Uncertainty and Sensitivity Analysis

This section discusses the uncertainty and sensitivity analysis performed for the current study. The purpose of this analysis is to evaluate the reliability of the results and to identify which parameters most significantly influence the study outcomes.

Sources of Uncertainty

Key sources of uncertainty identified in the model include input data variability, model assumptions, and measurement errors. For each parameter, plausible ranges were determined based on available literature and expert judgment.

Methodology

A probabilistic approach was adopted by generating samples using Monte Carlo simulation. For sensitivity analysis, key parameters were varied one at a time (OAT) as well as simultaneously to assess their individual and combined effects on model outputs.

Results

The analysis demonstrated that outcome X is most sensitive to parameter Y, with a Â±20% change in output for a Â±10% change in Y. Other influential parameters include Z and W. The overall uncertainty range for the primary result was found to be between A and B under the tested conditions.

Limitations

The analysis assumes parameter independence and may not account for all potential correlations. Uncertainties in input data were estimated based on currently available information and may be revised as new data becomes available.

Conclusion

The uncertainty and sensitivity analysis highlights the robustness of the studyâ€™s main findings while emphasizing critical parameters for further investigation. Ongoing improvements to data quality and model assumptions will help refine the results.

Important Notes

- Uncertainty analysis helps quantify confidence in model results and supports informed decision-making.
- Sensitivity analysis identifies parameters that most influence the model outcomes, guiding focus for data collection and refinement.
- Document assumptions and data sources transparently for reproducibility.
- Update analysis if new data or improved methods become available.
- Interpret results in the context of recognized model limitations.