Rural-urban improvements in modifiable risk factors across Tasmania from an online, public health dementia risk reduction initiative: data from ISLAND (Island Study Linking Ageing and Neurodegenerative Disease)

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1. Background

- People living in diverse rural areas have shown higher rates of Alzheimer's disease and related dementias (ADRD) compared with their urban counterparts[1,2]
- Further, individuals in rural areas have higher rates of modifiable risk factors for ADRD, such as physical inactivity and alcohol misuse, that account for up to 40% of dementia cases[3]
- We've previously shown how our Preventing Dementia Massive Open Online Course (PD-MOOC) and custom Dementia Risk Profile (DRP) tool work synergistically to reduce dementia risk via modifiable risk factors and positive behaviour change[4]
- Tasmania is Australia's only island state and is a geographically diverse place, where access to resources may be limited
- Here we investigated the efficacy of our PD-MOOC and DRP in both urban and rural settings in Tasmania. We hypothesized:
  - Rural participants would display greater ADRD risk via modifiable risk factors as measured via DRP, four-year risk factor trajectories and phosphorylated tau 181 (p-tau 181)
  - Both rural and urban participants would reduce their risk profiles over time.

2. Methods

- Participants were recruited from the ISLAND Study Linking Ageing and Neurodegenerative Disease (ISLAND)[5]
- Rural and urban definitions were defined using Australian Bureau of Statistics' Australian Statistical Geography Standard (Figure 1)
- All ISLAND participants were invited to complete a set of surveys online including a questionnaire on dementia risk factor adherence with custom traffic light feedback tool that presents known risk factors such as physical activity, smoking and hypertension in terms of high (red), medium (amber) and low (green) risk
- All participants were invited to complete the free 6-week PD-MOOC
- At four clinics across the state, participants also provided blood samples for measurement of p-tau 181 and genotyping for apolipoprotein E (APOE) Multilevel longitudinal regression models assessed change in number and type of risk factors, with effects moderated by exposure to the DRP and PD-MOOC

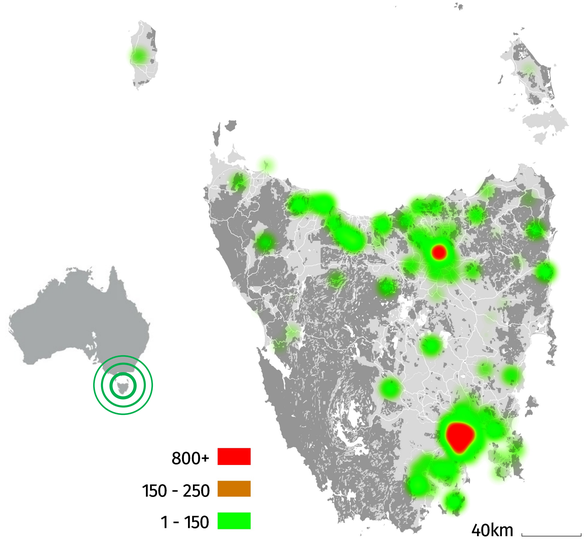

Figure 1: Geographic residence of participants in Tasmania (N per km^2). Red hotspots indicates urban areas: Hobart (South) and Launceston (North)

3. Results I

- Over four years of follow up, both urban and rural participants significantly reduced their modifiable risk factor profiles as measured via the DRP ($p < 0.001$). This benefit was greatest for participants who completed the PD-MOOC (Figure 2)
- There was no significant difference in plasma p-tau 181 (pg/mL) between urban and rural participants (Table 1)
- Urban participants (n = 1,752; 75.2%) were significantly more likely to have a university qualification and be socioeconomically advantaged than rural (n = 579; 24.8%) participants (Table 1)

	Urban	Rural	p-value
N (%)	1,752 (75%)	579 (25%)	
Age at baseline in years (mean [SD])	64.2 (7.69)	64.5 (7.67)	0.450
Gender: N female (%)	1,228 (70%)	425 (73%)	0.311
APOE ε4 presence: N yes (%)	200 (27%)	49 (24%)	0.487
Education: N with prior university degree	1,050 (60%)	282 (49%)	**<0.001**
Socioeconomic status: N advantaged (%)	660 (38%)	23 (4%)	**<0.001**
Plasma p-tau pg/mL (mean [SD])	1.39 (0.65)	1.52 (0.69)	0.521

Table 1: Demographic statistics for included ISLAND participants (n = 2331)

4. Results II

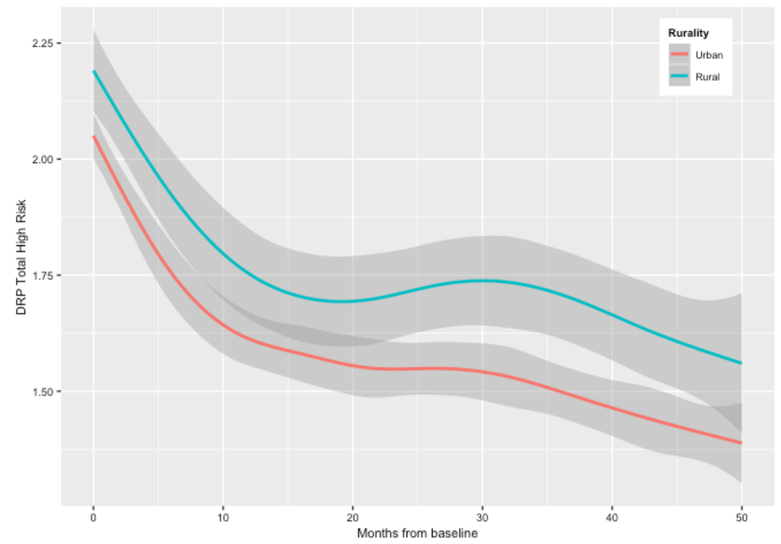

Figure 2: Positive impact of public health initiative on DRP is seen in both urban and rural ISLAND participants (n = 2331, 70.9% female)

5. Conclusions

- Our ISLAND public health dementia risk reduction initiative had a positive impact on modifiable risk factor adherence in both urban and rural Tasmanian Australians.
- This large-scale cohort study shows that an online targeted public health campaign to reduce incidence and prevalence of ADRDs has the capacity to benefit both rural and urban populations.

References

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