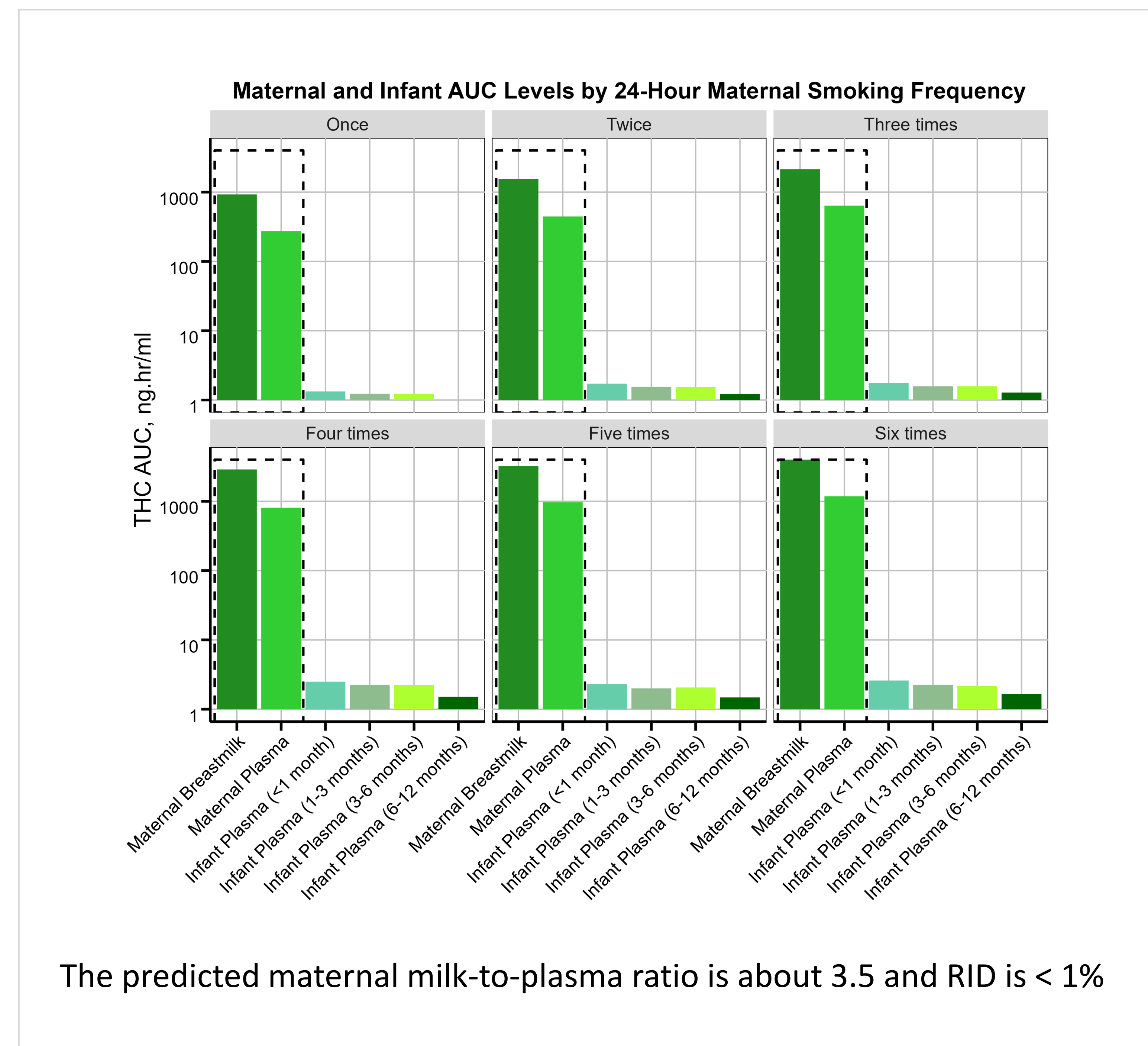


Modeling THC Pharmacokinetics in Infants Exposed to Breastmilk from Recreational Cannabis Users



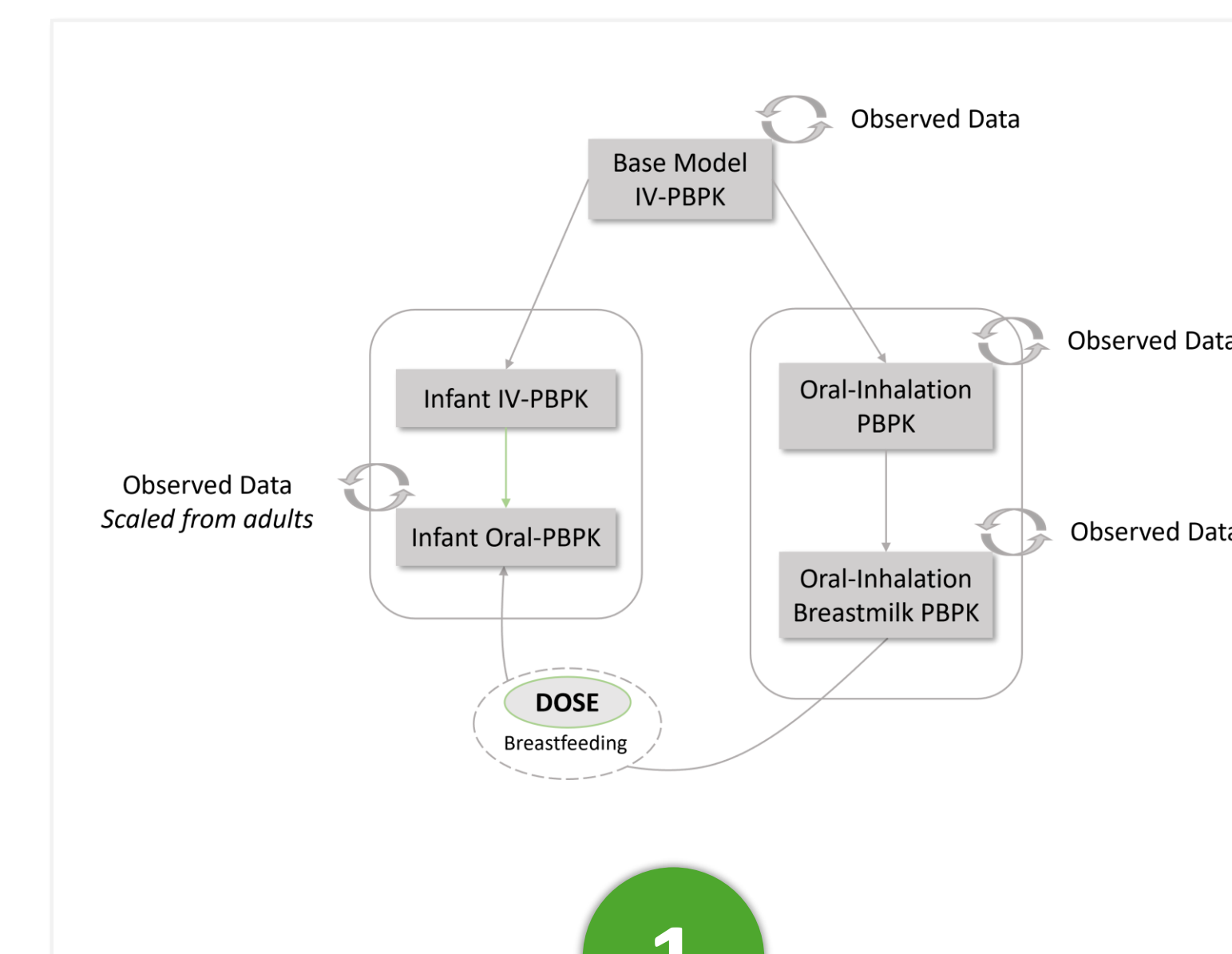
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Motivation

Several studies, including ours, have shown that THC accumulates in breast milk. However, data on corresponding infant exposure via breastfeeding remain scarce due to ethical constraints on conducting a dedicated pharmacokinetic study in this vulnerable population. This lack of information has potentially led to divergent breastfeeding recommendations among lactation professionals, as observed in a recent survey [1]. This study aims to predict infant plasma THC levels using an extended lactation PBPK model.

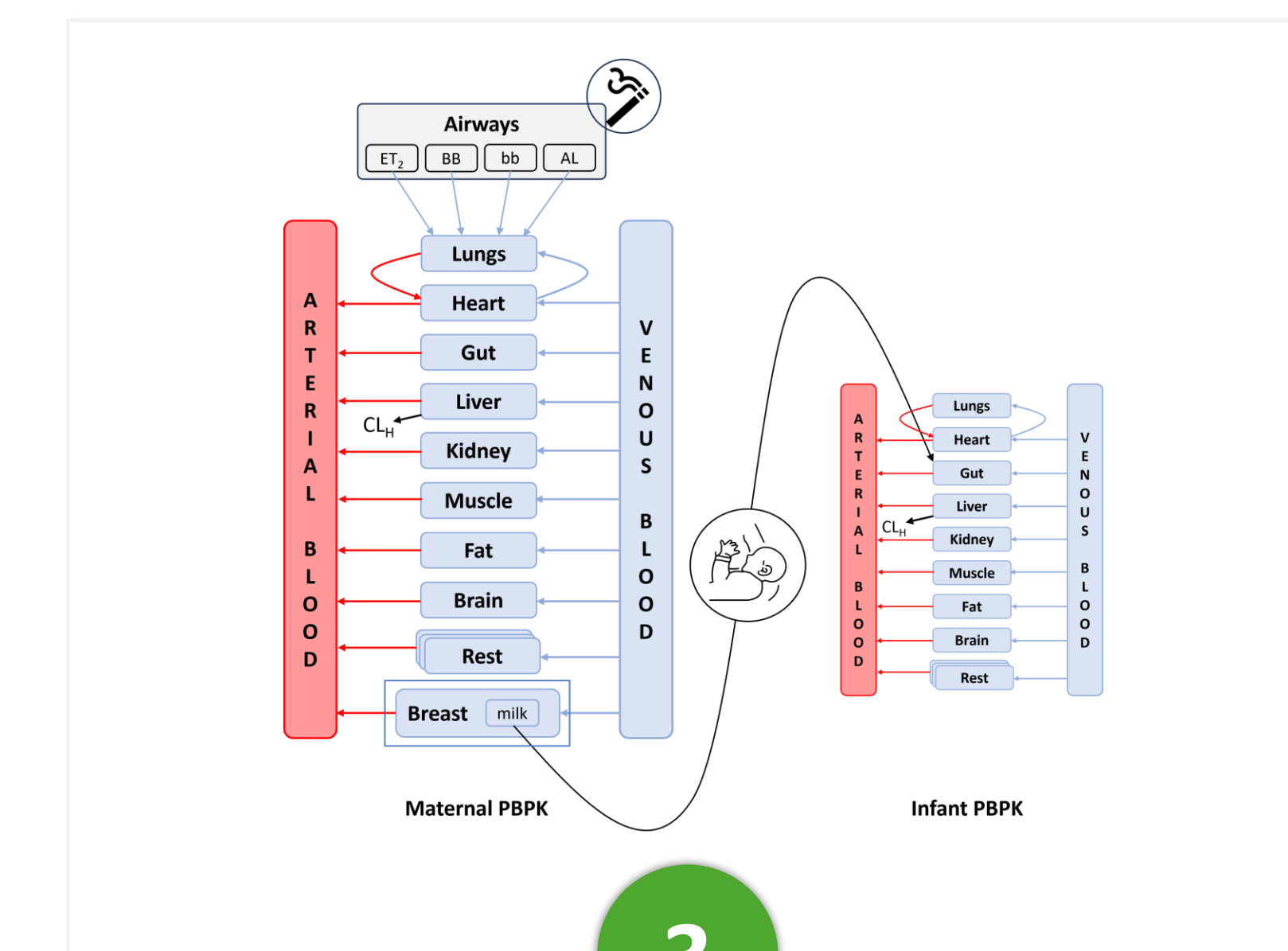
Methods



1 Model workflow

Parameters	Value
Molecular weight – g/mol	314.5
Octanol-water partition coefficient	6.97
Solubility – mg/L	2.8
V _{max} (CYP3A4, CYP2C9) – μmol/min/mg	624, 4905
K _m (CYP3A4, CYP2C9) – μmol/L	0.07, 5.48
Aerodynamic size of THC smoke – μm	0.39
Etc.	

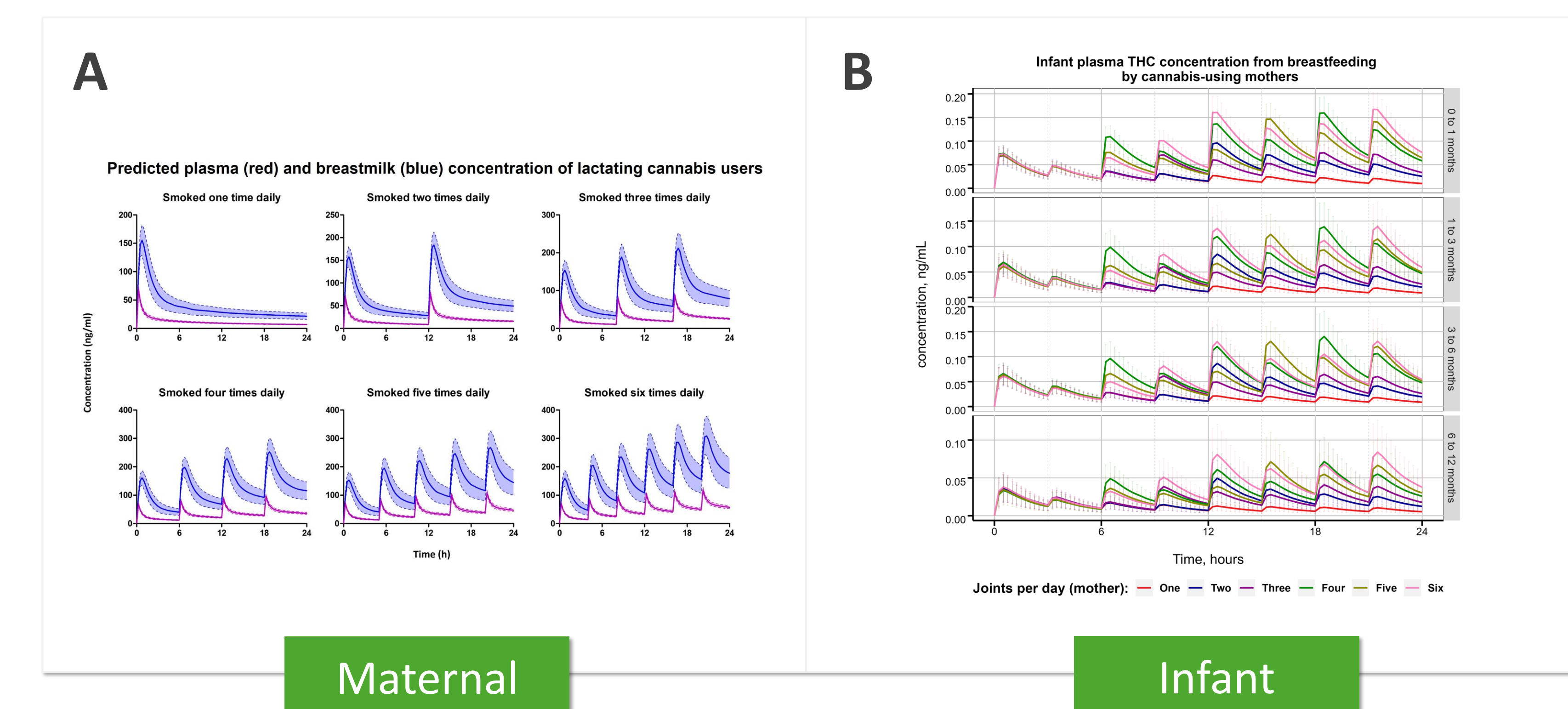
2 Model input



3 Final model structure

Results

A simulation of 100 lactating women (mean age: 28 years, weight: 78 kg) who smoked 0.32 g of a cannabis joint containing 14.14% THC showed that THC concentrations are higher in breastmilk and increase with the frequency of use (Figure A). However, the predicted THC levels in breastfed infants remain far below the reported threshold (2–5 ng/mL) needed to stimulate cannabinoid receptors (Figure B). Infant exposure decreased with increasing postnatal age.



Maternal

Infant

Conclusion

An infant PBPK model describing the pharmacokinetics of THC in infant plasma was successfully developed and validated. Although the model suggests lower THC exposures in breastfed infants' plasma, the potential health risks remain uncertain. Prioritizing research in this area is essential to better equip lactation professionals with evidence-based guidance for women who are actively using cannabis and considering breastfeeding.

References

Bergeria et al. (2015). Surveying Lactation Professionals Regarding Marijuana Use and Breastfeeding. *Breastfeed. Med.* 2015, 10, 377–380.

Infants are exposed to minimal maternal THC via breastfeeding by cannabis-using mothers. However, the benefit-risk balance may require further clinical assessment based on real-world evidence.

