Methodological Aspects of a COVID-19 Vaccine Discrete Choice Experiment Survey in Canada, Germany, UK, and US General Populations

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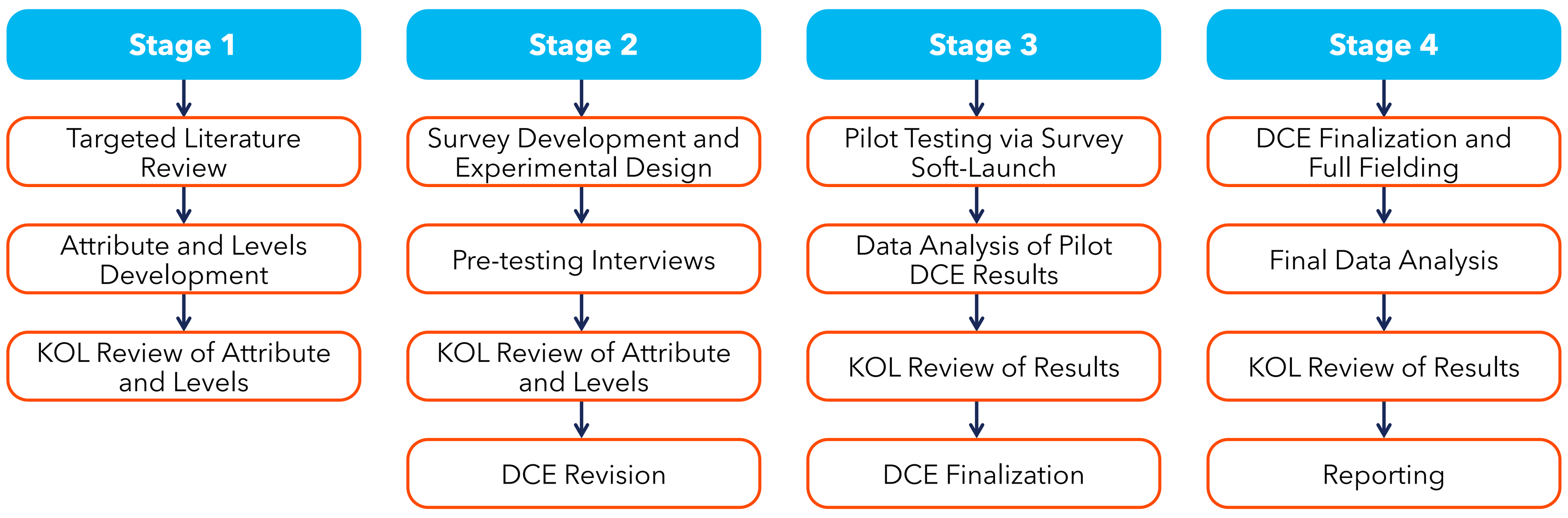
BACKGROUND AND OBJECTIVES

- Understanding the public's vaccine preference is critical in order to implement effective vaccination strategies and increase nationwide vaccine coverage within the evolving dynamics of the COVID-19 landscape[1] including an in-depth understanding of the drivers of COVID-19 vaccine hesitancy.[2]
- This study aimed to explore COVID-19 vaccine preferences in Canada, Germany, the UK, and the United States using a Discrete Choice Experiment (DCE). The findings of this study will be useful to provide decision makers with quantitative insights into the reasons why people choose some vaccine characteristics over others and provide insights into how this might differ across population subgroups.
- The development of a DCE requires the development of an experimental design, evidence-based attribute selection, and validation of understanding with target audiences. This poster reports on the methodology this study employed.

METHODS

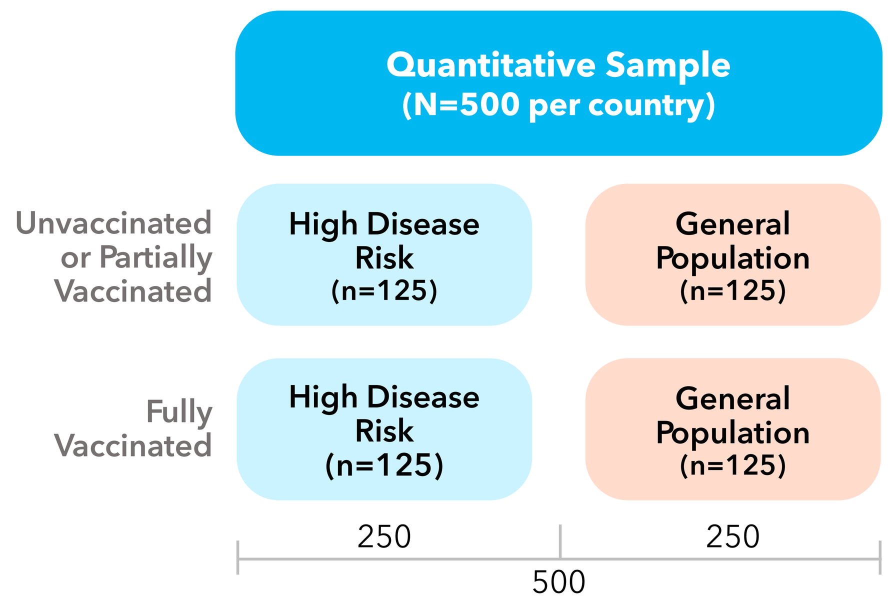
- Discrete choice experiment (DCE) is a survey method in which participants are asked to choose among different hypothetical health intervention profiles. The profiles are defined by the characteristics of the intervention (efficacy, side effects, mode of administration), and their associated levels (e.g., different levels of efficacy). The combination of attributes and levels is determined by an experimental design.[3,4]
- The DCE was developed and fielded according to best practices[5] and as illustrated in **Figure 1**.

Figure 1. Project Schema



- The recruitment of the overall sample for each study stage was stratified by country, vaccination status and disease risk status (see **Figure 2**). The sample sizes were set to enable comparison of estimates between these subgroups.

Figure 2. Subgroup Quotas



RESULTS

Pre-test Interviews

Six phone interviews were completed in each country (N=24).

- Mean age was 43.7; 50% were women.
- 50% reported receiving the full COVID-19 vaccine series.
- 45.8% received the initial series but were unsure about additional doses.
- One was unvaccinated (4.2%).

This phase of the study validated the importance of key vaccine attributes driving people's choices. Participants' **top** priorities were 1) vaccine protection against COVID-19, 2) serious side-effects, 3) protection against severe COVID-19, and 4) common side-effects, followed by 5) vaccine type and 6) timing of COVID-19/influenza vaccines.

Instrument Modifications

- All participants completed the survey, and 18 out of 24 participants had no suggestions or comments.
- Based on the feedback from participants as well as the KOLs, some revisions were implemented in the following (see **Table 1 and Figure 3**):

Table 1. Original and Revised Attributes, Levels and Descriptions

Pre-testing Patient Facing Attribute	Patient Facing Levels	Revised Attribute Name	Attribute Description
Vaccine type	1. Protein subunit vaccine 2. mRNA	No change	Modified description with infographics to enhance participant understanding (**Figure 3**)
Chance you will be protected against COVID-19 infection following exposure	1. 99% 2. 85% 3. 70% 4. 55%	No change	
Chance you will be protected against severe COVID-19 disease following exposure	1. 99% 2. 85% 3. 70% 4. 55%	No change	
Risks of common side effects	1. 95% 2. 80% 3. 65% 4. 50%	Chance you will experience common side effects	
Risk of serious side effects	1. Tiny increased risk of myocarditis/ pericarditis 2. No increased risk of myocarditis and pericarditis	Chance you will experience serious side effects	1. Low increased chance of myocarditis/pericarditis 2. No increased chance of myocarditis and pericarditis Additional minor changes to the attribute description, and infographics used
Timing of COVID-19 and flu vaccines	1. With annual flu vaccine via a single injection 2. With annual flu vaccine via two injections 3. Separately to the flu vaccine	No change	With the annual flu vaccine via a single combined injection Together at same time/place with the annual flu vaccine via two separate injections (ie: one COVID-19 vaccine and one influenza vaccine), as the same time and visit with your health care provider Separately to the annual flu vaccine at a different time and visit with your healthcare provider Minor changes to the attribute description, and infographics used

- The revised choice task based on the feedback received is seen in **Figure 4**

These interviews validated the importance and understanding of key attributes driving people's choices, and feedback was used to improve attribute description clarity.

Figure 3. Vaccine Type Description

Vaccines to Prevent COVID-19

- There are many different types of vaccines, and these are made by different companies. All vaccines work by making the body's immune system create protective antibodies, which are made to fight a specific virus, like the one that causes COVID-19. This is called an "immune response."
- After a COVID-19 vaccine causes this immune response, your immune system will be better prepared to recognize the virus and fight it with proteins called antibodies, which are made to fight a specific virus. This is called an immune response. If the body then encounters the real virus, your immune system will recognize it and know how to fight it. This is called *immune memory*.
- In this survey, we are interested in your opinion on the *types of vaccines* and would like you to specifically consider two types of vaccines:
  - Protein subunit vaccines
  - Messenger RNA (mRNA) vaccines

Protein Subunit Vaccine:

How it works

A protein subunit vaccine contains harmless proteins unique to the virus.

These harmless proteins cause your body's immune system to make antibodies to target the specific virus. An additional ingredient is added to help the vaccines work better.

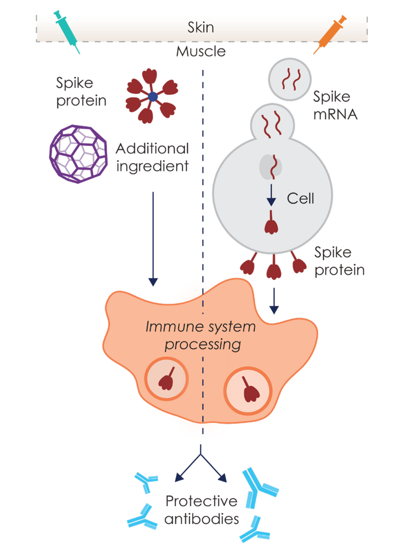
For COVID-19, protein subunit vaccines use a harmless version of the Spike protein that is similar to what is found in the virus.

Where it has been used

Protein subunit vaccines have been used for many years. Some examples include:

- Hepatitis B, seasonal flu, Human Papilloma Virus (HPV), bacterial meningitis and more.
- A hepatitis B vaccine was the first protein subunit vaccine to be approved, over 30 years ago.

During the COVID-19 pandemic, protein subunit vaccine research progressed and some protein subunit vaccines for COVID-19 received approval during this time.



Your body's immune system learns how to recognize the vaccine version of Spike proteins.

This prepares your body to fight the real virus if it encounters it in the future.

Messenger RNA Vaccine:

How it works

These vaccines contain messenger RNA (mRNA), which acts like instructions for the body's cells.

This messenger enters your cells and teaches them how to make the same kind of Spike protein that the virus has.

For COVID-19, mRNA vaccines teach human cells how to make Spike protein.

Where it has been used

While the mRNA vaccines are a relatively new way of developing vaccines, they have been researched for decades for several diseases. Some examples include:

- The flu, rabies, multiple sclerosis and cancer (e.g., cervical, prostate, liver cancer).

Before the COVID-19 pandemic, no mRNA vaccines had completed the full approval process for use in humans. The pandemic enabled mRNA vaccine research to progress rapidly and some mRNA vaccines for COVID-19 received approval during this time.

Figure 4. Illustrative Choice Task Revised for Full Launch

Please imagine that these were your **only** options.

Vaccine Characteristic	Option A	Option B
Vaccine type	Protein Subunit vaccine	mRNA vaccine
Chance you will be protected against COVID-19 infection following exposure	85 out of 100 (85%)	70 out of 100 (70%)
Chance you will be protected against <u>severe</u> COVID-19 disease following exposure	85 out of 100 (85%)	99 out of 100 (99%)
Chance you will experience common side effects	65 out of 100 (65%)	95 out of 100 (95%)
Chance you will experience serious side effects	Low increased chance of myocarditis or pericarditis	No increased chance of myocarditis or pericarditis
Timing of COVID-19 and flu vaccines	With the annual flu vaccine via a <u>single</u> combined injection	Together at same time/place with the seasonal annual flu vaccine via two separate injections (ie: one COVID-19 vaccine and one influenza vaccine), at the same time and visit with your health care provider

Which vaccine would you choose if these were your only options?

No COVID-19 vaccine	Option A	Option B

DCE Pilot

The survey included 259 respondents in total from the UK (n=96), the US (n=90) and Canada (n=74).

- Mean age was 69.3 years (SD=8.59), 60% were men.
- Of the total sample 9.7% were partially vaccinated/unvaccinated and 90.3% were fully vaccinated (**Table 3** provides a breakdown by country and category).

Instrument Modifications

- No changes to the DCE experimental design were deemed necessary.
- Some of the supplementary questions pertaining to vaccine decisions for children were removed from the survey given the limited insight they were providing.

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STRENGTHS AND LIMITATIONS

- To ensure high data validity, the survey was pilot tested in two stages by participants in addition to reviewed by in-country KOLs. The sample size was large to ensure good precision on preference estimates and to explore subgroup variation.
- This research analyses self-reported/stated preferences and, therefore, they may not always match revealed preferences/decision making in real-world situations.

CONCLUSIONS

- This study highlights the importance of key vaccine attributes driving people's choices and evaluates people's characteristics that may influence vaccine preferences.
- With these findings the full DCE survey was fielded in Canada, Germany, the UK, and USA (up to 2,000 participants) to increase the understanding of COVID-19 vaccine preference and hesitancy and the data is currently being analyzed. Full survey results will be available in autumn 2023.

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