A Broad Spectrum of Psychological Traits and Mortality Risk: A Two-Wave Cohort Study

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Background : In many mental disorders, affected individuals have an approximately twofold higher all-cause mortality rate compared to the general population (Correll 2022). Even characteristics in the normal range can significantly impact daily life and mortality rates (Cuijpers 2002). However, the impact of a wider range of subthreshold psychological traits on mortality is largely unexplored. **Purpose:** We examined the impact of 12 psychological traits on mortality.

Methods : We used data from two waves of the Okazaki Study (N ≈ 5,000 per wave). We assessed 12 traits: personality, depression/anxiety, ADHD traits, autism traits, alexithymia, obsessive-compulsive (OC) traits, psychotic-like experiences, problem gambling, quality of life (QOL), subjective happiness, insomnia, and chronotype. Cox proportional hazards models with P-splines confirmed all associations were linear; thus, we report Hazard Ratios (HRs) per 1-SD increase, adjusted for sex and age.

Results : Depression/anxiety (HR=1.24) and lower subjective happiness (HR=0.76-0.89) were consistent predictors of mortality across both waves. Alexithymia (HR=1.17) and ADHD traits (HR=1.10) were also significant predictors in the second wave. In the third wave, OC traits (HR=1.19), insomnia symptoms (HR=1.19), and lower QOL (HR=0.69) were significantly associated with mortality.

Conclusion : Depression/anxiety, insomnia, and lower subjective happiness/QOL were intercorrelated, suggesting their link to mortality is driven by common internalizing traits. This, and the findings for alexithymia and ADHD traits, is consistent with previous research. Crucially, we identified obsessive-compulsive traits as a novel risk factor for mortality. Future research should elucidate the pathways linking these traits to mortality.

Association between the Scientific Long-Term Care System Add-on and the Continence Support Add-on

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Background : The Long-term Care Information System for Evidence (LIFE), introduced in 2021, aims to improve care quality through evidence-based practice. The effects of outcome-based add-ons such as the ADL Maintenance and Continence Support Add-ons remain unclear. This study examines the association between the Scientific Long-Term Care System Add-on and uptake of the Continence Support Add-ons to clarify the role of policy incentives in promoting quality improvement.

Methods : This study was deemed exempt by the institutional Research Ethics Committee. We analyzed data from 8,218 long-term care facilities using the SCUEL database constructed by MeCompany to examine the association between the Scientific Long-Term Care System Add-on and Continence Support Add-ons (II–III). The primary outcome was the presence of Continence Support Add-ons, and the main exposure was the Scientific Add-on. Covariates included facility size, staffing composition, residents' care-need levels, prefectural population density, and the number of non-scientific LIFE-related add-ons. Inverse probability of treatment weighting (IPTW) with 1% trimming was applied, and weighted logistic regression was performed to estimate marginal effects.

Results : Unweighted descriptive statistics showed that the prevalence of Continence Support Add-ons II－III was 5.0% (421/8,218). Among facilities without the Scientific Long-Term Care System Add-on, the prevalence was 0.4% (12/3,219), compared with 7.9% (409/5,199) among those with it. Weighted logistic regression confirmed a significant association, with facilities implementing the Scientific Add-on being more likely to claim Continence Support Add-ons II–III (odds ratio: 2.44, 95% CI: 1.28–4.68, p =0.007).

Conclusions : Facilities that implemented the Scientific Long-Term Care System Add-on were significantly more likely to claim Continence Support Add-ons II–III.

Target Trial Emulation under Non-Mutually Exclusive Assignment: Structural Pitfalls and Methodological Remedies

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Traditional epidemiologic designs typically assume that the exposed and unexposed groups are mutually exclusive, forming the foundation for causal inference. Target Trial Emulation (TTE), an increasingly adopted framework for estimating causal effects from observational data, may not always require this assumption. Although often applied in settings with non-mutually exclusive treatment assignment, the implications of such structures for causal estimation are underexplored. In real-world contexts, patients may receive overlapping treatments or neither, leading to ambiguous group distinctions that challenge effect validity. We conducted a simulation study evaluating multiple TTE implementation strategies under non-mutually exclusive treatment assignment. Treatment overlap and covariate alignment were systematically varied to assess how emulation strategies perform under violations of mutual exclusivity. Our results show that non-mutually exclusive assignment can introduce substantial bias unless treatment overlap and positivity are explicitly addressed during propensity score estimation and outcome modeling. Notably, when covariate overlap is sufficient, non-mutually exclusive assignment can recover marginal effects with performance comparable to or exceeding mutually exclusive assignment. However, when overlap is poor, even advanced strategies fail to recover the true marginal effect. These findings underscore the importance of aligning study design, estimand, and treatment-assignment structure when applying TTE in real-world settings.

GIS-Based Assessment of Cross-SMA Accessibility to Identify Underserved Regions and Priority Hubs

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Background : Japan has established Secondary Medical Areas (SMAs) as units for providing secondary medical care, primarily focused on inpatient treatment. Yet SMAs contain heterogeneous urban–rural contexts and hospital scales. Under universal coverage, financial barriers are relatively small. Therefore, patients often choose hospitals outside their SMAs when access is easy. This study proposes an indicator of potential healthcare resource availability that incorporates resources from the focal SMA and neighbors.

Objective : To visualize and validate potential access to hospital resources that accounts for cross-SMA relationships, with geography operationalized as road-network travel time.

Methods : We applied the Enhanced Two-Step Floating Catchment Area (E2SFCA) method. Bed counts were treated as capacity, with each hospital's capacity contributing to areas reachable within 60 minutes by car, weighted by distance decay. For each SMA, we computed an accessibility index (Ai) and mapped it. Face validity was assessed by comparing Ai with observed patient flows between SMAs (self-sufficient, outflow, inflow).

Results : The E2SFCA indicator refined existing classifications by distinguishing underserved SMAs with access to neighboring regions from those without. A low Ai suggests limited interchange with neighboring areas. Patients are constrained to use resources within their own medical area. Conversely, a high Ai implies SMA-boundary movement, indicating that patients can draw on a broader pool of medical resources beyond their own area.

Conclusions : Accounting for geography clarifies heterogeneity within underserved regions, distinguishing SMAs with no viable recourse beyond their own limited resources from those functionally supported by nearby capacity. E2SFCA thus provides a policy-ready indicator for hospital consolidation, mergers, and referral-network/transport design under population decline, complementing bed and workforce counts with travel-based realism.

Employer and Alumni Perspectives on Graduate Skill Requirements in Epidemiology and Biostatistics

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Introduction : The demand for epidemiology and health data analytics skills has increased globally. This study aims to determine Australian industry needs as described by potential employers and recent graduates to inform teaching curricula.

Methods : Industry partners were interviewed to discuss essential workplace skills for new Masters graduates in epidemiology and biostatistics. Recent University of Melbourne Masters graduates completed an online survey, rating the importance of workplace skills and extent of insufficient teaching during their degree on a Likert scale ranging 1-5. Heatmaps were generated to visualise relationships between these two dimensions with those with a latter median score ≥4 identified as targets for curriculum enhancement.

Results : Between December 2024 and June 2025, 8 of 20 industry partners were interviewed and 42 of 412 eligible graduates completed the survey. Three key skill themes emerged:*Communication*: Employers emphasised clear, concise, audience-tailored communication. Graduates identified teaching gaps in skills with the following median (IQR): "writing for lay audiences" 4 (3-4), "writing for journals" 4 (3-4), and "oral communication in large settings" 4 (3-5).

Technical: Employers expected proficiency in statistical programs, especially R, alongside strong data management. Graduates reported the greatest gaps in "using R" 5 (4-5), "handling missing data" 4 (3-5), and "data management" 4 (3-5).*Professional*: Employers valued critical thinking and self-directed ongoing learning while highlighting the need for project management. Graduates likewise reported insufficient training in "project management" skills 4 (3-5).

Conclusion : Employers and graduates identified consistent gaps in key skills. Enhancing training in lay and scientific communication, R programming, data management, and project management should be prioritised in epidemiology and biostatistics curricula to ensure graduates are prepared for evolving workforce demands.