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Quitline Outcomes for Smokers in 6 States: Rates of Successful Quitting Vary by Mental Health Status

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Abstract

Introduction: Tobacco cessation quitlines are generally effective in assisting smokers who want to quit. However, up to half of quitline callers report a history of mental health conditions and/or recent emotional challenges (MH+), and there has been little study of cessation outcomes for this population. Moreover, evidence suggests that callers who expect their MH+ to interfere with quit attempts have less success with quitting. This study compares rates of quitting among MH+ callers and callers with no mental health conditions or recent emotional challenges (MH–). It also compares rates of quitting between those who felt that mental health issues would interfere with their quit attempt (MHIQ+) and those who did not (MHIQ–).

Methods: National Jewish Health collected telephone data from 6 state quitlines. Participants received up to 5 coaching sessions and up to 8 weeks of nicotine replacement therapy. Smoking status was assessed during 3-month and 6-month post-intervention calls in a subset of participants (n = 4,960) for whom follow-up interviews were completed.

Results: Participation in follow-up interviews was not significantly different between callers with MH+ and those without MH– (p = .13). However, at follow-up MH+ participants were less likely to report a successful quit compared with MH– (3-month: 31% vs. 43%; 6-month: 33% vs. 43%; both p < .001). Among MH+ participants, those reporting MHIQ+ were significantly less likely to quit compared with those who were MHIQ– (3-month: 24% vs. 34%; 6-month: 26% vs. 35%; both $p \leq .001$).

Conclusions: These findings highlight the importance of evaluating both the mental health status of individuals seeking support for smoking cessation as well as the individuals' expectations for success, because they may need more tailored intervention to ensure the potential for better compared with outcomes.

Introduction

While large population gains in tobacco cessation have been made over the past four decades,[1] cigarette smoking remains the leading cause of preventable morbidity and mortality in the United States.[2] Despite the trend towards a reduction in smoking rates amongst the general population, decreases in U.S. smoking rates have not been realized among individuals with psychiatric disorders including substance use disorders (a history of mental health conditions and/or recent emotional challenges [MH+]).[3] These individuals continue to face significant tobacco-related health disparities, with MH+ individuals comprising approximately 200,000 of the 430,000 U.S. deaths per year due to tobacco use.[4,5]

While approximately 19% of U.S. adults continue to smoke cigarettes,[6] a number of studies have found the smoking rate among the MH+ population to be at least twice this rate.[7,8] In a large population sample of those seeking tobacco cessation help, 81% had a lifetime psychiatric comorbidity (40% substance use disorders, 28% anxiety, and 13% depression).[9] Another recent analysis found that 19.9% of U.S. adults aged 18 years or older had a mental illness, and 36.1% were current smokers compared with 21.4% among adults with no known mental illness.[10] Mental illness is not only an independent risk factor for smoking but associated with a number of smoking-related risk factors, including higher poverty, lower education, and lower employment.[3]

A review of the cessation literature demonstrates inconsistent findings regarding the psychiatric population's ability to quit smoking. Like the general population of smokers, the majority of these smokers report an intention to quit, are often motivated to set a quit date, and attempt to quit at similar rates.[11–15] At the same time, having a mental illness is associated with higher levels of nicotine dependence, intensity of smoking, and smoking severity.[13] While some studies have found that smokers with psychiatric disorders are less likely to quit smoking than are other smokers,[9,13,16–18] others have found that quit rates among psychiatric populations are similar to the general population of smokers[19]: smokers with a history of major depression have quit rates as high as 38%[7] and smokers with schizophrenia have quit rates of 10%–30%.[20,21] A recent population-based study found that smokers with mental illnesses make more quit attempts, are more optimistic about quitting, and use smoking cessation treatment as often as their non-mentally ill counterparts.[22] With the exception of smokers with anxiety, short-term abstinence among MH+ smokers was also similar to other smokers. This is a different cessation pattern seen in other high risk populations such as low income populations where treatment use and cessation success are lower.[23–26]

Across all smokers, cessation interventions with demonstrated effectiveness have long been available but have poor uptake, with over 90% of those trying to quit making unaided attempts.[27] This low uptake may reflect factors, such as lack of marketing that reach certain demographic sub-groups with higher smoking rates and that tobacco cessation services are often lacking in community healthcare settings, including behavioral health treatment settings.[28,29]

Referral to quitlines can encourage aided quit attempts. Available in all U.S. States, telephonic quitlines typically offer a combination of counseling and nicotine replacement therapy (NRT) to populations.[30,31] These public services are advantageous for many smokers because treatment is not face-to-face which eliminates transportation and anonymity concerns, and services are offered at low to no cost. For the general population, a recent Cochrane review found that proactive telephonic services help smokers to quit compared to brief counseling or self-help materials.[30] Nationally, in 2012 the North American Quitline Consortium reported public quitline self-reported 30-day abstinence at 7 months to be approximately 30%.[32]

Quitlines have long acknowledged that many callers appear to struggle with mental illnesses and addictions.[33] Moreover, quitlines are in agreement that it is difficult to attend to the needs of MH+ callers if psychiatric conditions are not being screened. Therefore, many quitlines use a series of mental health screening questions at intake.[34] A large state quitline has found that almost one in four smokers who called met criteria for current major depression alone.[35] If all MH+ conditions are included, these callers represent about half of all callers.[10] Several quitline studies suggest that 7-day abstinence rates for persons with mental illnesses, including depression, are equivalent to general callers at end of treatment and at 6 months.[36–38]

Also, there is some indication that callers, who expect or have a self-prognosis that their MH+ will interfere with quit attempts, have less success with quitting.[39] This may be due to multiple bio-psycho-social barriers MH+ smokers face including reinforcement of tobacco use in treatment settings, and common provider expectations that these individuals will be unable to quit.[29] Because a self-expectation question may hold utility in predicting cessation rates among MH+ smokers, an optional question is increasingly utilized by quitlines not only to assess this risk factor, but also to potentially adjust the cessation intervention.[34] One recent population level study that included this question found that those reporting mental health limitations were substantially more likely to use NRT and receive provider advice to quit. However, study findings suggest that cessation success wasn't higher, and may be substantially lower among individuals with anxiety.[22] The purpose of this study was to extend current knowledge by evaluating quitline data across six states, to determine the prevalence of MH+ callers and further characterize this population as compared to callers with no mental health conditions or recent emotional challenges (MH–). We hypothesize the MH+ callers will have less success with quitting. And among MH+ callers, those who self-report that mental health issues will interfere with their quit attempt (MHIQ+) will be even less successful at quitting than those who do not report mental health issues will interfere (MHIQ–).

Methods

Sample

National Jewish Health has been a quitline service provider since December 2002, and has served approximately 950,000 participants across 12 states, several corporations, and numerous health plans. National Jewish Health collected data from six state quitlines (Idaho, Kentucky, Michigan, Montana, Ohio, and Pennsylvania; n = 26,379) between January 1, 2012 and December 31, 2012 that agreed to participate. This time period was selected because it was the first year of data obtained from new software designed.

The number of callers from each state is presented in Table 1. The standard treatment consists of an intake that includes the mental

Table 1. Demographic Characteristics for Intake Sample

State	Number of callers	Percent of full sample	Percent female	Mean age (*SD*)	Percent Caucasian
Idaho	1,270	4.8	63.7	44.8 (13.8)	92.6
Kentucky	1,866	7.1	66.6	45.1 (13.7)	82.5
Michigan	5,150	19.5	67.8	45.3 (13.3)	73.8
Montana	5,766	21.9	55.8	44.6 (14.2)	91.4
Ohio	5,126	19.4	61.9	45.2 (12.8)	74.0
Pennsylvania	7,201	27.3	64.6	47.1 (13.3)	75.1

health questions and up to five coaching calls with the opportunity for additional calls throughout the program. National Jewish's state clients have differing offerings of quit medications ranging from none (Kentucky) to nicotine patches only (Ohio and Pennsylvania) to multiple forms of NRT (i.e., including gum and lozenges; Idaho, Michigan and Montana). Only Montana offered prescription medications (i.e., bupropion, varenicline).

Table 1 also provides the sample sizes and demographics for each of the six participating states. More than a quarter of callers were from Pennsylvania, while less than 12% of the callers were from either Idaho or Kentucky. In all six states, females were more likely than males to call, though they were the majority (>.66%) in Kentucky and Michigan only. The age distribution of callers was noticeably similar across the six states, with mean ages in the middle 40s for each. Based on self-reported ethnicity, a majority of callers were Caucasian, ranging from 73.8% in Michigan to 92.6% in Idaho.

Clients were asked to consent to follow-up interviews at 3- and 6-months following enrollment. Follow-up interviews were performed by an external evaluation agency. Eligibility for follow-up was based on participants' consent as well as quotas set by individual states' contracts. States' quotas were based on budgetary constraints. Eligible callers were randomly selected and placed into calling queues. Calls that resulted in a final disposition (i.e., completed survey, refusal, wrong number, request never call list, deceased) were not recontacted. All other callers (e.g., answering machine or call back) received eight additional contact attempts. Of the 26,379 intake callers, 21,499 consented for follow-up interviews. Of those, approximately half were not contacted because the individual state's contractual quota was reached or a maximum of eight attempts to contact the individual was reached. Additionally, 2,909 could not be reached because of a wrong phone number. Approximately 12% refused to complete the 3-month follow-up interview, but agreed to future follow-up calls. Three-month follow-up interviews were completed by 4,960 (23%) of the callers who completed the intake interview and consented to being recontacted following the intervention. Attrition analysis demonstrated no significant difference in 3-month follow-up rates between intake callers with and without mental health issues ($\chi^2_{(1)} = 2.24$; $p = .13$). Continued participation from 3- to 6-month follow-up was substantial, with four of the six states retaining a majority (>70%) of participants at the second follow-up.

Measures

Quitline Intake Assessment

Participants who enrolled in the quitline program completed minimal data set (MDS) questions recommended by North American Quitline Consortium (NAQC), which allows for comparisons and pooling of data across quitlines. The MDS, consisting of 18 questions is collected from eligible callers at intake. Eligibility requires residency of the state offering the program. Question categories include reasons for calling and awareness of the quitline, tobacco behaviors and caller characteristics (e.g., demographics, health status).

Aligned with the recommendations of the Behavioral Health Advisory Forum,[34] and endorsed by NAQC as a component of the MDS, a series of three mental health screening questions were asked during the intake interview for all callers: (a) "Do you have any mental health conditions, such as an anxiety disorder, depression disorder, bipolar disorder, alcohol or drug abuse, or schizophrenia?" (b) "During the past two weeks, have you experienced any emotional challenges such as excessive stress, feeling depressed or anxious?" and (c) "During the past two weeks, have you experienced any emotional challenges that have interfered with your work, family life, or social activities?" If callers responded "yes" to one or more of these questions, (hereafter designated as MH+) they were then asked, "Do you believe that these mental health conditions or emotional challenges will interfere with your ability to quit?" To better understand the full spectrum of historical and current emotional challenges, an endorsement of any of these three questions was considered an indicator of mental health conditions for this study.

Independent Follow-up Assessment

In an attempt to quantify the effectiveness of the National Jewish Health's quitline program, an outside research organization was contracted to conduct an independent, follow-up survey of a random sample of quitline participants. Brief follow-up interviews, conducted 3 and 6 months after the intervention, assessed participants' current smoking status ("Have you smoked any cigarettes or used other tobacco products in the past 30 days?"). Response to this question was utilized as the primary outcome measure used to compare callers who did (MH+) versus did not (MH–) report having mental health issues at intake, as well as to compare callers who did (MHIQ+) versus did not (MHIQ–) expect their mental health issues to interfere with their ability to quit.

Data Analyses

All analyses were conducted in SPSS Statistics, Version 21 (IBM Corporation).[40] Independent groups *t* tests were conducted to test for mean differences in age between our contrasting MH+ and MH– groups. Standard chi-square tests were conducted to compare the proportion of expected versus observed proportions of callers who reported MH+ across (categorical) demographic groups, specifically male versus female groups. Logistic regression analyses were conducted to examine whether mental health status and (separately) MHIQ were predictive of smoking cessation rates (at follow-up), over and above the potential influence of moderating variables such as age and sex.

Though callers received the standard protocol for their coaching calls, not all were offered NRT because of state-specific contractual agreements. However, the outcomes analyses were not aimed at treatment efficacy, but instead whether characteristics at intake were associated with smoking outcomes. Thus, for the outcomes analyses, data across all six states were combined.

Results

Mental Health Issues at Intake

Table 2 illustrates the differential rates of mental health issues (MH+ and MH–) that were reported in each participating state as well as the proportion of callers with mental health conditions and/or recent emotional challenges who did (MHIQ+) or did not (MHIQ–) report concern that their mental health issues may interfere with the ability to quit successfully. Averaging across the six states, more than 76% of callers reported a history of mental health issues. The lowest rates of MH+ were in Montana (61.8%) and Ohio (63.4%). Overall, more than half of callers with MH+ reported that they were not concerned that their mental health issues may interfere with their quit attempt, ranging from 57.9% in Kentucky to 73.2% in Montana.

A higher proportion of female callers reported mental health issues (78.4%) compared with males (66.7%) ($\chi^2_{(1)} = 439.8$; $p <$

.001). However, among all callers who report mental health issues, women and men did not differ significantly in their belief that mental health issues could interfere with their ability to quit; 33.0%, 31.9%, respectively; ($\chi^2_{(1)}$ = 2.3; p = .13). Callers who reported MH+ were significantly younger than callers who reported MH– ($t_{(26,377)}$ = 5.42; p < .001), though the difference in mean ages in the two groups was only slightly greater than 1 year. A similar age difference is observed in the rates of concern that mental health issues could interfere with the ability to quit (MHIQ+); the mean age of MHIQ+ callers was 43.8 years compared to 46.0 years in the MHIQ– callers ($t_{(19,538)}$ = 11.25; p < .001). Based on these findings, both sex and age of the caller were included as covariates in the logistic regression analyses presented below.

Smoking Outcomes at Follow-up

Quit rates in the 4,960 callers who completed follow-up interviews at 3 and 6 months were the primary outcome measures. A comparison of 3-month follow-up data across six states shows a range of successful quitting at 3 months (i.e., answered 'No' when asked whether they had smoked in the past 30 days) from 21.5% in Kentucky to 43% in Montana in Table 3. The rates of successful quitting at 6 months were similar ranging from 21.9% in Idaho to 40.0% in Montana.

When considering the entire follow-up sample, regardless of mental health status reported at intake, some interesting demographic patterns emerge. The proportion of males and females who completed a follow-up interview was nearly identical to the proportions at intake (62% females at 3-months, 63% at intake). However, among the males who completed a 3-month follow-up, a significantly larger proportion reported that they were currently not smoking (37.9% males vs. 31.6% of females; ($\chi^2_{(1)}$ = 20.44; p < .001). Older callers were also more likely to complete 3-month follow-up interviews; the mean age among the follow-up sample was 48.46 years, compared to 45.61 years among all intake callers.

Table 2. Rates of Mental Health Issues Among Quitline Callers at Intake

			Concern that MH issues may interfere with quit?	
State	Mental health issues?		Yes	No
Idaho	Yes	88.6%	29.8%	70.2%
	No	11.4%	–	–
Kentucky	Yes	83.7%	42.1%	57.9%
	No	16.3%	–	–
Michigan	Yes	83.9%	35.8%	64.2%
	No	16.1%	–	–
Montana	Yes	61.8%	26.8%	73.2%
	No	38.2%	–	–
Ohio	Yes	63.4%	30.7%	69.3%
	No	36.6%	–	–
Penn	Yes	79.5%	32.9%	67.1%
	No	20.5%	–	–

Associations Between Mental Health Issues and Smoking Outcomes

Table 4 illustrates the smoking status of callers who participated in follow-up phone interviews. During the first follow-up interview, conducted approximately 3 months after their intake interview, callers who reported MH+ were significantly less likely to report no tobacco use in the past 30 days than callers who did not report a history (MH-) ($\chi^2_{(1)}$ = 63.18, p < .001). Callers with MHIQ+ were significantly more likely to report tobacco use in the past 30 days than callers with MHIQ- ($\chi^2_{(1)}$ = 41.43; p < .001).

Results from the 6-month follow-up interviews were strikingly similar to results from the 3-month follow-up, showing significantly lower quit rates among MH+ callers ($\chi^2_{(1)}$ = 42.37; p < .001), and particularly among MHIQ+ ($\chi^2_{(1)}$ = 17.79; p < .001). Neither sex nor age of the callers significantly influenced the association between mental health status (MH+ vs MH-) and successful quitting. Likewise, these demographic characteristics did not moderate the association between expectation that mental health issues would interfere with the quit attempt and successful quitting (odds ratios ranged from .86 to 1.14; all p > .17).

Discussion

On average, more than one in every three smokers who completed follow-up reported no tobacco use in the past 30 days. Though quit rates were higher in MH- callers, a substantial number of MH+ callers were able to maintain their quit for up to 6-months after their intervention. These data suggest that not only do mental health issues serve as a barrier to successfully quitting, outcomes are further impacted by how MH+ smokers feel that their mental health issues *will* or *will not* influence their ability to quit tobacco. Averaging across the six states studied, fewer than half of MH+ callers believed that these issues would interfere with their attempt to quit. Thus, the majority with MH+ believe that quitting is possible, and for this

Table 3. Smoking Status at 3- and 6-Month Follow-up in 6 States

			Smoked in past 30 days? (percent)			
	Number of completed follow-up interviews		No		Yes	
State	3-month follow-up	6-month follow-up	3-month follow-up	6-month follow-up	3-month follow-up	6-month follow-up
Idaho	315	187	28.9	21.9	71.1	78.1
Kentucky	437	314	21.5	22.3	78.5	77.7
Michigan	988	814	31.8	29.1	68.2	70.9
Montana	1,381	1,186	43.0	40.0	57.0	60.0
Ohio	1,004	884	29.3	32.1	70.7	67.9
Penn	835	549	35.9	30.2	64.1	69.8

Table 4. Mental Health Influences on Smoking Status at 3- and 6-Month Follow-up

		Not smoking in past 30 days		Smoking in past 30 days		Total
3 months	MH–	*n* = 568	43%	*n* = 757	57%	*n* = 1,325
	MH+[a]	*n* = 1,119	31%	*n* = 2,516	69%	*n* = 3,635[e]
	MHIQ–	*n* = 848	34%	*n* = 1,636	66%	*n* = 2,484
	MHIQ+[b]	*n* = 271	23%	*n* = 880	77%	*n* = 1,151
6 months	MH–	*n* = 243	40%	*n* = 322	60%	*n* = 565
	MH+[c]	*n* = 474	29%	*n* = 983	71%	*n* = 1,457[e]
	MHIQ–	*n* = 358	32%	*n* = 655	68%	*n* = 1,013
	MHIQ+[d]	*n* = 116	24%	*n* = 328	76%	*n* = 444

MH– = no mental health conditions or recent emotional challenges; MH+ = a history of mental health conditions and/or recent emotional challenges; MHIQ– = condition in which callers reported that they did not expect their mental health conditions or recent emotional challenges to interfere with their ability to quit; MHIQ+ = condition in which callers reported that they did expect their mental health conditions or recent emotional challenges to interfere with their ability to quit.

[a]Significant difference in 3-month smoking outcomes by mental health status ($p < .001$).

[b]Significant difference in 3-month smoking outcomes by interference status ($p < .001$).

[c]Significant difference in 6-month smoking outcomes by mental health status ($p < .001$).

[d]Significant difference in 3-month smoking outcomes by interference status ($p < .001$).

[e]This total is broken down by MHIQ status in the two cells below.

group, their ability to quit tobacco is similar to the general population of tobacco users. These results reinforce findings from a recent study that MH+ smokers are often optimistic about their ability to quit and may even make more quit attempts than MH– smokers.[22] This remains an important message to deliver to the mental health community. The quit data for the MHIQ+ subset suggest that current quitline practice may not be the appropriate intervention for this group.

This study extends current knowledge about the details of cessation behaviors and patterns among those endorsing mental health conditions at the population-level. Telephone quitlines have demonstrated effectiveness for segments of the population that are at greater risk for tobacco use and typically harder to reach, including the under-insured, lower SES and lower educational level.[41] This study demonstrates how many adults with mental health conditions (MH+) are using quitlines and the resulting cessation outcomes among these smokers. Across six states, more than three out of four quitline callers reported a history of a mental health condition (ranging from 61.8% in Montana to 88.6% in Idaho). This prevalence of MH+ callers is even higher than recent nationally reported rates showing that 36% of people reporting any mental illness smoke cigarettes.[10] Consistent with national statistics, more women were MH+.[42] Younger callers were also more likely to report mental health conditions.

This study found that quitline coaching and cessation pharmacotherapy is leading to significant cessation rates among MH+ callers. Like prior community-based treatment studies, results suggest that the MH+ population benefits from typical evidence-based psychosocial and pharmacological cessation interventions.[21,43,44] At the same time, MH+ cessation rates are significantly poorer than those who were MH–, and cessation rates are even further reduced when individuals have expectations that these issues will compromise their quit attempts. Given that the majority of callers indicated that they have mental health conditions, more attention is warranted regarding how quitlines might best respond to MH+ callers' needs. This is particularly important since reduced quit rates and long-term abstinence for smokers with mental health conditions are not related to low motivation or expectations.[22,45] A majority of these individuals want to quit smoking, but continue to face disproportionate smoking related health disparities.

MH+ smokers might possibly benefit by alterations to current quitline protocols or enhanced coordination between quitlines and community behavioral health or primary care agencies.[46,47] We know of no studies that explore different quitline protocols for MH+ versus MH– callers.[27] Quitlines have not historically created cessation protocols for persons with psychiatric mental health conditions, similar to what many have for other at-risk populations such as pregnant smokers. For the MH+ population, a greater length and intensity of treatment,[14,48,49] and calls of shorter duration may better match MH+ callers' cognitive functioning.[33] But a necessary first next step is to determine if certain diagnostic groups are over-represented among quitline callers, so that quitlines might potentially tailor counseling and pharmacotherapy to the needs of these specific callers. Outside of several quitline pilot studies that have screened for depression symptoms, quitlines have not screened for other diagnostic groups, such as anxiety, bipolar disorder, psychotic disorders, attention-deficit/hyperactivity disorder (ADHD), post-traumatic stress disorder, or substance use disorders. As a salient example, there is gathering evidence that the poor outcomes among persons with mental illnesses might be in part due to low cessation rates among smokers with anxiety.[22,48] Anxiety has been recognized as having a complex association with smoking and associated with more severe withdrawal and risk for tobacco cessation failure,[50] and more intensive treatment may be necessary.

The high likelihood that callers will have mental health conditions suggests that quitline staff may need more intensive and ongoing training in working with MH+ smokers. At present, quitline staff that provide coaching calls hold varied educational backgrounds and experience. There is no current requirement to have experience in counseling persons with mental illnesses or addictions. Currently, National Jewish Health quitline staff receives training on general topics related to working with the MH+ population, as well as continued education on general mental health topics. While there is expert agreement that quitline staff should not be expected to diagnose mental conditions, they can remain within their scope of practice to build quit strategies that match the functional abilities and readiness of callers.[34] Quitline staff and callers, might benefit by more in-depth staff orientation to the MH+ population, as well as more tailored continued education. Based on study findings, relevant topics might include strategies

engaging and sustaining treatment for young callers and women who are MH+, as well as callers who have poor expectations.

Limitations

Follow-up response rates were below the quitline standard of 50.0%.[51] Response rates were limited by quotas specified in the states' contracts, which were based on budgetary constraints. These quotas varied widely and thus, limited our ability to fully evaluate potential state-by-state differences in quit rates. Also, it was not possible to randomize subjects in this study because there was not an equivalent group for comparison. Counseling and pharmacotherapy services (i.e., the type and duration of NRT and other pharmacotherapy) differed across states, which may, in part, explain the variability in cessation outcomes. While no difference in follow-up completion rates by presence of mental health condition, older callers were more likely to complete follow-up interviews. In addition, it should be noted that the mental health screening questions were only asked at intake and not at follow-up. Finally, all smoking and abstinence measures were self-reported, which may be less accurate than more objective measures. Mental health conditions were not separated into specific categories, whereas prevalence of smoking can differ among persons with various mental illness diagnoses.

Conclusions

Mental health conditions cut across all callers, including other at-risk populations that quitlines serve. Better meeting the needs of smokers with mental health conditions is a key to continued gains in reducing tobacco cessation overall. The characteristics and cessation outcomes for this large, multistate sample of quitline callers with mental health conditions has important implications for further investigation and possible future modification of quitline treatment of smokers with self-reported mental health concerns.

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Declaration of Interests

None declared.

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