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Measuring the scale of underinvestment in Australia's mental health services system: a dynamic modelling analysis

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What did we do?

This report presents an analysis of the need for increased national investment in mental health services in Australia. We developed a high-level system dynamics model of the interaction between the provision of mental health services and disease progression (i.e., progression to severe mental disorders in people with pre-existing moderate disorders) that we used to answer two key questions: 1) how many public mental health services, financed by either the Commonwealth or states and territories, need to be provided per year to ensure that all Australians with a mental disorder and a need for care receive immediate and effective treatment? and 2) what effect does delayed care-seeking have on the scale of the investment required to achieve complete treatment coverage for people with a need for mental health services? As significantly more resources are needed per patient to treat severe mental disorders than mild-moderate disorders, we expect that needs-based demand for mental health care will decline as the proportion of people receiving adequate treatment earlier in the course of illness and recovering (i.e., before they develop a severe disorder) increases.[1]

Fig. 1 shows the general structure of the system dynamics model used for the analyses. Numbers of people with mild-moderate and severe mental disorders who perceive a need for services are modelled as stocks (represented using boxes; see ref. 2) with inflows corresponding to initial engagement with treatment and outflows corresponding to recovery; the flow of people with mild-moderate disorders into the stock of people with severe disorders corresponds to disease progression among those with a perceived need for care. Needs-based demand for mental health services depends on the numbers of people with mild-moderate and severe mental disorders perceiving a need for care and the mean numbers of services required per patient to treat disorders at each level of severity (we assume 6.4 services per year for mild-moderate disorders and 20 services per year for severe disorders; see Table S1). The capacity of mental health services to meet current need determines the rate at which people with a perceived need for care are treated and recover. As services capacity increases relative to demand, the per capita recovery rate also increases, reducing both the total number of people with mental disorders requiring care and the number of people with mild-moderate disorders developing severe disorders per year. Since more services are required per patient to treat severe disorders than mild-moderate disorders, a reduction in the number of patients progressing to develop severe disorders results in an increase in the total number of patients treated per year (given constant services capacity), which further increases the per capita recovery rate.
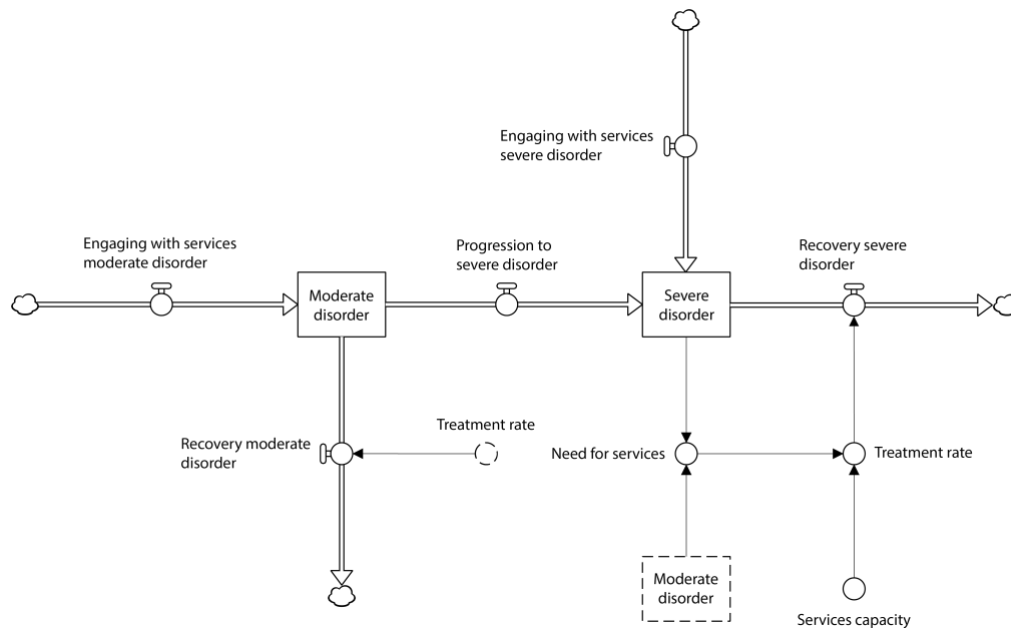
Fig. 1. High-level structure of the system dynamics model used to estimate the need for increased investment in Australia's public mental health care system and examine the effect of delayed care seeking on demand for services.

What did we find?

Fig. 2 shows the relationship between the total number of Medicare-subsidised mental health services that can be provided per year (including general practitioner, psychiatrist, and psychologist and other allied health services) and the equilibrium number of people with mild-moderate or severe mental disorders and a perceived need for treatment.[†] Panel A was generated assuming that *c*. 45% of people have a severe mental disorder when they initially engage with the mental health care system (estimated based on survey data published by the ABS; see Table S1). The equilibrium number of people with a mental disorder and a perceived need for services declines to 0 (at which point people are treated and recover as they present for care) when services capacity reaches 32.0 million services per year, which is 2.74 times the actual number of services provided in 2017−18 (11.7 million).[3]

[†] At equilibrium, the number of people engaging with services per year is equal to the number of people recovering (plus mortality), so the total number of people with a mental disorder and a perceived need for care remains constant. The equilibria in Fig. 2 are stable, so the system will tend to evolve towards these states over time when it is perturbed (e.g., when an abrupt change in services capacity moves the system away from its equilibrium state).
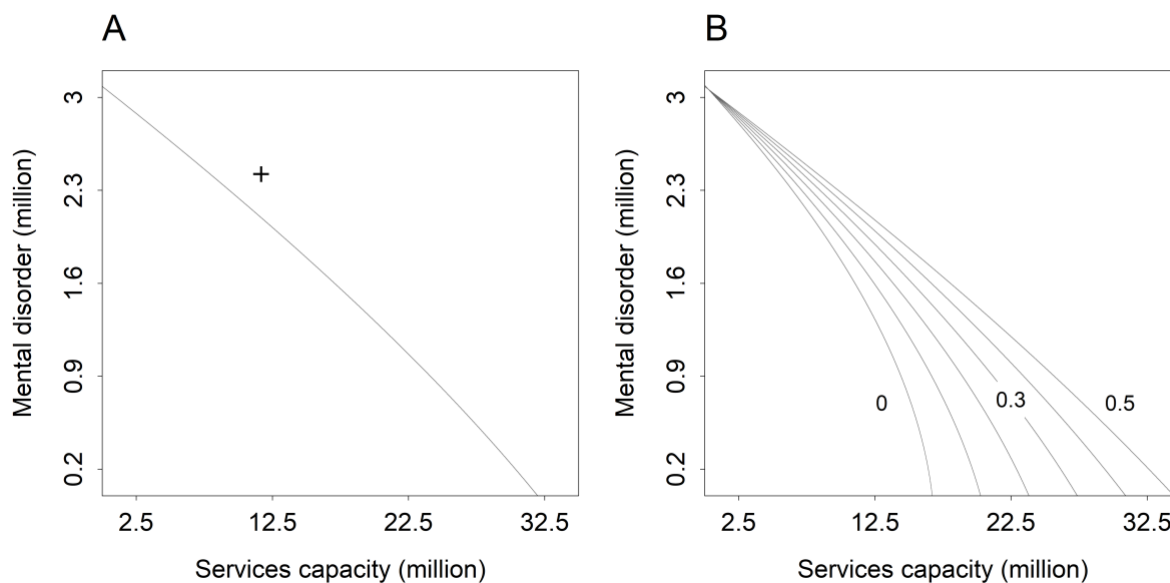
Fig. 2. Equilibrium numbers of people with mild-moderate or severe mental disorders and a perceived need for care for varying services capacities (i.e., the total number of mental health services that can be provided per year). Panel A was derived assuming that *c*. 45% of people have a severe disorder at the time they first enter the services system. The effect of progressively reducing this percentage is shown in panel B (from 50% on the right to 0% on the left). The cross in panel A shows services capacity and the number of people with a perceived need for mental health care in 2017-18.

Total government expenditure on direct provision of mental health services in 2018−19 was $8.30 billion, including $1.30 billion for Medicare-subsidised services (general practitioner, psychiatrist, and psychologist and other allied health services), $0.54 billion for PBS-subsidised medications, and $6.46 billion for recurrent expenditure on state and territory specialised psychiatric services (psychiatric hospital care, community mental health care services, residential mental health services).[3] Assuming the scale of underinvestment in subsidised medications and state and territory specialised psychiatric services is similar to that estimated for Medicare-subsidised services above, the investment required to ensure that all Australians with a mental disorder and a perceived need for care receive immediate and effective treatment is 2.74 times current expenditure, or approximately $22.7 billion per year.

Panel B of Fig. 2 shows the effect of progressively reducing the proportion of people who have a severe mental disorder when they initially engage with the mental health care system on the relationship between Medicare-subsidised mental health services capacity and the equilibrium number of people with a perceived need for

treatment. As the proportion of people initially seeking care when they have a severe disorder declines (due to earlier, effective intervention), the investment required to achieve complete treatment coverage for people with a perceived need for mental health services is reduced significantly. For example, if only 10% of people have a severe disorder when they first engage with services (as opposed to the estimated value of 43.0%; see Table S1), people are treated and recover as they present for care when services capacity exceeds 20.3 million services per year, or 1.74 times the number of Medicare-subsidised services provided in 2017−18. Needs-based expenditure per year in this case is estimated to be $14.4 billion, or $8.33 billion less than the required annual expenditure of $22.7 billion under current patterns of care.

Policy implications

The analyses presented here provide evidence that the current pattern of severe underinvestment in public mental health services in Australia, and particularly in more effective early intervention services, perpetuates a grossly inefficient and more costly mental health care system. If we persist with this 'business as usual' approach, nearly three times the number of mental health services currently provided per year are required to ensure that all Australians with a mental disorder and a perceived need for care receive timely and effective treatment. Achieving an expansion of mental health services capacity of this scale would depend not only on significantly increased government expenditure (actual expenditure on mental health services in 2018−19 was $14.4 billion less than the $22.7 billion needed), but also a substantial increase in the number of specialised mental health professionals providing clinical care (psychiatrists, clinical psychologists, mental health nurses, etc.). However, policies aimed at increasing the skilled mental healthcare workforce, while necessary, will have minimal impact on services capacity in the near term (due to the time required for training), so that additional interventions designed to reduce total demand for care are also necessary to address current capacity constraints as well as to achieve desirable health outcomes at lower cost to Government.

Our results indicate that increasing the proportion of people engaging with mental health services before they develop a severe disorder (e.g., by lowering the cost of accessing specialised care and prioritising early intervention services) would significantly reduce the number of services required to achieve complete treatment coverage for people with a need for mental health care. Economic and social policies (e.g., welfare payment increases, increasing the accessibility of tertiary education and vocational training, introducing a job guarantee) have the potential to modify population-level exposure to established risk factors for psychological distress and

associated mental disorders (unemployment, financial hardship, poverty, homelessness, etc.),[4] and so provide another means of reducing pressure on the mental health services system. And finally, there is scope for improving the effectiveness of existing services (e.g., via the routine use of technology to provide better coordinated and more personalised, measurement-based care), reducing needs-based demand for mental health care through an increase in the per-service recovery rate.

Appendix

Table S1. Model parameter values assumed in the analyses presented in Fig. 2. The system dynamics model in Fig. 1 was fitted to psychological distress prevalence data from the National Health Survey (for the period 2007−08 to 2017−18)[5] and data on Medicare-subsidised services usage published by the Australian Institute of Health and Welfare.[3]

Parameter	Value	Notes
Total population	20289938	National population aged 15 years and above at the start of 2018 (Australian Bureau of Statistics, 2020. Australian demographic statistics. Cat. no. 3101.0. Australian Bureau of Statistics, Canberra)
Mental health services capacity (per year)	11672819	Number of Medicare-subsidised mental health-specific services provided in 2017−18 (ref. 3)
Per capita mortality rate mild-moderate disorder (per year)	0.009	Derived from mortality data published by the Australian Bureau of Statistics (2020. Deaths, Australia. Cat. no. 3302.0. Australian Bureau of Statistics, Canberra)
Mortality hazard ratio severe disorder	1.4	Derived from Russ et al. (2012, Br. Med. J. 345, e4933)
Per capita help seeking rate (per year)	0.06	Estimated via model fitting
Proportion of people initially perceiving a need for care who have a severe disorder	0.43	Derived from data published by the Australian Bureau of Statistics (2012, Information paper. Use of the Kessler psychological distress scale in ABS health surveys, Australia, 2007-08. Cat. no. 4817.0.55.001. Australian Bureau of Statistics, Canberra)
Per capita disease progression rate (per year)	0.14	Estimated via model fitting
Services per patient mild-moderate disorder (per year)	6.4	
Services per patient severe disorder (per year)	20	
Per capita spontaneous recovery rate (per year)	0.31	Derived from Goldberg et al. (1998, Br. J. Gen. Pract. 48, 1840−1844)
Proportion of patients recovering with treatment	0.45	Derived from Thase et al. (1997, Arch. Gen. Psychiatry 54, 1009−1015)

References

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