

## Decrease in Suicide Rates After a Change of Policy Reducing Access to Firearms in Adolescents: A Naturalistic Epidemiological Study

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The use of firearms is a common means of suicide. We examined the effect of a policy change in the Israeli Defense Forces reducing adolescents' access to firearms on rates of suicide. Following the policy change, suicide rates decreased significantly by 40%. Most of this decrease was due to decrease in suicide using firearms over the weekend. There were no significant changes in rates of suicide during weekdays. Decreasing access to firearms significantly decreases rates of suicide among adolescents. The results of this study illustrate the ability of a relatively simple change in policy to have a major impact on suicide rates.

Suicide is the third most common cause of death among children and adolescents aged 10 to 24 years in the United States. Around the world, use of firearms is a common means of suicide, ranging from 38% of all suicides in Europe (Perret, Abudurehman, Perret-Catipovic, Flomenbaum, & La Harpe, 2006) to 60–70% in the United States (Shields, Hunsaker, & Hunsaker, 2006; Singh & Lathrop, 2008). In particular, the availability of firearms has been shown to have an effect on suicide rates among adolescents and young

men (Brent et al., 1991; Brent et al., 1993; Grossman et al., 2005; Kellermann et al., 1992; Miller, Azrael, & Hemenway, 2002; Miller, Hemenway, & Azrael, 2004; Miller, Lippmann, Azrael, & Hemenway, 2007; Shemassa, Rogers, Spaulding, & Roberts, 2004; Sloan, Rivara, Reay, Ferris, & Kellermann, 1990). Further, more stringent regulation of access to firearms has been shown to reduce overall suicide rates (Kellermann et al., 1992; Lewis, Hawton, & Jones, 1997; Marzuk et al., 1992) and rates of suicide by firearms (Caron, 2004; Carrington & Moyer, 1994; Goldney, 2006; Haw et al., 2004; Kapusta, Etzersdorfer, Krall, & Sonneck, 2007; Loftin, McDowall, Wiersma, & Cottey, 1991; Ludwig & Cook, 2000; Rich, Young, Fowler, Wagner, & Black, 1990), particularly among young men (Beautrais, Fergusson, & Horwood, 2006; Bridges, 2004; Cantor & Slater, 1995; Cheung & Dewa, 2005; Leenaars, Moksony, Lester, & Wenckstern, 2003; Lester & Leenaars, 1993; Ozanne-Smith, Ashby, Newstead, Stathakis, & Clapperton, 2004; Webster, Vernick, Zeoli, & Manganello, 2004).

The Israeli Defense Force (IDF) is a

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poulation-based army that utilizes mandatory induction to draft all 18–21-year-old adolescents in the country. Approximately 90% of all suicides in the IDF are performed using firearms, and during the years 2003–2005 there were, on average, 28 suicides per year, of which 26.3 were suicides by firearm. Suicide prevention has become a major priority of the IDF Mental Health Department, and considerable efforts have been made to decrease rates of suicide in the military.

As Israel is a relatively small country, many IDF soldiers go home over the weekend, and took their weapons with them. The IDF changed its policy in 2006, dictating that soldiers should leave their weapons at their bases when headed home for weekend leave. This policy change was just part of a suicide prevention program that also included dissemination of information regarding suicide prevention, and a declaration by the IDF chief of staff that suicide prevention was one of the major goals of the IDF for that year. We describe here the impact of this policy, which reduced availability of firearms while on leave, on rates of suicide in soldiers aged 18 to 21.

Previous studies have suggested that although restricted access to firearms is associated with decreased rates of suicide, the reduction in the rates of suicide by firearms is offset by increases in suicide by other means, leading to no overall decrease in suicide rates (Cheung & Dewa, 2005; Rich et al., 1990; Sloan et al., 1990). Therefore, we examined the effect of reduced access to firearms on suicide by firearms and total suicide rates. Because the change in policy mostly affected access to firearms on weekends, we also examined changes in rates of suicides on weekends and weekdays separately.

## METHOD

The rates of suicide before and after the change of policy regarding bringing home weapons on leave were compared by independent samples *t* tests, performed separately for total suicide rates, suicides using

firearms, suicide during weekends, and suicide during weekdays. Because the policy change was made in 2006, rates of suicide between the years 2003–2005 were compared to those of 2007–2008.

## RESULTS

The overall rates of suicide before the policy change are in line with rates of suicide in adolescents in this age group (Mann et al., 2005; Perret et al., 2006; Powell, Fingerhut, Branche, & Perrotta, 2000). Following the change in policy total suicide rate decreased by 40%, from an average of 28 per year during 2003–2005 to an average of 16.5 per year in 2007–2008 ( $T = 3.35, p = .04$ ). Most of this decrease in suicide rates was due to a decrease in suicide using firearms over the weekend, from an average of 10 per year (2003–2005) to an average of 3 per year (2007–2008) ( $T = 17.44, p < .001$ ). There were no significant changes in rates of suicide during weekdays.

## DISCUSSION

We found a 40% decline in the number of suicides annually after the change of policy reducing access to firearms during weekends. This is in line with previous studies that have found that restricting access to firearms is effective in decreasing both suicide rates due to firearms and overall suicide rates (Ozanne-Smith et al., 2004; Webster et al., 2004). These data clearly emphasize the effectiveness of decreasing access to firearms on suicide prevention; the 40% decrease in rates of suicide is an achievement unparalleled by any other means of suicide prevention (Mann et al., 2005).

Contrary to previous studies, we did not find a compensatory increase in suicide performed by other means (Cheung & Dewa, 2005; Rich et al., 1990; Sloan et al., 1990). This might indicate that easy access to firearms might increase rates of impulsive suicide attempts, whereas the need to plan, at

least somewhat, other means of suicide might deter some from committing suicide.

These data are limited in that they were collected only in the Israeli military; however, as the IDF is based on a mandatory draft, soldiers in the IDF can be considered to be a population-based sample, and as such

these results should be applicable to other populations of adolescents. The results of this study indicate that decreasing access to firearms can significantly decrease rates of suicide among adolescents, a finding that should encourage policy makers to decrease access to firearms.

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Manuscript Received: July 23, 2009

Revision Accepted: July 23, 2009