

Ten to Men Insights #3

Chapter 2: Health outcomes and health service use among first-time fathers in Australia

Supplementary materials

Methods

In this chapter, data from Waves 1–4 of the *Ten to Men* study were used. Wave 1 data were collected from October 2013 to July 2014, Wave 2 data from November 2015 to May 2016, Wave 3 data from July 2020 to February 2021 and Wave 4 data from August to December 2022. The following section includes details of the demographic and other factors that were used as covariates in this research. Further information on the study design, questionnaires, statistical considerations, data files and other data resources are available via the *Ten to Men Data User Guide* (Volpe, 2024).

Key exposure: Being a first-time father

This exposure is described in the main document but further details are provided here. In Waves 1–4, men aged 18+ years were asked whether they had experienced any of several events in the past 12 months, one of which was 'Becoming a father for the first time'. Responses were coded as '0 = No' for men who were not new fathers and '1 = Yes' for men who were new fathers in the past 12 months. Men who became new fathers at previous wave(s) were excluded from the analyses.

Specifically, when considering new fathers at Wave 2, we excluded men who became new fathers at Wave 1 and kept those who had no children at Waves 1 and 2 or became new fathers at Wave 2. We also only retained men who answered either 'yes' or 'no' to the question 'Have you experienced any of the following events in the past 12 months? 'Becoming a father for the first time' (i.e. did not have missing data for this question) at Wave 2.

When considering new fathers at Wave 3, we excluded men who became new fathers at Wave 1 or Wave 2. We kept those who either had no children at Waves 1, 2 and 3 or became new fathers at Wave 3. Additionally, we only retained men who answered either 'yes' or 'no' to the question 'Have you experienced any of the following events in the past 12 months? Becoming a father for the first time' (i.e. did not have missing data for this question) at Wave 3.

Demographic and other measures

All demographic and other measures described below were taken from the pre-fatherhood time point (either Wave 1 or Wave 2), unless otherwise specified.

Age

Age (in years) was measured as a continuous covariate at each Wave for most analyses. However, when testing for interaction (i.e. whether age modified the association between becoming a father and each health outcome), we classified age into 2 categories: lowest 50% and highest 50%. In these analyses, age was taken from the Wave in which men became a new father (either Wave 2 or Wave 3) or the equivalent Wave for similar non-fathers.

Region

For each wave, an indicator of region was generated using the Australian Statistical Geography Standard (ASGS) that defines geographical locations in terms of remoteness, based on the 2011 Census of Population and Housing (Waves 1 and 2) or the 2016 Census of Population and Housing (Waves 3 and 4). Detailed information about the remoteness structure may be sourced from the 2021 Census Community Profiles (Australian Bureau of Statistics [ABS], 2021). For the current analyses, categories were coded as 0 = Major cities; 1 = Regional (including inner regional, outer regional, remote and very remote).

Area disadvantage

Disadvantage was measured with Socio-Economic Indexes for Areas (SEIFA), a measure developed by the ABS that ranks geographical areas of Australia according to relative socio-economic advantage and disadvantage. The 2011 SEIFA measure used in the current research is based on information from the Index of Relative Socio-Economic Disadvantage (IRSD). Detailed information about SEIFA may be sourced from the ABS website. For the current analyses a 3-category indicator of disadvantage was generated for each wave, separately, using the 2011 SEIFA percentage variable and coded as 1 = High disadvantage (bottom 25%); 2 = Medium disadvantage; and 3 = Low disadvantage (top 25%). For our analyses, we combined medium and low disadvantage to create a binary variable.

Culturally and linguistically diverse (CALD) status

A set of questions were used to determine whether respondents were culturally and/or linguistically diverse. Aligned with the definition of cultural and linguistic diversity recommended by Pham and colleagues (2021) and the ABS (2022) standards, respondents were coded as culturally and linguistically diverse (1 = Yes) if they were born in a non-English speaking country, if English was not the main language spoken at home or if they were not proficient in English. All other respondents were coded as '0 = No'.

Education

Questions on the highest year of schooling completed (specifically, secondary schooling for Waves 1 and 2) and highest qualification completed were used to determine a man's education. These questions were modified from the Longitudinal Study of Australian Children (Australian Institute of Family Studies [AIFS], 2018). For each Wave (Waves 1–4), we derived binary measures. Respondents were coded as '1' if they had an undergraduate or above qualification and '0' if they did not (or if they had up to some qualification).

Data analysis

How does becoming a first-time father impact the short- and medium-term health of men?

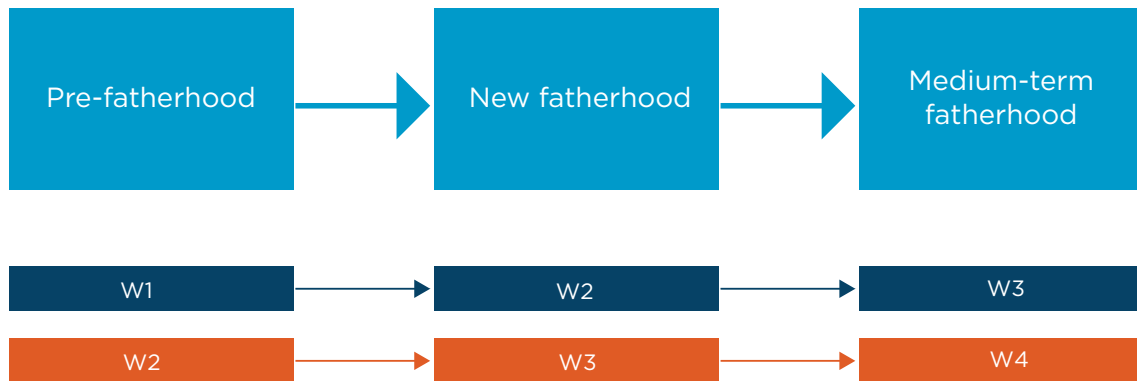
For Research Question 1, we considered the effect of becoming a first-time (new) father on 3 health outcomes (obesity, moderate/severe depression and 7+ hours sleep duration) for men who became first-time fathers in Wave 2 or Wave 3 compared to similar men who were non-fathers (men of the same age range and who were not yet fathers). To provide descriptive context, we firstly calculated the prevalence of each health outcome at the new fatherhood and medium-term fatherhood time points and incidence at the new fatherhood time point, for fathers and similar men who were non-fathers, using unweighted cross-tabulations and 95% confidence intervals.

Prevalence refers to the proportion of men with a given health condition at a particular time – for example, proportion with depression in new fatherhood. Incidence refers to men who developed a condition but did not have it at the previous Wave (e.g. men with depression in new fatherhood who did not have depression in pre-fatherhood). Specifically, we considered Wave 1, 2 and 3 prevalence for Wave 2 new fathers and Wave 2, 3 and 4 prevalence for Wave 3 new fathers (Figure S1).

We then investigated the effect of becoming a first-time father on mental health outcomes (moderate/severe depression) and physical health outcomes (obesity and 7+ hours sleep per night) in new and medium-term fatherhood using adjusted multivariable Poisson regression analyses. We fitted models for prevalence (all cases of a health outcome) and incidence (men with a particular outcome who did not have the outcome in previous wave(s)). We compared new fathers at a particular Wave (Wave 2 or 3) with men who did not have children prior to that Wave (e.g. new fathers in Wave 2 versus men who did not have children in Waves 1 or 2) and were of the same age range as the new fathers. For sleep, we only considered Wave 3 new fathers because sleep was not measured in Wave 1 so we did not have a pre-fatherhood time point for Wave 2 new fathers. See Figure S1, below, for further details of the analytic sample.

In the final models, we adjusted for age, region, CALD status, SEIFA disadvantage and highest educational qualification. We combined data for new fathers in Waves 2 and 3 and similar men who were non-fathers from these waves. Men who were non-fathers in Wave 2 but had missing data from Wave 3 were excluded from the analyses because we did not know whether they had become a new father in Wave 3. We also tested whether age modified the association between becoming a father and the prevalence of each health outcome in new and medium-term fatherhood using interaction parameters. Due to small sample sizes, we could not test whether age modified the association between becoming a father and the incidence of each health outcome in new fatherhood.

We then investigated which pre-fatherhood exposures were associated with the prevalence and incidence of each health condition (obesity, moderate/severe depression and 7+ hours sleep duration) in first-time fathers in new and medium-term fatherhood, using adjusted Poisson regression analyses. We fitted separate models for each health outcome in new or medium-term fatherhood. Predictors were pre-fatherhood age, region, CALD status, SEIFA disadvantage, highest educational qualification and the pre-fatherhood/baseline health condition (for prevalence only) and the new fatherhood health condition (for prevalence in medium-term fatherhood only).

Figure S1: Analytic sample for Research Question 1

Notes: Colours represent cohorts of first-time fathers. Sleep was only measured at Waves 2–4.

Health service use of new fathers in Wave 4 during the perinatal period

Analyses for Research Question 2 compared first-time fathers in Wave 4 to similar men who were non-fathers. We used data from Wave 4 given that this was the most recent Wave and could provide us with an understanding of health service use following the COVID-19 pandemic in 2022. We determined the most common combinations of health services used by new fathers by concatenating all variables related to health service use (see [Table S1](#)).

We investigated combinations of services given that many men use more than one health service for their health, rather than in isolation. We then calculated the weighted percentage and 95% confidence interval of new fathers who used each combination of health services using raked cross-sectional population weights for Wave 4. We compared the prevalence of the top health services used by fathers to those for similar men who were non-fathers (i.e. men who were non-fathers and had no children prior to or in Wave 4 and were of the same age range as new fathers). A similar approach was used for assessing how the combinations of health services differed by physical and mental health status (men with moderate/severe depression, obesity (BMI of 30+) and an average of less than 7 hours of sleep per night). However, we only concatenated variables relevant to each health outcome ([Table S2](#)). For example, dentists, optometrists or chiropractors were not included for any of the health outcomes.

We considered the main barriers to health service engagement during the perinatal period by concatenating the 4 groupings of barriers (health system, structural, individual and cultural, consistent with previous research (Macdonald et al., 2022)). See [Table S3](#) for barriers included in each category. We then calculated the weighted percentage and 95% confidence interval of new fathers with each combination of barriers using raked cross-sectional population weights for Wave 4. We compared the prevalence of the top groupings of barriers used by first-time fathers to those for similar men who were non-fathers (i.e. men who were non-fathers and had no children prior to or in Wave 4 and were of the same age range as new fathers).

Table S1: List of all health services considered for first-time fathers for Research Question 2

Health services
• A family doctor/General Practitioner
• Aboriginal health worker
• Accredited counsellor
• Acupuncturist
• Alcohol and drug worker
• Audiologist/Audiometrist

Health services

- Cardiologist
- Chemist/Pharmacist (for advice only)
- Chiropodist/Podiatrist
- Chiropractor
- Community nurse, practice nurse or nurse practitioner
- Dentist
- Dermatologist
- Dietitian/Nutritionist
- Endocrinologist
- Exercise physiologist
- Gastroenterologist
- Haematologist
- Massage therapist
- Naturopath
- Neurologist
- Nurse
- Oncologist
- Optician/Optommetrist
- Orthopaedic specialist
- Osteopath
- Physiotherapist/Hydrotherapist
- Psychiatrist
- Psychologist
- Rheumatologist
- Urologist
- Other health service

Table S2: Health services considered when looking at combinations of health services for each outcome

Health outcome	Services considered	Relevant references
Overall	All services (see Table S1 above)	N/A (all services considered)
Depression	GP, accredited counsellor, alcohol/drug worker, pharmacist, psychiatrist, psychologist and other health service	Beyond Blue (2025), Chisholm et al. (2001), Halcomb et al. (2022), myGov (2025), Kamusheva et al. (2020), McHugh & Weiss (2019), Pirkis et al. (2022), Stone et al. (2019)
Obesity	GP, accredited counsellor, cardiologist, pharmacist, nurse, dietician/nutritionist, endocrinologist, exercise physiologist, haematologist, community nurse, psychologist and other health service	Abbott et al. (2021), Australian Institute of Health and Welfare [AIHW] (2020), National Health and Medical Research Council (2013), Turner et al. (2018)
Less than 7 hours sleep per night	GP, accredited counsellor, alcohol/drug worker, pharmacist, community nurse, dietician/nutritionist, nurse, psychiatrist, psychologist and other health service	Hayes et al. (2012), Roehrs & Roth (2015), Sydney Centre for TMJ & Sleep Therapy (2004-2019), Sýkorová et al. (2025)

Note: The most relevant health services for each condition were determined by reviewing the literature and assessing the proportion of respondents who reported using each health service.

Table S3: Barriers for health service use according to categories described in Macdonald et al. (2022)

Category and definition	Barriers to health service use
Health system, defined as being 'driven by available social and economic resources, policy, prioritisation, service culture, practitioner education and training and professional values' (Macdonald et al., 2022, p 15).	<ul style="list-style-type: none"> No service available in area at time needed Waiting time too long/no appointments Not taking new patients
Structural, defined as 'those that prescribe how a service is delivered (e.g. where, when and at what cost), and are constrained by geography, funding, supply, and demand' (Macdonald et al., 2022, p 16).	<ul style="list-style-type: none"> Cost Transportation problems
Individual, [including] 'internalised influences of cultural beliefs and norms, social and economic capital, any form of marginalisation, and personal values and beliefs. These affect trust in the healthcare system, likelihood of seeking help, health literacy, knowledge of one's own risk and available services, financial resources, satisfaction with care and adherence to treatment' (Macdonald et al., 2022, p 15).	<ul style="list-style-type: none"> Decided not to seek care/didn't bother Personal/family Work commitments
Cultural, including 'collectively held values and standards that guide expectations of how an individual should behave or how a service should be delivered' (Macdonald et al., 2022, p 16).	<ul style="list-style-type: none"> Language problems

Results

Table S4: Characteristics of first-time fathers and non-fathers included in the analyses

Characteristic	Non-fathers, <i>n</i> (%)	First-time fathers, <i>n</i> (%)
Total	1,189 (78.0%)	336 (22.0%)
Age ^a	32.7 (11.1)	31.9 (7.7)
Region		
Major cities	800 (67.3%)	209 (62.2%)
Inner regional/outer regional/remote	389 (32.7%)	127 (37.8%)
CALD background	128 (10.8%)	44 (13.1%)
SEIFA disadvantage		
High disadvantage	287 (24.1%)	88 (26.2%)
Middle or low disadvantage	902 (75.9%)	248 (73.8%)
Education		
Up to some qualification	785 (66.0%)	215 (64.0%)
Undergraduate and above	404 (34.0%)	121 (36.0%)
Depression at pre-fatherhood time point	169 (14.2%)	31 (9.2%)
Obesity at pre-fatherhood time point	241 (22.3%)	77 (24.7%)
7+ hours sleep at pre-fatherhood time point	801 (69.5%)	60 (68.2%)

Notes: ^a Mean (SD) for age. CALD = culturally and linguistically diverse. Demographic characteristics and depression at the pre-fatherhood time point are for the *n* = 1,525 men included in the regression analyses examining the effect of being a first-time father on the prevalence of moderate/severe depression in new fatherhood. Most characteristics were similar when considering men included in the regression analyses examining the effect of being a first-time father on the prevalence of obesity (*n* = 1,392) and 7+ hours sleep (*n* = 1,240) in new fatherhood. However, for the sleep sample, only 7.1% were first-time fathers and 56.8% had up to some educational qualification. For obesity and 7+ hours sleep at the pre-fatherhood time point, sample sizes are for the effect of being a first-time father on the prevalence of each of these outcomes in new fatherhood (*n* = 1,392 for obesity and *n* = 1,240 for sleep). For depression and obesity, sample consists of new fathers in Waves 2 and 3 and similar men who were non-fathers (of the same age range and not yet fathers). For sleep, the sample consists of new fathers in Wave 3 and similar men who were non-fathers.

Source: Ten to Men data, unweighted, Waves 1-4

Table S5: Prevalence of health conditions (moderate/severe depression, obesity and an average of 7+ hours sleep duration) in first-time fathers in new and medium-term fatherhood and non-fathers at the same time points

Health condition	Fathers (% [95% CI])	Non-fathers (% [95% CI])
New fatherhood		
Depression	11.7 [8.6, 15.4]	17.6 [15.5, 19.8]
Obesity	24.6 [20.2, 29.4]	26.0 [23.5, 28.6]
Sleep	60.9 [51.3, 69.8]	69.1 [66.4, 71.7]
Medium-term fatherhood		
Depression	13.1 [9.1, 17.9]	17.9 [15.6, 20.4]
Obesity	24.1 [18.9, 29.9]	30.0 [27.1, 32.9]
Sleep	59.8 [49.0, 69.9]	68.2 [65.2, 71.1]

Notes: For depression and obesity, sample consists of new fathers in Waves 2 and 3 and similar men who were non-fathers (of the same age range and not yet fathers). For sleep, the sample consists of new fathers in Wave 3 and similar men who were non-fathers. Unweighted sample sizes in new fatherhood (% fathers): $n = 1,598$ for depression (23.5% fathers); $n = 1,516$ for obesity (23.6% fathers) and $n = 1,316$ for sleep (8.7% fathers). Unweighted sample sizes in medium-term fatherhood (% fathers): $n = 1,264$ for depression (19.4% fathers); $n = 1,226$ for obesity (20.0% fathers) and $n = 1,095$ for sleep (8.4% fathers).

Source: Ten to Men data, unweighted

Table S6: Incidence of health conditions (moderate/severe depression, obesity and 7+ hours sleep duration) in first-time fathers in new fatherhood and non-fathers at the same time point

Health condition	Fathers (% [95% CI])	Non-fathers (% [95% CI])
Depression	7.1 [4.6, 10.5]	11.2 [9.3, 13.3]
Obesity	9.4 [6.1, 13.7]	10.0 [8.0, 12.2]
Sleep	34.5 [17.9, 54.3]	44.9 [39.8, 50.2]

Notes: For depression and obesity, sample consists of new fathers in Waves 2 and 3 and similar men who were non-fathers (of the same age range and not yet fathers). For sleep, the sample consists of new fathers in Wave 3 and similar men who were non-fathers. Unweighted sample sizes (% fathers): $n = 1,358$ for depression (23.7% fathers); $n = 1,108$ for obesity (22.9% fathers) and $n = 394$ for sleep (7.4% fathers).

Source: Ten to Men data, unweighted

Table S7: Parameter estimates from multivariable Poisson regression models examining the effect of being a first-time father (compared to non-father) on the prevalence of selected health conditions at the new fatherhood and medium-term fatherhood points, adjusting for covariates

	Depression			Obesity			7+ hours sleep		
	aRR	95% CI	<i>p</i>	aRR	95% CI	<i>p</i>	aRR	95% CI	<i>p</i>
New fatherhood									
First-time father (ref = non-father)	0.71	[0.52, 0.97]	0.03	0.98	[0.95, 1.02]	0.34	0.90^a	[0.77, 1.05]^a	0.18^a
Age (continuous)	0.99	[0.98, 0.996]	0.01	1.00	[1.00, 1.00]	0.21	1.00	[0.99, 1.00]	0.24
Inner regional/outer regional/remote area (ref = major cities)	0.96	[0.76, 1.20]	0.70	1.01	[0.98, 1.04]	0.71	1.02	[0.94, 1.10]	0.70
CALD status (ref = non-CALD)	0.75	[0.48, 1.16]	0.19	0.97	[0.93, 1.00]	0.08	0.99	[0.88, 1.12]	0.89
Middle or low disadvantage (ref = high disadvantage)	0.72	[0.58, 0.90]	<0.01	0.98	[0.94, 1.01]	0.13	1.04	[0.95, 1.14]	0.36
Undergraduate and above (ref = up to some qualification)	0.63	[0.48, 0.85]	<0.01	0.97	[0.95, 1.00]	0.07	1.06	[0.98, 1.14]	0.12
Health condition at baseline (ref = no)	4.77	[3.86, 5.88]	<0.01	1.64	[1.59, 1.69]	<0.01	1.75	[1.56, 1.96]	<0.01
Medium-term fatherhood									
First-time father (ref = non-father)	1.03	[0.74, 1.42]	0.87	0.97	[0.95, 1.01]	0.10	0.97	[0.82, 1.13]	0.66
Age (continuous)	0.99	[0.98, 1.00]	0.25	1.00	[1.00, 1.00]	0.16	1.00	[1.00, 1.00]	0.67
Inner regional/outer regional/remote area (ref = major cities)	1.11	[0.89, 1.39]	0.36	1.00	[0.98, 1.03]	0.79	0.98	[0.90, 1.07]	0.61
CALD status (ref = non-CALD)	0.99	[0.61, 1.62]	0.97	1.02	[0.98, 1.06]	0.43	0.90	[0.77, 1.04]	0.15
Middle or low disadvantage (ref = high disadvantage)	0.92	[0.74, 1.15]	0.46	1.00	[0.98, 1.03]	0.77	1.01	[0.92, 1.12]	0.79
Undergraduate and above (ref = up to some qualification)	0.76	[0.57, 1.01]	0.06	0.98	[0.95, 1.00]	0.08	1.02	[0.95, 1.11]	0.53
Health condition at baseline (ref = no)	2.02	[1.56, 2.62]	<0.01	1.20	[1.13, 1.27]	<0.01	1.45	[1.28, 1.65]	<0.01
Health condition in new fatherhood (ref = no)	4.98	[3.70, 6.70]	<0.01	1.56	[1.47, 1.64]	<0.01	1.77	[1.53, 2.04]	<0.01

Notes: ^aAge modified the association between being a first-time father and 7+ hours sleep duration in new fatherhood (*p* for interaction = 0.02). Youngest 50% of men: aRR = 1.08, 95% CI [0.93, 1.25], *p* = 0.31; oldest 50% of men: aRR = 0.72, 95% CI [0.54, 0.98], *p* = 0.03.

aRR = adjusted risk ratio; 95% CI = 95% confidence interval, *p* = *p* value, CALD = culturally and linguistically diverse. Models adjusted for pre-fatherhood health status, new fatherhood health status (for medium-term fatherhood), age, region, CALD status, area socio-economic disadvantage and education. Unweighted sample sizes for models in new fatherhood: *n* = 1,525 for depression; *n* = 1,392 for obesity and *n* = 1,240 for sleep. Unweighted sample sizes for models in medium-term fatherhood: *n* = 1,212 for depression; *n* = 1,116 for obesity and *n* = 1,020 for sleep.

Source: *Ten to Men* data, unweighted, Waves 1-4

Table S8: Parameter estimates from multivariable Poisson regression models examining the effect of being a first-time father (compared to non-father) on the incidence of selected health conditions at the new fatherhood time point, adjusting for covariates

	Depression			Obesity			7+ hours sleep		
	aRR	95% CI	<i>p</i>	aRR	95% CI	<i>p</i>	aRR	95% CI	<i>p</i>
First-time father (ref = non-father)	0.57	[0.36, 0.90]	0.02	0.99	[0.95, 1.03]	0.56	0.75	[0.45, 1.25]	0.28
Age (continuous)	0.98	[0.96, 0.99]	<0.01	1.00	[1.00, 1.00]	0.40	0.98	[0.97, 0.99]	<0.01
Inner regional/outer regional/remote area (ref = major cities)	0.99	[0.69, 1.40]	0.93	1.01	[0.97, 1.05]	0.54	0.97	[0.75, 1.25]	0.82
CALD status (ref = non-CALD)	0.68	[0.36, 1.27]	0.22	0.96	[0.92, 1.00]	0.08	0.91	[0.64, 1.27]	0.57
Middle or low disadvantage (ref = high disadvantage)	0.73	[0.52, 1.04]	0.08	0.97	[0.93, 1.02]	0.22	1.02	[0.78, 1.32]	0.89
Undergraduate and above (ref = up to some qualification)	0.62	[0.42, 0.91]	0.01	0.96	[0.93, 0.99]	0.01	1.25	[0.99, 1.58]	0.06

Notes: aRR = adjusted risk ratio; 95% CI = 95% confidence interval, *p* = *p* value, CALD = culturally and linguistically diverse. Models adjusted for age, region, CALD status, area socio-economic disadvantage and education. Unweighted sample sizes for models in new fatherhood: *n* = 1,325 for depression; *n* = 1,074 for obesity and *n* = 379 for sleep.

Source: *Ten to Men* data, unweighted

Table S9: Parameter estimates from multivariable Poisson regression models investigating predictors of prevalence of selected health conditions in new fatherhood and medium-term fatherhood for first-time fathers

	Depression			Obesity			7+ hours sleep		
	aRR	95% CI	<i>p</i>	aRR	95% CI	<i>p</i>	aRR	95% CI	<i>p</i>
New fatherhood									
Health condition at baseline (ref = no)	8.06	[4.60, 14.14]	<0.01	1.64	[1.54, 1.74]	<0.01	2.02	[1.20, 3.38]	0.01
Age (continuous)	0.99	[0.96, 1.03]	0.73	1.00	[1.00, 1.00]	0.84	0.98	[0.96, 0.997]	0.02
Inner regional/outer regional/remote area (ref = major cities)	0.58	[0.31, 1.10]	0.10	1.02	[0.96, 1.09]	0.49	0.97	[0.73, 1.30]	0.86
CALD status (ref = non-CALD)	0.96	[0.39, 2.38]	0.92	0.94	[0.87, 1.02]	0.13	0.79	[0.31, 1.98]	0.61
Middle or low disadvantage (ref = high disadvantage)	0.44	[0.25, 0.80]	0.01	0.97	[0.90, 1.04]	0.42	1.22	[0.85, 1.74]	0.28
Undergraduate and above (ref = up to some qualification)	0.88	[0.40, 1.94]	0.75	1.03	[0.97, 1.09]	0.35	1.04	[0.77, 1.41]	0.79
Medium-term fatherhood									
Health condition at baseline (ref = no)	1.69	[0.75, 3.81]	0.20	1.19	[1.05, 1.35]	0.01	1.35	[0.83, 2.20]	0.23
Health condition in new fatherhood (ref = no)	4.78	[2.40, 9.50]	<0.01	1.54	[1.37, 1.74]	<0.01	1.87	[1.10, 3.18]	0.02
Age (continuous)	0.97	[0.92, 1.01]	0.14	1.00	[1.00, 1.00]	0.23	1.01	[0.99, 1.03]	0.22
Inner regional/outer regional/remote area (ref = major cities)	1.36	[0.72, 2.55]	0.35	1.05	[0.98, 1.13]	0.14	0.90	[0.62, 1.31]	0.58
CALD (ref = non-CALD)	0.80	[0.20, 3.16]	0.75	1.02	[0.95, 1.11]	0.54	0.60	[0.18, 1.98]	0.40
Middle or low disadvantage (ref = high disadvantage)	0.59	[0.32, 1.09]	0.09	0.99	[0.92, 1.07]	0.85	1.18	[0.74, 1.89]	0.49
Undergraduate and above (ref = up to some qualification)	0.79	[0.40, 1.58]	0.51	0.97	[0.91, 1.03]	0.28	1.00	[0.73, 1.36]	0.98

Notes: aRR = adjusted risk ratio; 95% CI = 95% confidence interval, *p* = *p* value, CALD = culturally and linguistically diverse. Models adjusted for pre-fatherhood health status (and new fatherhood health status for medium-term fatherhood time point), age, region, CALD status, area socio-economic disadvantage and education. Unweighted sample sizes for models in new fatherhood: *n* = 336 for depression; *n* = 312 for obesity and *n* = 90 for sleep. Unweighted sample sizes for models in medium-term fatherhood: *n* = 221 for depression; *n* = 212 for obesity and *n* = 74 for sleep.

Source: *Ten to Men* data, unweighted, Waves 1-4

Table S10: Parameter estimates from multivariable Poisson regression models investigating predictors of incidence of selected health conditions in new fatherhood for first-time fathers

	Depression			Obesity			7+ hours sleep		
	aRR	95% CI	<i>p</i>	aRR	95% CI	<i>p</i>	aRR	95% CI	<i>p</i>
Age (continuous)	0.91	[0.83, 0.996]	0.04	1.00	[1.00, 1.01]	0.45	0.99	[0.91, 1.09]	0.90
Inner regional/outer regional/remote area (ref = major cities)	0.33	[0.12, 0.91]	0.03	1.07	[0.99, 1.15]	0.09	0.32	[0.03, 3.18]	0.33
CALD status (ref = non-CALD)	0.73	[0.16, 3.31]	0.69	0.95	[0.88, 1.03]	0.21	1.09	[0.29, 4.09]	0.89
Middle or low disadvantage (ref = high disadvantage)	0.29	[0.13, 0.64]	<0.01	0.95	[0.87, 1.04]	0.25	0.94	[0.25, 3.48]	0.92
Undergraduate and above (ref = up to some qualification)	1.23	[0.46, 3.25]	0.68	0.98	[0.92, 1.05]	0.65	0.66	[0.21, 2.02]	0.47

Notes: aRR = adjusted risk ratio; 95% CI = 95% confidence interval, *p* = *p* value, CALD = culturally and linguistically diverse. Models adjusted for age, region, CALD status, area socio-economic disadvantage and education. Unweighted sample sizes for models in new fatherhood: *n* = 305 for depression; *n* = 235 for obesity and *n* = 29 for sleep.

Source: *Ten to Men* data, unweighted

Table S11: Prevalence of health outcomes for fathers and non-fathers in Wave 4 for Research Question 2

Health condition	Fathers (% [95% CI])	Non-fathers (% [95% CI])
Depression	31.5 [20.2, 45.6]	46.1 [41.0, 51.2]
Obesity	28.8 [17.2, 44.0]	27.9 [23.4, 33.0]
Sleep (less than 7 hours)	40.2 [26.6, 55.5]	31.6 [26.9, 36.8]

Notes: Sample consists of first-time fathers in Wave 4 and similar men who were non-fathers (not yet fathers and of the same age range). Unweighted sample sizes for fathers: *n* = 128 for depression; *n* = 120 for obesity and *n* = 124 for sleep. Unweighted sample sizes for non-fathers: *n* = 927 for depression; *n* = 885 for obesity and *n* = 909 for sleep.

Source: *Ten to Men* data, using Wave 4 raked cross-sectional population weights

References

- Abbott, S., Parretti, H. M., & Greenfield, S. (2021). Experiences and perceptions of dietitians for obesity management: A general practice qualitative study. *Journal of Human Nutrition and Dietetics: The Official Journal of the British Dietetic Association*, 34(3), 494–503.
- Australian Bureau of Statistics (ABS). (2021). *2021 Census Community Profiles*. Canberra: ABS. www.abs.gov.au/census/find-census-data/community-profiles/2021/AUS
- Australian Bureau of Statistics. (2022). *Standards for statistics on cultural and language diversity*. Canberra: ABS. abs.gov.au/statistics/standards/standards-statistics-cultural-and-language-diversity/latest-release
- Australian Institute of Family Studies (AIFS). (2018). *Growing Up in Australia: The Longitudinal Study of Australian Children (Wave 8 K Interview)*. Melbourne: AIFS. aifs.gov.au/sites/default/files/2024-10/wave_8_labelled_questionnaires_for_k_cohort.pdf
- Australian Institute of Health and Welfare (AIHW). (2020). *A framework for monitoring overweight and obesity in Australia* (Cat. No. PHE 272). Canberra: AIHW.
- Beyond Blue. (2025). *Find a mental health professional*. Beyond Blue. beyondblue.org.au/get-support/find-a-mental-health-professional
- Chisholm, D., Amir, M., Fleck, M., Herrman, H., Lomachenkov, A., Lucas, R. et al. (2001). Longitudinal Investigation of Depression Outcomes (the LIDO study) in primary care in six countries: Comparative assessment of local health systems and resource utilization. *International Journal of Methods in Psychiatric Research*, 10(2), 59–71.
- Halcomb, E., McInnes, S., Patterson, C., Moxham, L., & Bird, S. (2022). Australian general practice nurse involvement in mental health: A descriptive survey. *Collegian*, 29(4), 448–455.
- Hayes, S. M., Murray, S., Castriotta, R. J., Landrigan, C. P., & Malhotra, A. (2012). (Mis) perceptions and interactions of sleep specialists and generalists: Obstacles to referrals to sleep specialists and the multidisciplinary team management of sleep disorders. *Journal of Clinical Sleep Medicine*, 8(6), 633–642.
- Kamusheva, M., Ignatova, D., Golda, A., & Skowron, A. (2020). The potential role of the pharmacist in supporting patients with depression: A literature-based point of view. *Integrated Pharmacy Research and Practice*, 9, 49–63.
- Macdonald, J. A., Mansour, K. A., Wynter, K., Francis, L. M., Rogers, A., Angeles, M. R. et al. (2022). *Men's and boys' barriers to health system access: A literature review*. Prepared for the Australian Government Department of Health and Aged Care, Canberra.
- McHugh, R. K., & Weiss, R. D. (2019). Alcohol use disorder and depressive disorders. *Alcohol Research: Current Reviews*, 40(1).
- myGov. (updated 3 June 2025). *Seeking professional help for mental health*. Canberra: myGov. my.gov.au/en/services/health-and-disability/mental-health/seeking-professional-help
- National Health and Medical Research Council (NHMRC). (2013). *Clinical practice guidelines for the management of overweight and obesity in adults, adolescents and children in Australia*. Melbourne: NHMRC.
- Pirkis, J., Currier, D., Harris, M., Mihalopoulos, C., Arya, V., Banfield, M. et al. (2022). *Evaluation of Better Access*. Melbourne: University of Melbourne.
- Pham, T. T. L., Berecki-Gisolf, J., Clapperton, A., O'Brien, K. S., Liu, S., & Gibson, K. (2021). Definitions of culturally and linguistically diverse (CALD): A literature review of epidemiological research in Australia. *International Journal of Environmental Research and Public Health*, 18(2), 737.
- Roehrs, T. A., & Roth, T. (2015). Sleep disturbance in substance use disorders. *The Psychiatric Clinics of North America*, 38(4), 793–803.
- Stone, J., Marsh, A., Dale, A., Willis, L., O'Toole, S., Helfgott, S. et al. (2019). *Counselling guidelines: Alcohol and other drug issues* (4th ed.). Perth: Mental Health Commission.
- Sydney Centre for TMJ & Sleep Therapy. (2004–19). *What types of doctors treat sleep disorders?* Sydney: Sydney Centre for TMJ & Sleep Therapy. tmjandsleep.com.au/articles/what-types-of-doctors-treat-sleep-disorders
- Sýkorová, M., Nolte, E., Martineau, F., Miller, M. A., Eriksson, S. H., Quinnell, T. G. et al. (2025, preprint). *Barriers and facilitators to specialist service referrals for sleep disorders from healthcare professionals' perspective: A scoping review of qualitative research evidence*.
- Turner, M., Jannah, N., Kahan, S., Gallagher, C., & Dietz, W. (2018). Current knowledge of obesity treatment guidelines by health care professionals. *Obesity (Silver Spring)*, 26(4), 665–671.
- Volpe, F., Biddiscombe, K., Silbert, M., & Martin, S. (2024). *Ten to Men: The Australian Longitudinal Study on Male Health – Data user guide, Version 6.0, December 2024*. Melbourne: Australian Institute of Family Studies.