

Post-traumatic stress, depression, and anxiety during the 2021 Myanmar conflict: a nationwide population-based survey



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Summary

Background The UN warns that Myanmar faces the ‘triple crises’ of mass conflict, uncontrolled COVID-19, and economic collapse. Therefore, we aimed to assess the population mental health burden, healthcare needs, and the associated risk factors in Myanmar.

Methods We established a nationwide random sample and recruited 1038 adults via random digit dialling from July 3–Aug 9, 2021, during the ongoing conflict since Feb 1, 2021, and surge in SARS-CoV-2 infections. Probable post-traumatic stress disorder (PTSD) was assessed using the PTSD Checklist—Civilian Version. Probable depression and anxiety were assessed using the Patient Health Questionnaire-2 and the Generalized Anxiety Disorder-2. We calculated population attributable fractions for probable mental disorders using multivariable logistic regression models. Based on the mental health burden and healthcare-seeking patterns, we projected the need for mental health services.

Findings During the ‘triple crises’, a third of adults in Myanmar (34.9%, 95% CI 32.0–37.7) reported a probable mental disorder. Prevalence of probable PTSD, depression, and anxiety were 8.1% (6.6–9.7), 14.3% (12.0–16.6), and 22.2% (19.7–24.7), respectively. We estimated that up to 79.9% (43.8–97.9) of probable PTSD was attributable to political stress. This corresponds to 2.1 million (1.1–3.2 million) fewer adults with probable PTSD if political stress was removed from the population. The mental health burden could translate into roughly 5.9 million adults seeking mental health services.

Interpretation The mental health burden in Myanmar is substantial, and population mental health might only be restored when the three crises have ended. An accelerated peace process is critical to protecting Myanmar’s population mental health.

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Introduction

On Feb 1, 2021, the military seized power from Myanmar’s civilian government and declared a state of

emergency.¹ In response, healthcare workers, other civil servants and civilians have launched a series of nationwide mass demonstrations, known as the ‘Civil

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Research in context

Evidence before this study

In 2021, the UN had warned about Myanmar facing the ‘triple crises’ of mass conflict, uncontrolled COVID-19, and economic collapse. Given that each crisis could have a substantial mental health impact, the ‘triple crises’ in Myanmar could jointly exert an even more devastating toll on the population mental health. We searched PubMed, Web of Science, PsycINFO, and CINAHL Plus for studies on population mental health since the start of the conflict in Myanmar from Feb 1, 2021 to March 9, 2024. To date, no studies have used a random sample to examine the mental health of the general population in Myanmar during the ongoing conflict (started in 2021). Prior to the conflict, the Global Burden of Disease (GBD) study 2020 estimated that the prevalence of anxiety and depression in Myanmar during the COVID-19 pandemic in 2020 was 4.7% and 1.2%, respectively.

Added value of this study

This is the first study using a nationwide random sample to assess Myanmar’s population mental health burden, risk factors, and healthcare needs during the conflict. Here, we estimated that one in three adults (34.9%) in Myanmar has a probable mental disorder, which is substantially higher than estimates prior to the conflict. Only half of the affected individuals intended to seek professional care. Given the mental and physical health burden and healthcare-seeking patterns in Myanmar, we estimated that 5.9 million and 5.6 million adults would seek access to mental and physical health services, respectively. We showed that the mass conflict, uncontrolled COVID-19, and economic collapse has each

contributed to a distinct mental disorder. Specifically, the high levels of probable post-traumatic stress disorder (PTSD) were primarily attributed to the conflict, anxiety to COVID-19, and depression to the economy. The triple crises have therefore resulted in high prevalence of probable PTSD, anxiety, and depression, and Myanmar’s population mental health can therefore only be restored when all three crises have ended.

Implications of all the available evidence

The impact of conflicts, epidemics, and economic shocks on population mental health has been assessed individually. However, the mental health consequences of co-occurring population shocks have been more sparsely documented even though conflicts, collective actions, and economic crises have taken place in more than 190 countries during COVID-19 pandemic. Here, we identified a substantial mental health burden in Myanmar during the conflict. Individuals who were single or attained tertiary education were at higher risk of probable PTSD. Those that experienced serious injury or threatened death during the conflict were less likely to access mental health services and reported more privacy concerns deterring them from seeking professional help. The triple crises and widening care gap could intensify given the escalating nationwide civil war, health system collapse, and low COVID-19 vaccination rates which may collectively lead to half of Myanmar’s population living in poverty. Our findings reinforce that humanitarian access and scalable community-oriented interventions need to be stepped up urgently. Above all, an accelerated peace process is critical to safeguarding population mental health in Myanmar.

Disobedience Movement’.² The conflict has escalated nationwide, with the military having deployed live ammunition, rubber bullets and water cannons, and more than one million people have been forcibly displaced.^{1,3} Contact-tracing, testing, treatment, and plans for mass COVID-19 vaccinations were abruptly halted, contributing to a major surge of more than 300,000 COVID-19 cases from July to September 2021 with a case fatality rate among the highest in the world.⁴

Despite experiencing a major COVID-19 outbreak in August 2020, the COVID-19 epidemic was largely under control prior to the conflict with stringent public health measures (e.g., stay-at-home orders) in place.⁵ The economy was strained by the COVID-19 before the conflict given disruptions to supply chains and labour shortages.⁶ The conflict and COVID-19 have exerted an even more devastating impact on the economy through further disruptions to banking, communication, and transportation systems.⁷ Coupled with the devaluation of the Myanmar kyat to its historic low, many essential foods and medicines have become unaffordable.⁸ As a consequence, a quarter of the

Myanmar population is currently classified as being moderately or severely food-insecure and around half of the population is projected to be driven into poverty.⁹ The UN has therefore warned that Myanmar faces the ‘triple crises’ of mass conflict, uncontrolled COVID-19, and economic collapse.⁸

Mass conflicts, epidemics, and economic crises have each been shown to have a substantial mental health impact. First, the WHO estimated the prevalence of any mental disorders in conflict-affected populations to be 22.1%.¹⁰ Notably, protracted conflicts such as Northern Ireland’s ‘The Troubles’ have been associated with long-term mental health consequences, where 39.1% of the adult population had a lifetime psychiatric disorder.¹¹ Second, the COVID-19 pandemic was estimated to result in an additional 53 million individuals with major depressive disorder and 76 million individuals with anxiety disorders worldwide.¹² Third, experiencing income loss following a population shock was found to be associated with poor mental health in low-income and middle-income countries (LMICs).¹³ Therefore, it is a grave concern that the ‘triple crises’ in Myanmar could

jointly exert an even more devastating toll on population mental health.¹⁴

Prior to the conflict, Myanmar's health system was already under-resourced. This has worsened during the conflict with over 30 health workers killed and 280 arrested, and many more on strike.¹⁵ The collapse of Myanmar's health system could exacerbate the 'triple crises' given the rise in unmet health needs, such as conflict-induced injuries, COVID-19, and common mental disorders. As such, profound political, socioeconomic, and environmental forces are impacting population health in Myanmar. However, this has not been assessed following the conflict that started on Feb 1, 2021. Using a nationwide random sample, we aimed to examine the population mental health burden, health-care needs, and the associated risk factors in Myanmar.

Methods

Study design and participants

A random sample survey was conducted and 1038 participants (aged ≥ 18 years) in Myanmar were recruited. The sample size was derived based on the Leslie and Kish formula (Appendix p 1).¹⁶ Participants were contacted via random digit dialling from July 3–Aug 9, 2021, during the ongoing conflict since Feb 1, 2021, and surge in SARS-CoV-2 infections (COVID-19). Mobile phone numbers were randomly generated and sampled as 85.8% of the Myanmar population have a mobile phone, and only 4.3% of households have a fixed-line telephone.¹⁷

All survey items were translated from English to Burmese by researchers fluent in both languages, which were then reviewed and agreed upon by all Burmese-speaking co-authors and were piloted (Appendix p 1). We calculated the cooperation and response rates according to prevailing accepted standards (Appendix p 2).¹⁸ Telephone interviews were conducted in a single session via voice call by trained interviewers in Myanmar. The purpose of the survey and the participant's right to refuse to answer or withdraw from the study at any time without consequences were explained (Appendix p 2). Verbal consent was obtained from all participants.

The survey was first tested in an online panel of individuals in Myanmar and the Burmese diaspora, which was approved by the Institutional Review Board of the University of Hong Kong/Hospital Authority Hong Kong West Cluster [UW 21–131].

Outcomes and covariables

Mental health outcomes

The primary outcomes were post-traumatic stress disorder (PTSD), depression, and anxiety as these are the most common mental health outcomes assessed during population shocks such as conflicts, epidemics, and disasters.^{10,12,19}

PTSD symptoms in the past month were assessed using the six-item PTSD Checklist-Civilian Version (PCL-C).²⁰ Participants with a score of ≥ 14 (range 6–30) and exposure to traumatic events since Feb 1, 2021, were classified as having probable PTSD. The six-item PCL-C showed an acceptable level of internal consistency in our sample (Cronbach's alpha: 0.81). Exposure to traumatic events was defined as per the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) Criterion A, including asking 1) if participants experienced or witnessed traumatic events, i.e., actual or threatened death or serious injury ('direct trauma exposure') and 2) if traumatic events ever occurred to participants' family or close friends ('indirect trauma exposure').²¹ A PCL-C score of ≥ 14 showed high sensitivity (92%) and good specificity (72%) for PTSD screening in a primary care setting in the US.²⁰

Probable depression and anxiety in the past two weeks were assessed using the Patient Health Questionnaire-2 (PHQ-2) and Generalized Anxiety Disorder-2 (GAD-2), respectively. Both scales range from 0 to 6 with a cut-off score of ≥ 3 indicating probable depression or anxiety.^{22,23} Both scales have been validated among general populations in high-income countries in the Western part of the globe, and have been used in other humanitarian emergencies and LMICs.^{22–28} The scales showed acceptable internal consistency (Cronbach's alpha: 0.78 for PHQ-2 and 0.68 for GAD-2) in our pilot, but the Cronbach's alpha in the full sample was 0.71 for PHQ-2 and 0.36 for GAD-2.

We use the term 'probable' as these assessment tools are validated screening instruments and are not diagnostic interviews.

Physical health burden

In addition to mental health burden, we also assessed physical health burden by asking if participants had a prior diagnosis of chronic disease, and if they ever suspected themselves to be infected with SARS-CoV-2.

Intention to seek healthcare

Intention to seek professional care for mental and physical problems related to the conflict was assessed. For those who responded in the affirmative, we further assessed the type of health professionals they would consult (i.e., clinical psychologists, counsellors, doctors, nurses, social workers, traditional medicine practitioners, and others). For those who responded in the negative, we further inquired about the reasons.

Risk factors for common mental disorders

Risk factors were categorised into conflict-related factors, COVID-19-related factors and the impact of 'triple crises'.

Conflict-related factors included exposure to traumatic events, argument with family on sociopolitical

events, and time spent on sociopolitical news on social media, and were all in relation to the conflict since Feb 1, 2021. Exposure to traumatic events was categorised using Criterion A of PTSD in the DSM-5, including direct trauma exposure and indirect trauma exposure as stated before. Argument with family on sociopolitical events was measured by asking participants whether they argued with their family about recent events in the past month. Time spent on sociopolitical news was assessed by the number of hours they spent on news about recent events via social media (e.g., Facebook, Twitter, YouTube) per day during the past month.

COVID-19-related factors were assessed by asking if their family or close friends were ever infected or had died from COVID-19, and if they had close contact with a confirmed COVID-19 case. Perceived risk of COVID-19-related death in the coming month was categorised into never/very unlikely/unlikely, evens, or likely/very likely/certain.

We assessed the perceived impact of the conflict and COVID-19 as an indicator of stress responses.²⁹ The impact of the conflict and COVID-19 were each assessed using a single-item measure asking if participants were stressed by the political environment and risk of SARS-CoV-2 infection, respectively. The impact of economic collapse was assessed by asking if participants had experienced income loss since the conflict. Income loss is an important economic determinant of mental health, and income could be considered as an essential dynamic coping resource for psychological adaptation during crises.^{30,31} Survey items regarding conflict-related factors, COVID-19-related factors and the ‘triple crises’ are presented in [Appendix p 3](#).

Sociodemographic characteristics including age, sex, ethnicity, marital status, education, employment, household income, the number of household members, and region of residence were ascertained. Previous mental health status was indicated by a prior diagnosis of depression or anxiety.

Statistical analysis

To account for sociodemographic differences between our sample and the general population, we applied raking to our data using the 2014 Myanmar census as a reference ([Appendix p 4](#)).^{17,32} Sociodemographic characteristics were used to calculate weights during the raking procedure, and these weights were applied in all of the analyses ([Appendix p 4](#)). Based on respondents’ mental and physical health status and their intention to seek professional care, we calculated the weighted prevalence of healthcare needs and estimated the number of adults in Myanmar in need of health services.

We used multivariable logistic regression models to identify factors associated with probable PTSD, depression, and anxiety, as well as any mental disorders, adjusting for sociodemographic characteristics and pre-existing mental disorders. Odds ratio with associated

95% CI were calculated and reported. The E-value was calculated to assess how robust the association was to potential unmeasured or uncontrolled confounding.³³

Built on a multivariable logistic regression model which adjusted for the impact of ‘triple crises’ simultaneously, we calculated the population attributable fraction (PAF) and absolute reduction of mental disorders if the impact of a crisis was removed. This was achieved by mimicking a hypothetical scenario where the impact of a crisis is removed from the population ([Appendix p 4](#)).³⁴ As the ‘triple crises’ could be intercorrelated, adjusting the three crisis measurements simultaneously might underestimate the influence of an individual crisis. We therefore conducted a sensitivity analysis where the impact of ‘triple crises’ were modelled separately. In addition, we also estimated the joint PAF (i.e., mimicking the most extreme hypothetical scenario in which the removal of one stressor would also remove the other two stressors), to act as an upper bound of estimates for individual PAFs.³⁵

The percentages of missing data are presented in [Appendix p 5](#), and predictors of missingness in [Appendix p 6](#). Missing data were imputed using multiple imputation by chained equations, and results were combined from 20 imputed datasets using Rubin’s rule.³⁶ Confidence intervals for population attributable fraction and absolute reduction of mental disorder in the weighted sample were estimated using the statistical procedure Multiple Imputation Bootstrapping (Pooled Sample).³⁷ Complete case analysis was also conducted examining associated factors with the common mental disorders. All analyses were done using R version 4.1.0; R Core Team (2020) and Stata/MP 17.0.

Role of the funding source

The funding source played no part in designing the study, collecting, and analysing data, interpreting findings, or deciding to publish the results.

Results

Our nationwide random sample enrolled 1038 adults, which included participants from all states and regions in Myanmar ([Fig. 1](#)). The cooperation and response rates of the survey were 74.3% and 34.5%, respectively. Participants who resided in Mandalay and Yangon ([Fig. 1](#)), and obtained tertiary education were over-represented in our random sample ([Appendix p 7](#)). After raking, the sociodemographic distribution of the sample conformed to that of the 2014 Myanmar census, and all differences between the weighted sample and the census were small ([Appendix p 7](#)).

Mental health burden and intention to seek mental healthcare

One in three adults surveyed in Myanmar (34.9%, 95% CI 32.0–37.7) had any probable mental disorders

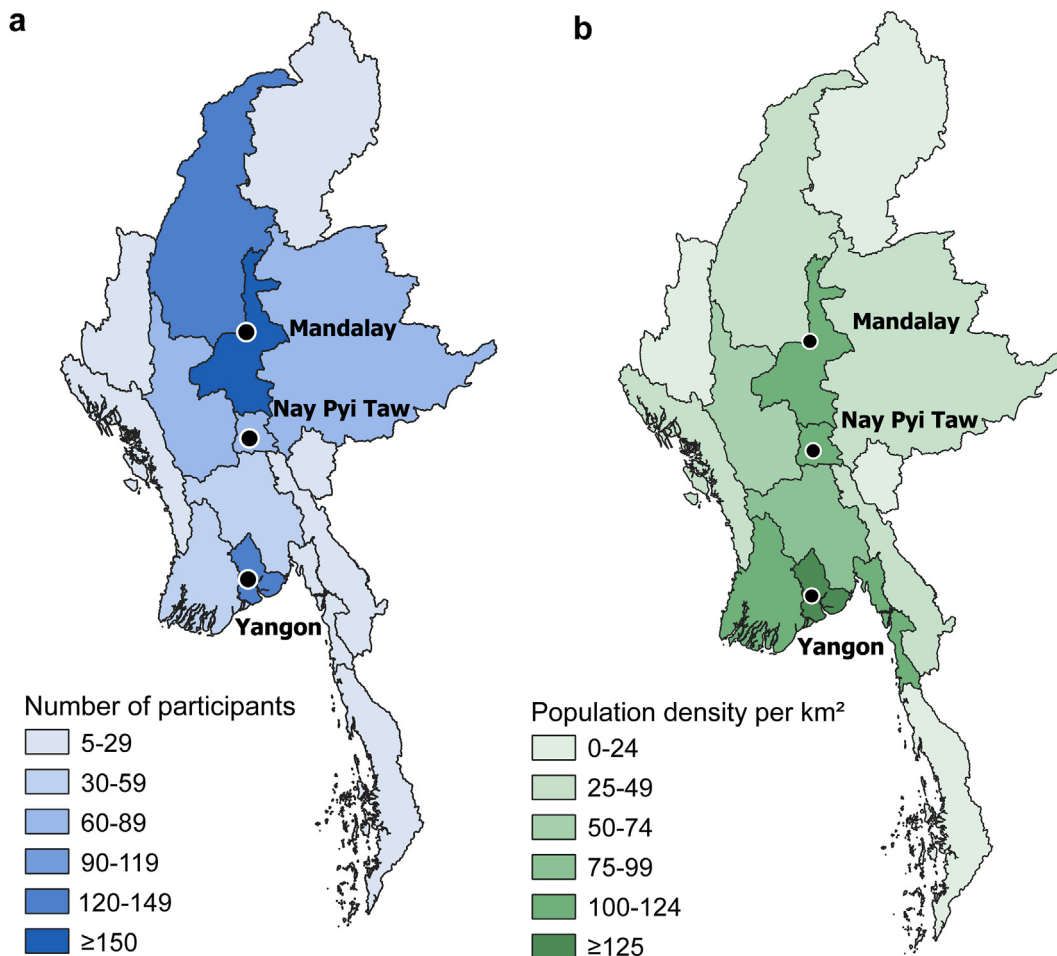


Fig. 1: Geographical distribution of randomly sampled participants in Myanmar, July–August 2021. (a) The number of participants sampled from each administrative unit (b) Population density (aged ≥ 15) based on the 2014 census. The largest cities in Myanmar are labelled.

(i.e., PTSD, depression, or anxiety) (Fig. 2a). The weighted prevalence of probable PTSD, depression, and anxiety among adults was 8.1% (6.6–9.7), 14.3% (12.0–16.6), and 22.2% (19.7–24.7), respectively. The prevalence of co-morbid probable mental disorders ranged from 2.6% (PTSD and anxiety) to 6.3% (depression and anxiety), and 1.5% of participants had all three probable mental disorders.

Half of the individuals would seek professional help for mental health problems related to the conflict (Appendix p 8), and individuals with probable PTSD were the least likely to seek help (Fig. 2b). Participants who intended to seek help regarding mental health problems preferred doctors, clinical psychologists, social workers, nurses, traditional medicine practitioners, and then counsellors (Appendix p 8). Reasons for not seeking professional help for mental health problems included self-management (i.e., perceived ability to self-manage their health problems), seeking help from

family or friends, and hospital closures (Appendix p 8). Direct trauma exposure and lower educational attainment were associated with lower odds of seeking professional help for mental health problems related to the conflict (Appendix pp 9–10). The mental health burden could translate into 5.9 million (95% CI 5.1–6.7 million) adults in need of mental health services in Myanmar.

Physical health burden and intention to seek physical healthcare

We estimated that 11.3% of the population (95% CI 9.3–13.3) suspected they were infected with SARS-CoV-2, and 10.2% (8.4–12.0) had a previous diagnosis of chronic diseases (Fig. 3a).

In contrast to healthcare seeking for mental health problems, three-quarters of the weighted sample would seek help for physical health problems related to the conflict (Appendix p 8). Participants who intended to seek help preferred doctors, social workers, nurses, and

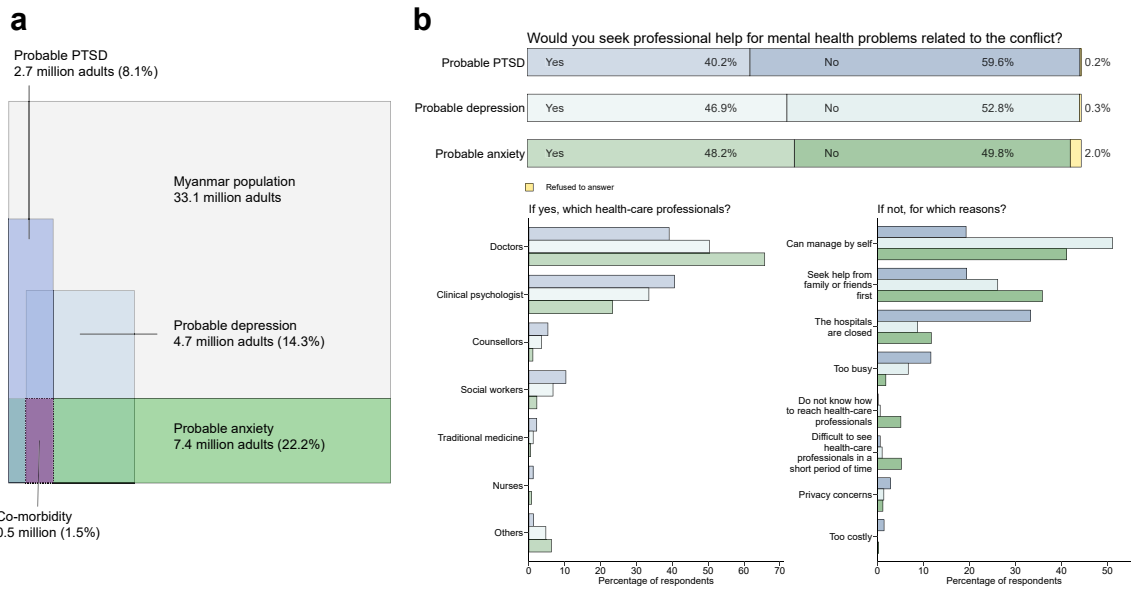


Fig. 2: Mental health burden and intention to seek professional help during the 2021 Myanmar conflict. (a) Weighted prevalence of probable mental disorders during the 2021 Myanmar conflict. Area of rectangles are proportional to the adult population size of Myanmar. (b) Intention to seek professional help among individuals with probable post-traumatic stress disorder (PTSD), depression and anxiety for mental health problems related to the 2021 conflict. For those responding in the affirmative, we further enquired which specific types of healthcare professionals (can choose more than one option), and for those responding in the negative, we asked for the reasons.

then traditional medicine practitioners (Appendix p 8). Reasons for not seeking professional help included self-management, seeking help from family or friends, lack of access to healthcare professionals, worry over being

infected with SARS-CoV-2, and hospital closures (Appendix p 8). Being women or older adults and having a higher household income were associated with higher odds of professional help-seeking for physical health

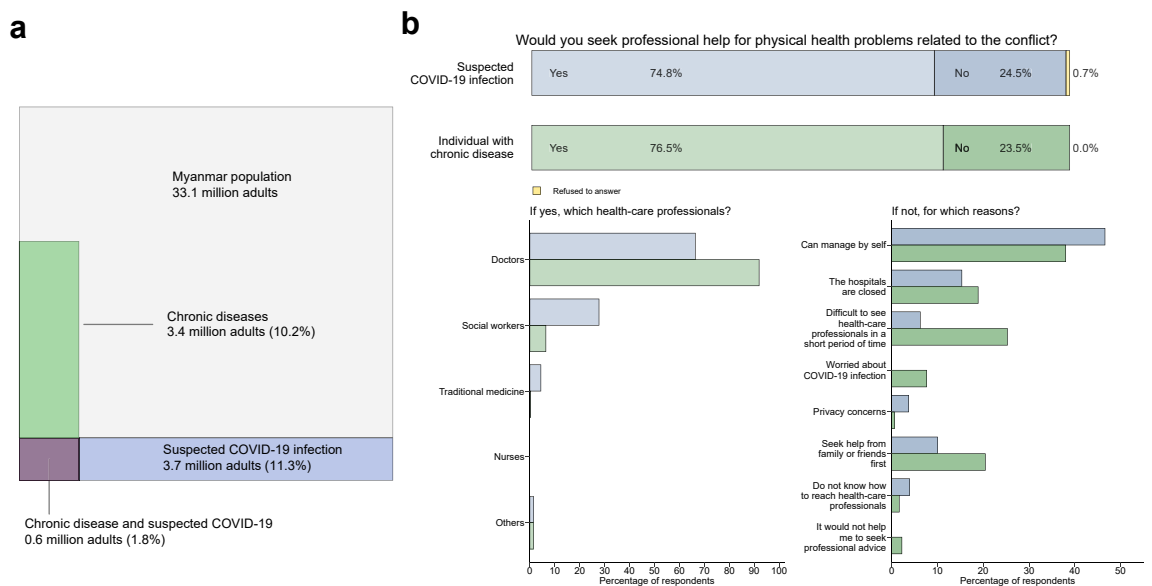


Fig. 3: Physical health burden and intention to seek professional help during the 2021 Myanmar conflict. (a) Weighted prevalence of physical health problems during the 2021 Myanmar conflict. Area of rectangles are proportional to the adult population size of Myanmar. (b) Intention to seek professional help for physical health problems related to the 2021 conflict.

problems (Appendix p 9). The physical health burden would translate into 5.6 million (4.8–6.4 million) adults in need of physical health services in Myanmar.

Risk factors of common mental disorders in Myanmar

Prevalence of risk factors and their associations with mental disorders were reported in Table 1. We estimated that 11.0% (95% CI 9.2–12.9) of the population had direct trauma exposure and 6.8% (5.3–8.4) had indirect trauma exposure. For time spent on social media,

16.8% spent 2–4 h per day and 22.3% spent >4 h per day on sociopolitical news via social media. In terms of COVID-19-related factors, 54.8% (51.9–57.8) of participants reported that their family or close friends had been infected with SARS-CoV-2, and 23.2% (20.6–25.8) reported their family or close friends had died from COVID-19. Additionally, 12.0% (10.1–14.1) reported having close contact with a confirmed COVID-19 case. More than one in ten (13.9%, 11.7–15.9) perceived their risk of dying from COVID-19 in the coming month as likely, very likely or certain. Exposure to the impact of

	Prevalence (95% CI)	Probable PTSD	Probable depression	Probable anxiety
Conflict-related factors				
Direct trauma exposure				
No	89.0% (87.2–90.9)	- ^a	Ref	Ref
Yes	11.0% (9.2–12.9)	- ^a	2.70 (1.20, 6.07)	1.52 (0.71, 3.26)
Indirect trauma exposure				
No	93.2% (91.7–94.6)	- ^a	Ref	Ref
Yes	6.8% (5.3–8.4)	- ^a	4.50 (1.82, 11.15)	0.70 (0.26, 1.88)
Time spent on social media on sociopolitical news (hours)				
None	26.3% (23.8–29.2)	Ref	Ref	Ref
≤2	34.6% (31.7–37.6)	1.38 (0.36, 5.28)	3.35 (1.30, 8.60)	1.06 (0.53, 2.14)
2–4	16.8% (14.5–19.0)	3.48 (0.81, 14.94)	3.74 (1.20, 11.69)	2.12 (0.94, 4.76)
>4	22.3% (19.7–24.9)	7.12 (1.92, 26.35)	9.92 (3.85, 25.52)	2.54 (1.15, 5.61)
Argued with family about sociopolitical events				
No	89.9% (88.0–91.7)	Ref	Ref	Ref
Yes	10.1% (8.4–11.8)	0.87 (0.37, 2.05)	2.99 (1.35, 6.61)	1.35 (0.61, 3.03)
COVID-19 related factors				
Family or close friends died of COVID-19				
No	76.8% (74.1–79.3)	Ref	Ref	Ref
Yes	23.2% (20.6–25.8)	3.89 (1.48, 10.19)	1.67 (0.75, 3.70)	2.70 (1.48, 4.92)
Family or close friends infected with SARS-CoV-2				
No	45.2% (42.2–48.3)	Ref	Ref	Ref
Yes	54.8% (51.9–57.8)	2.11 (0.86, 5.16)	0.81 (0.43, 1.51)	3.19 (1.70, 5.99)
Close contact with a confirmed case				
No	88.0% (86.1–89.9)	Ref	Ref	Ref
Yes	12.0% (10.1–14.1)	1.42 (0.51, 3.93)	0.59 (0.20, 1.73)	1.92 (0.97, 3.80)
Perceived risk of COVID-19-related death				
Never/Very unlikely/Unlikely	61.2% (58.2–64.2)	Ref	Ref	Ref
Evens	25.0% (22.3–27.6)	3.11 (1.03, 9.33)	1.09 (0.52, 2.29)	1.25 (0.64, 2.46)
Likely/Very likely/Certain	13.9% (11.7–15.9)	4.74 (1.45, 15.50)	1.77 (0.79, 3.96)	2.73 (1.31, 5.70)
Impact of 'triple crises'				
Stress due to the political environment				
No	32.4% (29.9–35.3)	Ref	Ref	Ref
Yes	67.6% (64.7–70.4)	12.71 (1.71, 94.61)	3.08 (1.13, 8.37)	1.43 (0.74, 2.74)
Stress due to the risk of SARS-CoV-2 infection				
No	29.5% (26.8–32.5)	Ref	Ref	Ref
Yes	70.5% (67.6–73.4)	1.38 (0.52, 3.64)	2.47 (1.07, 5.72)	2.31 (1.09, 4.87)
Loss of income				
No	63.2% (60.2–66.0)	Ref	Ref	Ref
Yes	36.8% (33.7–39.5)	3.24 (1.55, 6.78)	5.32 (2.52, 11.21)	1.44 (0.79, 2.63)

Prevalence was estimated with weighted data. Odds ratios and 95% confidence intervals were calculated using multivariable logistic models, adjusting for sociodemographics and doctor-diagnosed depression or anxiety prior to the conflict. Significant results are bolded (p < 0.05). ^aPart of criterion A for probable PTSD.

Table 1: Risk factors of probable PTSD, depression, and anxiety during the 2021 Myanmar conflict.

'triple crises' was prevalent, with most of the participants reporting being stressed by the political environment (67.6%), the risk of SARS-CoV-2 infection (70.5%), and one-third experiencing income loss since the conflict (36.8%).

Being single and having attained tertiary education were associated with higher odds of probable PTSD (Appendix p 11). By contrast, older age was associated with lower odds of probable PTSD. Higher household income was associated with lower odds of probable PTSD but higher odds of probable depression.

Participants with direct or indirect trauma exposure or who had arguments with family members on sociopolitical events were more likely to develop probable depression (Table 1). Excessive social media exposure (>4 h) to sociopolitical news was associated with higher odds of all three probable disorders. Having family members or close friends who died from COVID-19 or a higher perceived risk of COVID-19-related death were both associated with probable PTSD and anxiety. Having family members or close friends infected with SARS-CoV-2 was associated with probable anxiety. All conflict-related and COVID-19-related factors, apart from arguments with family and contact with a confirmed case, were associated with higher odds of any mental disorders (Appendix p 12).

Being stressed due to the political environment was associated with higher odds of probable PTSD and depression (Table 1), while being stressed due to SARS-CoV-2 infection was associated with probable depression and anxiety, and income loss was associated with probable PTSD and depression. Complete case analysis for risk factors yielded similar findings (Appendix p 13).

E-values of significant associations ranged from 3.68 to 24.91 (Appendix p 14), indicating that considerable unmeasured confounding would be needed to explain away an association estimated.

Population attributable fraction for common mental disorders

Results for population attributable fraction are presented in Fig. 4 and Appendix p 15. Adjusting for the impact of 'triple crises' simultaneously, the majority of probable PTSD was potentially attributable to political stress (PAF: 79.9%, 95% CI 43.8–97.9) (Fig. 4). Over one-third of the individuals with probable anxiety (38.0%, 4.8–67.0) were potentially attributable to COVID-19 stress, and up to half of the individuals with probable depression (46.4%, 20.6–65.7) were attributable to income loss. Sensitivity analyses for PAF where the impact of 'triple crises' was modelled separately yielded similar estimates for the above findings (Appendix p 15).

The joint PAF of the 'triple crises' also indicated that probable PTSD was mostly attributable to political stress (77.6%, 33.9–98.0) and probable anxiety was primarily attributable to COVID-19 stress (41.0%, 0.5–72.6) (Appendix p 15). By contrast, political and COVID-19

stress may have also contributed to probable depression in addition to income loss (64.1%, 29.1–91.6).

If political stress was hypothetically removed from the whole population, the absolute reduction in probable PTSD could be up to 6.2%, corresponding to 2.1 million (95% CI 1.1–3.2 million) fewer individuals with probable PTSD (Fig. 4). If stress due to the risk of SARS-CoV-2 infection was hypothetically eliminated from the whole population, probable anxiety could be reduced by up to 8.4%, corresponding to 2.8 million (0.4–5.1 million) fewer individuals with probable anxiety. If there were no income loss since the conflict, the absolute reduction in probable depression could be up to 6.6%, corresponding to 2.2 million (1.0–3.3 million) fewer individuals with probable depression.

Discussion

Our nationwide random sample survey, which was established from July 3–Aug 9, 2021, suggests that one in three (34.9%, 95% CI 32.0–37.7) adults in Myanmar reported a probable mental disorder during the 'triple crises'. The prevalence of probable PTSD, depression and anxiety were 8.1% (6.6–9.7), 14.3% (12.0–16.6), and 22.2% (19.7–24.7), respectively. The updated WHO pooled estimates for PTSD, depression, anxiety disorder, and in conflict-affected settings were 15.3% (95% Uncertainty interval [UI]: 9.9–23.5), 10.8% (8.1–14.2) and 21.7% (16.7–28.3), respectively.¹⁰ However, our findings are not comparable to the WHO pooled estimates as the instruments used in our study are different from those included in the meta-analysis. Moreover, the pooled estimates included studies conducted in convenience samples and focused on selected regions or vulnerable subgroups (e.g., refugees).¹⁰ This might explain the higher WHO pooled estimates for PTSD compared to our nationwide estimates for Myanmar as the former may have sampled those with more traumatic exposures.

We therefore searched for more comparable benchmarks for our findings, in particular, studies that were conducted during an ongoing conflict (as opposed to post-conflict). A total of ten studies conducted during a conflict were identified,^{38–46} of which five were included in the WHO meta-analysis^{38–42} and five were published afterwards.^{43–47} The majority (7 out of 10) of these studies collected regional rather than nationwide data and reported varying estimates with the prevalence of probable depression ranging from 16.1%–41.9%,^{40–42,44,45} probable PTSD from 8.3%–50.1%,^{39,42,43,45} and only one estimate for probable anxiety (26%).⁴⁵ Two studies obtained nationwide convenience samples using online surveys, which yielded high prevalence of depression: (46.8%–61%) and anxiety (54.1%–58%).^{46,47} The remaining one is more comparable to our study as it obtained a nationwide random sample in Israel using random

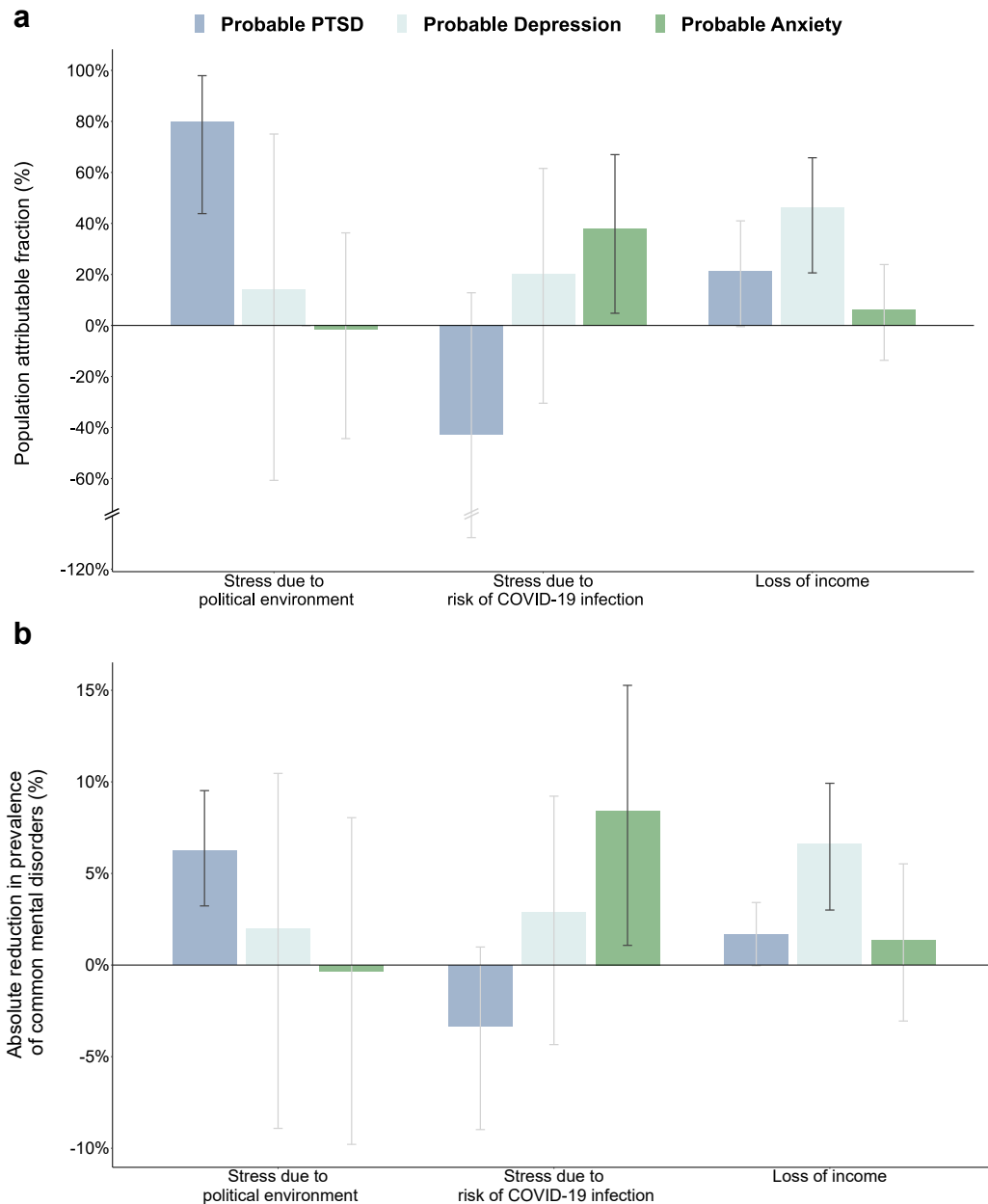


Fig. 4: Population attributable fractions and absolute changes in the prevalence of common mental disorders in Myanmar if the impact of a crisis was removed during the 2021 Myanmar conflict. (a) Weighted proportion (95% CI) of individuals with common mental disorders that is attributable to the impact of a crisis. (b) Absolute reduction in weighted prevalence (95% CI) of common mental disorders if the impact of a crisis was removed in the population.

digital dialling and reported a probable PTSD prevalence of 5.5%.³⁸ This would be similar to our estimates of probable PTSD during the Myanmar conflict.

Baseline estimates are needed to identify the changes in mental health outcomes during the Myanmar conflict. However, to our knowledge, there has not been a prior nationwide random sample established in Myanmar,⁴⁸ as with many LMICs.⁴⁹ Prior to the conflict,

the best available prevalence of depression (1.2%) and anxiety (4.7%) in Myanmar in 2020 was estimated by the Global Burden of Disease using meta-regression models.¹² However, caution is needed in interpreting these baseline prevalence as they are not derived from survey data collected in Myanmar.¹² Given the lack of nationwide random samples during ongoing conflict settings including Myanmar, our findings could serve as

an important benchmark for future studies conducted in such circumstances.

Based on the participants' mental and physical health burden, as well as their healthcare-seeking patterns, we estimated that 5.9 million and 5.6 million adults in Myanmar would potentially seek access to mental and physical health services, respectively. However, these healthcare needs are largely unmet due to the collapse of Myanmar's health system. The health system was under-resourced even prior to the conflict, with 0.7 doctors for every 1000 population compared to 1.3 in LMICs in 2019.⁵⁰ As the public sector accounted for over 80% of healthcare delivery, its collapse will likely exacerbate the inverse care law and widen health inequalities in Myanmar.^{51,52} Recognising the widening care gap in Myanmar, clinicians have continued to provide care via telemedicine, charity clinics and private hospitals.¹⁵ Mental health services have been mainly driven by non-governmental organisations as coordinated efforts in local and national agencies have largely been absent even prior to the conflict.⁵³ As participants that had direct trauma exposure and lower educational attainment were less likely to seek mental healthcare, these subgroups may require more focused attention (Appendix pp 9–10). Health education could target improving mental health literacy and destigmatising health-seeking behaviours to narrow the care gap.⁵⁴ At the same time, scalable approaches could be implemented, such as mobilising community health and social workers, engaging in religious and spiritual practices by community services, and maintaining national hotlines to provide timely access to mental health services.⁵⁴

Since the conflict, one in ten adults reported direct trauma exposure, one in four lost a family member or close friend to COVID-19, and one in three reported income loss. Considering the magnitude of co-occurring population shocks in Myanmar, their combined mental health impact may not be surprising. Adjusting for the impact of 'triple crises' simultaneously, we found that each crisis was independently associated with a distinct probable mental disorder: the conflict was the main driver for PTSD, the COVID-19 pandemic for anxiety, and the economic collapse for depression (Fig. 4). The joint PAF of all three stressors was similar to the individual PAF of political stress for probable PTSD, and the individual PAF of COVID-19-related stress for probable anxiety. This suggests that the other two stressors did not have a substantial additional impact on these mental health outcomes. For probable depression, the joint PAF of all three stressors (64.1%) was larger than the PAF of income loss (46.4%), suggesting that political and COVID-19 stress may have also contributed to probable depression. We estimated that if political stress was removed from the population, up to 2.1 million cases of probable PTSD could have been prevented, which could potentially reduce Myanmar's level of PTSD to that of

other LMICs.⁵⁵ If COVID-19 were eliminated from the population, there could be approximately 2.8 million fewer adults with probable anxiety. If there was no income loss since the conflict, there could be up to 2.2 million fewer adults with probable depression, and the impact could be even larger if political and COVID-19-related stress was also removed simultaneously (up to 3.0 million fewer adults with probable depression).

Evidently, the 'triple crises' must end to restore population mental health in Myanmar. However, this is unlikely to be achieved soon. The conflict has further escalated given the state of emergency extended by the military and the declaration of a nationwide civil war.¹ For the COVID-19 pandemic, Myanmar remains to have one of the lowest vaccination rates in Asia (35% as of February 2022).⁵⁵ As over 70,000 civilians have sought refuge in neighbouring countries, without adequate vaccination rates, Myanmar was cited as at risk of becoming a 'super-spreader state' for new variants.^{56,57} The UN Development Programme projects that if the conflict and the COVID-19 pandemic remain unchecked, economic gains made over the past two decades would reverse and half of Myanmar's population could live in poverty.⁵⁸ Further, given the current collapse of Myanmar's health system, this would significantly set back plans to achieve universal health coverage by 2030.⁵² Thus, the 'triple crises' will likely have long-term implications on population health if the conflict remains unresolved.^{9,14}

Our study is subject to several limitations. First, we relied on sampling mobile phone numbers randomly in Myanmar as mobile phone ownership is high (85.8%) in the Myanmar population.⁵⁹ The widespread conflict, surge in COVID-19 cases and health system collapse precluded in-person recruitment or monitoring of healthcare utilisation (e.g., prescriptions, admissions).¹⁵ Nevertheless, our random sampling attained nationwide coverage including all states and regions (Fig. 1). Second, individuals with tertiary education were over-represented in our unweighted sample. This may be due to higher mobile phone ownership in this subgroup, ongoing telecommunication issues in Myanmar (i.e., shutdown ordered by the military) that have disproportionately affected rural areas,⁶⁰ and potentially lower trust in participating in a survey and fear of repercussions among those with lower educational attainment. Nonetheless, we applied raking such that the distribution of educational attainment in our weighted sample (13.7%) was comparable to the latest census (10.3%) (Appendix p 7). Moreover, all socio-demographic differences between the weighted sample and Myanmar's census were shown to be small (Cohen's *w* around 0.1). To assess the potential influence of oversampling on our findings, we compared the unweighted prevalence of probable mental disorders among those with different educational attainment (Appendix p 16). Notably, the prevalence of probable

PTSD (6.2%), depression (14.1%) and anxiety (23.0%) among those with non-tertiary educational attainment were similar to the weighted sample i.e., probable PTSD (8.1%), depression (14.3%), and anxiety (22.2%). This suggests that the oversampling of individuals with tertiary education had little influence on our weighted estimates.

Third, probable mental disorders were assessed by screening instruments, which have not been validated in Myanmar, and could represent acute responses to ongoing stressful events rather than true psychopathology. Although these scales have been used in population shocks and other conflict-affected settings, caution should be exercised when comparing our estimates with other studies.^{24,25} Internal consistency for PCL-C and PHQ-2 remained satisfactory for in our full sample but not for GAD-2. It has been suggested that the psychometrics of mental health scales could vary during a pandemic,¹² and future studies are needed to evaluate the psychometrics of mental health scales during population shocks.

Fourth, the cross-sectional design limits our ability to compare the prevalence of mental disorders before and during the ‘triple crises’. However, similar to many LMICs, to our knowledge, there are no pre-existing nationwide random samples in Myanmar prior to the conflict.^{48,49} Thus, it would not be possible to conduct a longitudinal population-representative study with pre-conflict data. As such, our study could represent the best available evidence to date on mental health during the Myanmar conflict. Fifth, our findings are subject to reverse causality and residual confounding (e.g., religion⁶¹). Nevertheless, the assumption regarding causality between the impact of ‘triple crises’ and common mental disorders in our study is supported by robust evidence from natural experiments and key systematic reviews.^{10,12,19,62} Further, the E-value of significant associations indicate that a considerable degree of residual confounding would be required to explain away the point estimate of these associations. Sixth, in our PAF calculations, adjusting for other crises could underestimate the impact of each crisis given the correlation among the three crises. Reassuringly, our sensitivity analyses found that modelling each stressor separately and joint PAF of all three stressors yielded similar estimates. Finally, children and adolescents were not included in our survey, yet are susceptible to long-term mental health sequelae following exposure to violence.¹⁰ As children and adolescents account for a third of Myanmar’s population,¹⁷ this vulnerable group must be redressed urgently.

The mental health burden in Myanmar during the ‘triple crises’ of mass conflict, COVID-19 pandemic and economic collapse deserves focused attention and action. With a protracted conflict, it is concerning that Myanmar could be on course for the long-term mental health consequences of Northern Ireland’s ‘The Troubles’ where 39.1% of the adult population had developed a psychiatric disorder in their lifetime as assessed using the Composite

International Diagnostic Interview.¹¹ To avert the grave psychiatric sequelae, humanitarian access and scalable community-oriented mental health interventions need to be urgently stepped up in Myanmar.^{11,41} Above all, violence needs to cease immediately. It is only through peace that the fundamental right to health could be returned to the people of Myanmar.

Contributors

MYN conceived and designed the study. YA, TSM, XF, HMT, PPTZ, and MYN carried out the study. XF, KN, FF, and MYN wrote the analytic plan and analysed the data. XF and TSM conducted the literature review. XF, KN, FF, and MN visualised the data. MYN wrote the paper with input from TSM, XF, and KN. XF, KN, TSM, YA, HMT, PPTZ, FF, MSC, CML, PL, WCC, GML, and MYN interpreted the data, critically revised the manuscript, and approved the final version.

Data sharing statement

The data are available upon request to the corresponding author.

Editor note

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Declaration of interests

The authors declare that they have no conflicts of interest.

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Appendix A. Supplementary data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.lansea.2024.100396>.

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