Estimating levels of mental health service need by small geographic area: A case study for Aboriginal and Torres Strait Islander adults living in South East Queensland

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Abstract

Objective: The objective of this study was to determine regional variation in need for mental health care for Aboriginal and Torres Strait Islander adults (18+ years).

Methods: Three Australian Indigenous health surveys were analysed, and prevalence rates of high/very high psychological distress (as per the Kessler-5 tool) by the Index of Relative Socio-economic Disadvantage were computed and combined via meta-analysis. These estimates were applied to census population data to estimate regional needs and summed to geographic planning regions. Final estimates were assessed for face validity by comparing with other existing estimates of mental health need.

Results: The Index of Relative Socioeconomic Disadvantage had a dose–response relationship with high/very high psychological distress, whereby the more disadvantaged an area, the greater the levels of reported distress. This methodology resulted in varying levels of need within South East Queensland.

Conclusions: The approach was found to have good face validity and provides a data-driven method to determine relative levels of need.

Implications for Public Health: To ensure equity of mental health service provision, planners should account for variation in levels of need within a catchment. This method may be used throughout Australia to determine regional variation in need for care where other data are lacking to ensure evidence-based investment planning decisions at the local level.

Key words: Aboriginal and Torres Strait Islander, social and emotional wellbeing, service planning, Indigenous, First Nations, health disparities

Introduction

It has been well established that the mental health needs of Aboriginal and Torres Strait Islander people are best accommodated through tailored services that harness individual and community strengths.[1,2] Additionally, the key to achieving Aboriginal and Torres Strait Islander health equity is being able to access services that are free of racism, responsive and culturally safe.[3] To be able to effectively plan for these mental health services, it is important to understand and quantify who in the population may need them.

In Australia, there are national mental health surveys[4,5] that can be used to derive mental disorder prevalence and corresponding service-need estimates. However, these surveys do not disaggregate results by Indigenous status. In the absence of nationally representative data on the prevalence of mental disorders for Aboriginal and Torres Strait Islander populations, proxy measures have been used. One study using the Kessler-5 (K-5) psychological distress scale and self-reported diagnosis of mental disorders estimated the prevalence of mental disorders for Aboriginal and Torres Strait Islander adults in 2007 to range from 33 to 68%.[6] Although national estimates serve an important purpose in estimating need on a national level, they are not very useful for sub-national planning. To do this kind of planning, these estimates need to be accompanied by information about how the prevalence (and subsequent level of service need) may vary across regions.

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To be able to plan for mental health service provision, it is important to know whether the level of need within a catchment varies across the smaller subregions that comprise it. If planners assume that the level of need across the catchment is equal, there may be areas of greater service need that end up being not sufficiently resourced to meet this need. With scarce resources and limited funding, it is important to take an equity-based approach when service planning and ensure that services are available for, and used by, those who need them most.[7] This is particularly important when considering planning for Aboriginal and Torres Strait Islander populations who comprise varying proportions of the total population in different areas and require tailored service responses that meet their unique needs.[2]

Previous studies have used known correlates of mental health need at the national level to predict mental health need at smaller area levels. In a paper by Meadows et al.,[8] the Index of Relative Socioeconomic Disadvantage (IRSD) was used in combination with the Kessler-10 psychological distress measure (K-10) to create an index to identify overall population mental health bed needs in Victoria. They found that the resulting need-adjusted demand ratios ranged from 0.6 to 1.4 across different areas.[8] The IRSD was used because previous research found socioeconomic disadvantage to be correlated with poorer mental health and higher levels of psychological distress.[9] Significant psychological distress, as measured using the K-10, is correlated with diagnoses of mood and anxiety disorders in non-Indigenous samples.[10] There is a modified five-item version of this measure (K-5), which is routinely used to capture the psychological distress levels of respondents in Aboriginal and Torres Strait Islander health surveys.[11]

The Torrens University Public Health Information Unit (PHIDU) has developed the Aboriginal and Torres Strait Islander Social Health Atlases of Australia that map a range of demographic and social indicators, as well as indicators of health status and service use, by Indigenous Areas (IAREs) and Indigenous Regions (IREGs).[12] This includes the modelled prevalence of K-5 high/very high psychological distress based on the 2018/19 National Aboriginal and Torres Strait Islander Health Survey (NATSIHS).[13] To generate these small-area estimates, survey responses from the NATSIHS are combined with demographic information from the Census and administrative data sources to build a predictive model.[13] Whist this is a step forward in understanding small-area variation in psychological distress among this population, IREGs are larger than traditional areas for service planning (e.g. Statistical Area Level 2 or 3). It can also be resource intensive to combine data sources to be able to model in this way.

This study sought to generate modelled small-area estimates of mental health service needs among Aboriginal and Torres Strait Islander adults for an example catchment of South East Queensland. South East Queensland is a largely urban region and home to 11% of Australia's and 38% of Queensland's Aboriginal and Torres Strait Islander populations.[14] The population across the region is expected to grow from 85,000 in 2018 to 130,000 by 2031, making it the largest and fastest-growing population of Aboriginal and Torres Strait Islander peoples in Australia.[14] Most of the Aboriginal and Torres Strait Islander burden of disease in Queensland, as in the rest of Australia, is in urban areas.[15]

This study was part of broader projects designed to understand mental health needs and access specifically to inform improvements to mental healthcare for Aboriginal and Torres Strait Islander peoples in the South East Queensland region.[16,17] The projects were conducted in close partnership with the Institute for Urban Indigenous Health (IUIH), which is a network organisation of Community Controlled Health Services in this region.

In this study, we sought to explore whether the IRSD can be used as a proxy measure to compare regional differences in psychological distress for Aboriginal and Torres Strait Islander adults. Specifically, we wanted to address the following aims:

1. To understand whether the IRSD can be used as a proxy measure for determining regions of greater mental health service need for Aboriginal and Torres Strait Islander adults (18+ years) mental health service planning and assess the face validity of results by comparing the findings to other available measures.
2. To explore the application of IRSD to model the mental health service needs of Aboriginal and Torres Strait Islander adults living in South East Queensland, across catchments that align with planning and service partnerships between local Aboriginal Community Controlled Health Organisations and mainstream mental health services.

Methods

Positionality Statement

IP, SD, CP and HW are non-Indigenous researchers living in Meanjin (Brisbane), Australia. AF is a non-Indigenous researcher living both in Australia and overseas. SD, AF and CP have a background in psychology, and HW is a psychiatrist. All authors are experienced in quantitative analysis and public health methodologies. We acknowledge that our non-Indigenous cultural lens may have influenced the design and interpretation of the study. As non-Indigenous researchers, we seek to continuously learn and ensure our research is strengths-based and culturally informed. This project was designed in collaboration with local stakeholders from a Community Controlled Health Service to inform mental health service planning for Aboriginal and Torres Strait Islander peoples living in Queensland. As such, we were fortunate to work with a project steering committee and received significant input from Aboriginal and Torres Strait Islander stakeholders who assisted in study conceptualisation, design and interpretation of results.

Catchment information

The Australian Bureau of Statistics (ABS) defines a range of geographical areas, based on population size, that build upon each other.[18] The smallest area unit used to release census data is Statistical Area Level 1 (SA1); these are then aggregated into Statistical Area Level 2 (SA2), followed by Statistical Area Level 3 (SA3). SA2s and SA3s are often the smallest area levels used for service planning purposes. For example, in Queensland, Hospital and Health Services (HHSs), which are independent statutory bodies responsible for planning and delivering specialist public sector mental health services across specified geographical areas, often plan at the SA2 or SA3 area level. HHS areas also comprise Aboriginal Community Controlled Health organisations delivering primary mental health/social and emotional well-being care. The following analysis therefore focussed on reporting findings at the SA3 area level, building up from the SA2 area level. SA3s comprise populations ranging from approximately 30,000 to 130,000 people and are designed to ensure each has similar geographic and socio-demographic characteristics. In the South East Queensland catchment, there are 50 SA3s, and four HHSs (i.e. Brisbane North,

Brisbane South, West Moreton, and Gold Coast). For comparison with PHIDU data, the SA2s were also aggregated into IARE catchments (11 in South East Queensland). Full details of the South East Queensland catchment can be found in supplementary material, Table A.

Survey and sample

Three iterations of representative cross-sectional household surveys of Aboriginal and Torres Strait Islander peoples' health conducted by the ABS were used: the 2018-19 and 2012-13 NATSIHS and the 2014-15 National Aboriginal and Torres Strait Islander Social Survey (NATSISS). These surveys are alternately completed approximately every four years. To gain a representative sample, a multi-stage sampling process is used, consisting of a community sample (made up of discrete Aboriginal and Torres Strait Islander communities) and a non-community sample (made up of private dwellings outside Aboriginal and Torres Strait Islander communities).[19] Total sample sizes for the past three iterations (spanning 10 years) have ranged from approximately 9,000 (2012/13 NATSIHS) to over 10,500 people (2018/19 NATSIHS), and overall response rates have ranged from 73% (2018/19 NATSIHS) to 78% (2014/15 NATSISS). The ABS provides person weights reflecting the age and sex distribution of the Aboriginal and Torres Strait Islander population alongside the data files for analysis. The survey methodologies for the NATSIHS and NATSISS are explained in detail elsewhere.[20,21] See supplementary material, Table B for a summary of data sources and how they have been used in this study.

Measures

Significant psychological distress (K-5)

The K-5 is a brief measure of psychological distress for use within Indigenous Australian communities.[22] It comprises five questions and measures the frequency of each in the past four weeks: "In the last 4 weeks, about how often did you feel: (1) nervous; (2) without hope; (3) restless or jumpy; (4) everything was an effort and; (5) so sad that nothing could cheer you up?" The responses are indicated using a five-item scale for each question: none of the time (1); a little of the time (2); some of the time (3); most of the time (4); all of the time (5). The scores are then summed to create an overall score ranging from 5 to 25. Levels of psychological distress can be categorised into the following groups: low (5–7), moderate (8–11), high (12–14) and very high (15+).

The index of relative socioeconomic disadvantage

The IRSD is one of the Socio-Economic Indexes for Areas. It is a composite index based on information regarding socioeconomic factors and resources within an area, including weighted contributions from income, education, employment, type of housing and other variables.[23] It is provided in deciles, and a low score indicates an area with relatively greater disadvantage (e.g. the area may comprise many households with a low income or many people in low skill occupations), whereas a high score indicates a relative lack of disadvantage. The IRSD is provided in deciles from 1 (most disadvantaged) to 10 (least disadvantaged). Due to small sample sizes, these were aggregated into quintiles.

Data analysis

The aims of this study were addressed in several steps. First, the past three iterations of Aboriginal and Torres Strait Islander health surveys were used to test the relationship between IRSD quintiles and K-5 high/very high psychological distress and whether this was consistent over time. Each survey was analysed individually in an online secure data analysis facility using Stata (Stata-MP version 16.0), accounting for the complex survey design and weighting procedures. The jackknife method was employed to compute standard errors.[24] χ^2 tests were used to assess whether there was a significant relationship between levels of K-5 high/very high psychological distress and IRSD quintiles. Then the K-5 summary scores, using the cut-off point of high/very high (score 12+) within each IRSD quintile, were computed using weighted percentages and 95% confidence intervals (CIs). Results were then combined into a master dataset and further analysed using RStudio (R version 3.5.1). Random-effects meta-analysis was used to pool prevalence of K-5 high/very high psychological distress within each IRSD quintile across survey years. Before applying these estimates to South East Queensland, a visual inspection of plotted histograms was used to see whether the age distribution of Aboriginal and Torres Strait Islander adults living in South East Queensland was comparable to the age distribution of Aboriginal and Torres Strait Islander adults in Australia.

Next, the mental health service needs of Aboriginal and Torres Strait Islander adults living in South East Queensland were modelled. To do this, population numbers for Aboriginal and Torres Strait Islander adults aged 18+ for the SA2s in the catchment were extracted from the 2021 Census[25] using ABS TableBuilder. Based on the IRSD quintile of each SA2, the expected proportion of people with high/very high psychological distress was multiplied by the population numbers to obtain estimates of the number of people in each SA2 who might have a mental health service need. Using correspondence files, the SA2 populations were aggregated to SA3, HHS and IARE regions to estimate the number of people in each of these regions who might have high/very high psychological distress and therefore a mental health service need. Ranges of 95%CIs were calculated throughout.

The results of this analysis were compared to other available data on possible mental health needs for South East Queensland Aboriginal and Torres Strait Islander populations. As these data sources are only available at certain geographic areas, face validity checks were completed at different geographies. The comparisons made were with:

- Self-reported current mental disorder diagnosed by a clinician using the 2021 Census data at the SA3 level.[26]
- Modelled K-5 high/very high psychological distress based on NATSIHS predictors using PHIDU Social Health Atlas at the IARE level.[12]

The study design and subsequent results were also discussed with the steering committee for the overall project. The steering committee was chaired by the IUIH and comprised both Aboriginal and Torres Strait Islander and non-Indigenous clinicians, service providers and service planners working within the IUIH network and other local health services in the region. The steering committee provided feedback on the face validity of findings throughout.

Results

The proportion of people nationally within each IRSD quintile who had high/very high psychological distress ranged from 18.0% (2014/15 NATSIHS; quintile 5 least disadvantaged) to 35.2% (2014/15 NATSIHS quintile 1 most disadvantaged). Across all survey iterations, there was a significant association between levels of high/very high psychological distress and IRSD quintiles; the proportion of the population with high/very high psychological distress increased with greater disadvantage. However, the relationship between levels of high/very high psychological distress and IRSD quintiles was not linear for all survey iterations. For example, the 2018/19 NATSIHS saw a higher proportion of people in quintile 4 with high/very high psychological distress (28.8%) than in quintile 3 (24.5%). The meta-analysis pooled these prevalence estimates across survey years. Once pooled, a dose–response relationship was evident between the IRSD quintile and high/very high psychological distress. These pooled prevalence estimates were used for the remainder of the study. Individual survey and meta-analysis results can be found in supplementary material Table C. Preliminary checks found consistency in the age distribution of Aboriginal and Torres Strait Islander adults living in South East Queensland to the Australia total.

By applying the IRSD quintile-specific proportions of high/very high distress to each SA2 in the catchment, it was found that the estimated number of Aboriginal and Torres Strait Islander adults in South East Queensland with high/very high distress was 16,633 (30.0%; CI: 26.7-33.5), as shown in Table 1. The estimated proportion of adults with high/very high distress ranged from approximately one in five (21.6%; CI: 18.4-25.1) in the least disadvantaged SA3 (Kenmore – Brookfield – Moggill) to one in three (34.4%; CI: 32.9–35.9) in the most disadvantaged SA3 (Beaudesert). The difference between regions was less pronounced at the IARE and HHS levels. For IAREs the proportion of adults with high/very high distress ranged from 27.2% (CI: 23.6–31.3%) in the least disadvantaged IARE (Brisbane City) to 33.9% (CI: 31.9–35.9) in the most disadvantaged IARE (Esk-Kilcoy). For HHSs, the proportion of adults with high/very high distress ranged from 28.9% (CI: 24.8–33.5%) in the least disadvantaged HHS (Gold Coast) to 32.5% (CI: 30.0–35.1) in the most disadvantaged HHS (West Moreton). **Figure 1** shows maps of the variation of estimated prevalence rates and absolute numbers of people with high/very high psychological distress across SA2 regions within South East Queensland. Figure A in the supplementary material plots the number and proportion of people with high/very high psychological distress by SA3.

Estimated prevalence rates within each region were converted into a percentage of the average level of need (100% being average). The second column in Table 1 shows this variation in the level of need across South East Queensland. For SA3s, this ranged from 72.0% (CI: 68.9–74.8) in the least disadvantaged SA3 (Kenmore – Brookfield – Moggill) to 114.8% (CI: 123.0–107.2) in the most disadvantaged SA3 (Beaudesert). The difference between regions was less pronounced at the HHS level, where the estimates ranged from 96.5% (CI: 92.8–99.9) in the least disadvantaged HHS (Gold Coast) to 108.3% (CI: 112.2–104.7) in the most disadvantaged HHS (West Moreton).

Columns four and five in Table 1 allow for comparison of existing estimates of Aboriginal and Torres Strait Islander mental health need in South East Queensland regions with the findings from this analysis. Column four shows the number of people who reported having a current mental disorder from the 2021 Census at all geographical catchment levels. Column five shows the estimated number of people with high/very high distress from PHIDU modelling at the IARE level based on NATSIHS K-5 scores combined with demographic Census and administrative data to generate small area estimates. This ranged from 684 people in Redland IARE to 4,467 in Brisbane City IARE. Figure B in the supplementary material is a bar chart showing estimates from this study compared to prevalence estimates from the Census at the SA3 level. **Figure 2** is a bar chart showing all three estimates (this study, PHIDU and Census data) at the IARE level. For all IAREs aside from Brisbane City, the IRSD estimates from this study resulted in the highest estimates of need. For Brisbane City, the PHIDU estimate was the highest. The order of highest to lowest estimated number of people with high/very high distress or self-reported diagnosis for IAREs was the same for the IRSD method and Census estimates. Self-reported diagnostic estimates from the Census were higher than PHIDU estimates for Logan, Ipswich and Caboolture IAREs.

Discussion

This study found that there is a significant, linear relationship between greater IRSD socio-economic disadvantage of areas and higher prevalence of high/very high psychological distress for Aboriginal and Torres Strait Islander peoples. Using this relationship to estimate levels of relative need for mental health services for the geographical catchments in South East Queensland, we found variation in levels of need across SA3s ranging from 72.0% to 114.8%. Higher rates of need for care often pertained to regions that were a greater distance from major urban centres. However, when planning for mental health services, considerations should be made to not only areas with higher levels of need but also the number of people living in an area. For example, the SA3 of Beaudesert had the highest estimated prevalence of high/very high psychological distress (34.4%; CI: 32.9–35.9%) but a relatively low number of people with a service need (n: 182; CI: 174–190). Planners should use an equity-based approach and take both prevalence and absolute numbers into consideration when prioritising new service locations.[7]

Overall patterns from this analysis were consistent with other indicators of need including prevalence of self-reported mental disorder diagnoses from the Census and modelled high/very high psychological distress based on the NATSIHS. For most SA3s, the estimated number of people with psychological distress was higher than the number of people who reported having a current mental disorder diagnosis from the Census. This aligns with previous research comparing high/very high psychological distress levels with self-reported diagnostic measures.[6] Having a self-reported diagnosis requires the participants to (1) have been able to see a health practitioner, (2) be diagnosed, (3) have that diagnosis clearly communicated to them,[6] and (4) for the participant to report this in a survey. As it is measured by the K-5 (within survey collection), having significant psychological distress does not require service access. The 2020–2022 National Study of Mental Health and Wellbeing found that only 45.1% of people with a 12-month mental disorder had seen a health professional for their mental health in the past 12 months.[27] Although this was a general population sample, it likely explains why self-reported diagnostic estimates from the Census were mostly lower than those in our modelling.

Table 1: Estimated proportion and number of Aboriginal and Torres Strait Islander adults in each South East Queensland region with high/very high distress based on IRSD modelling, compared to Census and PHIDU estimates.

South East Queensland (SEQ) regions	Proportion with high/ very high distress % (CI)	Resource allocation based on difference from SEQ average % (CI)	Estimated number of people with high/very high distress n (CI)	Self-reported mental disorder diagnosis (census)[a] n	Number of people with high/ very high distress (PHIDU)[b] n
South East Queensland total					
Total	30.0 (26.7–33.5)	n/a	16,633 (14,830–18,613)	12,592	13,913[c]
Hospital and health services					
Brisbane North	29.1 (25.8–32.7)	97.0 (96.5–97.4)	5,174 (4,590–5,816)	4,161	n/a
Brisbane South	30.1 (26.9–33.6)	100.5 (100.8–100.2)	6,033 (5,395–6,734)	4,506	n/a
Gold Coast	28.9 (24.8–33.5)	96.5 (92.8–99.9)	2,524 (2,165–2,924)	1,731	n/a
West Moreton	32.5 (30.0–35.1)	108.3 (112.2–104.7)	2,902 (2,680–3,139)	2,194	n/a
Indigenous Area Regions)					
Beaudesert–Boonah	31.8 (29.2–34.7)	106.2 (109.1–103.6)	282 (258–308)	194	1,410[d]
Esk–Kilcoy	33.9 (31.9–35.9)	113.0 (119.5–107.0)	227 (214–241)	179	
Gatton–Laidley	33.4 (31.5–35.4)	111.5 (117.8–105.7)	403 (379–427)	269	
Noosa	n/a – out of catchment	n/a – out of catchment	n/a – out of catchment	n/a – out of catchment	
Redcliffe	32.7 (30.2–35.3)	109.1 (113.2–105.4)	463 (429–501)	387	
Brisbane City	27.2 (23.6–31.3)	90.8 (88.2–93.4)	4,271 (3,697–4,912)	3,417	4,467
Caboolture	32.5 (29.8–35.4)	108.4 (111.4–105.5)	1,882 (1,725–2,050)	1,362	1,356
Gold Coast	29.0 (24.9–33.5)	96.7 (93.1–100.0)	2,477 (2,127–2,866)	1,699	1,985
Ipswich	32.3 (29.7–35.1)	107.8 (111.1–104.8)	2,239 (2,058–2,434)	1,720	1,357
Logan	32.2 (29.6–35.1)	107.6 (110.8–104.6)	2,582 (2,370–2,810)	1,969	1,821
Pine Rivers	28.1 (24.7–31.9)	93.8 (92.3–95.1)	1,017 (892–1,154)	805	833
Redland	28.8 (24.8–33.3)	96.2 (93.0–99.2)	790 (681–912)	591	684
Statistical Area Level 3					
Bald Hills–Everton Park	25.5 (21.6–29.8)	85.0 (80.7–89.0)	144 (122–169)	111	n/a
Beaudesert	34.4 (32.9–35.9)	114.8 (123.0–107.2)	182 (174–190)	130	n/a
Beenleigh	32.9 (30.5–35.5)	109.8 (114.0–105.8)	415 (384–447)	359	n/a
Bribie–Beachmere	31.3 (27.4–35.5)	104.4 (102.4–105.9)	254 (222–289)	194	n/a
Brisbane Inner	27.1 (22.7–32.0)	90.4 (85.0–95.5)	300 (252–355)	288	n/a
Brisbane Inner–East	22.3 (18.8–26.2)	74.4 (70.4–78.3)	114 (96–134)	116	n/a
Brisbane Inner–North	22.5 (19.3–26.1)	75.1 (72.3–77.7)	257 (221–298)	309	n/a
Brisbane Inner–West	21.6 (18.4–25.1)	72.0 (68.9–74.8)	103 (88–120)	133	n/a
Broadbeach–Burleigh	26.3 (21.0–32.4)	87.6 (78.5–96.6)	193 (154–238)	114	n/a
Browns Plains	32.6 (29.8–35.6)	108.8 (111.4–106.2)	656 (599–717)	478	n/a
Caboolture	33.7 (31.9–35.6)	112.6 (119.5–106.3)	894 (846–944)	709	n/a
Caboolture Hinterland	31.3 (27.4–35.5)	104.4 (102.4–105.9)	209 (182–237)	62	n/a
Capalaba	28.3 (24.3–32.8)	94.4 (90.8–97.7)	337 (289–390)	260	n/a
Carindale	24.3 (20.5–28.6)	81.2 (76.9–85.2)	131 (110–154)	110	n/a
Centenary	22.2 (18.8–26.2)	74.2 (70.3–78.0)	55 (46–64)	36	n/a
Chermside	26.7 (22.5–31.4)	89.1 (84.3–93.5)	301 (254–353)	234	n/a
Cleveland–Stradbroke	28.9 (25.0–33.3)	96.6 (93.7–99.4)	467 (404–538)	343	n/a
Coolangatta	27.4 (22.7–32.8)	91.5 (85.0–97.7)	256 (212–306)	165	n/a
Forest Lake–Oxley	33.3 (31.2–35.5)	111.1 (116.8–105.8)	744 (697–793)	350	n/a
Gold Coast–North	31.7 (28.6–34.9)	105.7 (107.1–104.2)	282 (255–311)	200	n/a
Gold Coast Hinterland	26.3 (21.0–32.4)	87.6 (78.5–96.6)	70 (56–86)	37	n/a
Holland Park–Yeronga	24.5 (20.0–29.7)	81.9 (74.9–88.6)	238 (194–288)	225	n/a
Ipswich Hinterland	33.1 (30.7–35.6)	110.5 (115.0–106.2)	695 (645–748)	437	n/a
Ipswich Inner	32.5 (30.2–35.1)	108.5 (112.9–104.6)	1,263 (1,171–1,361)	1,066	n/a
Jimboomba	30.4 (27.1–34.0)	101.5 (101.6–101.3)	427 (381–477)	288	n/a
Kenmore – Brookfield – Moggill	21.6 (18.4–25.1)	72.0 (68.9–74.8)	43 (36–50)	34	n/a
Loganlea–Carbrook	32.2 (29.7–34.9)	107.5 (111.1–104.2)	460 (424–499)	351	n/a
Mt Gravatt	28.1 (24.0–32.7)	93.8 (89.7–97.5)	196 (167–228)	159	n/a
Mudgeeraba–Tallebudgera	25.0 (20.3–30.4)	83.4 (75.9–90.8)	108 (87–131)	84	n/a
Narangba–Burpengary	31.5 (28.4–34.9)	105.1 (106.3–104.0)	561 (506–621)	425	n/a

(continued)

TABLE 1. Continued

South East Queensland (SEQ) regions	Proportion with high/very high distress % (CI)	Resource allocation based on difference from SEQ average % (CI)	Estimated number of people with high/very high distress n (CI)	Self-reported mental disorder diagnosis (census)[a] n	Number of people with high/very high distress (PHIDU)[b] n
Nathan	27.0 (22.4–32.2)	90.0 (83.8–95.9)	134 (111–160)	115	n/a
Nerang	30.1 (26.2–34.2)	100.4 (98.2–102.0)	336 (294–383)	232	n/a
North Lakes	30.5 (27.1–34.2)	101.7 (101.4–102.0)	500 (445–562)	379	n/a
Nundah	27.0 (22.2–32.5)	90.1 (83.1–96.8)	183 (151–220)	157	n/a
Ormeau – Oxenford	28.6 (24.4–33.3)	95.5 (91.4–99.3)	679 (579–790)	491	n/a
Redcliffe	32.6 (30.2–35.3)	109.0 (113.0–105.3)	466 (430–503)	380	n/a
Robina	28.6 (24.5–33.2)	95.6 (91.8–99.0)	176 (150–203)	115	n/a
Rocklea–Acacia Ridge	30.9 (27.8–34.3)	103.1 (104.1–102.3)	205 (185–228)	158	n/a
Sandgate	30.4 (26.9–34.3)	101.6 (100.9–102.2)	357 (316–402)	252	n/a
Sherwood–Indooroopilly	24.1 (19.8–29.0)	80.4 (74.0–86.5)	84 (69–101)	85	n/a
Southport	31.6 (28.6–34.8)	105.6 (107.2–103.9)	308 (278–339)	219	n/a
Springfield–Redbank	31.9 (29.2–34.9)	106.6 (109.4–103.9)	802 (734–875)	592	n/a
Springwood–Kingston	32.8 (30.6–35.2)	109.6 (114.5–105.0)	624 (582–670)	489	n/a
Strathpine	31.0 (27.2–35.2)	103.6 (101.8–104.9)	296 (260–336)	217	n/a
Sunnybank	30.7 (27.0–34.8)	102.6 (101.0–103.7)	125 (110–141)	86	n/a
Surfers Paradise	29.4 (25.0–34.3)	98.2 (93.5–102.4)	117 (100–137)	64	n/a
The Gap–Enoggera	25.4 (21.3–30.2)	84.9 (79.6–90.0)	175 (147–208)	163	n/a
The Hills District	21.6 (18.4–25.1)	72.0 (68.9–74.8)	220 (188–256)	204	n/a
Toowoomba	31.7 (29.1–34.6)	105.9 (108.8–103.1)	142 (130–155)	115	n/a
Wynnum – Manly	27.5 (23.4–32.2)	91.9 (87.6–95.9)	350 (298–409)	279	n/a

n = count; CI = confidence interval; SEQ = South East Queensland; IRSD = the Index of Relative Socioeconomic Disadvantage; PHIDU = The Torrens University Public Health Information Unit.

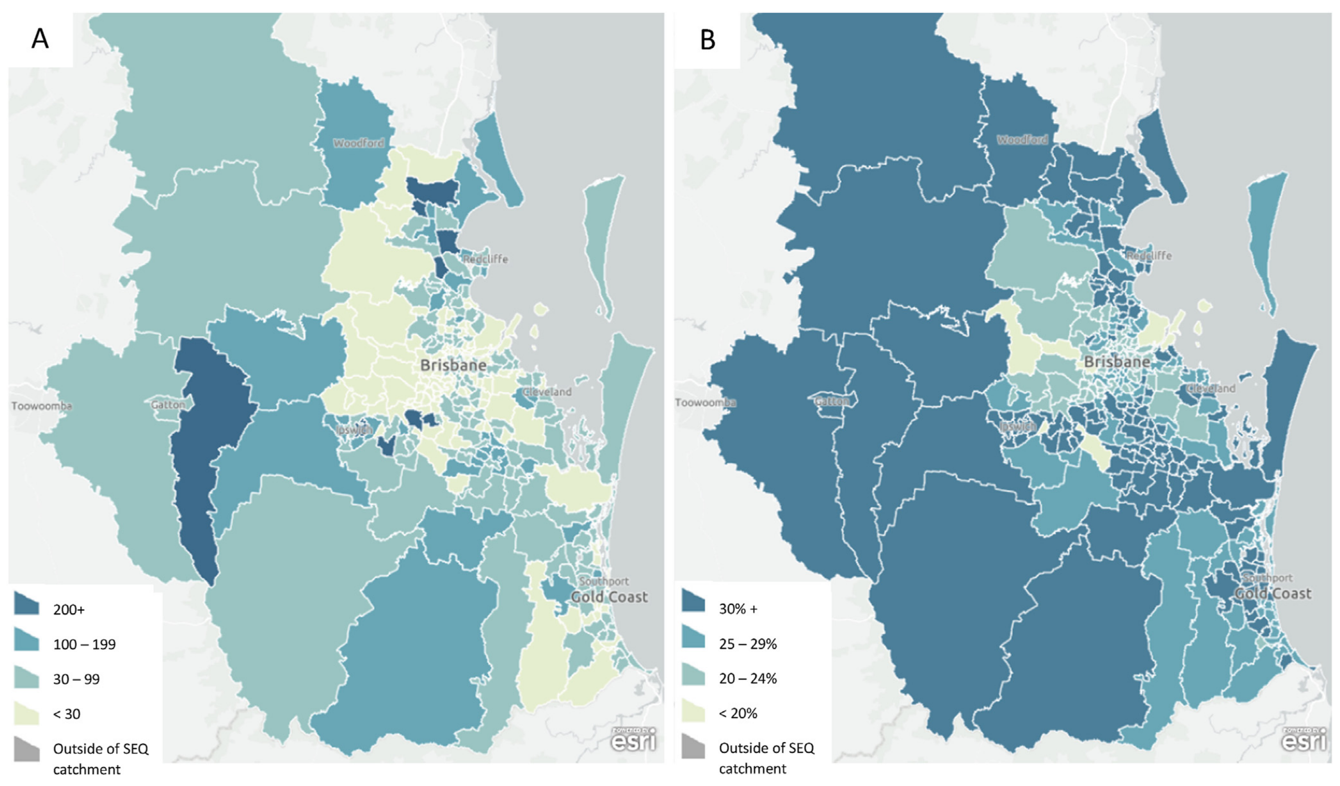
[a]Estimates of self-reported mental disorder clinician diagnoses of mental disorders from the 2021 Australian Census.[26]

[b]PHIDU estimates are modelled K-5 high/very high distress based on NATSIHS predictors.[12]

[c]Includes Noosa IARE.

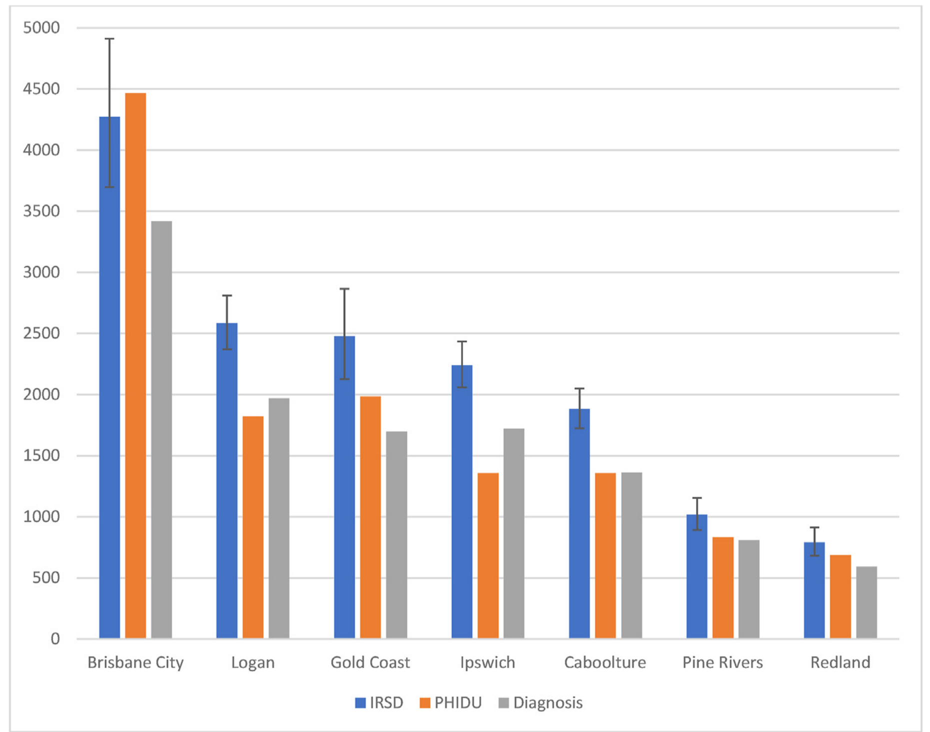
[d]Some IAREs are aggregated in PHIDU modelling due to small cell counts.

Figure 1: Maps of South East Queensland showing (A) the number of people with an estimated service need in each SA2 and (B) the proportion of each SA2 population estimated to have high/very high psychological distress.



Abbreviation: SA2 = Statistical Area Level 2.

Figure 2: Comparison of the IRSD-estimated number of people with high/very high psychological distress, PHIDU-estimated number of people with high/very high psychological distress and census self-reported mental disorder diagnosis at the IARE level.



Abbreviatins: IARE = Indigenous Area; IRSD = the Index of Relative Socioeconomic Disadvantage; PHIDU = The Torrens University Public Health Information Unit.

There were three exceptions to this pattern, all of which are inner-city locations: Brisbane Inner—North, Brisbane Inner—East, and Brisbane Inner—West. These SA3s had a lower estimated number of people with psychological distress than the number of people who reported having a current mental disorder diagnosis. This may reflect greater service availability (and subsequent higher rates of diagnoses). Additionally, the IUIH has an Inner City Referral Service for Aboriginal and Torres Strait Islander people living within 5 km of the Brisbane Central Business District who require social health support.[28] Having this service in the area may lead to higher engagement with mental health services. It may also lead to those who have a mental disorder diagnosis experiencing less psychological distress because their service needs have been met. Finally, Census figures may include people living in boarding houses or inpatients accessing mental health treatment in hospitals. Conversely, as the majority of SA2s in these SA3 regions are classified as IRSD quintile 5, the estimated number of people with high/very high psychological distress is lower. For these reasons, areas such as this may not be as appropriate for the IRSD methodology presented in this paper as the IRSD quintile of the area may not accurately reflect the true level of need in the area.

Two other SA3s are noteworthy to mention when comparing results from this study to Census data: Forest Lake—Oxley and Caboolture Hinterland. The modelled number of people with high/very high psychological distress was more than twice as high as the number with self-reported mental disorder diagnoses for both SA3s. This may be explained by there being correctional centres in Wacol (within Forest Lake—Oxley SA3) and Woodford (within Caboolture Hinterland SA3). People in these facilities are counted in overall Census numbers, however, do not answer the full census questionnaire. This means that they are not included in the number of people who have a current mental disorder, despite a very high prevalence of mental illness among Aboriginal and Torres Strait Islander prisoners.[29] The proportion of the Aboriginal and Torres Strait Islander adult (18+ years) population who were in a correctional centre in the Forest Lake—Oxley SA3 and Caboolture Hinterland SA3 during the 2021 Census was approximately 3% and 54%, respectively.[30] To a lesser extent, this also explains the differences in estimates for the Ipswich Hinterland SA3. This SA3 also has a correctional centre within it, and approximately 1% of Aboriginal and Torres Strait Islander adults living in that SA3 were there on Census night.[30] This finding highlights that self-reported mental disorder diagnoses estimates are less reliable in areas where there are large numbers of people not completing the whole Census questionnaire.

Strengths

This study provides a methodology to determine localised estimates of need where limited data are available. Importantly, it allows for small-area-level analysis, which is important for service planning to ensure differences between regions are not masked through the use of high-level catchments.[31] Although this case study was conducted for South East Queensland only, the methods can be applied to other Australian regions of interest using the same datasets. Similar methodology could also be used for other countries, using similar relevant indicators where data are available. Although proxy measures were used, the results from this study have good alignment with other available measures. Stakeholders the project steering

committee also found the results to have good face validity compared to known areas of need in the region.

Limitations

The IRSD was originally derived as a population measure of disadvantage for the whole Australian population and is not tailored for use for Aboriginal and Torres Strait Islander populations. Because of this, other indicators or a composite indicator may be better. For example, an Indigenous-specific Relative Socioeconomic Outcomes index (IRSEO) was derived using 2016 census data by the Centre for Aboriginal Economic Policy Research. The IRSEO includes nine socioeconomic outcomes, which span employment, educational qualifications, income and housing.[32] The IRSEO is useful for considering advantage and disadvantage at Indigenous Area levels; however, it could not be used for this study as it is not included in national Aboriginal and Torres Strait Islander health surveys and is also not available at the SA2 level.

Additionally, the IRSD is based on the whole population residing in each SA2, and for many SA2s, Aboriginal and Torres Strait Islander peoples only account for a small proportion of the total SA2 population. For example, in the SA2s included in this study, Aboriginal and Torres Strait Islander adults were estimated to make up between 0% (Enoggera Reservoir) to 16.2% (Wacol) of the total adult population in the area. The average proportion of the adult population who are Aboriginal and Torres Strait Islander in the whole South East Queensland catchment was 2.3%. It is possible that using the IRSD to determine need for care for Aboriginal and Torres Strait Islander peoples may result in the ecological fallacy, whereby false inferences are made about individuals based on group characteristics.[33] However, it is still important to note the characteristics of the overall population in the areas in which Aboriginal and Torres Strait Islander peoples live as they likely have an impact on the wellbeing of the resident population.[34] Additionally, the estimates produced by our analysis aligned with other available proxy measures and had good face validity.

High/very high psychological distress as measured by the K-5 also has limitations as a proxy measure of mental health service need. This measure is based on psychological distress over the past 4 weeks, meaning that it may not capture people who need a service but are feeling well at the point in time when the data are collected. Some people who have high/very high psychological distress may also not need a formal service response. For example, people may be in acute distress related to a life event and may improve with support from family and friends alone. Despite this, the K-5 does capture people who may need a service response and is a useful proxy measure for the purposes of determining levels of relative needs across regions.

Real-world impact

The findings of this study were used to inform a service-mapping project using the National Mental Health Service Planning Framework (NMHSPF) in South East Queensland (the ISEQ-NMHSPF Project).[16] The modelling in this study was used to inform modifications to NMHSPF outputs to account for the diversity of needs across the region and was found to have good face-validity by project stakeholders. This service-mapping project highlighted the needs and service gaps for Aboriginal and Torres Strait Islander adults in the region and subsequently (along with community consultation and additional data sources) led to successful advocacy by the IUIH to gain funding to establish a new mental health hub in Ipswich, West Moreton.[35]

Conclusions

The IRSD has relationship with psychological distress and has fairly good face validity as a proxy measure for mental health need for Aboriginal and Torres Strait Islander adults in South East Queensland. As it is regularly captured and available at small-area levels from Census data, it may be a useful proxy for needs-based service planning.

Conflicts of interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: IP and CP report financial support was provided by MRFF grant number 2017915. AF, SD and HW reports financial support was provided by MRFF grant number 2017915 and Queensland Health salaries.

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Ethics

This research was approved by The University of Queensland Office of Research Ethics (clearance no. 2020001954).

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Appendix A Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.anzjph.2024.100185.