Title

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Chapter 5

When Could a Stigma Program to Address Mental Illness in the Workplace Break Even?

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Objective: To explore basic requirements for a stigma program to produce sufficient savings to pay for itself (that is, break even).

Methods: A simple economic model was developed to compare reductions in total short-term disability (SDIS) cost relative to a stigma program's costs. A 2-way sensitivity analysis is used to illustrate conditions under which this break-even scenario occurs.

Results: Using estimates from the literature for the SDIS costs, this analysis shows that a stigma program can provide value added even if there is no reduction in the length of an SDIS leave. To break even, a stigma program with no reduction in the length of an SDIS leave would need to prevent at least 2.5 SDIS claims in an organization of 1000 workers. Similarly, a stigma program can break even with no reduction in the number of SDIS claims if it is able to reduce SDIS episodes by at least 7 days in an organization of 1000 employees.

Conclusions: Modelling results, such as those presented in our paper, provide information to help occupational health payers become prudent buyers in the mental health market place. While in most cases, the required reductions seem modest, the real test of both the model and the program occurs once a stigma program is piloted and evaluated in a real-world setting.

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Quand un programme anti-stigmatisation portant sur la maladie mentale en milieu de travail pourrait-il faire ses frais?

Objectif : Explorer les exigences de base pour qu'un programme anti-stigmatisation produise des épargnes suffisantes pour atteindre le seuil de rentabilité (c'est-à-dire, faire ses frais).

Méthodes : Un modèle économique simple a été mis au point pour comparer les réductions des coûts totaux de l'incapacité à court terme (INCT) avec les coûts d'un programme anti-stigmatisation. Une analyse de sensibilité à 2 voies a servi à illustrer les conditions dans lesquelles ce scénario de rentabilité se produit.

Résultats : Au moyen des estimations de la littérature des coûts de l'INCT, cette analyse indique qu'un programme anti-stigmatisation peut procurer une valeur ajoutée même s'il n'y a pas de réduction de la durée du congé pour INCT. Pour atteindre le seuil de rentabilité, il faudrait qu'un programme anti-stigmatisation sans réduction de la durée du congé pour INCT élimine au moins 2,5 réclamations d'INCT dans une organisation de 1000 travailleurs. De même, un programme anti-stigmatisation peut faire ses frais sans réduction du nombre de réclamations d'INCT s'il est capable de réduire les épisodes d'INCT d'au moins 7 jours dans une organisation de 1000 employés.

Conclusions : Les résultats de la modélisation, comme ceux présentés dans notre article, procurent de l'information pour aider les agents de santé au travail à devenir des acheteurs prudents au sein du marché de la santé mentale. Bien que dans la plupart des cas, les réductions demandées semblent modestes, le test véritable du modèle et du programme se passe lorsque le programme anti-stigmatisation est piloté et évalué dans un contexte du monde réel.

Canadian employers increasingly have become aware of the economic costs of mental disorders. Between one-to two-thirds of the economic burden has been attributed to work productivity losses.[1–3] These losses have been measured as work absences or unproductive work days.[4,5]

From an employer's perspective, there are at least 3 forms of work absences: sick days, SDIS claims, and long-term disability claims.[6] They are differentiated by days covered and medical certification requirements. Over the past decade, SDIS claims related to mental disorders have garnered the most attention among employers because of their steady growth.[7] In addition, the length of an SDIS claim for a mental disorder can be double that for a physical disorder, resulting in twice the cost.[8]

As organizations seek solutions to stem the rise in SDIS claims related to mental disorders, they have also been confronted with the fact that treatment alone is not the answer. The most difficult aspects of addressing mental disorders in the workplace are the negative attitudes and discrimination associated with mental disorders.[9] This stigma can result in discouraging workers from seeking help and treatment.[10] Nevertheless, evidence suggests that early treatment helps to decrease the burden of SDIS and that treatment may be able to increase work productivity.[11,12] Thus addressing the stigma of mental disorders is one way employers may decrease the burden of mental disorders in the workplace.

However, on identifying a potential solution, an employer must decide whether it is worth the investment. How much should an employer pay for a stigma intervention? Using an economic model, our paper explores basic requirements for a stigma program to produce sufficient savings to pay for itself. That is, when would an organization break even? Our analysis uses a simple model designed to highlight overall themes regarding costs. Future work could produce models more specific to particular organizational circumstances and intervention design.

Abbreviations

Δdays	change in SDIS days
Δn	change in number of SDIS cases
$C_{episode}$	cost of an SDIS episode
C_p	cost of the program
$C_{SDISday}$	cost of an SDIS day
C_{time}	cost of program attendance time
C_{train}	cost of program training
$days_{SDIS}$	duration of an SDIS episode
$days_{sp}$	days for each SDIS case under the stigma program
$days_{sq}$	days for each SDIS case under the status quo
n_{SDIS}	number of SDIS cases
n_{sp}	number of SDIS cases under the stigma program
n_{sq}	number of SDIS cases under the status quo
SDIS	short-term disability

Clinical Implications

- An organization faced with a choice of programs in which to invest should examine whether it is getting value from its investment.

- Identifying the break-even point where the costs of implementing a stigma program are equivalent to the reductions in costs resulting from its implementation is a helpful way to understand whether there is value from an investment.

Limitations

- A simple model was used for this analysis. Future work could produce models more specific to particular organizational circumstances and intervention design.

- Once a stigma program is piloted and evaluated in a real-world setting, the data emerging from the evaluation could be used to populate the model.

Background

The Setting

Our analysis is based on a hypothetical organization with 1000 employees: 10% are managers (100 managers) and all are assumed eligible for SDIS benefits. The organization must decide whether to invest in a stigma program.

Costs to the Organization of the Stigma Program Being Considered

The stigma program's cost (C_p) has 2 components: training cost (C_{train}) and managers' time cost (C_{time}) to attend the training. Based on the materials for a stigma program,[13] we assume C_{train} = $3000 for 15 managers and $2000 for each additional 10 managers. Each training session can accommodate 25 managers; the organization needs 4 training sessions (C_{train} = $5000 × 4 = $20 000).

Each training session lasts 6 hours. It is assumed that during their attendance, the managers are absent from their routine responsibilities. The managers' time cost is calculated using the average wage of a Canadian management occupation ($35/hour in 2011).[14] Thus C_{time} = 100 managers × 6 hours × $35/hour = $21 000.

Based on these assumptions, the stigma program's total cost to the organization is $C_p = C_{train} + C_{time}$ = $41 000. The question is: Can the organization save at least $41 000 by investing in the stigma program?

Benefits (in the Form of Savings)

The organization can experience savings in 2 ways: decrease in the occurrence of SDIS episodes or reduction in the length of SDIS episodes. Based on findings from Dewa et al,[8] we assume that annually there are 2.1 SDIS episodes related to mental disorders/100 employees/year. For an organization of 1000 workers, there would be 21 SDIS cases (n_{SDIS} = 21). From Dewa et al,[8] we assume that the average length of an SDIS episode for a mental disorder is 65 days ($days_{SDIS}$ = 65 days). The episode cost is assumed to be $17 734 ($C_{episode}$ = $17 734) or an average of

Table 1 Variables and their values

Variable	Description	Value	Source and notes
Employees			
N	Number of employees	1000 employees	1000 employees based on authors' assumption
n_{SDIS}	Number of short-term disability (SDIS) cases	Varies	
n_{sq}	Number of SDIS cases under the status quo	21 SDIS cases	From Dewa et al,[8] 2.1 people/100 employees go on SDIS
Δn	Change in number of SDIS cases	Varies	This variable is varied in conjunction with Δdays to determine the combinations of results that allow a stigma program to break even
n_{sp}	Number of SDIS cases under the stigma program	Varies	This variable is calculated as $n_{sp} = n_{sq} - \Delta n$ and $n_{sq} = n_{sp} + \Delta n$
SDIS days			
days$_{SDIS}$	Duration of an SDIS episode	Varies	
days$_{sq}$	Days for each SDIS case under the status quo	65 days	Dewa et al[8]
Δdays	Change in SDIS days	Varies	This variable is varied in conjunction with Δn to determine the combinations of results that allow a stigma program to break even.
days$_{sp}$	Days for each SDIS case under the stigma program	Varies	This variable is calculated as: days$_{sp}$ = days$_{sq}$ − Δdays and days$_{sq}$ = days$_{sp}$ + Δdays
Costs			
C_p	Cost of the program	$41 000	Calculated as $C_p = C_{train} + C_{time}$
C_{train}	Cost of program training	$20 000	C_{train} = $5000 per 25 managers × 4 teams of 25 managers
C_{time}	Cost of program attendance time	$21 000	C_{time} = 6 hours × $35/hour — 6 hours estimate[13] — $35/hour estimate[16]
$C_{episode}$	Cost of an SDIS episode	$17 734	From Dewa et al,[8] $17 734 is the mean cost for mental disorder episode
$C_{SDISday}$	Cost of an SDIS day	$273	Calculated as $C_{episode}$ / days$_{sq}$

$C_{SDISday}$ = $273/day (a $17 734 SDIS episode lasting 65 days = a loss of $17 734/65 days = $272.83 ≅ $273 per day). Based on Kessler et al,[15] we assume that a stigma program can change perceptions of service and result in an increase in early intervention. In turn, with early intervention, cases of SDIS may be averted (n_{SDIS} decreased), their duration reduced (days$_{SDIS}$ decreased), or both.

Break-Even Analysis

A stigma program breaks even when reductions in total SDIS cost equal C_p. We considered savings generated by fewer episodes of SDIS (n_{SDIS} is reduced from 21 episodes), shortened SDIS episodes (days$_{SDIS}$ is reduced from 65 days per episode) or both (decrease in both n_{SDIS} and decrease in days$_{SDIS}$). We denote the stigma program's change in n_{SDIS} as Δn and the change in days$_{SDIS}$ as Δdays. Table 1 lists each variable, its definition, and its assumed value.

Methods

We employ 2 methods for our break-even analysis (Figures 1 and 2). The first involves comparing reductions in total

SDIS cost (savings) to a stigma program's costs (costs). We illustrate potential savings in Figure 1 with n_{SDIS} on the *y* axis and the monetary value of lost days (as days$_{SDIS}$ × $C_{SDISday}$) on the *x* axis. Using the fact that the formula for Area is the product of length and width, we can illustrate total SDIS days lost under status quo and under a stigma program by computing the areas $n_{sq} \times$ days$_{sq}$ and $n_{sp} \times$ days$_{sp}$. The difference in the Areas equals the potential benefits of adopting a stigma program.

We use 2-way sensitivity analysis to illustrate conditions under which a break-even scenario occurs. Two-way sensitivity analysis allows 2 key variables to vary while maintaining the break-even condition that
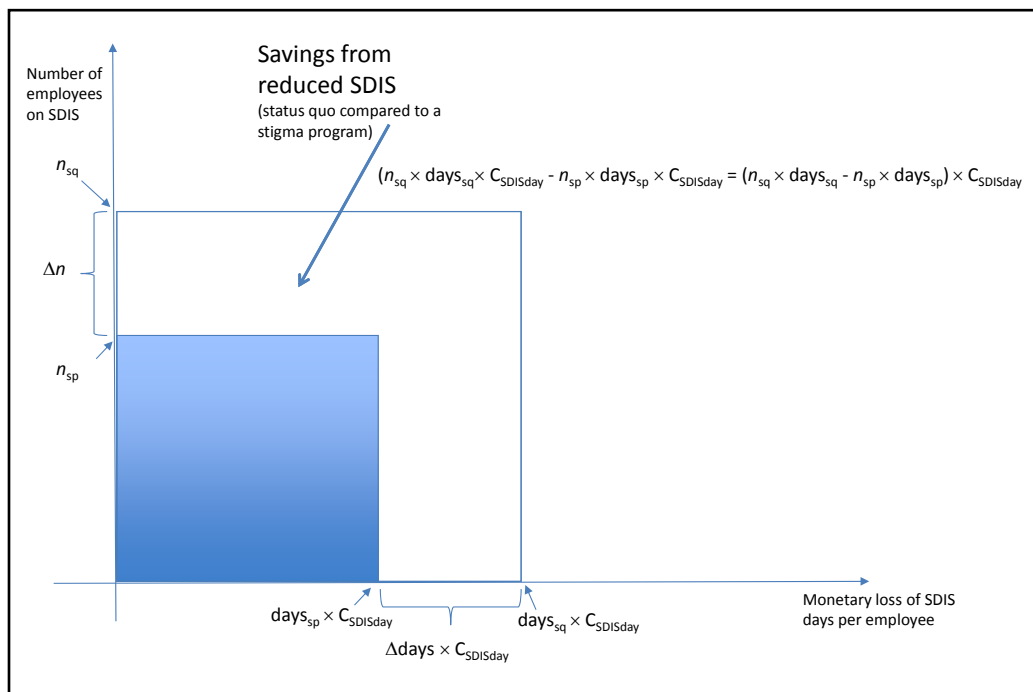
$$(n_{sq} \times \text{days}_{sq} - n_{sp} \times \text{days}_{sp}) \times C_{SDISday} = C_p$$

Using estimates from the literature (Table 1) for n_{sq}, days$_{sq}$, $C_{SDISday}$, and C_p, the 2-way sensitivity analysis focuses on the unknown n_{sp} and days$_{sp}$. By using the fact that

$$n_{sp} = n_{sq} - \Delta n \text{ and days}_{sp} = \text{days}_{sq} - \Delta\text{days},$$

we find

Figure 1 Savings from a stigma program related to fewer and shorter short-term disability (SDIS) episodes

$C_{SDISday}$ = cost of an SDIS day; $days_{sp}$ = days for each SDIS case under the stigma program; $days_{sq}$ = days for each SDIS case under the status quo; n_{sp} = number of SDIS cases under the stigma program; n_{sq} = number of SDIS cases under the status quo

$$n_{sq} \times days_{sq} - (n_{sq} - \Delta n) \times (days_{sq} - \Delta days) = C_p / C_{SDISday}$$

This equation can be solved for the unknown Δn as a function of the known estimates and the unknown $\Delta days$. The resulting formula is

$$\Delta n = (C_p / C_{SDISday} - n_{sq} \times \Delta days) / (days_{sq} - \Delta days).$$

By applying the estimates from the literature, the formula for the 2-way sensitivity analysis is

$$\Delta n = (\$41\,000 / \$273 - 21 \times \Delta days) / (65 - \Delta days)$$

or

$$\Delta n = (\$150 - 21 \times \Delta days) / (65 - \Delta days)$$

Figure 2 contains a graph of the break-even solution.

Results

Figure 1 shows the potential benefits (in monetary units) of adopting a stigma program. The fully shaded rectangle represents the dollar value of SDIS days lost under a stigma program ($n_{sp} \times days_{sp} \times C_{SDISday}$). The difference between this and the amount lost under the status quo is illustrated by the outer white rectangle.

$$\text{This area} = (n_{sq} \times days_{sq} - n_{sp} \times days_{sp}) \times C_{SDISday}$$

From Figure 1, this can be written as

$$[n_{sq} \times days_{sq} - (n_{sq} - \Delta n) \times (days_{sq} - \Delta days)] \times C_{SDISday}$$

Break even occurs when this area equals C_p. In other words, when a stigma program's cost in relation to the cost of an SDIS day is

$$(C_p/C_{SDISday}) = n_{sq} \times days_{sq} - (n_{sq} - \Delta n) \times (days_{sq} - \Delta days),$$

the program pays for itself. From the literature, we take $n_{sq} = 21$, $days_{sq} = 65$ days, $C_p = \$41\,000$ and $C_{SDISdays} = \$273$. This means if a stigma program can reduce the number of SDIS cases related to mental illness by 2 ($\Delta n = 2$) and the duration of each of these SDIS episodes by 1 day ($\Delta days = 1$), the Savings and the Cost will be equal (the definition of break even in this context).

Figure 2 traces all of the combinations of Δn and $\Delta days$ necessary for a stigma program to break even. When $\Delta days = 0$, $\Delta n = 150/65 \cong 2.3$. In contrast, if $\Delta n = 0$, then $\Delta days = 150/21 \cong 7$. Although appearing to show a line, Figure 2 is a curved frontier. That is, the slope varies depending on the value of $\Delta days$, as the slope $\equiv d\Delta n/d\Delta days = -1215/(\Delta days - 65^2)$. For example, the slope in Figure 2 is about $-1215/4225 \cong -0.29$ when $\Delta days = 0$ and $-1215/3364 \cong -0.36$ when $\Delta days = 7$. This means the trade-offs are different at the extremes, and the magnitudes of the trade-offs change along the frontier.

Discussion

Figure 1 illustrates that it is possible for a stigma program to break even. The exact performance specification required to break even depends on factors that include the program cost, an SDIS claim cost, as well as stigma program performance metrics, such as reduction in the number of employees going on SDIS leave and SDIS duration. Using

Figure 2 Conditions to break even for a stigma program related to fewer and shorter short-term disability (SDIS) episodes
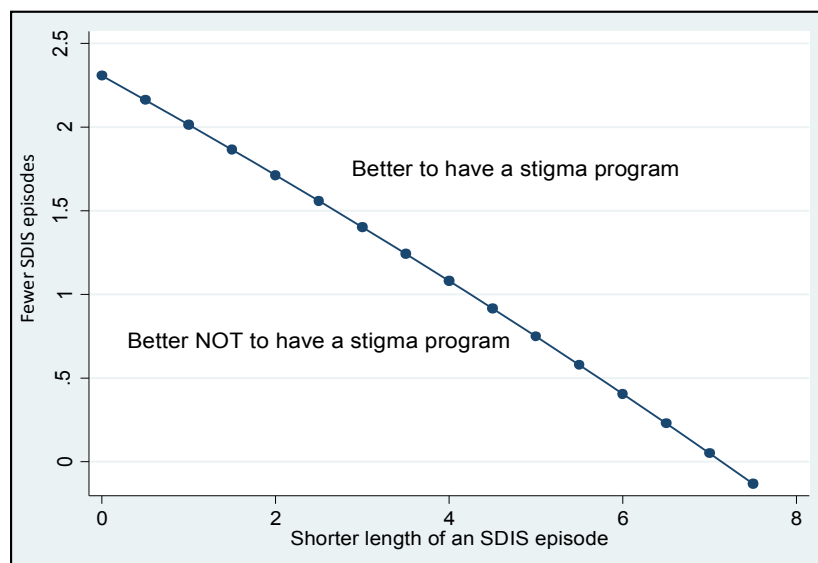
estimates from the literature, this analysis shows that a stigma program can provide value added even if there is no reduction in the quantity of SDIS episodes. In an organization of 1000 employees, to break even, a stigma program with no reduction in the length of an SDIS leave would need to prevent at least 2.5 SDIS claims. Or, a stigma program could break even with no reduction in the number of SDIS claims if it is able to reduce SDIS episodes by at least 7 days. Different scenarios yield different conclusions. For example, Figure 2 shows that a stigma program with a 2-case reduction in SDIS episodes coupled with a 2-day reduction in SDIS duration would pay for itself.

The conclusion about whether an organization should adopt a stigma program rests on its particular context. Any organization faced with a choice of programs in which to invest should examine whether it is getting value from its investment. A stigma program would be no exception. Figure 1 illustrates the types of benefits a company could expect (for example, shorter SDIS duration, fewer employees on SDIS, or both). Evaluation results could confirm that these benefits have materialized. Future research could enhance our simple model to explore additional complexities (for example, if only a certain percentage of workers are affected by the stigma program, there is little stigma in the workplace or there is an effective and successful disability management program in place) and other outcomes that could affect program costs.

Conclusion

In our paper, the possibility that a stigma program could break even was explored. Figures 1 and 2 illustrate the circumstances under which this occurs. While in most cases the required reductions seem modest, the real test occurs once a stigma program is piloted and evaluated in a

real-world setting. Modelling results, like the ones presented in our paper, provide information to help occupational health payers become prudent buyers in the mental health market place.

Acknowledgements

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