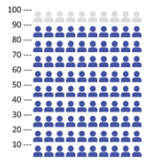
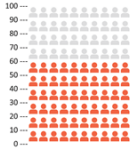
Vaccine efficacy in preventing COVID-19	 80% vaccine efficacy, i.e. out of 100 people were vaccinated against COVID-19 80 will be protected	 90% vaccine efficacy, i.e. out of 100 people were vaccinated against COVID-19 90 will be protected
Risk of mild side-effects	 60% chance that you will have flu-like symptoms after vaccination (headaches, chills, muscle and joint pain)	 20% chance that you will have flu-like symptoms after vaccination (headaches, chills, muscle and joint pain)
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2) What are the drivers of choice?

Methods

- Can use more than one
- Qualitative methods
  - Focus group discussions
  - One-on-one interviews
  - Consultation with stakeholders
- Literature review
- “Experts” choosing attributes and levels
- Pre-determined by specific scenario e.g. pipeline of new HIV drugs
- Pilot studies
  - Ranking of attributes

Health Economics

Research Article | Full Access

Using qualitative methods for attribute development for discrete choice experiments: issues and recommendations

Joanna Coast, Hareth Al-Janabi, Eileen J. Sutton, Susan A. Horrocks, A. Jane Vosper, Dawn R. Swancutt, Terry N. Flynn

First published: 06 May 2011 | https://doi.org/10.1002/hec.1739 | Citations: 321

Key points

- 2 stage process
  - Conceptual development
  - Refinement of language to convey the intended meaning
    - Pilot!

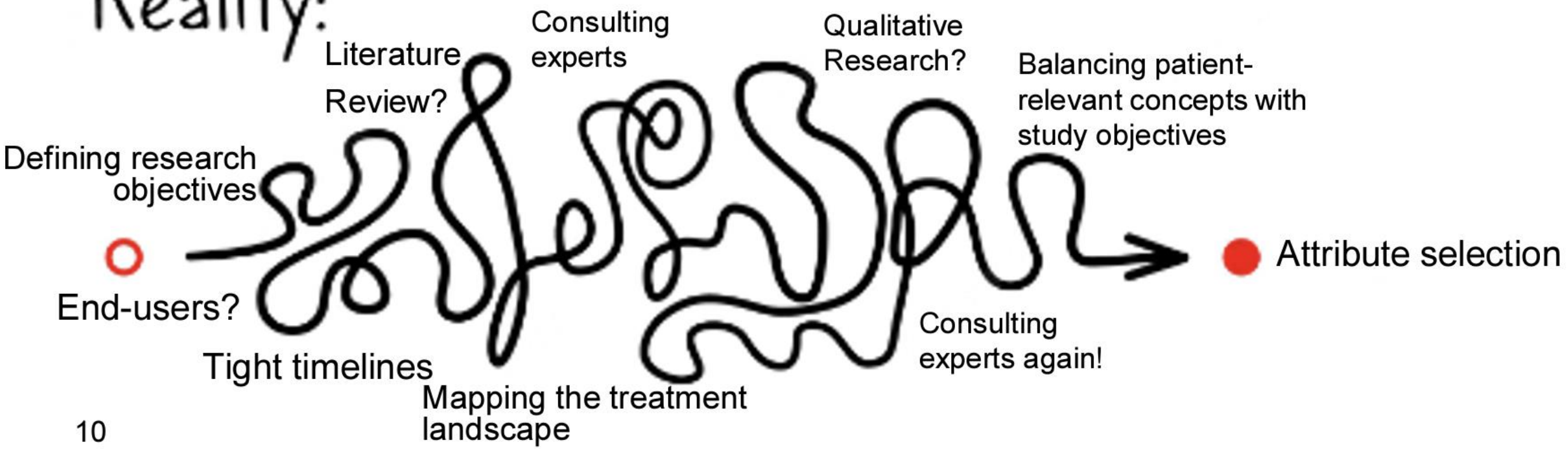
Key points

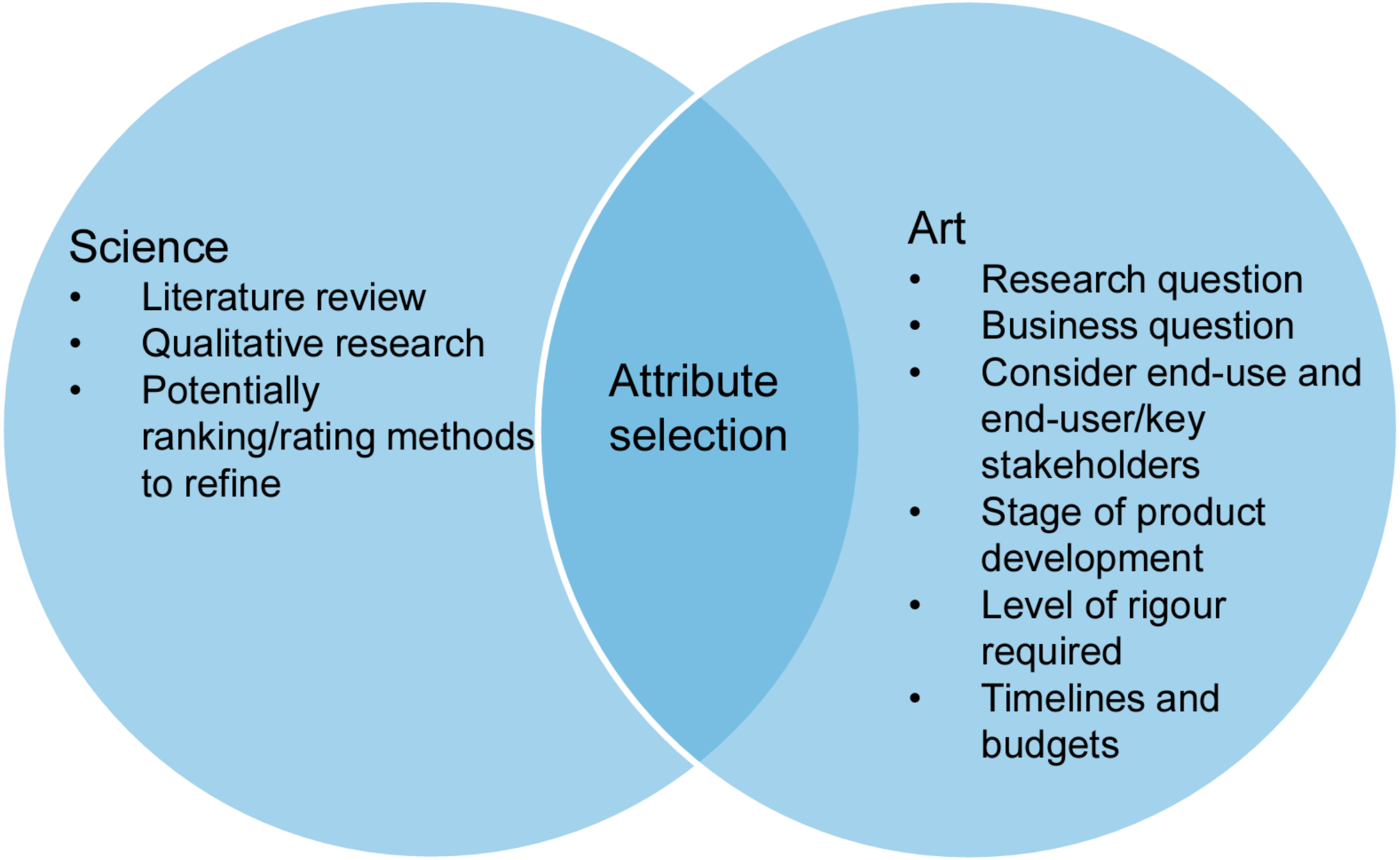
- Choose attributes
  - Not too close to latent construct “utility”
    - No attribute labelled “utility” or that expresses overall happiness with the alternative
  - Important to decision-maker (‘drivers of choice’)
  - Capable of being traded
    - Not too dominant that you have no one trading
  - Able to be ‘manipulated’

Expectation:

Literature review Qualitative research Consulting experts → Attribute selection

Reality:




Science
• Literature review
• Qualitative research
• Potentially ranking/rating methods to refine
Attribute selection
Art
• Research question
• Business question
• Consider end-use and end-user/key stakeholders
• Stage of product development
• Level of rigour required
• Timelines and budgets

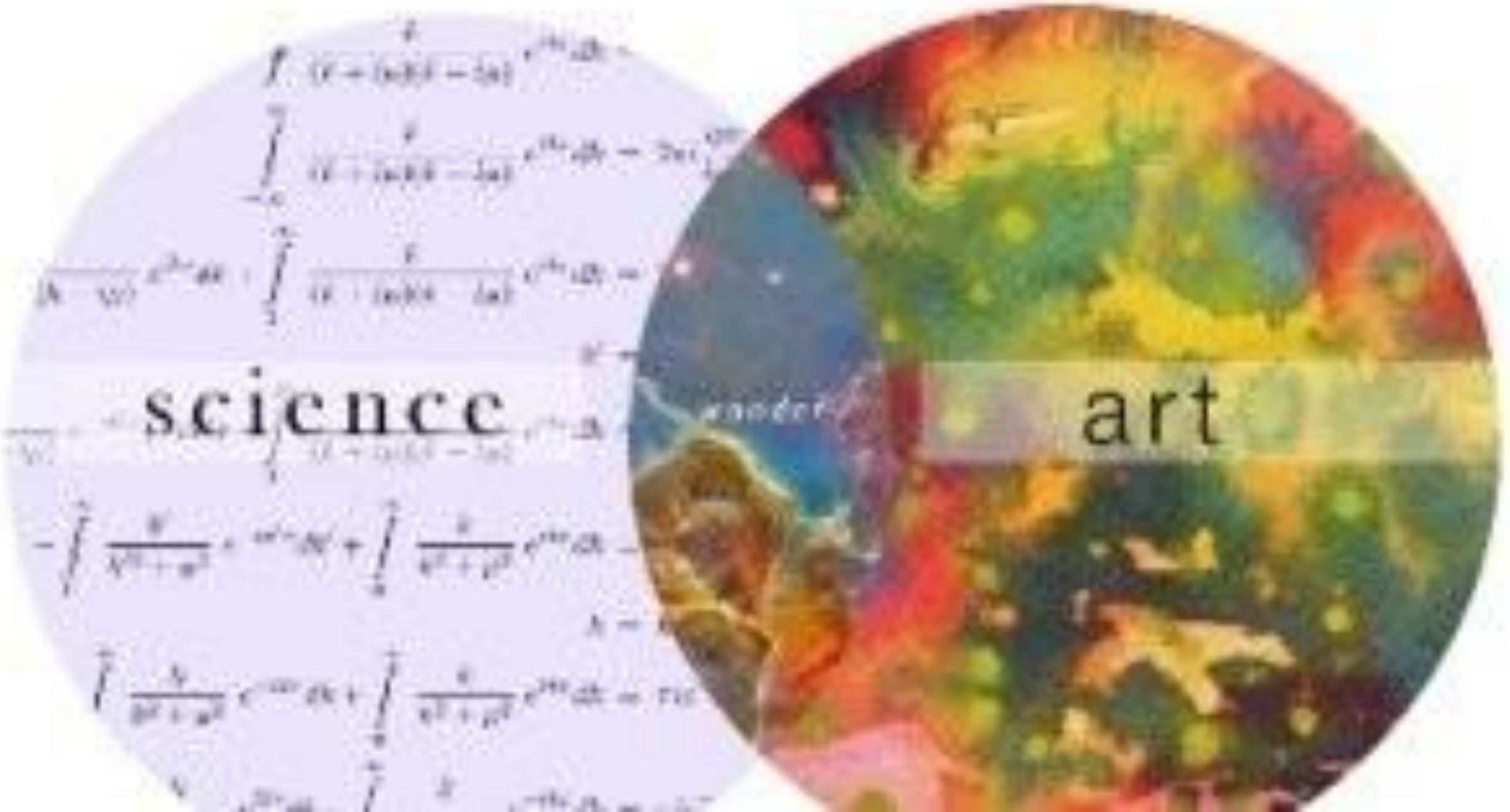
~20 potential attributes

3) How do you prioritize which attributes to present?

~4-6 final attributes

Possible activities

- Ranking exercise
- Utilise qualitative studies
  - Show choice sets (at the end of interview)
  - Ask if anything important missing
- Discussions with ‘experts’
- Model data from first 10% of total sample


science
art
wonder

Questions?

Session 3 – small group discussion

Session 3 – discussion

- What other questions would you include in your survey?
- How will you collect survey responses
  - discuss pros/cons of online vs. paper vs. interviewer-assisted?
- How will you recruit?

Session 4. Experimental design and presentation of choice sets

Objectives

- Understand different types of experimental designs
  - Demonstrate NGENE and Qualtrics
- Understand different ways choice sets can be presented
- Describe what survey platforms are compatible for DCE surveys

1) Experimental designs

Experimental design

- Determines what combinations of levels are shown in a choice set?
- Why does it matter?
  - Maximise amount of information from each choice made
  - => reduce sample size

Types of experimental designs

- Full factorial design
  - Every possible combination of attribute levels
  - 2 alternatives, 3 attributes with 4 levels
  - Total combination = ?

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  - 2 alternatives, 3 attributes with 4 levels
  - Total combination = (4 X 4 X 4) x (4 X 4 X 4) = 4,096!

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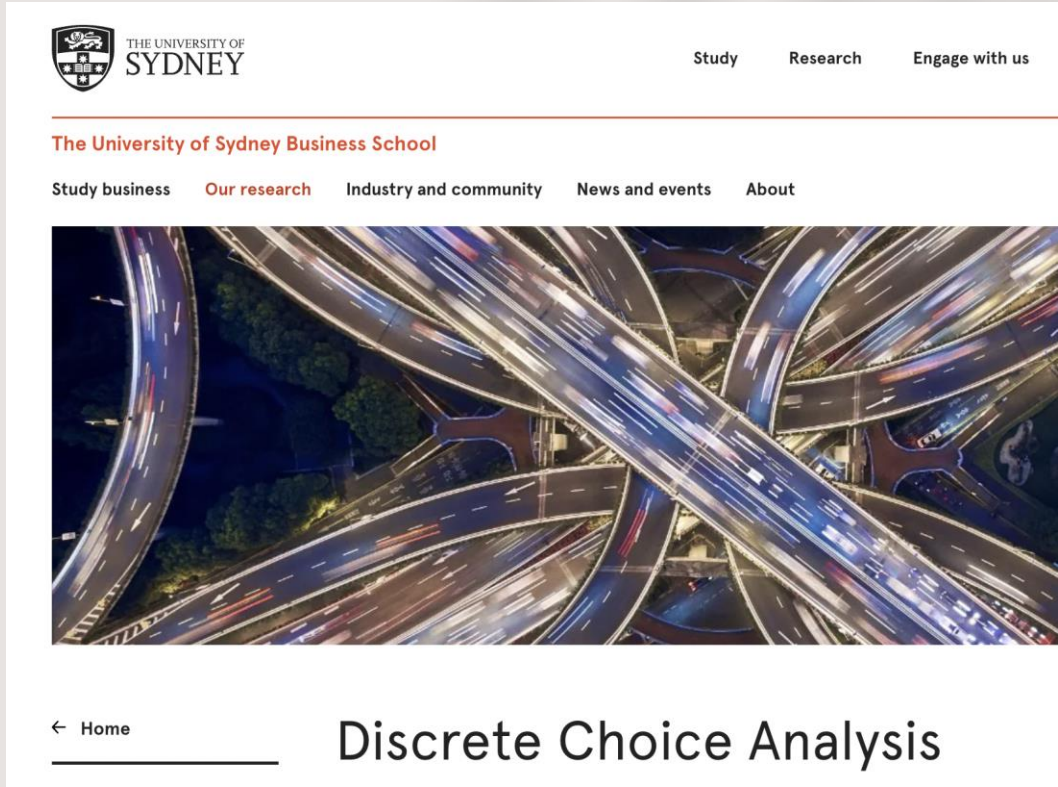
Slides from

- https://www.sydney.edu.au/business/our-research/institute-of-transport-and-logistics-studies/courses/discrete-choice-analysis.html



Full factorials

Example

Consider a one week safari trip to **Kruger Park.** Which malaria prevention option would you prefer, knowing that medication **reduces risk with 90 per cent** ?

Preventative medication	No medication
{2, 4, 6, 8} weeks duration {no, mild, moderate, severe} side effects {$10, $40, $70, $100} cost	

○ ○

Full factorials

Example (design coding)

Consider a one week safari trip to **Kruger Park.** Which malaria prevention option would you prefer, knowing that medication **reduces risk with 90 per cent ?**

Preventative medication	No medication
{0, 1, 2, 3} (duration) {0, 1, 2, 3} (side effects) {0, 1, 2, 3} (cost)	

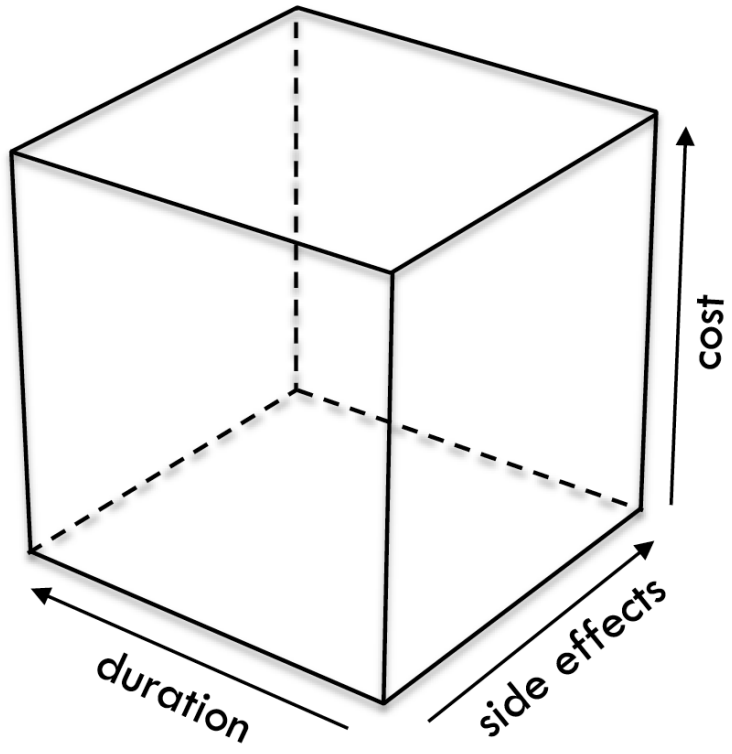
○ ○

Full factorials

64 possible choice tasks (full factorial)

1	0	3	0
2	0	3	1
3	0	3	2
4	0	3	3
5	1	3	0
6	1	3	1
7	1	3	2
8	1	3	3
9	2	3	0
10	2	3	1
11	2	3	2
12	2	3	3
13	3	3	0
14	3	3	1
15	3	3	2
16	3	3	3

1	0	2	0
2	0	2	1
3	0	2	2
4	0	2	3
5	1	2	0
6	1	2	1
7	1	2	2
8	1	2	3
9	2	2	0
10	2	2	1
11	2	2	2
12	2	2	3
13	3	2	0
14	3	2	1
15	3	2	2
16	3	2	3



1	0	1	0
2	0	1	1
3	0	1	2
4	0	1	3
5	1	1	0
6	1	1	1
7	1	1	2
8	1	1	3
9	2	1	0
10	2	1	1
11	2	1	2
12	2	1	3
13	3	1	0
14	3	1	1
15	3	1	2
16	3	1	3

1	0	0	0
2	0	0	1
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4	0	0	3
5	1	0	0
6	1	0	1
7	1	0	2
8	1	0	3
9	2	0	0
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14	3	0	1
15	3	0	2
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Full factorials

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9	2	3	0
10	2	3	1
11	2	3	2
12	2	3	3
13	3	3	0
14	3	3	1
15	3	3	2
16	3	3	3

1	0	2	0
2	0	2	1
3	0	2	2
4	0	2	3
5	1	2	0
6	1	2	1
7	1	2	2
8	1	2	3
9	2	2	0
10	2	2	1
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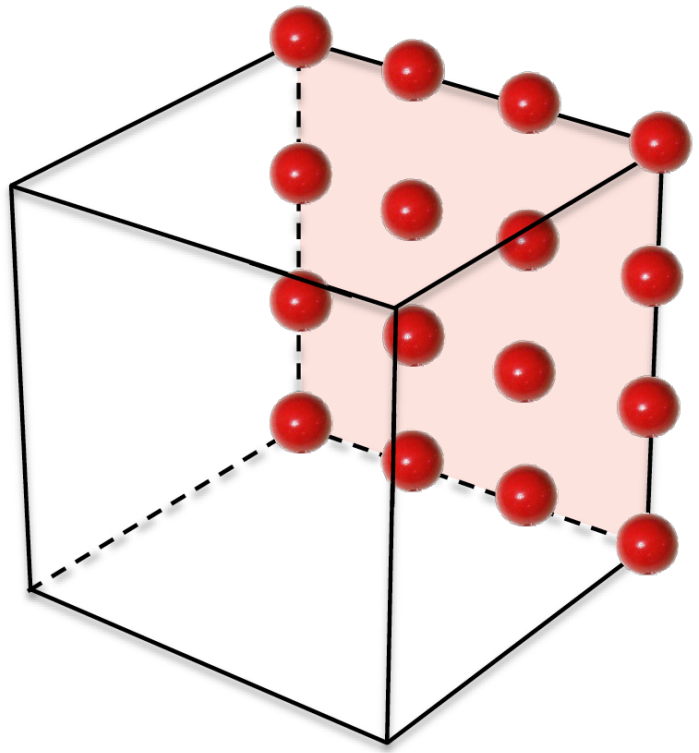
12	2	2	3
13	3	2	0
14	3	2	1
15	3	2	2
16	3	2	3



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8	1	1	3
9	2	1	0
10	2	1	1
11	2	1	2
12	2	1	3
13	3	1	0
14	3	1	1
15	3	1	2
16	3	1	3

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2	0	0	1
3	0	0	2
4	0	0	3
5	1	0	0
6	1	0	1
7	1	0	2
8	1	0	3
9	2	0	0
10	2	0	1
11	2	0	2
12	2	0	3
13	3	0	0
14	3	0	1
15	3	0	2
16	3	0	3

Full factorials

64 possible choice tasks (full factorial)

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2	0	3	1
3	0	3	2
4	0	3	3
5	1	3	0
6	1	3	1
7	1	3	2
8	1	3	3
9	2	3	0
10	2	3	1
11	2	3	2
12	2	3	3
13	3	3	0
14	3	3	1
15	3	3	2
16	3	3	3

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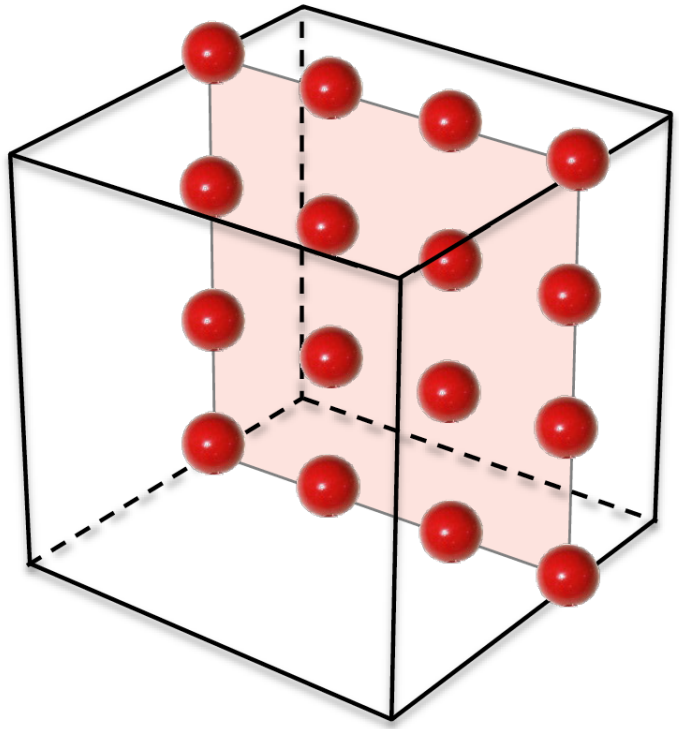
2	0	2	1
3	0	2	2
4	0	2	3
5	1	2	0
6	1	2	1
7	1	2	2
8	1	2	3
9	2	2	0
10	2	2	1
11	2	2	2
12	2	2	3
13	3	2	0
14	3	2	1
15	3	2	2
16	3	2	3



1	0	1	0
2	0	1	1
3	0	1	2
4	0	1	3
5	1	1	0
6	1	1	1
7	1	1	2
8	1	1	3
9	2	1	0
10	2	1	1
11	2	1	2
12	2	1	3
13	3	1	0
14	3	1	1
15	3	1	2
16	3	1	3

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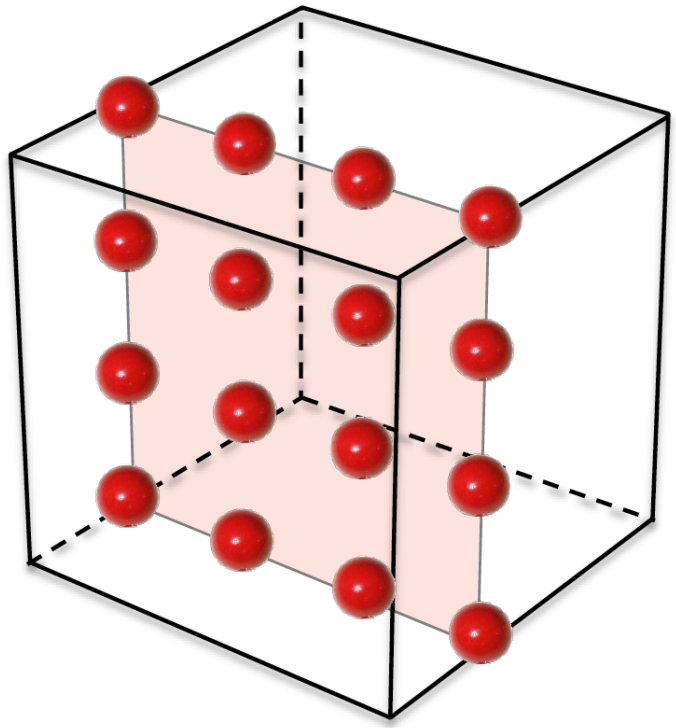
2	0	0	1
3	0	0	2
4	0	0	3
5	1	0	0
6	1	0	1
7	1	0	2
8	1	0	3
9	2	0	0
10	2	0	1
11	2	0	2
12	2	0	3
13	3	0	0
14	3	0	1
15	3	0	2
16	3	0	3

Full factorials

64 possible choice tasks (full factorial)

1	0	3	0
2	0	3	1
3	0	3	2
4	0	3	3
5	1	3	0
6	1	3	1
7	1	3	2
8	1	3	3
9	2	3	0
10	2	3	1
11	2	3	2
12	2	3	3
13	3	3	0
14	3	3	1
15	3	3	2
16	3	3	3

1	0	2	0
2	0	2	1
3	0	2	2
4	0	2	3
5	1	2	0
6	1	2	1
7	1	2	2
8	1	2	3
9	2	2	0
10	2	2	1
11	2	2	2
12	2	2	3
13	3	2	0
14	3	2	1
15	3	2	2
16	3	2	3



1	0	1	0
2	0	1	1
3	0	1	2
4	0	1	3
5	1	1	0
6	1	1	1
7	1	1	2
8	1	1	3
9	2	1	0
10	2	1	1
11	2	1	2
12	2	1	3
13	3	1	0
14	3	1	1
15	3	1	2
16	3	1	3

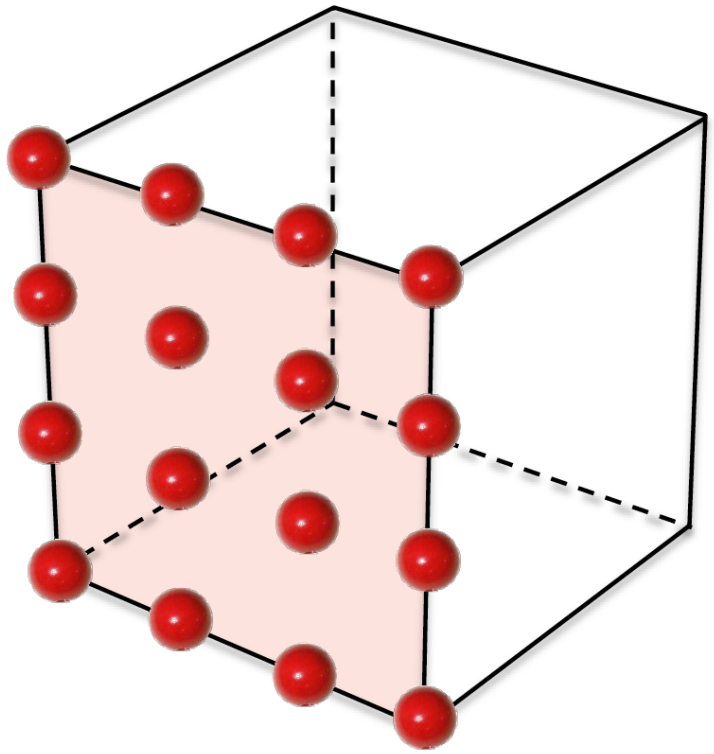
1	0	0	0
2	0	0	1
3	0	0	2
4	0	0	3
5	1	0	0
6	1	0	1
7	1	0	2
8	1	0	3
9	2	0	0
10	2	0	1
11	2	0	2
12	2	0	3
13	3	0	0
14	3	0	1
15	3	0	2
16	3	0	3

Full factorials

64 possible choice tasks (full factorial)

1	0	3	0
2	0	3	1
3	0	3	2
4	0	3	3
5	1	3	0
6	1	3	1
7	1	3	2
8	1	3	3
9	2	3	0
10	2	3	1
11	2	3	2
12	2	3	3
13	3	3	0
14	3	3	1
15	3	3	2
16	3	3	3

1	0	2	0
2	0	2	1
3	0	2	2
4	0	2	3
5	1	2	0
6	1	2	1
7	1	2	2
8	1	2	3
9	2	2	0
10	2	2	1
11	2	2	2
12	2	2	3
13	3	2	0
14	3	2	1
15	3	2	2
16	3	2	3



1	0	1	0
2	0	1	1
3	0	1	2
4	0	1	3
5	1	1	0
6	1	1	1
7	1	1	2
8	1	1	3
9	2	1	0
10	2	1	1
11	2	1	2
12	2	1	3
13	3	1	0
14	3	1	1
15	3	1	2
16	3	1	3

1	0	0	0
2	0	0	1
3	0	0	2
4	0	0	3
5	1	0	0
6	1	0	1
7	1	0	2
8	1	0	3
9	2	0	0
10	2	0	1
11	2	0	2
12	2	0	3
13	3	0	0
14	3	0	1
15	3	0	2
16	3	0	3

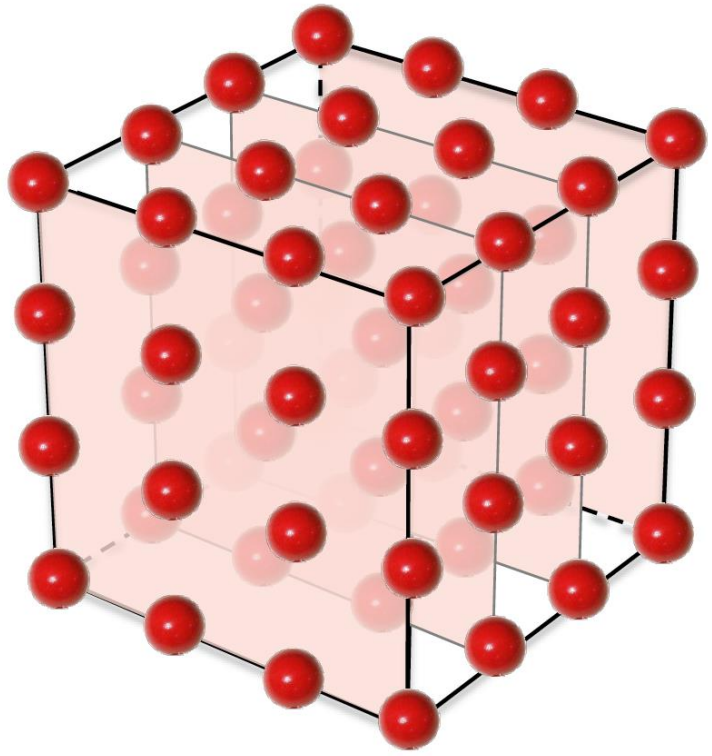
Full factorials

64 possible choice tasks (full factorial)

– Do we really need all 64 choice tasks? Or can we make a sub-selection?

1	0	3	0
2	0	3	1
3	0	3	2
4	0	3	3
5	1	3	0
6	1	3	1
7	1	3	2
8	1	3	3
9	2	3	0
10	2	3	1
11	2	3	2
12	2	3	3
13	3	3	0
14	3	3	1
15	3	3	2
16	3	3	3

1	0	2	0
2	0	2	1
3	0	2	2
4	0	2	3
5	1	2	0
6	1	2	1
7	1	2	2
8	1	2	3
9	2	2	0
10	2	2	1
11	2	2	2
12	2	2	3
13	3	2	0
14	3	2	1
15	3	2	2
16	3	2	3



1	0	1	0
2	0	1	1
3	0	1	2
4	0	1	3
5	1	1	0
6	1	1	1
7	1	1	2
8	1	1	3
9	2	1	0
10	2	1	1
11	2	1	2
12	2	1	3
13	3	1	0
14	3	1	1
15	3	1	2
16	3	1	3

1	0	0	0
2	0	0	1
3	0	0	2
4	0	0	3
5	1	0	0
6	1	0	1
7	1	0	2
8	1	0	3
9	2	0	0
10	2	0	1
11	2	0	2
12	2	0	3
13	3	0	0
14	3	0	1
15	3	0	2
16	3	0	3

Types of experimental designs

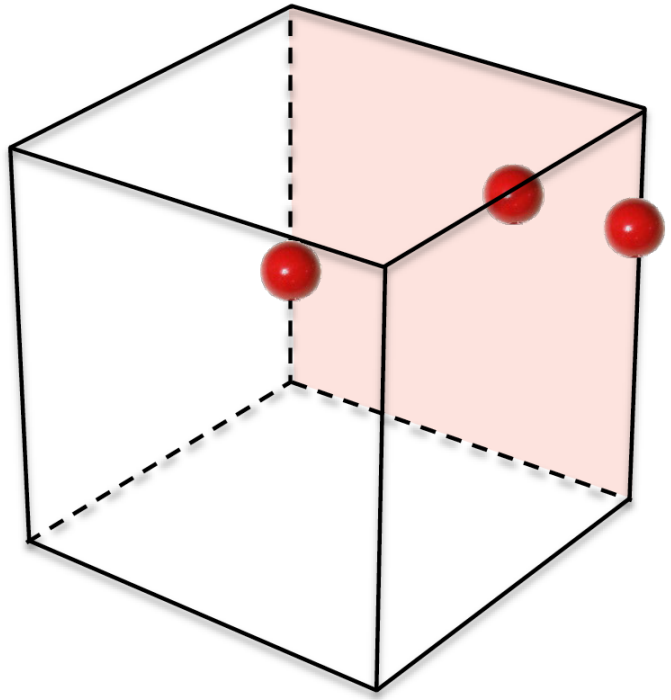
- **Fractional** factorial design
  - Subset of total possible combinations
  - How do you choose which subset?

Types of experimental designs

- **Fractional** factorial design
  - Subset of total possible combinations
  - How do you choose which subset?
    - Random
    - Give 1st subset to 1st respondent, 2nd subset to 2nd respondent, and so on…
  - Risk of seeing only certain levels of attributes

Fractional factorial designs

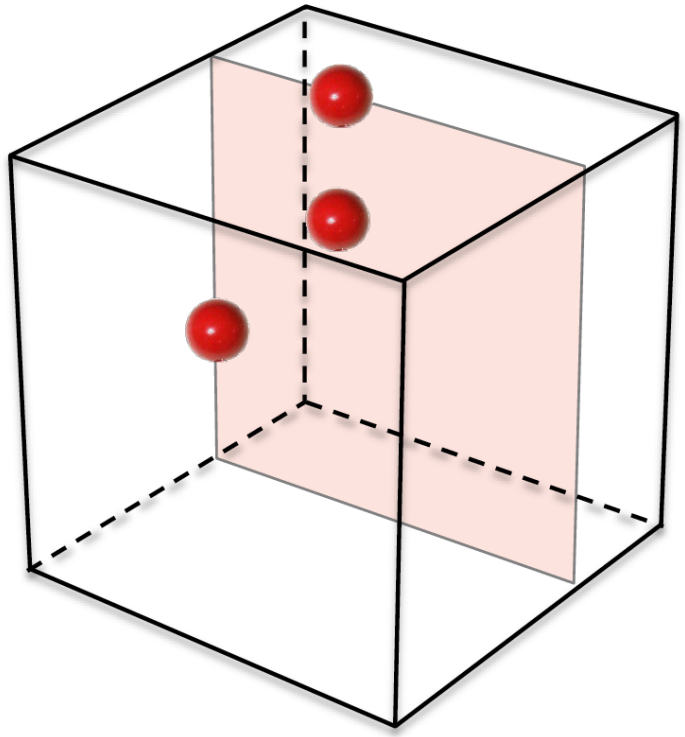
Random design (16 choice tasks)



1	0	3	1
2	2	3	2
3	3	3	2
4	0	2	1
5	1	2	2
6	1	2	3
7	0	1	1
8	0	1	2
9	0	1	3
10	1	1	1
11	2	1	2
12	3	1	2
13	0	0	0
14	1	0	2
15	2	0	0
16	2	0	1

Fractional factorial designs

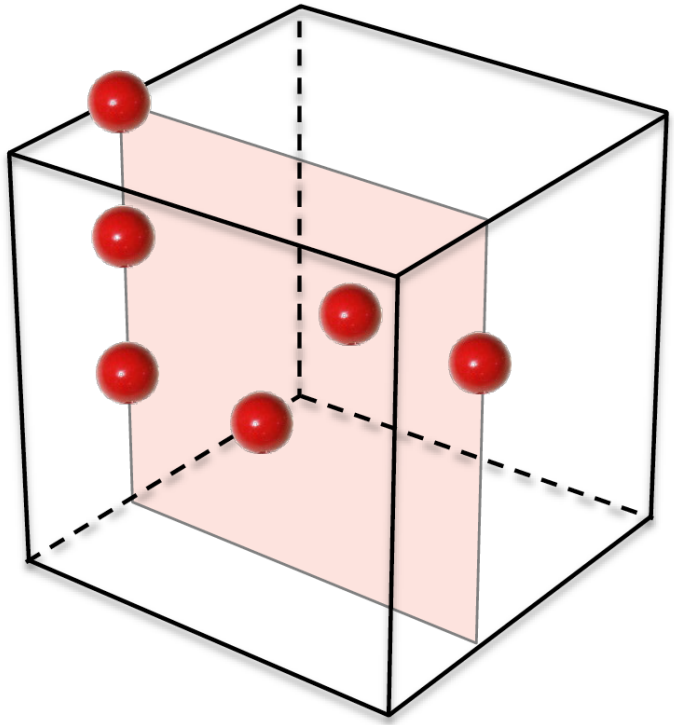
Random design (16 choice tasks)



1	0	3	1
2	2	3	2
3	3	3	2
4	0	2	1
5	1	2	2
6	1	2	3
7	0	1	1
8	0	1	2
9	0	1	3
10	1	1	1
11	2	1	2
12	3	1	2
13	0	0	0
14	1	0	2
15	2	0	0
16	2	0	1

Fractional factorial designs

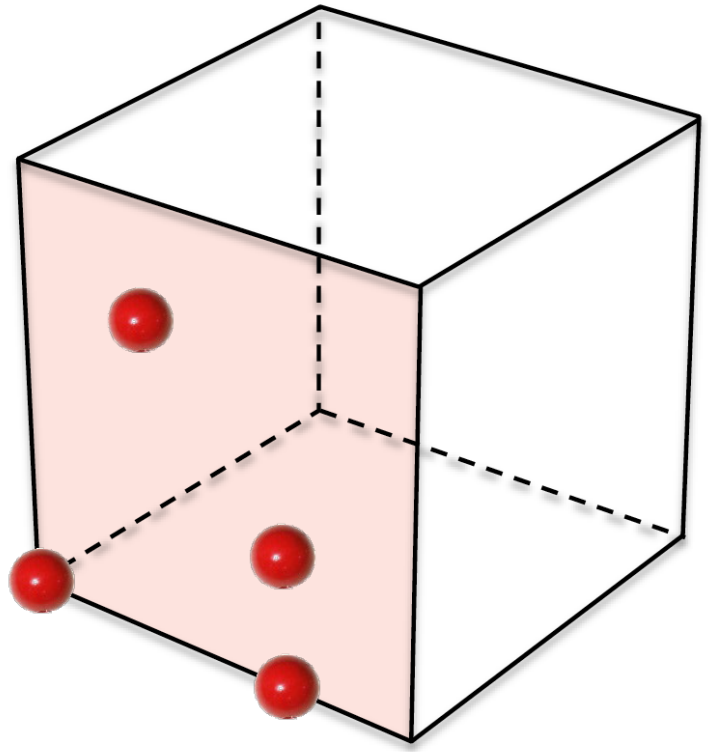
Random design (16 choice tasks)



1	0	3	1
2	2	3	2
3	3	3	2
4	0	2	1
5	1	2	2
6	1	2	3
7	0	1	1
8	0	1	2
9	0	1	3
10	1	1	1
11	2	1	2
12	3	1	2
13	0	0	0
14	1	0	2
15	2	0	0
16	2	0	1

Fractional factorial designs

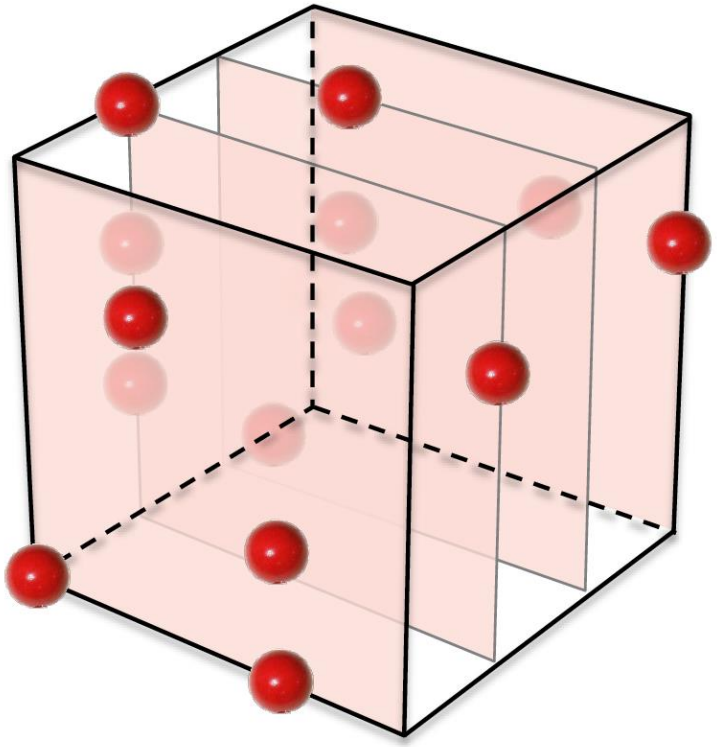
Random design (16 choice tasks)



1	0	3	1
2	2	3	2
3	3	3	2
4	0	2	1
5	1	2	2
6	1	2	3
7	0	1	1
8	0	1	2
9	0	1	3
10	1	1	1
11	2	1	2
12	3	1	2
13	0	0	0
14	1	0	2
15	2	0	0
16	2	0	1

Fractional factorial designs

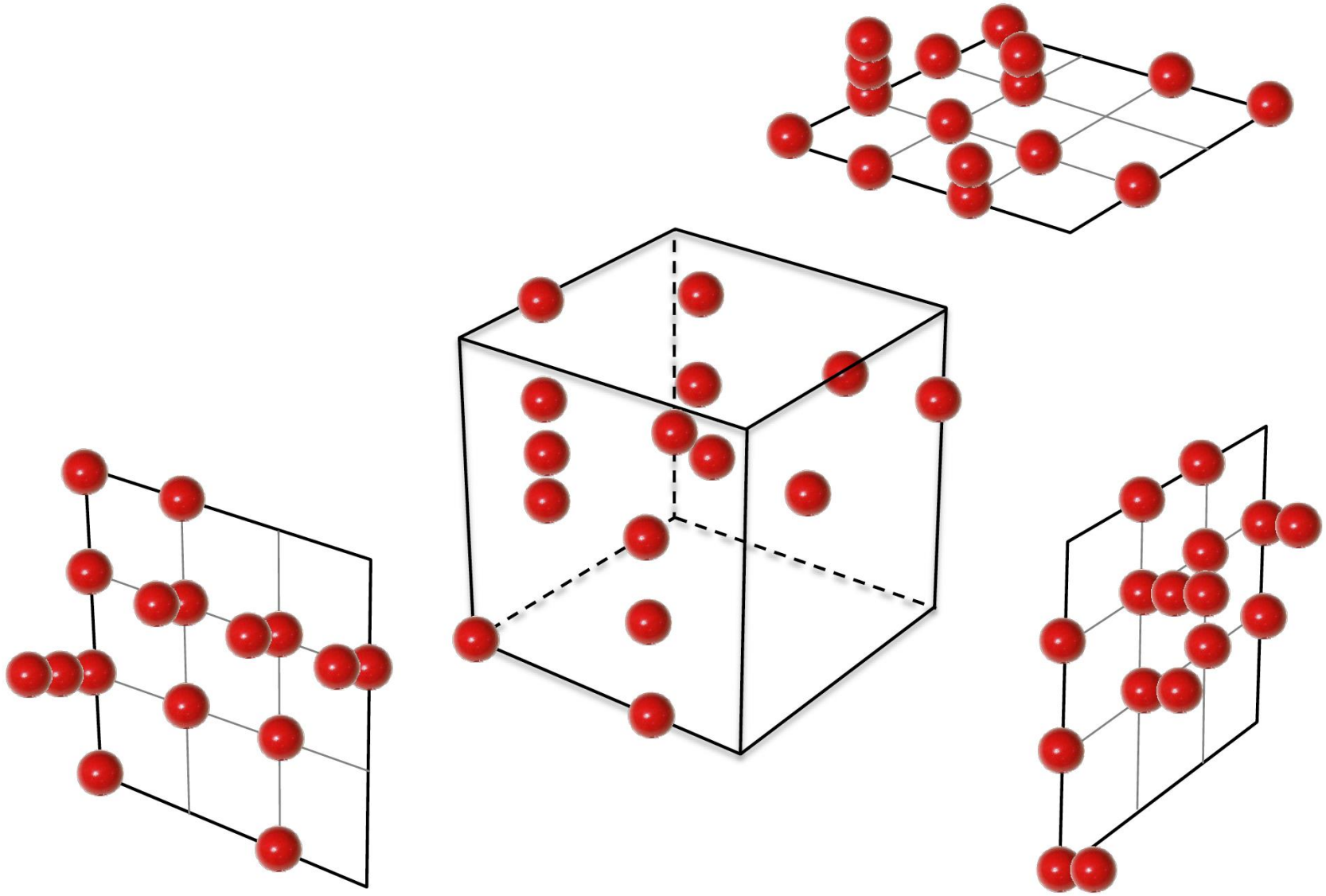
Random design (16 choice tasks)



1	0	3	1
2	2	3	2
3	3	3	2
4	0	2	1
5	1	2	2
6	1	2	3
7	0	1	1
8	0	1	2
9	0	1	3
10	1	1	1
11	2	1	2
12	3	1	2
13	0	0	0
14	1	0	2
15	2	0	0
16	2	0	1

Fractional factorial designs

Random design (16 choice tasks)



Types of experimental designs

- **Fractional** factorial design
  - Orthogonal designs
    - Uncorrelated attribute levels
    - Every pair of levels occurs equally (rows)

S	x_1	x_2
1	0	1
2	0	1
3	0	0
4	0	0
5	0	0
6	0	1
7	1	0
8	1	1
9	1	1
10	1	0
11	1	1
12	1	0

Types of experimental designs

- Fractional factorial design
  - Orthogonal designs
    - Uncorrelated attribute levels
    - Every pair of levels occurs equally (rows)

S	x_1	x_2
1	0	1
2	0	1
3	0	0
4	0	0
5	0	0
6	0	1
7	1	0
8	1	1
9	1	1
10	1	0
11	1	1
12	1	0

Types of experimental designs

- Fractional factorial design
  - Orthogonal designs
    - Uncorrelated attribute levels
    - Every pair of levels occurs equally (rows)

S	x_1	x_2
1	0	1
2	0	1
3	0	0
4	0	0
5	0	0
6	0	1
7	1	0
8	1	1
9	1	1
10	1	0
11	1	1
12	1	0

Types of experimental designs

- Fractional factorial design
  - Orthogonal designs
    - Uncorrelated attribute levels
    - Every pair of levels occurs equally (rows)
    - Each level appears equal number of times for each attribute (columns)

S	x_1	x_2
1	0	1
2	0	1
3	0	0
4	0	0
5	0	0
6	0	1
7	1	0
8	1	1
9	1	1
10	1	0
11	1	1
12	1	0

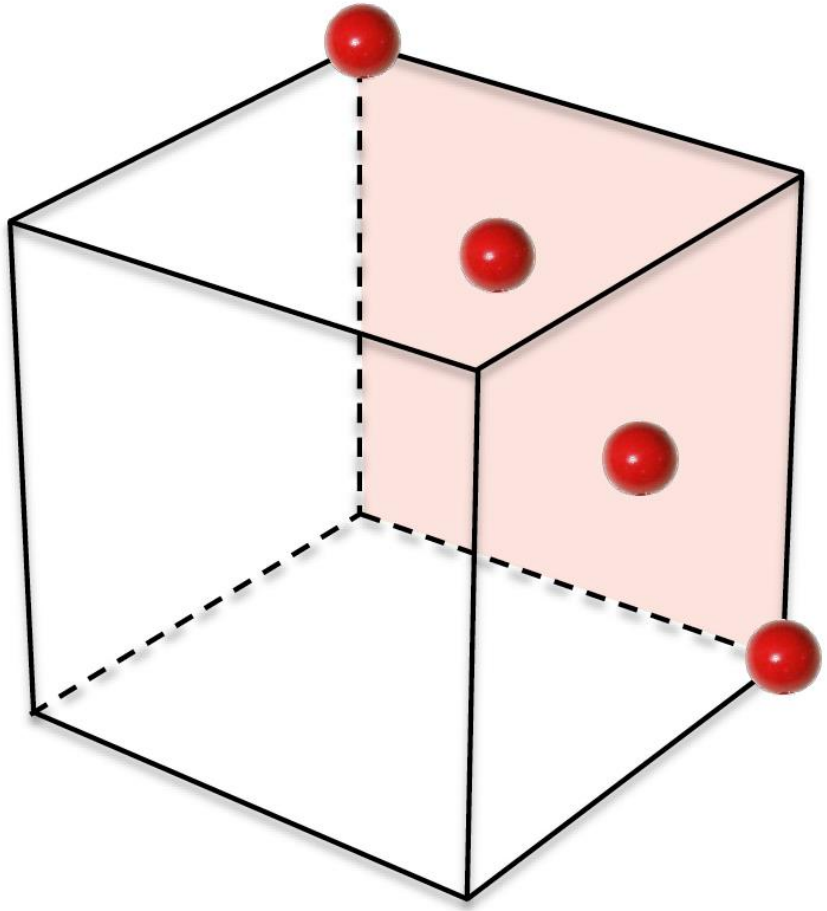
Types of experimental designs

- Fractional factorial design
  - Orthogonal designs
    - Almost impossible to manually generate orthogonal arrays
    - Design libraries
      - http://support.sas.com/techsup/technote/ts723_Designs.txt
      - http://neilsloane.com/oadir/
    - Software (e.g. NGENE, SAS, SPSS)

Types of experimental designs

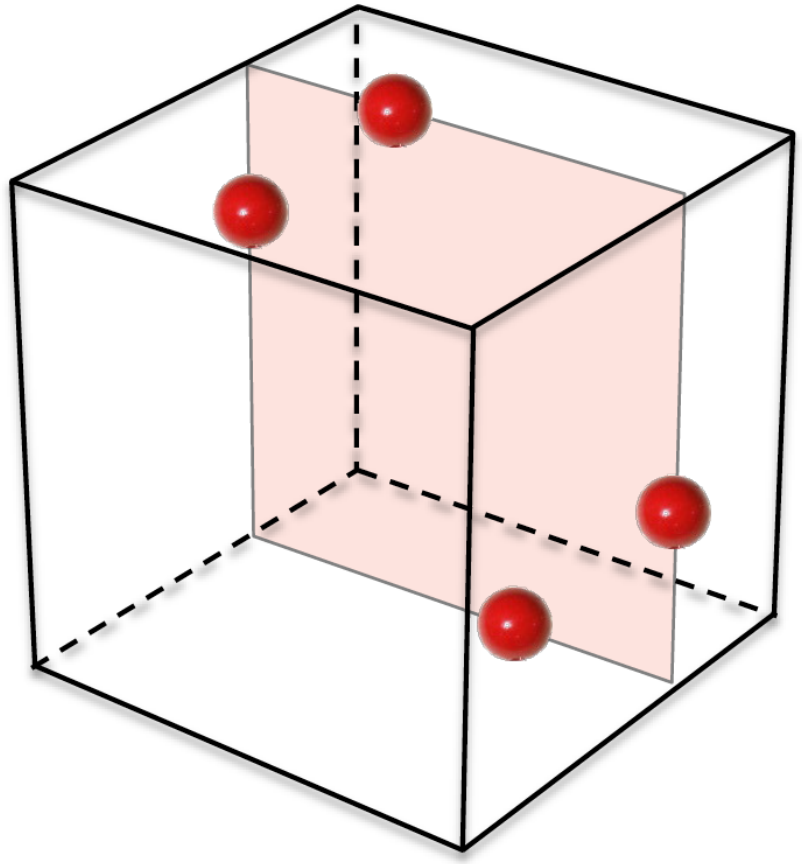
- Fractional factorial design
  - Orthogonal designs
    - Design may be orthogonal but data used in estimation is often not orthogonal
      - Respondents not completing all choice sets assigned
      - Blocks of choice sets not equally distributed
    - Undesirable combinations
      - Dominant
      - Impossible

Orthogonal design (16 choice tasks)



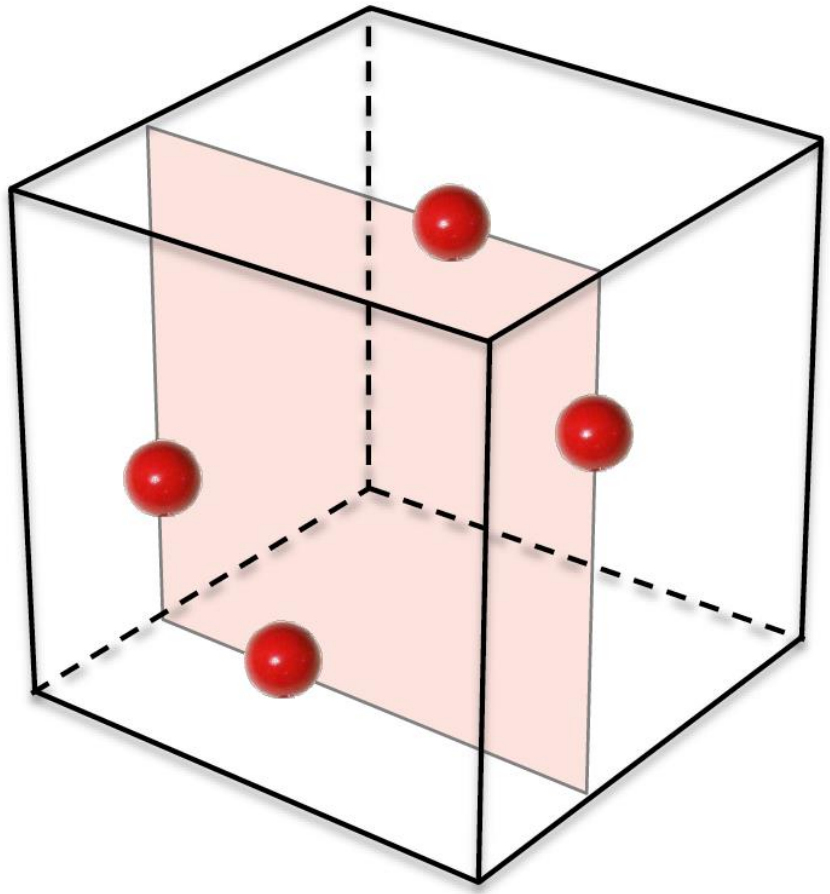
1	0	3	3
2	1	3	2
3	2	3	1
4	3	3	0
5	0	2	2
6	1	2	3
7	2	2	0
8	3	2	1
9	0	1	1
10	1	1	0
11	2	1	3
12	3	1	2
13	0	0	0
14	1	0	1
15	2	0	2
16	3	0	3

Orthogonal design (16 choice tasks)



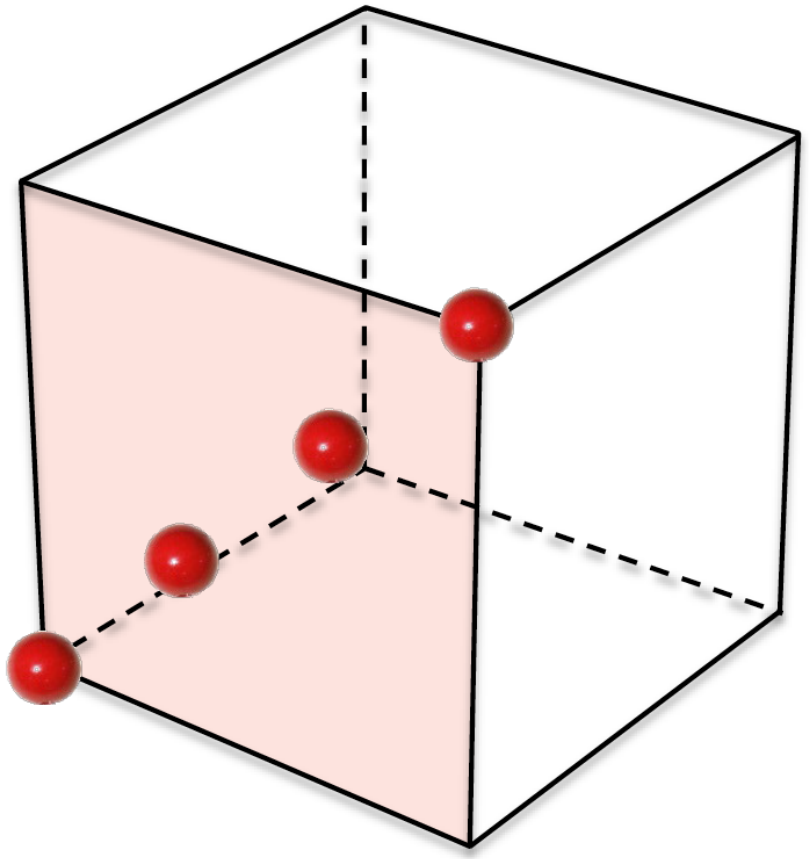
1	0	3	3
2	1	3	2
3	2	3	1
4	3	3	0
5	0	2	2
6	1	2	3
7	2	2	0
8	3	2	1
9	0	1	1
10	1	1	0
11	2	1	3
12	3	1	2
13	0	0	0
14	1	0	1
15	2	0	2
16	3	0	3

Orthogonal design (16 choice tasks)



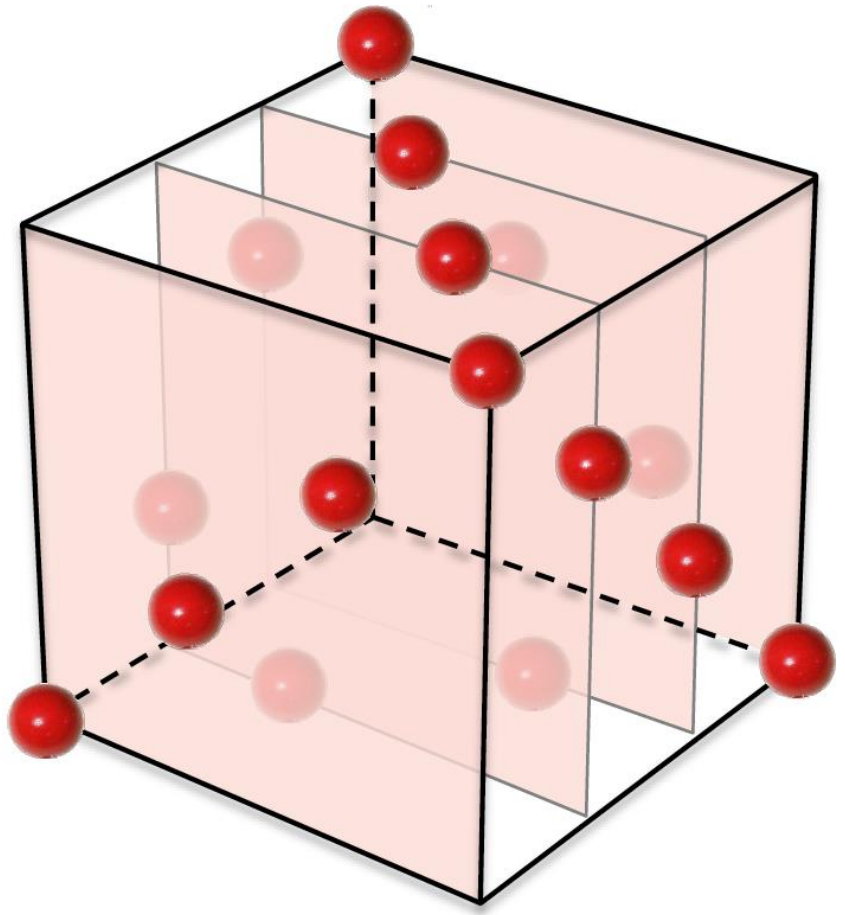
1	0	3	3
2	1	3	2
3	2	3	1
4	3	3	0
5	0	2	2
6	1	2	3
7	2	2	0
8	3	2	1
9	0	1	1
10	1	1	0
11	2	1	3
12	3	1	2
13	0	0	0
14	1	0	1
15	2	0	2
16	3	0	3

Orthogonal design (16 choice tasks)



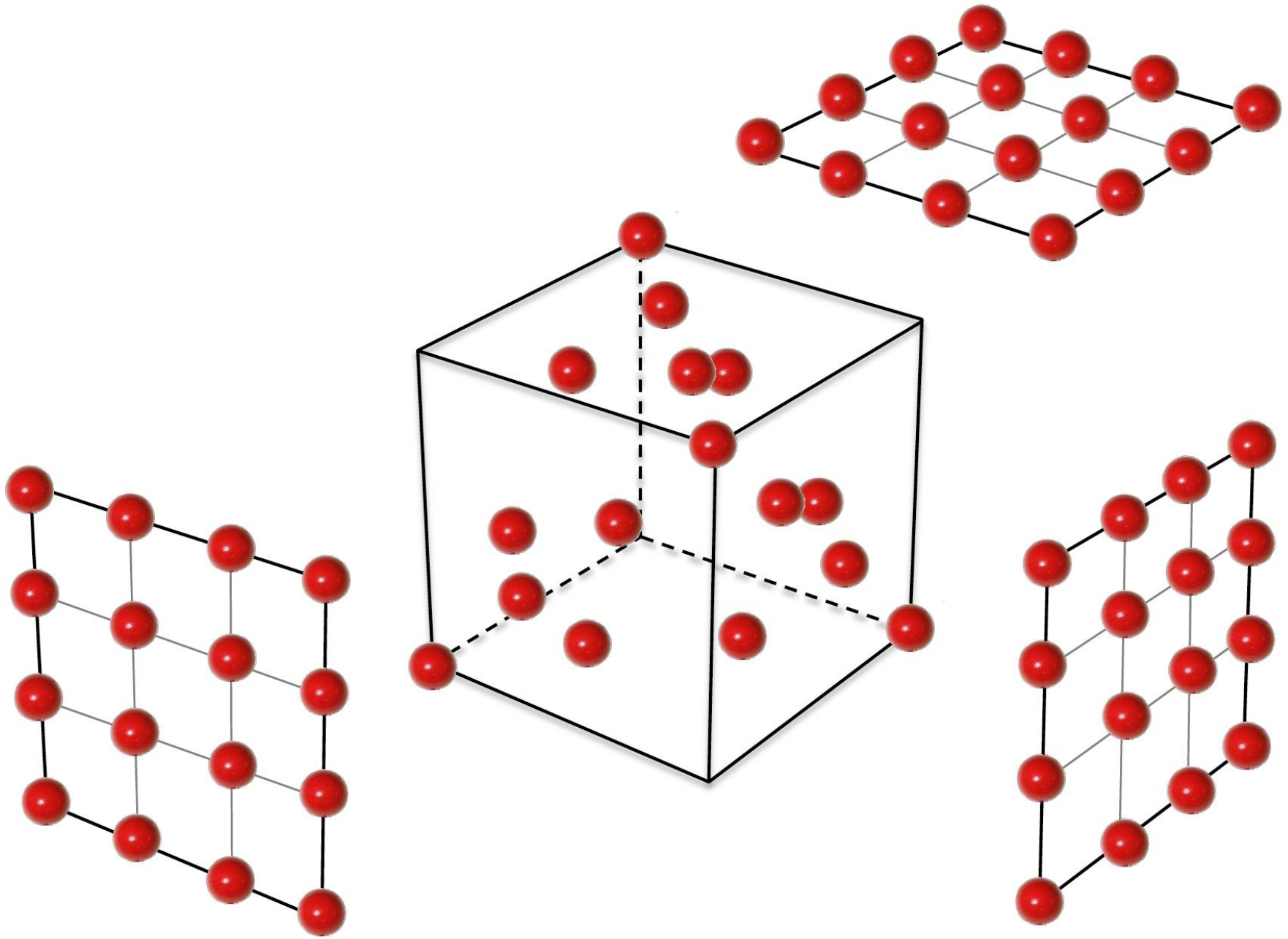
1	0	3	3
2	1	3	2
3	2	3	1
4	3	3	0
5	0	2	2
6	1	2	3
7	2	2	0
8	3	2	1
9	0	1	1
10	1	1	0
11	2	1	3
12	3	1	2
13	0	0	0
14	1	0	1
15	2	0	2
16	3	0	3

Orthogonal design (16 choice tasks)



1	0	3	3
2	1	3	2
3	2	3	1
4	3	3	0
5	0	2	2
6	1	2	3
7	2	2	0
8	3	2	1
9	0	1	1
10	1	1	0
11	2	1	3
12	3	1	2
13	0	0	0
14	1	0	1
15	2	0	2
16	3	0	3

Orthogonal design (16 choice tasks)



Types of experimental designs

- Fractional factorial design
  - Efficient designs
    - Captures more efficient per choice set answered => Less survey respondents needed
    - Smaller standard errors => More reliable estimates

asymptotic variance-covariance (AVC) matrix

$$\Omega = \begin{pmatrix} se(\beta_1)^2 & \cdots & \\ \vdots & \ddots & \\ & & se(\beta_K)^2 \end{pmatrix},$$

where $se(\beta_k)$ is the standard error of parameter β_k

Types of experimental designs

- Fractional factorial design
  - Efficient designs
    - Captures more efficient per choice set answered => Less survey respondents needed
    - Smaller standard errors => More reliable estimates
    - Bayesian D-efficient designs (gold standard)

How to generate designs?

- Generator developed designs
  - https://onlinelibrary.wiley.com/doi/book/10.1002/9780470148563
  - https://www.youtube.com/watch?v=xv3n2ZfRmYo

Experimental designs

- Applying “constraints”
  - Need to avoid unusual / impossible combinations

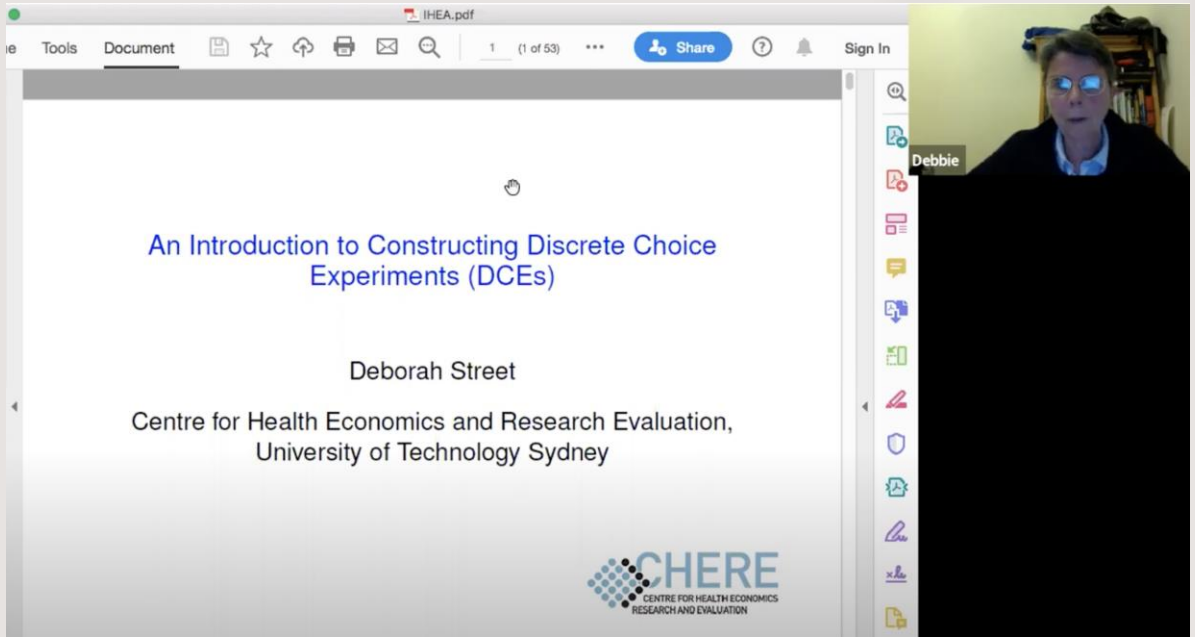
  What do you think about:
  - Type of PreP: “Injectable PrEP”
  - Access: “Mailed to Home”

Experimental designs

- Applying “constraints”
  - Need to avoid unusual / impossible combinations

  What do you think about:
  - Type of PreP: “Injectable PrEP”
  - Access: “Mailed to Home”
  - **(Depends on aim of study)**
    - Have to carefully explain “unusual”/”new” combinations to participants

- **iHEA Webinar - June 1, 2020: An Introduction to the Construction of Discrete Choice Experiments**
- https://www.youtube.com/watch?v=xv3n2ZfRmYo



2) Presentation of choice sets

Why do we care about *how* choice sets are presented?

Why care?

- Could influence choices
- Help reduce cognitive burden
- Reduce misunderstandings of what you want from them

What could influence someone's choices in a DCE survey?

Presentation of choice sets *may* influence respondent choice

- Text
- Cognitive biases
- Mode of delivery
- Visual cues

Text

- “Cheap talk”
- Terminology
  - Terminology and concepts may be unfamiliar to respondents
  - Key assumption is that respondents understand all attributes and levels in the same way to make a rational choice
- How the choice scenario is asked

Cognitive biases

- Left-right bias
  - Testable / amenable
- Order bias
  - Amenable
- Anchoring effect
  - People swayed by statistics / numerical value presented
- Framing
  - Gain or loss
  - Lives saved v.s. lives lost
  - Probability of surviving vs. probability of dying

Mode of delivery

- Paper
  - static
- Interviewer assisted
- Online
  - Beware of small screens for Mobile phones

Visual cues

- Display format of choice set
  - The more realistic you can make it, the better
- Pictures, statistical values, graphs, videos
- Structure of choice sets
  - Number of alternatives, attributes, levels

Presentation of choice sets

- Table
- Pictures
- Videos / animation
  - Unexplored

What do you like or dislike about these examples?

Internet Dating Survey - 2 / 26

Choosing a person to contact

In this survey, we are going to show you a number of hypothetical profiles of people from a dating website that you could potentially contact for a date.

We will show you the profiles of three potential contacts at a time.

Each time we show you the different profiles, we want you to choose the profile of the person that you would most likely contact in real life.

You will be shown nine scenarios which ask you to choose among the three potential contacts on offer.

Before we start, we will look at an example.

Next

An example

You will first be asked to choose between contacting Person A , B and C, or none.

We will then ask which you would prefer to contact if you had to choose among the three.

In making the choice, we want you to consider the following scenario:

If you were looking through a dating website and had a choice among the three people shown based on the descriptions listed, which person would you choose to contact?

	Person A	Person B	Person C	None
Drinking Habit	Moderate drinker	Non drinker	Casual drinker	
Smoking Habit	Smoker	Non smoker	Ex smoker	
Children	None currently	Single parent	Single parent	
Job	White Collar	Blue Collar	Blue Collar	
Looks	Average	Above average	Below average	
Cost to contact	$10	$20	$15	
I would choose to contact	○	◉	○	○
If I had to choose, I would choose	○	◉	○	

You will be shown nine scenarios similar to the above one. Each scenario will show the profiles of different potential contacts.

We want you to select which person you would contact in each scenario based only on the profiles shown in that scenario.

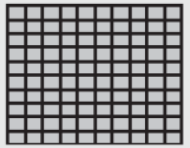
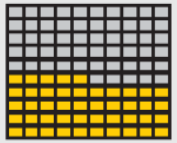
That is, we want you to think only about the three people shown in the scenario and not other people who might have been shown in scenarios that you have seen previously.

Please make sure that you understand the task before proceeding. Once you go to the next screen, you will not be able to go back.

Back

Next

Prostate cancer

	Active Surveillance	Radiotherapy	Surgery
Risk of permanent urinary incontinence due to treatment	 Nobody (0%)	 5 out of 100 (5%)	 20 out of 100 (20%)
Risk of permanent erectile dysfunction due to treatment	 Nobody (0%)	 25 out of 100 (25%)	 45 out of 100 (45%)
Risk of other permanent side-effects due to treatment	No	Yes, substantial risk of • Bowel problems • Frequent urge to urinate	Yes, small risk of mortality within 6 weeks
Main aim is cure	No, the tumour remains in the body	Yes, but the disease may return	Yes, but the disease may return
Frequency of PSA testing with a risk of new prostate biopsies	Four times in a year and at least one biopsy per year	Once in a year	Once in a year
Which alternative do you prefer?	☐	☐	☐

Meat choice scenario 4 of 4

Looking at each of the meat products shown, we want you to tell us how much of each meat product you would purchase, assuming that you were shopping under similar circumstances to your last grocery shopping trip when you purchased meat (that is, if you were buying for a BBQ, then please pretend that you are buying for one now. If it were for a normal week, then pretend that it is a normal week now).

Diced	Roast	Mince	Diced
			
 Vacuum packed	 Vacuum packed	 Multi wrapped	 Modified atmosphere packed
Country of Origin New Zealand	Country of Origin China	Country of Origin New Zealand	Country of Origin United States
100% Grass fed	100% Grass fed 100% Free of antibiotics 100% Free of hormones 100% Free of steroids 100% Free range	100% Grass fed 100% Free of hormones 100% Traceable 100% Free range	100% Free of antibiotics 100% Free of hormones 100% Traceable 100% Free of steroids
Average per 100g Engergy 590 KJ Protein 18 g Fat 9 g Omega 3 0.28 g Iron 5 mg Zinc 9 mg	Average per 100g Engergy 520 KJ Protein 27 g Fat 18 g Omega 3 0.28 g Iron 5 mg Zinc 11 mg	Average per 100g Engergy 545 KJ Protein 26 g Fat 11 g Omega 3 0.28 g Iron 3 mg Zinc 10 mg	Average per 100g Engergy 610 KJ Protein 33 g Fat 13 g Omega 3 0.28 g Iron 4 mg Zinc 14 mg
Best Before 3 days to expiry $/KG $18.00 Net KG 0.25 kg Total Price $4.50	Best Before 1 week to expiry $/KG $19.00 Net KG 0.5 kg Total Price $9.50	Best Before 1 week to expiry $/KG $18.00 Net KG 0.5 kg Total Price $9.00	Best Before 2 weeks to expiry $/KG $14.00 Net KG 1 kg Total Price $14.00

Given the meat products as described, how many of each (including none) would you must likely purchase assuming these were the only meats available on the shelf?

None	None	None	None
One	One	One	One
Two	Two	Two	Two
Three	Three	Three	Three
More than three	More than three	More than three	More than three

<< >>

Shelf 1 of 16

$22.99 | $7.99 | $12.99 | $17.99 | $22.99

Special -20% off listed price | Special -20% off listed price

Think about your **next** red wine purchase to have at your home for dinner with some friends or family, if the wines above are the only ones available, what would you most likely choose (select one)?

○ ○ ○ ○ ○

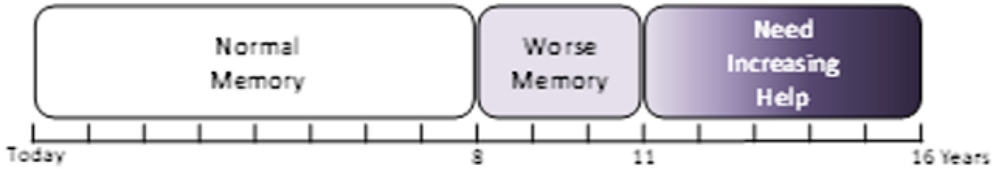
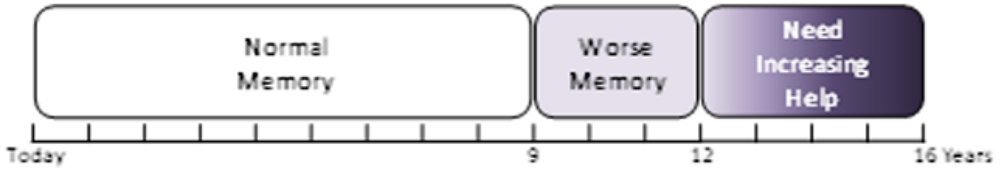
OR ○ none of the above - I would shop elsewhere

SUBMIT

Iberia					Total	3 hr 40 min	€ 65	
	From	To	Departure	Arrival	Stops	Travel Time	Price	Choose this ticket
Flight	Amsterdam	Girona Airport	6:00	8:00	0	2 hr 00 min	€ 50	
Ground Transportation	Girona Airport	Barcelona City				1 hr 40 min	€ 15	

Transavia					Total	5 hr 00 min	€ 65	
	From	To	Departure	Arrival	Stops	Travel Time	Price	Choose this ticket
Flight	Amsterdam	Girona Airport	12:00	16:00	1 - (2 hr 00)	4 hr 00 min	€ 50	
Ground Transportation	Girona Airport	Barcelona City				1 hr 00 min	€ 15	

Vueling					Total	4 hr 20 min	€ 84	
	From	To	Departure	Arrival	Stops	Travel Time	Price	Choose this ticket
Flight	Amsterdam	Girona Airport	6:00	9:00	1 - (1 hr 00)	3 hr 00 min	€ 75	
Ground Transportation	Girona Airport	Barcelona City				1 hr 20 min	€ 9	

What Will Happen to You	Daily Nausea	Increased Chance of Disabling Stroke In First Year	Increased Chance of Sudden Death In First Year
No Medicine 	None	None	None
Medicine 	**2** times a month 	3 people out of 100 (3%) 	3 people out of 100 (3%) 

Which would you choose if these were your only options?

☐ No medicine

☐ Medicine

Johnson FR, et al, Value Health. 2019;22(9):1063-9.

Ways probabilities are presented matters

- Risk
  - Probability or likelihood of an outcome

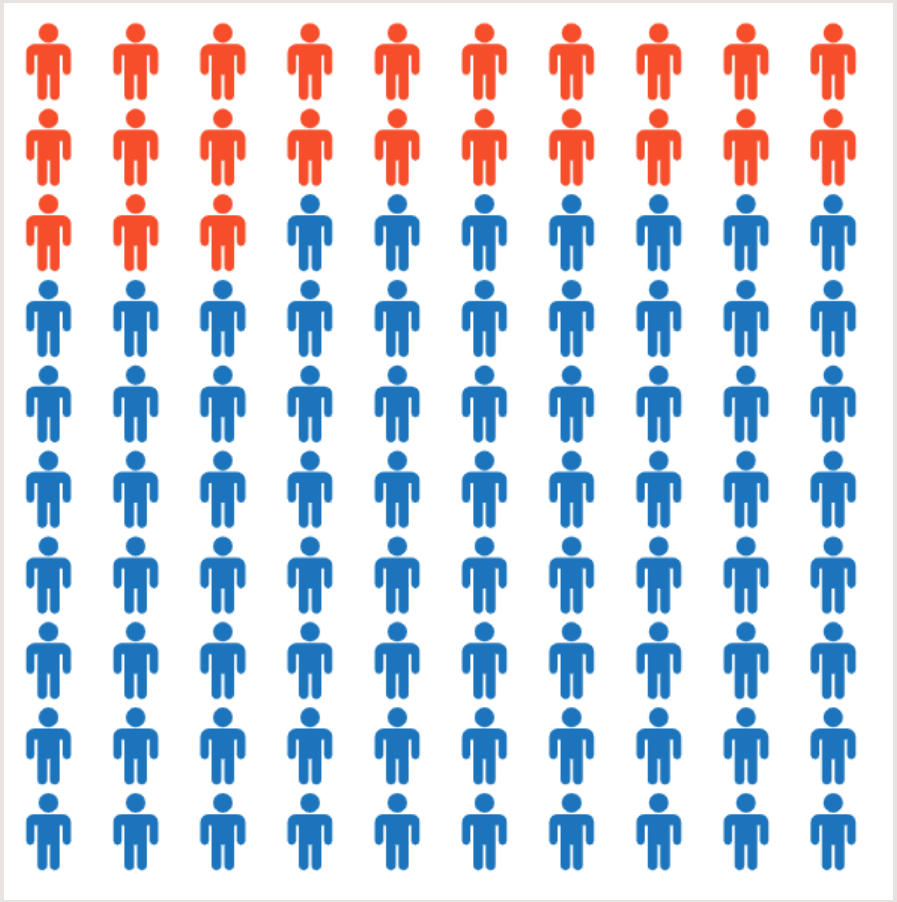
MySTIRisk

Risk Display Options

Phyu Mon Latt
Monash University

Option **1** – Icon Array

Current Risk



Future Risk

Your highest risk of getting an STI is Chlamydia.

At present, in a group of 100 people who gave the same answers as you on this survey, 23 will have Chlamydia.

Over the next 12 months, in a group of 100 people who gave the same answers as you on this survey, 10 are likely to have Chlamydia.

Option **2** – Government Recommendation

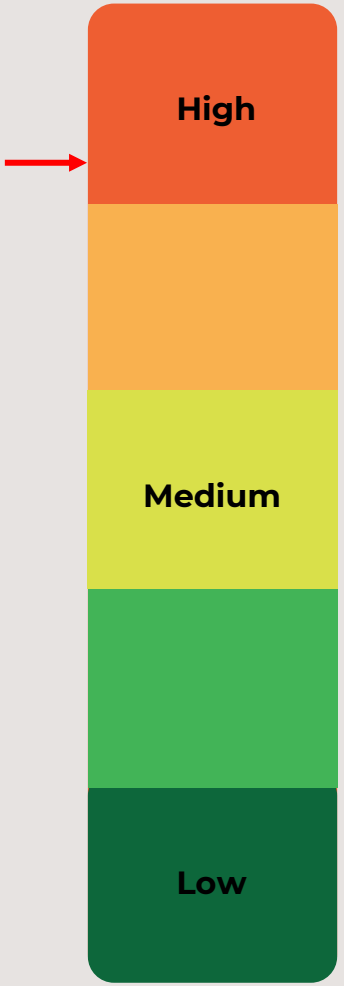
Your risk of acquiring one or more STIs is **high**.

Australian Guidelines recommend you **have an STI testing**.

Option **3** – Risk Bar

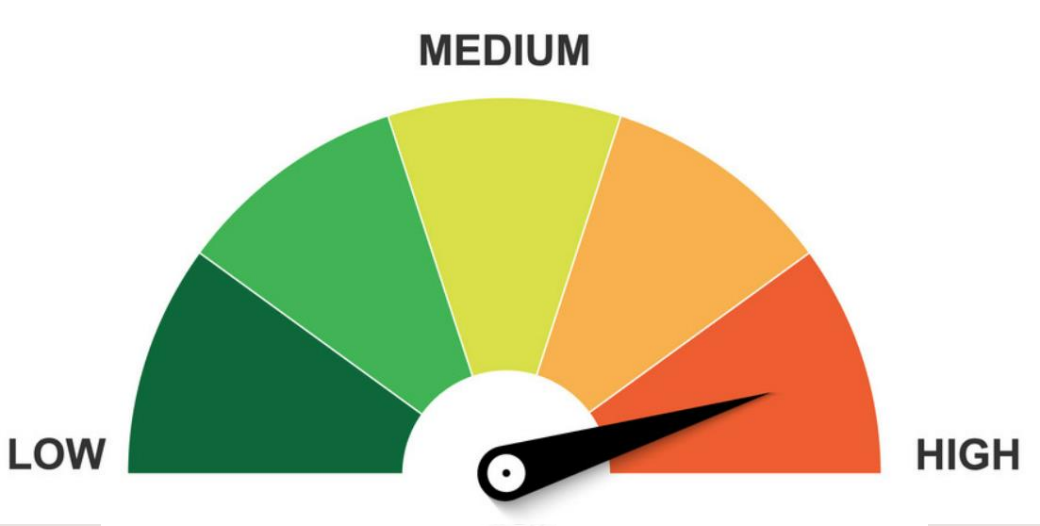
Your risk of acquiring one or more STIs is **high**.

We recommend you **have an STI test**.



Option **4** – Risk Meter

Your STI Risk



High Risk

Your risk of acquiring one or more STIs is in the **top 20%** of all clients who attended MSHC.

We recommend you **have an STI test**.

Option **5** – Current Display

Risk report

If a person had attended Melbourne Sexual Health Centre and provided the answers you did, their risk of infections are below.

Risk of HIV

- At present, in a group of **1000 people**, **4** will have HIV.
- Over the next 12 months, in a group of **1000 people**, **2** are likely to catch HIV.

Risk of Syphilis

- At present, in a group of **100 people**, **9** will have syphilis.
- Over the next 12 months, in a group of **100 people**, **4** are likely to catch syphilis.

Risk of Gonorrhoea

- At present, in a group of **100 people**, **14** will have gonorrhoea.
- Over the next 12 months, in a group of **100 people**, **9** are likely to catch gonorrhoea.

Risk of Chlamydia

- At present, in a group of **100 people**, **23** will have chlamydia.
- Over the next 12 months, in a group of **100 people**, **10** are likely to catch chlamydia.

Which is the ‘right’ one?

- Test which is the most effective, preferred by your target population
- Ask Phyu Mon later…

Framing Bias

Framing bias occurs, when individuals rely too much on "how information is presented."

WallStreetMojo

Framing bias

- Individual's decisions influenced by the way information is presented (instead of facts and figures)
- "Positive" framing
  - 70% people saved
- "Negative" framing
  - 30% people died
- People more likely to "gamble" to avoid losses

Be careful

- Left-right bias
- Order bias
- Colours
- Imagery

How can you check if your choice set presentation is reasonable?

Test it!

- Pre-test
  - Think aloud interviews
- Pilot
  - Up to 20 people
  - 10% of sample

Tips

- Think about your audience
  - How much background knowledge would they have?
  - Would they understand the terms consistently?
- Instruction page before DCE survey
- Account for or test for cognitive biases
  - Framing
  - Remove anchoring statements
  - Left-right / order bias

We will now show some choices to understand your HIV PrEP care preferences. You won't have experienced some of these things, but please try and decide what you think you would prefer based on the information shown. Below we detail the options you will select among:

PrEP modality:

- Daily oral pill: a daily tablet you take each day
- On-demand tablet: you take the pill depends on your sexual activity schedule – 2 pills 2-24 hours before sex, 1 pill 24 hours after the first pill, and 1 pill 48 hours after the first pill.
- Long-acting injectable PrEP: injectable PrEP, after the first two injections in the first month, provided every 2 months.
- PrEP implant: small (2-4cm) tube inserted under the skin of upper arm, allows slow release to prevent HIV infection for 5-6 months. It can be removed if treatment needs to be stopped.

Getting your PrEP prescription:

- Same-day prescription: you don't need to wait the lab test result to get your prescription.
- 2-visit prescription: you wait till the lab result shows that you are eligible to take on PrEP (standard-of-care).
- Telehealth prescription: you will still be required to have the same lab tests and upload results to the online platform.

In the example below, choosing Option 1 means you would prefer to use daily oral pill, 2-visit prescription, having text reminders about taking your pill and follow-up visit, and pay no out-of-pocket cost.

Choosing Option 2 means you would prefer to use on-demand oral pill, same-day prescription, having a smartphone application to remind you about taking pills and follow-up visit, and pay 700 RMB out-of-pocket.

If you do not prefer option 1 or option 2, you can choose “None of these options”.

Option 1	Option 2
Daily oral pill	On-demand oral pill
2-visit prescription	Same-day prescription
Medication home delivery	Medication home delivery
Text reminder for medication adherence	Smartphone application
At no cost	30% off (700RMB)

Questions?

Session 4 – Live demonstration
NGENE / Qualtrics

www.choice-metrics.com

- Experimental design generation software
- Can apply constraints
- Generate orthogonal and Bayesian efficient designs

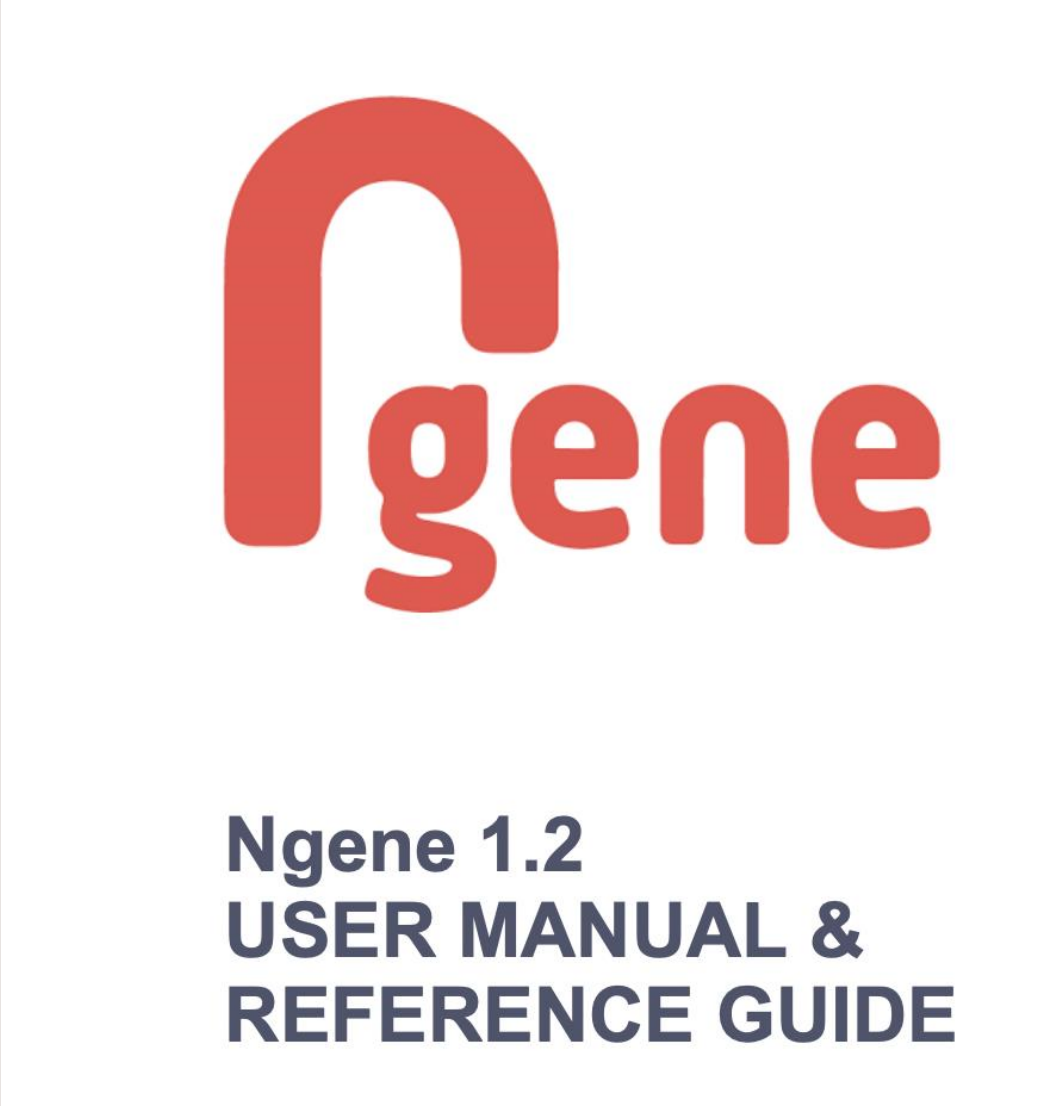
www.choice-metrics.com

- Syntax driven

Syntax - Singapore DCE Workshop 2023.ngs

```
Design
; alts = A, B, C
; rows = 60
; eff = (mnl,d)
; block = 10
; cond:
if(a.Mode = [3], a.Pickup=[0,1]) ,
if(b.Mode = [3], b.Pickup=[0,1])
; model:
U(A) = b1.effects[0|0|0]*Mode[1,2,3,0] +
       b2.effects[0|0]*Pres[1,2,0] +
       b3.effects[0|0|0|0]*Pickup[1,2,3,4,0] +
       b4.effects[0|0|0]*Supp[1,2,3,0] +
       b5.effects[-0.00001|-0.00001|-0.00001]*Cost[1,2,3,0]/
U(B) = b1.effects*Mode +
       b2.effects*Pres +
       b3.effects*Pickup +
       b4.effects*Supp +
       b5.effects*Cost/
U(C) = b6[0]
$
```

https://choice-metrics.com/NgeneManual120.pdf



NGENE live demonstration

Qualtrics live demonstration

LOGIN SUPPORT

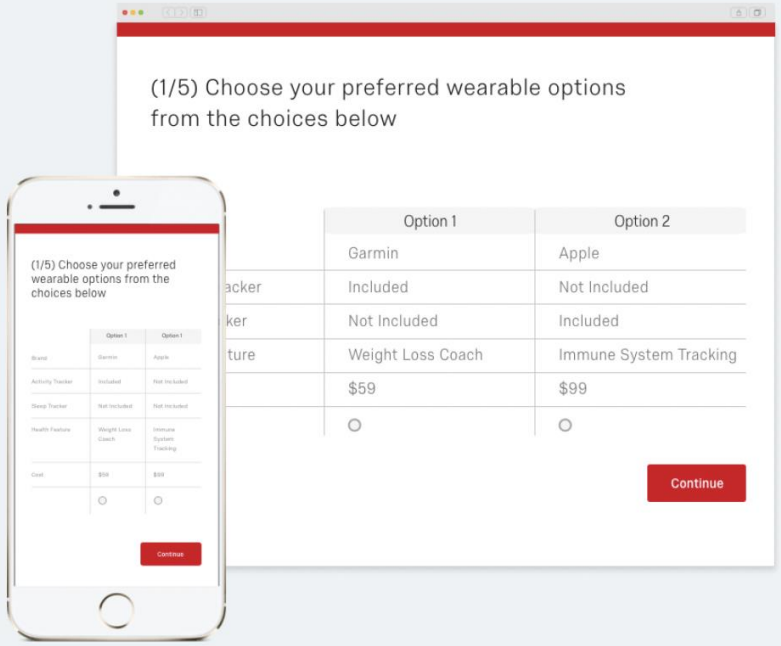
qualtrics XM PRODUCTS SOLUTIONS CUSTOMERS RESOURCES COMPANY REQUEST DEMO

Platform > Core XM > Conjoint Analysis

CONJOINT ANALYSIS SOFTWARE TOOL

Optimize products and pricing with predictive insights

REQUEST DEMO



Session 5. How to analyse choice data

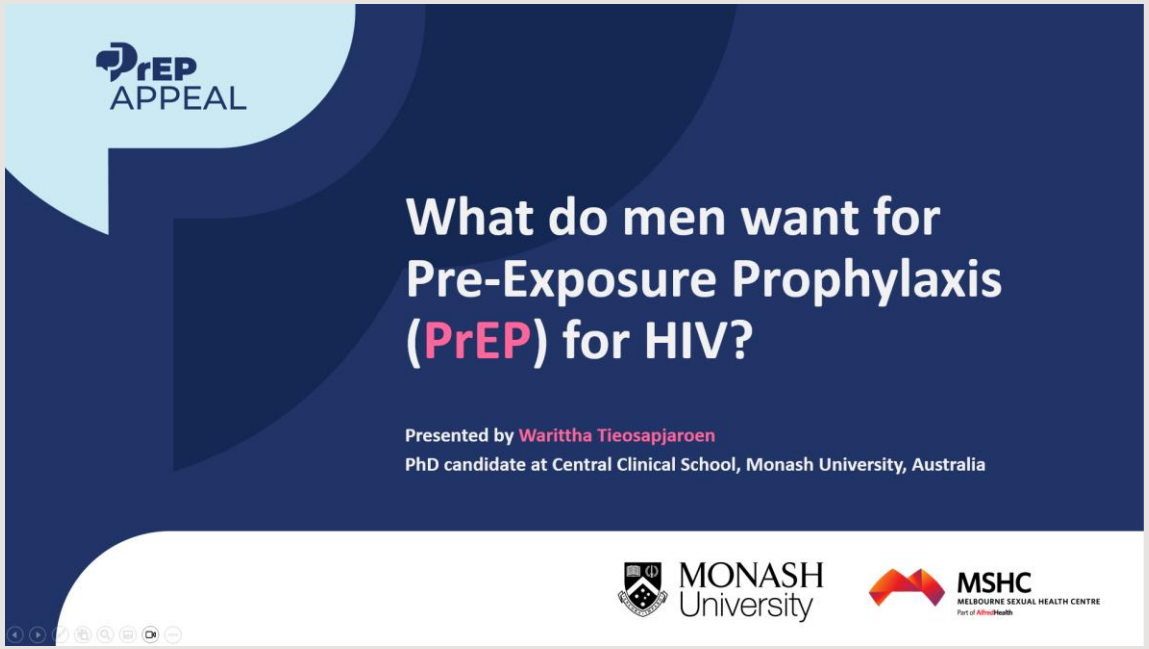
Have you downloaded Nlogit and the ‘PrEP DCE.lpj’ file?

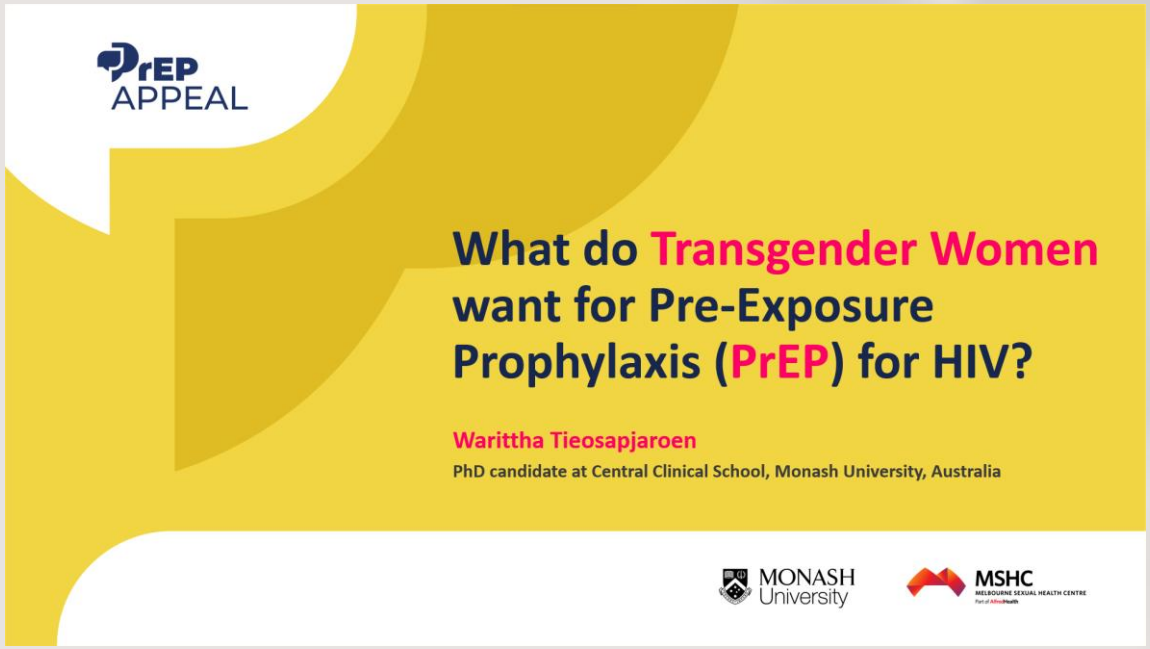
Warittha Tieosapjaroen (Nittha)

- PharmD, MBiotech
- PhD Candidate at Melbourne Sexual Health Centre, Alfred Health, Central Clinical School, Monash University
- HOPE Project Manager
- wtieosapjaroen@mshc.org.au

Preferences for Weight Gain Compared With Other Antiretroviral Therapy Side Effects in People Living With HIV: A Discrete Choice Experiment

Warittha Tieosapjaroen, PharmD, MBiotech,[a,b]
Christopher K. Fairley, MBBS, PhD, FRACP, FAFPHM,[a,b]
Eric P.F. Chow, PhD, MPH, MBiostats, MApplSc,[a,b,c] *Ivette Aguirre, MClinPharm,*[a]
Jennifer F. Hoy, AM, FRACP, FAHMS,[d] *and Jason J. Ong, PhD, MMed, MBBS, FAChSHM, FRACGP*[a,b,e]





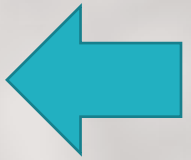
Session 4: Abstract driven session
Friday June 9, 2023
10.30-11.30 am

Objectives of the session

- Understand DCE data
- Demonstrate DCE syntax
- Demonstrate to Nlogit
- Understand DCE outputs

Common DCE models

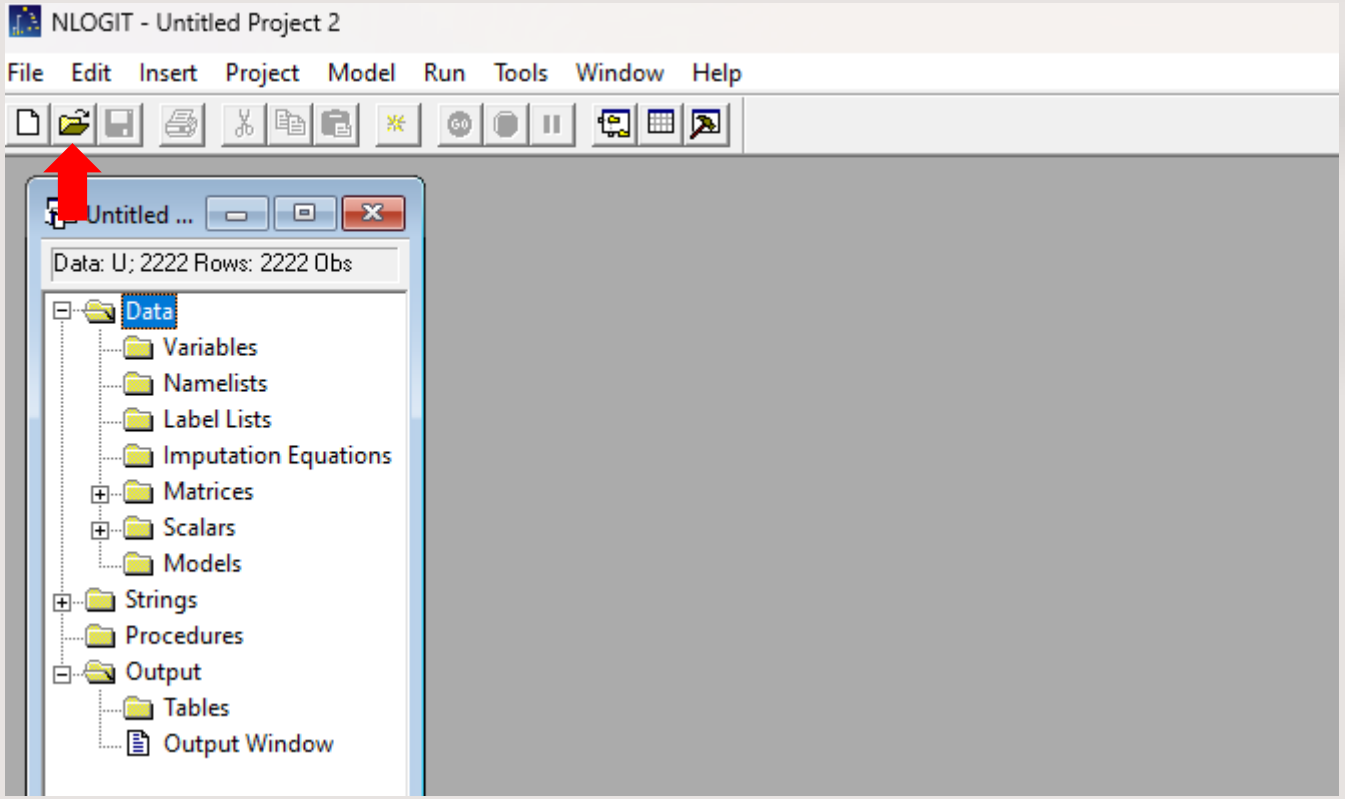
- Multinomial logit (MNL) - analyse preferences from each choice set independently



- Random parameter logit (RPL) - analyse preferences by panelling all the choice sets from each respondent

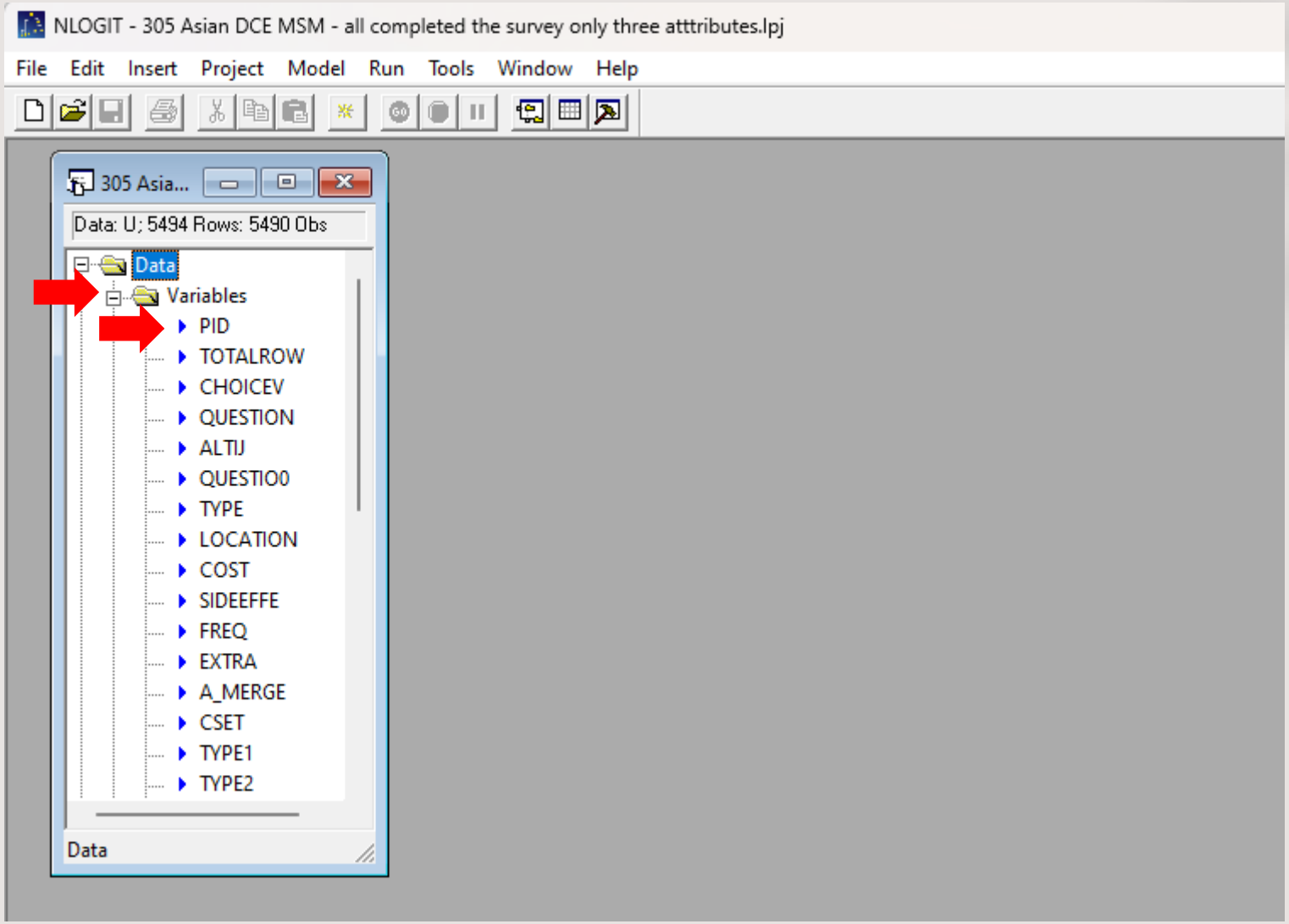
- Latent class model (LCM) – explore preferences shared between individuals and group them together.

Understand DCE data



Open the 'PrEP DCE.lpj' file

Understand DCE data



Understand DCE data

Choice indicator
1= chosen
0= not chosen

Number of alternatives in each choice situation

Alternative indicator
1= Alt. A
2= Alt. B
3= Alt. C or Opt out

	pid	totalrow	choicev	question	cset	altij	type	location	cost	sideeffects	freq	extra
1	168	18	0	1	3	1	2	6	4	4	2	3
2	168	18	1	1	3	2	1	1	1	3	3	1
3	168	18	0	1	3	3	.	.	.	.	.	.
4	168	18	0	2	3	1	2	1	4	2	4	3
5	168	18	1	2	3	2	1	3	3	3	2	1
6	168	18	0	2	3	3	.	.	.	.	.	.
7	168	18	1	3	3	1	5	2	1	4	4	1
8	168	18	0	3	3	2	3	4	3	1	1	3
9	168	18	0	3	3	3	.	.	.	.	.	.
10	168	18	1	4	3	1	5	5	1	4	2	3

An example of a DCE question

Cset=3

Altij
1= Alt. A
2= Alt. B
3= Alt. C or Opt out

Question 1	A	B	Opt out
Type of PrEP	Oral long-acting PrEP	Injectable PrEP	x
Service location	Pharmacy	Hospital	x
Cost	$AU 25	Free	x
Side effects	Rare chance of kidney problems	Mild	x
Visit frequency	Every 6 months	Every year	x
Extra services	STI testing	None	x
Which choice do you prefer?	○	○	○

Understand your DCE data

Number of alternatives in each choice situation

Alternative indicator
1= Alt. A
2= Alt. B
3= Alt. C or Opt out

	pid	totalrow	choicev	question	cset	altij	type	location	cost	sideeffects	freq	extra
1	168	18	0	1	3	1	2	6	4	4	2	3
2	168	18	1	1	3	2	1	1	1	3	3	1
3	168	18	0	1	3	3	.	.	.	.	.	.
4	168	18	0	2	3	1	2	1	4	2	4	3
5	168	18	1	2	3	2	1	3	3	3	2	1
6	168	18	0	2	3	3	.	.	.	.	.	.
7	168	18	1	3	3	1	5	2	1	4	4	1
8	168	18	0	3	3	2	3	4	3	1	1	3
9	168	18	0	3	3	3	.	.	.	.	.	.
10	168	18	1	4	3	1	5	5	1	4	2	3

An example of a DCE question

Question 1	A	B	Opt out
Type of PrEP	Oral long-acting PrEP	Injectable PrEP	x
Service location	Pharmacy	Hospital	x
Cost	$AU 25	Free	x
Side effects	Rare chance of kidney problems	Mild	x
Visit frequency	Every 6 months	Every year	x
Extra services	STI testing	None	x
Which choice do you prefer?	○	✓ ○	○

ChoiceV
1= chosen
0= not chosen

Understand your DCE data

Choice indicator
1= chosen
0= not chosen

Alternative indicator
1= Alt. A
2= Alt. B
3= Alt. C or Opt out

	pid	totalrow	choicev	question	cset	altij	type	location	cost	sideeffects	freq	extra
1	168	18	0	1	3	1	2	6	4	4	2	3
2	168	18	1	1	3	2	1	1	1	3	3	1
3	168	18	0	1	3	3	.	.	.	.	.	.
4	168	18	0	2	3	1	2	1	4	2	4	3
5	168	18	1	2	3	2	1	3	3	3	2	1
6	168	18	0	2	3	3	.	.	.	.	.	.
7	168	18	1	3	3	1	5	2	1	4	4	1
8	168	18	0	3	3	2	3	4	3	1	1	3
9	168	18	0	3	3	3	.	.	.	.	.	.
10	168	18	1	4	3	1	5	5	1	4	2	3

DCE syntax

```
Nlogit
    ;lhs=choicev,cset,altij
    ;choices=A,B,C
    ;model:
    U(A,B)= Type1*Type1+Type2*Type2+Type3*Type3+Type4*Type4+
      Cost1*Cost1+Cost2*Cost2+Cost3*Cost3+
      SE1*SE1+SE2*SE2+SE3*SE3+SE4*SE4/
    U(C)=neither
    $
```

Modify the code in red according to your DCE data

;=start the command
/ =separate utility functions
$= end command

DCE syntax

```
Nlogit
    ;lhs=choicev,cset,altij
    ;choices=A,B,C
    ;model:
    U(A,B)= Type1*Type1+Type2*Type2+Type3*Type3+Type4*Type4+
    Cost1*Cost1+Cost2*Cost2+Cost3*Cost3+
    SE1*SE1+SE2*SE2+SE3*SE3+SE4*SE4/
    U(C)=neither
    $
```

In the 'PrEP DCE' data, there are Alternatives A,B and opt out

If you have four alternatives, ;choices=A,B,C,D

DCE syntax

```
Nlogit
    ;lhs=choicev,cset,altij
    ;choices=A,B,C
    ;model:
    U(A,B)= Type1*Type1+Type2*Type2+Type3*Type3+Type4*Type4+
    Cost1*Cost1+Cost2*Cost2+Cost3*Cost3+
    SE1*SE1+SE2*SE2+SE3*SE3+SE4*SE4/
    U(C)=neither
    $
```

;model:
U (alternative name)= <parameter name>*<variable name>

*baseline levels are not included

DCE syntax

U (alternative name)= <parameter name>*<variable name>

Variables = attributes presented to respondent.

Parameters = estimated values that represent underlying preferences that individuals have for each level of variables

DCE syntax

```
Nlogit
    ;lhs=choicev,cset,altij
    ;choices=A,B,C
    ;model:
    U(A,B)= Type1*Type1+Type2*Type2+Type3*Type3+Type4*Type4+
    Cost1*Cost1+Cost2*Cost2+Cost3*Cost3+
    SE1*SE1+SE2*SE2+SE3*SE3+SE4*SE4/
    U(C)=neither
    $
```

*baseline levels are not included

Practice time

Practice 5.1

Practice time

(Question 5.1) Create a DCE syntax for the dataset below

pid	Totalrow	choicev	question	cset	altij	nausea	diarrhea	headache
111	4	1	1	2	1	1	2	3
111	4	0	1	2	2	2	3	1
111	4	1	2	2	1	3	2	1
111	4	0	2	2	2	2	1	3
112	4	0	1	2	1	1	3	2
112	4	1	1	2	2	3	1	2
112	4	0	2	2	1	2	1	3
112	4	1	2	2	2	3	2	1
113	4	1	1	2	1	2	1	3
113	4	0	1	2	2	1	2	3
113	4	1	2	2	1	1	3	2
113	4	0	2	2	2	2	3	1

Practice time

Please answer the questions 5.1 using data provided.

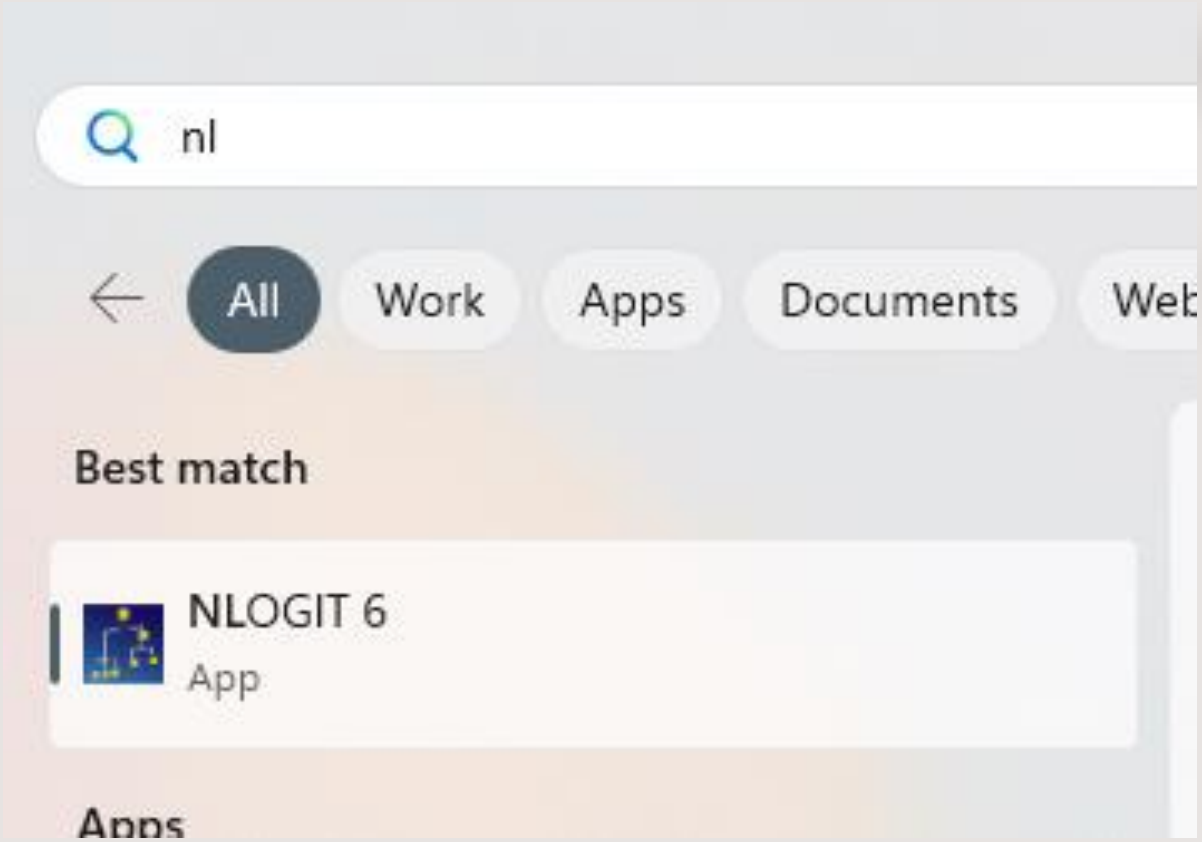
Antiretroviral A and B have side effects as mentioned below. Choose the antiretroviral that you prefer more.

	Antiretroviral A	Antiretroviral B
Nausea	Not all all	Once a week
diarrhea	Three times a week	Not at all
headache	Not at all	Once a week
	○	○

There are two DCE questions in this survey

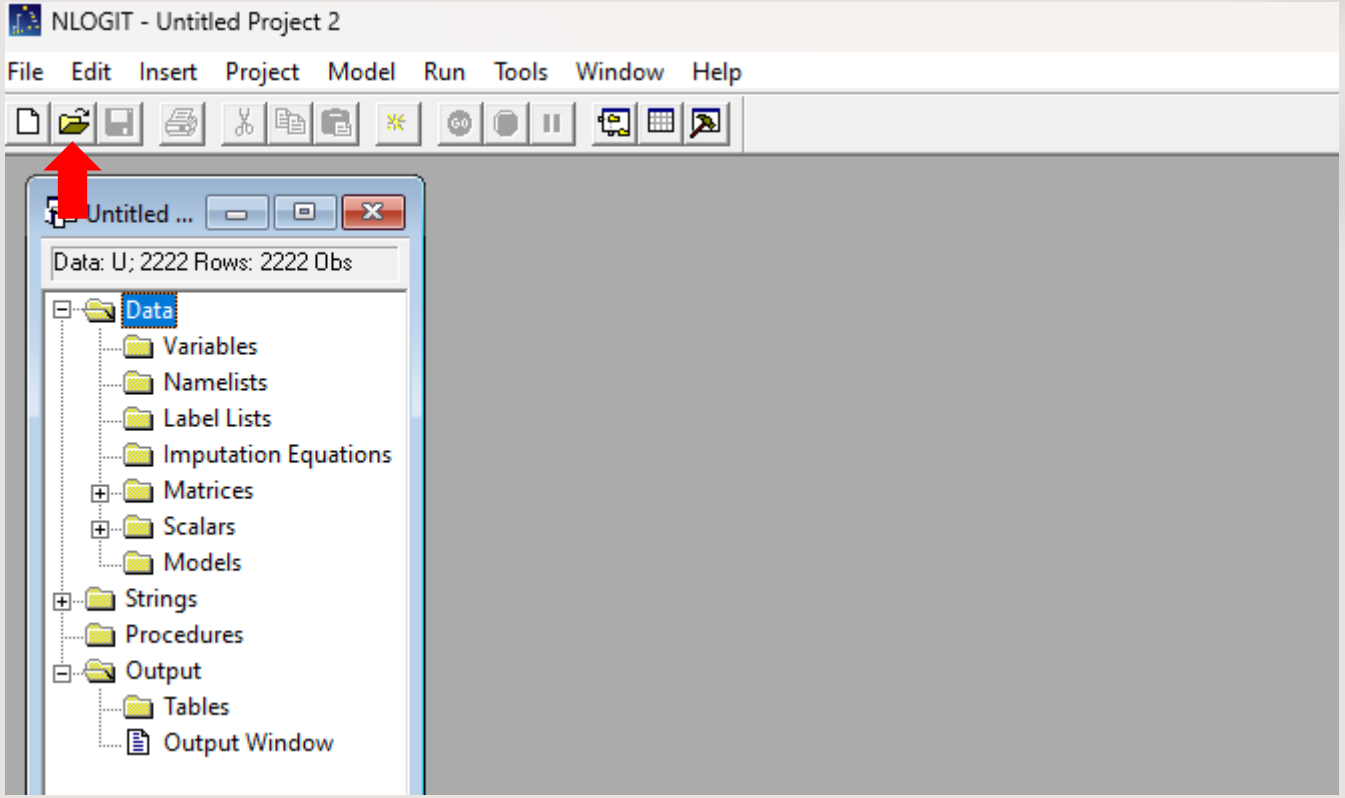
Not at all	Attribute level 1
Once a week	Attribute level 2
Three times a week	Attribute level 3

Introduction to Nlogit

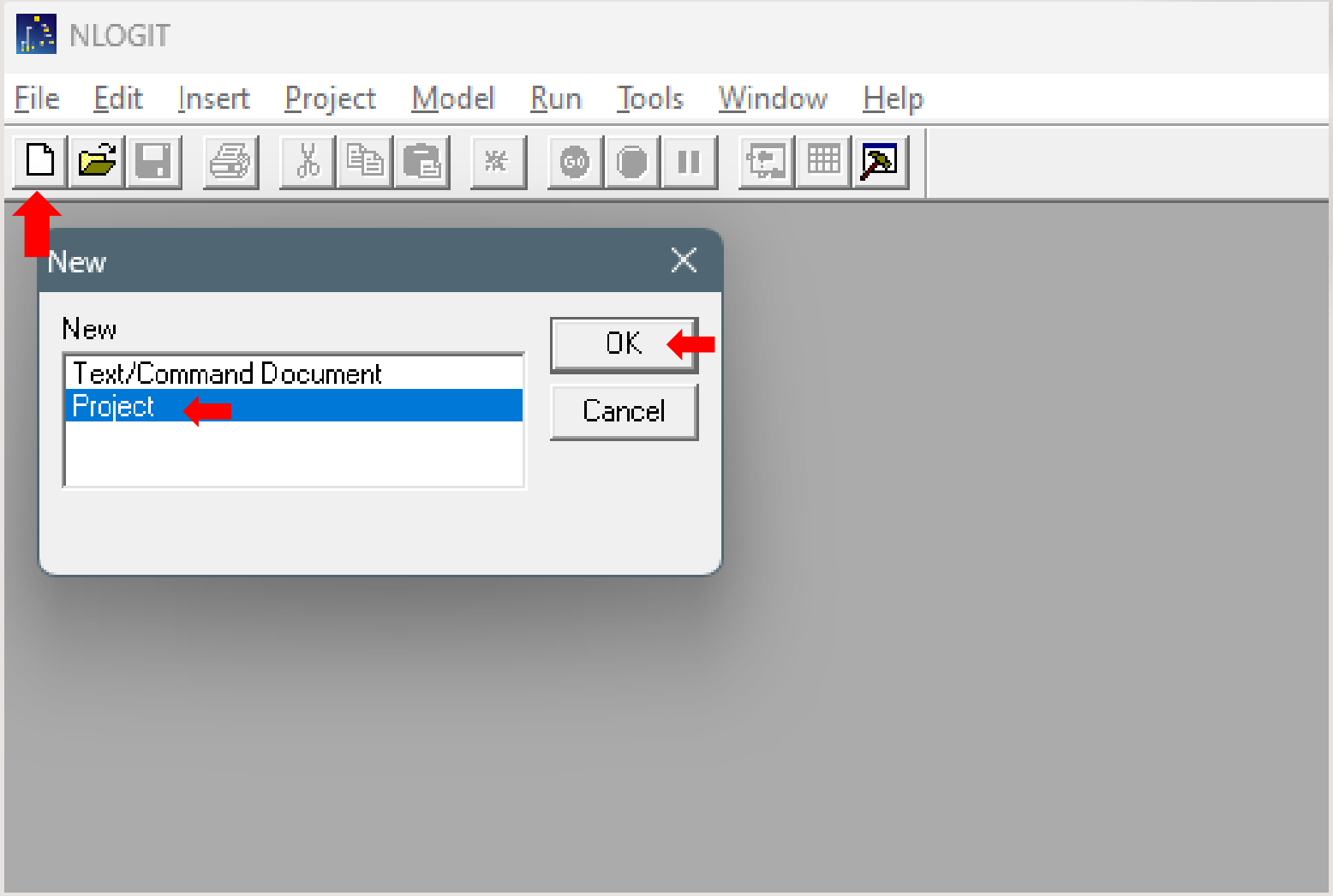


Introduction to Nlogit

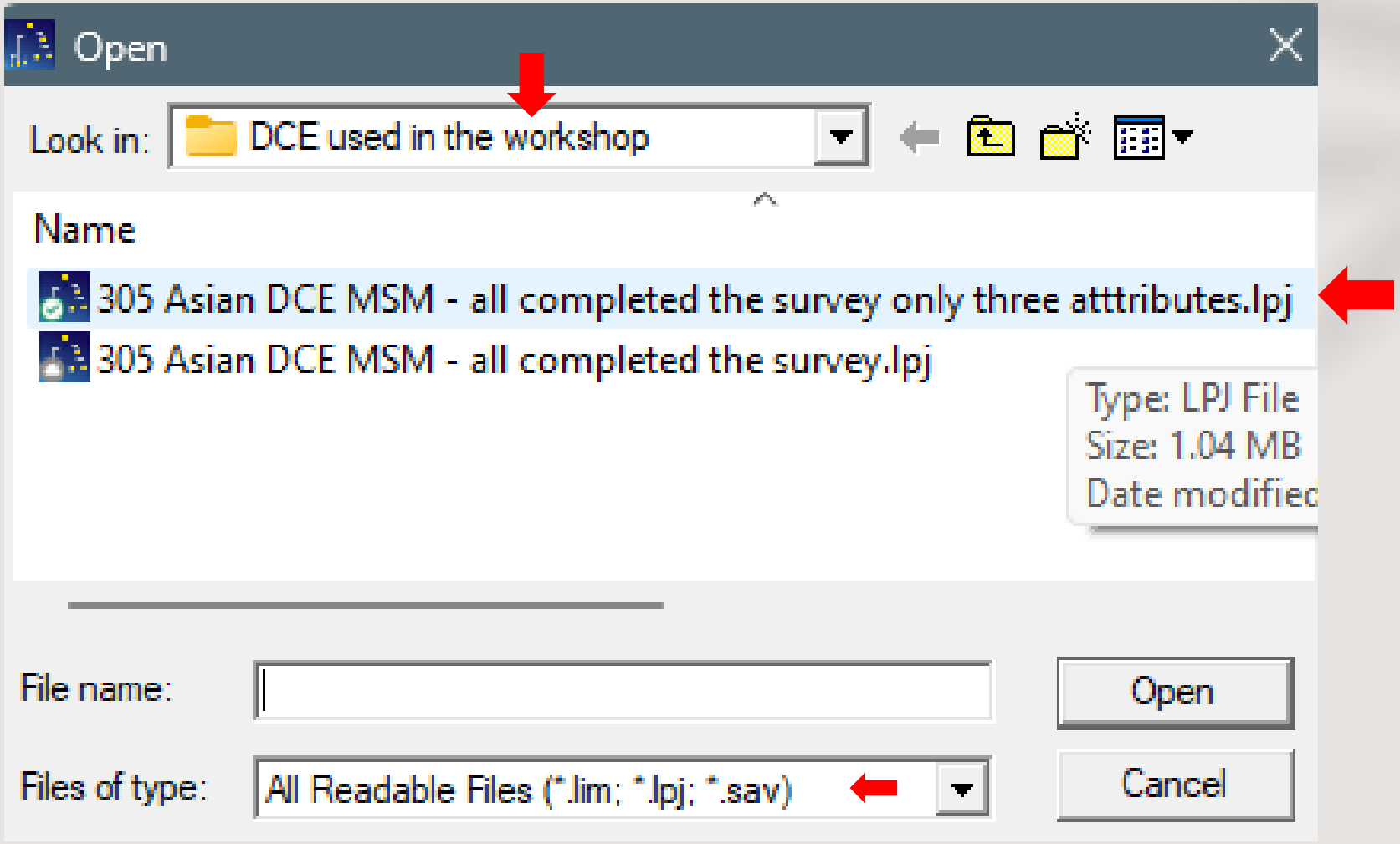
If the project window is already opened



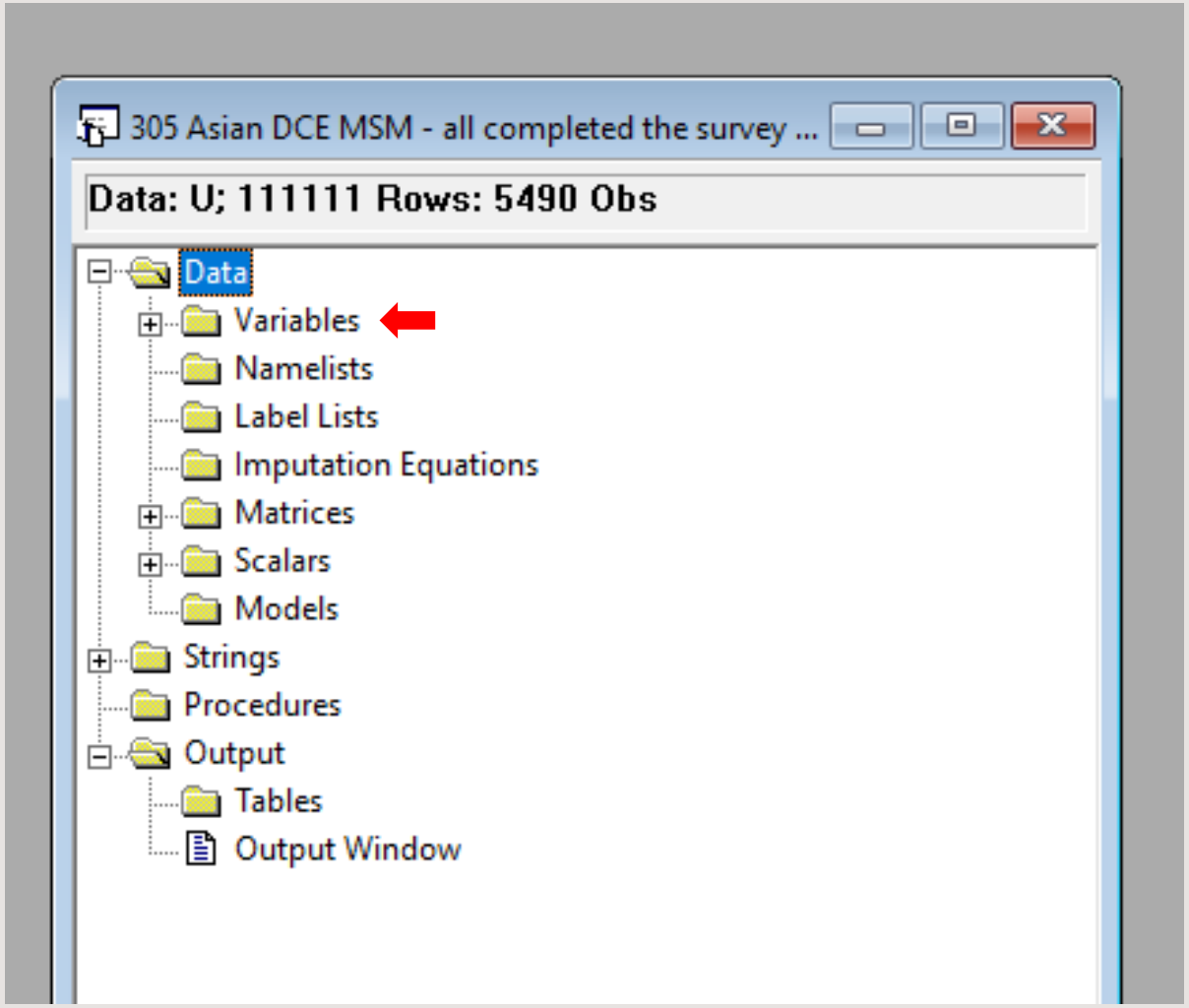
Introduction to Nlogit

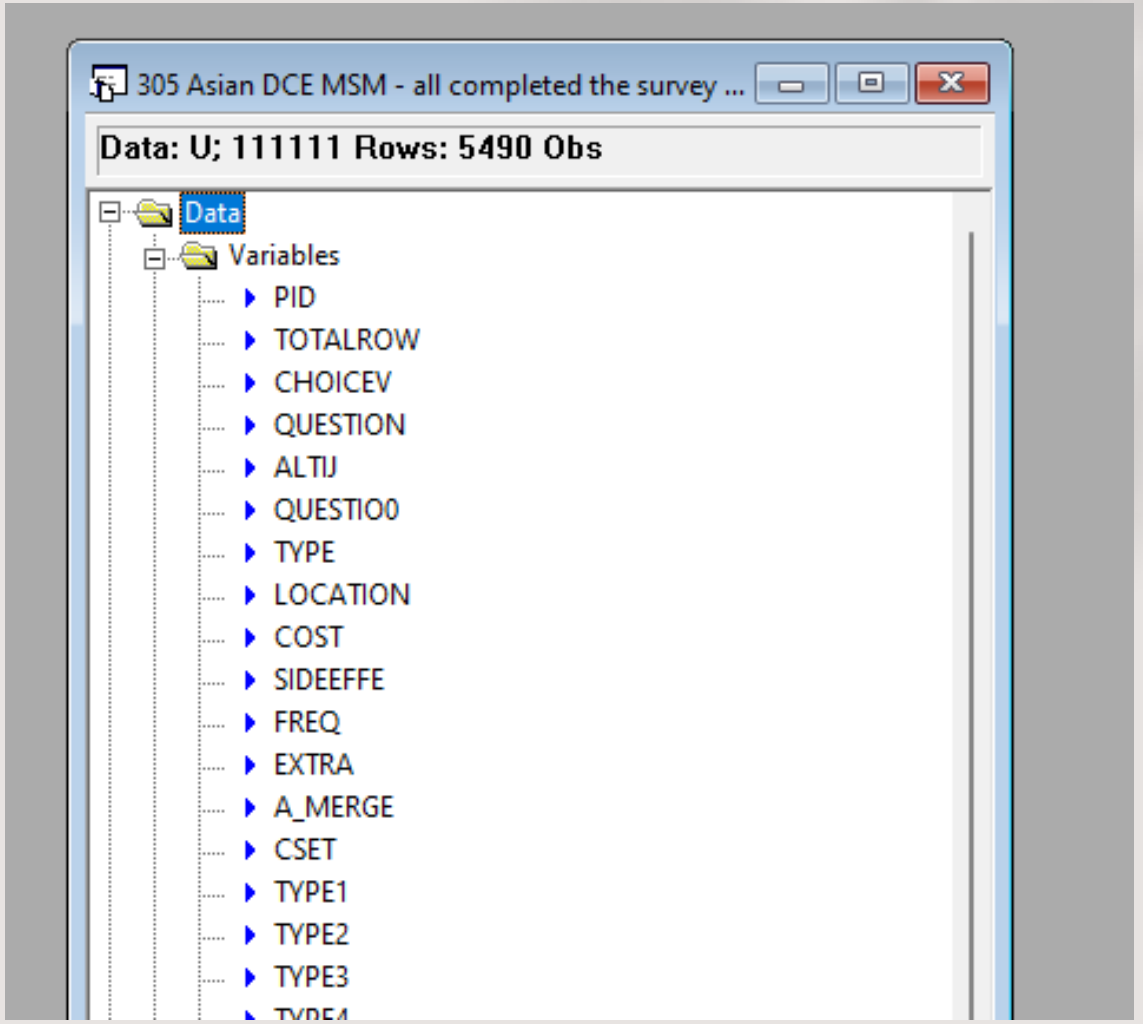


Introduction to Nlogit

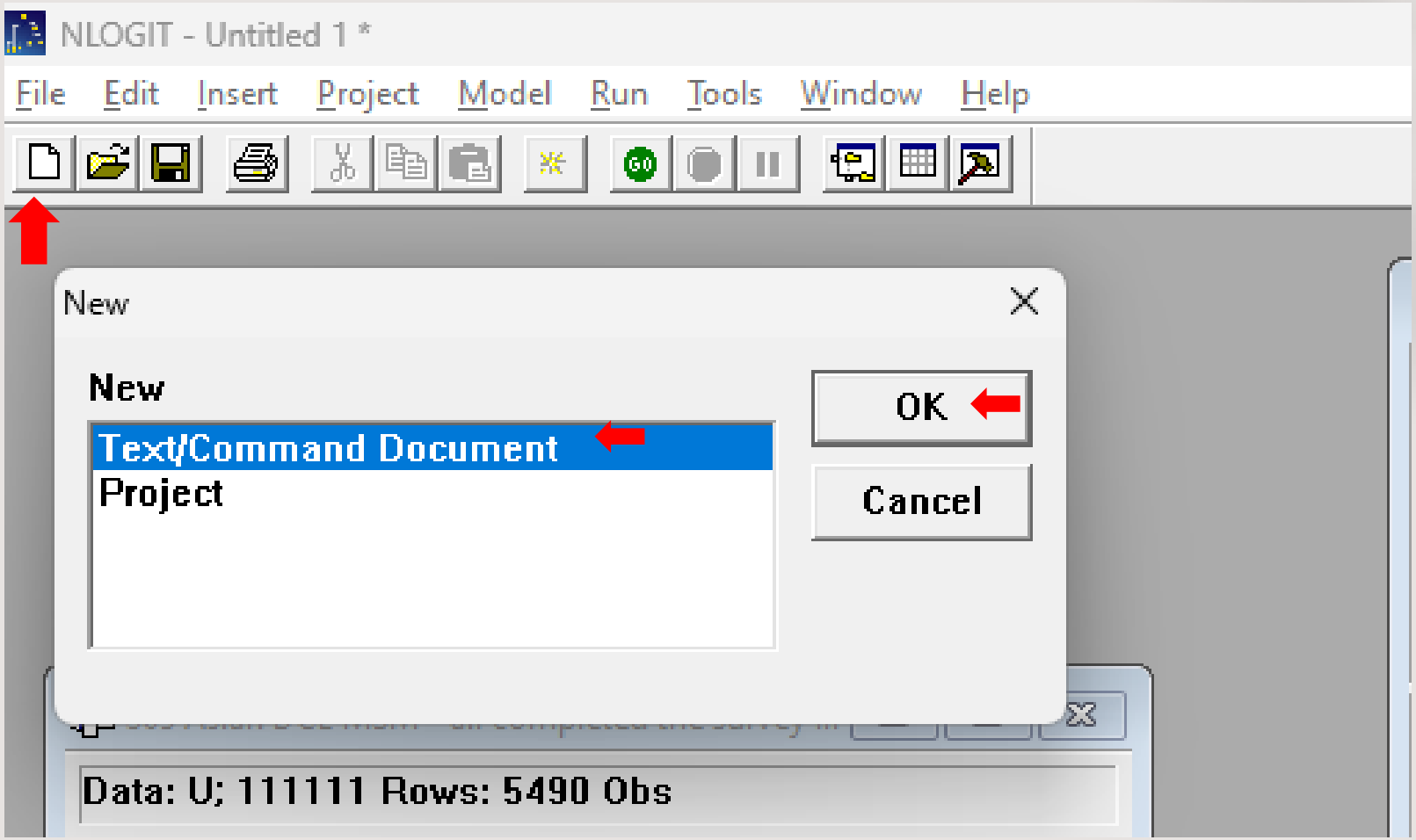


Introduction to Nlogit

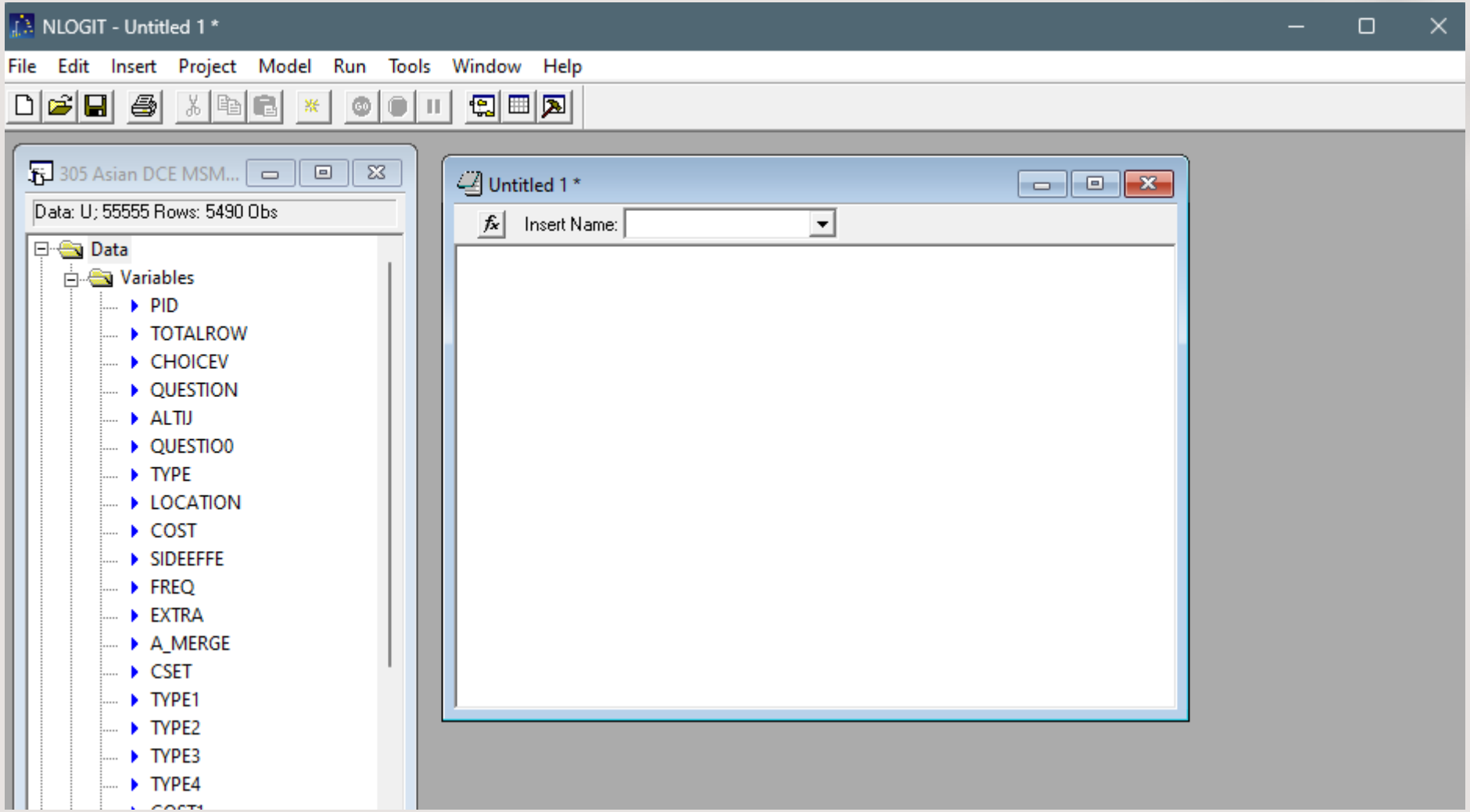




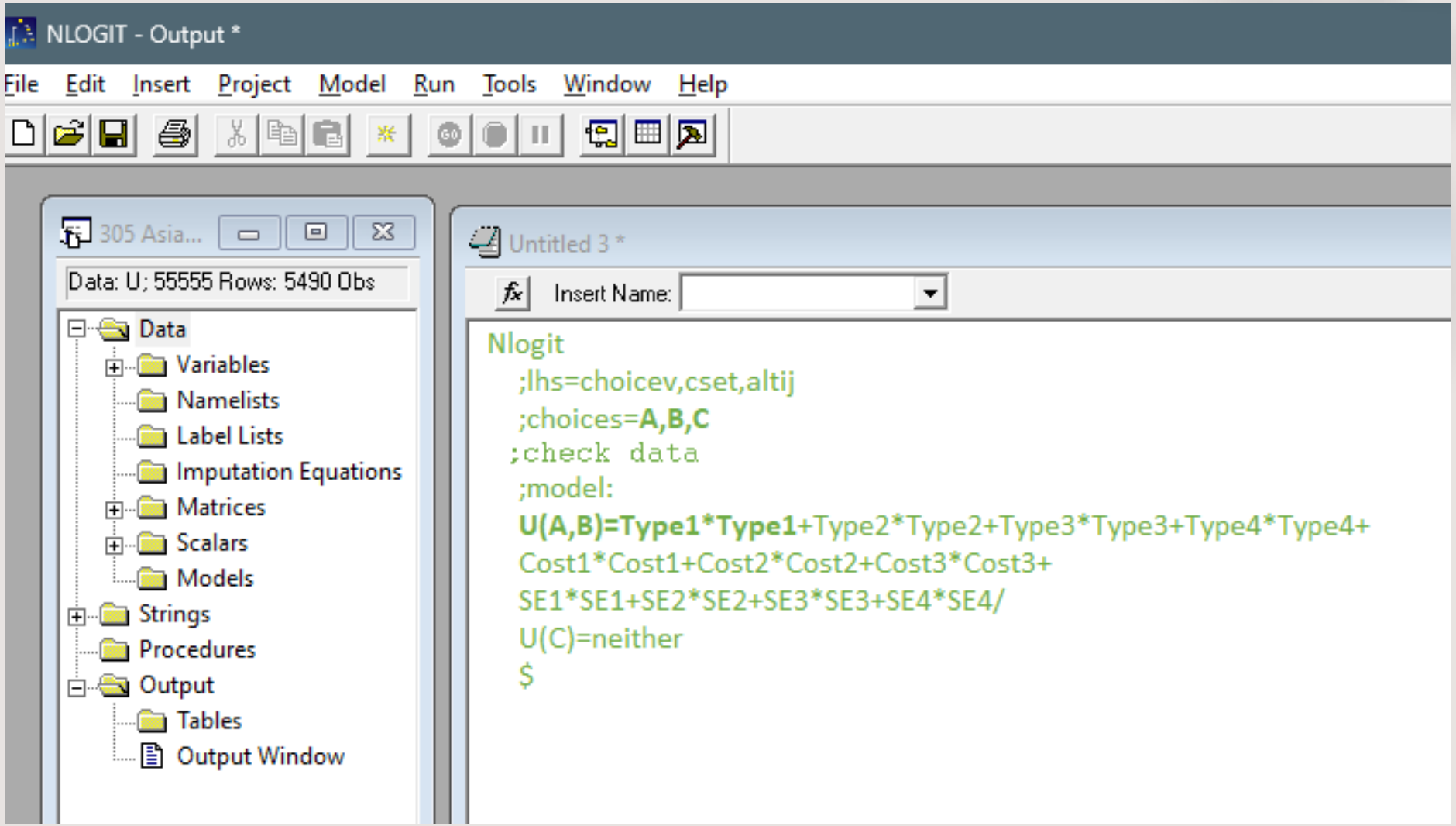
Introduction to Nlogit



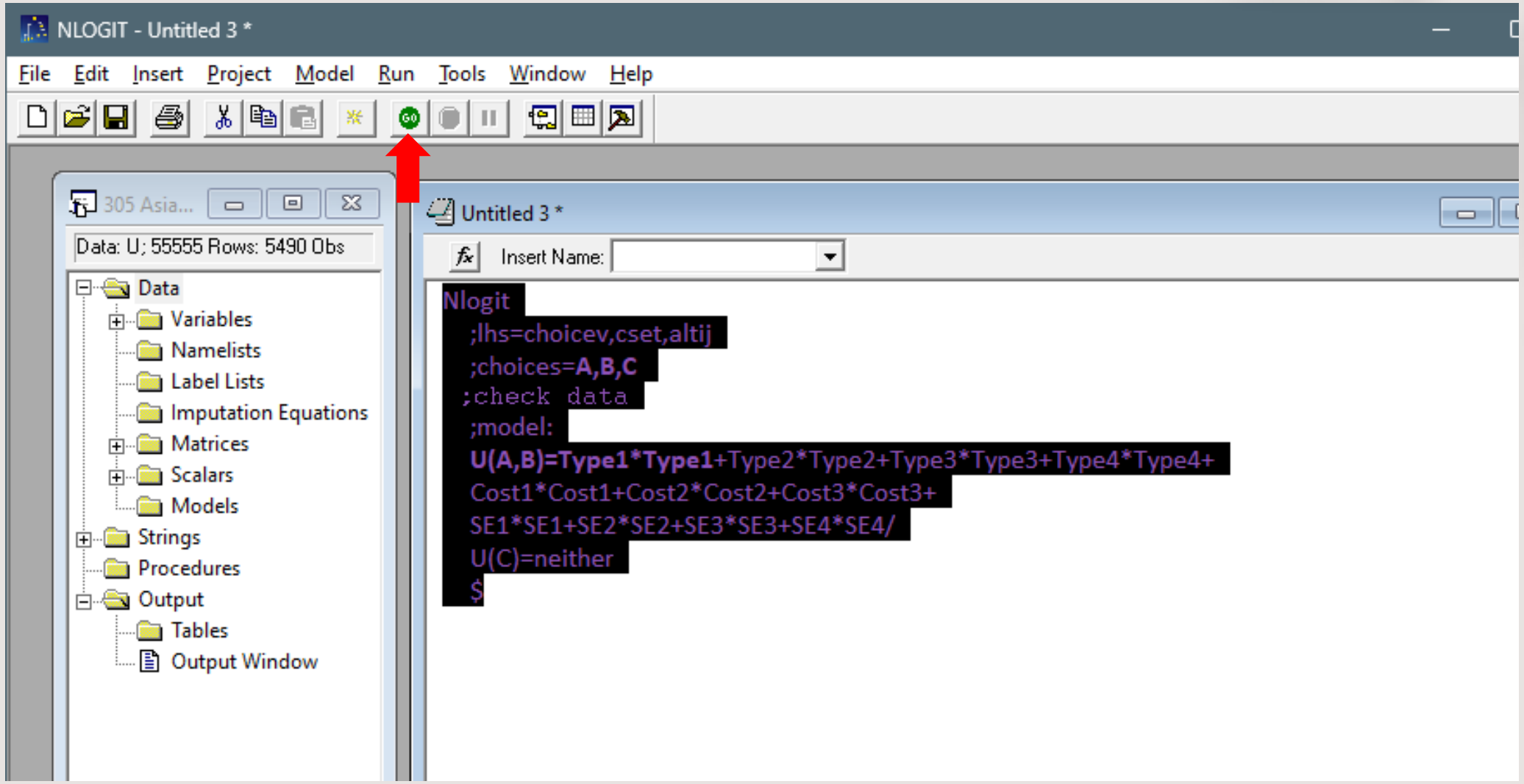
Introduction to Nlogit



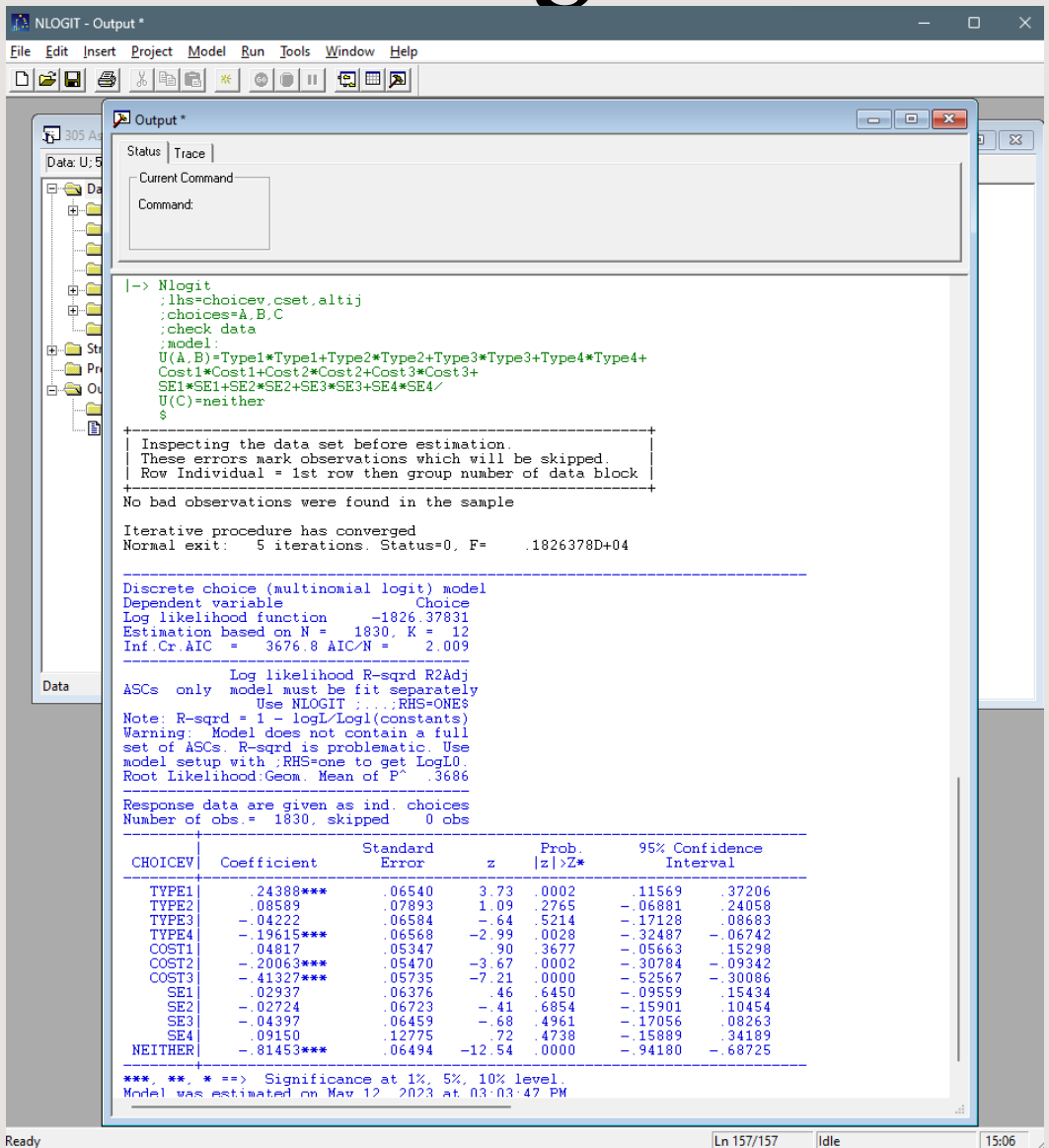
Introduction to Nlogit



Introduction to Nlogit



Introduction to Nlogit



MNL output

```
+----------------------------------------------------+
| Inspecting the data set before estimation.         |
| These errors mark observations which will be skipped.  |
| Row Individual = 1st row then group number of data block |
+----------------------------------------------------+
No bad observations were found in the sample

Iterative procedure has converged
Normal exit:  5 iterations. Status=0, F=    .1826378D+04
```

Check bad observations

Normal or abnormal convergence

MNL output

```
---------------------------------------------------------------------
Discrete choice (multinomial logit) model
Dependent variable                Choice
Log likelihood function     -1826.37831
Estimation based on N =   1830, K =  12
Inf.Cr.AIC  =   3676.8 AIC/N =    2.009

          Log likelihood R-sqrd R2Adj
ASCs  only  model must be fit separately
          Use NLOGIT ;...;RHS=ONE$
Note: R-sqrd = 1 - logL/Logl(constants)
Warning:  Model does not contain a full
set of ASCs. R-sqrd is problematic. Use
model setup with ;RHS=one to get LogL0.
Root Likelihood:Geom. Mean of P^  .3686
---------------------------------------
Response data are given as ind. choices
Number of obs.=  1830, skipped    0 obs
```

Check model fit
Lower LL and AIC/N = better model fit

Compare the number of observations loaded to Nlogit to your dataset

MNL output

On-demand PrEP
Injectable PrEP
Long-acting oral PrEP
Implant PrEP
Low cost
Fair cost
High cost
Interaction with other medications
Mild
Rare chance of kidney problems
Mild pain at injection

CHOICEV	Coefficient	Standard Error	z	Prob. |z|>Z*	95% Confidence Interval	
TYPE1	.24388***	.06540	3.73	.0002	.11569	.37206
TYPE2	.08589	.07893	1.09	.2765	-.06881	.24058
TYPE3	-.04222	.06584	-.64	.5214	-.17128	.08683
TYPE4	-.19615***	.06568	-2.99	.0028	-.32487	-.06742
COST1	.04817	.05347	.90	.3677	-.05663	.15298
COST2	-.20063***	.05470	-3.67	.0002	-.30784	-.09342
COST3	-.41327***	.05735	-7.21	.0000	-.52567	-.30086
SE1	.02937	.06376	.46	.6450	-.09559	.15434
SE2	-.02724	.06723	-.41	.6854	-.15901	.10454
SE3	-.04397	.06459	-.68	.4961	-.17056	.08263
SE4	.09150	.12775	.72	.4738	-.15889	.34189
U(C)=NEI	.81453***	.06494	12.54	.0000	.68725	.94180

***, **, * ==> Significance at 1%, 5%, 10% level.
Model was estimated on Mar 21, 2023 at 06:41:17 PM

MNL output

Level	**Coefficient**
Free PrEP	= -sum(low + medium + high cost) =0.566
Low cost	0.048
Fair cost	-0.201
High cost	-0.413

CHOICEV	Coefficient	Standard Error	z	Prob. |z|>Z*	95% Confidence Interval	
TYPE1	.24388***	.06540	3.73	.0002	.11569	.37206
TYPE2	.08589	.07893	1.09	.2765	-.06881	.24058
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COST1	.04817	.05347	.90	.3677	-.05663	.15298
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U(C)=NEI	.81453***	.06494	12.54	.0000	.68725	.94180

***, **, * ==> Significance at 1%, 5%, 10% level.
Model was estimated on Mar 21, 2023 at 06:41:17 PM

Output interpretation

Like

Free	**=** - sum(low + medium + high cost) **=0.566**
Low cost	0.048
Fair cost	-0.201
High cost	-0.413

Dislike

CHOICEV	Coefficient	Standard Error	z	Prob. |z|>Z*	95% Confidence Interval	
TYPE1	.24388***	.06540	3.73	.0002	.11569	.37206
TYPE2	.08589	.07893	1.09	.2765	-.06881	.24058
TYPE3	-.04222	.06584	-.64	.5214	-.17128	.08683
TYPE4	-.19615***	.06568	-2.99	.0028	-.32487	-.06742
COST1	.04817	.05347	.90	.3677	-.05663	.15298
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SE3	-.04397	.06459	-.68	.4961	-.17056	.08263
SE4	.09150	.12775	.72	.4738	-.15889	.34189
U(C)=NEI	.81453***	.06494	12.54	.0000	.68725	.94180

***, **, * ==> Significance at 1%, 5%, 10% level.
Model was estimated on Mar 21, 2023 at 06:41:17 PM

Practice time

Practice 5.2

Practice time

```
+--------------------------------------------------------+
| Inspecting the data set before estimation.             |
| These errors mark observations which will be skipped.  |
| Row Individual = 1st row then group number of data block |
+--------------------------------------------------------+
No bad observations were found in the sample

Iterative procedure has converged
Normal exit:   5 iterations. Status=0, F=    .1671696D+05

------------------------------------------------------------------------------
--
Discrete choice (multinomial logit) model
Dependent variable                Choice
Log likelihood function     -16716.96429
Estimation based on N =  17034, K =  12
Inf.Cr.AIC  =  33457.9 AIC/N =    1.964
--------------------------------------
          Log likelihood R-sqrd R2Adj
ASCs only  model must be fit separately
        Use NLOGIT ;...;RHS=ONE$
Note: R-sqrd = 1 - logL/Logl(constants)
Warning:  Model does not contain a full
set of ASCs. R-sqrd is problematic. Use
model setup with ;RHS=one to get LogL0.
Root Likelihood:Geom. Mean of P^  .3748
--------------------------------------
Response data are given as ind. choices
Number of obs.= 17034, skipped    0 obs
--------+---------------------------------------------------------------------
        |                    Standard            Prob.      95% Confidence
 CHOICEV|  Coefficient         Error       z    |z|>Z*         Interval
--------+---------------------------------------------------------------------
   TYPE1|     .18423***       .02209     8.34   .0000      .14092    .22753
   TYPE2|    -.10623***       .02681    -3.96   .0001     -.15878   -.05367
   TYPE3|     .20243***       .02177     9.30   .0000      .15975    .24510
   TYPE4|    -.33720***       .02297   -14.68   .0000     -.38222   -.29219
   COST1|     .15201***       .01789     8.50   .0000      .11695    .18707
   COST2|    -.09151***       .01816    -5.04   .0000     -.12710   -.05593
   COST3|    -.70162***       .02060   -34.05   .0000     -.74200   -.66124
     SE1|    -.08038***       .02159    -3.72   .0002     -.12269   -.03807
     SE2|    -.05410**        .02237    -2.42   .0156     -.09795   -.01025
     SE3|    -.28835***       .02231   -12.93   .0000     -.33207   -.24463
     SE4|     .16032***       .04255     3.77   .0002      .07691    .24372
 NEITHER|    -.68532***       .02080   -32.95   .0000     -.72608   -.64456
--------+---------------------------------------------------------------------
***, **, * ==> Significance at 1%, 5%, 10% level.
Model was estimated on May 12, 2023 at 04:33:40 PM
------------------------------------------------------------------------------
```

Practice time

Attribute	Levels	Coefficient	Range of attribute	Relative Importance*100
Type of PrEP	Daily oral			
	On-demand			
	Injectable			
	Long-acting oral			
	Implant			
Cost	Free			
	Low			
	High			
	Very High			
Side effects	No			
	Interactions with other medications			
	Mild			
	Rare change of kidney problems			
	Mild pain at injection			

Practice time

The participants most preferred daily oral PrEP, followed by implant, long acting oral,……

Relative importance

Attribute	Levels	Coefficient	Range of attribute	Relative Importance*100
Type of PrEP	Daily oral	-0.0914	0.24388-(-0.19615)=0.44003	0.44003/(0.44003+0.97900+0.14116)=28.2
	On-demand	0.24388		
	Injectable	0.08589		
	Long-acting oral	-0.04222		
	Implant	-0.19615		
Cost	Free	0.56573	0.56573-(-0.41327)=0.97900	0.97900/(0.44003+0.97900+0.14116)=62.7
	Low	0.04817		
	High	-0.20063		
	Very High	-0.41327		
Side effects	No	-0.04966	0.09150-(-0.04966)=0.14116	0.14116/(0.44003+0.97900+0.14116)=9.05
	Interactions with other medications	0.02937		
	Mild	-0.02724		
	Rare change of kidney problems	-0.04397		
	Mild pain at injection	0.09150		

Session 6. Application of choice data

Objectives of the session

- Demonstrate how DCE data can be applied
- RPL models
  - Heterogeneity overall
  - RPLX – interactions with certain sociodemographic groups
- LCA models
  - Market shares
- Simulation
  - Uptake from best/worst combinations of attribute levels

Real world examples

Designing HIV testing and self-testing services for young people in Nigeria: A discrete choice experiment

The Patient - Patient-Centered Outcomes Research

An Official Journal of the International Academy of Health Preference Research

- Motivation
  - A third of new HIV infections occur among young people and the majority of young people living with HIV are in sub-Saharan Africa.
- Aim
  - We examined the strength of Nigerian youth preferences related to HIV testing and HIV self-testing.

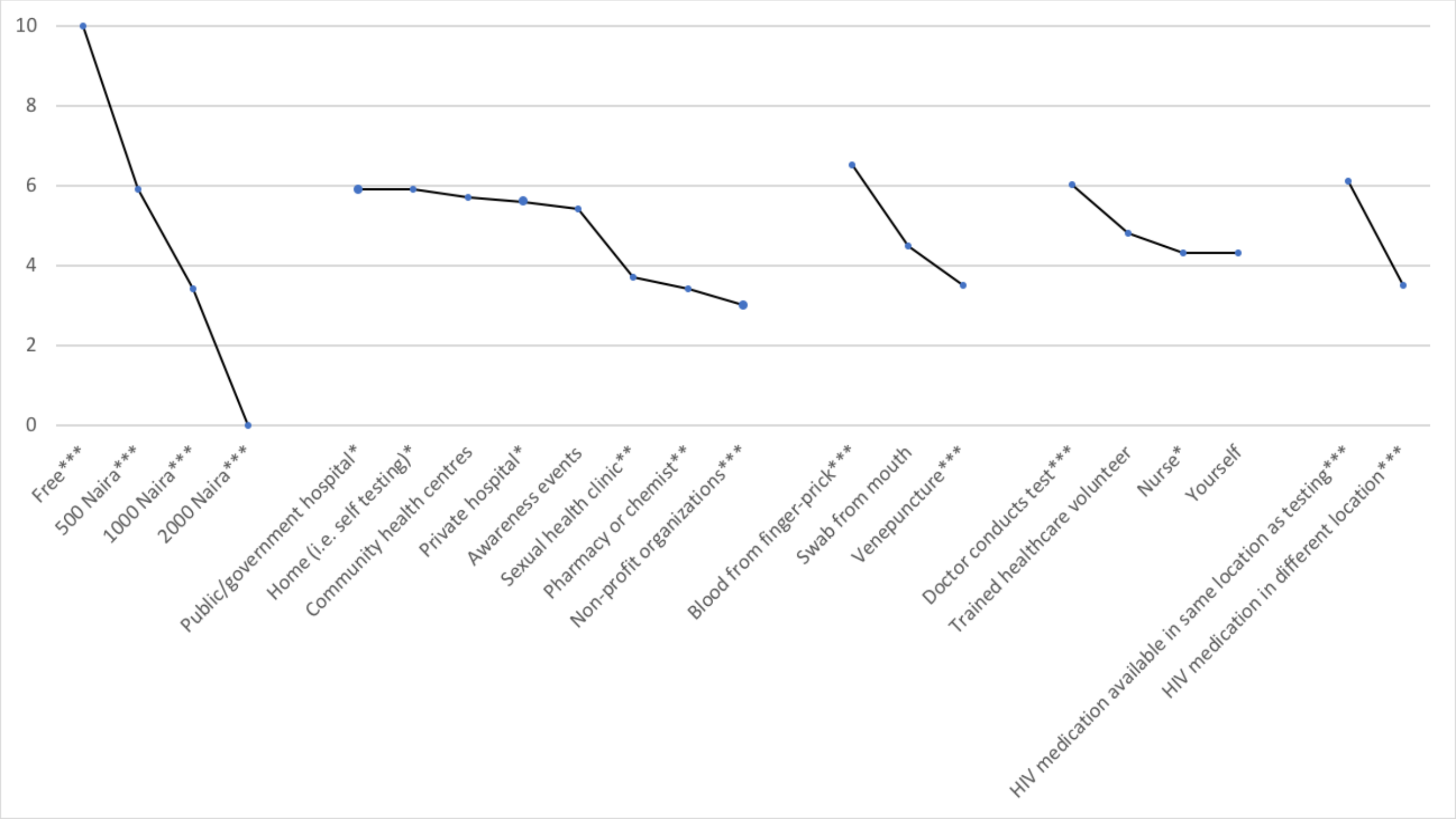
Method

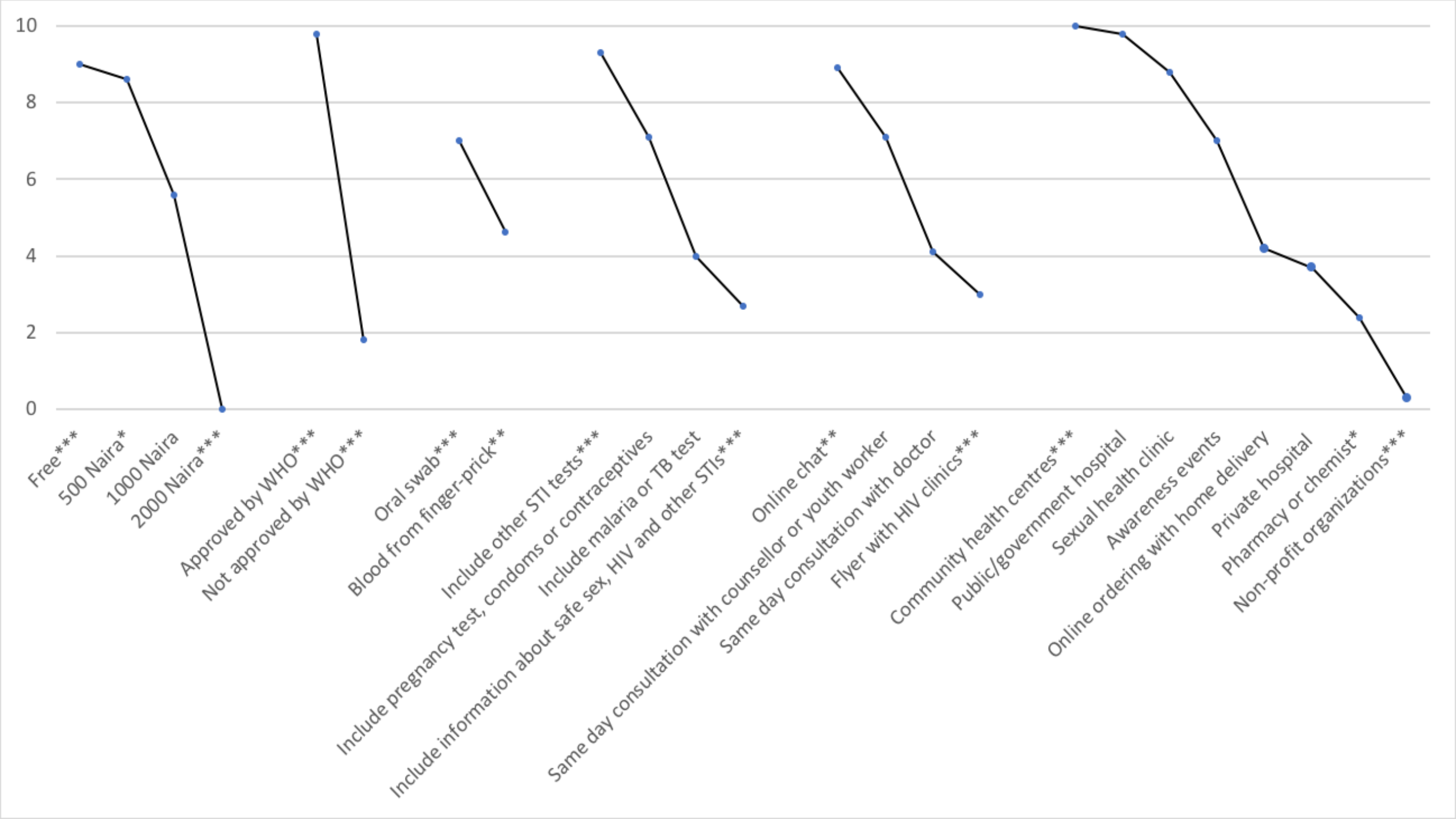
- Participants completed one of two DCEs:
  - 1) **preferred qualities of HIV testing** (cost, location of test, type of test, person who conducts the test and availability of HIV medicine at the testing site)
  - 2) **preferred qualities of HIVST kits** (cost, test quality, type of test, extra items and support if tested positive).

	Option 1	Option 2	Option 3
Cost	Free	1000 naira	
Test quality	Approved by World Health Organization	Not approved by the World Health Organization	
Type of test	Swab from mouth	Blood from finger-prick	
Extra items	Test for other sexually transmitted infections (syphilis, chlamydia, gonorrhoeae)	Information about safe sex, HIV and other sexually transmitted infections	I would not test for HIV using option 1 or 2
Support if test positive	Same-day in-person consultation with trained counsellor or youth health worker	Flyer with the list of HIV clinics	
Location to get Kit	Pharmacy or Chemist	School	
Your choice	.	.	.

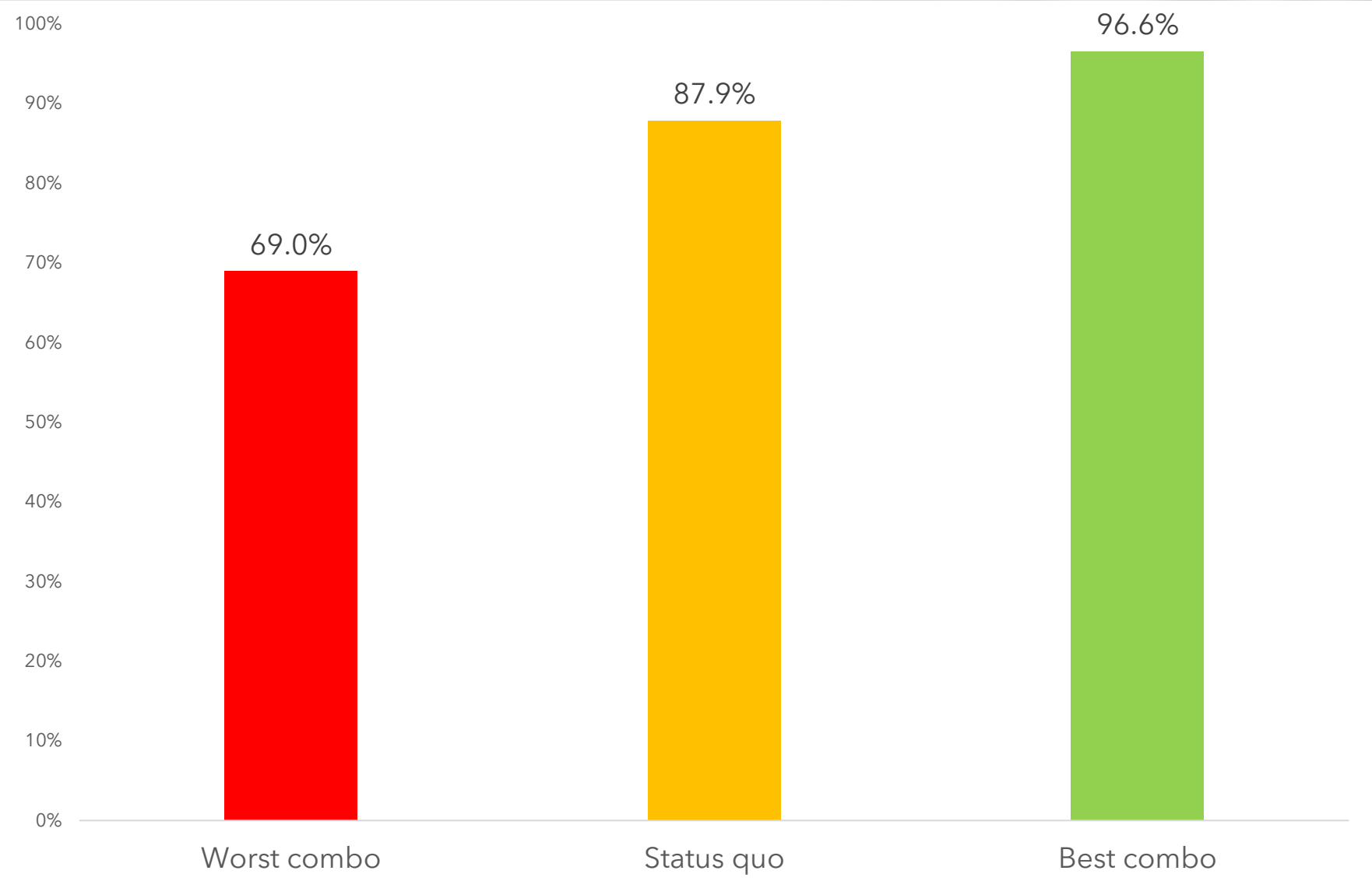
Results

- 504 youth participated
  - mean age 21 (SD 2) years
  - 38% men
  - 35% had higher than secondary school education

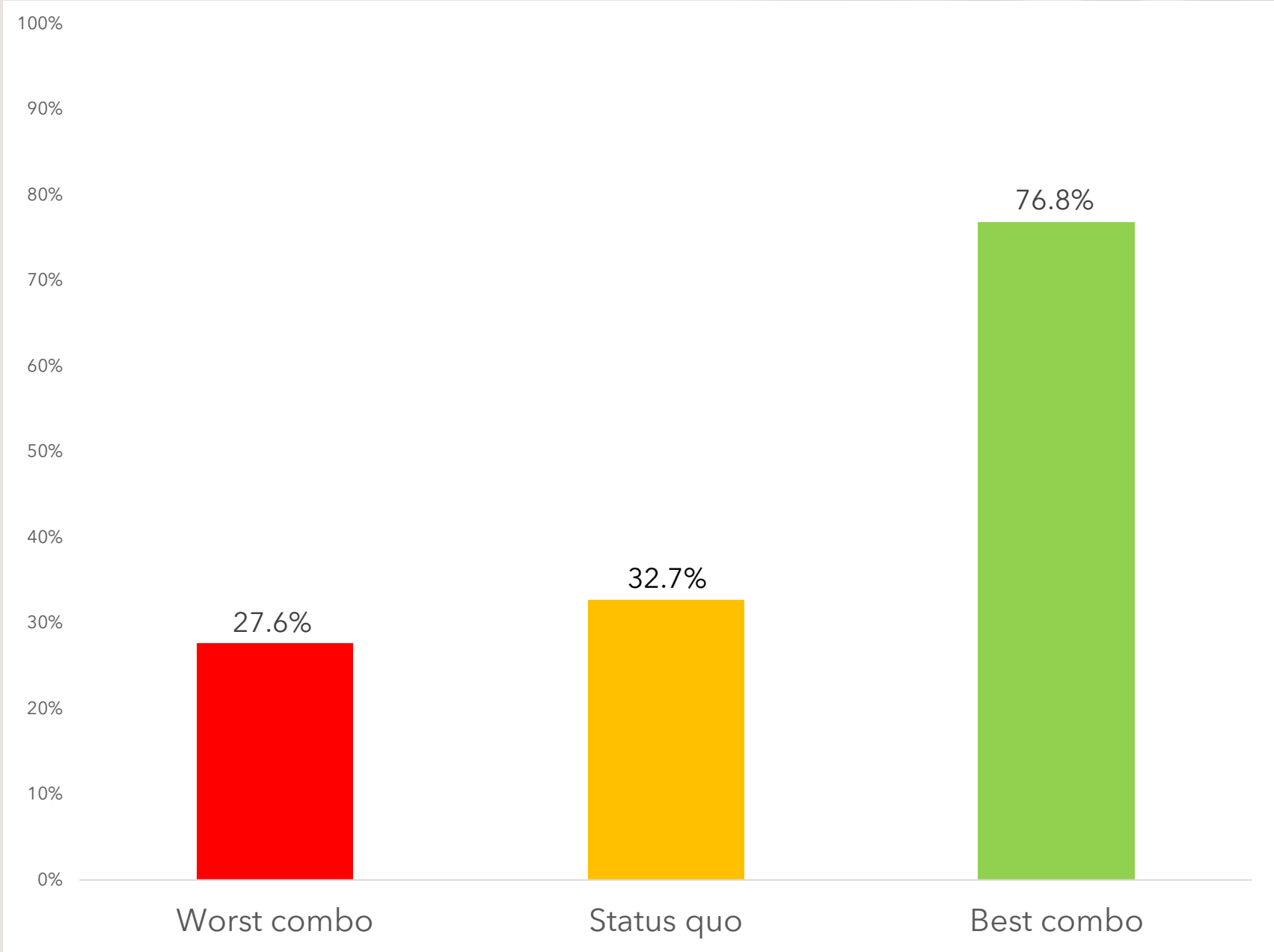

10
8
6
4
2
0
Free***
500 Naira***
1000 Naira***
2000 Naira***
Public/government hospital*
Home (i.e. self testing)*
Community health centres
Private hospital*
Awareness events
Sexual health clinic**
Pharmacy or chemist**
Non-profit organizations***
Blood from finger-prick***
Swab from mouth
Venepuncture***
Doctor conducts test***
Trained healthcare volunteer
Nurse*
Yourself
HIV medication available in same location as testing***
HIV medication in different location***


10
8
6
4
2
0
Free***
500 Naira*
1000 Naira
2000 Naira***
Approved by WHO***
Not approved by WHO***
Oral swab***
Blood from finger-prick**
Include other STI tests***
Include pregnancy test, condoms or contraceptives
Include malaria or TB test
Include information about safe sex, HIV and other STIs***
Online chat**
Same day consultation with counsellor or youth worker
Same day consultation with doctor
Flyer with HIV clinics***
Community health centres***
Public/government hospital
Sexual health clinic
Awareness events
Online ordering with home delivery
Private hospital
Pharmacy or chemist*
Non-profit organizations***

HIV testing uptake



HIVST uptake



Value in Health ISPOR

THEMED SECTION: APPLICATIONS OF HEALTH PREFERENCES RESEARCH | VOLUME 23, ISSUE 7, P870-879, JULY 01, 2020

The Preferred Qualities of Human Immunodeficiency Virus Testing and Self-Testing Among Men Who Have Sex With Men: A Discrete Choice Experiment

Jason J. Ong, PhD • Richard De Abreu Lourenco, PhD • Deborah Street, PhD • ... Martin Holt, PhD • John Kaldor, PhD • Rebecca Guy, PhD • Show all authors

Published: July 17, 2020 • DOI: https://doi.org/10.1016/j.jval.2020.04.1826 •

Aims

- **Primary**:
  - To assess preferences of Australian GBM for HIVST relative to other testing methods, and for how to access HIVST.
- **Secondary:**
  - Assess for **heterogeneous preferences** between subgroups
    - Young vs. older (>25 years)
    - Frequent vs. infrequent testers (>2 years ago or never)
    - Australian-born vs. recent migrants (arrived <5 years)
    - 1 vs. > 1 sexual partners in preceding 6 months

METHODS

- **Study population**
  - Australia-wide
  - GBM
  - 18 years and over
  - HIV negative
- **Online Recruitment**
  - Weekly Grindr advertisements over 6 weeks with link to online survey
- **Sexual health clinic recruitment**
  - Two urban sexual health clinics
  - Two community-based organizations

Which of these two options would you prefer?

	HIV self-testing Option 1	HIV self-testing Option 2
Information on how to use the kit	Written instruction leaflet (text and pictures)	Option of having an online chat with peer
Packaging	A small branded package (size of egg carton containing 2 eggs)	A small plain package (size of egg carton containing 2 eggs)
Access	Order online with kits mailed to your home	Kits available from staff of a medical clinic
Cost (out of pocket)	$60	$40
Which would you choose?	○	○

DCE 1: HIV TESTING PREFERENCES

Imagine you have decided to have an HIV test. There are a number of different options for testing that may differ based on the following factors:

Attribute	Levels
Cost:	Free; $20; $40; $60
Speed of results:	1 minute; 20 minutes; 1 day; 3 days
Window period (time it takes after a risky event before test shows if you've been infected):	4 weeks; 6 weeks; 12 weeks;
Mode of test:	Venepuncture; oral swab; finger prick
% of tests that are correct:	92%; 95%; 99%; 99.9%
Specimen collected by:	Healthcare worker; yourself; peer

DCE 2: SELF TEST KIT DISTRIBUTION

Imagine you have decided to have an HIV test and have been offered the option of an HIV self-test. Your choice may differ based on the following factors:

Attribute	Levels
Cost:	Free; $20; $40; $60
Test Access:	Order online; vending machine; pharmacy shelf; pharmacy staff; medical clinic; community-based organization; sex-on-premises-venues
Packaging:	Large plain; large branded; small plain; small branded.
Information:	Written leaflet; online video; online chat.

Results

- 1,606 men participated
  - Mean age 36.1 (SD 11.6)
  - 15% recently arrived in Australia (<5 years)
  - Median 4 (anal) sex partners in the last 6 months (IQR 2-9)
  - 15% last test > 2 years ago or never tested

DCE 1: Preference for type of HIV test

Short window period (36%)

- Self-testing (27%)
- High accuracy (22%)
- Cheap tests (15%)

DCE 1: Preference for type of HIV test

- Short window period (36%)
- Self-testing (27%)
- High accuracy (22%)
- Cheap tests (15%)

Who are they?

- Recent migrants
- Infrequent testers

Accuracy

- Recent migrants
- Frequent partner change

Cheap test

- Age >25
- Infrequent partner change
- Australian born
- Frequent testers

Window period

- Infrequent testers
- Age >25 years

Self-testing

- Recent migrants
- Infrequent testers

Accuracy

- Recent migrants
- Frequent partner change

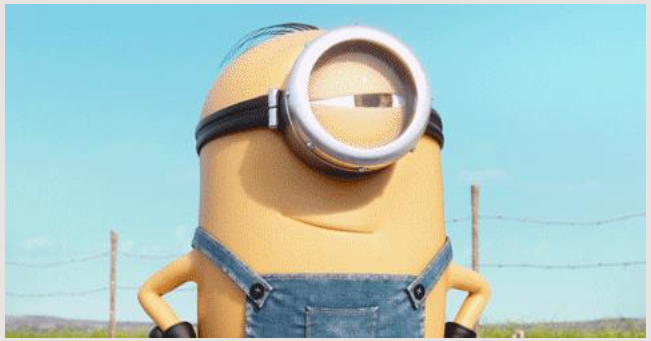
Cheap test

- Age >25
- Infrequent partner change
- Australian born
- Frequent testers

Window period

- Infrequent testers
- Age >25 years

Self-testing



DCE 2: Self-test kit distribution

- Price-sensitive (45%)
- Retail (Pharmacy or online) (29%)
- Sex-on-premises venues (14%)
- Buy from healthcare staff (12%)

DCE 2: Self-test kit distribution

- Retail (29%)
  - Online was 4x more preferred than pharmacy

PrEP APPEAL

Preference for PrEP among Men who Have Sex with Men and Transgender women in 16 Countries in the Asia-Pacific

A Discrete Choice Experiment

TEAM

W. Tieosapjaroen[1,2], B.R. Bavinton[3], H.-M. Schmidt[4,5], K.E. Green[6], N. Phanuphak[7], M. Poonkasetwattana[8], N.S. Suwandi[8], D. Fraser[3], C. Chan[3], M. Cassell[9], L. Zhang[1,2], W. Tang[10], J.J. Ong[1,2,11]

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4 UNAIDS Regional Office for Asia and the Pacific, Bangkok, Thailand, Global HIV, Hepatitis and STIs Programme,

5 World Health Organization, Geneva, Switzerland,

6 The Program for Appropriate Technology in Health, Hanoi, Vietnam,

7 Institute of HIV Research and Innovation, Bangkok, Thailand,

8 APCOM, Bangkok, Thailand,

9 Family Health International 360, Hanoi, Vietnam,

10 The University of North Carolina at Chapel Hill Project-China, Guangzhou, China,

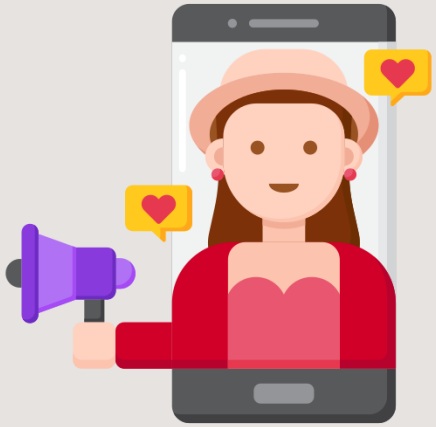
11 London School of Hygiene and Tropical Medicine, Faculty of Infectious and Tropical Diseases, London, United Kingdom

STUDY SETTING

A cross-sectional survey was created and delivered to MSM in 16 countries in the Asia-Pacific region between May-November 2022.

Gay dating apps

Social media platforms



Social media influencers

Local MSM/TGW community's mailing lists

STUDY SETTING

- Cambodia
- China
- India
- Indonesia
- Laos
- Malaysia
- Myanmar
- Nepal
- The Philippines
- Thailand
- Vietnam
- China SAR Hong Kong
- China SAR Taiwan
- Japan
- Singapore
- Australia

INCLUSION CRITERIA

- MSM and TGW aged over 18 years
- no prior HIV diagnosis
- who lived in the included 16 countries in Asia-Pacific
- who self-identified as gay, bisexual or other men who have sex with men or transgender woman.

FINAL ATTRIBUTES

Type of PrEP

- Daily oral
- On-demand oral
- Injectable
- Long-acting oral
- implant

Service location

- Hospital
- STI clinic
- GP
- Peer-led community clinic
- pharmacy

Cost

- Free
- Low
- Moderate
- High

Side effects

- None
- Interaction with other medications
- Mild
- Rare chance of kidney problems
- Mild pain form injection

Extra services

- None
- STI testing
- Mental health counselling

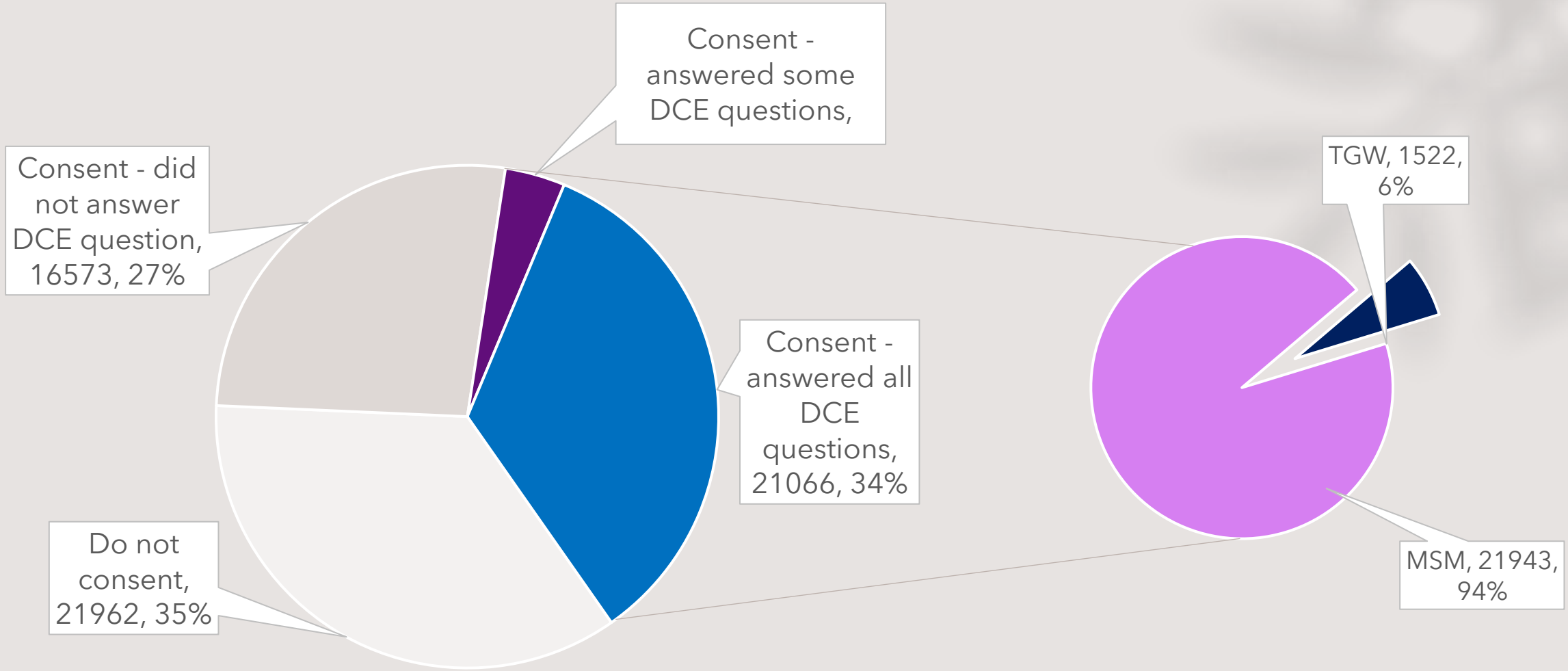
Suppose you want to take PrEP, knowing that it reduces your risk for HIV by 99%, which of the following products do you prefer:

	A	B	Opt out
Type of PrEP	Oral long-acting PrEP	Injectable PrEP	x
Service location	Pharmacy	Hospital	x
Cost	$AU 25	Free	x
Side effects	Rare chance of kidney problems	Mild	x
Visit frequency	Every 6 months	Every year	x
Extra services	STI testing	None	x
Which choice do you prefer?	○	○	○

PrEP APPEAL

RESULT

RESPONDENTS INCLUDED



People clicked on the survey

Completed at least one DCE question

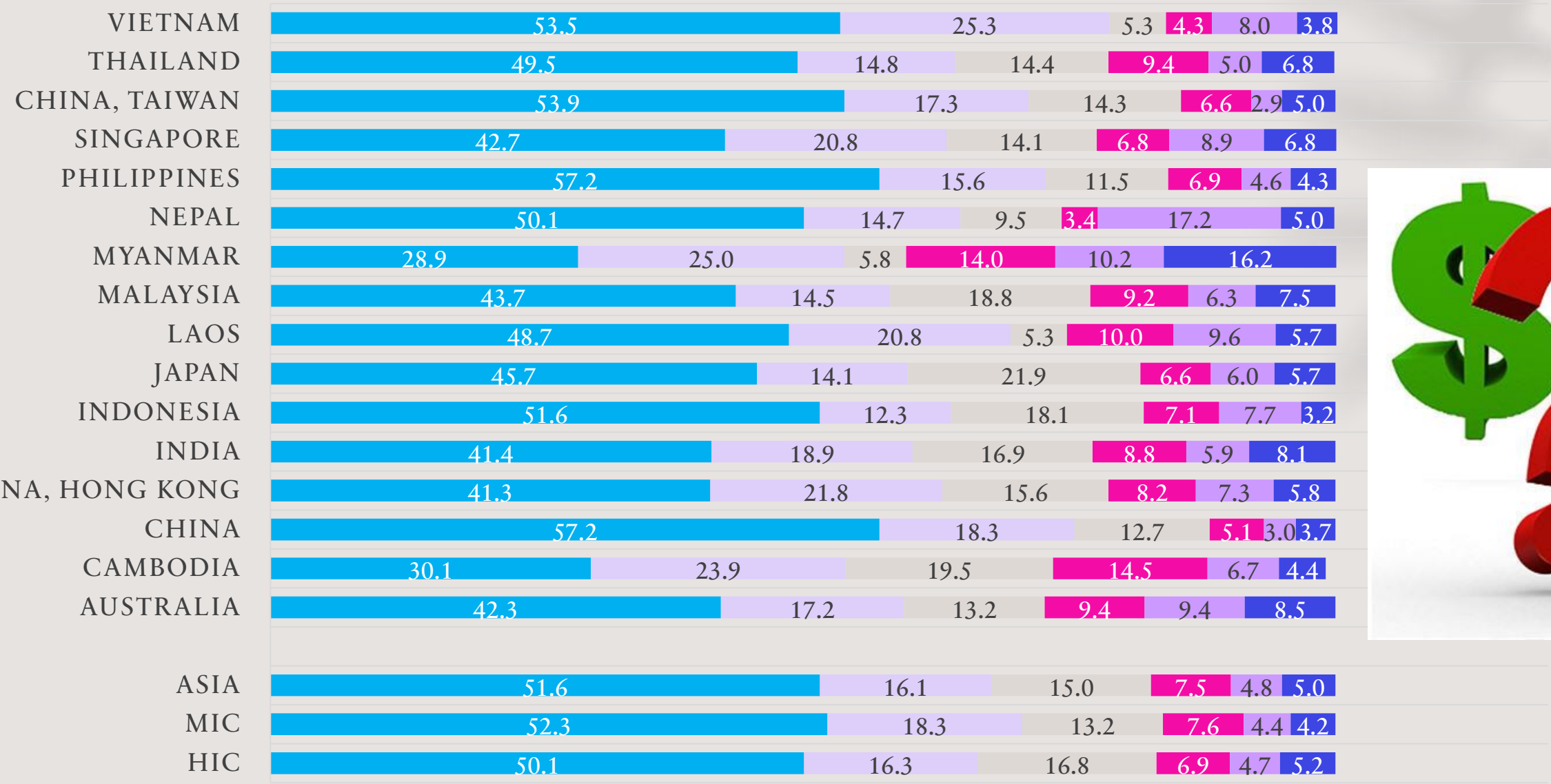
Demographic characteristics

	MSM	% or SD	TGW	% or SD
N	21,943		1,522	
Age	32	9.5	28	7.0
Country				
Thailand	1,552	7.1	256	16.8
Vietnam	1,451	6.6	253	16.6
Indonesia	1,428	6.5	80	5.3
The Philippines	2,289	10.4	98	6.4
China	1,853	8.4	28	1.8
Malaysia	1,035	4.7	13	0.9
Myanmar	561	2.6	145	9.5
India	2,768	12.6	145	9.5
Cambodia	821	3.7	127	8.3
Laos	312	1.4	34	2.2
Nepal	459	2.1	343	22.5
Australia	1,894	8.6	0	0
China, Taiwan	2,564	11.7	0	0
Singapore	770	3.5	0	0
China, Hong Kong	646	2.9	0	0
Japan	1,540	7.0	0	0

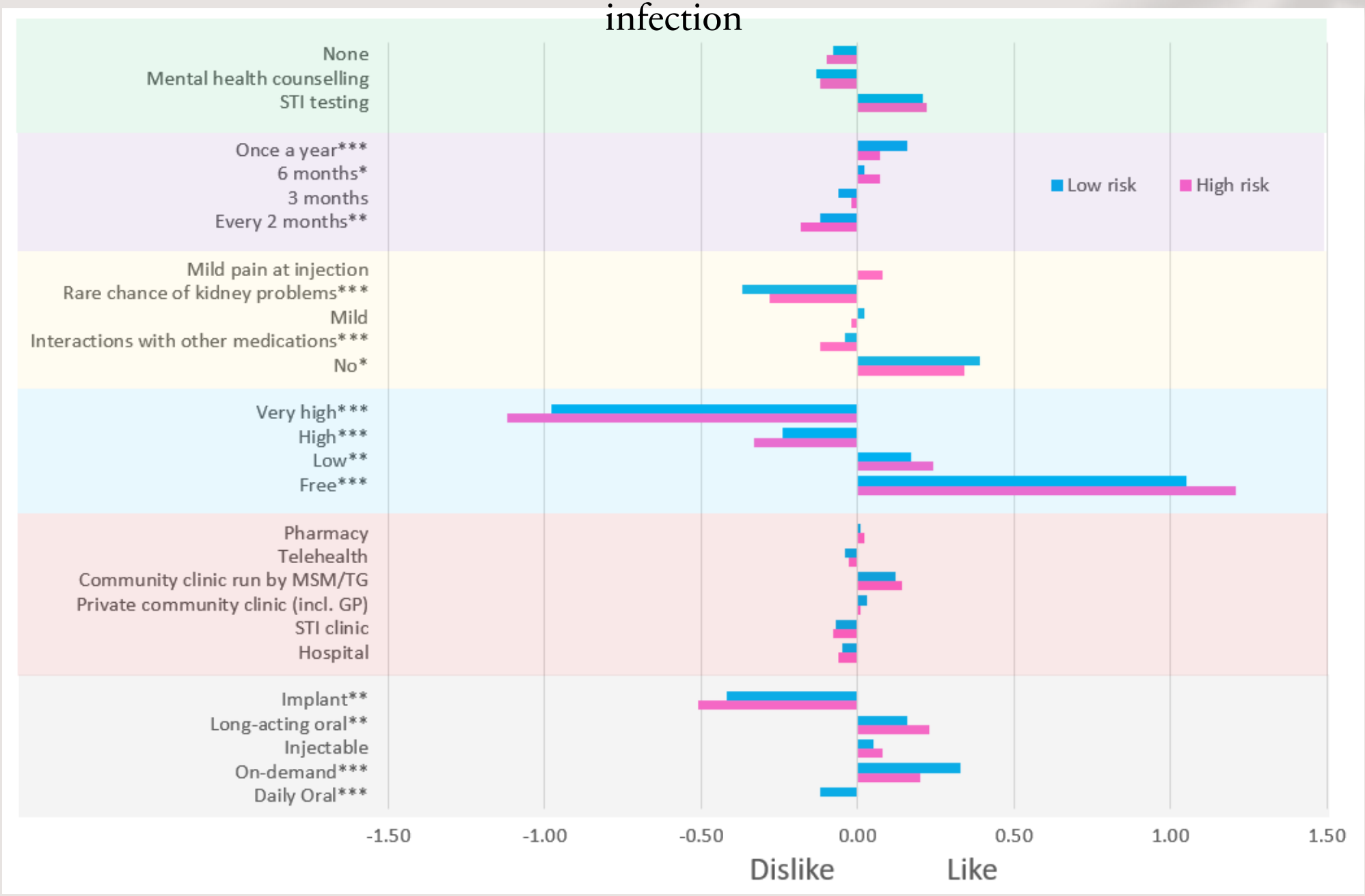
Demographic characteristics

	MSM	% or SD	TGW	% or SD
N	21,943		1,522	
Education level				
No schooling	120	0.6	57	3.8
Up to high school or equivalence	7,515	34.3	984	64.7
At least undergraduate degree	13,372	60.9	460	30.2
Others	936	4.3	3	0.2
Ever taken PrEP				
No	10,923	49.8	450	29.6
Yes	5,892	26.9	697	45.8
missing	5,128	23.4	7	0.5
Currently taking PrEP				
Yes	4,098	18.7	531	34.9
No	1,768	8.1	151	9.9
Missing	16,077	73.3	840	55.2
Sexual partner in the last 6 months				
None	2,188	10.0	180	11.8
One partner	3,751	17.1	237	15.6
Multiple partners	13,028	59.4	826	54.3
Missing	2,976	13.6	149	9.8

Drivers of choice (relative importance) of PrEP for Men who Have Sex with Men in Asian Countries (N=21,722)



Heterogeneity preference for PrEP between individuals at high- vs low-risk of HIV infection



The uptake of the worst and best PrEP service package among Asian MSM

Country	Scenario	Uptake (%)	Type of PrEP	Service location	Cost	Side effects	Visit frequency	Extra service
Asian MIC	Worst	71	Implant	Hospital	Very high	Rare chance of kidney problems	Every 2 months	Mental health counselling
	Status quo	95						
	Best	98	On-demand	Community clinic run by MSM/TG	Free	No side effect	Once a year	STI testing
Asian HIC	Worst	50	Implant	STI clinic	Very high	Rare chance of kidney problems	Every 2 months	Mental health counselling
	Status quo	96						
	Best	99	On-demand	Community clinic run by MSM/TG	Free	No side effect	Once a year	STI testing
Australia	Worst	48	Implant	Hospital	Very high	Rare chance of kidney problems	Every 2 months	None
	Status quo	97						
	Best	100	Long-acting oral	Pharmacy	Free	No side effect	Once a year	STI testing

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Conclusions

- Cost is a major driver of choice for both MSM in Asia-Pacific
- Preference-sensitive PrEP services can improve uptake
  - Community-run clinics
  - Less frequent visits
  - Options beyond daily oral PrEP
- Key differences between countries

Questions?

Session 6 – Small group discussion

Session 6 – discussion

- Share with your group members a possible DCE you could construct within the next 12 months in your area of interest.
- What is your next step?

Next year

- Economic evaluations alongside trials
- Resources already on website
  - Crowdsourcing
  - Designathons

Post-workshop survey

Thank you

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