

## Dissecting Dishonesty Using Behavioural Economics

SCOR Global Life collaborated with MBA students from Nanyang Business School to study the reasons behind “dishonesty” during the insurance application process, as well as potential solutions by using the concepts of Behavioural Economics (BE).

In life and health underwriting, it is crucial for applicants to disclose their health status accurately in order for the insurer to complete an accurate risk assessment. Ensuring higher rates of accurate disclosures would result in a closer approximation of the actual claims experience with the pricing assumptions made. This would, allow insurers to better anticipate and react to the needs of their portfolio and ensure long term sustainability of insurance products.

However, in reality, the purchase decision is often influenced by cognitive and emotional processes which are far from being rational. These cognitive and emotional barriers could cause “dishonesty”, resulting in issues such as misrepresentation or under-disclosure of health issues, lifestyle or adverse habits when completing the application form.

Through this project, we work to better understand the following question:

**How can we utilize our understanding of BE to enable more accurate disclosures from insurance applicants?**

### Project Team

The project team is made up of five MBA students from diverse industries, working together with the SCOR Global Life (SGL) Southeast Asia Underwriting and Claims Team, under an educational collaboration called – “Strategy Projects at Nanyang” (SPAN). We received expert input and guidance from SGL Behavioural Science Team in hypothesis formulation and Cohort Study design.

### 1.0 Project Scope and Journey



Figure 1.0 : Illustration of the Project Scope and Journey

We conducted extensive research pertaining to BE concepts and the science behind customers’ decision making. The research findings then allowed us to further explore how the design of the health declaration used in application forms could positively influence the mindset of customers and encourage them to make accurate disclosures.

Next, potential solutions were derived, such as exploring methods to reduce customers’ cognitive load while answering questions, removing elements of stigmatization in questions asking about lifestyle choices, and managing ambiguity.

To validate the effectiveness of these solutions, an online survey was performed in Singapore with participants selected via convenience sampling. Results generated from the survey were used to compare the disclosure rates between a set of traditional health questions seen in an insurance application form and a BE-enhanced set of health questions via A/B Testing method.

The research findings gathered from this study help to pave the way to further explore new ideas and reshape the industry’s approach in gathering medical histories (which are often sensitive and can make people uncomfortable or unwilling to answer accurately) during the process of customer on-boarding.

## Research Findings

### 1.1 Considerations Behind Decision Making

Based on literature reviews, we investigated various intrinsic and extrinsic motivations that drives higher non-disclosure rate. According to the Incentive Theory, behaviour is primarily motivated by the incentive of intrinsic and extrinsic factors. Motivation refers to a desire, need or drive that contributes to and explains behavioural changes.



Figure 1.1 : Intrinsic and Extrinsic Motivation Behind Decision Making

### 1.2 Intrinsic Motivations

Intrinsic motivation refers to behaviours that is driven by internal rewards, rather than by a separable consequence. In the context of life insurance application, intrinsic motivation is influenced by various factors, illustrated in the following matrix :

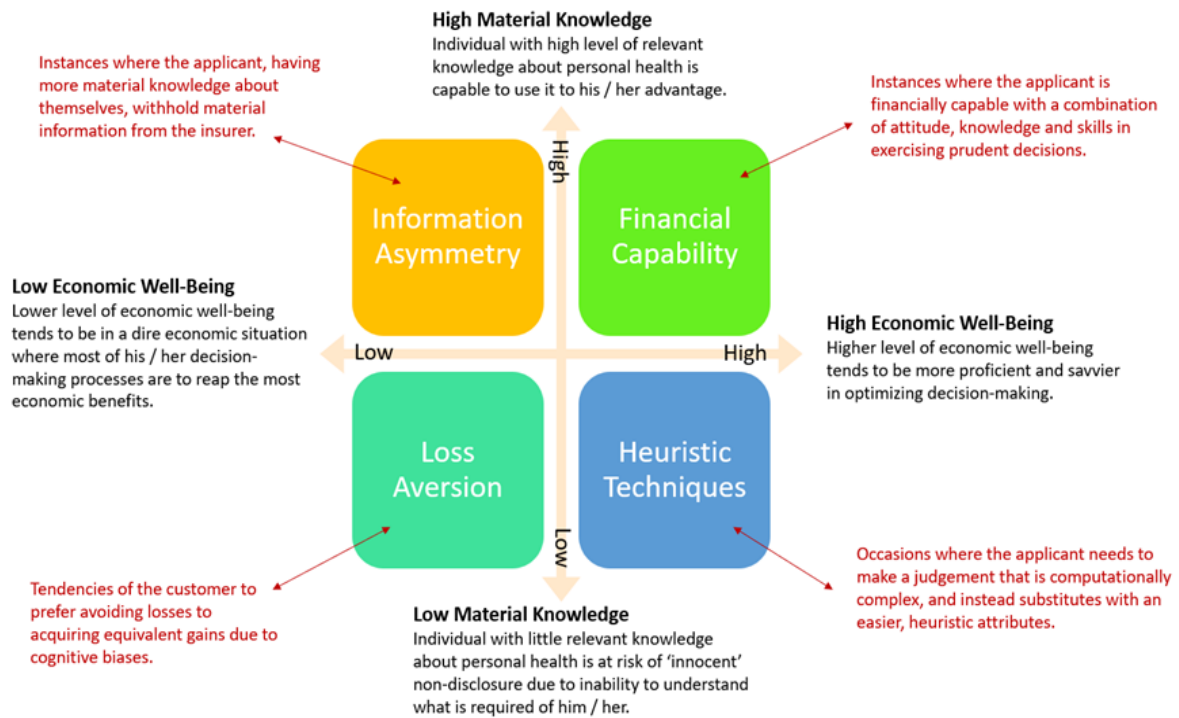


Figure 1.2 : Intrinsic motivations and their correlation with application disclosure

In the design of health questions, it is important to ensure that applicants do not resort to using heuristic techniques in providing their responses. While heuristic techniques could facilitate timely decisions, rendering decision-making process simpler and faster via mental short-cuts, doing so with limited insights and context could result in poor decision-making, biases, and errors in judgement. This may give rise to the unfortunate "innocent" non-disclosure.

### 1.3 Extrinsic Motivations

In extrinsic motivation, rewards, factors, or incentives serve as motivation for specific activities. Unlike intrinsic motivation, external factors drive this form of motivation. Extrinsic motivations that could influence the level of honesty upon health disclosures include:




<p><b>Incentives</b></p> <ul style="list-style-type: none"> <li>• Incentivized-based program in the sales of insurance products is largely driven by sales records.</li> <li>• Accurate disclosure of customers health information is often not a priority in the producer's agenda.</li> <li>• While there are regulatory initiatives such as Balanced Scorecard (BSC) Framework implemented in the past to curb material misrepresentation, there remains a need to strengthen its enforcement to safeguard customers interest.</li> </ul>	
<p><b>Technology &amp; Education</b></p> <ul style="list-style-type: none"> <li>• Transformative technologies, coupled with education that promotes engagement, can help insurers to tap into human psychology, emotions and social dynamics that drive how, why and when customers make choices to transform customer experiences, protection products, price points and more.</li> <li>• Combining insights from BE with scalable technology platforms – there is a vast potential to positively impact decision making upon answering health disclosures.</li> </ul>	
<p><b>Engagements</b></p> <ul style="list-style-type: none"> <li>• As the service industry matures, customers are seeing a thinning engagement margin in the industry during to rising expectations.</li> <li>• Without proper customer engagement and a clear understanding of what services the customers are paying for, distrust towards insurer rises, and they will resort to putting their self-interest above everything else.</li> </ul>	

Figure 1.3 : Intrinsic motivations and their correlation with application disclosure

## 2.0 The Cohort Study via A / B Testing

An online survey was carried out in Singapore to test our hypothesis. These participants were divided into two groups, with Group 1 answering BE-enhanced health questions and Group 2 serving as a control, answering an existing set of health questions similar to those used by most insurers in Singapore.

The demographics of the participants are as below:

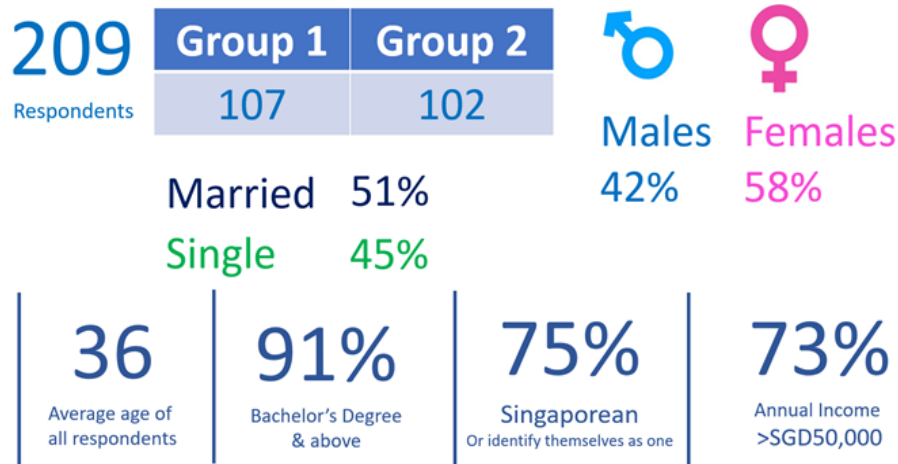


Figure 2.0 : Infographics on the demographics of the study participants

## 2.1 The Smoker's Question

Traditionally, questions pertaining to applicants' smoking habits were phrased in a direct manner where customers were asked to validate their smoking status and to recall their smoking habits over an extended period. We hypothesized that the manner of asking about such habits would place social stigmatization on smokers and likely resulted in social desirability bias leading to non-disclosure and/or under disclosure of the smoking status.

Control Question	BE-Enhanced Question															
<p>Do you smoke cigarette(s) and / or other tobacco product(s)?</p> <p><input type="radio"/> Yes</p> <p><input type="radio"/> No</p> <p>If yes, please state the average number of stick(s) of cigarette and / or unit(s) of other tobacco product(s) you smoked per day.</p> <p><input type="text"/></p> <p>Stick(s) of cigarette and / or unit(s) of other tobacco product(s) per day.</p>	<p>When was the last time you smoked cigarettes and / or other tobacco product(s)?</p> <table border="1"> <tr> <td>In the past month</td> <td>In the past 6 months</td> <td>In the past 12 months</td> </tr> <tr> <td>1 – 5 years ago</td> <td>More than 5 years ago</td> <td>Never</td> </tr> </table> <p>How frequently do you use, or did you smoke cigarettes and / or other tobacco product(s)?</p> <table border="1"> <tr> <td>40 or more per day</td> <td>20 – 39 per day</td> <td>10 – 19 per day</td> </tr> <tr> <td>1 – 9 per day</td> <td>Less than once a week</td> <td></td> </tr> <tr> <td>Less than once a month</td> <td>Less than 7 per week</td> <td></td> </tr> </table>	In the past month	In the past 6 months	In the past 12 months	1 – 5 years ago	More than 5 years ago	Never	40 or more per day	20 – 39 per day	10 – 19 per day	1 – 9 per day	Less than once a week		Less than once a month	Less than 7 per week	
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Figure 2.1 : The smoker's question in the study.  
Group 1 participants answered the BE-Enhanced Question  
Group 2 participants answered the Control Question

The survey results showed that the number of Group 1 participants who declared themselves having a smoking habit is about three times more than Group 2 participants. (Figure 2.2) Furthermore, Group 1 participants who declared having a smoking habit gave a higher number of cigarettes smoked per day; 70% of the smokers from Group 2 participants declared fewer cigarettes smoked per day compared to Group 1 participants. (Figure 2.3)

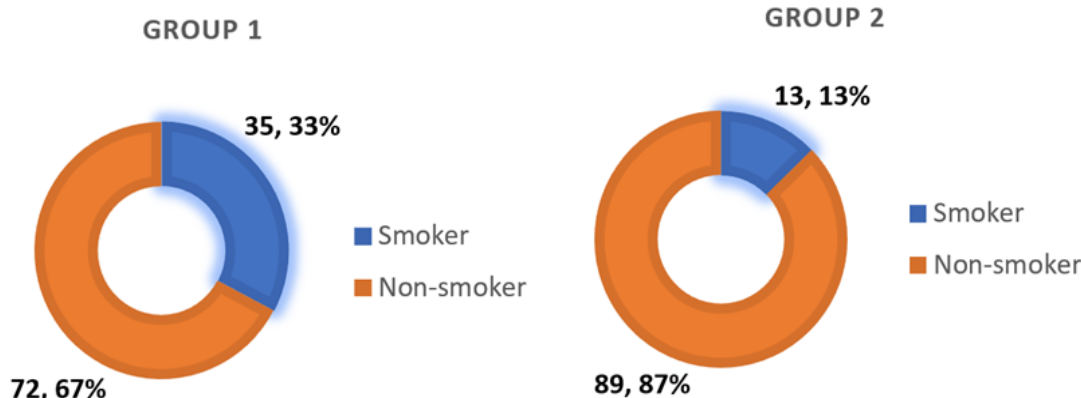


Figure 2.2 : Smoking habit disclosures, Group 1 Vs Group 2

Social Stigma is the disapproval of, or discrimination against, a person based on perceivable social characteristics that serve to distinguish them from other members of a society. Our survey results strongly suggest that by minimizing the element of social stigmatization when asking about smoking habits and framing the question by instead asking for participants' "smoking experience" (which assumes such behavior exists without asking a dichotomous question that implies wrongdoing or invalidates a habit), the number of accurate disclosures improves.

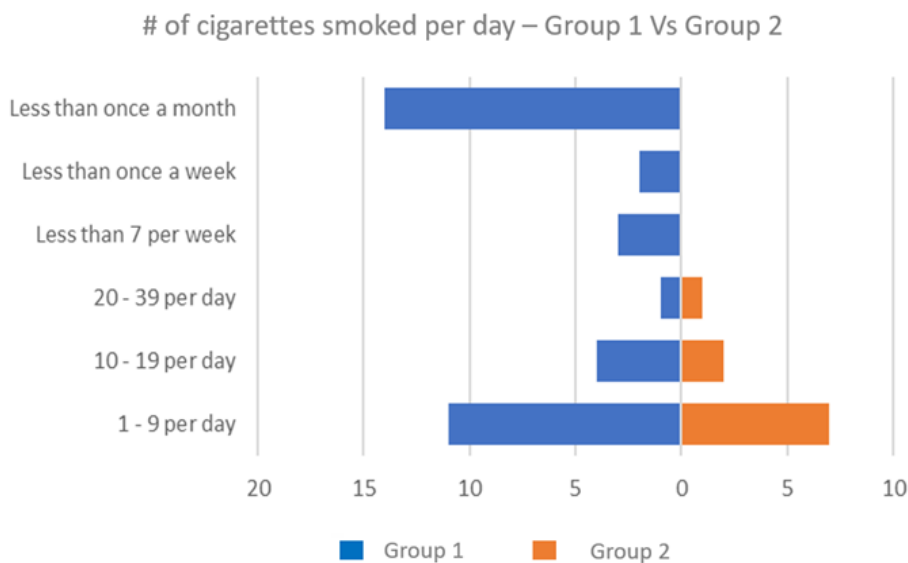


Figure 2.3 : Number of cigarettes smoked per day, Group 1 Vs Group 2

Social Desirability Bias is a form of response bias in which people prefer to answer questions according to how their responses will be interpreted by others rather than reply truthfully. Participants would tend to declare the minimum quantity due to self-perceived social disapprovals and insecurity. Providing more options, as shown in the BE-enhanced questions answered by Group 1 participants, removes the task of coming up with their own response. As a result, participants are more likely to truthfully disclose the number of cigarettes smoked with reduced social desirability bias, (i.e., when survey provided options as compared to open textbox field).

## 2.2 Question on Alcohol Consumption

Most insurers gather information relating to alcohol consumption by having customers disclose the intake of each drink type in a given period of time, for e.g. weekly Vs yearly. However, by considering the seasonal changes in alcohol consumption, given an extended period, e.g. 1 year, customer may not be able to recall the intake of drinks. Furthermore, customers may find it easier to provide the average quantity of alcoholic beverages of each drink type as there may be a stronger association to it.

Control Question	BE-Enhanced Question
<p>If yes, please state the total number of standard alcoholic beverages you drink on a <b>weekly basis</b>.</p> <p>1 standard alcoholic beverage equates to 1 can of beer (330 mL), or 1 glass of wine (125 mL), or 1 shot of spirits (30 mL)</p> <p>(integer only)</p> <p>Total number of standard drinks <input type="text"/></p> <p>Others, please specify : <input type="text"/></p>	<p>If yes, please state the average quantity of alcoholic beverages (by drink type) you drink on a <b>weekly basis</b>.</p> <p>(Please fill in '0' if not applicable)</p> <p>Can of beer (330 mL) <input type="text" value="0"/></p> <p>Glass of wine (120 mL) <input type="text" value="0"/></p> <p>Shot of spirits (30 mL) <input type="text" value="0"/></p> <p>Total <input type="text" value="0"/></p> <p>Others, please specify : <input type="text"/></p>

Figure 2.4 : The question on alcohol consumption in the study  
 Group 1 participants answered the BE-Enhanced Question  
 Group 2 participants answered the Control Question

This leads us to the hypothesis that there will be a higher rate of disclosure if we are able to reduce the cognitive burden of calculating because it would be easier for the customer to answer honestly.

However statistical analysis shows that both Group 1 and Group 2 participants have similar ratios of people who drink alcohol: 73% and 76% respectively. Comparing both groups of participants who consume alcohol, there is no statistical difference between the amount of weekly alcohol consumption. (Figure 2.5)

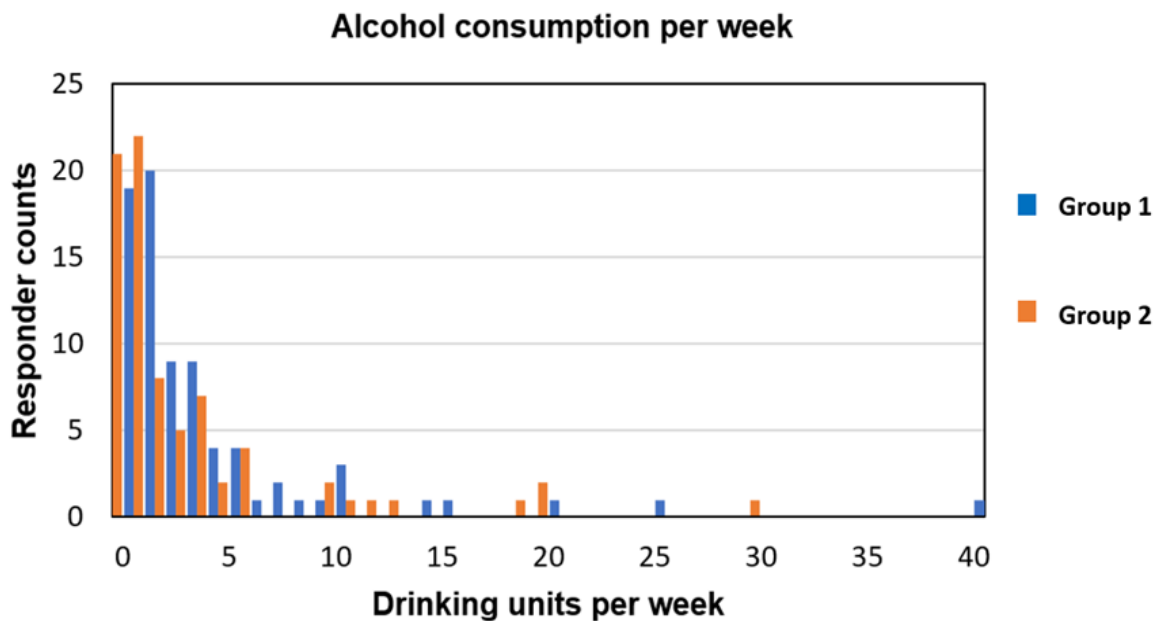


Figure 2.5 : Amount of alcohol consumption per week, Group 1 Vs Group 2



Quantitatively, the analysis suggests that there is no significant difference in disclosure, whether the question on the average consumption of alcoholic beverages is based on each drink type or when bundled together over the course of a week. We conducted further qualitative analysis and found that the participants who drink large amounts of alcohol were hesitant or reluctant to disclose the actual amount of alcohol they consumed. Hence, the high-risk cohort may tend to under disclose, regardless of the change in question format.

### 2.3 Question on Diabetes

It is rather common for questions about diabetes to be embedded within questions about other endocrinal disorders, rendering the question computationally complex. This may cause applicants to resort to applying heuristic techniques. For example:

*Have you ever experienced symptoms, or received medical advice, or had treatment for diabetes, elevated or raised blood sugar, thyroid disorders or any other endocrine disease or disorders (whether diagnosed or not)?*

We hypothesized that providing a clear disease definition and visual aids would make it easier to recall the disease and answer accurately. Furthermore, these steps would help the participants link their personal medical history with the diseases, making it less likely that they would feel the need adopt mental shortcuts in their response to such questions.

A baseline question on Diabetes and Pre-Diabetes was answered by Group 2 participants, without providing the definitions of disease and visual aids. This served as a control. On the other hand, Group 1 participants answered the set of questions that is 'BE-Enhanced'. (Figure 2.6)

#### Clear Definitions and Visual Aids

Pre-Diabetics have blood glucose level readings that range between 7.8 millimoles per litre (mmol/l) and 11 mmol/l 2 hours after an oral glucose tolerance test – higher than normal, but not high enough to be diagnosed as Type 2 Diabetes.

Pre-Diabetes means you have a higher than normal blood sugar level. It's not high enough to be considered Type 2 Diabetes yet, but without lifestyle changes, adults and children with prediabetes are more likely to develop Type 2 Diabetes.

Blood Test	NORMAL	PRE-DIABETES	DIABETES
Fasting glucose	< 6.1 mmol/L (<100 mg/dL)	6.1 – 6.9 mmol/L (100 – 125 mg/dL)	>7.0 mmol/L (>125 mg/dL)
2-hour plasma glucose level after oral glucose tolerance test	< 7.8 mmol/L (<140 mg/dL)	7.8 – 11.0 mmol/L (140 – 200 mg/dL)	>11.1 mmol/L (>200 mg/dL)

**SYMPTOMS**

Type 2 Diabetes happens when your body becomes resistant to insulin and is associated with genetics and lifestyle choice.

Figure 2.6 : Cognitive enhancement with visual aids and disease definition answered by Group 2 participants

The results of our study (Figure 2.7) revealed that Group 1 participants actually have a slower response time compared to Group 2 participants. In other words, Group 1 seemed to take more time to understand the question before answering. Without clear definition and visual aids, Group 2 participants may have had limited knowledge on the disease and might not spend much time thinking and assessing their own risk profile, resorting to System 1 thinking<sup>1</sup> to pass off the question quickly.

With the question being enhanced from a cognitive angle, the aids provided the participants information and clarity on the subject matter, potentially prompting them to use their cognitive skills and critical thinking, known as System 2 thinking<sup>2</sup>, for their decision making.

<sup>1</sup> Defined as instantaneous thinking, driven by instinct and prior learning

<sup>2</sup> Defined as slower thinking, driven by deliberation and logic

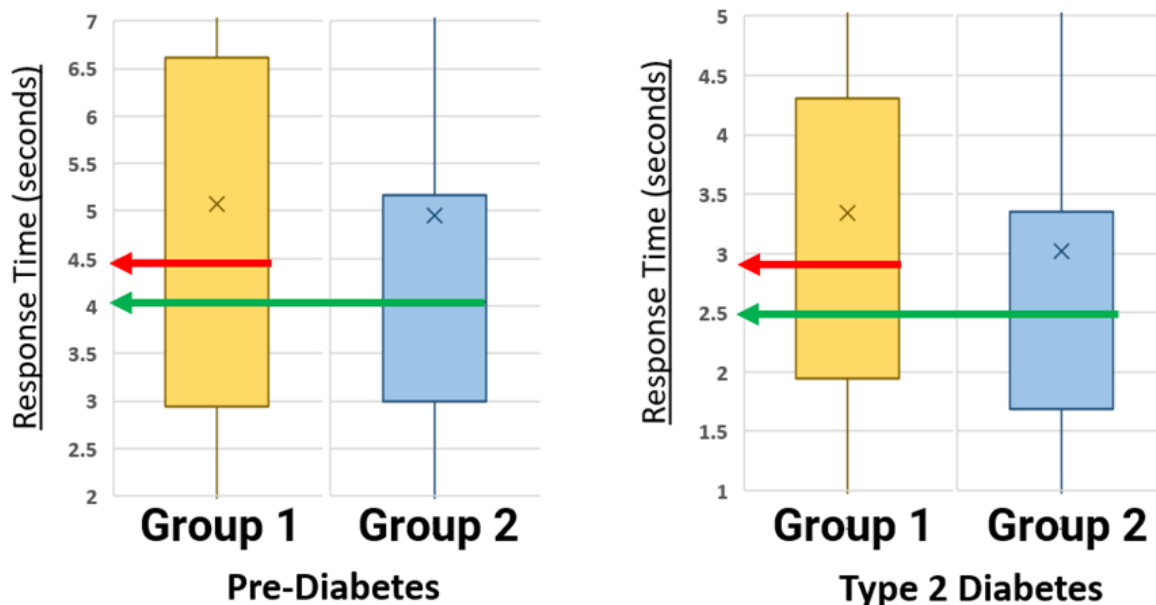


Figure 2.7 : Response Time in answering the Question on Diabetes and Pre-Diabetes – Group 1 Vs Group 2

## Potential Next Step

While our Cohort Study was completed in a “laboratory” environment, purely simulating the process of insurance application, the results of the study suggest that BE can play an important role in improving accurate disclosure among insurance applicants. The impact of implementing seemingly small changes is significant, as supported by the results of our experiments.

Our potential next steps in BE and its application in insurance include:

- A real-world application of the survey: by continuing the survey in an actual insurance application setting, we would be able to increase the number of people surveyed and include representation across all segments of society (age, education, etc.). This would allow more stable distribution and trends and, therefore, even more meaningful insights.
- Study the applications of BE in enhancing the engagement levels of health/wellness programs offered by insurers.

## What Does These Insights Mean To Us

Behavioural Economics is an entire academic field of its own and, unfortunately, its application and the insights it has to offer are still underutilized within the insurance industry. This research study is just the tip of the iceberg and we seek to explore this topic deeper with our clients. The more empirical data we have through research projects like this, the easier it will be to prove or disprove the assumptions we make in the underwriting process. This ultimately helps to remove the frictional cost we embed in the pricing of insurance products.

Stay tuned to South Asia Watch for more updates on SCOR Global Life’s initiatives on Behavioural Economics.



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