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ADULT MENTAL HEALTH

Gender identity and mental health inequalities 2001–2022: population-level evidence from an Australian cohort study

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ABSTRACT

Background Trans, non-binary and gender-diverse (TGD) people experience poorer mental health relative to cisgender populations. However, we know little on how TGD mental health inequalities are changing over time. With newly available information on gender identity within Australia's largest longitudinal household survey, we aimed to provide the first nationally representative estimates of temporal trends in TGD mental health inequalities.

Methods We used the 2001–2022 Household, Income and Labour Dynamics in Australia Survey, a national probability sample of Australian adults. Using questions about sex at birth and gender identity, asked in the 2022 wave, we compared temporal trends in mental health among TGD and cisgender respondents. Mental health was measured using the five-item Mental Health Inventory (MHI). Adjusting for age, income and other observable characteristics, we calculated annual population-weighted estimates of mean MHI Scores for TGD and cisgender respondents and corresponding TGD mental health inequalities.

Results Across the 22-year period, TGD respondents consistently reported poorer mental health than cisgender respondents. Prior to 2010, differences in MHI Scores were more variable, but TGD MHI Scores were generally lower than cisgender respondents. From 2010 onwards, there was a trend of widening inequalities, with TGD-cisgender MHI inequalities ranging from −5.1 (95% CI −10.6, 0.3) in 2010 to −7.6 (95% CI −10.8, −4.4) in 2022, indicating clinically relevant differences in mental health. Effects were driven by younger populations.

Conclusion TGD-cisgender mental health inequalities are increasing in Australia, with inequalities more apparent between 2010 and 2022. Policy action and greater protections for gender-diverse Australians are urgently needed.

INTRODUCTION

Transgender, non-binary, and gender-diverse (TGD) populations are individuals who identify with genders that are different to the gender socially attributed to the sex assigned at birth.[1] TGD populations represent a substantial and growing proportion of the population, with global estimates ranging from 0.5% to 4.5% among adults, and 2.5% to 8.4% among children and adolescents.[2]

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Results from recent systematic reviews have demonstrated that trans, non-binary, and gender-diverse (TGD) populations experience poorer mental health outcomes relative to their cisgender counterparts. These studies have, however, relied on cross-sectional or convenience samples.
⇒ Only one study in the US that examined trends in mental health inequalities over a 8-year period found that TGD-cisgender inequalities in poor mental health days and frequent mental distress widened between 2014 and 2021. Little is known on how TGD mental health inequalities have changed over longer time periods using clinically validated measures, and no studies exist in the Australian context.
⇒ Analysis of TGD and cisgender mental health over time is needed to inform country-specific progress in addressing mental health inequalities among gender-diverse populations.

WHAT THIS STUDY ADDS

⇒ Making use of newly available reporting of gender identity in a nationally representative and longitudinal population-level survey in Australia, we provide information on TGD-cisgender mental health inequalities between 2001 and 2022.
⇒ Using clinically validated measures of mental health, we show TGD inequalities in mental health have widened over time, particularly since 2010.
⇒ The observed inequalities are clinically significant.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ Our results demonstrate that there are significant TGD-related mental health inequalities in Australia, and they have widened since 2010.
⇒ Alongside existing evidence documenting poorer mental health outcomes among TGD populations, these trends suggest the need for social and legal reform to reduce persistent and widening mental health inequalities.
⇒ Enhanced collection of gender identity in population-level surveys is urgently needed to better understand the extent of this public health issue and target effective solutions.

Alongside increasing awareness of TGD identities, emerging research has shown that compared with populations with binary cisgender identities (cisgender men and cisgender women), TGD populations are at much higher risk of mental health disorders, self-harm behaviour and suicide.[3 4]

Societal and structural-level conditions that explicitly disadvantage or constrain TGD populations are posited to be a key contributor to these mental health inequalities.[4 5] TGD populations also disproportionately face stigma, discrimination, and violence and human rights challenges.[6 7] Human rights violations among TGD populations also vary dramatically across different geographical contexts, and there is significant variability in the legal rights, freedoms, and societal attitudes pertaining to TGD populations across, and within, different countries.[7 8] For example, in Australia, recognition of TGD identities on formal documents is still, in many cases, dependent on certified medical intervention, many facets of gender-affirming care are not publicly subsidised, and conversion therapy practices are still legal in some jurisdictions.[8]

Given the ongoing societal and structural-level changes pertaining to gender minorities, there is an urgent need to understand how TGD mental health inequalities have changed over time and how these vary across different contexts. With the exception of one study conducted in the USA that documented widening TGD-cisgender inequalities in poor mental health days and frequent mental distress between 2014 and 2021,[9] no other studies have explored long-term temporal trends in TGD mental health inequalities. Moreover, to our knowledge, no studies have investigated clinically validated measures of mental health in population-based samples, and to date, none exist in the Australian context.

The scant research in this space is in part due to the lack of comprehensive information on gender identity in longitudinal or population-based data sets.[10] Addressing this important gap in the literature surrounding a critical public health issue, this study exploits newly available information on gender identity in Australia's longest running, population-based, household survey to investigate how TGD-cisgender mental health inequalities have changed over a 22-year period between 2001 and 2022.

METHODS

Engagement

It is important for TGD people to be involved as collaborators in all aspects of research that concerns them. We discussed initial plans with collaborators at LGBTIQ+ Health Australia (LHA)—Australia's peak body for LGBTIQ+ health—and additionally spoke with public contributors via the LHA 12th Health in Difference Conference in April 2024. Small group discussions were held with public contributors and members of LHA, which included representation from people with lived and professional experience. Discussions continued throughout the project, and a public contributor with lived experience and a representative from LHA joined the study team as coauthors. These discussions have informed and guided the study design, consideration and selection of control variables, and refinements to the framing, language, and discussion of findings.

Data

We use data from the 2022 Restricted Release of the Household, Income, and Labour Dynamics in Australia (HILDA) Survey. HILDA is an annual survey of over 17 000 Australians, with data (at the time of writing) available from 2001 (wave 1) to 2022 (wave 22).[11] The HILDA Survey uses a complex probabilistic sampling design and has high retention rates.[11] HILDA is largely representative of Australians aged 15 years and older. A Person Questionnaire is administered via a personal interview, and a Self-Completion Questionnaire is provided to all persons completing the Person Questionnaire and collected by the interviewer at a later date.

Gender identity measures

In 2022, for the first time, the HILDA Survey included questions on sex at birth and gender identity in the Self-Completion Questionnaire. The format and structure of these questions follow the 'Cisgender and Trans and Gender Diverse Classification' developed by Australia's national statistical agency, the Australian Bureau of Statistics (ABS).[12] The questions asked are: (1) 'What was your sex recorded at birth?', with response options of 'male', 'female', or 'other term'; and (2) 'How do you describe your gender', with response options of 'Man or male', 'Woman or female', 'Non-binary' or 'I use a different term'. TGD identity was derived from these two questions, providing 'Cisgender and Transgender and Gender Diverse Classification' with response options of 'cisgender', 'transgender and gender diverse' and 'inadequately described'. For example, someone responding 'male' to the sex at birth question and 'Woman or female' or 'Non-binary' to the 'How do you describe your gender?' question will be coded as having a TGD identity. When respondents select 'another term' for either sex at birth or current gender, these responses require additional context to determine alignment. Without clear alignment, such cases are classified as 'inadequately described'. Unfortunately, the HILDA Survey does not make these distinct questions available, but the process of assigning TGD identity is exactly aligned with the format recommended by the ABS.[12 13]

In the present study, respondents who were classified as 'transgender and gender diverse' were recorded as TGD. TGD identity was then retrospectively assigned to all respondents. Thus, the sample for analysis includes people who participated in wave 22, completed the Self-Completion Questionnaire and had responded to the gender identity questions. Respondents who did not complete the gender identity questions, or who were classified as 'inadequately described', were excluded from the analysis. A flow chart describing how the study population was selected is provided in online supplemental figure S1.

Outcome measures

Mental health is measured using the mental health subscale of the 36-Item Short Form Health Survey (SF-36), also known as the five-item Mental Health Inventory (MHI).[14] The scale is collected in all waves and is an additive index ranging from 0 (worst mental health) to 100 (best mental health). The MHI assesses symptoms of depression and anxiety, in addition to positive aspects of mental health in the past 4 weeks. It is constructed using five questions about how much of the time respondents had been nervous, felt calm and peaceful, felt down, been happy, or felt that nothing could cheer them up. These five items are clinically validated as a screening instrument for mood disorders or severe depressive symptomatology.[15] A difference of 4–5 points on the MHI Scale has shown to be clinically important for mental health symptoms.[16]

Statistical analysis

We first reported population-weighted descriptive characteristics of the 2022 sample with complete data for TGD and cisgender respondents. This used sampling weights provided by

the HILDA Survey to adjust for clustering and stratification of the survey design and non-response.

To compare the mental health of TGD and cisgender people, we first calculated unadjusted estimates of the mean MHI Scores for each wave of the HILDA Survey for TGD and cisgender people. Exploiting the longitudinal design of HILDA, we then estimated MHI inequalities with an ordinary least squares model where we interacted TGD identity with each wave. We additionally controlled for observable characteristics that have been applied in similar analyses on TGD health inequalities.[4 9] Variables included age in age bins (15–24 years, 25–34 years, 35–44 years, 45–54 years, 55–64 years, 65–74 years, 75 plus years), whether born outside of Australia, education level (less than high school, high school or equivalent, university or above), marital status (single or in married/de facto relationship), and quartiles of equivalised household income. Again, following previous studies in this space,[4 9] we also controlled for the binary 'sex' variable which is collected through the 'household form'. This household form is completed by one household member on behalf of the entire household with only 'male' or 'female' response options provided under the sex category until 2022. In 2022, there was also the response option of 'another term'. However, these data are not made available through HILDA due to 'data quality reasons' and previous wave values were used for those cases.[17] To this end, the values provided remain binary. It is possible that household members may interpret this question distinctly from 'sex at birth'. Finally, as access to healthcare and broader place-based factors are key determinants of mental health,[5] we additionally controlled for rurality and state/territory indicators.

We then computed adjusted average predicted MHI Scores and their corresponding Wald 95% Confidence Intervals (CIs) for TGD and cisgender Australians in each year at the observed values of the covariates in the model.[4]

Missing data for observable characteristics were handled using the missing indicator method (<1% missing for all control variables). All analyses were population-weighted using HILDA sampling weights. We employed the cross-section population weight for all people who responded to the Self-Completion Questionnaire in the relevant wave, which adjusts for initial probability of selection, person non-response, and benchmarks to external high-quality national population statistics including household type, location, age, labour force status, and marital status.[13 18] Full details on the weighting procedure are available elsewhere.[18] The selection of this weight was informed by discussions with the HILDA Survey team. Standard errors are clustered at the household level.

For each wave, we considered differences between TGD and cisgender people to be statistically significant if 95% CIs were not overlapping.[19]

Following these main analyses, we conducted several robustness checks.

First, given we were mapping TGD identity for individuals from 2022 backward to earlier years, attrition and sample changes over time may bias our estimates. This could be the case, for example, if TGD respondents were more likely to drop out of the sample over time. It is also possible that age effects and cohort differences could bias our results, in particular given HILDA has had sample top-ups over time (most notably in 2011). To investigate these potential biases, we explored differences in the age distribution over each wave and repeated the analysis for younger people (30 years and below). We additionally restricted the sample to those who were present in the sample prior to 2011 (ie, completed the survey between 2001 and 2010) and tested the robustness of our results to more explicitly consider the effects of the 2011 top-up sample by applying the population weights which exclude the 2011 top-up sample.[11]

Finally, although our primary analyses employed complete case analysis, there were missing MHI Scores for 5.7% of observations. Analysis of the missing MHI data, when stratified by TGD status, and demographic and socioeconomic characteristics, suggested that data were not missing completely at random (see online supplemental table S1). Thus, following the framework for the handling of missing data in observational studies,[20] a sensitivity analysis was conducted using multiple imputation for MHI Scores to ensure that missing values for MHI Scores were not biasing the results in our complete case analysis. Multiple imputation was conducted using predicted mean matching with 50 imputations. All analyses were conducted using Stata V.17. The code used to generate all results in this paper is publicly available at https://github.com/ksaxby/code.

Role of the funding source

The funder had no role in study design, data collection, data analysis, data interpretation, or writing of the report.

RESULTS

Across the 22 waves, there were 200 087 MHI responses from 14 482 respondents, including 215 TGD respondents (from on average 17 waves of data per person). The proportion of TGD people per wave ranged between 0.7% to 1.5% of the sample (online supplemental table S2). The population-weighted descriptive characteristics of TGD and cisgender respondents in wave 22 are presented in table 1. Compared with cisgender individuals, TGD respondents on average were younger (33.7 years vs 46.2 years), had higher levels of educational attainment, lower levels of household income, were more likely to be single, less likely to be born outside of Australia, and were less likely to be male (28% vs 49%). Note that due to a substantially smaller sample size for TGD respondents compared with cisgender respondents, the characteristics for TGD respondents tended to have larger CIs. The age distributions for each wave (online supplemental figure S2) indicate that the relative age of the sample has been increasing over time, although slightly more sharply for cisgender respondents relative to TGD respondents.

The adjusted mean MHI scores for TGD and cisgender respondents in each wave and the corresponding inequalities are presented in figure 1. Full results, including unadjusted and adjusted MHI scores and inequalities, are provided in online supplemental tables S3 and S4, respectively.

Between 2001 and 2009, adjusted mean MHI Scores ranged between 74.8 (95% CI 74.2, 75.4) and 75.3 (95% CI 74.8, 75.9) for cisgender respondents. Over the same period, TGD respondents had adjusted mean MHI Scores ranging between 68.6 (95% CI 62.0, 75.2) and 76.7 (95% CI 72.3, 81.1). While mean adjusted MHI Scores were generally lower for TGD respondents in every year relative to cisgender individuals, there was significant variability in the adjusted MHI Scores between years, with the 95% CIs of estimates for TGD and cisgender individuals overlapping in most years between 2001 and 2009.

After 2009, there was a clear divergence in trends in MHI Scores between TGD and cisgender respondents. Mean MHI Scores decreased for both cisgender and TGD respondents, although more sharply for TGD respondents, leading to an observable widening of TGD mental health inequalities. With the exception of 2015, between 2010 and 2022, mean differences in

Table 1 Population-weighted estimates of demographic characteristics of cisgender and TGD respondents in 2022

	Cisgender (n=14 252)		TGD (n=215)	
	Mean	(95% CI)	Mean	(95% CI)
Age (years)	46.24	(45.84, 46.65)	33.67	(30.94, 36.40)
Age group (years)				
15–24	0.15	(0.14, 0.16)	0.34	(0.26, 0.41)
25–34	0.17	(0.17, 0.18)	0.29	(0.22, 0.37)
35–44	0.17	(0.16, 0.18)	0.14	(0.08, 0.20)
45–54	0.16	(0.15, 0.17)	0.09	(0.03, 0.14)
55–64	0.14	(0.14, 0.15)	0.10	(0.04, 0.15)
65+	0.20	(0.19, 0.21)	0.05	(0.01, 0.08)
Male ('sex')	0.49	(0.48, 0.50)	0.28	(0.21, 0.34)
Highest education				
Less than high school	0.21	(0.20, 0.22)	0.31	(0.23, 0.39)
High school or equivalent	0.38	(0.37, 0.39)	0.35	(0.27, 0.42)
University	0.41	(0.40, 0.42)	0.35	(0.27, 0.42)
Married	0.61	(0.60, 0.62)	0.46	(0.37, 0.54)
Born outside of Australia	0.27	(0.27, 0.28)	0.20	(0.13, 0.28)
Equivalised household income				
First quartile (lowest)	0.24	(0.23, 0.25)	0.25	(0.18, 0.32)
Second quartile	0.23	(0.22, 0.24)	0.31	(0.23, 0.39)
Third quartile	0.26	(0.25, 0.27)	0.26	(0.19, 0.33)
Fourth quartile (highest)	0.27	(0.26, 0.28)	0.17	(0.12, 0.23)
Rural	0.19	(0.18, 0.20)	0.13	(0.07, 0.18)
State/territory				
New South Wales	0.31	(0.30, 0.33)	0.34	(0.26, 0.42)
Victoria	0.26	(0.25, 0.27)	0.29	(0.22, 0.36)
Queensland	0.20	(0.19, 0.21)	0.16	(0.11, 0.21)
South Australia	0.07	(0.07, 0.08)	0.07	(0.04, 0.11)
Western Australia	0.10	(0.10, 0.11)	0.08	(0.03, 0.13)
Tasmania	0.02	(0.02, 0.02)	0.01	(0.00, 0.03)
Northern Territory	0.01	(0.01, 0.01)	0.01	(0.00, 0.02)
Australian Capital Territory	0.02	(0.01, 0.02)	0.04	(0.01, 0.07)

All values are population-weighted and adjusted for sex, age bins, whether born outside of Australia, education level, marital status, quartile of equivalised household income, rurality, and state/territory indicators. The binary 'sex' question may be interpreted distinctly from 'sex at birth'. Please see the text for more details. TGD, trans, non-binary and gender-diverse.

adjusted MHI Scores were clinically significant, ranging from −5.1 (95% CI −10.6, 0.3) in 2010 to −7.6 (95% CI −10.8, −4.4) in 2022. The largest observable difference in MHI Scores was observed in 2020, where TGD respondents' mean adjusted MHI Scores were 12.9 (95% CI 9.2, 16.7) points lower than cisgender respondents.

The sensitivity analyses restricting the sample to 2001–2010 respondents, applying population weights which exclude the 2011 top-up sample, restricting to younger respondents, and multiple imputation of missing MHI Scores are presented in the online supplemental table S5 and online supplemental figure S3. Broadly, these sensitivity analyses yield similar results, indicating a trend of widening mental health inequalities from 2009 onwards. These analyses also suggest that effects appear to be concentrated among younger people, with MHI inequalities widening from −8.4 (95% CI −16.1, −0.8) in 2009 to −11.3 (95% CI −16.3, −6.3) in 2022.

DISCUSSION

Our findings show that over the 22-year period from 2001 to 2022, TGD respondents had worse mental health than cisgender respondents, with a trend of widening inequalities from 2010 onwards. From 2010, adjusted MHI Scores were 5–13 points lower for TGD individuals relative to cisgender counterparts, even when controlling for potential confounders. Given that a change in MHI Scores of 4–5 points is clinically meaningful,[16] this finding represents a substantial and clinically relevant difference in mental health between TGD and cisgender Australians.

Our findings reinforce a growing body of research which has reported poorer mental health outcomes among gender-diverse communities.[4] The findings also align with a recent longitudinal study in the USA which found that TGD inequalities in the number of poor mental health days were widening between 2014 and 2021.[9] Given gender-based stigmatisation and discrimination have deleterious effects on mental health,[21] these results are also consistent with a survey which found that exposure to antitrans rhetoric and interpersonal discrimination among TGD Australians had increased in recent years.[22]

The results of this study should be interpreted within the context of several important limitations. First, our sample only identifies individuals reporting gender identity in 2022, since that was the first time this question was asked in the HILDA Survey. As such, we were unable to examine the prospective impact of changes in gender identity on individuals' mental health. This retrospective assignment further hinders our ability to account for the fact that gender identity and expression may be non-linear for some TGD individuals.[23] This should be investigated as and when new waves of HILDA become available. Further, this approach necessitates that our sample is restricted to individuals who participated in wave 22 of the HILDA Survey. Consequently, we have larger samples in more recent waves, with only about half of the sample participating in the initial waves. Given potential attrition in the survey over time, it is possible that there could have been changes in the estimated results should gender minorities have been more likely to drop out of HILDA. Stigma surrounding TGD identity could also hinder reporting and thus identification of TGD respondents in our sample. The framing of the gender identity question in HILDA also excludes other identities including individuals who are questioning or not 'out' as TGD. Given the lack of collection of gender identity within population-level surveys,[10] it is difficult to compare the TGD sample in HILDA to other 'representative' samples of TGD in Australia. Should national data collections on gender diversity improve, there will be scope to revisit such analyses in the future. Further, the limited sample size of TGD respondents in HILDA makes it difficult to conduct robust subgroup analyses to further understand which individuals are at heightened risk of poorer mental health. For these reasons, we used adjusted models that included a range of demographic and socioeconomic characteristics, rather than examining trends in mental health inequalities through disaggregation of specific population characteristics. Finally, it is important to acknowledge that, with this sample size, it is difficult to fully separate out the difference in mental health between cisgender and TGD individuals from other characteristics, such as age. This is a particular challenge as young people have poorer mental health[24] and, as we demonstrate, are much more likely to be TGD. Nevertheless, when we restrict our sample to younger populations, we observe the same trends in widening TGD mental health inequalities. Collection of TGD identities and mental health in comprehensive whole-of-population data, such as the Census, will be essential to investigate this with greater precision.

Despite these limitations, the present study boasts several strengths and is the first to provide empirical evidence on temporal trends in TGD-cisgender mental health inequalities

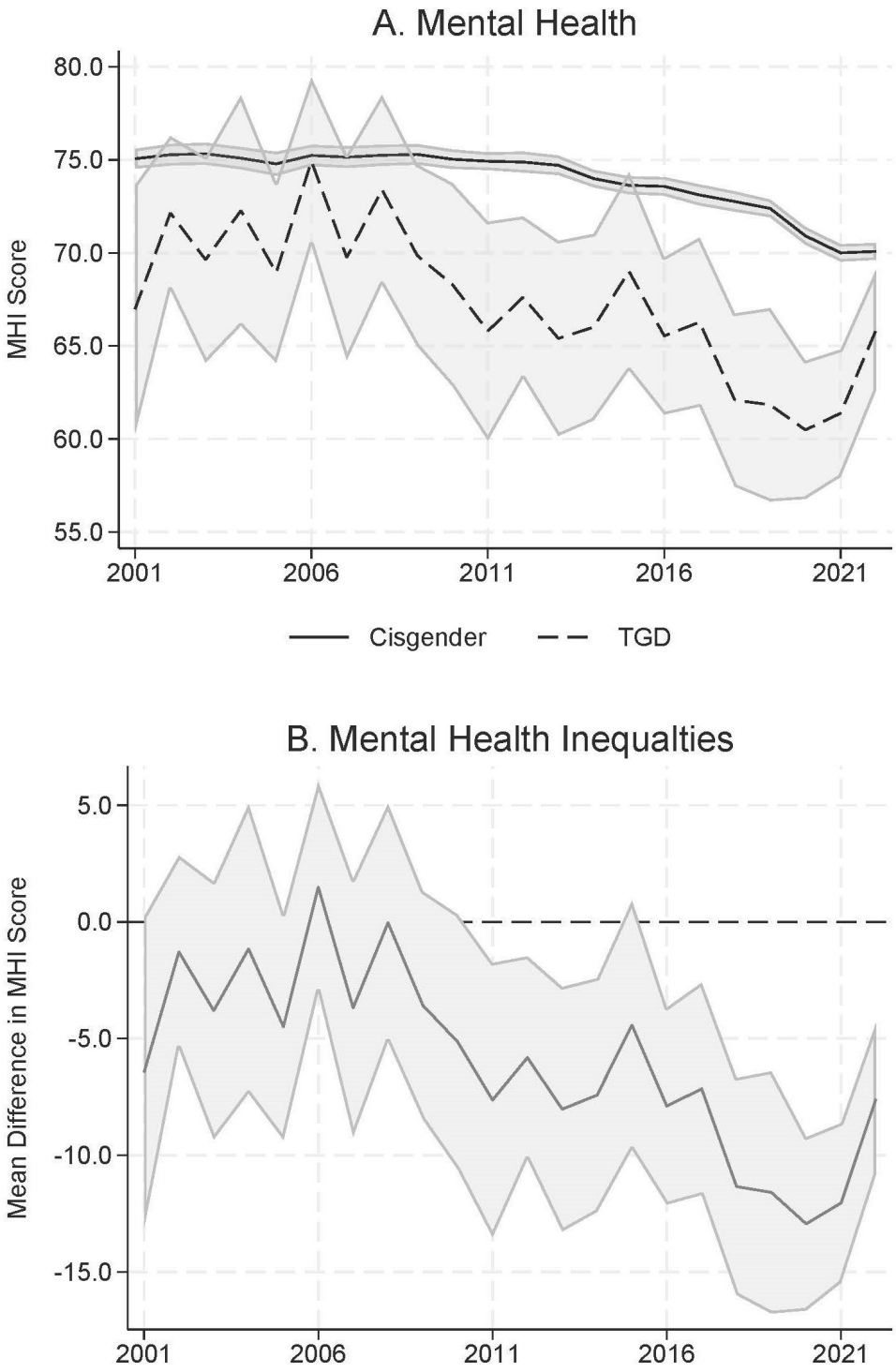

Figure 1 Mental health over time for cisgender and TGD Australians 2001–2022. (A) Mental health: adjusted population-weighted mean MHI scores, with 95% CIs. (B) Adjusted mental health inequalities: mean difference in adjusted MHI Scores, with 95% CIs. Notes: All values are population-weighted and adjusted for sex, age bins, whether born outside of Australia, education level, marital status, quartile of equivalised household income, rurality, and state/territory indicators. MHI, Mental Health Inventory; TGD, trans, non-binary and gender-diverse.

in Australia. In particular, the external validity of this research is bolstered by the large and nationally representative sample over a long period of time, from 2001 to 2022. To our knowledge, this represents the longest temporal trends analysis for TGD populations globally and is the first to document temporal inequalities using a clinically validated measure of mental health. Further, the comprehensive and longitudinal measures on social and economic factors captured within the HILDA Survey enable us to control for a dynamic set of important confounding characteristics that could impact mental health.

Altogether, these results provide important and context-specific policy insights for Australia. According to the LGBT Equality Index, Australia is the nineteenth most LGBT-friendly country in the world—seven places ahead of the USA.[8] In recent years, there have been vast improvements in rights and protections for gender minorities in Australia, including bolstering

antidiscrimination protections (eg, the 2013 Sex Discrimination Amendment), removal of 'forced divorce' provisions after transitions prior to Marriage Equality in 2017, and improvements in accommodating gender diversity in official identification (eg, 'X' category in passports without requiring sex reassignment surgery or amended birth certificates since 2011).[8] However, despite this progress, our results suggest that these have been insufficient to ameliorate gender minority mental health inequalities, particularly in recent years.

There remain substantial human rights challenges for TGD Australians. It is highly likely that structural factors are contributing to these mental health inequalities. For example, although a substantial body of research has shown that access to gender-affirming care is associated with better mental health outcomes, including improved quality of life and reduced symptoms of depression and suicidal ideation among TGD populations,[25 26] there is inadequate and inequitable access in Australia.[5] Many facets of gender-affirming care (eg, surgeries, speech therapy) are still not publicly funded through Australia's universal health insurance scheme[5] and thus patients must self-fund and face substantial out-of-pocket costs to access this care. More broadly, TGD-cisgender mental health inequalities could be exacerbated by limited supply of specialty mental healthcare providers in the Australian context.[5] Scarce supply could make it more difficult for TGD Australians to find inclusive and affirming psychological care.[27] Indeed, unmet healthcare needs have been cited as a key issue among gender minorities.[4] Improved access to affirming care is therefore likely to play an important role in reducing TGD-cisgender mental health inequalities.

Ultimately, more empirical research on the pathways driving gender minority mental health inequalities is needed to help design and deliver effective and targeted policy solutions. Robust and well-powered sample sizes in population-level data sets will be essential to carry out such research. In particular, the Standard for Sex, Gender, Variations of Sex Characteristics and Sexual Orientation Variables, 2020 ('2020 Standard')[28 29] should be included in population-based surveys, including in subsequent waves of the HILDA Survey and in Australia's Census of Population and Housing (conducted every 5 years). This would enhance our understanding of how prospective changes in gender identity influence mental health and enable broader analyses that could be stratified by additional gender subgroups, such as non-binary identities. Should the 2020 Standard be included in the 2026 Census, there will also be scope to empirically investigate the drivers of mental health inequalities, including healthcare utilisation, through data sets such as the Person Level Integrated Data Asset.[30] Inclusion in large population-level surveys would also facilitate subgroup analyses (eg, by age, remoteness, socioeconomic position) to understand which population groups should be explicitly targeted in policy response. Nevertheless, these results suggest the need for immediate policy action for this important public health issue to reduce clinically important and widening inequalities in TGD mental health.

Contributors KS, GB and ZA developed the research questions and analysis plan, with input from all authors. KS and SHT obtained the data from the Department of Social Services. SHT and KS accessed and verified the underlying data. SHT and KS cleaned the data and conducted the statistical analysis with support and interpretation from GB, ZA, DP, RS and ID. SHT and KS did the literature review and drafted the figures and manuscript text following discussion with all authors. All authors contributed to editing the final manuscript. KS was responsible for the decision to submit the manuscript, with agreement from all authors. All authors have seen and approved the final text. KS is the guarantor.

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Data availability statement The code used to generate all results in this paper is publicly available at https://github.com/ksaxby/code under filename "tgd_mh_analysis.do". Data are available upon request to the Department of Social Services (dataverse.ada.edu.au/dataverse/hilda).

Author note Throughout this study, we collectively use the terminology trans, nonbinarynon-binary, and gender diverse ('TGD'). We acknowledge that the framing of questions and the aggregation of respondents in the HILDA Survey may not capture the experiences of trans/transgender and other gender and bodily diverse people and communities. We understand that the results presented in this manuscript, along with the underlying concepts and theories discussed may cause sadness or distress. If you need to talk to someone, there are local and national support services available in Australia. Anonymous and free LGBTQ+ peer support is available through QLife (qlife.org.au/ or phone 1800 184 527) and a list of services and supports is available at LGBTIQ+ Health Australia's website: lgbtiqhealth.org.au/services_and_supports. The authors thank the LGBTQ+ communities' representatives whose knowledge, advocacy and support hashave informed this work. For crucial and informative insights, the authors thank speakers and delegates from the LGBTIQ+ Health Australia 12th Health in Difference conference. The authors also thank Brooke Garrard from the Melbourne Institute for guidance on the framing of sex and gender identity questions in the HILDA Survey and Nicole Watson for her guidance regarding HILDA weights. This paper uses unit record data from the Household, Income and Labour Dynamics in Australia Survey (HILDA) conducted by the Australian Government Department of Social Services (DSS). The findings and views reported in this paper, however, are those of the authors and should not be attributed to the Australian Government, DSS, or any of DSS' contractors or partners.

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