

Anna Baran^{1*}, Paweł Kropiwnicki²

Advantages and pitfalls of the Swedish National Program for Suicide Prevention 2008

Zalety i wady szwedzkiego krajowego programu zapobiegania samobójstwom z 2008 roku

¹ Mid-Sweden Network for Suicide Prevention, Sweden

² Klinika Psychiatrii Młodzieżowej Uniwersytetu Medycznego w Łodzi, Poland

* PhD student at Department of Adolescent Psychiatry, Medical University of Łódź, Poland.

Correspondance: Anna Baran, os. Tysiąclecia 8/51, 31-604 Kraków, Poland, tel.: +46 707 898 517 (Sweden), +48 793 961 381 (Poland), e-mail: annabaran00@gmail.com

Abstract

Introduction: The World Health Organization report (2014) recommends the introduction of national programs for suicide prevention. However, the research on their effectiveness is scarce. As a result, policy makers do not have sufficient data for their decisions on the appropriate level of investment in suicide prevention. It is of great importance to know whether the introduction of a national prevention program results in a reduction in suicide rates, and if so, in what age groups and over what period of time after the announcement of the program. Sweden introduced the first suicide prevention program in 1995. It was then modified in 2008, and most recently in 2015. **Objectives:** The aim of this study was to answer the question about the impact of the suicide prevention program in Sweden (2008) on the total suicide rate as well as the age- and gender-specific suicide rates in the subsequent years. **Material and methods:** The study provides the overview of the suicide prevention program and suicide rates in Sweden in males and females, in the age groups 0–24, 25–44, 45–64 and over 65, 1, 3 and 6 years before and after the introduction of the national program for suicide prevention. The study presents the statistical analysis of changes in average suicide rates following the announcement of the Swedish National Program for Suicide Prevention 2008 with reference to chosen periods. **Conclusions:** The Swedish National Program for Suicide Prevention did not result in the reduction of suicide rates in the year after its introduction, whereas suicide rates decreased in all groups, except for the youth (under 24 years old), in 2009–2011 and 2009–2014.

Key words: suicide prevention, national program, Sweden, suicide rate, effectiveness, program evaluation

Streszczenie

Wstęp: Choć raport Światowej Organizacji Zdrowia (2014) zaleca wprowadzenie krajowych programów zapobiegania samobójstwom, niewiele jest badań nad ich efektywnością. W rezultacie decydenci nie mają wystarczających danych do podejmowania decyzji w sprawie odpowiedniego poziomu finansowania inwestycji mających na celu zapobieganie samobójstwom. Musimy wiedzieć, czy wprowadzenie narodowego programu zapobiegania prowadzi do redukcji liczby samobójstw, a jeśli tak, to w jakich grupach wiekowych i w jakim czasie po ogłoszeniu programu. Szwecja wprowadziła pierwszy program zapobiegania samobójstwom w 1995 roku, następnie modyfikowała go w 2008, a ostatnio w 2015 roku. **Cel badania:** W badaniu starano się uzyskać odpowiedź na pytanie dotyczące wpływu szwedzkiego programu zapobiegania samobójstwom z 2008 roku na liczbę samobójstw w kolejnych latach w zależności od wieku i płci. **Materiał i metody:** Badanie przedstawia przegląd programu zapobiegania samobójstwom i wskaźników samobójstw u mężczyzn i kobiet w Szwecji w grupach wiekowych 0–24, 25–44, 45–64, ponad 65 lat w ciągu roku, 3 oraz 6 lat przed i po wprowadzeniu krajowego programu zapobiegania samobójstwom. Zaprezentowano analizę statystyczną zmian uśrednionego wskaźnika samobójstw po ogłoszeniu szwedzkiego krajowego programu zapobiegania samobójstwom w 2008 roku w odniesieniu do wybranych okresów. **Wnioski:** Szwedzki krajowy program zapobiegania samobójstwom nie spowodował zmniejszenia liczby samobójstw w ciągu roku po jego wprowadzeniu, natomiast wskaźnik samobójstw zmniejszył się we wszystkich grupach z wyjątkiem młodzieży (poniżej 24. roku życia) w latach 2009–2011 i 2009–2014.

Słowa kluczowe: prewencja samobójstw, program narodowy, Szwecja, wskaźnik ryzyka samobójczego, efektywność, ewaluacja programu

INTRODUCTION

Suicide is a significant public problem, accounting for approximately 1,200 deaths yearly in Sweden. The cost of suicides in 2014 was estimated at 9 billion Swedish crowns (SEK) of indirect costs (loss of the quality-adjusted life-years, QALYs) and 46–60 million SEK of direct costs (costs of transport, treatment, investigation). High costs are associated mainly with the loss of QALYs; in 2014 more than 38,000 QALYs were lost because of suicide (Swedish Civil Contingencies Agency, 2015). Moreover, about 3,000 men (64 per 100,000 people) and 4,800 women (102 per 100,000 people) are treated each year for at least one night in hospital because of injuries caused by self-destructive behaviour (Swedish Civil Contingencies Agency, 2015).

In the WHO (World Health Organization) Mental Health Action Plan 2013–2020, WHO Member States have committed themselves to work towards the global target of reducing the suicide rate in countries by 10% by 2020 (World Health Organization, 2013). In 2014, the WHO presented the report with recommendations for governments and policy-makers (World Health Organization, 2014). The Scandinavian countries have a long tradition of national suicide prevention programs. Finland (1993) was the first country in the world to introduce a comprehensive national strategy for suicide prevention across sectors and at multiple levels. Norway introduced their national program in 1994, and Sweden in 1995 (De Leo and Evans, 2003). The evaluation of the national suicide prevention programs (1980–2000) in 21 OECD nations showed that since the nationwide programs were initiated, in some countries (e.g. in Sweden), the number of suicides decreased by 140 per year on average (Matsubayashi and Ueda, 2011).

In 2005, the government ordered the Swedish Institute of Public Health and the Swedish National Board of Health and Welfare to develop proposals for policies and measures needed for the continuation of the national program for suicide prevention. They were created in consultation with the NASP (National Center for Suicide Research and Mental Ill-Health). This included proposals for population-oriented strategies and actions for state agencies, counties and municipalities (Swedish National Board of Health and Welfare and Swedish National Public Health Institute, 2006). In June 2008, the program was approved by the parliament. The program recommended nine strategies (Swedish Parliament, 2008). Some suicide preventive goals and activities have been evaluated e.g. Mental Health First Aid (MHFA) (Svensson and Hansson, 2014) and the investment in mental healthcare in the years 2007–2011 (The Agency of Public Management, 2012). Nevertheless, there is scarce research on effectiveness of national suicide prevention programs (Department of Health, 2015; Mann *et al.*, 2005; Matsubayashi and Ueda, 2011; World Health Organization, 2014). In 2014, the WHO proposed criteria for evaluation, as the lack of research and standards for evaluation

of national programs for suicide prevention make it difficult for policy-makers to take evidence-based decisions on the necessary investment in suicide prevention.

OBJECTIVES

The aim of this study was to answer the question about the impact of the comprehensive suicide prevention program in Sweden (2008) on the total suicide rate as well as the age- and gender-specific suicide rates in the subsequent years.

MATERIAL AND METHODS

The Swedish government published an official document with nationwide strategies in 2008, and this year will be considered the index-year in this study. The national program for suicide prevention (2008) as well as the WHO guidelines (World Health Organization, 2014) are presented. The result of the program depends on the implementation of its strategies. This study briefly summarises the evaluation of these strategies. Data from the National Board of Health and Welfare were used to calculate the average suicide rates for the following periods of time: 1) one year before (2007) and one year after the index-year (2009), 2) three years before (2005–2007) as well as three years after the index-year (2009–2011), 3) six years before (2002–2007) and six years after the index-year (2009–2014). The average suicide rate for 15 groups (males, females and both sexes under 24 years old, 25–44, 45–64, over 65 years old and 0–65+ age group) was calculated. Trends were calculated via linear regression and indicate the direction and magnitude of the slope created by rates in the 6-year period. The direction (upward or downward) is indicated by the presence of a + or - while the value of the slope indicates the magnitude or the trend. *T*-values indicate whether the change in average suicide rates or slopes are significant ($p < 0.05$) or non-significant (ns). In this model, a statistically significant reduction in the slope of post-implementation suicide mortality trends as compared to the pre-implementation suicide mortality trends is considered an indicator of a positive impact of the national suicide prevention program.

RESULTS

The launching of the National Suicide Prevention Program in Sweden in 2008 was followed by an increase in national suicide rates in all studied age groups (0–65+, 0–24, 25–44, 45–64 and 65+) in 2009. Suicide rates increased from 12.31 in 2007 to 12.7 in 2008 and to 13.34 in 2009. The total average suicide rate three years after the introduction of the program (2009–2011) decreased from 12.99 (in 2005–2007) to 12.41. The total average suicide rate six years after the introduction of the program (2009–2014) decreased (from 12.9 to 12.3) in comparison to 2002–2007. The reduction of the suicide rate was observed in age groups above the age of 25 three and six years after the introduction of the national

Total	2008	2007	2009	Diff	2005–2007	2009–2011	Diff	2002–2007	2009–2014	Diff
0–65+	12.69	12.31	13.34	1.03	12.99	12.41	-0.59	12.9	12.33	-0.57
0–24	5.09	4.08	5.04	0.96	4.34	4.61	0.26	4.26	4.66	0.39
25–44	12.91	13.31	13.60	0.29	13.24	12.69	-0.55	13.24	12.42	-0.82
45–64	17.58	18.17	20.02	1.85	18.83	18.47	-0.36	18.62	18.11	-0.52
65+	18.01	16.05	17.15	1.10	18.65	18.33	-0.32	18.63	16.53	-2.10
Female										
	2008	2007	2009	Diff	2005–2007	2009–2011	Diff	2002–2007	2009–2014	Diff
0–65+	6.79	7.06	7.56	0.50	7.92	6.93	-1.00	7.5	7.15	-0.40
0–24	3.29	2.79	3.40	0.61	3.29	2.86	-0.43	2.92	2.96	0.04
25–44	7.34	7.94	7.17	-0.77	8.41	7.11	-1.30	7.97	7.21	-0.76
45–64	9.09	10.55	11.74	1.19	11.47	10.07	-1.40	10.93	10.57	-0.36
65+	8.25	7.58	8.74	1.16	9.44	8.58	-0.86	9.36	8.77	-0.59
Male										
	2008	2007	2009	Diff	2005–2007	2009–2011	Diff	2002–2007	2009–2014	Diff
0–65+	18.65	17.63	19.17	1.54	18.14	17.93	-0.21	18.35	17.54	-0.81
0–24	6.80	5.30	6.59	1.29	5.34	6.26	0.92	5.55	6.27	0.72
25–44	18.26	18.47	19.77	1.30	17.89	18.05	0.16	18.31	17.43	-0.88
45–64	25.93	25.68	28.17	2.49	26.07	26.75	0.68	26.19	25.53	-0.66
65+	30.40	26.94	27.68	0.74	30.62	25.67	-4.95	30.83	25.96	-4.87

Tab. 1. Changes in average suicide rates following the announcement of the Swedish National Program for Suicide Prevention 2008

program. The average suicide rate in the youth increased in the young male population (0–24 years old) three and six years after the announcement of the national suicide prevention program. The average suicide rate in Sweden was lower after six years of implementation than after one and three years, but this trend was not maintained in the age

group under 24. The group that showed the most positive effect of the national program was the elderly (Tab. 1). There was a significant change in the suicide mortality trend among males in the group 65+ during the six years following the introduction of the national suicide prevention program. Non-significant changes in slope (from positive to negative)

Total (age group)	Average rate and 95% CI for 6 years before	Average rate and 95% CI for 6 years after	Trend (slope and SE) for 6 years before	Trend (slope and SE) for 6 years after	Difference between slopes [t-value and (p)]
0–24	4.26 (3.80–4.72)	4.66 (4.22–5.09)	0.20 (.18)	0.93 (.17)	0.48 ns
25–44	13.24 (12.93–13.55)	12.44 (11.55–13.33)	-0.89 (.12)	0.07 (.35)	-0.13 ns
45–64	18.62 (17.59–19.66)	18.11 (16.76–19.47)	0.21 (.40)	0.38 (.53)	0.07 ns
65+	18.63 (17.06–20.20)	16.53 (15.40–17.67)	-0.98 (.61)	-0.72 (.44)	-1.09 ns
0–65+	12.90 (12.39–13.41)	12.34 (11.69–12.99)	-0.23 (.20)	0.98 (.25)	-0.45 ns
Males					
0–24	5.55 (4.73–6.37)	6.27 (5.82–6.72)	0.41 (.32)	0.85 (.17)	-0.26 ns
25–44	18.31 (17.44–19.18)	17.46 (16.16–18.75)	0.29 (.34)	1.65 (.50)	0.12 ns
45–64	26.19 (24.75–27.62)	25.54 (23.12–27.95)	-0.15 (.56)	-1.04 (.06)	0.75 ns
65+	30.83 (28.52–33.13)	25.96 (23.79–28.14)	-1.34 (.90)	-1.49 (.85)	2.41 (p = .02436)
0–65+	18.35 (17.55–19.15)	17.56 (16.45–18.66)	0.39 (.31)	0.34 (.43)	0.68 ns
Females					
0–24	2.92 (3.6–2.23)	2.96 (2.51–3.40)	0.68 (0.27)	0.41 (.17)	-0.72 ns
25–44	7.97 (7.21–8.73)	7.22 (6.34–8.10)	0.41 (.29)	0.03 (.34)	0.36 ns
45–64	10.93 (9.88–11.98)	10.57 (9.19–11.96)	0.91 (.41)	-0.15 (.54)	-1.22 ns
65+	9.36 (8.16–10.56)	8.79 (8.03–9.54)	0.07 (.47)	0.92 (.29)	-0.41 ns
0–65+	7.55 (6.88–8.22)	7.16 (6.64–7.67)	0.86 (.26)	-0.59 (.20)	-1.47 ns

Tab. 2. Changes in average suicide rates and trends six years before and six years after the announcement of the Swedish National Program for Suicide Prevention 2008

were observed in the group of females aged 45–64 and 0–65+. Male (0–24, 25–44 and 0–65+) and female (0–24, 25–44 and 65+) rates continued the upward trend evident in the years preceding the national program implementation. This analysis suggests that national suicide prevention

program have had little or no impact on reducing suicide rates, with the exception of elderly males (65+) (Tab. 2). Figs. 1–3 show the rates of suicide for all age groups, adults 25–44 and 45–64, as well as elderly (65+), in the years pre- and post-announcement of the national suicide prevention

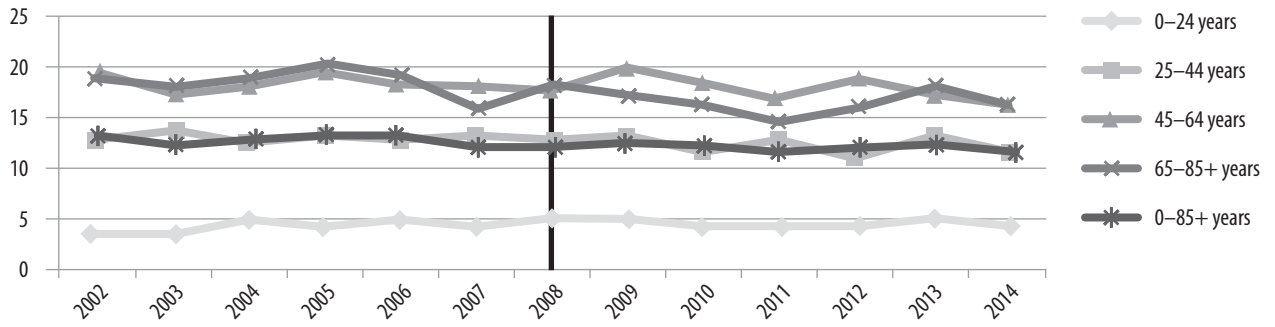


Fig. 1. Suicide rates before and after the implementation of national suicide prevention program (2008) in Sweden. Males and females

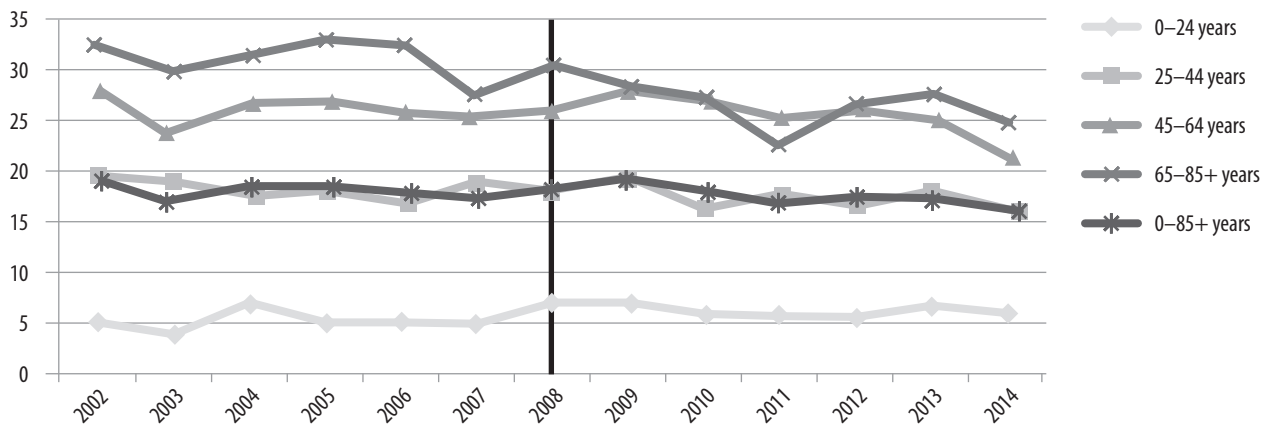


Fig. 2. Suicide rates before and after the implementation of national suicide prevention program (2008) in Sweden. Males



Fig. 3. Suicide rates before and after the implementation of national suicide prevention program (2008) in Sweden. Females

The implementation of the national suicide prevention program (2008) was preceded by decreases in suicide rates among males and females. The most substantial decrease was noted in the age group 65–85+, and this trend continued after the introduction of the national suicide prevention program. Rates in young males and females appeared to continue the upward trend that was evident in the years preceding the national strategy implementation. This analysis suggests that national suicide prevention strategies have had little or no impact on reducing suicide rates in the age group 0–24.

program in Sweden. The only group where the change was significant is the elderly males (65+) (Figs. 1–3).

Some more information about the program as well as its implementation can help us understand the above findings. The national program for suicide prevention recommended nine strategies (Swedish Parliament, 2008). The analysis of the program in comparison to the WHO guidelines shows that this program follows these recommendations with a few exceptions, e.g. it does not mention the role of the mass media in suicide prevention. The WHO recommendations, the program as well some challenges are presented in Tab 3.

In the period 2007–2011, the Swedish government has increased the spending on psychiatry. A total of 3.7 billion SEK was spent on various projects. Extensive resources were invested in the training of mental health care professionals, including the obligatory introduction of standards of care and management of a patient at risk for suicide in all counties. The introduction of the Lex Maria regulation (Swedish National Board of Health and Welfare, 2005) resulted in an analysis of every suicide that was considered to be related with the health care. One of the specific objectives was to reduce the number of suicides within four weeks of contact with the health care by 30%. The report, which was published in autumn 2012, found that this objective had not been achieved. The number of suicides within four weeks after contact with the health care was estimated at 457 (38%) in 2006 and 451 in 2010 (40%) (The Agency of Public Management, 2012). A national summary concerning suicides committed in 2006–2008

showed that some kind of suicide risk assessment had been made in about a half of the cases (Swedish National Board of Health and Welfare, 2010), and that this had changed to the better as a result of educational efforts. The latest report on suicide risk assessment shows that there are no instruments that have sufficient reliability to predict suicidal behaviour (Swedish Agency for Health Technology Assessment and Assessment of Social Services, 2015a). In 2010, the Swedish government invested in the pilot study of a Gatekeeper program called MHFA (Mental Health First Aid). The MHFA program was welcomed by NGOs and professionals. This program continues, and modified versions for professionals working with the youth and elderly have been recently introduced. The aim of all Gatekeeper programs is to help people in crisis. They are recommended by the WHO (World Health Organization, 2014). The Gatekeeper programs in the Norwegian Army (Mehlum and Schwebbs, 2000) and the US Air Force (Knox *et al.*, 2003) have reported lowering suicide rates.

DISCUSSION

The results of this study show that the Swedish National Program for Suicide Prevention 2008 was of limited effectiveness. The program was challenged by the economic crisis in 2008–2010 which resulted in an increase in suicide rates in many countries (Fountoulakis *et al.*, 2014; Nordt *et al.*, 2015). At the same time, a nadir in suicide rates was observed in 2007 in Sweden and in some other European countries (Fountoulakis *et al.*, 2014). The fact that

WHO guidelines	Swedish National Program for Suicide Prevention	Challenges
Surveillance and improved data quality	Analysis of suicide cases which occurred within the healthcare system and 28 days after discharge from the healthcare system	Improvement in monitoring the system for suicide attempts, suicides as well as risk factors and suicide preventive interventions
Means restriction	Reducing the availability of means to commit suicide, minimising alcohol consumption in target and high-risk groups	Developing systems reducing suicides by hanging and intoxication
Engage the media	The program does not mention the role of the media in suicide prevention	Engagement of the media, incl. the social media
Access to services	Promoting better life opportunities in order to support the groups that are most at need	More specific formulation of necessary actions and their implementation
Training and education	Raising competence of key health care and prison staff who care for people with suicidal problems	Education of healthcare professionals, social care managers, patients and their relatives
Improved quality of care	Supporting medical, psychological and psychosocial services in suicide prevention	Engagement of patients, relatives, managers and professionals
Crisis intervention	Educating gatekeepers about effective management of persons with suicide risk	Introducing crisis intervention knowledge that decreases the suicide rate
Postvention	Supporting voluntary organizations	National and regional financing and education
Awareness	Spreading knowledge about evidence-based methods of reducing suicide	Introducing structures for spreading knowledge
Oversight and coordination	NASP (National Center for Suicide Research and Mental Ill-Health)	Improving the system of financing, coordination, evaluation and research
Engage key stakeholders	The program does not mention key stakeholders	Strengthen the engagement and responsibility of key stakeholders
Change attitudes and beliefs	Educating gatekeepers about effective management of persons with suicide risks	Destigmatisation of mental and social care institutions, and their interventions
Conduct evaluation and research	Analysis of suicide cases which occurred within the healthcare system and 28 days after discharge from the healthcare	Adjusting the evaluation and research systems to the needs of the society
A comprehensive national suicide preventive strategy	National program for suicide prevention (2008), the changes suggested by The Public Health Agency (2015)	Implementing national programs at national, regional and local levels

Tab. 3. The WHO guidelines (2014) and the main strategies of the Swedish National Program for Suicide Prevention 2008

despite these disturbances, the average suicide rate for the whole population decreased slightly 3 years and 6 years after the announcement of the program, needs to be emphasised. This decrease was mostly due to the decrease in suicide rates in the elderly males (65+). It was the only group where the changes in suicide rates in the 6-year period were significant. This finding is consistent with a study by De Leo and Evans (2003), who also found that the elderly are more likely to be affected by the implementation of national programs (De Leo and Evans, 2003). This study does not confirm the results of the study from 1980–2000 (Matsubayashi and Ueda, 2011) which concludes that suicide prevention programs have a positive impact on suicide rates among male populations younger than 25. An increase in the number of suicides in this age group may depend on rapid development of new technologies that have dramatically increased the access to information of negative content and the risk of a Werther effect. For young people, challenged by storms of adolescence, having difficulties in finding work and/or motivation to further education, it might have increased a sense of meaninglessness, anxiety, frustration and hopelessness, which altogether is a fertile ground for the development of self-destructivity. Prevention programs should be better adjusted to the needs of young people. It is important to emphasise the role of resilience (Wasserman *et al.*, 2015; Swedish Agency for Health Technology Assessment and Assessment of Social Services, 2015b).

The limited effects of the Swedish program (2008) could also result from the characteristics of the program itself and/or problems with its implementation. There were some differences between the recommendations of the WHO (2014) and the program (2008). One of the differences was omitting the role of the mass media in suicide prevention. During an economic crisis, some people who have lost their jobs do not feel well, while others cannot cope with the situation and seek refuge in the healthcare system (Mäki and Martikainen, 2007; Swedish Social Insurance Agency, 2012; The Public Health Agency, 2015). Reducing the availability of psychiatric help in crisis, especially in regions with higher unemployment, can result in an increase in suicide rates (Karošec Jagodic *et al.*, 2012, 2013). Moreover, there are some contradictory findings about the influence of different policies on the mental health care. In England, Gunnell *et al.* have found no evidence that policy changes designed to reduce the risk of post-discharge suicide resulted in a reduction of deaths (Gunnell *et al.*, 2012). The main policy was that everyone with a severe mental illness or a history of self-harm in the previous 3 months should be followed up in the community within 7 days. In another study from England, the researchers have observed that the implementation of the recommendations was associated with lower suicide rates. The provision of 24 h crisis care was associated with the biggest fall in suicide rates (While *et al.*, 2012). Nevertheless, the medical model of suicide prevention has some limitations, and it needs to be completed with other interventions. Moreover, suicide victims are characterised

by reluctance in seeking help during a suicidal crisis as, on average, only about 45% of suicide victims have contact with mental health or primary care providers in a month prior to suicide (Luoma *et al.*, 2002). The national program needs to be adjusted to the needs of the non-contact group (Ying and Chang, 2009).

This study has some limitations. First, it does not investigate how particular components of the prevention program affect suicide rates, with the exception of the mental healthcare and MHFA. The relative impact of different strategies on national suicide rates is important for planning but difficult to estimate (Mann *et al.*, 2005). Ideally, we should track all strategies of national suicide prevention policies and examine their impact on suicide rates (Matsubayashi and Ueda, 2011). Second, the study focuses exclusively on average suicide rates. It does not take into account the potential effect of the sociodemographic variables. Ideally, suicide prevention programs should be able to protect vulnerable populations, even in times of crises, and to be optimally adjusted to the sociodemographic conditions of the region.

CONCLUSION

Suicide is a result of complex interactions of various risk factors and protective factors. Consequently, a combination of suicide preventive interventions, addressing different risk factors at various levels in different populations, is required to be included in national suicide prevention programs. Since the introduction of the national program in 2008, suicide rates have declined over the years both for males and females in all age groups, with the exception of the 0–24 age group in which suicide rates have increased. The Swedish national program might have decreased the negative effects of the economic crisis of 2008–2010. Nevertheless, further research should be able to reveal which parts of the program play the most important role in different age groups, and how they can be improved so that they become more effective in reducing suicide rates in the young and working population in the times of constant changes and crises. It is challenging to take advantage of the experience of the past and that of other countries in building and implementing national suicide prevention programs. Hopefully, we will have some breakthroughs in the future that will support more comprehensive data collection which will facilitate building the research infrastructure so that various interventions could be tested efficiently and translated to effective suicide prevention interventions.

Conflict of interest

The authors do not report any financial or personal relationships with other persons or organizations that could adversely affect the content of the publication and lay claim to this publication.

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