



# THAT-Brisbane Launch

*Transport Health Assessment Tool for Brisbane*

*November 23<sup>rd</sup>, 2023, 2-3pm*

Project Leads: Dr Lucy Gunn, A/Prof Melanie Davern

Modelling: Dr Belen Zapata-Diomedes, Mr Steve Pemberton, Dr Alan Both

Knowledge Translation: Ms Katherine Murray



# THAT-Brisbane Launch: Agenda

1. Acknowledgement of Country
2. Introduction to the team and project
3. Transport Health Assessment Tool for Brisbane: Modelling overview
4. Questions
5. Next steps
6. Close

# Acknowledgement of Country



## **Womindjeka – Come with purpose**

RMIT University acknowledges the people of the Woi wurrung and Boon wurrung language groups of the eastern Kulin Nation on whose unceded lands we conduct the business of the University. RMIT respectfully acknowledges their Ancestors and Elders, past and present. RMIT also acknowledges the Traditional Custodians and their Ancestors of the lands and waters across Australia where we conduct our business.

# THAT-Brisbane: Acknowledgements

- Special thanks to our funders:



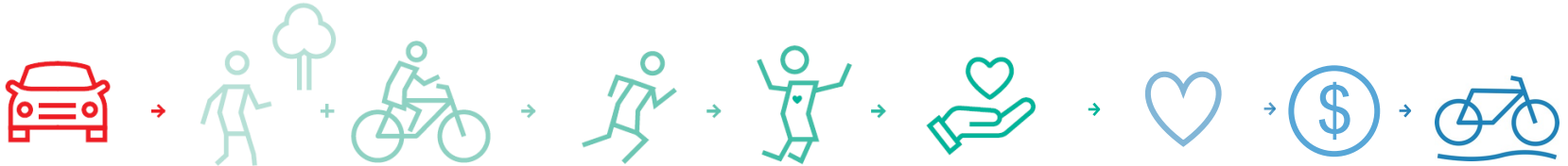
- Support:





# THAT-Brisbane: Introductions

- Research Team
- About the project and thank you to project collaborators
- What is the Transport Health Assessment Tool for Brisbane? What's new?



Short car trips are replaced by Active Transport scenarios

Increased physical activity leads to reduced chronic disease

Health Impacts including HALYs and Life Years are derived from the HIA model

Health benefits, value, and cost saving metrics can be used for advocacy



# Where to find THAT-Brisbane

<https://auo.org.au/>



<https://auo.org.au/that-brisbane/>



# Planning cities and communities

- [AUO Impact & Blog](#)
- [Guidance Notes](#)
- [RMIT AUO + GTAV Resources](#)
- [Advocacy Resources](#)
- [THAT-Melbourne](#)
- [THAT-Brisbane](#)
- [Academic References](#)

Harnessing complex data for future needs

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# THAT-Brisbane: Video

Video explaining the new features and how to use the tool

Let's have a look at this...

<https://player.vimeo.com/video/887169653?h=bde196e1eb>





# THAT-Brisbane Launch

## *Modelling overview*

Modelling:      Dr Belen Zapata-Diomedí  
                         Mr Steve Pemberton  
                         Dr Alan Both

# Health impact modelling

- Health impact modelling serves as a robust methodology designed to quantify the effects of initiatives on population health.
- Particularly valuable for assessing initiatives outside the health sector, such as transportation.
- Health impact modelling provides a comprehensive perspective on the broader influences shaping public health.
- Results from health impact modelling enable a proactive, a priori assessment of policy impacts on health. This anticipatory approach empowers decision-makers with valuable insights into potential health outcomes before implementing policies.

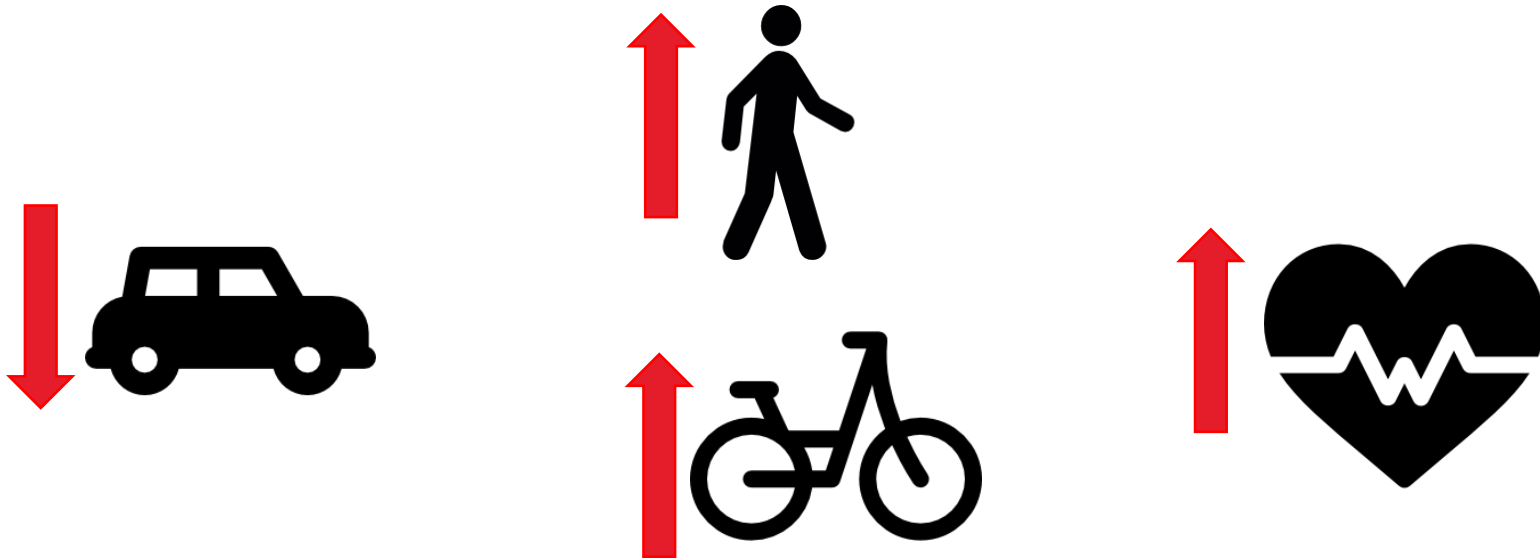


# **Transport Health Assessment Tool for Brisbane**

## **THAT-Brisbane**

What are the health impacts related to physical activity of replacing car trips under 10 km with walking and cycling?

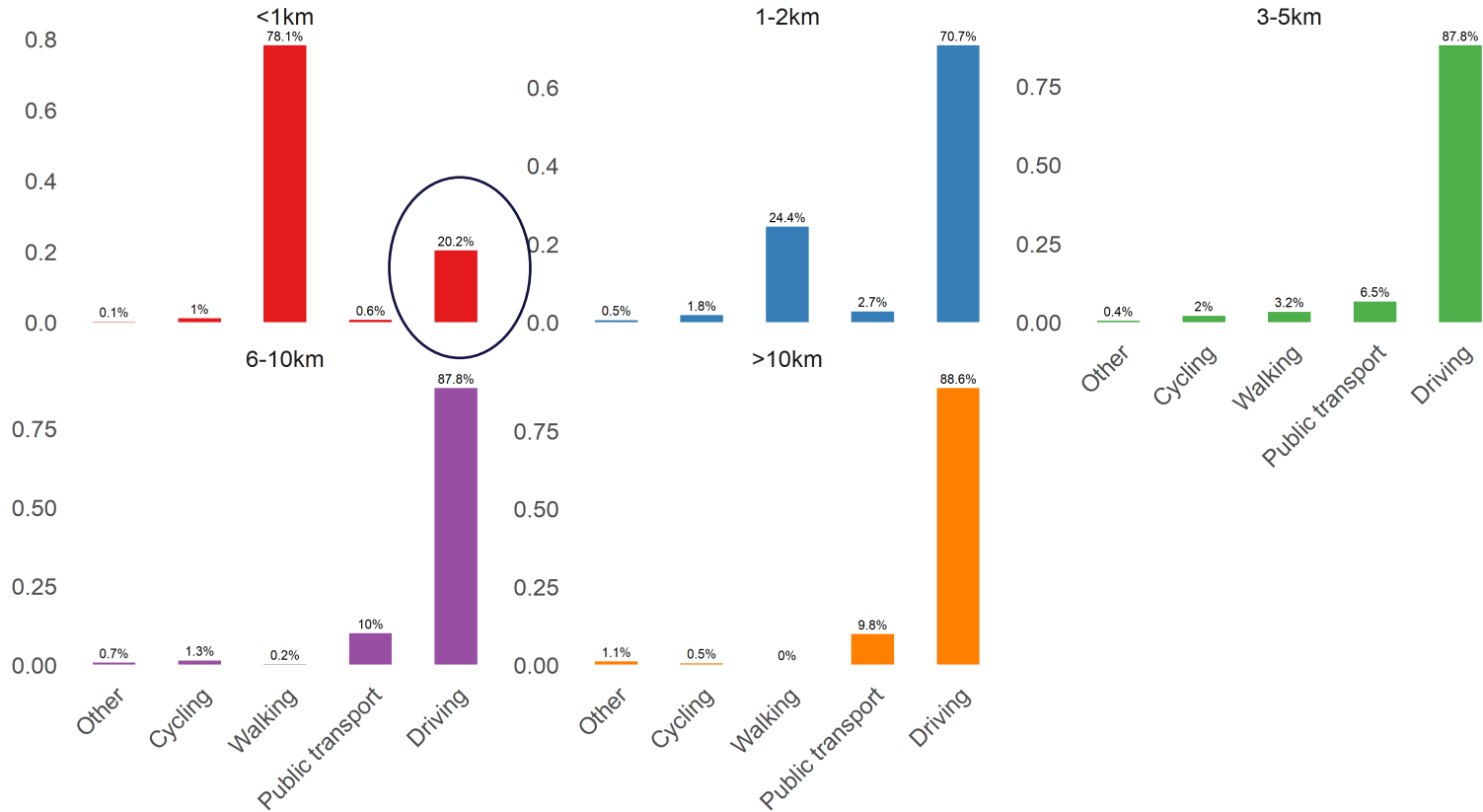
# Overview of THAT-Brisbane



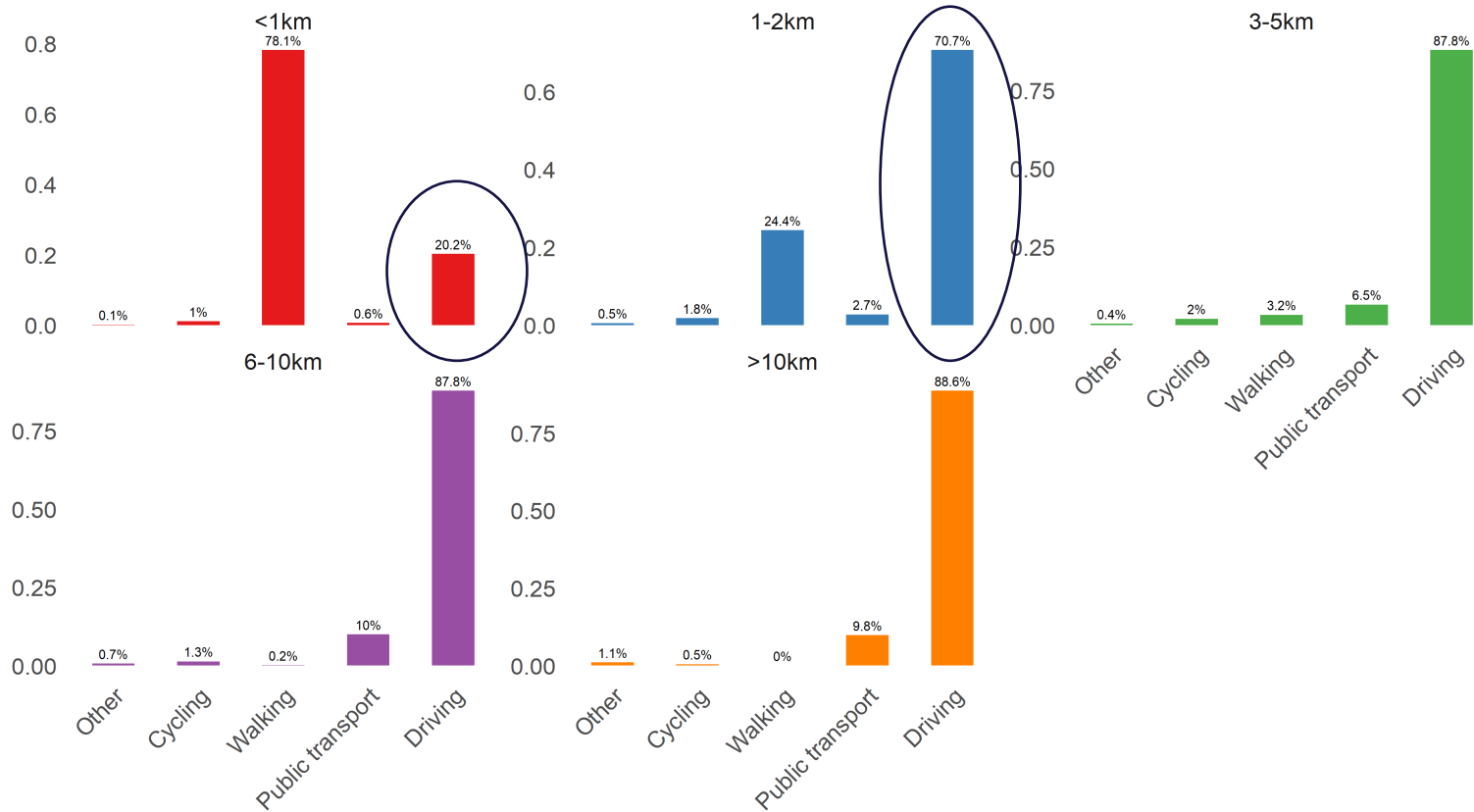
# Transport mode share by distance category Brisbane (trip stages)



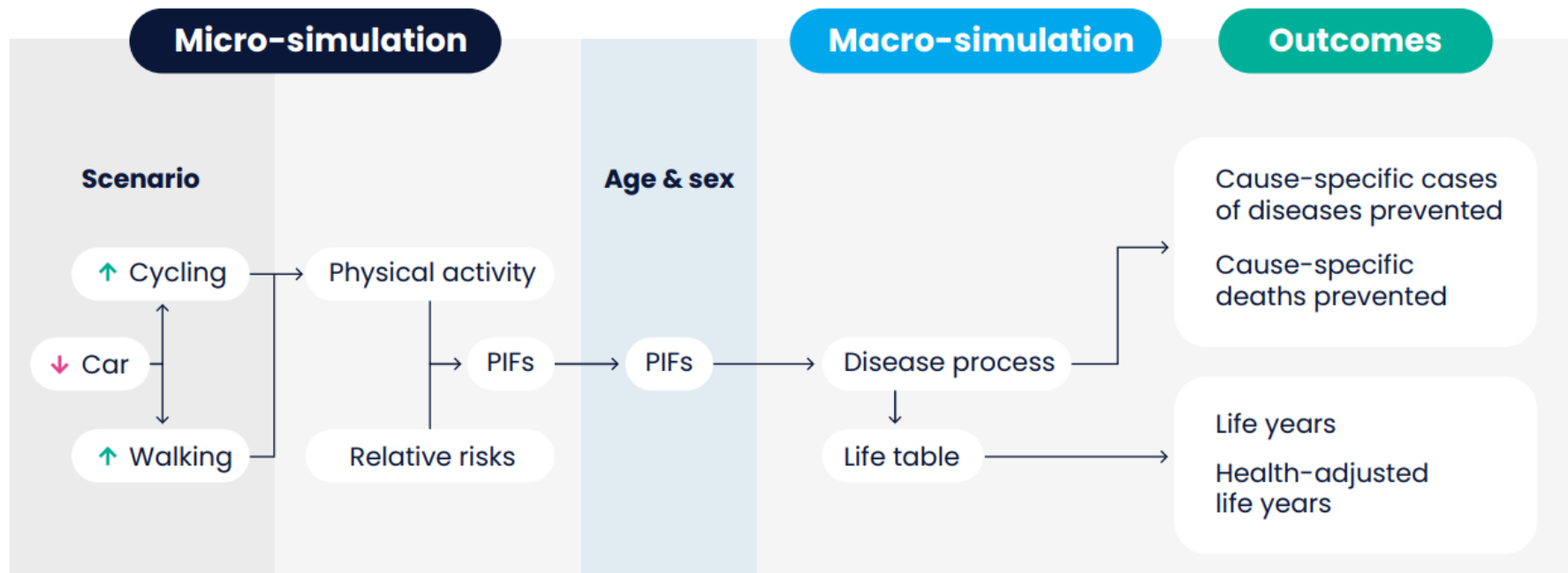
# Transport mode share by distance category Brisbane (trip stages)



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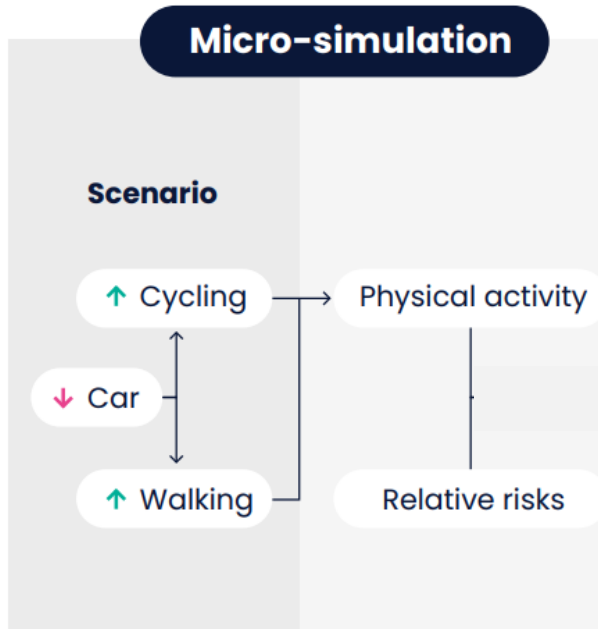


# Overview of THAT-Brisbane methods





# Overview of THAT-Brisbane methods



Inputs	Source
Travel	Queensland Household Travel Survey 2017-2020
Physical activity	National Health Survey 2017-18, Australian Bureau of Statistics(ABS)
Relative risks	Garcia, L., ...& Brage, S. (2023). Non-occupational physical activity and risk of cardiovascular disease, cancer and mortality outcomes: a dose–response meta-analysis of large prospective studies. <i>British Journal of Sports Medicine</i> , bjsports-2022-105669. Pearce, M., ...& Woodcock, J. (2022). Association Between Physical Activity and Risk of Depression: A Systematic Review and Meta-analysis. <i>JAMA Psychiatry</i> , 79(6), 550-559.

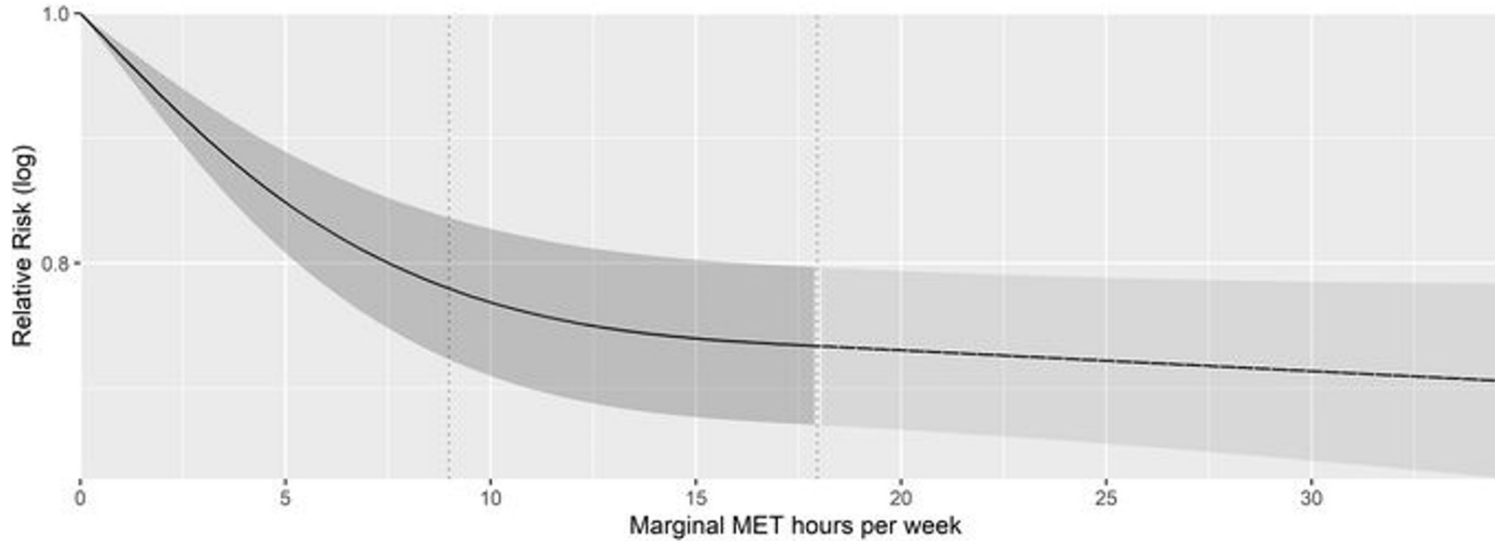


# Example of decreased risk of cardiovascular diseases from increase physical activity

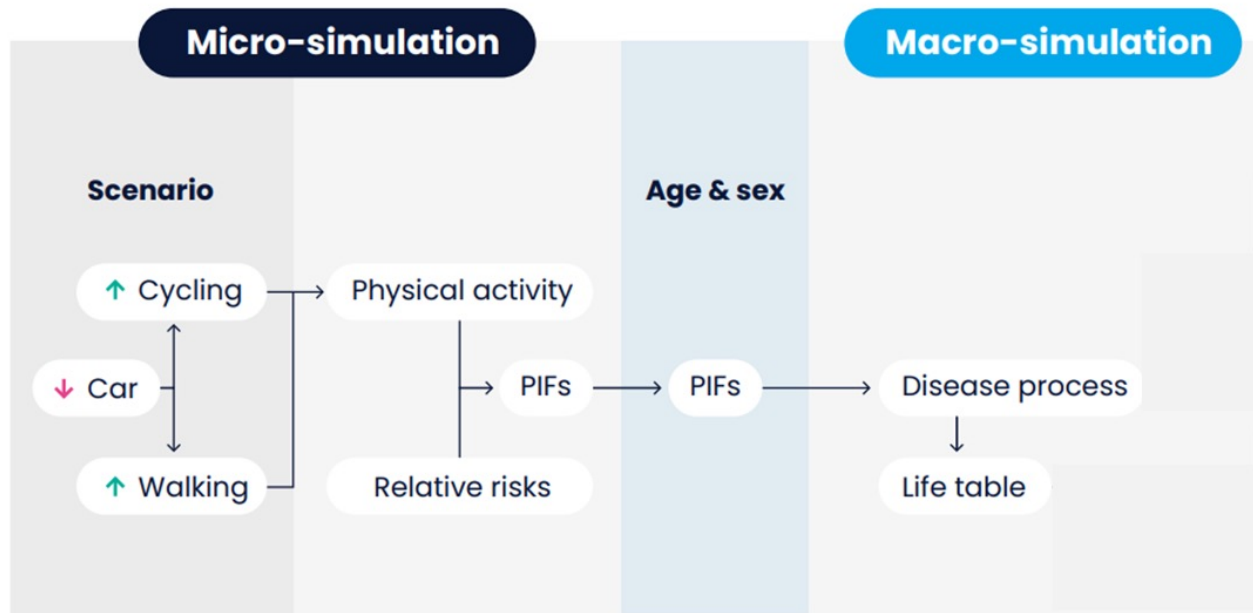
## Coronary heart disease

Number of entries: 26

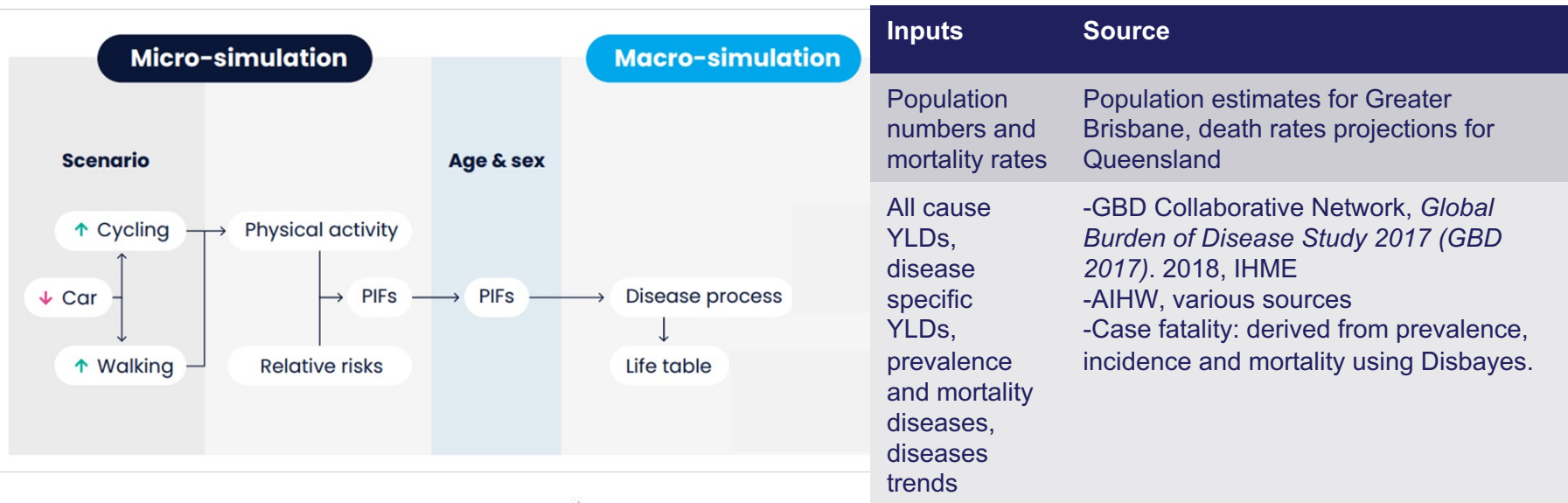
Person-years: 29,071,019



# Overview of THAT-Brisbane methods



# Overview of THAT-Brisbane methods



# Macro-simulation

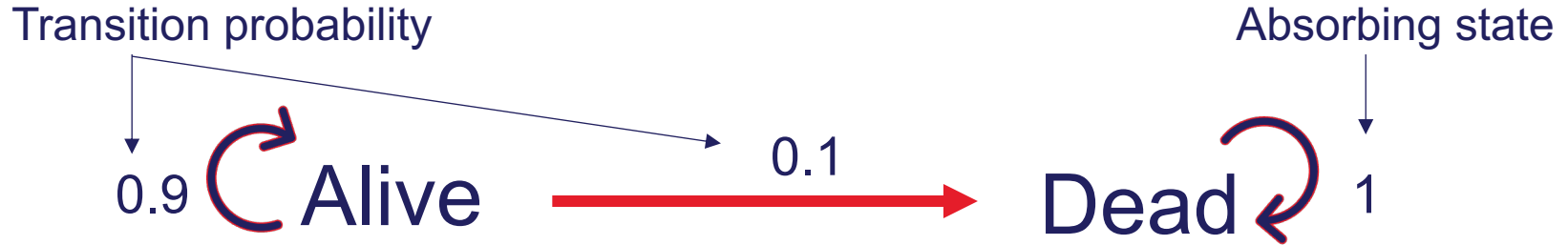
## Proportional multi-state life table model (PMSLT)

- **Combines**
  - **Life tables:**
    - **Two states model:** alive and dead
    - **Outcomes:** life years, health-adjusted life years, life expectancy.
  - **Disease models:**
    - **Three states model:** healthy, disease, dead from the disease
    - **Outcomes:** incident cases, deaths, person-years with disease

Blakely, T., et al. (2020). Multistate lifetable modelling of preventive interventions: concepts, code and worked examples.  
Barendregt, J. J., et al. (1998). "Coping with multiple morbidity in a life table." *Math Popul Stud* 7(1): 29-49.

# Two states model-life table

## State transition diagram



### Recurrent state

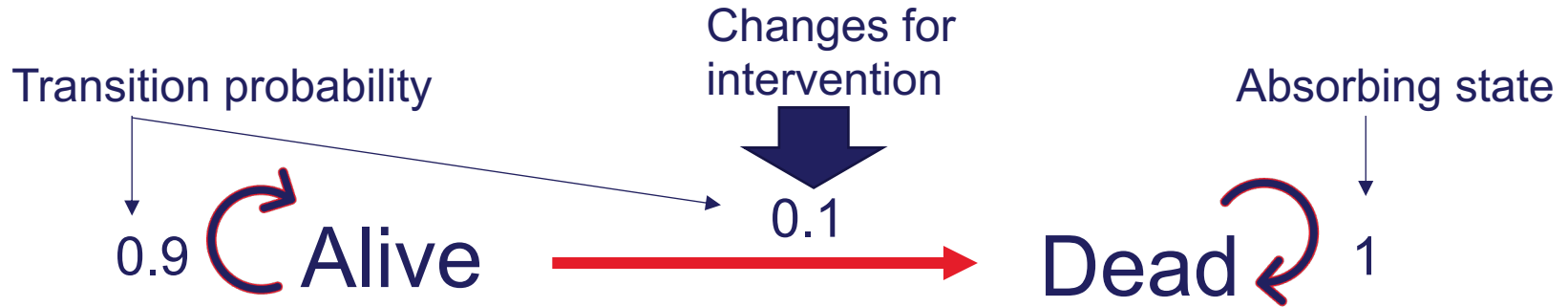
Might leave or stay in the state in the next cycle.

### Absorbing state

Cannot leave state, probability of leaving in next cycle in 0.

# Two states model-life table

## State transition diagram



### Recurrent state

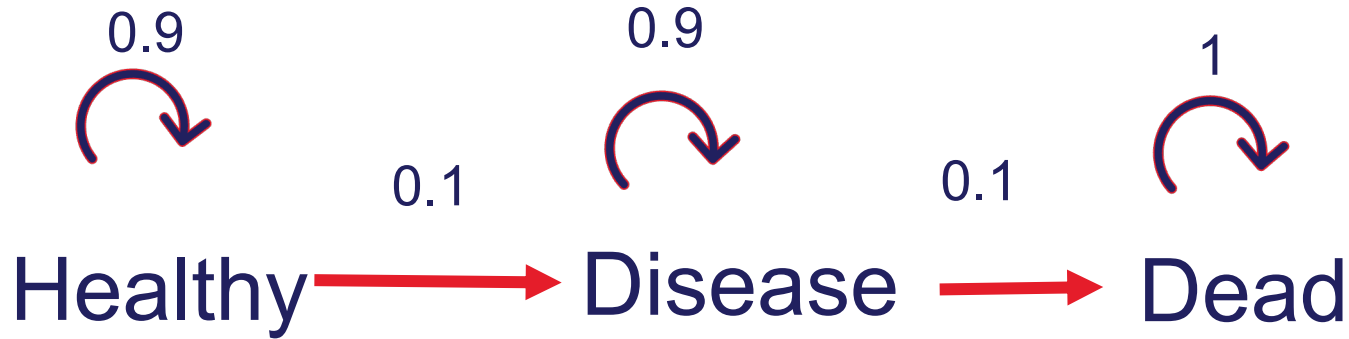
Might leave or stay in the state in the next cycle.

### Absorbing state

Cannot leave state, probability of leaving in next cycle in 0.

# Three states model-disease process

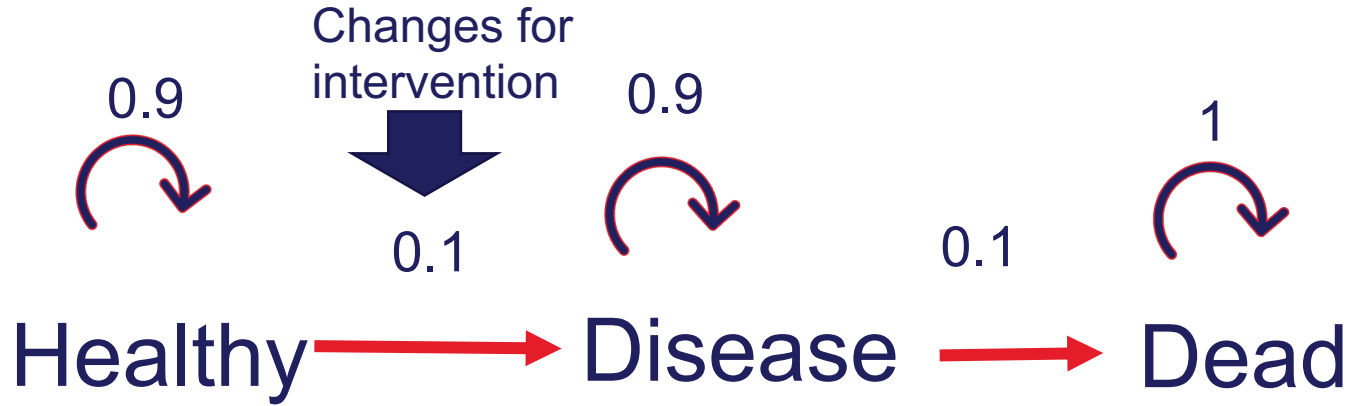
## State transition diagram



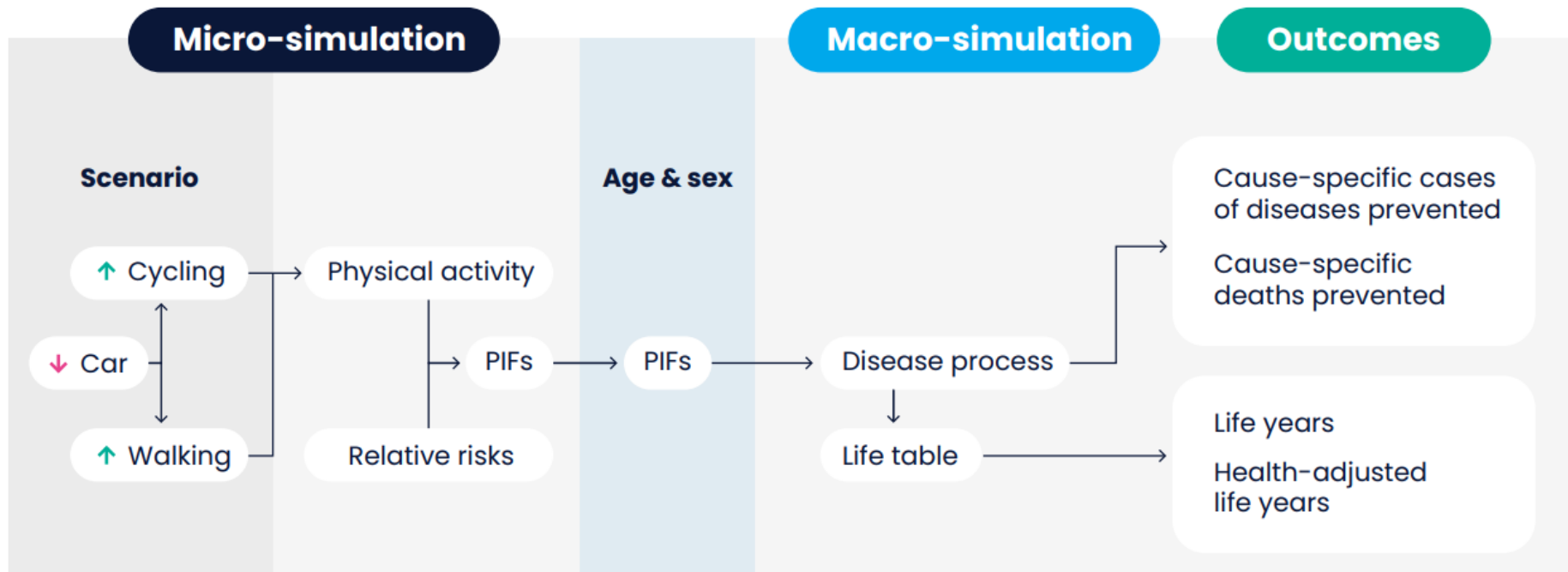


# Three states model-disease process

## State transition diagram



# Overview of THAT-Brisbane methods



# Value



## Trips to replace:

- All ?
- Commuting ?

## Replace car trips with:

Walking

- 0 - 1km with walking
- 0 - 2km with walking

Scenario: replacing car trips under 1km with walking for all trip purposes

Description Incidence Mortality Health **Value** Savings References Credits

The value of improvements to community health can be calculated<sup>a</sup> by translating the Health Adjusted Life Years (HALYs) from each scenario into dollar terms using the value of a statistical life year<sup>b</sup>. The value of a statistical life year is an estimate of the amount a society is willing to trade to reduce the risk of death for one year.

In the simulation model, HALYs are generated across time and are cumulative. Thus, to help us understand the value of HALYs across time in present day terms, it is necessary to use discounting<sup>c</sup> to reduce HALYs generated at the future point in time. Discounted HALYs from these future points can be added up to give the aggregate value of HALYs in today's terms as a measure of the value of improvements to community health arising from the chosen scenario.

HALYs



\$

Value of statistical life: \$5.3m  
Value of statistical life year: \$227,000  
(Office of Best Practice Regulation, in 2022 dollars)

Discount rates: 3%, 5% and 7%

# Savings



## Trips to replace:

- All ?  
 Commuting ?

## Replace car trips with:

- Walking
- 0 - 1km with walking  
 0 - 2km with walking

Scenario: replacing car trips under 1km with walking for all trip purposes

Description Incidence Mortality Health Value **Savings** References Credits

An increase in physical activity due to the chosen scenario reduces chronic disease cases across a lifetime and reduces spending for each disease within the health care system resulting in overall health care cost savings<sup>a</sup>.

Table 3 provides estimated health care cost savings associated with the prevented cases of chronic diseases per 1,000 members of the population according to the selected scenario. These figures are based on applying average health care system costs per prevalent case of disease and using three alternative discount rates<sup>b</sup>:

Change in  
disease  
prevalence



Health system  
cost savings  
(\$)

Estimates of health system costs per prevalent case  
of disease

(Australian Institute of Health and Welfare)

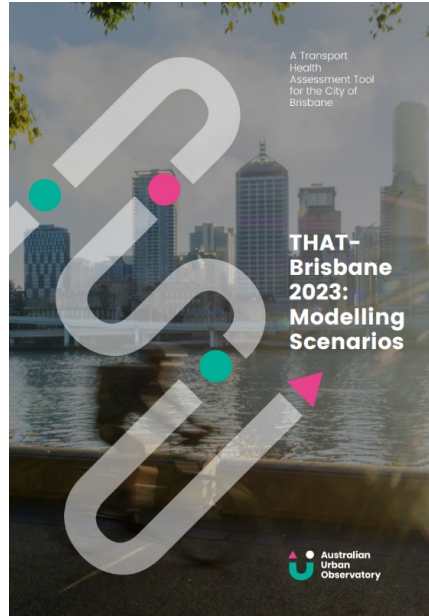
Discount rates: 3%, 5% and 7%

# Download scenario reports via Figshare

QR-Code: Figshare reports



<https://figshare.com/s/1773e83d74a11c410da2>





# THAT-Brisbane Launch

## *Questions for the team*

Chair: Associate Professor Melanie Davern



# THAT-Brisbane Launch

## *Next steps*

Modelling: Dr Belen Zapata-Diomedí

## Next steps



Joining Impact models of transport  
with spatial measures of the Built  
Environment (JIBE)



Developing tools for knowledge  
translation in transport and health  
modelling





# THAT-Brisbane Launch: Close & thank you



Findings brief: <https://preventioncentre.org.au/resources/a-transport-and-health-assessment-tool-for-planning-healthier-cities/>



# THAT-Brisbane Launch: Links & contact

## AUO

<https://auo.org.au/>



## Contact:

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[melanie.davern@rmit.edu.au](mailto:melanie.davern@rmit.edu.au)

[belen.zapata-diomedi@rmit.edu.au](mailto:belen.zapata-diomedi@rmit.edu.au)

## THAT-tools

<https://auo.org.au/that-brisbane/>



<https://auo.org.au/that-melbourne/>



## Scenario reports

<https://figshare.com/s/1773e83d74a11c410da2>



[https://figshare.com/articles/online\\_resource/Downloadable THAT Melbourne scenario\\_results/19027673](https://figshare.com/articles/online_resource/Downloadable_THAT_Melbourne_scenario_results/19027673)





**Thank you**