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Communication

The Potential Impact of a Public Health Approach to Improving the Physical Health of People Living with Mental Illness

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Abstract: With already wide disparities in physical health and life expectancy, COVID-19 presents people with mental illness with additional threats to their health: decreased access to health services, increased social isolation, and increased socio-economic disadvantage. Each of these factors has exacerbated the risk of poor health and early death for people with mental illness post-COVID-19. Unless effective primary care and preventative health responses are implemented, the physical illness epidemic for this group will increase post the COVID-19 pandemic. This perspective paper briefly reviews the literature on the impact of COVID-19 on service access, social isolation, and social disadvantage and their combined impact on physical health, particularly cancer, respiratory diseases, heart disease, smoking, and infectious diseases. The much-overlooked role of poor physical health on suicidality is also discussed. The potential impact of public health interventions is modelled based on Australian incidence data and current research on the percentage of early deaths of people living with mental illnesses that are preventable. Building on the lessons arising from services' response to COVID-19, such as the importance of ensuring access to preventive, screening, and primary care services, priority recommendations for consideration by public health practitioners and policymakers are presented.



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1. Introduction

The physical health of people living with mental illness is one of the most significant problems in global public health. For example, a 2017 study showed that in one year, 10,359 Australians with mental illness died prematurely of the top 10 (excluding suicide) causes of death [1]. On a population basis, this equates to one death per million population per day. Comprising 12.8% of the population, people accessing mental health-related services constituted over half of all premature deaths due to physical health conditions [2].

COVID-19 can cause a dramatic increase in the avoidable deaths of people living with mental illness unless targeted preventative action is taken. People living with mental illness already suffer a significantly elevated risk of early death from chronic health conditions such as respiratory disease, cancer, diabetes, and ischemic heart disease (see Figure 1) [3]. All of these conditions are associated with higher mortality in COVID-19 cases [4].

This paper briefly overviews key research related to the health outcomes for people living with mental illness with a focus on CVD, cancer, vaccine-preventable conditions, and

smoking. Combining this research with population incidence data, the potential impact of public health interventions is modelled. It then examines major primary health and mental health policy positions and guidelines developed in the context of COVID-19.

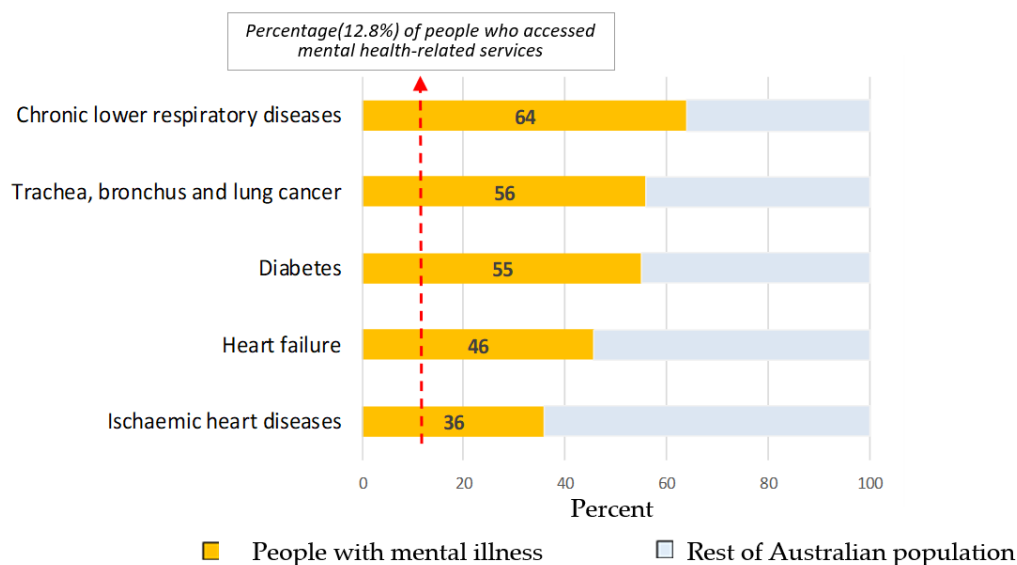


Figure 1. Proportion of early deaths of persons (age: 15–74 years) accessing mental health-related services by cause of death (adapted from ABS, 2017) [2].

The paper aims to build on recent research findings, COVID-19-related public health lessons, and policy recommendations to present four ‘shovel-ready’ public health interventions to improve the physical health of people living with mental illness.

2. Increasing Disparities in Health Service Access

Eighty percent of adults with a diagnosed mental illness have at least one comorbid mortality-related physical health condition, and 55% have two or more [5]. On average, people with mental illness in Australia die 14 years earlier than the general population [6,7]. There is substantial variability in the definition of severe mental illness in research [1,8,9]. Despite this definitional variance, there is strong and consistent evidence that people living with psychotic disorders such as schizophrenia have elevated risk and also that the increased risk of poor health and premature death is seen across the whole spectrum of mental health diagnoses [10].

Multiple factors increase the risk of early death for people living with severe mental illness due to the impact of COVID-19. These include reduced access to healthcare, increased risk of delayed (or missed) diagnosis, lower rates of vaccination [11,12], medication side effects, high rates of smoking [13], and, crucially, the presence of multiple long-term chronic health conditions [3]. Older people with mental illness are particularly at risk, given the vulnerability related to aging and the high rates of physical health comorbidity in older people with mental illness [2].

Generally, COVID-19 has resulted in fewer GP and emergency department visits for health concerns [14]. Further, the pandemic has reduced the capacity of the medical workforce, with increased burnout rates and COVID-19-related furlough periods. A delay in the diagnosis and treatment of chronic conditions such as heart disease, cancer, cerebrovascular disease, and diabetes will deleteriously impact patients’ short and long-term health outcomes. Previously, people living with mental illness tended to not access treatment due to reasons such as perceived stigma and cost (such as out-of-pocket expenses) [15]. Now they may also fear infection through exposure to the virus and increased difficulty accessing services due to the impacts of COVID-19 on the health workforce.

2.1. Heart Disease

People living with mental illness have lower rates of heart disease screening [16]. COVID-19 has resulted in a significant decrease in cardiac screening overall [17]. Heart disease causes the premature death of over 1740 Australians with mental illness every year, and most of these cardiac deaths are preventable [18]. Put in perspective, the number of preventable deaths of people with mental illness due to heart disease is greater than the total number of Australian deaths due to road accidents [19]. A New Zealand cohort study found that “risk factor patterns including metabolic disturbances may only be part of the reason for the high rates of CVD among people with SMI” [18] (p. 9). Diagnostic overshadowing of physical health conditions by mental health problems and differences in preventive care [18], screening [16], treatment [20], and procedural interventions [20,21] may contribute to this disparity, and each of these is less accessible in the context of the COVID-19 pandemic.

2.2. Cancer

People with mental illness have higher cancer mortality rates, even though their cancer incidence is the same or lower than in the general population [22]. In Australia, over 6000 people with mental illness die prematurely of cancer each year (see Table 1). This is more than the combined deaths due to suicide and road accidents [19]. There are already disparities in cancer screening for people living with mental illness [23,24]. The onset of COVID-19 has been associated with fewer GP visits, a decrease in cancer screening [25], and cessations of breast screening services [26]. (The greatest increase in relative risk of early death for women living with mental illness is breast cancer). Delayed detection and diagnosis reduce the chances of survival. COVID-19 can potentially increase both the rate and the proportion of cancer-caused deaths of people with mental illness [26]. Those with lung cancer have increased respiratory health risks associated with COVID-19, causing double jeopardy for these people.

Table 1. Annual number of cancer-caused deaths in the Australian population 2011/12—age 15–74 (prorated and adapted from ABS [2]).

| Underlying Cause of Death | Mental Illness | | Rest of Population | | Total Population | |
|--|----------------|-------|--------------------|-------|------------------|-------|
| | No. | Row % | No. | Row % | No. | Row % |
| Trachea, bronchus, and lung cancer | 2567 | 56 | 2031 | 44 | 4598 | 100 |
| Colon, sigmoid, rectum and anus cancer | 1064 | 51 | 1018 | 49 | 2082 | 100 |
| Breast cancer | 1012 | 56 | 785 | 44 | 1797 | 100 |
| Blood and lymph cancer | 895 | 51 | 876 | 49 | 1771 | 100 |
| Prostate cancer | 523 | 61 | 332 | 39 | 856 | 100 |
| Total cancer caused deaths | 6061 | 55 | 5042 | 45 | 11,103 | 100 |
| | | | | | 0 | 0 |
| Total number accessing MBS/PBS | 2.8 Mil | 12 | 21.5 Mil | 88 | 24.3 Mil | 100 |

2.3. Infectious Diseases and Vaccine Preventable Conditions

The existing data indicate that people living with mental illness have much lower hepatitis and flu vaccination rates than the general population [27]. The low vaccination rates for people with mental illness are unmistakably evident in the five times higher rate of vaccine-preventable hospitalization and seven times higher rate of vaccine-preventable hospital bed days [12]. People with mental illness are more susceptible to infections during epidemics. This is probably due to higher rates of medical co-morbidities, but it may also be related to confined living arrangements, lower levels of personal protection behaviors, and lower awareness of risk [28]. It can also be related to the increased difficulties in accessing timely medical services. In addition, when and if services are accessed, treatment is more challenging due to increased complexity related to the co-existing mental health condition.

One striking example during an infectious disease epidemic in Africa found that 49% of people living with severe mental illness died from an infectious disease [29]. Immediate public health action to provide people living with mental illness screening for current vaccination status, (including COVID-19 and influenza) would lessen virus prevalence in the community, reduce the burden on public hospitals, save money and save lives.

2.4. Smoking

The decrease in the rate of smoking in developed countries has been a public health success story, with the last 20 years seeing a 60% reduction in the percentage of the population who are daily smokers [30]. However, for people living with mental illness, smoking rates have remained high [13]. While international rates for smoking mostly fall in the range of 9–12% [30], smoking rates among people with mental illness are twice [31] to three times [30] that of those with no mental health disorder. Pre-existing respiratory disease and smoking are risk factors for more severe outcomes associated with influenza and COVID-19 [4]. Smokers who contract COVID-19 are 1.4 times more likely to have severe symptoms of COVID-19 and approximately 2.4 times more likely to be admitted to an ICU, need mechanical ventilation, or die than non-smokers [32].

3. Social Health, Physical Health and Mental Health

3.1. Social Isolation, Mental Illness and Early Mortality

People living with severe mental illness already suffer higher rates of social exclusion and social isolation [33]. The impact of social isolation on mental health is well documented [34]. However, social isolation is also a risk factor for all-cause (physical health) mortality [35], especially in the elderly [36]. Social isolation is related to increased cardiovascular diseases, cancer, and lower respiratory disease. These conditions are also the major causes of the early death of people living with mental illness [2]. Unless assertive action is taken, COVID-19-related social isolation will further amplify this already elevated risk of poor health and early death of people living with mental illness.

3.2. Increased Social Disadvantage

Many underlying causes of the reduced life expectancy for people living with mental illness are related to low socio-economic status (see Figure 2). As social inequality increases in a post-COVID-19 economy [37], health inequities will increase for people with mental illnesses. With COVID-19, the health disparities within the overall population will increase in relation to those with good cash reserves versus those without, those who can work from home versus those who cannot, those with work versus those who are unemployed, and those in commodious homes versus those living in crowded conditions [38]. These disparities are already present disproportionately in people with serious mental illness, and the data suggest this has increased due to COVID-19 [37].

Social disadvantage strongly affects health outcomes for the general population [37]. For people living with mental illness, this effect is amplified [39]. While people living with mental illness have 2.4 times increased risk of early death, for those with low SES, this increases to three times, and for those not in full-time employment, it is five times the risk (see Figure 2). While these data no doubt reflect both the causes and consequences of poor mental health, they nonetheless underscore the importance of good physical health care and the relationship between health and meaningful social and economic participation. In a post-COVID-19 economy, if these factors are not addressed proactively, the number of early deaths of people living with mental illness could increase significantly.

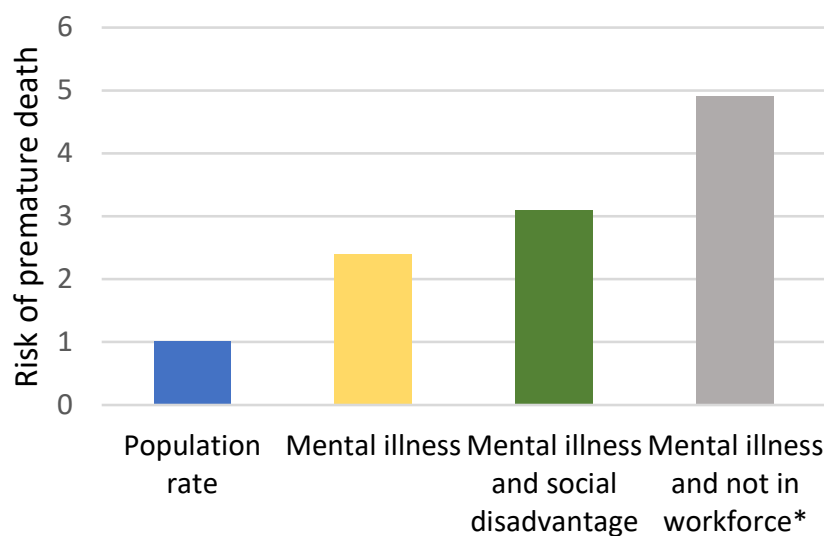


Figure 2. Relative risk of early death by population group (adapted from ABS, 2017 [2]). * Persons aged 15 to 64 years, compared to total Australian population 15 to 64 years.

3.3. Physical Health, Mental Illness and Suicidality

The impact of COVID-19 has increased the prevalence of physical health problems. Poor physical health is associated with almost half of all completed suicides (see Figure 3) [40,41]. Despite extensive efforts during the last 2 decades, suicide has proven to be an extremely challenging problem to address effectively [42]. Improving the physical health of people living with mental illness should be a key component of any suicide prevention strategy.

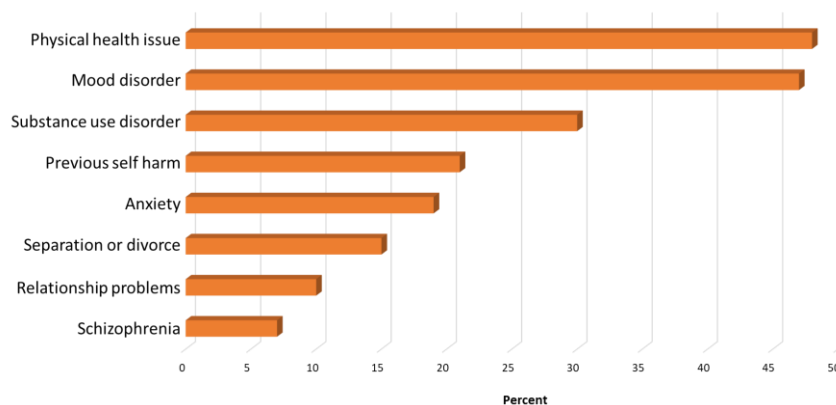


Figure 3. Percentage of suicide deaths associated with risk factors (adapted from ABS, 2018, 2019 [40,41]).

Poor physical health also has a deleterious effect on mental health generally. Nearly all chronic medical conditions are associated with an increased prevalence of high psychological distress [43], with a dose–response relationship between poor physical health and depression consistent across 11 countries [44].

There is justifiably considerable attention on suicide prevention in the COVID-19 and post-COVID-19 context, and this should be expanded to include the (ten times greater) risk of early death due to preventable physical health conditions in people living with mental illness [2]. Further, physical health should not be overlooked as a key component of any COVID-19 or post-COVID-19 suicide prevention strategy. Improving the physical health of people living with mental illness is a largely neglected strategy to improve mental health and reduce suicide risk, particularly in older people [45].

4. Estimating Public Health Intervention Impact

Estimating the efficacy of public health interventions is difficult. Public health interventions need to be applied via policies or programs over entire populations, and the evaluation of epidemiological outcomes is obtained from observational studies. Efficacy is reliant not only on the resources needed but also on the social and organizational capacity needed to realize the conditions of change [46]. For instance, even if vaccine efficacy is high, the unit of analysis is a whole population, not individuals [47]. Further, the causes of the poor health and premature death of people living with mental illness are multiple, dynamic, and interrelated and exist within a changeable socio-economic environment. As such, estimating the efficacy of public health and clinical interventions is a complex process. Bearing this in mind, some discussion of potential public health program impacts across disease and intervention types is warranted.

4.1. Cancer and Cardiovascular Disease

With respect to ischemic heart diseases, people with schizophrenia are 70% less likely to undergo procedures and 40% less likely to be hospitalized, and 2.4 times more likely to die prematurely [48]. As such, interventions to achieve equity of access to screening, medical intervention, and hospital procedures might be expected to yield good results. On the other hand, the prescription of statins for reducing cardiovascular mortality has relatively low efficacy [49]. For cancer, even though people living with mental illness have the same or lower cancer incidence [22], they have eight times the rate of early death due to cancer [1]. Attaining equity of cancer outcomes would reduce the annual number of cancer-caused preventable deaths by 192 per 100,000 general population. However, the question remains as to what suite of interventions would be needed to move the rate of premature deaths due to cancer, heart disease, or other mortality-related chronic diseases down to the population base rate, and what capacity would be required to effectively implement a public health campaign across an entire population?

4.2. Smoking Cessation and Vaccination

Intervention trials have reported that people living with mental illness have a successful quit rate (at six months postvention) of 7–34% [50]. However, smoking cessation does not guarantee protection from premature death, and the effectiveness of a population-based intervention is expected to be much lower than in controlled trials [47]. With respect to the benefits of vaccination, based on hospital data, an effective campaign could reduce potential vaccine-preventable hospitalizations by 12.1 per 100,000 population per year [12]. Yet, this relies on successful implementation across the entire populace.

Based on these data, the efficacy of interventions such as vaccinations, smoking cessation, health screening, and medical interventions for mortality-related chronic conditions could be expected to lie between 0.1% and 25%. The actual efficacy of public health interventions depends on the clinical efficacy of the intervention itself, program level implementation effectiveness, the physical health conditions targeted, and the interactions between social, clinical, comorbid, and system factors. Table 2 presents the estimates of public health intervention impact on premature death rates, based on estimates of the proportion of preventable premature deaths (between 38% [51] and 69% [52]).

Investment in improving the physical health of people living with mental illness would significantly reduce preventable premature deaths of people living with mental illness. As an example, a 1% efficacy rate across the 38% of preventable deaths would result in an annual reduction of 3.14 deaths per 100,000 general population. (It should be noted that the 38% estimate of preventable deaths is based on a total population and, as such represents a conservative figure.) Put in context, for the populations of the USA, Japan, France, and Australia, this would mean an annual reduction in premature deaths of people living with mental illness by 10,626, 3894, 2029, and 822, respectively. The public value of such an investment is compelling and roughly equates to halving the suicide rates in these countries.

Table 2. Estimates of annual preventable deaths of people accessing mental health-related services by preventability and treatment efficacy.

| Intervention Efficacy | Total CVD, Cancer & Respiratory Disease | Annual Deaths per 100 k | | Annual Deaths per 100 k | | Annual Deaths per 100 k | | | |
|-----------------------|---|-------------------------------------|--------|-------------------------|--------|-------------------------|-------|--------|--------|
| | | Preventable | | Preventable | | Preventable | | | |
| | | 69% | 38% * | 69% | 38% * | 69% | 38% * | | |
| | | Total Top 10 Causes (Excl. Suicide) | | Total All Causes | | | | | |
| | 330 | 231.12 | 125.47 | 369 | 258.38 | 140.27 | 827 | 578.60 | 314.10 |
| 25% | | 57.78 | 31.37 | | 64.60 | 35.07 | | 144.65 | 78.52 |
| 10% | | 23.11 | 12.55 | | 25.84 | 14.03 | | 57.86 | 31.41 |
| 5% | | 11.56 | 6.27 | | 12.92 | 7.01 | | 28.93 | 15.70 |
| 1% | | 2.31 | 1.25 | | 2.58 | 1.40 | | 5.79 | 3.14 |
| 0.1% | | 0.23 | 0.13 | | 0.26 | 0.14 | | 0.58 | 0.31 |

* The 38% estimate is derived from the AIHW calculations for the entire Australian population [51], the 69% estimate is based on percentage of preventable cardiac deaths of people with serious mental illness [52].

In addition to reducing preventable deaths, initiatives to improve the physical health of people living with mental illness would profoundly impact personal, social, and economic domains. Simple actions can make a discernible difference. For instance, effective vaccination programs for people with mental illness would significantly improve health, save hospitalization costs, and reduce pressure on health staff still struggling to deal with the impacts of COVID-19.

5. Discussion

The Lancet Psychiatry Commission blueprint for protecting physical health in people with mental illness and the WHO multi-level framework to address excess mortality in persons with severe mental disorders both underscore the fact that the major causes of the premature death of people with mental illness are multiple, complex, dynamic, and interrelated [53,54]. The major causes of preventable deaths include high rates of smoking, lower rates of physical health screening and treatment, medication side effects (particularly some anti-psychotic medicines), poor diet, and low levels of physical activity. Most of these factors are modifiable with the care workforce and infrastructure already in place. However, due to insufficient action across the domains of public health, illness prevention, primary care, and mental health care, the physical health disparities for people living with mental illness continue to increase [55]. Failure to implement basic health interventions proven to address these factors and improve health will increase the disparities in physical health outcomes for people living with mental illness due to COVID-19.

5.1. Policy and Practice Opportunities for Change

The first action of the Australian COVID-19 Primary Care Response (PCR) is to protect vulnerable people from the effects of COVID-19. People with severe mental illness are already at high risk of poor health and early death, so they must be proactively considered as some of the most vulnerable in this context. The PCR also commits to ‘continue the provision of regular primary care services to the whole community for acute and chronic conditions, and mental health concerns’ [56]. The physical health of people living with mental illness is also a significant component of the mental health pandemic plans [57]. Plans identify ‘those with chronic mental health concerns as being vulnerable to the impacts of COVID-19 including unemployment, poor physical health, social isolation’ (p. 20) and highlight their need to have access to regular or emergency health care [57].

Prior to COVID-19, a policy thinktank approached the problem of the poor health and early death of people living with severe mental illness using a primary care and chronic disease systems approach. It brought together national primary care, chronic care, and mental health experts from across Australia to develop a series of actions across the micro, meso, and macro levels of the health system. Arising from this process, the *Being Equally*

Well Roadmap [58] recommended nine priority actions to improve the physical health of people living with severe mental illness. The recommendations included actions to enhance care coordination, such as guidelines and care navigators, removing financial barriers to access care, quality improvement mechanisms, additional research funding, stigma and discrimination campaigns, and targeted education material for health professionals.

5.2. Implications

The following suggested initiatives build upon the *Being Equally Well*, mental health pandemic, and primary care plan recommendations to address the increased vulnerability and risk of premature death of people with severe mental illness in the current COVID-19 context. Other well-mapped reform opportunities will improve the physical health outcomes for people living with mental illness, such as work engagement and community participation and programs to reduce the systemic discrimination experienced by people with mental illness in their contact with health services. While vitally important, these are complex system-wide challenges and require considerable time to develop and implement.

The health services' responses to COVID-19 present an opportunity to apply the learnings regarding the importance of access to prevention, screening, and primary care to reduce the health inequity and life expectancy gap for people living with mental illness. The following recommendations are 'shovel-ready' actions that are readily implementable using the existing mental health and primary care workforce.

- People living with severe mental illness should be included as a high-risk group with increased health vulnerabilities requiring targeted screening and treatment for high-risk chronic health conditions, particularly:
 - Cancer;
 - Cardiovascular disease (see for example, the New Zealand, Cardiovascular Disease Risk Assessment and Management for Primary Care guidelines which recommend screening for people with severe mental illness over the age of 25 years) [59];
 - Respiratory disease;
 - Diabetes.
- People living with severe mental illness should be provided with subsidized access to all major approved vaccines (in addition to COVID-19 vaccines)
- People living with mental illness should have subsidized access to smoking cessation support, including nicotine replacement therapy
- Increased support for telehealth follow-up of people living with severe mental illness and chronic physical health conditions, especially for older persons with mental illness.

5.3. Conclusions and Future Research

The current public health settings and actions appear to be not significantly reducing the life expectancy gap for people living with mental illness. The poor health and early death of people living with mental illness are partially related to the general population risk factor patterns related to mortality-related chronic conditions. However, it is also related to the stigma, systemic discrimination, and inequitable service access factors, which operate more strongly for marginalized groups such as those with experience of mental illness. There is a pressing need to implement effective public health interventions to address the poor health of people living with mental illness. This paper presented four relatively straightforward public health actions which are readily implementable and encompass both the general and specific risk factors associated with the major causes of poor health for people living with mental illness.

There is a plethora of research reports on the poor health and early death of people living with mental illness. Increased research focus on the efficacy of early detection and illness prevention programs for people with mental illness is needed. Research should also investigate the practice and process of implementing primary care or public health programs. In particular, research should explore the experiences of consumers, carers,

clinicians, managers, and service partners involved in intervention trials, including their perceptions of program acceptability, validity, and practicality. This knowledge is crucial for the design and implementation of sustainable and efficacious programs.

People with mental illness have the right to ‘receive the same standard of health care as someone without mental illness’ [60] (p. 15). Reforms during and after the COVID-19 pandemic can ensure we respect these rights, enhance health, and improve the life expectancy of people living with mental illness.

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References

1. Roberts, R. Equally Well. In *Physical Health and Mental Illness. A Narrative Literature Review*; National Mental Health Commission, Charles Sturt University: Bathurst, NSW, Australia, 2019.
2. Australian Bureau of Statistics. *Mortality of People Using Mental Health Services and Prescription Medications, Analysis of 2011 Data*; ABS: Canberra, ACT, Australia, 2017.
3. Momen, N.C.; Plana-Ripoll, O.; Agerbo, E.; Benros, M.E.; Børghlum, A.D.; Christensen, M.K.; Dalsgaard, S.; Degenhardt, L.; de Jonge, P.; Debost, J.-C.P. Association between mental disorders and subsequent medical conditions. *N. Engl. J. Med.* **2020**, *382*, 1721–1731. [[CrossRef](#)] [[PubMed](#)]
4. Jordan, R.E.; Adab, P.; Cheng, K.K. COVID-19: Risk factors for severe disease and death. *BMJ* **2020**, *368*, m1198. [[CrossRef](#)] [[PubMed](#)]
5. Australian Bureau of Statistics. *National Health Survey: Mental Health and Co-Existing Physical Health Conditions, Australia, 2014–2015*; ABS: Canberra, ACT, Australia, 2016.
6. Sara, G.; Arumuganathan, M.; Chen, W.; Wu, F.; Currow, D.; Large, M.; Mulder, C.; Ramanuj, P.P.; Burgess, P.M. Cohort profile: Mental Health Living Longer: A population-wide data linkage to understand and reduce premature mortality in mental health service users in New South Wales, Australia. *BMJ Open* **2019**, *9*, e033588. [[CrossRef](#)]
7. Lawrence, D.; Hancock, K.J.; Kisely, S. The gap in life expectancy from preventable physical illness in psychiatric patients in Western Australia: Retrospective analysis of population based registers. *BMJ* **2013**, *346*, f2539. [[CrossRef](#)] [[PubMed](#)]
8. Gonzales, L.; Kois, L.E.; Chen, C.; López-Aybar, L.; McCullough, B.; McLaughlin, K.J. Reliability of the Term “Serious Mental Illness”: A Systematic Review. *Psychiatr. Serv.* **2022**, 1–8. [[CrossRef](#)] [[PubMed](#)]
9. Zumstein, N.; Riese, F. Defining severe and persistent mental illness—A pragmatic utility concept analysis. *Front. Psychiatr.* **2020**, *11*, 648. [[CrossRef](#)]
10. Chesney, E.; Goodwin, G.M.; Fazel, S. Risks of all—Cause and suicide mortality in mental disorders: A meta review. *World Psychiatr.* **2014**, *13*, 153–160. [[CrossRef](#)]
11. Lorenz, R.A.; Norris, M.M.; Norton, L.C.; Westrick, S.C. Factors associated with influenza vaccination decisions among patients with mental illness. *Int. J. Psychiatr. Med.* **2013**, *46*, 1–13. [[CrossRef](#)]
12. Sara, G.; Chen, W.; Large, M.; Ramanuj, P.; Curtis, J.; McMillan, F.; Mulder, C.; Currow, D.; Burgess, P. Potentially preventable hospitalisations for physical health conditions in community mental health service users: A population-wide linkage study. *Epidemiol. Psychiatr. Sci.* **2021**, *30*, e22. [[CrossRef](#)]
13. Prochaska, J.J.; Das, S.; Young-Wolff, K.C. Smoking, Mental Illness, and Public Health. *Ann. Rev. Public Health* **2017**, *38*, 165–185. [[CrossRef](#)]
14. Lim, J.; Broughan, J.; Crowley, D.; O’Kelly, B.; Fawsitt, R.; Burke, M.C.; McCombe, G.; Lambert, J.S.; Cullen, W. COVID-19’s impact on primary care and related mitigation strategies: A scoping review. *Eur. J. Gen. Pract.* **2021**, *27*, 166–175. [[CrossRef](#)] [[PubMed](#)]
15. Priester, M.; Browne, T.; Iachini, A.; Clone, S.; DeHart, D.; Seay, K. Treatment Access Barriers and Disparities Among Individuals with Co-Occurring Mental Health and Substance Use Disorders: An Integrative Literature Review. *J. Subst. Abuse Treat.* **2016**, *61*, 47–59. [[CrossRef](#)]
16. Hippisley-Cox, J.; Parker, C.; Coupland, C.; Vinogradova, Y. Inequalities in the primary care of patients with coronary heart disease and serious mental health problems: A cross-sectional study. *Heart* **2007**, *93*, 1256. [[CrossRef](#)] [[PubMed](#)]

17. Einstein, A.J.; Shaw, L.J.; Hirschfeld, C.; Williams, M.C.; Villines, T.C.; Better, N.; Vitola, J.V.; Cerci, R.; Dorbala, S.; Raggi, P. International impact of COVID-19 on the diagnosis of heart disease. *J. Am. Coll. Cardiol.* **2021**, *77*, 173–185. [CrossRef] [PubMed]
18. Cunningham, R.; Poppe, K.; Peterson, D.; Every-Palmer, S.; Soosay, I.; Jackson, R. Prediction of cardiovascular disease risk among people with severe mental illness: A cohort study. *PLoS ONE* **2019**, *14*, e0221521. [CrossRef] [PubMed]
19. Australian Bureau of Statistics. Causes of Death, Australia. 2021. Available online: <https://www.abs.gov.au/statistics/health/causes-death/causes-death-australia/latest-release> (accessed on 4 May 2022).
20. Nielsen, R.E.; Banner, J.; Jensen, S.E. Cardiovascular disease in patients with severe mental illness. *Nat. Rev. Cardiol.* **2021**, *18*, 136–145. [CrossRef]
21. Laursen, T.M.; Nordentoft, M. Heart disease treatment and mortality in schizophrenia and bipolar disorder—changes in the Danish population between 1994 and 2006. *J. Psychiatr. Res.* **2011**, *45*, 29–35. [CrossRef]
22. Kisely, S.; Forsyth, S.; Lawrence, D. Why do psychiatric patients have higher cancer mortality rates when cancer incidence is the same or lower? *Aust. N. Z. J. Psychiatr.* **2016**, *50*, 254–263. [CrossRef]
23. Solmi, M.; Firth, J.; Miola, A.; Fornaro, M.; Frison, E.; Fusar-Poli, P.; Dragioti, E.; Shin, J.I.; Carvalho, A.F.; Stubbs, B. Disparities in cancer screening in people with mental illness across the world versus the general population: Prevalence and comparative meta-analysis including 4 717 839 people. *Lancet Psychiatr.* **2020**, *7*, 52–63. [CrossRef]
24. Tuesley, K.M.; Jordan, S.J.; Siskind, D.J.; Kendall, B.J.; Kisely, S. Colorectal, cervical and prostate cancer screening in Australians with severe mental illness: Retrospective nation-wide cohort study. *Aust. N. Z. J. Psychiatr.* **2019**, *53*, 550–558. [CrossRef]
25. Fedewa, S.A.; Star, J.; Bandi, P.; Minihan, A.; Han, X.; Yabroff, K.R.; Jemal, A. Changes in Cancer Screening in the US During the COVID-19 Pandemic. *JAMA Netw. Open* **2022**, *5*, e2215490. [CrossRef] [PubMed]
26. Duffy, S.W.; Seedat, F.; Kearins, O.; Press, M.; Walton, J.; Myles, J.; Vulkan, D.; Sharma, N.; Mackie, A. The projected impact of the COVID-19 lockdown on breast cancer deaths in England due to the cessation of population screening: A national estimation. *Br. J. Cancer* **2022**, *126*, 1355–1361. [CrossRef]
27. Control, C.f.D. Prevention. Hepatitis B vaccination coverage among adults—United States, 2004. *MMWR. Morb. Mortal. Wkly. Rep.* **2006**, *55*, 509–511.
28. Lewis, K.J.S.; Lewis, C.; Roberts, A.; Richards, N.A.; Evison, C.; Pearce, H.A.; Lloyd, K.; Meudell, A.; Edwards, B.M.; Robinson, C.A.; et al. The effect of the COVID-19 pandemic on mental health in individuals with pre-existing mental illness. *BJPsych Open* **2022**, *8*, e59. [CrossRef] [PubMed]
29. Fekadu, A.; Medhin, G.; Kebede, D.; Alem, A.; Cleare, A.J.; Prince, M.; Hanlon, C.; Shibre, T. Excess mortality in severe mental illness: 10-year population-based cohort study in rural Ethiopia. *Br. J. Psychiatr.* **2015**, *206*, 289–296. [CrossRef] [PubMed]
30. Australian Bureau of Statistics. *Pandemic Insights into Australian Smokers, 2020–2021*; ABS: Canberra, ACT, Australia, 2022.
31. Lawrence, D.; Mitrou, F.; Zubrick, S.R. Smoking and mental illness: Results from population surveys in Australia and the United States. *BMC Public Health* **2009**, *9*, 1–14. [CrossRef] [PubMed]
32. Vardavas, C.I.; Nikitara, K. COVID-19 and smoking: A systematic review of the evidence. *Tob. Induc. Dis.* **2020**, *18*, 20. [CrossRef]
33. Richter, D.; Hoffmann, H. Social exclusion of people with severe mental illness in Switzerland: Results from the Swiss Health Survey. *Epidemiol. Psychiatr. Sci.* **2019**, *28*, 427–435. [CrossRef]
34. Mann, F.; Wang, J.; Pearce, E.; Ma, R.; Schleif, M.; Lloyd-Evans, B.; Johnson, S. Loneliness and the onset of new mental health problems in the general population: A systematic review. *MedRxiv* 2021. [CrossRef]
35. Rico-Uribe, L.A.; Caballero, F.F.; Martin-Maria, N.; Cabello, M.; Ayuso-Mateos, J.L.; Miret, M. Association of loneliness with all-cause mortality: A meta-analysis. *PLoS ONE* **2018**, *13*, e0190033. [CrossRef]
36. Dahlberg, L.; McKee, K.J.; Frank, A.; Naseer, M. A systematic review of longitudinal risk factors for loneliness in older adults. *Aging Ment. Health* **2022**, *26*, 225–249. [CrossRef] [PubMed]
37. Marmot, M. *Recreating Society for Better Health*. American Public Health Association: Washington, DC, USA, 2022.
38. Marmot, M. Health equity in England: The Marmot review 10 years on. *BMJ* **2020**, *368*, m693. [CrossRef] [PubMed]
39. Bell, R.; Marmot, M. *Social Determinants and Mental Health*; Oxford University Press: Oxford, UK, 2022; p. 171.
40. Australian Bureau of Statistics. *Causes of Death Australia 2017 Intentional Self-Harm Key Characteristics*; ABS: Canberra, ACT, Australia, 2018.
41. Australian Bureau of Statistics. *Psychosocial Risk Factors as They Relate to Coroner-Referred Deaths in Australia 2017*; ABS: Canberra, ACT, Australia, 2019.
42. Productivity Commission. *Mental Health Inquiry Report*; Commonwealth of Australia: Canberra, ACT, Australia, 2020.
43. McNamara, B.J.; Banks, E.; Gubhaju, L.; Joshy, G.; Williamson, A.; Raphael, B.; Eades, S. Factors relating to high psychological distress in Indigenous Australians and their contribution to Indigenous-non-Indigenous disparities. *Aust. N. Z. J. Public Health* **2018**, *42*, 145–152. [CrossRef] [PubMed]
44. Braam, A.W.; Prince, M.J.; Beekman, A.T.; Delespaul, P.; Dewey, M.E.; Geerlings, S.; Kivelä, S.-L.; Lawlor, B.; Magnússon, H.; Meller, I. Physical health and depressive symptoms in older Europeans: Results from EURODEP. *Br. J. Psychiatr.* **2005**, *187*, 35–42. [CrossRef]
45. Erlangsen, A.; Vach, W.; Jeune, B. The effect of hospitalization with medical illnesses on the suicide risk in the oldest old: A population-based register study. *J. Am. Geriatr. Soc.* **2005**, *53*, 771–776. [CrossRef]

46. Skivington, K.; Matthews, L.; Simpson, S.A.; Craig, P.; Baird, J.; Blazeby, J.M.; Boyd, K.A.; Craig, N.; French, D.P.; McIntosh, E.; et al. A new framework for developing and evaluating complex interventions: Update of Medical Research Council guidance. *BMJ* **2021**, *374*, n2061. [[CrossRef](#)]
47. Barreto, M.L. Efficacy, effectiveness, and the evaluation of public health interventions. *BMJ* **2005**, *59*, 342–345. [[CrossRef](#)]
48. Lawrence, D.; Coghlan, R. Health inequalities and the health needs of people with mental illness. *N. S. W. Public Health Bull.* **2002**, *13*, 155–158. [[CrossRef](#)]
49. Chou, R.; Cantor, A.; Dana, T.; Wagner, J.; Ahmed, A.Y.; Fu, R.; Ferencik, M. Statin use for the primary prevention of cardiovascular disease in adults: Updated evidence report and systematic review for the US Preventive Services Task Force. *JAMA* **2022**, *328*, 754–771. [[CrossRef](#)]
50. Access Economics. *Smoking and Mental Illness: Costs*; SANE Australia: Canberra, ACT, Australia, 2007.
51. Australian Institute of Health and Welfare. *Australian Burden of Disease Study: Impact and Causes of Illness and Death in Australia 2015—Summary Report*; AIHW: Canberra, ACT, Australia, 2019.
52. Queensland Health. Cardiovascular Disease. Report of the Chief Health Officer. Brisbane, Qld: Qld Health. 2017. Available online: https://www.health.qld.gov.au/_data/assets/pdf_file/0031/644854/cardiovascular-disease-factsheet.pdf (accessed on 17 June 2022).
53. Liu, N.; Daumit, G.; Dua, T.; Aquila, R.; Charlson, F.; Cuijpers, P.; Druss, B.; Dudek, K.; Freeman, M.; Fujii, C.; et al. Excess mortality in persons with severe mental disorders: A multilevel intervention framework and priorities for clinical practice, policy and research agendas. *World Psychiatr.* **2017**, *16*, 30–40. [[CrossRef](#)]
54. Firth, J.; Siddiqi, N.; Koyanagi, A.; Siskind, D.; Rosenbaum, S.; Galletly, C.; Allan, S.; Canejo, C.; Carney, R.; Carvalho, A.F.; et al. The Lancet Psychiatry Commission: A blueprint for protecting physical health in people with mental illness. *Lancet Psychiatr.* **2019**, *6*, 675–712. [[CrossRef](#)]
55. Walker, E.; McGee, R.; Druss, B. Mortality in mental disorders and global disease burden implications: A systematic review and meta-analysis. *JAMA Psychiatr.* **2015**, *72*, 334–341. [[CrossRef](#)] [[PubMed](#)]
56. Desborough, J.; Hall, S.L.; de Toca, L.; Davis, S.; Roberts, L.; Kelaher, C.; Kidd, M. Australia’s National COVID-19 Primary Care Response. *Med. J. Aust.* **2020**, *213*, 104–106.e101. [[CrossRef](#)] [[PubMed](#)]
57. Australian Government. *National Mental Health and Wellbeing Pandemic Response Plan*; Australian Government: Canberra, ACT, Australia, 2020; Volume 2020.
58. Morgan, M.; Peters, D.; Hopwood, M.; Castle, D.; May, C.; Fehily, C.; Sharma, A.; Rocks, T.; McNamara, K.; Cobb, L.; et al. *Being Equally Well. A National Policy Roadmap to Better Physical Health Care and Longer Lives for People Living with Serious Mental Illness*; Victoria University: Melbourne, VIC, Australia, 2021.
59. Ministry of Health. *Cardiovascular Disease Risk Assessment and Management for Primary Care*; Ministry of Health: Wellington, New Zealand, 2018.
60. National Mental Health Commission. *Equally Well Consensus Statement. Improving the Physical Health and Wellbeing of People Living with Mental Illness in Australia*; NMHC: Washington, DC, USA, 2016.