

# Global Lifespan Trajectories of Pain

Matt Fillingim<sup>1</sup>, Azin Zare<sup>3</sup>, Christophe Tanguay-Saborin<sup>2</sup>, Jax Norman<sup>3</sup>, Gianluca Guglietti<sup>1</sup>, Lindsay Neuert<sup>3</sup>, Etienne Vachon-Preseau<sup>3</sup>

<sup>1</sup>Integrated Program in Neuroscience, McGill University, <sup>2</sup>Faculty of Medicine, University of Montreal, <sup>3</sup>Faculty of Dentistry, McGill University  
matthew.fillingim@mail.mcgill.ca

## INTRODUCTION

Pain lacks reliable and generalizable normative measurements across the lifespan, limiting our ability to assess deviations from typical pain patterns. To address this gap, we analyzed data from over 43 studies spanning 65 countries to develop global population-level normative trajectories for pain at eight common bodily locations.

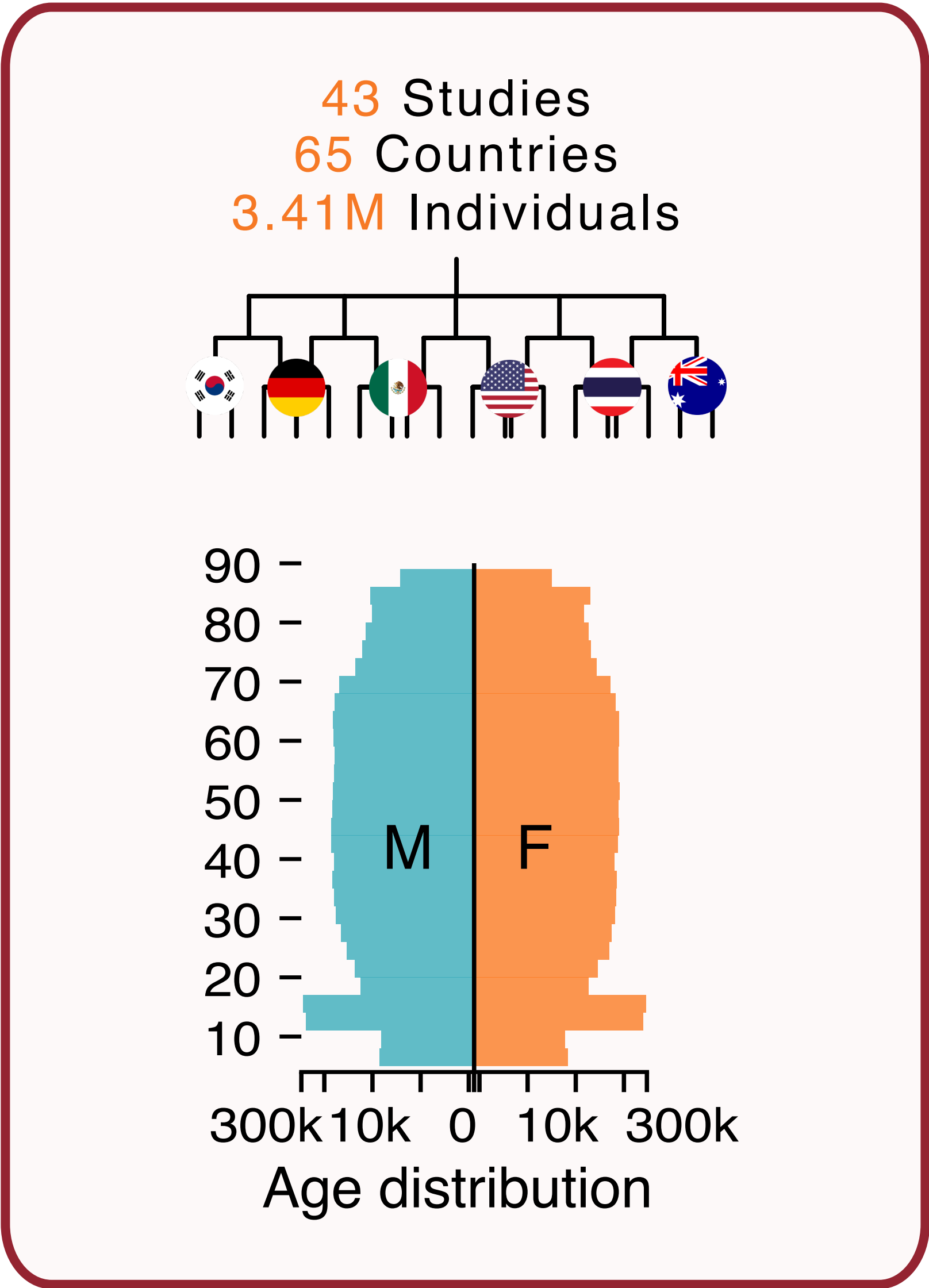
## METHODS

### Data:

Our analysis included data from 3.4 million individuals collected from population-based public datasets, biobanks, and pain surveys. Participants ranged in age from 5 to 105 years, representing populations from all six primary continents. Pain reports covered eight common bodily locations and were based on self-reported experiences of bothersome or interfering pain within the last month or longer.

### Analyses:

We employed generalized mixed-effects logistic regression models to examine the effects of age and sex on the probability of experiencing pain at each bodily location. Fixed effects were included for study site and geographic location, and three cubic splines were applied to capture non-linear age effects. The rate of change (RoC) in pain probability was calculated as the derivative of the fitted spline function with respect to age. Additional models were constructed to examine regional differences, with analyses stratified by geographic region.



Data hierarchy and distribution of ages stratified by males and females (log-scale).

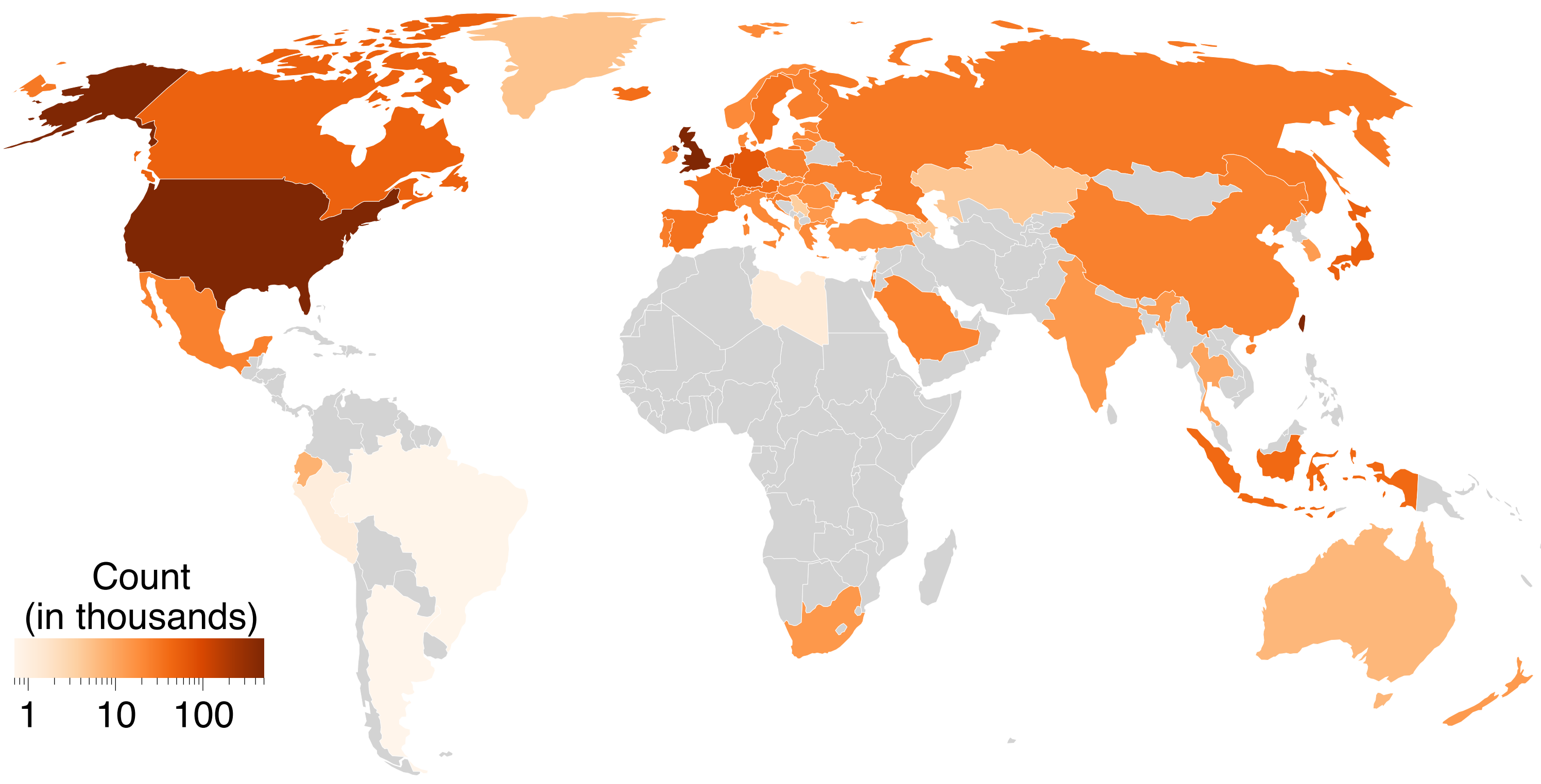
## CONCLUSION

Our study provides global, population-based normative trajectories of pain across the lifespan, capturing the effects of age, sex, and geographic region on eight common bodily pain locations. These findings establish a reliable reference for understanding typical pain patterns, enabling the identification of deviations in clinical and research contexts.

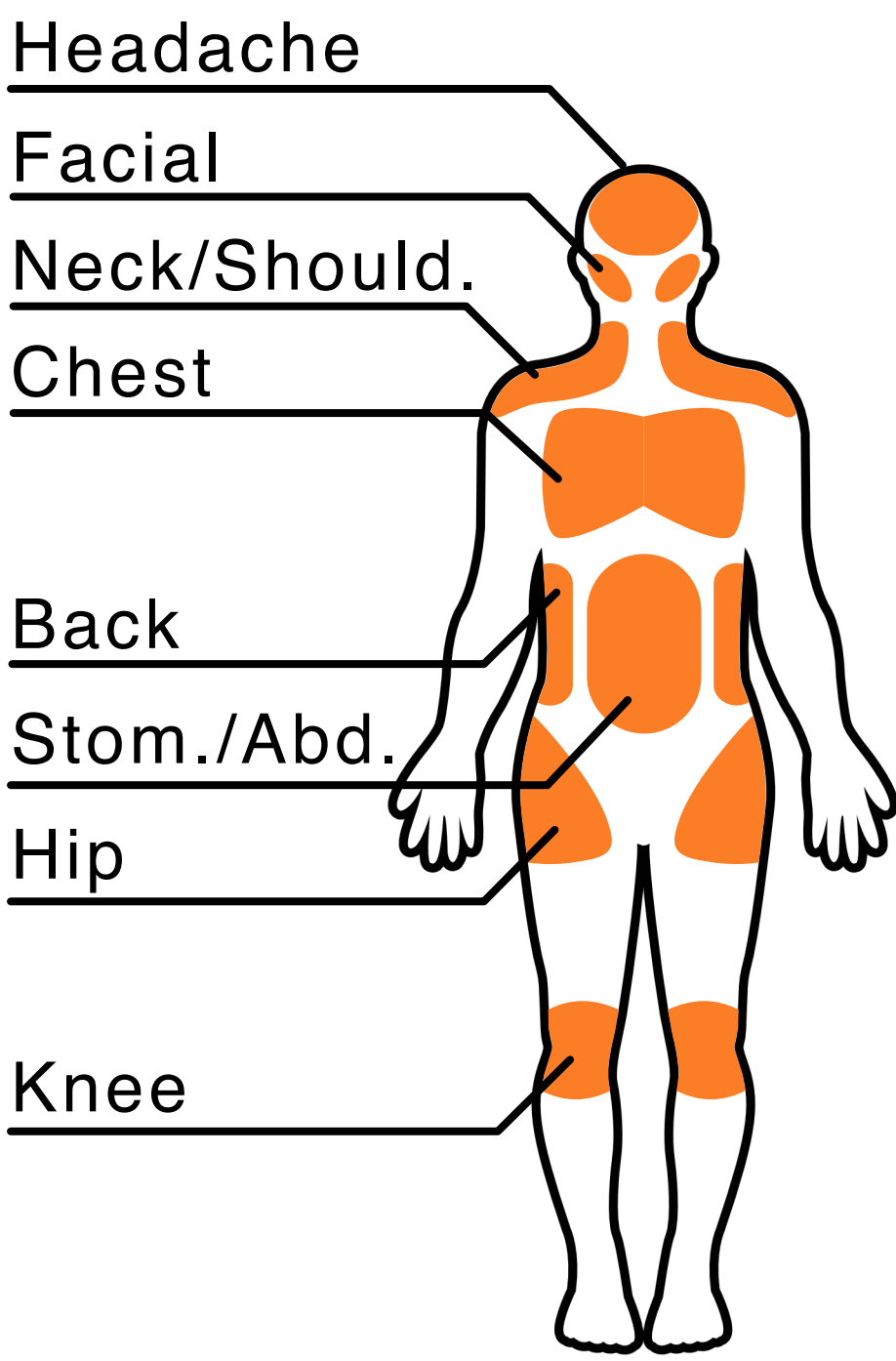


## RESULTS

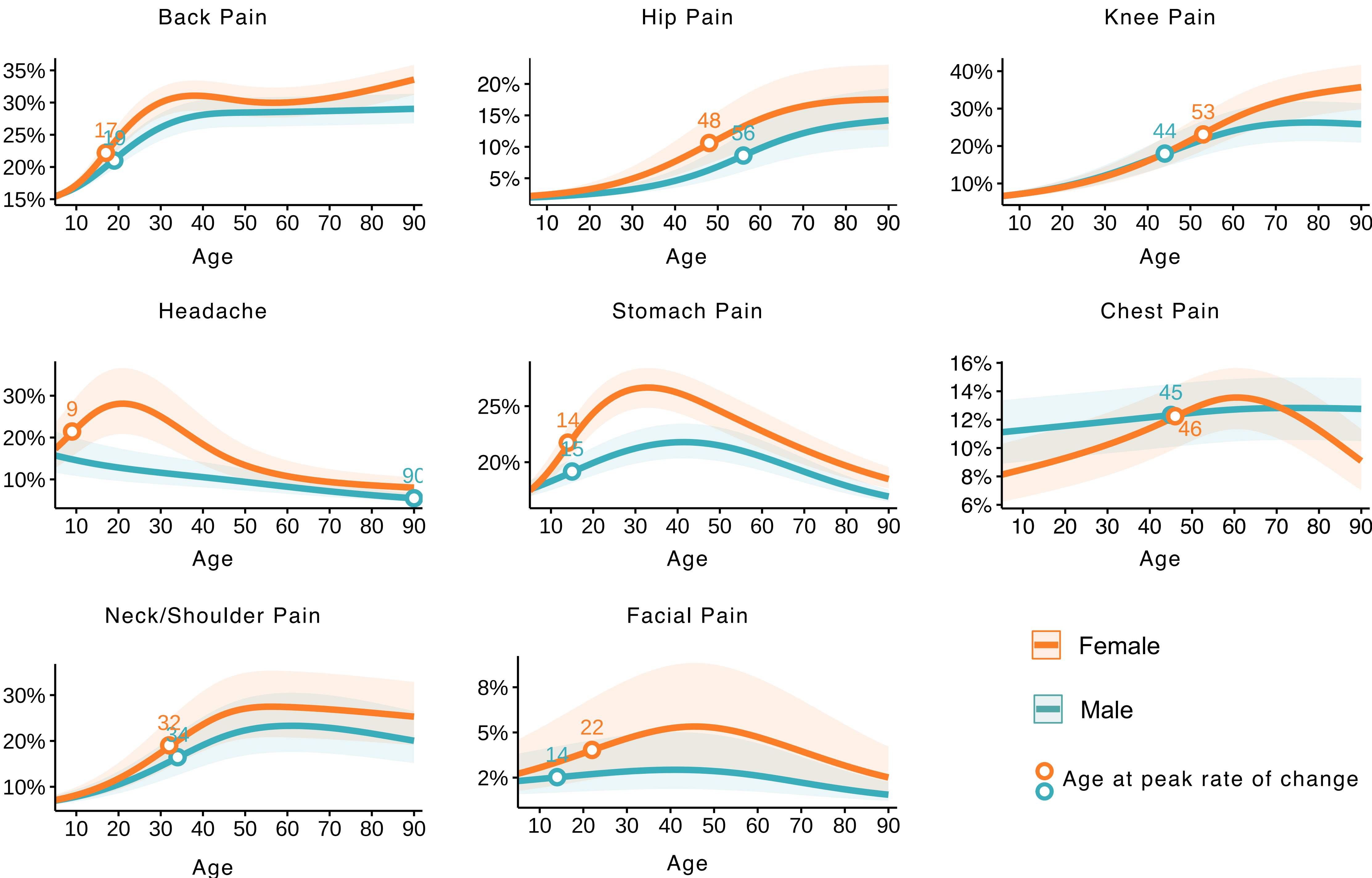
### A I Global sample distribution



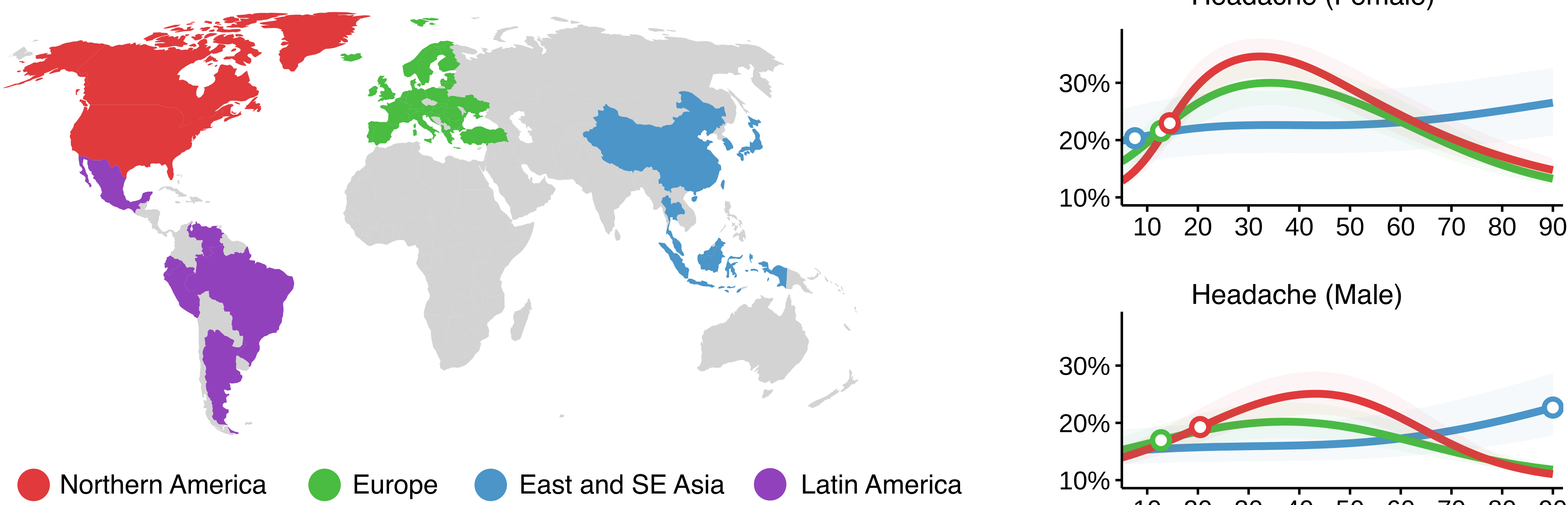
### B I Bodily pain phenotypes



### C I Charting normative probabilities of bodily pain across the lifespan



### D I Regional normative probabilities



**A.** Global distribution of samples across countries, illustrated on a world map. **B.** Schematic representation of bodily pain locations included in the analyses. **C.** Normative predicted probabilities of experiencing pain across 8 bodily locations throughout the lifespan, based on the full sample. **D.** Normative predicted probabilities for headache pain, stratified by three global geographical regions.