**Table 1. The Values in Modelling Framework**

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| --- | --- | --- | --- | --- | --- |
|  | **STEP 1: Identify Ethical** **Issues & Perspectives** | **STEP 2: Characterize** **Modelling** **Decisions**  | **STEP 3: Select** **Decision-Making Strategies**  | **STEP 4: Deliberate** **'Open' Decisions through *Democratization* strategy** | **STEP 5: Report and Evaluate— PPI Process and Model** |
| **Key Action** | Modellers and transdisciplinary participators engage in group discussion. | Modellers characterize upcoming modelling decisions according to relevant conceptual distinctions *(See Table 2).* | Team lead determines how each modelling decision will be made and why *(See Tables 2-3).* | Modellers and transdisciplinary participators consider alternatives and aim to identify and justify preferred method(s). | Summarize Steps 1-4. Report model weaknesses or other concerns raised through PPI. |
| **Key Purpose** | Orient team to ethical significance of decision-making in modelling and encourage group reflection and debate. | Inform selection of decision-making strategies and prioritize decisions for PPI. | Prepare to communicate and justify which decisions will and will not be informed by PPI.  | Consider alternative methods from diverse perspectives, including potential consequences and adequacy for purpose. Finalize decisions and/or record outstanding disagreements. | Demonstrate to what extent value-laden modelling decisions received input from transdisciplinary participators. |
| **Key Questions**  | What are the potential harms and benefits of the health intervention to be modelled?What are the potential harms and benefits of the modelling project?What is the 'right' standard of evidence to demand in this context?What will make modelling decisions ‘adequate for purpose’ in this context? | Are any decisions expected to be highly uncertain, influential, and/or provoke disagreement among participators?Are any decisions expected to be difficult to communicate about/understand among transdisciplinary groups?Are any decisions constrained by scientific guidelines/norms?Do any decisions require input from individual informants given lack of systematically-collected evidence? | What is the team's capacity for PPI? Considering the team's capacity and each decision’s unique features, how should each decision be made and why? *(See Table 3)*Which guidelines or other authoritative sources can be used to inform decisions?How will modellers communicate to the team about the decisions they will make independently? | What is the quality of the evidence and the nature of the uncertainty affecting the decision? Does uncertainty pertain to a ‘correct’ value or the ‘right’ question to be asking?Where a relevant ‘correct’ value is unknown, what are the downstream social/ethical consequences of over- vs. under-estimation and how do team members value them? Where there is uncertainty over the ‘right’ question to be asking, what are the downstream social/ethical consequences of the alternatives and how do team members value them? | Who was involved in the PPI process?What was the nature of the modelling decisions that participators were involved in? How did participators engage with the decision? What input did they give? Who had the highest level of decision-making power?Did participators flag any decisions they wished to be involved in? |

**Table 2. Conceptual distinctions between modelling decisions following the VIM framework**

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| --- | --- | --- | --- |
| **Modelling decision**  | **VIM framework definition** | **Considerations** | **Example(s)** |
| **Pivotal Decisions** | Modelling decisions where the best choice is uncertain, it is expected to have a significant impact on results, and/or team members are expected to suggest different courses of action. | Identifying Pivotal decisions is not a precise or algorithmic process—team members may disagree on which decisions qualify. However, by reflecting on the degree of uncertainty, expected impact on results, and likelihood of disagreement, modellers can identify decisions that warrant greatest attention. Decisions that modellers characterize as ‘Pivotal’ are a priority for PPI. | Choosing the data source and method to project future PM2.5 levels from wildfire smoke, given deep uncertainty, expected impact on model results, and potential for ethical disagreement (i.e., preferences for over- vs. under-estimating impact of climate change) |
| **Opaque****Decisions** | Modelling decisions that are expected to be difficult to communicate about and understand among transdisciplinary groups. The features and significance of these decisions may remain partly unknown to some participators in the modelling process. | Identifying Opaque decisions relies on anticipating communication capabilities among modellers and participators—again, team members may disagree on which decisions qualify­. Where the significance of modelling decisions is truly hard to explain, PPI may not be feasible. However, modellers should recognize that unexplained model features can undermine trust. For decisions classified as Opaque, participators should be asked how these features influence their trust in the model. | Selecting calibration targets for tuning a microsimulation model such as LEAP, as the nature of the decision, rationale for and impact of alternative methods may be difficult to communicate among all participators. |
| **Guideline Decisions** | Modelling decisions where the best course of action is constrained by an authoritative source. Guideline decisions are either i) supported by long-established, well-credentialed scientific consensus or public record and subject to little to no empirical uncertainty; or ii) informed by published guidelines reflecting strong institutional consensus. | Guideline decisions should be easy to agree on, as they are characterized by clear, authoritative sources and broad consensus, with little or no uncertainty. If team members disagree about whether a decision counts as a Guideline decision, it should not be treated as one. Modellers should be prepared to cite a published guideline or source that demonstrates well-established scientific or institutional consensus. | Setting the caloric value of 1g of glucose to 4 kcal or using national life table values to predict baseline mortality, as these rely on uncontested scientific facts/statistical methods.Selecting the discount rate(s) for costs and health outcomes, as the range of appropriate values is well-established by national and international health economic evaluation guidelines. |
| **Informant Decisions** | Modelling decisions that are expected to require input from one or more individual informants (e.g., a person with lived experience of a health condition, clinical experience, or other tacit knowledge), as the relevant evidence is unlikely to have been systematically collected in a reliable way. | Team members should generally agree on which decisions count as Informant decisions, as these are defined by a clear lack of scientific evidence. Such decisions are best informed by input from multiple informants and, given their inherent uncertainty, should be priorities for deliberation and sensitivity analyses to assess their impact on the model. | Estimating the proportion of school absences due to asthma that are specifically attributable to wildfire smoke exposure, as no published evidence is available to inform this decision. |

**Table 3. Decision-making strategies within the VIM framework**

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| --- | --- | --- |
| **Decision-making strategy** | **VIM framework definition** | **Considerations** |
| **Democratization**  | Involve all team members in a decision. Facilitate deliberation and invite all participators to give their reasons to pursue or avoid a certain course of action. Decisions made using ‘Democratization’ are described as ‘Open’ decisions as they will receive input via the PPI process. | **Strongly recommended for Pivotal decisions, wherever feasible**— Prioritize *Democratization* for decisions with highest uncertainty, expected impact, and/or potential for disagreement.May not be feasible for Opaque decisions— Deprioritize *Democratization* for Opaque decisions unless other considerations apply.**Not generally appropriate for Guideline decisions—**Using *Democratization* to inform Guideline decisions requires extraordinary justification.Generally more appropriate for Informant decisions than Pre-identification—Consider using *Democratization* to make final decisions after input from multiple informants. |
| **Pre-identification** | Identify in advance the ‘right’ values to inform a decision, such as by following modelling guidelines or another authoritative source. Decisions made using ‘Pre-identification’ are described as ‘Closed’ decisions as they will not receive input via the PPI process. | **Generally expected for Guideline decisions—** Use *Pre-identification* to avoid violating well-established scientific norms and reduce unnecessary burden on participators.Aim to avoid using *Pre-identification* for Informant decisions based on input from a single informant—Prioritize receiving input from multiple informants and use *Democratization* instead, wherever feasible  |
| **Transparency** | Invite modellers to make the decision independently, but to be transparent about their decision and the reasons behind it. If modellers consider it difficult to be transparent about the decision (e.g., because technical details are difficult to explain), ask them to be transparent about that difficulty. Decisions made using ‘Transparency’ are described as ‘Closed’ decisions as they will not receive input via the PPI process. | **Generally the default decision-making strategy in health economics modelling**—Use *Transparency* with discretion and provide justification. Invite transdisciplinary participators to review and flag decisions that should be revisited using *Democratization*. |

**Table 4. ‘Open’ decisions in the LEAP model project: summary and impact of PPI following the VIM framework**

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| --- | --- | --- |
| **‘Open’ decision** | **Summary of ‘value-ladenness’ (scientific flexibility, potential social/ethical consequences)** | **Impact of PPI following VIM framework**  |
| *Deliberation 1:* Select data source(s) and methods for projecting future wildfire | Scientists warn that deep uncertainty surrounds future wildfire, though it will be influenced by climate change. Selecting data sources and methods for wildfire projection cannot be determined by evidence alone and implicitly involves judging the ethical significance of various possible outcomes (e.g., representing future wildfire as being more severe or less severe than it really will be; signaling to the public that scientists can predict future wildfire to high degrees of accuracy; signaling to policy-makers that future wildfire will be determined exclusively by climate change and not by environmental policies, etc.). | * **Change to uncertainty management strategy—**Increase attention to disagreement between data sources and expand sensitivity analyses beyond what was initially planned.
 |
| *Deliberation 2:* Select data source(s) and methods to represent the impact of PM2.5 on asthma control | There are multiple ways to define and measure asthma control in the literature (e.g., medication use patterns, self-reported symptoms, functional tests). What outcome is chosen may impact how policy-makers and others perceive the severity of the disease. Existing data on the impact of PM2.5 on outcomes linked to asthma control may over- or underestimate the true impact of PM2.5 on people with asthma. | * **Change of outcome measure**—Avoid using salbutamol dispensations to represent asthma control as initially planned and use Asthma Control Test (ACT) instead.
 |
| *Deliberation 3:* Select data source(s) and methods to represent the impact of PM2.5 on moderate asthma exacerbations | Moderate asthma exacerbations can be defined and measured by various clinical criteria/tests and other self-reported and observed outcomes. Choosing between them involves judging what is important and may influence perceptions of asthma burden and downstream resource allocation decisions. Health care utilization may represent moderate asthma exacerbations but could over- or underestimate them. | * **Change to error-checking process—**Verify that care from a range of practitioners will be captured before using primary care visits to represent moderate asthma exacerbations.
 |
| *Deliberation 4:* Select data source(s) and methods to represent the impact of PM2.5 on severe to very severe asthma exacerbations | Like other exacerbations, severe to very severe asthma exacerbations can be defined and measured by various outcomes and choosing between them has downstream consequences. Using asthma-related emergency room visits is practical, but could fail to capture the link between PM2.5 and asthma exacerbations due to the limitations in current knowledge (e.g., the timing of the effect of PM2.5 and its complex determinants). | * **Expansion of model outcomes**—Model a range of ‘lagged’ effects to draw attention to heterogeneity among people with asthma and acknowledge that asthma exacerbations due to increases in PM2.5 may occur at different points after the exposure.
 |
| Select data source(s) and methods to represent the impact of PM2.5 on asthma incidence in children and adults | Impact of PM2.5 on asthma incidence has been studied using different methods in different settings, resulting in a range of ‘concentration response functions’ (CRF) identified in meta-analyses. It is unknown which CRF most accurately represents the impact in different parts of Canada and over- or underestimation could have policy implications. | * **Change to uncertainty management strategy—**Increase attention to disagreement between data sources and expand sensitivity analyses beyond what was initially planned.
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**Table 5. Cost-effectiveness of HEPA Filters: Representational Decisions and Decision-making Strategies in the LEAP Model Project**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Parameter** | **Description** | **Decision-making Strategy** | **Team members involved in decision *(\*highest decision-making power)*** | **Base case** | **DSA** | **PSA** | **Source** |
| **Fixed model inputs** |  |  |  |   |   |   |  |
| Start year |  | Closed (Transparency) | KJ\*, SL, AA | 2010 | - | - |  |
| Childhood cohort age at start, yr |  | Closed (Transparency) | KJ\*, SL, AA | 5 | 5, 10 | - |  |
| Adult cohort age at start, yr |  | Closed (Transparency) | KJ\*, SL, AA | 25 | 20, 30 | - |  |
| Discounting (annually) | Guideline decision | Closed (Pre-identification: Guidelines) | KJ\*, SL, AA | 1.5% | - | - |  |
| Air cleaner unit lifespan (years) |  | Closed (Transparency) | KJ\*, SL, AA | 5 | - | - |  |
| Air cleaner filter lifespan (months) |  | Closed (Transparency) | KJ\*, SL, AA | 9 | - | - |  |
| All-cause annual mortality |  | Closed (Transparency) | KJ\*, SL, AA | Varies by age (years) | - | - | Statistics Canada life tables [54]  |
| **Exposure inputs** |  |  |  |   |   |   |  |
| Historical monthly PM2.5 concentrations (2010-2022) | Pivotal decision | Closed (Transparency) | KJ\*, SL, AA | Various | - | - | CanOSSEM [26] |
| Projected monthly PM2.5 concentrations attributable to wildfire (2023-2036) | Pivotal decision | Open (Democratization) | KJ\*, AA, SL, SH, RC, SHC, ZZ | Various | - | - | RAQDPS [27]  |
| Projected monthly PM2.5 concentrations attributable to non-wildfire sources (2023-2036) | Pivotal decision | Closed (Transparency) | KJ\*, SL, AA | Various | - | - | Global Environment Multiscale – Modelling Air CHemistry (GEM-MACH) model [55]  |
| Climate scaling factor (2023-2036), annual increase in PM2.5 attributable to wildfire | Pivotal decision | Open (Democratization) | KJ\*, AA, SL, SH, RC, SHC, ZZ | 0.42% | 0%, 0.84% | - | Liu et al.[29]  |
| Infiltration efficiency | Pivotal decision | Closed (Transparency) | KJ\*, SL, AA | 0.61 | ± 20% | Normal | Barn et al.[56] |
| HEPA filter effect | Pivotal decision | Closed (Transparency) | KJ\*, SL, AA | 0.48 | ± 20% | Beta |
| Proportion of time spent at home | Pivotal decision | Closed (Transparency) | KJ\*, SL, AA | 0.89 (≤12 years)0.88 (>12 years) | ± 20% | Beta | Matz et al.[57] |
| **Rates, Probabilities, and Risk** |  |  |  |   |   |   |  |
| *Asthma control* |  |  |  |   |   |   |  |
| Proportion of well-controlled asthma at baseline |  | Closed (Transparency) | KJ\*, SL, AA | 0.506 (≤18 years)0.560 (>18 years) | ± 20% | Beta | Kennedy et al.[58] Sadatsafavi et al.[59] O'Byrne et al.[60]  |
| Proportion of not-well controlled asthma at baseline |  | Closed (Transparency) | KJ\*, SL, AA | 0.494 (≤18 years) 0.440 (>18) | ± 20% | Beta |
| Probability of well-controlled asthma to not-well controlled asthma (monthly) |  | Closed (Transparency) | KJ\*, SL, AA | 0.244 | ± 20% | Beta | Sadatsafavi et al.[59] |
| Probability of not well-controlled asthma to controlled asthma (monthly) |  | Closed (Transparency) | KJ\*, SL, AA | 0.140 | ± 20% | Beta |
| *Asthma exacerbations* |  |  |  |   |   |   |  |
| Relative risk of exacerbations in not well-controlled asthma (vs. well-controlled) |  | Closed (Transparency) | KJ\*, SL, AA | 1.20 | ± 20% | Log-normal | Pollack et al.[61]  |
| Rate of moderate exacerbation (annually) |  | Closed (Transparency) | KJ\*, SL, AA | 0.10 (≤18 years)0.090 (>18 years) | ± 20% | Beta | Adams et al.[61]Bateman et al.[62]Pollack et al.[61]  |
| Rate of severe exacerbation (annually) |  | Closed (Transparency) | KJ\*, SL, AA | 0.068 (≤18 years)0.011 (>18 years) | ± 20% | Beta |
| Rate of very severe exacerbation (annually) |  | Closed (Transparency) | KJ\*, SL, AA | 0.019 (≤18 years)0.009 (age>18) | ± 20% | Beta |
| Risk of death due to moderate exacerbation (per event) |  | Closed (Transparency) | KJ\*, SL, AA | 0.00027 | ± 20% | Beta | Watson et al.[63]  |
| Risk of death due to severe exacerbation (per event) |  | Closed (Transparency) | KJ\*, SL, AA | 0.001733 | ± 20% | Beta |
| Risk of death due to very severe exacerbation (per event) |  | Closed (Transparency) | KJ\*, SL, AA | 0.001801 | ± 20% | Beta |
| *Effects of PM2.5* |  |  |  |  |  |  |  |
| RR incident asthma (per 5 ug/m3 PM2.5) | Pivotal decision | Open | KJ\*, AA, SL, SH, RC, SHC, ZZ | 1.16 (≤18 years)1.07 (>18 years) | 1, 1.20 | Log-normal | Khreis et al.[35] Lee et al.[36]  |
| RR for loss of asthma control (per 10 ug/m3 PM2.5) | Pivotal decision | Open | KJ\*, AA, SL, SH, RC, SHC, ZZ | 1.04 | 1, 1.20 | Log-normal | Yao et al.[30]  |
| RR for moderate exacerbation (per 10 ug/m3 PM2.5) | Pivotal decision | Open | KJ\*, AA, SL, SH, RC, SHC, ZZ | 1.06 | 1, 1.20 | Log-normal | Yao et al.[30]  |
| RR for severe exacerbation (per 10 ug/m3 PM2.5) | Pivotal decision | Open | KJ\*, AA, SL, SH, RC, SHC, ZZ | 1.07 | 1, 1.20 | Log-normal | Borchers et al.[64]  |
| RR for very severe exacerbation (per 10 ug/m3 PM2.5) | Pivotal decision | Open | KJ\*, AA, SL, SH, RC, SHC, ZZ | 1.06 | 1, 1.20 | Log-normal | Borchers et al.[64]  |
| ***Air cleaner costs*** |  |  |  |   |   |   |  |
| Air cleaner unit rebate (every five years) | Pivotal decision | Closed (Transparency) | KJ\*, SL, AA | $150.00 | ± 20% | Gamma | Retail cost[65]  |
| Annual electricity cost for air cleaner (continuous use) |  | Closed (Transparency) | KJ\*, SL, AA | $10.08 | ± 20% | Gamma |
| Filter replacement (every nine months) | Pivotal decision | Closed (Transparency) | KJ\*, SL, AA | $30.00 | ± 20% | Gamma |
| **Asthma direct costs** |  |  |  |   |   |   |  |
| Well-controlled asthma (monthly) |  | Closed (Transparency) | KJ\*, SL, AA | $24.41 | ± 20% | Gamma | Sadatsafavi et al.[59] |
| Not-well controlled asthma (monthly) |  | Closed (Transparency) | KJ\*, SL, AA | $170.07 | ± 20% | Gamma |
| Moderate exacerbation (per event) |  | Closed (Transparency) | KJ\*, SL, AA | $185.04 | ± 20% | Gamma | Sadatsafavi et al.[66]  |
| Severe exacerbation (per event) |  | Closed (Transparency) | KJ\*, SL, AA | $585.41 | ± 20% | Gamma |
| Very severe exacerbation (per event) |  | Closed (Transparency) | KJ\*, SL, AA | $11,211.59 | ± 20% | Gamma |
| **Asthma indirect costs** |  |  |  |   |   |   |  |
| Well-controlled asthma (monthly) |  | Closed (Transparency) | KJ\*, SL, AA | $161.16 (≤18 years) $1,268.49 (>18 years)  | ± 20% | Gamma | Sadatsafavi et al.[59] & Kennedy et al.[58]  |
| Not well-controlled asthma (monthly) |  | Closed (Transparency) | KJ\*, SL, AA | $886.37 (≤18 years)$1,364.34 (>18 years) | ± 20% | Gamma | Sadatsafavi et al.[59] & Kennedy et al.[58]  |
| Moderate exacerbation |  | Closed (Transparency) | KJ\*, SL, AA | $591.90 | ± 20% | Gamma | Sadatsafavi et al.[66] |
| Severe exacerbation  |  | Closed (Transparency) | KJ\*, SL, AA | $1,183.81 | ± 20% | Gamma |
| Very severe exacerbation |  | Closed (Transparency) | KJ\*, SL, AA | $1,775.71 | ± 20% | Gamma |
| **Utilities** |  |  |  |   |   |   |  |
| General population  |  | Closed (Transparency) | KJ\*, SL, AA | 0.95 (5-11 years)0.89 (12-17 years)0.86 (>17 years) | ± 20% | Beta | Yan et al.[67] |
| Disutility of well-controlled asthma (monthly) |  | Closed (Transparency) | KJ\*, SL, AA | 0.0042 (≤18 years)0.013 (>18 years) | ± 20% | Beta | Lee et al.[36] & Lee et al.[68]  |
| Disutility of not well-controlled asthma (monthly) |  | Closed (Transparency) | KJ\*, SL, AA | 0.0067 (≤18 years)0.017 (>18 years) | ± 20% | Beta |
| Disutility of moderate exacerbation |  | Closed (Transparency) | KJ\*, SL, AA | 0.0057 | ± 20% | Normal | Lloyd et al.[69] |
| Disutility of severe exacerbation |  | Closed (Transparency) | KJ\*, SL, AA | 0.0075 | ± 20% | Normal |
| Disutility of very severe exacerbation |  | Closed (Transparency) | KJ\*, SL, AA | 0.0092 | ± 20% | Normal |

**Table 6. Questions for Participators in the LEAP Model Project**

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| --- | --- | --- | --- | --- |
| **Question** | **Partner A** | **Partner B** | **Partner C** | **Partner D** |
| **Of the modelling decisions you participated in, were there any where you felt your involvement was unnecessary or not appropriate?** | **No.** I don't think unnecessary or not appropriate, but there were some decisions that felt they needed a little more knowledge of the modelling than I had, so I could share my thoughts, but didn't feel like I could participate in the final decision. | **No.** There was at least one element of the decision-making that the team reverted the decisions to the mgmt team. Otherwise they were all appropriate.  | **No.** I believe the research team was very intentional and thoughtful about when to include us in modelling decisions and when to refrain. Of the modelling decisions I participated in, I always felt that my involvement was meaningful and appropriate. I clearly understood the role I played in contributing to those discussions, particularly when the decisions directly benefited from the insight of our lived experiences with asthma. At no point did I question why I was being asked for input, which speaks to how well the team aligned our participation with decisions that genuinely required our perspective. | **No.** I think the patient partner involvement was appropriate |
| **Of the modelling decisions you participated in, were there any where you felt your input should have had a greater impact on the final decision made by the modelling team lead?** | **No.** | **No.** The process was fair and respectful  | **No.** In my experience, the modelling team consistently made an effort to ensure our input was meaningfully considered in the final decisions. They regularly checked in with us to confirm that the outcomes felt reflective of our insights and lived experiences. If there were ever concerns that a decision didn’t fully capture what had been shared, the team was open and accommodating in revisiting the conversation.  | **No.** The researchers and other patient partners were very engaging ... we had good discussions and decisions were made based on evidence, consensus, informed-decision making.  |

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|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Question** | **Partner A** | **Partner B** | **Partner C** | **Partner D** |
| **Thinking about the modelling decisions you participated in, do you have any outstanding concerns about data limitations or other issues that affected those aspects of the model?** | **No.** | **Unsure.** No actually outstanding concerns but the continual concern that the completed model (with the information available to us all) may show some inaccurate assumptions that could skew the messaging. That said, we have been careful to work as best we can to reduce less-dependable data while also clarifying sources and why those sources we used.  | **No.** Initially, I had some concerns about the method used to choose the concentration-response function (CRF) for PM2.5 and asthma incidence. However, after voicing my thoughts and listening to the perspectives of the rest of the team, I felt reassured by how the modelling team approached the discussion. They took the time to understand our varying viewpoints and guided us toward a mutually agreed-upon conclusion. I appreciated that they not only ensured our lived experiences were accounted for but also made sure we fully understood the research terminology and rationale behind the modelling decisions, allowing for a more informed and meaningful discussion. | **No.** We discussed various options including the "weaknesses"/limitations and decided the best option |
| **Were there any modelling decisions you were not involved in where you feel your input would have been valuable?** | **No.** | **No.** It is a great practice to segment the work based on what is reasonable in terms of input.  | **Unsure.** I trust that the modelling team was intentional in involving us as patient partners in decisions where our lived experience could provide meaningful insight. When reviewing Table 1, many of the closed decisions appear to be primarily quantitative and based on existing data, where qualitative input may not have been as relevant. That said, I’m not fully aware of the specific details behind each of those closed modelling decisions, so I can’t confidently say whether my input would have added value in those areas. Overall, I felt the team made thoughtful choices about when to engage us. | **No.** The researchers were great in engaging us if the topics required patient partners' perspectives  |

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|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Question** | **Partner A** | **Partner B** | **Partner C** | **Partner D** |
| **If any of these decisions are revisited in the future, would you like to be invited to contribute?** | **Yes.** If the team thinks it appropriate for me to contribute, I would like to be invited. But I trust the team in their making and communicating their decisions in these matters. | **Yes.** Always interested in the outcomes and where we may have made errors.  | **Yes.** | **Yes.** Open to being involved again - part of the continuity (i.e. easier on everyone :)) |
| **Taking into account your experience with the modelling process and the information provided in Table [4], do you have any concerns regarding the decisions you were not involved in?** | **No.** | **No.** | **Unsure.** While I trust that the modelling team made thoughtful decisions about when to engage patient partners, I’m not fully aware of the specifics behind each of the closed modelling decisions, so I can’t confidently assess whether my input would have been valuable in those areas. That said, I did notice that most decisions related to Relative Risk (RR) for increased asthma risk due to PM2.5 exposure were open, with the exception of the RR for exacerbations. This stood out to me, as I believe our lived experiences, particularly with both well-controlled and poorly controlled asthma, could have offered useful context in understanding exacerbation patterns. Similarly, under the Asthma Costs section, I’m curious about what those costs encompass and whether the figures used truly reflect the financial burden and indirect costs experienced by people living with asthma. These are areas where additional context from lived experience may have been beneficial. | **No.** No concern |

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| --- | --- | --- | --- | --- |
| **Question** | **Partner A** | **Partner B** | **Partner C** | **Partner D** |
| **Do you have any additional comments or reflections that you feel are relevant to evaluating the LEAP model?** | none, i think the team has been great. | It was a great experience.  | One thing that stood out to me throughout this process was how open and collaborative the modelling team was. As someone without a technical background in modelling, I appreciated how they took the time to explain concepts and walk us through their reasoning. It made it easier to engage meaningfully and feel like our input had value. Looking ahead, I’d be interested in seeing how the LEAP model could continue to grow, especially in incorporating more social determinants of health, like socioeconomic status or housing conditions, which often intersect with asthma outcomes. I think accounting for t those realities could make the model even more representative and actionable. | Can't think of now |
| **In its current state, for what purpose(s) do you think the LEAP model should be used for?** | not sure, sorry | The LEAP model can be used to create other models in health research. Specifically how the material was delivered to the team.  | Given my understanding of the model, the LEAP model integrates risk factors, particularly air pollution, alongside interventions and health cost outcomes over time to support health economic evaluations and inform asthma-related policy. Its predictive nature makes it especially valuable for projecting future asthma incidence and prevalence based on environmental exposures like PM2.5. This can guide decision-makers on the potential impact and cost-effectiveness of interventions, such as air cleaners, in reducing asthma-related outcomes. Overall, I see the model being a powerful tool for policy planning, resource allocation, and evaluating the long-term benefits of public health interventions. | Using the model for public health advocacy and (prevention) health policy development |

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|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Question** | **Partner A** | **Partner B** | **Partner C** | **Partner D** |
| **Do you have any additional comments or reflections on patient and public involvement (PPI) in health economics modelling, including the approach to PPI that was taken in this project?** | I think the approach to PPI has been thoughtful and thorough. The approach and decisions have been communicated clearly and transparently. It really feels like the team have done their best to maximise PPI wherever it's been possible and appropriate. | Amazing approach. The plan used in delivering materials to the team can be used as best practices for engaging patient/family partners.  | Being part of this project really showed me the value of patient and public involvement (PPI) in health economics modelling. Traditionally, modelling has been viewed as highly technical and data-driven, but this project demonstrated that lived experience can meaningfully inform decisions, even in quantitative spaces. The team’s approach to PPI was intentional and inclusive. They clearly identified where our input would be most impactful and ensured we were prepared to contribute and always took the time to explain things so that we felt confident participating meaningfully. They also created space for open dialogue, treated our insights with respect, and were open to revisiting decisions based on our feedback. This experience showed me that PPI, when done thoughtfully, doesn’t just make modelling more inclusive, it makes it more grounded in reality and, ultimately, more relevant and ethical. | It was an honour to be invited as a patient partner to be part of the health economics modeling research! I had never thought a patient partners such as myself would be involved in such a research (as I am not a PhD, statistician etc.). The researches (Stephanie, Kate) were very helpful, patience in facilitating the sessions ... from providing an overview of the topics to guiding us what they need from us as a patient partners! I learned so much ... so thanks again for the opportunity! |