

# Mental health and support for rigorous tobacco control strategies in South Australia

Joshua Trigg <sup>1</sup>, Jacqueline Bowden,<sup>2</sup> Julia Morris,<sup>3</sup> Tony Daly,<sup>3</sup> Caroline Miller <sup>4,5</sup>, Billie Bonevski <sup>1</sup>

<sup>1</sup>Flinders Health and Medical Research Institute, College of Medicine and Public Health, Flinders University, Bedford Park, South Australia, Australia  
<sup>2</sup>National Centre for Education and Training on Addiction, Flinders University, Bedford Park, South Australia, Australia  
<sup>3</sup>Behavioural Research and Evaluations Unit, Cancer Council SA, Eastwood, South Australia, Australia  
<sup>4</sup>South Australian Health and Medical Research Institute, Adelaide, South Australia, Australia  
<sup>5</sup>School of Public Health, University of Adelaide, Adelaide, South Australia, Australia

## Correspondence to

Dr Joshua Trigg;  
joshua.trigg@flinders.edu.au

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## ABSTRACT

**Introduction** Tobacco endgame strategy includes policies to end the tobacco epidemic. As tobacco smoking prevalence is higher among people with mental health conditions (MHC), understanding the impact of rigorous tobacco control strategies for this group is critical. This study examined support for five tobacco control strategies among people with MHCs: increasing tobacco product tax, reducing tobacco retail locations, ending tobacco sales in alcohol-licensed venues, limiting retailers to one tobacco point of sale and reduced nicotine in smoked tobacco.

**Methods** Cross-sectional surveying of a representative sample of 3006 South Australians in 2021 aged  $\geq 15$  years included demographic, tobacco control strategy, smoking status and mental health indicators. Multivariable logistic regression was used to examine the influence of mental health on strategy support.

**Results** Support was high for all tobacco control strategies, highest for reducing nicotine content (80.4%) and lowest for increasing tobacco tax (67.2%). Support for increased tobacco tax was lower among people with MHCs than for those without by 7.8% (aged 18+ years) to 9.5% (aged 15+ years). People who smoked had significantly lower support for all strategies, and smoking status and MHC did not interact in influencing support.

**Conclusions** Support for tax-focused strategies was lower among people with MHCs. Retail and product-focused strategies may support equity in public acceptability of tobacco control action. Policy-makers must aim to maximise tobacco endgame support from populations most impacted by tobacco harms when implementing tobacco control strategies. Tax-focused approaches might be enhanced with consultation and advocacy for people with MHCs.

## INTRODUCTION

In Australia, smoking is almost twice as prevalent among people with a mental health condition (MHC) compared with the general population (20% vs 12%).<sup>1</sup> People who smoke daily are twice as likely to experience high-level psychological distress (25% vs 12%) or to be diagnosed with an MHC (29% vs 14%) compared with those who have never smoked.<sup>2</sup> This relationship between mental health and smoking remains robust after accounting for other factors (eg, gender).<sup>3</sup>

In Australia, MHC prevalence ranges from 16% (Northern Territory) to 23% (Queensland), with 20% in South Australia (SA),<sup>4</sup> and those with an MHC are more likely than those without to smoke tobacco and experience nicotine dependence.<sup>5</sup> Although this population bears a higher burden

## WHAT IS ALREADY KNOWN ON THIS TOPIC

- ⇒ Compared with the general Australian population, people with a mental health condition (MHC) are more likely to smoke tobacco and experience nicotine dependence.
- ⇒ Policy-makers need to understand how tobacco control measures are viewed by this priority population.

## WHAT THIS STUDY ADDS

- ⇒ Despite majority support, tax-based tobacco control strategies may have differential acceptability among people with MHCs, and retail and product-focused measures should be examined for potential support of mental health equity.

## HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

- ⇒ South Australia's tobacco control strategy implementation should consider how these measures may disproportionately impact people living with MHCs.

of illness and is more likely to have high tobacco-related chronic disease morbidity and mortality,<sup>6</sup> those with MHCs can be just as motivated to quit as those without.<sup>7</sup> Yet, smoking cessation supports such as nicotine replacement therapy are typically less effective for people with MHCs, who may have limited access, and who can benefit from alternative approaches (eg, tailored programmes).<sup>8</sup> Strategies for addressing tobacco use by people with MHCs range from cessation support, through to comprehensive policy.

Countries including Australia are setting or considering tobacco endgame goals to drive down smoking prevalence. Australia's National Preventive Health Strategy targets a smoking prevalence of  $\leq 5\%$  by 2030,<sup>9</sup> and the Smokefree Aotearoa 2025 Action Plan has a population-wide target of  $< 5\%$  by 2025.<sup>10</sup> Endgame goals are also being established in England, Scotland and Wales (smoke-free by 2030),<sup>11</sup> Canada ( $< 5\%$  by 2030),<sup>12</sup> and the USA ( $\leq 5\%$  by 2030).<sup>13</sup> These various plans include rigorous tobacco control policy measures that align with various aspects of endgame strategy. In SA, progress has been made towards tobacco endgame, through the South Australian Tobacco Control Strategy.<sup>14</sup> The Strategy targets a 6% smoking prevalence in South Australia by 2027, noting that the '... endgame' for tobacco... in South Australia will require significant investment in these



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higher prevalence groups...’ (Drug and Alcohol Services South Australia, p. 6).<sup>14</sup>

Rigorous tobacco control strategies that can support this are classifiable according to product focus (eg, nicotine content, design appeal), consumer focus (eg, purchasing, prescription), supply focus (eg, licensing, retail, marketing) and regulatory systems focus (eg, taxation, fines).<sup>15 16</sup> Examples include tobacco retailer supply and density restrictions (eg, liquor stores), restricting tobacco sales by birth year (ie, tobacco-free generation)<sup>16</sup> and staged excise tax increases.<sup>17</sup> These strategies are increasingly gaining public support.<sup>18</sup>

Public support is paramount for tobacco control strategies,<sup>19</sup> reinforcing the need to understand public perspectives on proposed tobacco control measures,<sup>20</sup> particularly among populations with a high smoking prevalence, like those with MHCs. This also emphasises the need for qualitative research with such populations to explore how their perspectives might inform political feasibility of a measure. Public support is important for gaining and sustaining political will to implement rigorous tobacco control measures, given potential opposition. Although there is evidence for their support in the general population,<sup>21</sup> little is known about the extent of support among people living with MHCs. Note that although support for a policy may benefit its implementation, ultimate policy effectiveness will require different measures.

This study assessed support among people living with an MHC for five rigorous tobacco control strategies that can support a tobacco endgame<sup>16</sup>: (1) Increasing tax on tobacco products and using the extra money to promote public health; (2) Reducing the number of places allowed to sell tobacco products to limit their availability; (3) Ending sale of tobacco products in alcohol-licensed venues to break the link between smoking and drinking alcohol; (4) Limiting alcohol and tobacco licensed retailers to only one point of sale for tobacco and (5) Mandating very low nicotine content for smoked tobacco products to make them non-addictive or minimally addictive.

## METHODS

### Study design

This study followed Strengthening the Reporting of Observational Studies in Epidemiology reporting guidelines.<sup>22</sup> A cross-sectional computer-assisted telephone interview survey with the SA Health Population Health Survey Module System (PHSMS) was conducted via the PHSMS annual omnibus telephone survey (November 2021–December 2021). People were eligible if aged  $\geq 15$  years and residing in SA. Data collection used random digit dialling and multistage systematic sampling of metropolitan and regional South Australian residential centres.<sup>23</sup> Items relating to this study include demographic questions, tobacco control strategy questions, smoking behaviour and mental health questions. The full items bank can be requested from SA Health<sup>23</sup> and PHSMS data from Preventive Health SA.<sup>24</sup>

### Procedure

A research provider contacted participants with a study summary and sought consent for surveying by phone. Parental consent was obtained for those aged  $< 18$  years to participate. Languages other than English and male or female interviewers could be chosen, where interviewers were available. Additional languages included Punjabi, Vietnamese, Arabic, Mandarin, Hindi, Spanish, Cantonese and Italian. Of eligible people contacted (n=3675), non-participation (n=669) resulted from refusal (n=287), discontinued contact (n=69), physical or mental

capacity (n=156), or language option unavailability (n=157). There was an 81.8% participation rate and a final sample of 3006 respondents.

## Measures

### Demographics

Demographic characteristics included age, gender, education, Aboriginal or Torres Strait Islander identification, metropolitan versus rural residence and relative socioeconomic advantage in ascending quintiles via Socio-Economic Index for Areas (SEIFA).<sup>25</sup>

### Tobacco control strategies

Tobacco control strategies were selected based on a synthesis of the tobacco endgame concept and tobacco control strategies,<sup>15</sup> followed by expert consultation on implementation feasibility in SA. Experts consulted included academics in tobacco control from the University of Queensland, University of Otago and Flinders University. Experts from the SA Government worked in the Tobacco Control Unit, and consultation was also held with Cancer Council South Australia.

Tobacco control measures need to be implemented in a way that is likely to result in substantial and rapid reductions in tobacco smoking prevalence to best support tobacco endgame. Given this and survey space availability limitations, five key strategies were selected as relevant to the South Australian context. Respondents were asked to ‘indicate how much you personally support the following approaches to reducing smoking in South Australia’, rating from 1 strongly agree to 5 strongly disagree, don’t know or prefer not to say:

- ‘The government should increase tax on tobacco products (excluding e-cigarettes) and use the extra money to promote health, including helping smokers to quit.’
- ‘The number of places allowed to sell tobacco products should be gradually reduced to make them less easily available.’
- ‘A law should be introduced to end the sale of tobacco products in bars and pubs to help break the link between smoking and drinking alcohol.’
- ‘Businesses that sell alcohol and have a tobacco licence, should have only one space where they can sell tobacco (including vending machines).’
- ‘A law should be introduced that reduces the amount of nicotine in cigarettes and tobacco products to make them less addictive.’

Binary variables were created for strategy support, with ‘somewhat agree’ and ‘strongly agree’ indicating support, and ‘neither agree nor disagree’, ‘somewhat disagree’ and ‘strongly disagree’ indicating non-support. Undecided responses were excluded, as these were minimally present in the data for tobacco control strategy support questions: increasing tax on tobacco products (don’t know, n=24; prefer not to say, n=9), reducing retail availability (don’t know, n=21; prefer not to say, n=5), ending sales in alcohol-licensed venues (don’t know, n=51; prefer not to say, n=5), limiting number of sales points (don’t know, n=72; prefer not to say, n=8) and reducing nicotine to reduce addictiveness (don’t know, n=48; prefer not to say, n=8). Valid proportions are given in results.

### Mental health

Mental health was assessed via two binary indicators designed with a mental health professional in previous SA Health public health surveillance research<sup>26</sup>: ‘Are you currently receiving treatment for anxiety, depression or any other mental health

problem?’ (ie, general condition) and ‘Are you currently receiving the disability pension on the basis of a psychological or psychiatric illness?’ (ie, severe condition).

The Patient Health Questionnaire 4 (PHQ-4) is an established four-item mental health screen for anxiety, depression and overall symptom severity.<sup>27</sup> All items are rated 0 not at all to 3 nearly every day, summing two items each for depression and anxiety (range: 0–6, cutoff  $\geq 3$ ), and all items for overall mental health symptom severity (range: 0–12, cut-offs: none, 0–2; mild, 3–5; moderate, 6–8; severe, 9–12). These cut-offs are recommended for this measure.<sup>27</sup> Binary variables were created for PHQ-4 indicating depression and anxiety. A binary indicator was also created that indicated the likely presence of a general or severe MHC and presence of mental health symptoms (ie, PHQ-4 score  $\geq 3$ ), labelled ‘MHC’. This was done to provide a greater degree of certainty in the presence of an MHC.

### Smoking status

Smoking status was assessed by asking participants whether they ‘currently smoke cigarettes, cigars, pipes or other tobacco products’ on a ‘daily’, ‘at least weekly’, ‘less often than weekly’ basis or ‘not at all’. Participants who smoked daily, at least weekly, or less often than weekly, were classified as people who smoked.

### Analyses

Data were weighted by inverse selection probability, then by age group, by gender and by metropolitan or country residence using 2016 Australian Census data. Descriptive analyses included  $\chi^2$  tests using the ‘tableone’<sup>28</sup> and ‘weights’<sup>29</sup> packages. Figures are provided for respondents aged  $\geq 15$  years, the full sample and separately for those aged  $\geq 18$  years. This is because some endgame policies may more closely affect respondents of legal tobacco and alcohol purchasing age in Australia ( $\geq 18$  years), such a retail focused strategies (eg, tobacco purchasing). Figures for the overall sample aged  $\geq 15$  years are presented for reference with studies using PHSMS datasets.

Weighted multivariable logistic regression analysis used ‘glm’ for tobacco control strategy support outcomes, in R V.4.1.1, with figures presented as numbers, percentages and crude ORs with 95% CIs. Weighted logistic regression was used to predict binary support for each of the five tobacco control strategies from age, gender, smoking status and MHC presence. The interaction of smoking status and MHC was also tested, and analyses were run for the total sample, and for those aged 18 years or older. Age, gender, education and relative socioeconomic advantage were included as covariates.

## RESULTS

Sociodemographic and mental health characteristics are shown in [table 1](#). Participants (n=3006) were aged  $\geq 15$  years (M $\pm$ SD=47.28 $\pm$ 18.78, range=15–94). The overall sample mostly lived in metropolitan (71.8%) compared with country (28.2%) areas, and in areas of higher relative socioeconomic advantage (SEIFA advantage ascending quintiles: 1=17.1%, 2=20.7%, 3=21.3%, 4=17.0% and 5=23.9%). The proportion of people who smoked tobacco decreased as relative social advantage increased ([table 1](#)). Few participants identified as Aboriginal or Torres Strait Islander (n=77) relative to those who did not (n=2907) or who did not report this (n=22). Many participants had graduate-level education (37.2%). The results tables in the following sections provide question-specific sample sizes for participants who provided a response on strategy support.

### Tobacco smoking and mental health

Among all respondents, 12.4% currently smoked. Overall, 16.9% lived with an MHC that was being treated or for which they received a disability support pension, with this significantly higher in those who smoked compared with those who did not ([table 1](#)). Scores on the PHQ-4 indicated depression in significantly more people who smoke (22.0%) than did not smoke (10.7%), and anxiety in significantly more people who smoke (28.0%) than did not smoke (16.6%). Most participants showed no PHQ-4 mental health symptoms (70.5%) while remaining participants reported mild (17.2%), moderate (6.8%) or severe (5.5%) mental health symptoms. Scores also showed higher symptom severity in people who smoked versus those who did not ([table 1](#)).

### Support for tobacco control strategies

Public support was high across all five tobacco control strategies ([table 2](#)). For the full sample, the greatest level of support was for introducing a law to reduce the amount of nicotine in cigarettes and tobacco products to make them less addictive (81.6%), followed by limiting alcohol and tobacco licensed retailers to only one point of sale for tobacco products (73.8%). Consistently high support was reported for increasing tax on tobacco products (67.9%), reducing the number of places allowed to sell tobacco products to limit their availability (70.8%) and for ending sale of tobacco products in alcohol-licensed venues break the link between smoking and drinking alcohol (70.2%).

A difference in level of support based on the presence of an MHC was reported only for increasing tax on tobacco products and using the extra money to promote public health. The presence of an MHC was associated with lower support for this approach, both in the full sample (70.0 vs 60.5%), and among participants aged  $\geq 18$  years (69.0 vs 59.4%) ([table 2](#)). Although this tobacco control strategy was less supported by people with an MHC, this did not influence support for the remaining strategies.

Difference in support was also tested by current smoking status ([table 3](#)). This showed that support for all strategies was significantly lower for people who currently smoked, compared with those who did not smoke. In the overall sample, compared with people who did not smoke, those who smoked were far less supportive of increasing tax on tobacco products (73.6% vs 28.7%) and reducing the number of places allowed to sell tobacco products to limit their availability (75.3% vs 40%). Smaller differences were reported for limiting alcohol and tobacco licensed retailers to only one point of sale for tobacco products (75.2% vs 64.7%) and for mandating reduced nicotine content in tobacco products (84.3% vs 60.8%). Similar levels of support across the five strategies were also seen for participants aged  $\geq 18$  years (see [table 3](#)).

### Demographic and mental health influence on tobacco control strategy support

Support for all five tobacco endgame strategies was examined by current smoking status, the presence of MHC and by the interaction of the presence of MHC and smoking status. Outcomes are separated by age, as respondents aged  $\geq 18$  years are most likely to have opportunity to be affected by some endgame strategies (eg, ability to buy tobacco or access alcohol-licensed venues). [Table 4](#) shows factors that influenced support for each tobacco control strategy via weighted multivariable logistic regression. Note that as for some of the included variables the confidence

**Table 1** Sociodemographic and mental health characteristics of total sample and by smoking status, aged ≥15 years

Characteristic	Full sample (n=3006)		Smokes* (n=371)		Does not smoke (n=2629)		χ <sup>2</sup>	df	P value
	n	%	n	%	n	%			
Gender							1.9	2	0.389
Female	1536	51.1	181	48.8	1354	51.5			
Male	1464	48.7	190	51.2	1269	48.3			
Diverse	6	0.2	0	0.0	6	0.2			
Age (years)							83.8	8	<0.001
15–17	199	6.6	11	3.1	188	7.1			
18–24	209	7.0	45	12.0	164	6.2			
25–34	503	16.7	63	16.9	437	16.6			
35–44	482	16.0	61	16.5	421	16.0			
45–50	308	10.2	44	11.8	264	10.0			
51–54	201	6.7	40	10.9	160	6.1			
55–64	465	15.5	79	21.1	386	14.7			
65–74	346	11.5	22	5.9	324	12.3			
≥75	293	9.8	7	1.9	286	10.9			
SEIFA (quintile)							51.8	4	<0.001
Q1	515	17.1	97	26.1	415	15.8			
Q2	623	20.7	88	23.7	534	20.3			
Q3	640	21.3	94	25.2	546	20.8			
Q4	510	17.0	44	11.7	466	17.7			
Q5	718	23.9	49	13.3	668	25.4			
Area classification							14.6	1	<0.001
Metropolitan	2158	71.8	235	63.4	1918	72.9			
Country	848	28.2	136	36.6	712	27.1			
Cultural identity							4.4	3	0.223
Aboriginal	70	2.3	14	3.8	56	2.1			
Torres Strait Islander	0	0.0	0	0.0	0.0	0.0			
Aboriginal and Torres Strait Islander	7	0.2	0	0.1	6.7	0.3			
Non-Indigenous	2907	96.7	354	95.4	2548	96.9			
Prefer not to say	22	0.7	2	0.6	19	0.7			
Education							59.7	4	<0.001
No school to secondary	1099	36.5	173	46.5	921	35.0			
TAFE/trade/certificate	453	15.1	85	22.8	368	14.0			
Diploma/advanced diploma	315	10.5	28	7.4	288	10.9			
Degree or higher	1118	37.2	82	22.1	1036	39.4			
Not stated	21	0.7	4	1.2	17	0.6			
Receiving treatment							27.3	1	<0.001
Yes	498	16.6	97	26.0	401	15.2			
No	2508	83.4	275	74.0	2229	84.8			
Receiving pension							1.8	1	0.174
Yes	42	1.4	8	2.2	34	1.3			
No	2964	98.6	363	97.8	2595	98.7			
Treatment or pension†							25.8	1	<0.001
Yes	507	16.9	97	26.1	409	15.6			
No	2499	83.1	274	73.9	2220	84.4			
Depression‡							37.5	1	<0.001
Yes	351	12.2	78	22.1	272	10.7			
No	2542	87.9	276	77.9	2266	89.3			
Anxiety§							27.2	1	<0.001
Yes	522	18.0	98	28.0	423	16.6			
No	2385	82.0	253	72.0	2131	83.4			
PHQ-4 symptoms¶							43.7	3	<0.001
None**	2014	70.5	208	60.7	1806	71.9			
Mild	491	17.2	57	16.5	434	17.3			
Moderate	195	6.8	37	10.9	157	6.3			
Severe	158	5.5	41	11.9	116	4.6			
Mental health condition††							32.2	1	<0.001
Yes	322	11.3	72	20.9	250	9.9			

Continued



Table 1 Continued

Characteristic	Full sample (n=3006)		Smokes* (n=371)		Does not smoke (n=2629)		X <sup>2</sup>	df	P value
	n	%	n	%	n	%			
No	2535	88.7	271	79.1	2264	90.1			

Weighted values, valid proportions and weighted X<sup>2</sup> tests are shown.  
 \*Missing smoking status (n=6).  
 †Combined indicators for receiving mental health treatment or pension.  
 ‡PHQ-4 depression ≥3.  
 §PHQ-4 anxiety ≥3.  
 ¶PHQ-4 overall: none (0–2), mild (3–5), moderate (6–8), severe (9–12).  
 \*\*\*'Normal' in the original scale indicates no mental health symptoms in non-clinical populations.<sup>27</sup>  
 ††Mental health condition combined was indicated by either receiving mental health treatment or psychiatric disability support pension, as well scoring higher than 0–2 on PHQ-4 symptoms.  
 Weighted frequencies were rounded to integer, and all values to one decimal place.  
 PHQ-4, Patient Health Questionnaire 4; SEIFA, Socio-Economic Index For Areas; TAFE, technical/further education.

intervals included an OR of 1.0, these require further testing with different samples to clearly state an effect is present.

Among those aged ≥18 years, people who smoked were significantly less likely to support increased tax on tobacco products (OR (95% CI) 0.14 (0.09, 0.22)), reduced retail availability (OR (95% CI) 0.23 (0.16, 0.34)), ending tobacco sales in alcohol-licensed venues (OR (95% CI) 0.26 (0.18, 0.39)), limiting points of sale for tobacco in alcohol-licensed venues that sell tobacco (OR (95% CI) 0.66 (0.45, 0.97)) and introducing a law to reduce the amount of nicotine in cigarettes and tobacco products to less addictive levels (OR (95% CI) 0.28 (0.19, 0.42)) than were non-smokers.

Males were less likely to support reducing nicotine to less addictive levels (OR (95% CI) 0.76 (0.59, 0.99)) than females. This effect was similar in the overall sample. Higher level of education was potentially associated with greater support for increased tax on tobacco products (OR (95% CI) 1.10 (1.01, 1.21)) and ending tobacco sales in alcohol-licensed venues (OR (95% CI) 1.11 (1.01, 1.22)). Higher level of relative socioeconomic advantage was also potentially associated with greater support for increased tax on tobacco products (OR (95% CI) 1.08 (0.99, 1.17)), as well as limiting points of sale for tobacco in alcohol-licensed venues that sell tobacco (OR (95% CI) 1.16 (1.06, 1.27)).

Age and the interaction of current smoking and the presence of an MHC did not meaningfully affect level of support for the five tobacco control strategies and in regression models, the

presence of an MHC alone was not significantly associated with a difference in support for any strategies. The effects described above were similar between the overall sample aged ≥15 years and those aged ≥18 years (table 4).

## DISCUSSION

This study examined support for five rigorous tobacco control measures in SA, according to current smoking status and MHC. Findings showed first that support for the five tobacco control measures was very high in a representative South Australian population. We found that although a tax-based measure was least supported overall, despite majority support, this was less supported by people with an MHC. Third, living with an MHC did not influence support for the remaining retail and product-focused tobacco control measures.

Although tax-based measures are highly effective at lowering smoking prevalence in Australia,<sup>30</sup> support for them is likely lower among people with an MHC. Such strategies can be blunt instruments, as they do not account for complex equity-relevant factors such as social context and accessibility of mental health support structures. For instance, lower socioeconomic status can be associated with higher psychological distress, and in turn, poorer mental health.<sup>31</sup> This may explain this difference in support, despite such strategies having the greatest impacts in populations with higher smoking prevalence and health burden.<sup>32</sup>

Table 2 Support for tobacco control strategies (% agree/strongly agree) for full sample and by presence of mental health condition

Strategy	Full sample		No mental health condition		Mental health condition*		X <sup>2</sup>	df	P value
	n	%	n	%	n	%			
Aged ≥15 years	(n=3006)		(n=2535)		(n=322)				
Increasing tax on tobacco products	2025	67.9	1762	70.0	194	60.5	12.0	1	<0.001
Reducing retail availability	2113	70.8	1792	71.1	220	69.4	0.4	1	0.527
End sales in alcohol-licensed venues	2081	70.2	1767	70.6	221	69.5	0.2	1	0.684
Limit number of sales points	2163	73.8	1831	74.0	238	75.4	0.3	1	0.603
Reduce nicotine to reduce addictiveness	2411	81.6	2047	81.8	257	80.5	0.3	1	0.585
Aged ≥18 years	(n=2807)		(n=2385)		(n=300)				
Increasing tax on tobacco products	1870	67.2	1638	69.2	177	59.4	12.3	1	<0.001
Reducing retail availability	1944	69.8	1673	70.6	197	67.1	1.6	1	0.201
End sales in alcohol-licensed venues	1923	69.5	1658	70.5	198	67.2	1.5	1	.226
Limit number of sales points	2008	73.5	1716	73.8	221	75.4	0.4	1	.550
Reduce nicotine to reduce addictiveness	2226	80.4	1906	80.9	234	79.0	0.7	1	.413

Sample sizes refer to participants who provided a response that indicated support or non-support of endgame strategies, and data on the relevant indicator variables. Weighted values, valid proportions and weighted X<sup>2</sup> tests are shown.  
 \*Mental health condition combined was indicated by either receiving mental health treatment or psychiatric disability support pension, as well scoring higher than 0–2 on PHQ-4 symptoms.  
 Weighted frequencies were rounded to integers.  
 PHQ-4, Patient Health Questionnaire 4.

**Table 3** Support for tobacco control strategies (% agree/strongly agree) for full sample and by smoking status

Strategy	Full sample		Smokes		Does not smoke		X <sup>2</sup>	df	P value
	n	%	n	%	n	%			
Aged ≥15 years	(n=3006)		(n=371)		(n=2629)				
Increasing tax on tobacco products	2025	67.9	106	28.7	1920	73.6	298.7	1	<0.001
Reducing retail availability	2113	70.8	148	40.0	1965	75.3	195.9	1	<0.001
End sales in alcohol-licensed venues	2081	70.2	155	42.1	1926	74.3	161.0	1	<0.001
Limit number of sales points	2162	73.8	231	64.7	1932	75.2	17.6	1	<0.001
Reduce nicotine to reduce addictiveness	2411	81.3	223	60.8	2188	84.3	117.6	1	<0.001
Aged ≥18 years	(n=2807)		(n=360)		(n=2442)				
Increasing tax on tobacco products	1870	67.2	100	28.0	1770	73.1	303.1	1	<0.001
Reducing retail availability	1944	69.8	142	39.7	1802	74.4	189.2	1	<0.001
End sales in alcohol-licensed venues	1923	69.5	149	41.8	1774	73.8	159.1	1	<0.001
Limit number of sales points	2008	73.5	219	63.6	1789	75.1	21.6	1	<0.001
Reduce nicotine to reduce addictiveness	2226	80.4	212	59.6	2014	83.7	121.5	1	<0.001

Sample sizes refer to participants who provided a response that indicated support or non-support of strategies, and data on the relevant indicator variables. Weighted values, valid proportions and weighted  $\chi^2$  tests are shown. Weighted frequencies were rounded to integers.

That we saw lower support for tax-focused strategy among individuals with an MHC suggests that people with poorer mental health may require additional support when implemented, such as financial distress counselling.<sup>33</sup> Interestingly, no effect was found for mental health on support for retail-focused and nicotine reduction approaches, these may be more broadly publicly acceptable tobacco control approaches regardless of mental health status. However, further research is needed on this, as Australia introduces reforms that increase tobacco prices and pricing transparency.<sup>34</sup>

As evidence supporting rigorous tobacco control measures for the general population grows,<sup>21</sup> the impacts of these measures on individuals with MHCs require careful consideration, as they do for various priority populations where health equity issues are raised.<sup>35</sup> Rigorous tobacco control strategies are a key tool for protecting people at disproportionate risk of harm.<sup>36</sup> SA's tobacco control strategy identifies people living with an MHC as a priority population and emphasises that to reduce inequality in health outcomes, significant investment and tailored approaches are needed to progress towards a tobacco endgame.<sup>14</sup>

Modelling supports the likely effectiveness of retail focused tobacco sale restrictions (eg, density, proximity and licensing)<sup>37</sup> and lower nicotine tobacco products.<sup>38</sup> Although South Australian tobacco retailers are permitted one point of sale (eg, sales counter/terminal), with an alcohol licence they can have up to five,<sup>39</sup> despite research suggesting that tobacco sales have little impact on alcohol-licensed premises' revenue.<sup>40</sup> This evidence may be leveraged in campaigning for reduced points of sale in alcohol-licensed venues. Restricting the number of points of tobacco sale in alcohol-licensed venues had more support among current smokers than did other strategy items, suggesting that retail-focused strategies may be good candidates for implementation in SA. This is also worth consideration given that the public still has opportunity to interact with signs or price boards identifying tobacco points of sale.<sup>39</sup>

Mandating very low nicotine content tobacco products was an approach for which support did not differ by MHC presence. Support for reduction of nicotine in tobacco products to reduce addictiveness was lower among men and those who smoked. Reducing nicotine levels may be a tobacco control approach that has broader acceptability, and where an approach is also found to be effective, this could help in designing them for equitable outcomes.<sup>41</sup> Evidence supports the effectiveness of mandated very low nicotine content tobacco products, though

more evidence is needed on further rigorous tobacco control policy perceptions among people with MHCs.<sup>42</sup> Estimates from Aotearoa/New Zealand suggest that mandated denicotinisation of tobacco would reduce smoking prevalence.<sup>38</sup> With the WHO supporting regulatory approaches that reduce nicotine in cigarettes to minimally addictive levels,<sup>43</sup> this is an approach that should be considered in the Australian context.<sup>34</sup>

Lastly, this study was consistent with research showing that people who smoke are significantly more likely to have an MHC,<sup>1 26 44</sup> and report more depression symptoms than those who do not smoke.<sup>45</sup> The proportion of people with more severe mental health symptoms was also higher among those who smoked. Together, this suggests that people with MHCs may be more likely to smoke and be affected by tobacco control measures. Indeed, people who smoke are often more socially disadvantaged.<sup>46</sup> This reinforces the need for policy-level tobacco control strategies that can garner the most support from people who smoke and from people with mental health needs.

### Limitations

We acknowledge that support for a broader range of endgame-relevant tobacco control strategies should be explored in future research, as the different approaches gain traction internationally. We also note that the main effect of MHC in the models requires further analysis, given the level of statistical significance, as well as testing with potential covariates such as income level to clarify associations with level of level of policy support. The authors will in future have access to data that will support these analyses. Further, comparison with data from other states and territories would provide a fuller picture of tobacco control strategy support. Finally, the level of policy acceptability is not necessarily indicative of effectiveness or differential impacts across groups. A highly acceptable policy may fall flat, and one with low public acceptance may prove very effective.

### CONCLUSION

This study of South Australians provides a unique snapshot of public support for rigorous tobacco control measures and suggests the potential for tax-based tobacco control strategies to have differential impacts on people living with MHCs. Alternatively, the comparable level of public support for remaining measures between those with and without an MHC suggests that these tobacco retail and product-focused approaches should be further examined for tobacco control strategies that support mental health equity.

**Table 4** Weighted logistic regression results for support of five rigorous tobacco control policy approaches

	Increasing tax on tobacco products		Reducing retail availability		End sales in alcohol-licensed venues		Limit number of sales points		Reduce nicotine to reduce addictiveness	
	OR (95% CI)	P value	OR (95% CI)	P value	OR (95% CI)	P value	OR (95% CI)	P value	OR (95% CI)	P value
Aged ≥15 years	(n=2839)		(n=2846)		(n=2821)		(n=2795)		(n=2820)	
Intercept	2.48 (1.45, 4.24)	0.001	2.83 (1.66, 4.85)	<0.001	2.83 (1.66, 4.80)	<0.001	1.78 (0.99, 3.20)	0.053	8.48 (4.53, 15.87)	<0.001
Age (years)	0.99 (0.98, 1.00)	0.066	1.00 (0.99, 1.00)	0.257	0.99 (0.99, 1.00)	0.142	1.00 (0.99, 1.01)	0.910	0.99 (0.98, 1.00)	0.010
Gender (male)*	1.07 (0.84, 1.36)	0.578	0.89 (0.71, 1.13)	0.350	0.79 (0.62, 1.00)	0.046	0.98 (0.77, 1.25)	0.880	0.74 (0.57, 0.96)	0.022
Education level	1.07 (0.98, 1.17)	0.147	1.03 (0.94, 1.13)	0.511	1.10 (1.00, 1.21)	0.051	1.00 (0.90, 1.10)	0.964	0.97 (0.88, 1.07)	0.523
Socioeconomic advantage (quintile)	1.10 (1.01, 1.20)	0.024	1.07 (0.99, 1.17)	0.091	1.05 (0.96, 1.14)	0.273	1.18 (1.08, 1.30)	<0.001	1.09 (0.99, 1.20)	0.067
Currently smokes*	0.13 (0.09, 0.20)	<0.001	0.22 (0.15, 0.32)	<0.001	0.25 (0.17, 0.37)	<0.001	0.69 (0.47, 1.02)	0.060	0.27 (0.18, 0.41)	<0.001
MHC (yes)*	0.74 (0.50, 1.10)	0.135	1.21 (0.81, 1.80)	0.351	1.02 (0.68, 1.53)	0.933	1.22 (0.77, 1.92)	0.395	0.97 (0.61, 1.56)	0.914
Smokes×MHC (yes)*	1.80 (0.73, 4.23)	0.209	0.78 (0.33, 1.84)	0.573	1.34 (0.58, 3.08)	0.491	0.90 (0.39, 2.06)	0.805	1.13 (0.48, 2.65)	0.773
Model Wald $\chi^2$ (df)	124.14(7), p<0.001		89.63(7), p<0.001		75.73(7), p<0.001		21.01(7), p=0.004		70.02(7), p<0.001	
Aged ≥18 years	(n=2802)		(n=2809)		(n=2784)		(n=2758)		(n=2783)	
Intercept	2.02 (1.14, 3.56)	0.015	2.47 (1.43, 4.28)	0.001	2.61 (1.50, 4.55)	0.001	1.84 (1.00, 3.36)	0.049	6.20 (3.17, 12.12)	<0.001
Age (years)	1.00 (0.99, 1.00)	0.331	1.00 (0.99, 1.01)	0.831	1.00 (0.99, 1.00)	0.270	1.00 (0.99, 1.01)	0.914	0.99 (0.99, 1.00)	0.173
Gender (male)	1.11 (0.88, 1.40)	0.373	0.95 (0.75, 1.19)	0.638	0.80 (0.64, 1.01)	0.064	1.01 (0.79, 1.28)	0.952	0.76 (0.59, 0.99)	0.041
Education level	1.10 (1.01, 1.21)	0.038	1.07 (0.97, 1.18)	0.157	1.11 (1.01, 1.22)	0.027	1.00 (0.91, 1.11)	0.957	1.01 (0.91, 1.12)	0.895
Socioeconomic advantage (quintile)	1.08 (0.99, 1.17)	0.071	1.02 (0.94, 1.11)	0.651	1.04 (0.96, 1.13)	0.332	1.16 (1.06, 1.27)	0.001	1.07 (0.98, 1.18)	0.132
Currently smokes	0.14 (0.09, 0.22)	<0.001	0.23 (0.16, 0.34)	<0.001	0.26 (0.18, 0.39)	<0.001	0.66 (0.45, 0.97)	0.034	0.28 (0.19, 0.42)	<0.001
MHC (yes)	0.76 (0.53, 1.11)	0.154	1.11 (0.75, 1.65)	0.592	0.91 (0.61, 1.35)	0.633	1.25 (0.81, 1.93)	0.310	0.94 (0.59, 1.51)	0.811
Smokes×MHC (yes)	1.68 (0.71, 3.99)	0.239	0.83 (0.36, 1.93)	0.669	1.46 (0.64, 3.34)	0.374	0.91 (0.41, 2.06)	0.829	1.22 (0.52, 2.86)	0.642
Model Wald $\chi^2$ (df)	117.67(7), p<0.001		81.75(7), p<0.001		71.87(7), p<0.001		20.02(7), p=0.006		60.66(7), p<0.001	

Sample sizes refer to participants who provided a response that indicated support or non-support of tobacco control strategies and data on the relevant indicator variables. Weighted logistic regression and crude OR are shown. Sample size varies by non-response.

\*Reference categories: gender (female), currently smokes (no), MHC (no MHC), and currently smokes×MHC (does not smoke, no MHC). Weighted frequencies were rounded to integers.

MHC, mental health condition.

X Joshua Trigg @JoshLTrigg

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#### ORCID iDs

Joshua Trigg <http://orcid.org/0000-0002-8173-5791>

Caroline Miller <http://orcid.org/0000-0001-9723-8047>

Billie Bonevski <http://orcid.org/0000-0001-8505-622X>

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