



THE UNIVERSITY OF
SYDNEY

**Brain and Mind
Centre**

Closing the gender gap: Supporting the mental health of Australian women during the COVID-19 era

20 April 2021

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Key messages

- Prior to the pandemic there was a significant gender gap for suicide attempts and other major mental health indicators other than suicide deaths.
- Women have been disproportionately affected by the pandemic through structurally imposed vulnerabilities that are likely to increase the mental health gender gap particularly as a result of increased rates of job loss due to their greater representation in precarious employment and ineligibility for JobKeeper.
- Gender-informed policies are needed to manage more effectively the unfolding mental health crisis in Australia. We recommend an urgent, coordinated policy response combining economic, social, and mental health services interventions with a gender equity lens.
- Our modelling suggests that the combination of education, employment, and participation strategies particularly targeted at women and enhanced mental health services are needed to close the gender gap.
- Specifically, employment programs (reinstating proactive, targeted business income support to support jobs in industries most effected by the pandemic until May 2022), economic incentives to achieve a increase in the rate female employment initiation, provision of affordable and accessible childcare, education programs aimed at increasing post-secondary enrolments, and significant investments in community-based mental health services capacity, technology-enabled care coordination, and post-suicide attempt care will be the most effective combination. This combination is projected to prevent 10,016 (5.9%) self-harm hospitalisations, and 63,340 (4.1%) mental health-related ED presentations over the period July 2020 to July 2025.

Background

Gender related differences of the impact of recession on suicide rates have been noted (Barr et al., 2012; Barth et al., 2011; Berk, Dodd, & Henry, 2006) with the greater increases in suicides traditionally seen in males being attributed to gender stereotypes as males being the primary breadwinner, and therefore experiencing greater shame associated with unemployment, in addition to reduced help seeking behaviours.^{1,2} However, the economic supports put in place in the wake of the pandemic in Australia (including JobKeeper to stem job loss, mortgage deferrals, and moratoriums on rental evictions) and a delay or initial decline in suicide deaths known as the ‘pulling-together’ effect^{1,3,4} have likely provided effective protections against the significant adverse suicide outcomes projected under the ‘do nothing’ / baseline scenarios originally projected in the [Road to Recovery](#) modelling report and which are usually experienced to a greater degree by men during recessions. Given that the majority of suicide deaths occur in men (i.e. [in 2019, males accounted for 75.4% of the 3318 suicide deaths in Australia](#)) and given that the temporary economic protections put in place benefitted men to a greater extent,⁵ Australia has been successful to date in preventing an overall increase in suicides in 2020.

In contrast, women are much more likely than men to be hospitalised for intentional self-harm (i.e., [in 2018–19 females accounted for 63.5% of the 29,434 self-harm hospitalizations in Australia](#)). In addition, women have been disproportionately affected by the pandemic through structurally imposed vulnerabilities including greater domestic and caregiver responsibilities including home schooling, increased exposure to domestic and family violence, and increased rates of job loss due to their greater representation in precarious employment and ineligibility for JobKeeper.^{5,6} There are early signs that these exposures are manifesting in increased rates of self-harm and other mental health related presentations to emergency departments (ED) across the country as previously projected.^{7,8} If not adequately addressed, these factors (and a removal of the broader economic supports in the first quarter of 2021) are likely to contribute to a increase in adverse mental health outcomes and place significant pressure on an already stretched mental health system.

What did we do?

Building on the program of systems modelling undertaken by the Brain and Mind Centre, University of Sydney (<https://www.sydney.edu.au/brain-mind/our-research/youth-mental-health-and-technology.html>) an age and gender stratified system dynamics model of the social and economic impacts of COVID-19 on population mental health outcomes in Australia has been developed. This model is an extension of the national model developed in 2020, which has been refined on the basis of empirical data on unemployment, underemployment and workforce participation over 2020⁹ (we previously relied on RBA and Treasury forecasts) and updated data on psychological distress from the Australian Bureau of Statistics,¹⁰ resolving previous uncertainty around the duration of economic protections and providing a clearer picture of the mental health trajectory Australia is likely to experience.

This updated and extended systems model projects the likely prevalence of psychological distress, mental health-related ED presentations, and self-harm hospitalisations, by age and gender, and provides as a decision support tool to prospectively assess the impacts of a range of further mitigation measures to reduce pressure on Australia's mental health system and prevent adverse population mental health outcomes. Appendix A provides a brief, high-level summary of the causal structure and pathways of the model, model validation graphs, and descriptions of each intervention, including assumptions and the evidence sources used to inform the integration of each intervention in the model. The key findings of the model are reported below with summary statistics for each scenario provided for the period 2020-2025, and graphs showing the impacts of mitigation scenarios over a longer time horizon (to 2031).

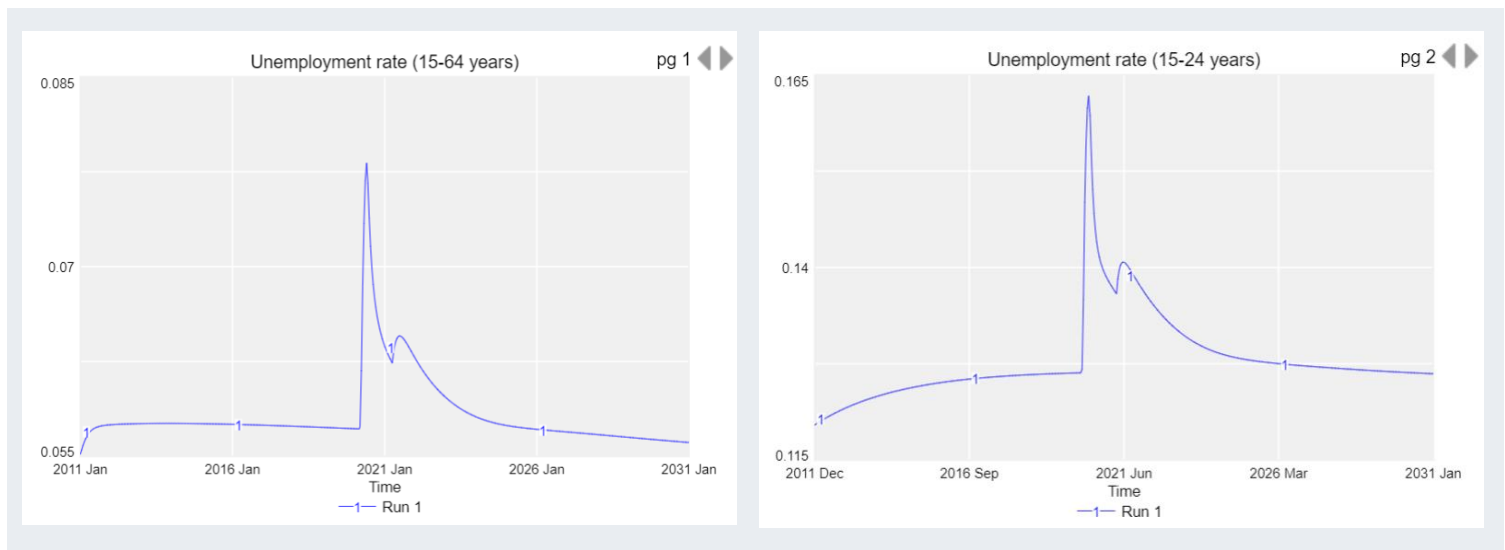
Key model assumptions:

Economic: Assumptions associated with peak (effective) unemployment for the total population and specifically for the youth population that were made in the original model have now been revised based on real time data from 2020. The model assumes a small rebound in unemployment associated with the cessation of the JobKeeper program (Fig. 1)

Social: The model assumes a reduction in community connectedness resulting from social dislocation unrelated to job loss (e.g., increased working from home, not participating in sports, reduced social gatherings), that persisted for a period of 12 months from the onset of the pandemic. This reduction in community connectedness was estimated to have peaked at 24% in August 2020, and is calibrated to empirical psychological distress data now available for 2020-2021.¹⁰

Demographic: The impact of the pandemic on overseas migration to Australia is uncertain. Reports have estimated that Australia could have as many as 959,551 fewer people by the end of 2022¹¹ than was forecast pre-COVID-19. We have therefore accounted for this in the population projections used in the model.

Figure 1: Pattern of unemployment underlying model outputs based on empirical data.



What did we find?

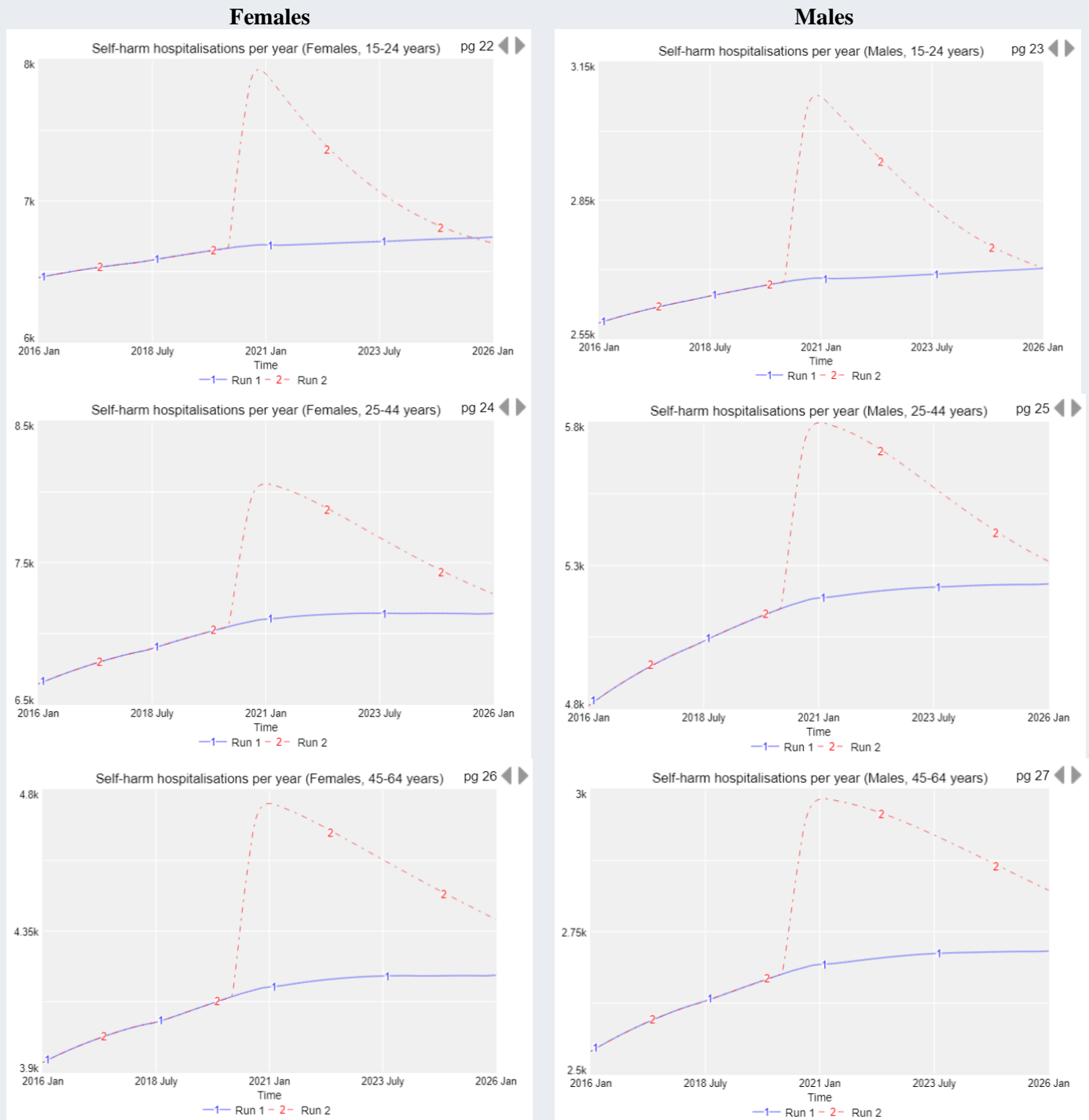
Projected mental health impacts of COVID-19:

- Despite a more rapid economic recovery than projected by the Reserve Bank of Australia in mid-2020, revision of model inputs with new empirical data available continues to forecast negative population mental health outcomes (Table 1). Estimates of the peak prevalence of psychological distress provided in the [Road to Recovery Revised Report in August 2020](#) were closely aligned with that seen in the empirical data from 2020.
- Over the 5 years from March 2020 to March 2025, self-harm hospitalisations (indicative of suicide attempts) are projected to increase by 6.5% across the population (i.e., compared to what would have happened if the pandemic had not occurred). Projected increases in self-harm hospitalisations are greater among women than men across all age-groups (Fig. 2). The rate ratio of female to male self-harm hospitalisations which had been decreasing prior to the pandemic increased from 1.7 in February 2020 to a peak of 1.74 in September 2020 indicating a widening gender gap.
- Mental health related ED presentations across the population are projected to increase by 5% over the 5-year period. Projected increases in presentations are higher among women than among men across all age-groups (Fig. 3)
- The modelling confirms that women will experience the greatest adverse mental health impacts associated with the COVID-19 pandemic.

Table 1: *Projected self-harm hospitalisations, and mental health-related emergency department presentations over the period March 2020 to March 2025 by age and gender.*

	Females			Males		
	No COVID-19	COVID-19	% increase	No COVID-19	COVID-19	% increase
<i>Population all ages</i>						
ED presentations	708,403	748,803	5.4	768,219	805,722	4.7
Self-harm hospitalisations	100,367	107,560	6.7	58,367	62,125	6.0
<i>Population aged 15-24 years</i>						
ED presentations	147,534	156,445	5.7	161,486	170,362	5.2
Self-harm hospitalisations	33,531	36,074	7.0	13,418	14,338	6.4
<i>Population aged 25-44 years</i>						
ED presentations	283,157	299,662	5.5	315,986	332,407	4.9
Self-harm hospitalisations	35,748	38,353	6.8	26,079	27,774	6.1
<i>Population aged 45-64 years</i>						
ED presentations	156,252	166,834	6.3	161,858	170,659	5.2
Self-harm hospitalisations	21,011	22,783	7.8	13,531	14,462	6.4

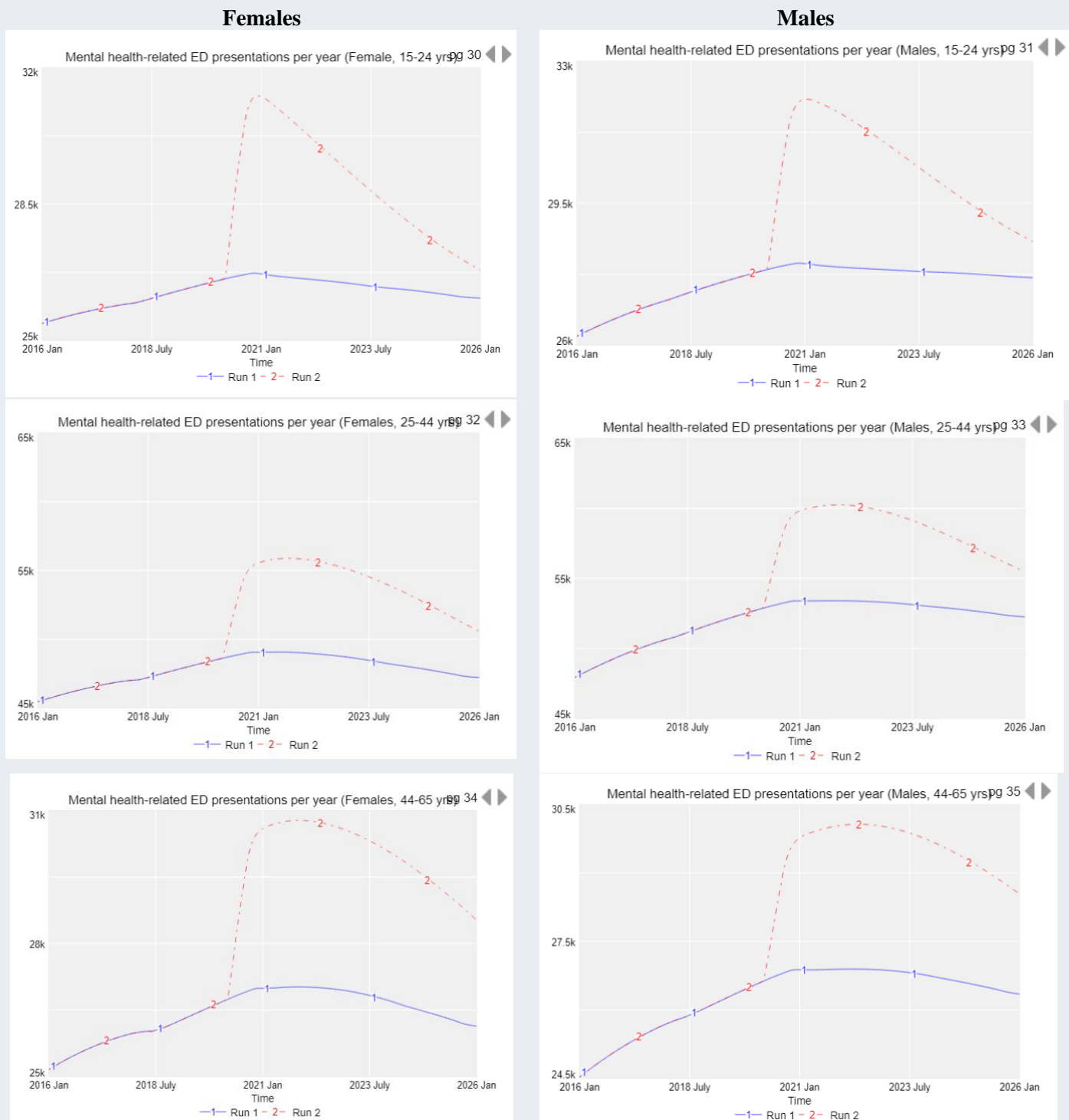
Figure 2: Impact of COVID-19 and recession on self-harm hospitalisation compared to the pre-COVID forecast trajectory by age and gender.



Run 1 – Pre-COVID-19 trajectory for self-harm hospitalisations.

Run 2 – Impact of COVID-19 and recession on self-harm hospitalisations.

Figure 3: Impact of COVID-19 and recession on mental health-related ED presentations compared to the pre-COVID forecast trajectory by age and gender.



Run 1 – Pre-COVID-19 trajectory for mental health-related ED presentations.

Run 2 – Impact of COVID-19 and recession on mental health-related ED presentations.

Strategies for mitigating the impact of COVID-19 on population mental health outcomes

- Gender stratified results of the projected impacts of alternative intervention scenarios on key mental health outcomes are provided in Table 2.
- Job creation programs targeted at women (achieving a five-fold increase in the rate of female employment initiation) are the single most effective strategy for reducing the adverse mental health impacts of the pandemic overall and deliver the greatest benefits in closing the gender gap (Fig. 4). Increasing the rate of female employment initiation coupled with the provision of affordable and accessible childcare will significantly reduce the duration of psychological distress across the population (fig. 5, run 2, red) and prevent 4,533 (2.7%) self-harm hospitalisations, and 32,260 (2.1%) mental health-related ED presentations during the period July 2021 to July 2025.
- Substantial investment in specialised mental health services capacity, technology-enabled coordination of multidisciplinary team-based care, and intensive post-suicide attempt support is needed to manage the current and projected surge in demand for mental health care. Combined, these interventions are projected to prevent 6,033 (3.6%) self-harm hospitalisations, and 41,374 (2.7%) mental health-related ED presentations over the period July 2021 to July 2025 (Fig. 5, run 3, pink).
- Mental health awareness campaigns are projected to have minimal impact on mental health outcomes and may even be detrimental, since they increase demand for already overstretched services, increasing waiting times and disengagement from care. Mental health awareness campaigns need to be preceded by significantly increased specialised, community-based mental health services capacity if they are to be effective.
- **BMC recommendation:** Gender-informed policies are needed to manage more effectively the unfolding mental health crisis in Australia. We recommend an urgent, coordinated policy response combining economic, social, and mental health services interventions with a gender equity lens. Our modelling suggests that the combination of employment programs (reinstating proactive, targeted business income support to support jobs in industries most effected by the pandemic until May 2022), economic incentives to achieve a five-fold increase in the rate female employment initiation, provision of affordable and accessible childcare, education programs aimed at increasing post-secondary enrolments by 20%, and significant investments in community-based mental health services capacity, technology-enabled care coordination, and post-suicide attempt care will prevent 10,016 (5.9%) self-harm hospitalisations, and 63,340 (4.1%) mental health-related ED presentations over the period July 2020 to July 2025 (Fig. 5, run 4, green).

Table 2: Impacts of employment, education, and health system strengthening scenarios on population mental health indicators.

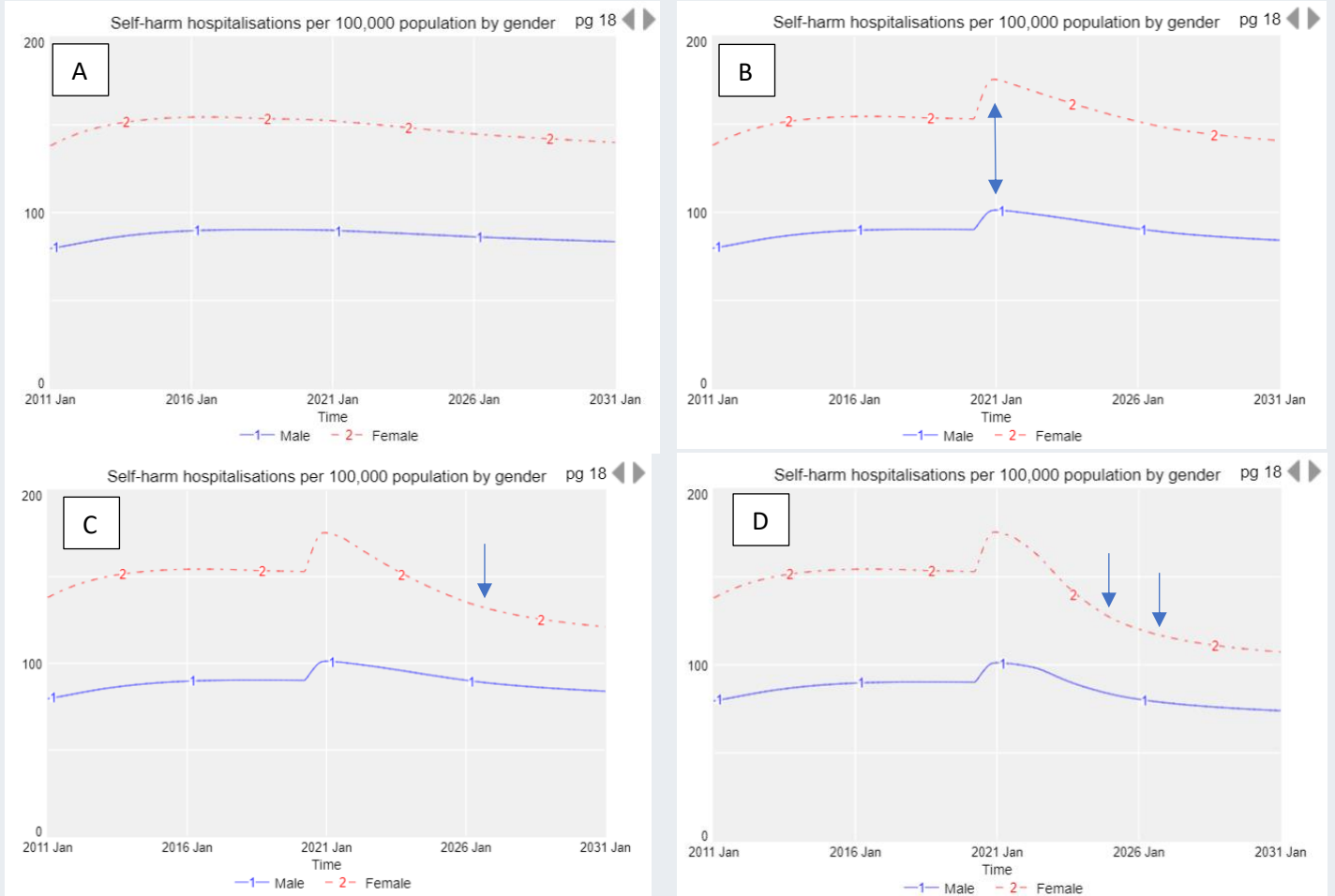
Scenarios*	Females (all ages)				Males (all ages)			
	Self-harm hosp. prevented		ED present. prevented		Self-harm hosp. prevented		ED present. prevented	
	n	%	n	%	n	%	n	%
a. Employ. Programs ext. to May 2022	218	0.2	1,243	0.2	153	0.2	1,582	0.2
b. Awareness campaigns	-1,445	-1.3	-70,328	-9.4	-250	-0.4	-52,333	-6.5
c. Education programs 20%	52	0.0	198	0.0	26	0.0	252	0.0
d. Services capacity increase	513	0.5	7,932	1.1	202	0.3	5,100	0.6
e. Tech.-enabled care	640	0.6	10,337	1.4	440	0.7	11,758	1.5
f. Post-attempt care	2,696	2.5	2,961	0.4	1,510	2.4	1,360	0.2
g. Online services	37	0.0	631	0.1	25	0.0	728	0.1
h. d + e + f	3,873	3.6	22,266	3.0	2,161	3.5	19,108	2.4
i. Childcare + Female jobs x2	2,459	2.3	17,165	2.3	215	0.3	5,454	0.7
j. Childcare + Female jobs x5	4,298	4.0	26,367	3.5	235	0.4	5,892	0.7
k. BMC recommended (a + c + d + e + f + j)	7,640	7.1	41,305	5.5	2,376	3.8	22,035	2.7

*Results are for the period March 2020 to 2025 with interventions introduced in June 2021. Cases (n) prevented and percent reduction against COVID baseline are presented.

Next steps:

The model will continue to be updated as revised estimates of migration, unemployment, underemployment, education and workforce participation, psychological distress, presentations to emergency care, self-harm hospitalisations, and suicide deaths are released. We recommend much more frequent, well-structured tracking of population mental health indicators and frameworks that facilitate accessibility of such aggregated timeseries data by research groups modelling and informing decision making to mitigate adverse mental health outcomes – nationally and regionally. This would enable indicative monitoring of progress of the strategies implemented, permit comparisons against projected impacts of the model, contribute to refinement of the model to strengthen forecasts over time, and empower decision makers at national and regional levels to be proactive and effective in responding to the ‘shadow pandemic’ of mental ill-health in Australia.

Figure 4: Closing the gender gap in self-harm hospitalisations.



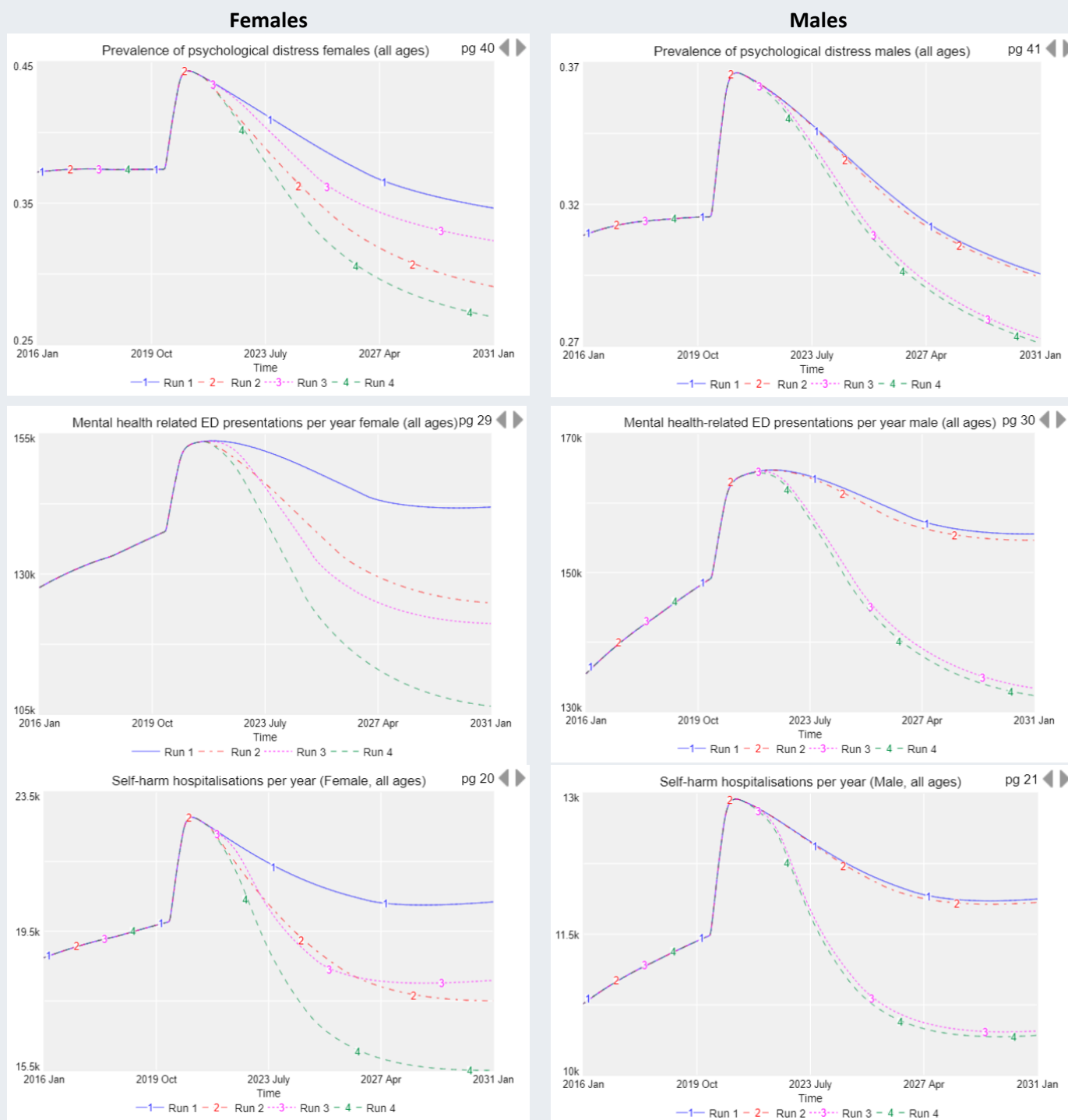
A. Had COVID-19 not occurred.

B. COVID-19 baseline

C. Job creation programs targeted at women (achieving a five-fold increase in the rate of female employment initiation) coupled with the provision of affordable and accessible childcare

D. BMC recommendation

Figure 5: Simulated impacts of best performing health system strengthening strategies combined with social and economic mitigation strategies targeted at women (2021-2031).



Run 1 – Baseline scenario

Run 2 – Programs to deliver a five-fold increase in the rate of female employment initiation + provision of affordable and accessible childcare
Run 3 – Expansion of specialised mental health services capacity (8-10% annually) + technology-enabled coordination of multidisciplinary team-based care + and intensive post-suicide attempt aftercare

Run 4 – BMC recommendation – Extending employment programs until May 2022 + Education support programs – increasing enrolments in post-secondary education and vocational training by 20% + expansion of specialist community-based mental health service capacity + technology enabled coordination of team-based care + intensive post-suicide attempt aftercare + provision of affordable and accessible childcare + a five-fold increase in the rate of female employment initiation.

References:

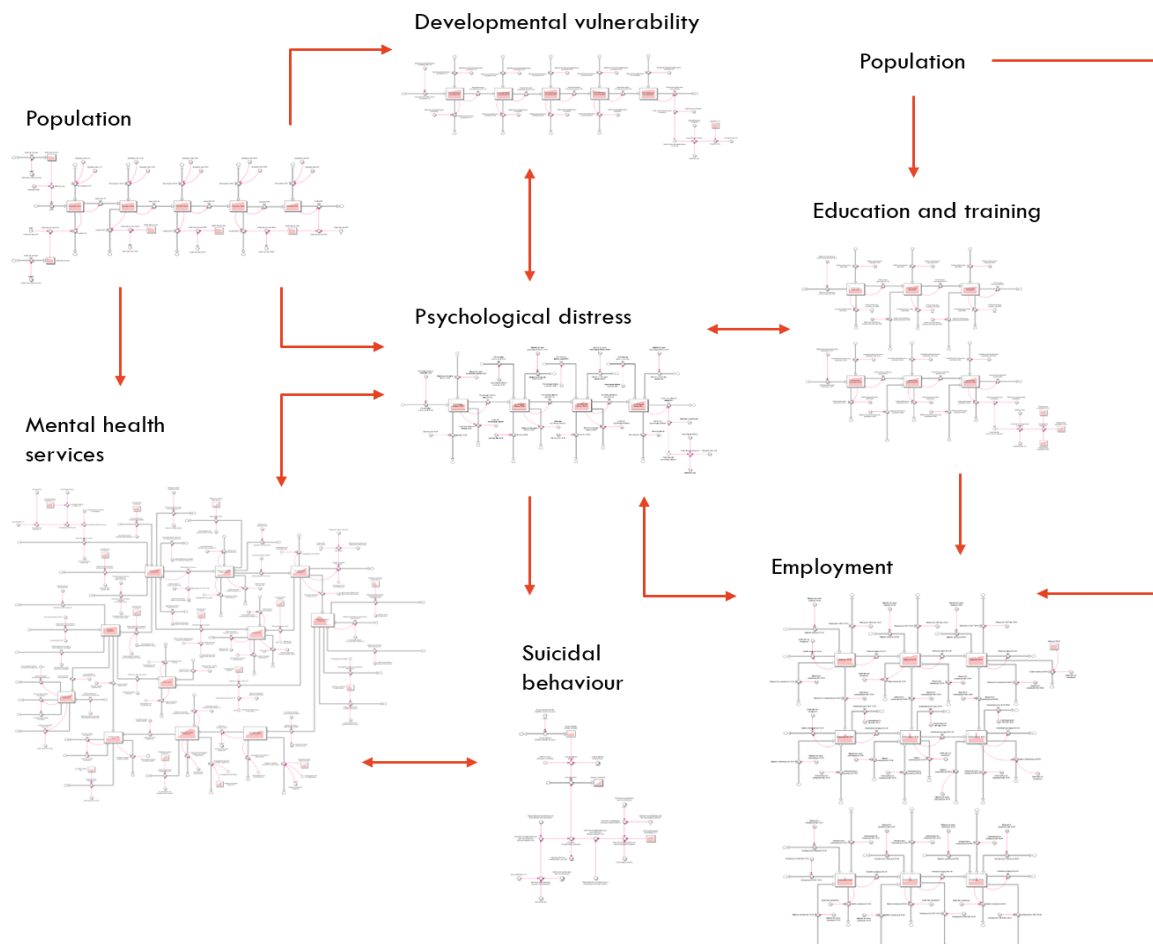
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- 4 Tanaka, T. & Okamoto, S. Increase in suicide following an initial decline during the COVID-19 pandemic in Japan. *Nat Hum Behav*, doi:10.1038/s41562-020-01042-z (2021).
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- 8 Atkinson, J., Skinner, A., Lawson, K., Song, Y. C. & Hickie, I. Road to Recovery: Revision of estimates based on revised RBA forecasts. (Brain and Mind Centre, University of Sydney: <https://www.sydney.edu.au/content/dam/corporate/documents/brain-and-mind-centre/revision-of-estimates-based-on-revised-rba-forecasts.pdf>, Sydney, Australia, 2020).
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- 10 Australian Bureau of Statistics. Household impacts of COVID-19 survey, 12-21 March 2021, Australia. (ABS, Canberra, Australia, 2021).
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Appendix A

Model summary:

The core model structure included: 1) a population component, capturing changes over time in the size and composition of the population resulting from births, migration, ageing, and mortality; 2) a psychological distress component that models flows of people to and from states of moderate to very high psychological distress (Kessler 10 [K10] score 16-50); 3) a developmental vulnerability component modelling exposure to childhood adversity and its effect on the risk of developing mental disorders in adolescence and adulthood; 4) a post-secondary education sector that captures participation in education and vocational training; 5) an employment sector that captures workforce participation, unemployment and underemployment across the population; 6) a mental health services component that models the movement of psychologically distressed people through one of several possible service pathways involving (potentially) general practitioners, psychiatrists and allied mental health professionals (including psychologists and mental health nurses), emergency department and psychiatric inpatient care, community- and hospital-based outpatient care, and online services; and 7) a suicidal behaviour component that captures self-harm hospitalisations and suicide deaths. Figure 9 presents a high-level map of the core model showing the (causal) connections among sectors. The model is stratified by age-groups (0-14 years, 15-24 years, 25-44 years, 45-64 years, 65+ years), and by gender to enable exploration of differential effects of strategies on these populations.

Figure S1: A high-level overview of the causal structure and pathways of the system dynamics model



Model validation

The model broadly reproduces historic trends across a range of indicators including the prevalence of psychological distress, mental health-related ED presentations, self-harm hospitalisations, and services referrals from 2011.

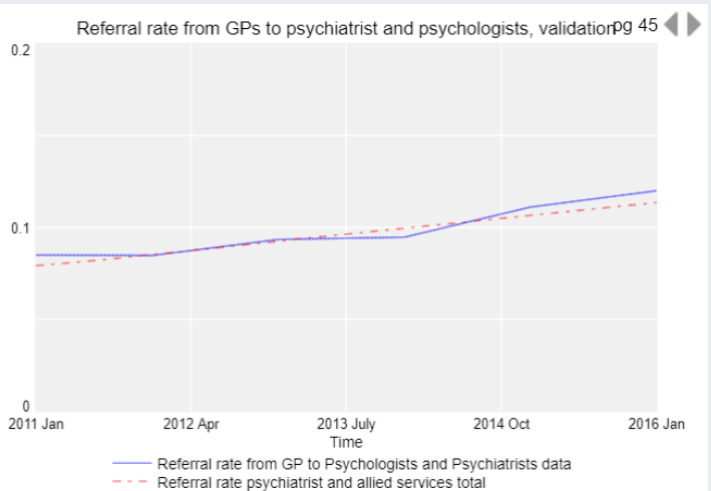
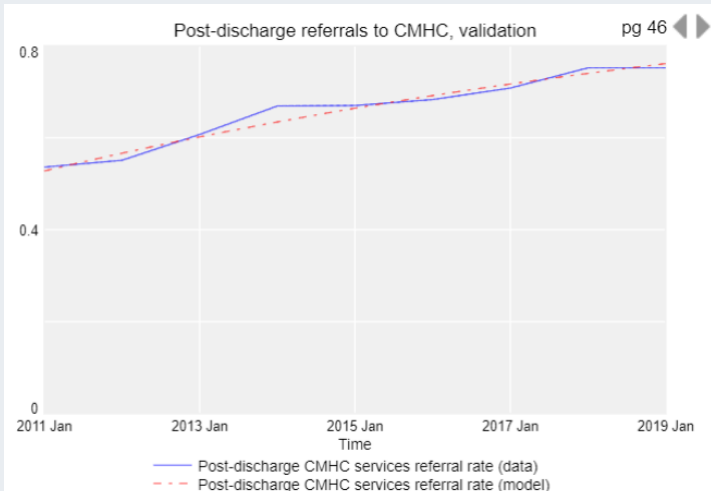
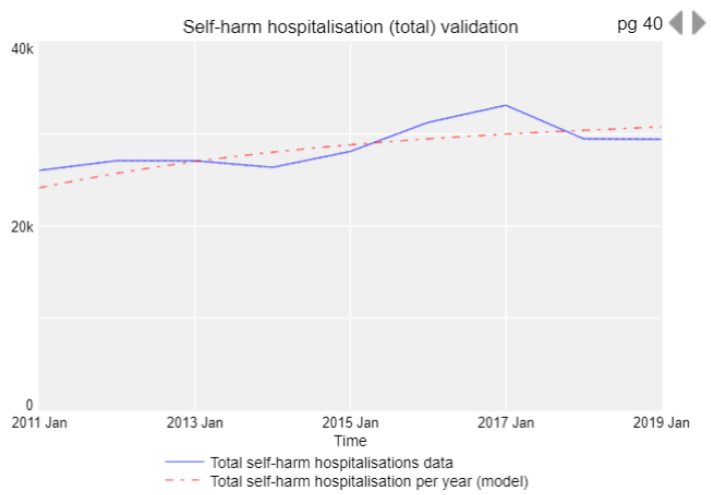
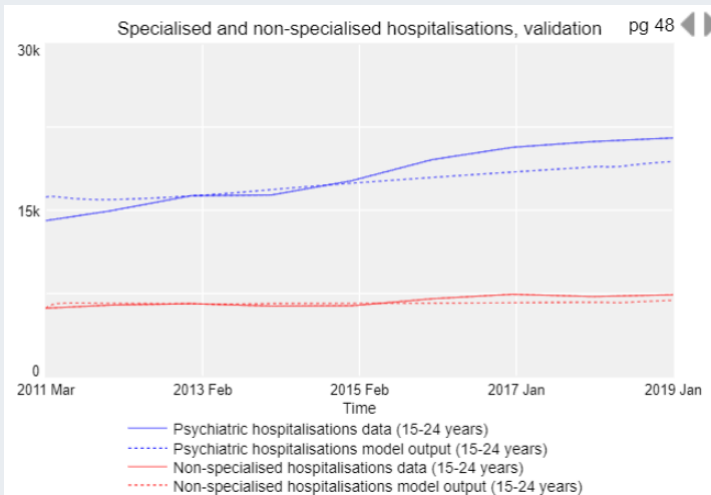
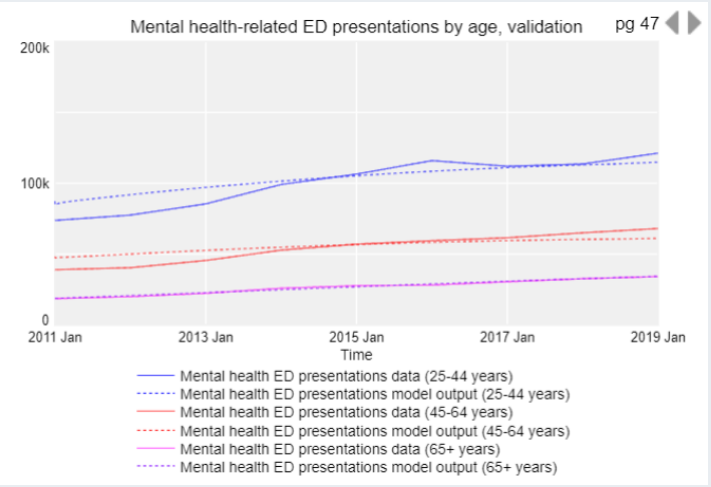
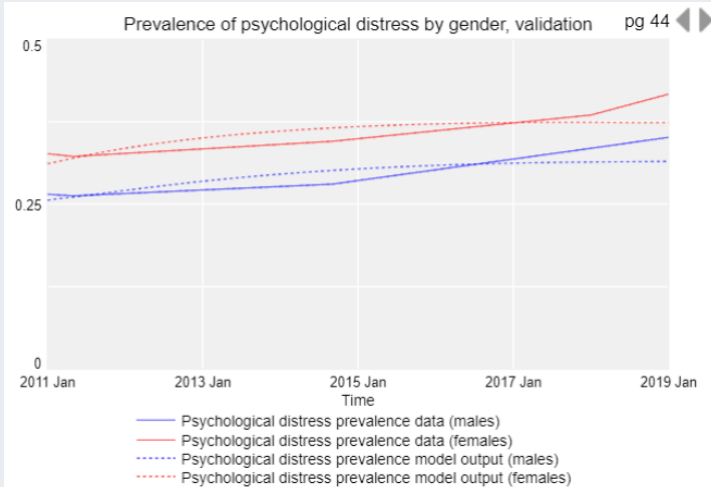


Table S1. Intervention definitions, parameter assumptions, and evidence sources. Parameters determining the direct effects of each intervention can be modified (on request) via an interactive model interface, enabling users to assess the impact of parameter assumptions on model outputs.

Intervention	Description
Post-suicide attempt care	<p>Post-attempt care is an active outreach and enhanced contact program that aims to reduce readmission in those presenting to services after a suicide attempt. It includes individually tailored contact, solution focused counselling, and motivations to ensure adherence to follow-up treatments and continuity of contact.</p> <p>Parameters that can be modified in this intervention are:</p> <p><i>Starting year</i> — the year in which post-attempt care programs commence (the default is 2021.5, or July 2021).</p> <p><i>Implementation time (years)</i> — the time after commencement required for post-attempt care programs to be fully implemented (the default is 2 years).</p> <p><i>Program duration (years)</i> — the duration of post-attempt care programs (the default is set to 1000 years, ensuring that programs remain in place until the end of the simulation).</p> <p><i>Maximum rate</i> — the maximum proportion of patients hospitalised for a suicide attempt receiving post-attempt care. The default value (0.7) assumes that post-attempt care will be provided to 70% of patients hospitalised for a suicide attempt when post-attempt care programs are fully implemented.</p> <p><i>Post-attempt care effect</i> — the proportion of potential repeat suicide attempts expected among patients receiving post-attempt care. The default value (0.398) implies that 39.8% of repeat attempts that would have occurred without post-attempt care actually occur when post-attempt care is provided; i.e., post-attempt care is assumed to prevent 60.2% of potential repeat suicide attempts. The default estimate is derived from Hvid et al. (2011, Nord. J. Psychiatry 65, 292-298).</p> <p><i>Repeat self-harm rate per year</i> — the probability that a person will self-harm in the year after a suicide attempt without post-attempt care. The default value (0.179) implies that 17.9% of people hospitalised for self-harm will re-attempt within 1 year (i.e., assuming they don't receive post-attempt care); this estimate is derived from Carroll et al. (2014, PLoS ONE 9, e89944).</p>
Technology-enabled, measurement-based care	<p>Technology-enabled, measurement-based care involves the use of online technology to facilitate delivery of multidisciplinary team-based care, in which medical and allied health professionals consider all relevant treatment options and collaboratively develop an individual treatment and care plan for each patient. Online technology improves coordination of care and facilitates communication between medical and allied health professionals, as each health professional involved in the care of a patient has access to the same information about that patient's treatment history.</p> <p>Parameters that can be modified in this intervention are:</p> <p><i>Starting year</i> — the year in which technology-enabled, measurement-based care is introduced (the default is 2021.5, or July 2021).</p> <p><i>Implementation time (years)</i> — the time required for technology-enabled, measurement-based care to be fully implemented (the default is 2 years).</p>

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Program duration (years) — the duration of investment in technology-enabled, measurement-based care (the default is set to 1000 years, ensuring that investment continues until the end of the simulation).

Maximum rate per service — the maximum proportion of mental health services provided that involve technology-enabled, measurement-based care. This proportion will depend on the number of medical and allied health professionals adopting online care coordination technologies, as well as the number of patients consenting to the use of these technologies in the management of their care (i.e., take-up among service providers and patients). The default value (0.7) assumes that technology-enabled, measurement-based care will be provided in 70% of mental health services completed when fully implemented.

Effect on recovery rate — the multiplicative effect of technology-enabled coordinated care on the per-service recovery rate (i.e., the probability that a patient's level of psychological distress will decrease after receiving treatment). The default estimate (1.177) is derived from Woltmann et al. (2012, Am. J. Psychiatry 169, 790-804), and implies that technology-enabled coordinated care increases the per-service probability of a reduction in psychological distress by 17.7%.

Effect on referral rate — the multiplicative effect of technology-enabled, measurement-based care on general practitioners' rates of referral to specialised mental health services (psychiatrists and allied mental health services). The default value (1.266) implies that technology-enabled, measurement-based care increases the per-consultation probability that a general practitioner will refer a patient with moderate to very high psychological distress to specialised psychiatric care by 26.6%, and is derived from Badamgarav et al. (2003, Am. J. Psychiatry 160, 2080-2090).

Effect on disengagement — the multiplicative effect of technology-enabled, measurement-based care on per capita rates of disengagement from mental health services (including disengagement while waiting for services and disengagement resulting from dissatisfaction with services received). The default estimate (0.520) is derived from Badamgarav et al. (2003, Am. J. Psychiatry 160, 2080-2090), and implies that technology-enabled, measurement-based care reduces rates of disengagement by 48.0%.

Awareness programs

Population-wide mental health education programs aimed at reducing stigma, improving recognition of suicide risk, and encouraging help-seeking. This intervention increases the per capita rates at which people perceive a need for mental health services and seek help from a general practitioner or online services.

Parameters that can be modified in this intervention are:

Starting year — the year in which mental health awareness campaigns commence (the default is 2021.5, or July 2021).

Implementation time (years) — the time after commencement required for mental health awareness campaigns to be fully implemented (the default is 0.167 years, or 2 months).

Program duration (years) — the duration of mental health awareness campaigns (the default is 5 years).

Effect on engagement — the multiplicative effect of mental health awareness campaigns on the per capita rates that people perceive a need for mental health care, seek help from a general practitioner, or access online services. The default value (1.585) is derived from Jorm et al. (2003, Psychol. Med. 33, 1071-1079).

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Engaging private services

Effect decay rate per year — the fractional rate per year at which the effect on engagement decreases to a value of 1 (i.e., no effect) after mental health awareness campaigns end. The default value (1) implies that the effect on engagement would decrease to a value of 1 in 1 year given the initial rate of decline (i.e., the rate immediately after awareness campaigns end). Note that the rate of decline in the effect of awareness campaigns itself declines as the effect approaches a value of 1, so the actual time required for the effect to decay completely will generally be greater than the inverse of the decay rate specified.

Partial or full subsidisation of access to private mental health outpatient services, designed to reduce pressure on the public mental health care system. This intervention increases the flow of patients perceiving a need for mental health care through private outpatient services.

Parameters that can be modified in this intervention are:

Starting year — the year in which access to subsidised private outpatient services commences (the default is 2021.5, or July 2021).

Implementation time (years) — the time required for subsidised access to private outpatient services to be fully implemented (the default is 0.167 years, or 2 months).

Program duration (years) — the duration of subsidised access to private outpatient services (the default is 5 years).

Maximum capacity increase — the maximum multiplicative increase in the number of private outpatient services provided per year as a direct result of subsidisation. The default value (2) assumes that subsidisation will increase the number of private outpatient services provided annually by a factor of 2.

Employment programs

Programs designed to stem rapidly increasing unemployment due to the COVID-19 pandemic (e.g., the JobKeeper Payment). This intervention reduces the increase in the per capita job loss rate resulting directly from the pandemic. The per capita rate of employment initiation can also be increased (or decreased); however, the default settings assume that employment programs have no direct effect on employment initiation.

Parameters that can be modified in this intervention are:

Starting year — the year in which employment programs commence (the default is 2020.33, or May 2020).

Implementation time (years) — the time required for employment programs to be fully implemented (the default is 0.167 years, or 2 months).

Program duration (years) — the duration of employment programs (the default is 0.917 years, 11 months. With the starting year set at 2020.33, this will set Employment programs to end in April 2021).

Effect on job loss — the multiplicative effect of employment programs on the increase in the job loss rate due to the COVID-19 pandemic. The default value (0.2) assumes that employment programs will reduce the increase in the per capita job loss rate by 80%.

Effect on employment initiation — the multiplicative effect of employment programs on the per capita employment initiation rate. The default value (1) assumes no effect of employment programs on employment initiation. Values greater than 1 increase the rate at which people secure employment (this could be achieved through an expansion of the public service, for example).

Education programs

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Programs providing support to students who have become unemployed due to the COVID-19 pandemic, enabling them to continue studying. This intervention reduces the per capita rate that students discontinue post-secondary study as a direct result of job loss. The per capita rate of enrolment in post-secondary study among people aged 15-24 years can also be increased (or decreased); however, the default settings assume that education programs do not directly affect the enrolment rate.

Parameters that can be modified in this intervention are:

Starting year — the year in which education programs commence (the default is 2021.5, or July 2021).

Implementation time (years) — the time required for education programs to be fully implemented (the default is 0.167 years, or 2 months).

Program duration (years) — the duration of education programs (the default is 5 years).

Effect on discontinuation — the multiplicative effect of education programs on the proportion of students discontinuing post-secondary study due to job loss. The default value (0.1) assumes that education programs reduce the proportion of students discontinuing study after becoming unemployed by 90%.

Effect on enrolment — the multiplicative effect of education programs on the per capita enrolment rate for 15-24-year-olds. The default value (1) assumes no effect of education programs on enrolment. Values greater than 1 increase the rate at which people aged 15-24 years enroll in post-secondary study (e.g., a value of 1.2 would increase the per capita enrolment rate by 20%).

Better Access

Reform of the existing *Better Access to Psychiatrists, Psychologists and General Practitioners through the MBS* (Better Access) initiative to provide patients with access to a greater number of specialised mental health care consultations per year. This intervention increases the flow of people with a perceived need for mental health care into psychiatrist and allied mental health services.

Parameters that can be modified in this intervention are:

Starting year — the year in which the reformed Better Access initiative commences (the default is 2020.75, or October 2020).

Implementation time (years) — the time after commencement required for the reformed Better Access initiative to be fully implemented (the default is 0.167 years, or 2 months).

Program duration (years) — the duration of the reformed Better Access initiative (the default is set to 100,000 years, ensuring that investment continues until the end of the simulation).

Services per week — the average number of specialised mental health care services provided per patient per week. The default value (1) assumes that patients attend 1 consultation per week, so that a patient attending a total of 4 consultations (for example) is assumed to do so over a period of 4 weeks.

Additional services per patient — the mean number of additional specialised mental health care services provided per patient per year under the reformed Better Access scheme. The default value (4) assumes that patients will attend an additional 4 consultations per year when the cap on the number of consultations per patient is increased.

Online services

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Increased investment in online (self-help) services providing support to people with relatively low care needs. This intervention increases the per capita rate that people with a perceived need for mental health care access online services.

Parameters that can be modified in this intervention are:

Starting year — the year in which increased investment in online services commences (the default is 2021.5, or July 2021).

Implementation time (years) — the time required to scale up investment in online services (the default is 0.167 years, or 2 months).

Program duration (years) — the duration of increased investment in online services (the default is 5 years).

Increase in services usage — the multiplicative effect of increased investment in online services on the rate that people perceiving a need for mental health care access those services. The default value (1.2) assumes that increased investment will increase the per capita rate of access to online services by 20%.

Services capacity growth

GP mental health services — multiplies the annual rate of increase in the total number of mental health-related GP consultations that can be completed per week. The default value (1) corresponds to the business as usual case, in which services capacity continues to increase at the current rate, estimated using Medicare Benefits Schedule (MBS) data for 2011-2019 assuming services were operating at (near-) maximum capacity over this period.

Psychiatrist and allied services — multiplies the annual rate of increase in the total number of psychiatrist and allied services that can be provided per week. The default value (1) corresponds to the business as usual case, in which services capacity continues to increase at the current rate, estimated using Medicare Benefits Schedule (MBS) data for 2011-2019 assuming services were operating at (near-) maximum capacity over this period.

Psychiatric hospital care — multiplies the annual rate of increase in the maximum number of public psychiatric hospital admissions per week. The default value (1) corresponds to the business as usual case, in which services capacity continues to increase at the current rate, estimated using hospital separations data published by the Australian Institute of Health and Welfare (available at: <https://www.aihw.gov.au/reports-data/health-welfare-services/mental-health-services/data>).

Community mental health — multiplies the annual increase in the total number of community mental health service contacts that can be provided per week. The default value (1) corresponds to the business as usual case, in which services capacity continues to increase at the current rate, estimated using data for the period 2011-2019 published by the Australian Institute of Health and Welfare (available at: <https://www.aihw.gov.au/reports-data/health-welfare-services/mental-health-services/data>).

Private hospital care — multiplies the annual rate of increase in the maximum number of private psychiatric hospital admissions per week. The default value (1) corresponds to the business as usual case, in which services capacity continues to increase at the current rate, estimated using hospital separations data published by the Australian Institute of Health and Welfare (available at: <https://www.aihw.gov.au/reports-data/health-welfare-services/mental-health-services/data>).

Private outpatient services — multiplies the annual increase in the total number of private outpatient services that can be provided per week. The default value (1) corresponds to the business as usual case, in which services capacity continues to increase at the current rate, estimated using data

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for the period 2014–2019 published by the Australian Institute of Health and Welfare (available at: <https://www.aihw.gov.au/reports-data/health-welfare-services/mental-health-services/data>).

Childcare programs

Programs designed to provide greater childcare availability and affordability. This enables people who are not in the labour force and would like a job, but are currently prevented by childcare reasons and of those people who are not in the labour force and do not want a job, but would if childcare was available to enter the labour force. This effect of this intervention is based on the Australia Bureau of Statistics' Survey of Income and Housing, Australia, 2017-18 data to calculate the labour force participation rates ratio pre and post intervention, and this effect is calculated for different sex and age groups. This effect increases the transition rate from not in the labour force into unemployment.

Parameters that can be modified in this intervention are:

Starting year — the year in which increased investment in childcare programs commence (the default is 2021.5, or July 2021).

Implementation time (years) — the time required to scale up investment in childcare programs (the default is 0.167 years, or 2 months).

Program duration (years) — the duration of increased investment in childcare programs (the default is 5 years).

Welfare programs

Programs designed to provide payments to those in unemployment or underemployment who are in financial distress due to the COVID-19 pandemic (e.g., the JobSeeker Payment). By reducing financial distress, this intervention reduces the prevalence of psychological distress in this population.

Parameters that can be modified in this intervention are:

Starting year — the year in which increased investment in welfare programs commences (the default is 2020.33, or May 2020).

Implementation time (years) — the time required to scale up investment in welfare programs (the default is 0.167 years, or 2 months).

Program duration (years) — the duration of increased investment in welfare programs (the default is 1 years).

Effect on psychological distress — the multiplicative effect of financial security (defined as an ability to pay utility bills on time) on the per capita rate of moderate-very high psychological distress onset. The default value (0.377) is derived from Kiely et al. (2015, Soc. Psychiatry Psychiatr. Epidemiol. 50, 909-91), and implies that an increase in welfare payments sufficient to provide financial security to someone experiencing financial hardship would reduce their risk of moderate-very high psychological distress by 62.3%.

Proportional increase in welfare payment — the multiplicative increase in mean household income from Government pensions and allowances resulting from an increase in welfare payments. The default value (1.176) is derived from ABS data on household financial resources indicating that the addition of the Coronavirus supplement to the JobSeeker Payment in April 2020 increased mean household income from Government pensions and allowances by 17.6% (see Australian Bureau of Statistics, 2020, Household financial resources, June 2020. Australian Bureau of Statistics, Canberra).

Female jobs creation programs

Programs designed to increase the jobs available to and hence increase the per-capita employment rates of females. This intervention increases the rate at which females transition from unemployment to underemployment and from unemployment to employment by a multiplier. This multiplier can be modified across different age groups for females.

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Parameters that can be modified in this intervention are:

Starting year — the year in which increased investment in female jobs creation programs commences (the default is 2021.5, or July 2021).

Female 15-24 — increases the monthly transition rates from unemployment to employment and from unemployment to underemployment for females aged 15-24 years old by a multiplier. The default value (1) corresponds to the business as usual case, in which the transition rates follow the trends from 2010-2020 data published by the Australia Bureau of Statistics' catalogue Labour Force, Australia

(<https://www.abs.gov.au/statistics/labour/employment-and-unemployment/labour-force-australia>).

Female 25-44 — increases the monthly transition rates from unemployment to employment and from unemployment to underemployment for females aged 25-44 years old by a multiplier. The default value (1) corresponds to the business as usual case, in which the transition rates follow the trends from 2010-2020 data published by the Australia Bureau of Statistics' catalogue Labour Force, Australia

(<https://www.abs.gov.au/statistics/labour/employment-and-unemployment/labour-force-australia>).

Female 45-64 — increases the monthly transition rates from unemployment to employment and from unemployment to underemployment for females aged 45-64 years old by a multiplier. The default value (1) corresponds to the business as usual case, in which the transition rates follow the trends from 2010-2020 data published by the Australia Bureau of Statistics' catalogue Labour Force, Australia

(<https://www.abs.gov.au/statistics/labour/employment-and-unemployment/labour-force-australia>).



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