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Predicting uptake of treatments to assist health technology assessment: A case study in preventive treatments for rheumatoid arthritis

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BACKGROUND

- Most health technology assessment (HTA) occurs before a technology enters the market.
- The actual uptake of a technology in practice can influence both the costeffectiveness and budget impact.
- In rheumatoid arthritis (RA), there is excitement about the potential to identify people at high risk of developing the disease and preventing onset with anti-rheumatic drugs.
- Preventative strategies will have considerable uncertain risks and benefits from in practice.
- A number of potential 'preventive treatments' are currently being studied in clinical trials (Figure 1), all powered on potential risk reduction.

Figure 1. Example choice set



OBJECTIVE

This case study, set in the window of opportunity before ongoing trials report results and HTA begins, aims to predict likely uptake of preventive treatment for RA based on treatment preferences.

PREFERENCE ELICITATION DESIGN

- Discrete choice experiment (DCE) where respondents
- Five key treatment attributes identified in focus groups with RA patients, first-degree relatives of RA patients and rheumatologists (Figure 2)
- Experimental design (SAS) developed 18 choice sets, blocked into 4 sets of 9 choices.
- Figure 2. Example choice set Click here if you are unsure Your risk of developing rheumatoid arthritis The way you take treatment The risk of side effects The certainty in estimates Your health care professional's opinion: I prefer: Would you choose not tr Responses analyzed using:
- Predicted uptake of hydroxychloroquine in phase 3 was 48% for FDRs and 70% for HCPs.
- In a simulated situation where any potential preventive treatment was available, predicted uptake was

 - 91% for HCPs (highest for oral methotrexate)

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Imagine that you have taken a test to predict your risk of developing rheumatoid arthritis (RA), and this is the result

Risk of developing rheumatoid arthritis in the next 5 years: 60% (60 out of every 100 people like you are expected to develop RA)

Imagine that you are now offered the choice between two treatments, which could prevent you from developing RA. Both are thought to be appropriate, but differ in a number of ways.

what to do		
Treatment A	Treatment B	No treatment
Your predicted risk of RA would reduce from <u>60</u> <u>people out of 100</u> to <u>44 people out of 100</u> over the next 5 years	Your predicted risk of RA would reduce from <u>60</u> <i>people out of 100</i> to <u>24 <i>people out of 100</i> over the</u> next 5 years	Your predicted risk of RA would stay the same at <u>60 people out of 100</u> over the next 5 years
	* *	
<u>IV/slow drip</u> , given by a physician or nurse at their office or hospital, which takes 3-4 hours. <u>Twice, 15 days apart, repeated once (2 doses</u> <u>total)</u>	An <u>oral pill</u> <u>Once daily</u> for one year	You don't take anything
<u>Common</u> : minor side effect, which is <u>reversible</u> <u>Very rare</u> : very serious side effect, which is <u>not</u> <u>reversible</u>	<u>Common</u> : minor side effect which is <u>reversible</u>	None
<u>Very little</u> : the true effect is <u>likely to be</u> <u>substantially different</u> from the estimate of the effect	<u>Limited</u> : The true effect <u>may be substantially</u> <u>different</u> from the estimate of the effect	<u>High</u> : The true effect is <u>likely to be close</u> to the estimate of the effect
Your health care professional would <u>not prefer</u> this treatment	Your health care professional would <u>prefer</u> this treatment	Your health care professional <u>does not offer an</u> <u>opinion</u> about this option
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eatment for now over your chosen treatment?		

METHODS & ANALYSIS

• The DCE was sent in English and French to samples of:

- First-degree relatives (FDRs) of patients via RA; patients on the JointHealth mailing list.
- Health care professionals (HCPs); via email to members of the Canadian Rheumatology Association
- Conditional logit regression models to estimate the significance and relative importance of attributes in influencing preferences
- Logit models with random effects (to account for repeated observations within individuals Coefficients each attribute level used to predict uptake of each preventive treatment

RESULTS

• 30 FDRs(73% female; province: AB 23%, BC 47%, ON 13%, QC 10%; 8 provinces), and

48 HCPs (81% rheumatologists, 8% nurses, 4% pharmacists; 60% female; 8 provinces)

- Treatment preferences were most strongly influenced by discussions of preferred options between providers and recipients, and potential risks and benefits (Figure 3).
 - 75% for FDRs (highest for hydroxychloroquine and statins)

• Predicted uptake of biologics for prevention was predicted to be very low (≤9%) for any group

igure 4. Predicted uptake for treatments currently under study



Ref: Very little certainty (true effect likely different to estimate) Limited certainty (true effect may be different to estimate) Moderate (true effect likely to be close to estimate)

> Ref: Infusion (twice, 3-4hrs, 15 days apart) Injection (once per week for a year) Oral pill (once per day for a year)

Ref: HCP/Recipient does not prefer this option HCP/Recipient indifferent HCP/Recipient prefers this option

Ref: RA risk reduced from 60/100 to 44/100 Risk reduced from 60/100 to 34/100 Risk reduced from 60/100 to 24/100

Ref: Side effects (minor: reversible; major: rare, irreverisble Side effects (minor: reversible; major: rare, reverisbl Side effects (minor: reversible



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CONCLUSIONS

Potential benefits of preventative treatment are not the most important consideration in the decision to initiate preventive treatment; other factors including safety, alignment of preferences and convenience influence uptake. Our results offer important insights and parameters for HTA considering potential budget impact, cost-effectiveness & acceptability of preventive RA strategies.